Volume II

CENTRAL RESERVOIR REPLACEMENT PROJECT

Draft Environmental Impact Report – Appendices

SCH #2018042078

Prepared for
East Bay Municipal Utility District

November 2019

EAST BAY
MUNICIPAL UTILITY DISTRICT

ESA

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APPENDIX A

Notice of Preparation and Initial Study

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EAST BAY MUNICIPAL UTILITY DISTRICT

NOTICE OF PREPARATION OF
DRAFT ENVIRONMENTAL IMPACT REPORT
CENTRAL RESERVOIR REPLACEMENT PROJECT
EAST BAY MUNICIPAL UTILITY DISTRICT

APRIL 26, 2018

TO: Responsible and Trustee Agencies, Organizations, and Interested Parties

FROM: East Bay Municipal Utility District
375 Eleventh Street, MS 701
Oakland, CA 94607-4240

SUBJECT: Notice of Preparation (NOP) of a Draft Environmental Impact Report for the Central Reservoir Replacement Project

The East Bay Municipal Utility District (EBMUD), acting as lead agency under the California Environmental Quality Act (CEQA), is preparing an environmental impact report (EIR) for the Central Reservoir Replacement Project (Project).

AGENCIES: EBMUD requests your input regarding the scope and content of the environmental information that is germane to your agency's statutory responsibilities in connection with the proposed Project.

ORGANIZATIONS AND OTHER INTERESTED PARTIES: EBMUD requests comments from organizations and interested parties regarding the environmental issues associated with construction and operation of the proposed Project.

PROJECT TITLE: Central Reservoir Replacement Project

PROJECT LOCATION: Central Reservoir is located on a 27-acre site in the City of Oakland, CA. The Project site is bordered by Interstate 580 (I-580) to the north, Ardley Avenue and 23rd Avenue to the west, 25th Avenue and East 29th Street to the south, and the Central Reservoir Recreation Area and Sheffield Avenue to the east (see Figure 1).

PROJECT PURPOSE: The Project will replace the existing open-cut reservoir (108 years old), which has reached the end of its useful life and is under the California Division of Safety of Dams' (DSOD) jurisdiction, with new on-site facilities to ensure long-term reliability and redundancy of the water distribution system, meet existing and future water needs, facilitate repair and replacement of aging infrastructure, and maintain water quality by downsizing the reservoir and replacing it with optimal storage based on projected future demands. The Project will also remove the dam embankments from DSOD's jurisdiction.

PROJECT DESCRIPTION: The Project includes demolition of the existing 154-million-gallon (MG) open-cut reservoir and material storage building; earthwork and subsurface preparation; construction of a reinforced tank foundation, three 17 MG concrete tanks within the existing reservoir basin, valve structure, drainage basin; and abandonment of existing monitoring wells. The Project also includes moving an existing rate control station currently located below ground at the corner of 25th Avenue and East 29th Street onto the Project site. The current access road around the reservoir perimeter would be retained and improved. The Project will also remove vegetation, replace security fencing, and restore and landscape the site following construction. The Project may also include an access driveway to connect the Redwood Day School parking area to Ardley Avenue. Figure 2 shows the conceptual site plan.

POTENTIAL ENVIRONMENTAL EFFECTS: Based on the Initial Study completed for the Project, the following areas of potentially significant environmental impacts will be analyzed in the Draft EIR: Aesthetics, Air Quality, Biological Resources, Cultural Resources and Tribal Cultural Resources, Energy Use, Geology and Soils, Greenhouse Gas Emissions, Hazards and Hazardous Materials, Hydrology and Water Quality, Noise, Recreation, and Transportation and Traffic. Potential cumulative impacts and potential for growth inducement will be addressed; alternatives, including the No Project Alternative, will be evaluated.

PUBLIC REVIEW PERIOD: This NOP is available for public review and comment pursuant to the California Code of Regulations, Title 14, Section 15082(b) for 30 days. The comment period for the NOP begins April 26, 2018 and ends on May 29, 2018. Due to limits mandated by State Law, your response must be sent at the earliest possible date but not later than 30 days after receipt of this notice.

RESPONSES AND QUESTIONS: Responses to or questions regarding this NOP should be directed to:

Aaron Hope, Project Manager
East Bay Municipal Utility District
375 Eleventh Street, MS 701
Oakland, CA 94607-4240
(510) 287-1496
centralreservoir@ebmud.com

CEQA PROCESS: The Draft EIR is planned for publication in summer 2019, with action by EBMUD's Board of Directors expected in winter 2020. Notice will be given of public meetings, including a meeting that will be held during the Draft EIR comment period. At the end of the review and comment process, EBMUD's Board of Directors will determine whether to certify the EIR and approve the Project. The NOP and all CEQA-related documents for this Project will be available for review on the EBMUD website at: www.ebmud.com/central

Xavier Irias | 4-26-18

Xavier J. Irias
Director of Engineering and Construction
East Bay Municipal Utility District

Date

XJI:DJR:ALH:dks
sb18_050_Central Reservoir_NOP

Attachments: Figure 1 Project Location
Figure 2 Conceptual Site Plan

SOURCE: ESRI World Imagery; EBMUD, 2017; ESA, 2017

EBMUD Central Reservoir

Figure 1
Project Location

ESA

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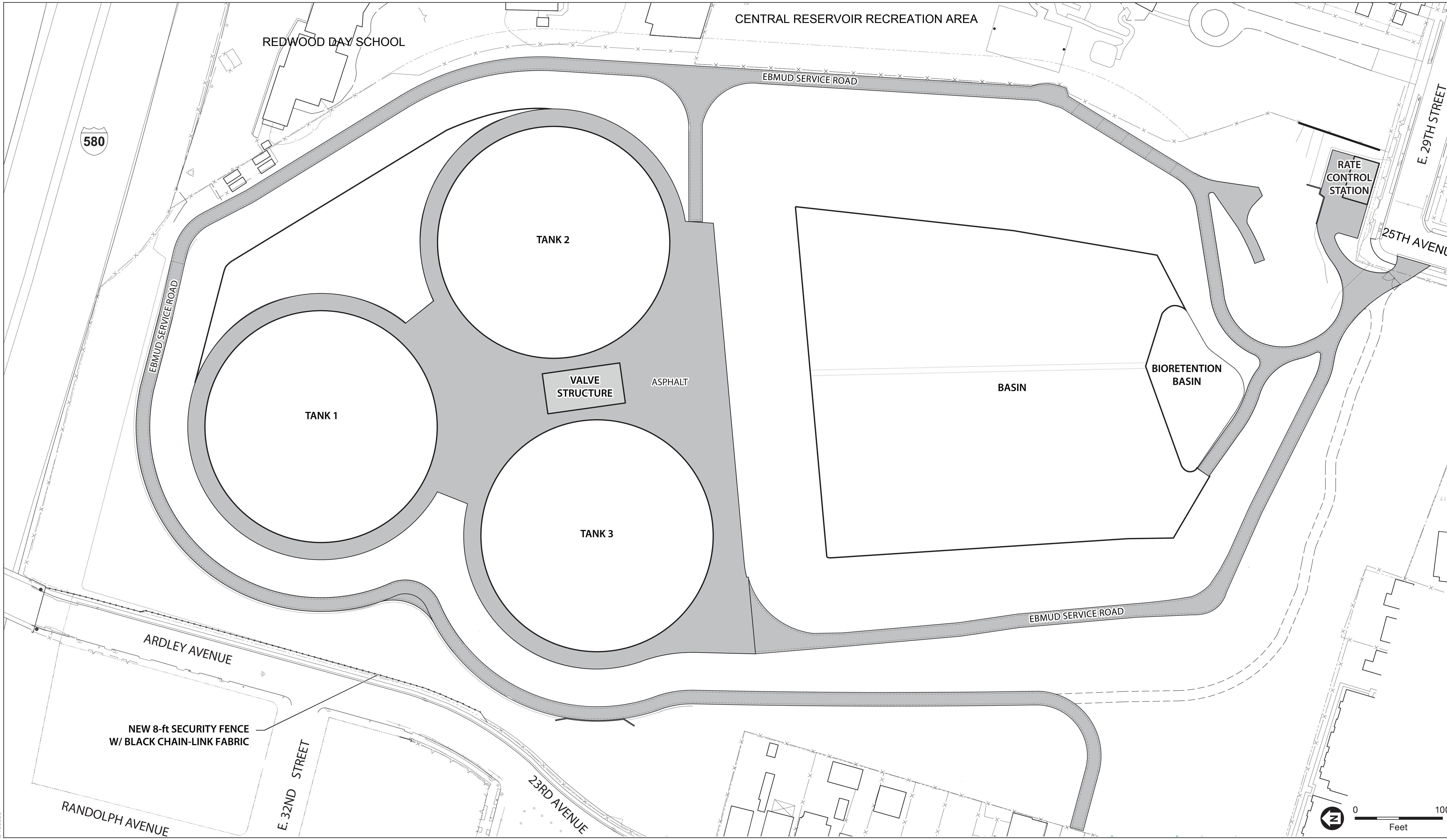


SOURCE: EBMUD, 2018; Muller & Caulfield, 2018

EBMUD Central Reservoir Replacement Project

Figure 2
Central Reservoir Conceptual Site Plan

ESA

East Bay Municipal Utility District
CENTRAL RESERVOIR REPLACEMENT PROJECT
Initial Study

April 2018

East Bay Municipal Utility District
Water Distribution Planning Division – MS 701
375 11th Street
Oakland, CA 94607

Prepared with Assistance from:

Environmental Science Associates
180 Grand Avenue, Suite 1050
Oakland, CA 94612

ENVIRONMENTAL CHECKLIST FORM
(Revised Checklist January 2018)

1.	Project Title:	Central Reservoir Replacement Project
2.	Lead Agency Name and Address:	East Bay Municipal Utility District Water Distribution Planning Division – MS 701 375 11th Street Oakland, CA 94607
3.	Contact Person:	Aaron Hope, Project Manager East Bay Municipal Utility District Water Distribution Planning Division – MS 701 375 11th Street Oakland, CA 94607 (510) 287-1496 www.ebmud.com/central
4.	Project Location:	Central Reservoir is located in the City of Oakland, CA. The Project site is bordered by Interstate 580 (I-580) to the north, Ardley Avenue and 23rd Avenue to the west, 25th Avenue and East 29th Street intersection to the south, and Sheffield Avenue to the east.
5.	Project Sponsor's Name and Address:	East Bay Municipal Utility District Water Distribution Planning Division – MS 701 375 11th Street Oakland, CA 94607
6.	General Plan Designation:	Mixed Housing Type Residential
7.	Zoning:	RM-1 (Mixed Housing-1)

8. Description of Project *(Describe the whole action involved, including, but not limited to later phases of the project, and any secondary, support, or off-site features necessary for its implementation. Attach additional sheets if necessary)*

   The Central Reservoir Replacement Project (Project) includes demolition of the existing 154-million gallon (MG) open cut reservoir, roof, lining, and material storage building, earthwork and subsurface preparation, construction of a cement reinforced tank foundation, construction of three 17 MG concrete tanks within the existing reservoir basin, a valve structure, a drainage basin, and abandonment of existing monitoring wells. The Project would demolish the existing rate control station which is located below ground at the corner of 25th Avenue and East 29th Street. A replacement rate control station would be constructed within the Project site fence line, approximately where the material storage building is currently located. The current access road from Central Reservoir up to and around the reservoir perimeter would be retained and improved. Figure 1 shows the Project location and Figure 2 shows the proposed site plan. The Project also includes removing vegetation, replacement of security fencing, and restoring and landscaping the site following construction. The Project may also include an access driveway to connect the Redwood Day School parking area to Ardley Avenue.

9. Surrounding land uses and setting *(briefly describe project's surroundings)*:

   The Central Reservoir site is surrounded to the west and south by single and multi-family residential homes. The Central Reservoir Recreation Area and Redwood Day School are adjacent to the eastern boundary of the reservoir site. Oakland Heights Nursing and Rehabilitation and the intersection of 25th Avenue and East 29th Street are located to the south of the site, and the north side is bordered by I-580.

10. Other public agencies whose approval is required *(e.g., permits, financing approval, or participation agreement):*

    Table 1 is a preliminary summary of the public agencies from which East Bay Municipal Utility District (EBMUD) may require approval and/or coordination is necessary in order to construct the Project. The EIR will confirm this list based upon input in response to the Notice of Preparation.

Table 1
Other Required Approvals and/or Coordination Necessary for the Project

Agency/ Stakeholder	Type of Jurisdiction	Type of Approval and/or Coordination Necessary
City of Oakland	Local	Encroachment permit for construction within city streets, sidewalk, and Central Reservoir Recreation Area. Approval for use of storm drains and/or sewer lines for dewatering activities.
Division of Safety of Dams	State	Review and approval of plans for removal of the Central Reservoir embankment and monitoring wells.
California Department of Toxic Substances Control (DTSC)	State	Hazardous materials and hazardous waste disposal in California.
California Air Resources Board (CARB)	State	Permit for portable equipment registration.
Regional Water Quality Control Board (RWQCB)	State and Federal	National Pollutant Discharge Elimination System Construction General Permit and Waste Discharge Requirements for dewatering and work within the bed and banks of waters of the U.S. and state.
Pacific Gas and Electric (PG&E)	State	Encroachment permit for relocation of power pole.
Alameda County Public Works	Local	Permit for abandonment of the monitoring wells.

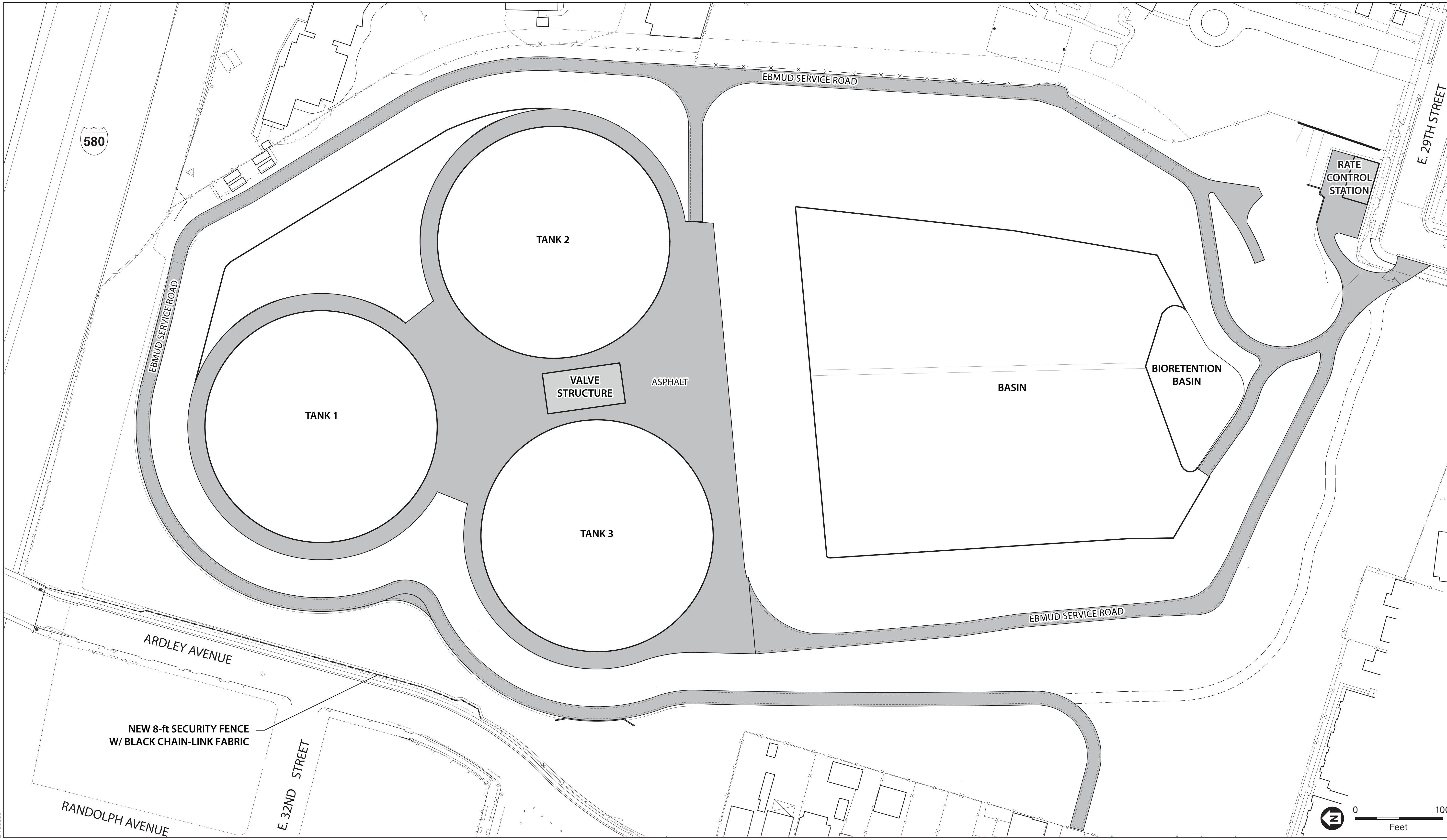
SOURCE: ESRI World Imagery; EBMUD, 2017; ESA, 2017

EBMUD Central Reservoir

Figure 1
Project Location

ESA

Path: U:\GIS\GIS\Projects\16xxxx\D160330_EBMUDCentralRes\03_MXDs_Projects\Fig1_ProjectLocation.mxd, rt 3/14/2018



SOURCE: EBMUD, 2018; Muller & Caulfield, 2018

EBMUD Central Reservoir Replacement Project

Figure 2
Central Reservoir Conceptual Site Plan

ESA

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ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this Project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages. Although it is listed separately in the checklist below, consideration of tribal cultural resources is included within the cultural resources environmental impact discussion section.

☒	Aesthetics	☐	Agriculture and Forestry Resources	☒	Air Quality
☒	Biological Resources	☒	Cultural Resources	☒	Energy Use
☒	Geology/Soils	☒	Greenhouse Gas Emissions	☒	Hazards/Hazardous Materials
☒	Hydrology/Water Quality	☐	Land Use and Planning	☐	Mineral Resources
☒	Noise	☐	Population/Housing	☐	Public Services
☒	Recreation	☒	Transportation/Traffic	☒	Tribal Cultural Resources
☐	Utilities/Service Systems	☒	Mandatory Findings of Significance		

DETERMINATION

On the basis of this initial evaluation:

☐ I find that the Project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☐ I find that although the Project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the Project have been made by or agreed to by the applicant. A MITIGATED NEGATIVE DECLARATION will be prepared.

☒ I find that the Project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the Project MAY have a "potentially significant impact" or "potentially significant unless mitigated" on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the Project could have a significant effect on the environment because all potentially significant effects (a) have been analyzed adequately in an earlier Environmental Impact Report pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier Environmental Impact Report, including revisions or mitigation measures that are imposed upon the Project, nothing further is required.

EVALUATION OF ENVIRONMENTAL IMPACTS

1. A brief explanation is required for all answers except “No Impact” answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A “No Impact” answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the Project falls outside a fault rupture zone). A “No Impact” answer should be explained where it is based on project-specific factors as well as general standards (e.g., the Project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).
2. All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.
3. Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. “Potentially Significant Impact” is appropriate if there is substantial evidence that an effect may be significant. If there are one or more “Potentially Significant Impact” entries when the determination is made, an EIR is required.
4. “Negative Declaration: Less Than Significant With Mitigation Incorporated” applies where the incorporation of mitigation measures has reduced an effect from “Potentially Significant Impact” to a “Less Significant Impact.” The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from Section XVII, “Earlier Analyses,” may be cross-referenced).
5. Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063(c)(3)(D). In this case, a brief discussion should identify the following:
   a) Earlier Analysis Used. Identify and state where they are available for review.
   b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.
   c) Mitigation Measures. For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the Project.
6. Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.
7. Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.
8. This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.
9. The analysis of each issue should identify:
   a) The significance criteria or threshold used to evaluate each question; and
   b) The mitigation measure identified, if any, to reduce the impact to less than significance.

ENVIRONMENTAL IMPACT CHECKLIST

I. Aesthetics **Would the Project:**	**Potentially Significant Impact**	**Less than Significant with Mitigation Incorporated**	**Less than Significant Impact**	**No Impact**
a) Have a substantial adverse effect on a scenic vista?	☒	☐	☐	☐
b) Substantially damage scenic resources, including but not limited to, trees, rock outcropping, and historic buildings within a state scenic highway?	☒	☐	☐	☐
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☒	☐	☐	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☒	☐	☐	☐

DISCUSSION

a. Potentially Significant Impact. The Project site is located in the San Antonio Planning Area of the City of Oakland. The residential neighborhoods surrounding the Project site have distant views of Oakland/Berkeley Hills. Identified as an area of great visual importance in the City of Oakland General Plan, the Oakland Hills may be considered a designated scenic vista (City of Oakland, 1996). The Project could disrupt access to this scenic vista and remove the visual qualities that make the view of the Oakland/Berkeley Hills unique. This impact is considered to be potentially significant and will be described further in the EIR.

b. Potentially Significant Impact. Interstate 580 (I-580) from the San Leandro city limits to State Route 24 in Oakland is a designated state scenic highway (Caltrans, 2017). The Project site is located south and adjacent to I-580 along this designated portion. Fleeting views of the Project would be available to the passing motorists traveling along I-580. The current Central Reservoir facility is not visible to the motorists along I-580 because it is screened from the highway by an existing vegetated berm (EBMUD’s existing auxiliary embankment) and a wall on top of this berm. The Project would include removal of the wall and construction of three concrete tanks within the existing reservoir basin, which would be approximately 22 feet higher than the existing reservoir roof. With removal of the wall, the new tanks would likely be briefly visible to motorists traveling along I-580. Due to the potential change in the views of the Project site from motorists traveling along I-580, this impact is considered to be potentially significant and will be described further in the EIR.

c. Potentially Significant Impact. The Central Reservoir property is visible to the residential neighborhoods located across from the site on Ardley Avenue/23rd Avenue and perpendicular streets (East 31st Street, East 32nd Street, East 30th Street), and to the residential neighborhoods on the corner of 25th Avenue and East 29th Street on the southeast side of the reservoir. The Central Reservoir property is also visible to users of the Central Reservoir Recreational Area and Redwood Day School. The residential properties currently view existing security fencing, landscaping and street trees, the existing reservoir, access road and materials storage building, and distant views of the Oakland/Berkeley Hills in the background. The users of the Central Reservoir Recreational Area and Redwood Day School currently have views of the trees along the perimeter of the reservoir, the roof of the Central Reservoir, and the existing security fencing.

The Project could change the visual character of the site. The existing developed areas would be replaced with new facilities (concrete tanks taller than the existing Central Reservoir, a drainage basin at the southern half of the Project site) and the type and scale of changes could be substantial enough to cause a change in the character of the site from the existing condition. The EIR will provide a detailed evaluation of potential impacts to the existing visual character of the site and its surroundings. This impact is considered to be potentially significant and will be described further in the EIR.

d. Potentially Significant Impact. Construction of the Project may include some nighttime work and use of night lighting. The Project may also include external lighting on the new facilities. The use of lighting during nighttime construction and new lighting associated the Project facilities may adversely affect day or nighttime views in the area. The Project facilities may also include components that create a new source of glare. Due to the addition of external lighting and potential nighttime construction this impact could be potentially significant and will be described further in the EIR.

II. Agriculture and Forestry Resources **Would the Project:**	**Potentially Significant Impact**	**Less than Significant with Mitigation Incorporated**	**Less than Significant Impact**	**No Impact**
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220[g]) or timberland (as defined in Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section51140 (g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒

II. Agriculture and Forestry Resources **Would the Project:**	**Potentially Significant Impact**	**Less than Significant with Mitigation Incorporated**	**Less than Significant Impact**	**No Impact**
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

DISCUSSION

a. No Impact. The Project site is not designated as prime Farmland, Unique Farmland, or Farmland of Statewide Importance. The California Department of Conservation designates the site as "Urban and Built-Up Land" (California Department of Conservation, 2014). The Project site is located within an urban area surrounded by residential uses west and south of the Project site, an elementary school and recreation area to the east, and I-580 to the north. Therefore, there would be no impact associated with converting farmland to non-agricultural use.

b. No Impact. The Project site is not currently zoned for agricultural use (City of Oakland, 2017) nor is it under a Williamson Act contract for agricultural preservation (Division of Land Resource Protection [DLRP], 2015). Therefore, there would be no impact associated with conflicting with existing zoning for agricultural use or a Williamson Act contract.

c-d. No Impact. The Project site is not designated as forest land or timberland (City of Oakland, 2017). Therefore, there would be no impact associated with conflicting with zoning for forest land or timberland or loss of this type of land.

e. No Impact. The Project would not involve changes that would result in loss of Farmland to non-agricultural use. The Project site is currently developed with an existing reservoir and located within an urban area surrounded by residential and community uses. Therefore, there would be no impact associated with conversion of farmland.

III. Air Quality **Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the Project:**	**Potentially Significant Impact**	**Less Than Significant With Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a) Conflict with or obstruct implementation of the applicable air quality plan?	☒	☐	☐	☐
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☒	☐	☐	☐

c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☒	☐	☐	☐
d) Expose sensitive receptors to substantial pollutant concentrations?	☒	☐	☐	☐
e) Create objectionable odors affecting a substantial number of people?	☒	☐	☐	☐

DISCUSSION

a-d. Potentially Significant Impact. The Project would require the use of construction vehicles and machinery, which could result in temporary, but potentially significant emission of criteria pollutants. The EIR will include a detailed analysis, including air quality modeling of construction emissions, to assess the potential impacts. This impact is considered to be potentially significant and will be described further in the EIR.

e. Potentially Significant Impact. The Project would generate odors from diesel exhaust emission during Project construction. This impact is considered to be potentially significant and will be described further in the EIR. Operation of the Project would have no significant odor impacts.

IV. Biological Resources **Would the Project:**	**Potentially Significant Impact**	**Less Than Significant With Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a) Have a substantial adverse effect, either directly or through habitat modifications on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations or by the California Dept. of Fish & Game or U.S. Fish & Wildlife Service?	☒	☐	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Dept. of Fish & Game or U.S. Fish & Wildlife Service?	☒	☐	☐	☐
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☒	☐	☐	☐
d) Interfere substantially with the movement of any resident or migratory fish or wildlife species or with	☒	☐	☐	☐

IV. Biological Resources Would the Project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
established resident or migratory wildlife corridors, or impede the use of wildlife nursery sites?				
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☒	☐	☐	☐
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

DISCUSSION

a-c. Potentially Significant Impact. The Project site is landscaped and regularly maintained. The habitats present within the Project site are characteristic of disturbed and urban habitats and are dominated by planted landscape shrubs and trees. Despite the disturbed site conditions, there is still potential for special-status species, such as nesting and migratory birds that are protected under the Migratory Bird Treaty Act or the California Fish and Game Code Sections 3503 and 3503.5 and special-status bat species, to occur at the Project site. The EIR will include a detailed analysis, including a query of state and federal plant and wildlife databases, and a reconnaissance-level biological resources survey to determine if special-status species, sensitive natural communities, or federally protected wetlands occur, or have potential to occur in the Project area. This analysis will be used to assess the potential impacts, including potential indirect aquatic habitat impacts due to altered Central Reservoir subdrain discharges to Sausal Creek and its associated riparian habitat. This impact is considered to be potentially significant and will be described further in the EIR.

d. Potentially Significant Impact. The Project site does not function as an important regional wildlife corridor because the site and adjacent areas have been developed, paved, or landscaped. The site is surrounded by residential development to the west and south sides, I-580 on the north side, and a recreation area and school to the east of the Project site. There would be no impact to wildlife movement corridors. However, nesting birds and roosting bats could use the reservoir site.

Nesting and migratory birds that are protected under the Migratory Bird Treaty Act or the California Fish and Game Code Sections 3503 and 3503.5 have potential to nest within the Project area. These species may use trees, shrubs, man-made structures or the ground for nesting habitat. Disruption of nesting special status avian species could occur as a result of increased human activity during construction (e.g., due to the use of heavy equipment and human traffic) during the breeding season (February 1st through August 31st). Construction activities could disturb nesting avian species and lead to nest abandonment or poor reproductive success.

Roosting habitats for special status bat species may be present in the Project site. These species typically use buildings, trees, bridges, and rock crevices for roost habitat. Construction activities may result in the removal or disturbance of hibernation or maternal roost sites due to tree removal, ground disturbance, noise or human intrusion. This is a potentially significant impact as it may result in direct mortality and reduction in reproductive success. The EIR will address impacts to special status bat species and migratory birds.

e. Potentially Significant Impact. The Project would require the removal or trimming of trees. The City of Oakland has established ordinances for tree protection. Pursuant to California Government Code § 53091, EBMUD, as a local agency and utility district serving a broad regional area, is not subject to building and land use zoning ordinances (e.g., tree ordinances) for projects involving facilities for the production, generation, storage, or transmission of water. However, it is the practice of EBMUD to work with local jurisdictions and neighboring communities during Project planning, and to consider local environmental protection policies for guidance. Construction of the Project would include removing vegetation, including trees. The removal of these trees could conflict with the City of Oakland Zoning Ordinance for protected trees, a potentially significant impact. This impact is considered to be potentially significant and will be described further in the EIR.

f. No Impact. There are no adopted Habitat Conservation Plans (HCP), Natural Community Conservation Plans (NCCP), or other local, regional, or state habitat conservation plans within the Project area (California Department of Fish and Wildlife [CDFW], 2017). Therefore, there would be no impacts associated with conflicts with HCPs or NCCPs.

V. Cultural Resources and Tribal Cultural Resources **Would the Project:**	**Potentially Significant Impact**	**Less Than Significant With Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a) Cause a substantial adverse change in the significance of a historical resource as defined in section 15064.5?	☒	☐	☐	☐
b) Cause a substantial adverse change in the significance of an archaeological resource as defined in section 15064.5?	☒	☐	☐	☐
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☒	☐	☐	☐
d) Disturb any human remains, including those interred outside of formal cemeteries?	☒	☐	☐	☐
e) Would the Project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:	☒	☐	☐	☐

V. Cultural Resources and Tribal Cultural Resources **Would the Project:**	**Potentially Significant Impact**	**Less Than Significant With Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe	☒	☐	☐	☐

DISCUSSION

a. Potentially Significant Impact. Central Reservoir was constructed in 1910 and therefore meets the minimum age threshold (older than 45 years) to potentially qualify for listing in the California Register of Historical Resources (California Register) and/or the National Register of Historic Places. A cultural resources technical report will be prepared to further record and evaluate the Central Reservoir according to the California and National Register criteria. The EIR will provide a detailed evaluation of potential impacts to historical resources.

b. Potentially Significant Impact. Although the Project site has been substantially disturbed given the built environment, construction in previously undisturbed sediment has the potential to disturb or damage buried and previously undiscovered archaeological resources. A cultural technical report will be prepared to identify areas of moderate or high potential for buried archaeological resources. The EIR will provide a detailed evaluation of potential impacts to archaeological resources.

c. Potentially Significant Impact. Although the Project site is in substantially disturbed areas given the built environment, construction has the potential to disturb or damage buried and previously undiscovered paleontological resources. The EIR will provide a detailed evaluation of potential paleontological resource impacts.

d. Potentially Significant Impact. The Project would involve trenching and excavation on the existing reservoir site. There is potential during trenching and excavation to uncover human remains. Impacts to human remains would be considered a potentially significant impact and will be described further in the EIR.

e. Potentially Significant Impact. Although the Project site has been substantially disturbed, construction in previously undisturbed sediment has the potential to disturb or damage tribal cultural resources, should any exist at the Project site. A cultural technical report will be prepared that will include a sacred lands file search of the Native American Heritage Commission's database and communication with local Native American tribes. Should any tribal cultural resources exist, the EIR will provide mitigation measures to avoid impacts to tribal cultural resources. This impact is considered to be potentially significant and will be described further in the EIR.

VI. Energy Use **Environmental impacts may include:**	**Potentially Significant Impact**	**Less-than-Significant Impact with Mitigation Measures Incorporated**	**Less-than-Significant Impact**	**No Impact**
a) The Project's energy requirements by amount and fuel type for each stage of the Project including construction, operation, maintenance, and /or removal.	☒	☐	☐	☐
b) The effects of the Project on local and regional energy supplies and on requirements for additional capacity	☐	☐	☐	☒
c) The effects of the Project on peak and base period demands for electricity and other forms of energy	☐	☐	☐	☒
d) The degree to which the Project complies with existing energy standards	☐	☐	☐	☒
e) The effects of the Project on energy resources	☒	☐	☐	☐
f) The Project's projected transportation energy use requirements and its overall use of efficient transportation alternatives	☐	☐	☐	☒

DISCUSSION

a, e. Potentially Significant Impact. Construction for the Project would require the use of fuels, including gas, diesel, and motor oil for a variety of construction activities. In addition, indirect energy use would be required for the production of construction materials, including extraction of raw materials and manufacturing. Construction impacts would be temporary and are expected to be less than significant with implementation of standard practices, such as reducing idling time for construction equipment and vehicles. Due to the use of fuels and energy for construction of the proposed Project, this impact is considered to be potentially significant and will be described further in the EIR.

b-d, f. No Impact. The Project would not require the construction of any new sources of energy supplies or additional energy infrastructure. Operation of the Project could potentially require the use of energy for periodic flushing, leak detection, repair, and maintenance, but this is not expected to be materially different from the energy requirements for maintenance of the existing facility and there would thus be no impacts local and regional energy supplies or need for additional capacity, or on either peak or base period electricity demands. Replacing the existing reservoir with tanks may actually decrease the need for maintenance trips to the reservoir site, reducing operational vehicles miles traveled and thus diminishing long-term transportation energy requirements. The Project would comply with federal standards for vehicle fuel efficiency because all vehicles and machinery that are sold within the United States are required to meet those standards The Project would comply with other applicable energy efficiency policies or standards including EBMUD standard practices and procedures that require a variety of measures that would reduce inefficient use of fuels. Therefore, there would be no impact associated with conflicts with energy policies.

VII. Geology and Soils **Would the Project:**	**Potentially Significant Impact**	**Less Than Significant With Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	☒	☐	☐	☐
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☐	☒
ii) Strong seismic ground shaking?	☒	☐	☐	☐
iii) Seismic-related ground failure, including liquefaction?	☒	☐	☐	☐
iv) Landslides?	☒	☐	☐	☐
b) Result in substantial soil erosion or the loss of topsoil?	☒	☐	☐	☐
c) Be located on strata or soil that is unstable, or that would become unstable as a result of the Project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☒	☐	☐	☐
d) Be located on expansive soil as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☒	☐	☐	☐
e) Have soils incapable of supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒

DISCUSSION

a. (i) No Impact. The Project area is not within any mapped fault zones (California Department of Conservation, 1982). Therefore, there would be no impacts associated with rupture of a fault.

a. (ii-iv) and b-d. Potentially Significant Impact. The Project may be susceptible to unstable soil or geologic conditions including liquefaction, ground shaking and erosion. The northern and southern portions of the reservoir site are adjacent to landslide zones (California Department of Conservation, 2003; City of Oakland, 2004). The Project site is also designated as a significant landslide area (since 1930) in the City of Oakland General Plan, and a portion of the southern boundary of the site is adjacent to a potential liquefaction area (City of Oakland, 2004). The Project will involve grading of the existing reservoir to create locally steeper side slopes. Although the Project would be designed and constructed to resist strong ground motions in accordance with the latest building code requirements, this impact is considered to be potentially significant. The EIR will provide a detailed evaluation of potential geology and soil impacts.

e. No Impact. Wastewater generation or disposal is not a part of the Project; therefore, land would not be used for treatment or disposal of wastewater. During construction, temporary self-contained toilets and hand washing facilities would be located on site. Any wastewater generated by these facilities would be hauled off site for treatment and disposal. Therefore, there would be no impacts associated with capability of soils to dispose of wastewater.

VIII. Greenhouse Gas Emissions **Would the Project:**	**Potentially Significant Impact**	**Less Than Significant With Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☒	☐	☐	☐
b) Conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☒	☐	☐	☐

DISCUSSION

a-b. Potentially Significant Impact. Project construction would result in temporary emissions of greenhouse gases. The EIR will provide a detailed analysis of greenhouse gas emissions from construction. The air quality modeling prepared for the EIR will include an analysis of the potential increases in greenhouse gas emissions. This impact is considered to be potentially significant and will be described further in the EIR.

IX. Hazards and Hazardous Materials **Would the Project:**	**Potentially Significant Impact**	**Less Than Significant With Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☒	☐	☐	☐

IX. Hazards and Hazardous Materials **Would the Project:**	**Potentially Significant Impact**	**Less Than Significant With Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the likely release of hazardous materials into the environment?	☒	☐	☐	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☒	☐	☐	☐
d) Be located on a site which is included on a list of hazardous materials sites complied pursuant to Government Code Section 65962.5 and as a result, would it create a significant hazard to the public or the environment?	☒	☐	☐	☐
e) 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, would the Project result in a safety hazard for people residing or working in the Project area?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the Project result in a safety hazard for people residing or working in the Project area?	☐	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☒	☐	☐	☐
h) Expose people or structures to the risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☒

DISCUSSION

Central Reservoir is a 154 MG open-cut reservoir that consists of a panel craft lining, which contains polychlorinated biphenyls (PCBs) in the interior coating, a transite (asbestos containing) roof, and may contain pentachlorophenol in the reservoir timber elements. The material storage building on-site may contain lead based paint (LBP).

a-d. Potentially Significant Impact. Construction of the Project would require the use of typical construction-related hazardous materials (e.g., fuel, oils and lubricants, and solvents and cleaning solutions) that must be properly handled and disposed of to minimize effects on workers and the environment. As noted above, the Project would include the removal of known and potentially hazardous building materials (e.g., transite [asbestos containing roof], PCBs in the reservoir liner, potential pentachlorophenol in the reservoir timber elements, and potential LBP on the material storage building. These hazardous building materials must be properly handled and disposed of to minimize effects on workers and the environment. A search of the California Department of Toxic Substance Control's EnviroStor Data Management System (accessed December 2017) and the California State Water Resources Control Board GeoTracker database (accessed January 2018) did not identify mapped areas showing historical contamination on the Project site. One closed leaking underground storage tank (LUST) cleanup site was identified approximately 1,000 feet southwest of the Project site in the GeoTracker database; however, this site is located downgradient of the Project site and would be unable to affect the Project site. Although there are is no historical contamination on the Project site, soils and groundwater in the Project area may contain hazardous materials depending on historical land uses. Because the Project would include excavation and trenching, there is the potential for the release of contaminated soil and/or groundwater, if encountered. EBMUD would comply with federal, state, and local laws regarding testing, management, and disposal of hazardous materials. Rupture of a subsurface gas pipeline, if present, during construction trenching could also generate a significant hazard. The EIR will provide a detailed evaluation of the potential hazards based on previous data available for hazardous material sites and contamination in soils. This impact is considered to be potentially significant and will be described further in the EIR.

e-f. No Impact. The closest airport is Oakland International Airport, located approximately six miles south of the Project site. The Project would not use any aeronautical equipment and would therefore not interfere with the airspace for any airport. None of the activities for the Project would create any significant hazards for people residing or working in or near an airport. Therefore, there would be no impact associated with creating hazards near a public or private airport.

g. Potentially Significant Impact. The construction of the Project would result in temporary lane and road closures. Although there are alternative vehicle routes in the Project vicinity, impacts to emergency access could be potentially significant and will be described further in the EIR.

h. No Impact. The Project is located completely in an urban/suburban area and would not include work in wildlands. The Project site is not located within a fire hazard area as identified in the City of Oakland General Plan (City of Oakland, 2004). The Project would not expose people or structures to a potential wildfire. Therefore, there would be no impact on the public from wildfires.

X. Hydrology and Water Quality **Would the Project:**	**Potentially Significant Impact**	**Less Than Significant With Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a) Violate any water quality standards or waste discharge requirements?	☒	☐	☐	☐
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (i.e., the production rate of pre-existing nearby wells would drop to a level which	☒	☐	☐	☐

X. Hydrology and Water Quality **Would the Project:**	**Potentially Significant Impact**	**Less Than Significant With Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
would not support existing land uses or planned uses for which permits have been granted)?				
c) Substantially alter the existing drainage pattern of the site area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on or off site?	☒	☐	☐	☐
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on-site or off-site?	☒	☐	☐	☐
e) Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?	☒	☐	☐	☐
f) Otherwise substantially degrade water quality?	☐	☐	☒	☐
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h) Place within a 100-year flood hazard area structures that would impede or redirect flood flows?	☐	☐	☐	☒
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☒
j) Inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☒

DISCUSSION

a and f. Potentially Significant Impact. EBMUD water distribution system/facilities are designed, constructed, operated and maintained to conform to state and federal requirements for water treatment and discharge. Activities involving soil disturbance, excavation, cutting/filling, stockpiling, dewatering and grading could result in increased erosion and sedimentation to surface waters during construction of the Project. Construction could produce contaminated stormwater runoff (nonpoint source pollution), a major contributor to degradation of water quality. In addition, fuels, lubricants and other hazardous materials associated with construction equipment could adversely affect water quality if spilled or stored improperly. EBMUD Standard Construction Specifications require that the contractor develop and implement an erosion and sedimentation control plan for construction. Once constructed the Project may require some flushing including water from the testing of the tanks that would also need to be discharged. If water from the reservoir is discharged to the storm drain system, there is a potential for water quality impacts to Sausal Creek. EBMUD Standard Construction Specifications requires that all discharges be conducted in accordance with a Water Control and Disposal Plan, which would ensure that any discharges are controlled to prevent contamination or sedimentation of receiving waters. Due to the possibility of contaminated stormwater runoff, this impact is considered to be potentially significant and will be described further in the EIR.

b. Potentially Significant Impact. During construction of the Project, dewatering would be conducted to drain the existing reservoir and dewatering is expected to be required to remove excess groundwater from excavations. No drinking water wells are located in the vicinity of the Project site. The Project will remove existing impermeable surface and replace it with landscaping around the new reservoir tanks, therefore there will not be a reduction in groundwater recharge. The Project will add a bioretention basin and stormwater system to regulate surface water runoff and groundwater recharge so that there is not a significant increase in local groundwater levels. Under existing conditions, some seepage occurs through the reservoir lining. Seepage from the reservoir is intercepted by an underdrain and conveyed to the stormdrain on 25th Avenue, from where it joins the East 27th Street stormdrain and is discharged into Sausal Creek underneath the East 27th Street crossing. A Hydrology Technical Study will be prepared as part of the EIR to evaluate the effects of replacing the current reservoir with its impervious roof and existing underdrain flows, with tanks surrounded by a combination of an impervious fill pad and permeable landscaping. Due to the alteration of the existing drainage pattern, the indirect effects on flows in Sausal Creek are potentially significant. The changes in estimated Project surface and groundwater flows will be analyzed and included in a Hydrology Technical Report that will be prepared and included as an Appendix to the EIR. The information from the technical report will be incorporated into the EIR hydrology and water quality section analysis. This impact is considered to be potentially significant and will be described further in the EIR.

c-e. Potentially Significant Impact. Drainage patterns may be temporarily disrupted during construction. EBMUD Standard Construction Specifications require that the contractor develop and implement an erosion and sedimentation control plan for construction. Existing constructed and natural drainage features at the Project site would be re-used and improved. The Project will eliminate existing leakages from the reservoir which flow to Sausal Creek via the 25th Avenue and East 27th Street stormdrain system. The EIR will include an analysis of the potentially significant effects of eliminating these leakages to Sausal Creek. Based on the hydrology measurements, the changes in estimated Project surface flows will be analyzed and included in a Hydrology Technical Report that will be prepared and included as an Appendix to the EIR. The information from the technical report will be incorporated into the EIR hydrology and water quality section analysis. This impact is considered to be potentially significant and will be described further in the EIR.

g-h. No Impact. The Project site is not located within a 100-year flood hazard area (FEMA, 2009) and does not include the construction of new housing; therefore, there would be no impact.

i. No Impact. The southeastern portion of the site is located in a dam failure inundation area (City of Oakland, 2004). Prior to construction activity on the Central Reservoir site, the existing reservoir would be drained. The existing embankment would be breached following the dewatering of the reservoir.

Therefore, the Project would not cause flooding due to the failure of a dam or levee because there would be no water impounded behind the embankment prior to its removal. Replacing the existing open cut reservoir with concrete tanks built to modern seismic standards would eliminate the existing embankment and reduce the risk of flooding; therefore, there would be no impact.

j. No Impact. The Project is not located in an area susceptible to seiches, tsunamis, or mudflows (City of Oakland, 2004); therefore, there would be no impact.

XI. Land Use and Planning **Would the Project:**	**Potentially Significant Impact**	**Less Than Significant With Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a) Physically divide an established community?	☐	☐	☐	☒
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the Project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☒	☐
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒

DISCUSSION

a. No Impact. The Project would replace an existing reservoir at a site already developed with a reservoir. Therefore, there would be no impact associated with the division of an established community.

b. Less than Significant Impact. Pursuant to California Government Code Section 53091(e), county and city zoning ordinances do not apply to the location or construction of facilities for the transmission of water. The EIR will, however, consider resource policies in the zoning ordinances and general plans for the City of Oakland in corresponding EIR sections (e.g., Noise, Biological Resources). The reservoir site is designated as “Mixed Housing Type Residential” in the City of Oakland General Plan (City of Oakland, 1998). The site is zoned RM-1 (Mixed Housing– 1) (City of Oakland, 2017). The City’s zoning ordinance identifies publicly owned structures as allowable uses within this zoning district. As described in Table 1, the Project may require an encroachment permit for construction within city streets, sidewalks and Central Reservoir Recreation Area, pursuant to Chapter 12.08 of the City of Oakland municipal code. EBMUD would prepare and submit to the Public Works Department for review and approval an encroachment permit application.

The City of Oakland General Plan goals, policies and objectives related to land use and applicable to the Project are listed below.

- Policy N12.1. Developing Public Service Facilities. The development of public service facilities and staffing of safety-related services, such as fire station, should be sequenced and timed to provide a balance between land use and population growth, and public services at all times.
- Policy N12.5 Reducing Capital Improvement Disparities. In its capital improvement and public service programs, the City should give special priority to reducing deficiencies in, and disparities between, existing residential areas.

The replacement of the existing reservoir with three concrete tanks would improve existing aging infrastructure and water supply reliability for existing and projected future customer demands, and enable EBMUD to maintain a high level of service in the area, consistent with Policy N12.1. All above-ground facilities would be located on the reservoir site, and would be consistent with the existing use of the site. The proposed facilities would not result in changes to land uses in the Project area, and therefore would not result in deficiencies in or disparities between existing residential areas, consistent with Policy N12.5 For these reasons and through adherence to the provisions of the municipal code, the Project would not obviously conflict with applicable City of Oakland land use policies and regulations. The impact is considered to be less than significant.

c. No Impact. As discussed above under Section IV Biological Resources, there are no adopted HCP, NCCP, or other local, regional, or state habitat conservation plans within the Project area (CDFW, 2017). Therefore, there would be no impacts associated with conflicts with HCPs or NCCPs.

XII. Mineral Resources **Would the Project:**	**Potentially Significant Impact**	**Less Than Significant With Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

DISCUSSION

a-b. No Impact. The Project is located in an urban/ suburban environment. There are no mineral resources within the Project area (City of Oakland, 1996). Therefore, there would be no impact to mineral resources.

XIII. Noise **Would the Project result in :**	**Potentially Significant Impact**	**Less Than Significant With Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☒	☐	☐	☐

XIII. Noise **Would the Project result in :**	**Potentially Significant Impact**	**Less Than Significant With Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☒	☐	☐	☐
c) A substantial permanent increase in ambient noise levels in the Project vicinity above levels existing without the project?	☐	☐	☐	☒
d) A substantial temporary or periodic increase in ambient noise levels in the Project vicinity above levels existing without the Project?	☒	☐	☐	☐
e) 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, would the Project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
f) 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?	☐	☐	☐	☒

DISCUSSION

a, b and d. Potentially Significant Impact. Construction of the Project would require the use of machinery and equipment that would generate short-term noise and vibration. The EIR will include a detailed analysis of impacts. A noise monitoring survey will be performed to characterize the existing noise conditions and sensitive receptors and the EIR will provide an assessment of future noise levels with construction, including the duration of impacts. This impact is considered to be potentially significant and will be described further in the EIR.

c. No Impact. The Project would include the replacement of an existing open-cut reservoir with three concrete tanks, which would not generate a new source of ambient noise. Maintenance and repair activities would occur as needed or as part of routine facility monitoring in accordance with standard inspection schedules, and the frequency of monitoring or maintenance activities would not change substantially from current conditions. The Project would not result in any permanent surface operations that would introduce new sources of noise or vibration. Therefore, there would be no impact associated with a permanent increase in ambient noise levels.

e-f. No Impact. The closest airport is Oakland International Airport, located approximately six miles south of the Project site. The Project would not expose people residing or working near the airport to excessive noise levels; therefore, there would be no impact associated with exposing people near a public or private airport to excessive noise levels.

XIV. Population and Housing **Would the Project:**	**Potentially Significant Impact**	**Less Than Significant With Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

DISCUSSION

a-c. No Impact. The Project would not create infrastructure that would induce unanticipated population growth. The Project entails replacement of an existing 154-MG reservoir with three 17-MG tanks, and would thus not increase capacity to store water. The Project would be constructed to meet water supply requirements for existing and projected future customer demands. There would, therefore, be no impacts to population and housing associated with inducing population growth from operation of the Project. In addition, none of the activities of the Project would displace housing or people as the Project would replace an existing reservoir at a site already developed with a reservoir. Therefore, there would be no displacement of housing or people associated with the Project.

XV. Public Services **Would the Project:**	**Potentially Significant Impact**	**Less Than Significant With Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:	☐	☐	☐	☒
i) Fire protection?	☐	☐	☐	☒
ii) Police protection?	☐	☐	☐	☒
iii) Schools?	☐	☐	☐	☒
iv) Parks?	☐	☐	☐	☒
v) Other public facilities?	☐	☐	☐	☒

DISCUSSION

a. No Impact. The Project replaces an existing reservoir and would not generate a need for any new public facilities (schools, fire or police protection, parks, or other public facilities) because it does not induce population and employment growth. Workers at the Project site are likely to commute from the existing Bay Area labor supply. Any deterioration of existing public facilities resulting from construction (e.g., streets) would be restored by EBMUD to pre-construction condition upon completion of construction. Therefore, there would be no impacts associated with new or physically altered governmental facilities.

XVI. Recreation **Would the Project:**	**Potentially Significant Impact**	**Less Than Significant With Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☒	☐	☐	☐
b) Does the Project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒

DISCUSSION

a. Potentially Significant Impact. The Project would not generate or attract additional population, as would be typically associated with residential, commercial or industrial uses; therefore, it would not affect demand for recreational facilities. While the Project would not increase use of recreational facilities, there could be short-term reduction in use of the Central Reservoir Recreation Area, located adjacent to the east side of the reservoir site. Some potential recreational users may choose to avoid the Central Reservoir Recreation during construction, particularly if there are higher levels of construction noise or other factors that could diminish their experience. It is therefore possible that some of the use that would have occurred at the Central Reservoir Recreation during the construction period would be shifted to other recreational facilities within the area. Any temporary diversion of some Central Reservoir Recreation users to those other facilities may create a burden on those facilities such that substantial deterioration could occur. This impact would be considered potentially significant and will be described further in the EIR.

b. No Impact. The Project consists exclusively of water distribution system facilities and does not require the construction or expansion of recreational facilities; therefore, there would be no impacts.

XVII. Transportation / Traffic **Would the Project:**	**Potentially Significant Impact**	**Less Than Significant With Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a) Conflict with an applicable plan, ordinance or policy establishing	☒	☐	☐	☐

XVII. Transportation / Traffic **Would the Project:**	**Potentially Significant Impact**	**Less Than Significant With Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
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?				
b) Conflict with an applicable congestion management program, including but not limited to level of service demands and travel demand measures, or other standards established by the county congestion management agency for designated roads an or highways?	☒	☐	☐	☐
c) 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?	☐	☐	☐	☒
d) Substantially increase hazards to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☒	☐	☐	☐
e) Result in inadequate emergency access?	☒	☐	☐	☐
f) Conflict with adopted policies, plans or programs regarding public transit, bicycle or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☒	☐	☐	☐

DISCUSSION

a-b. **Potentially Significant Impact**. Maintenance and repair activities would occur as needed or as part of routine facility monitoring in accordance with standard inspection schedules, and the frequency of trips associated with monitoring or maintenance activities would not change substantially from current conditions. The construction of the Project would result in temporary lane and road closures. In addition, the Project would generate vehicle trips during Project construction, temporarily contributing to increased traffic on local roadways. Truck trips would be associated with hauling materials, construction debris and equipment to and/or from the site. Construction employees would also contribute to vehicle trips. The construction and use of the proposed access driveway connecting the Redwood Day School parking area to Ardley Avenue could change traffic circulation. The EIR will evaluate the existing conditions of the Project area (including, but not limited to, traffic, bike and pedestrian conditions during school drop-off/pick-up times), estimate the Project travel demand, and identify potential transportation and traffic impacts during Project construction and operation. This impact is considered to be potentially significant and will be described further in the EIR.

c. No Impact. The Project involves replacement of an existing reservoir and does not include any aeronautical equipment, and would not include any activities that would interfere with the airspace above the site. Therefore, there would be no impact on air traffic patterns or to the public associated with a safety risk from changes to air traffic patterns.

d. Potentially Significant Impact. The Project would require the use of heavy machinery and equipment in public roadways, which could pose a hazard to the public using these roadways. The EIR will provide a detailed analysis of hazards to traffic and the public. This impact is considered to be potentially significant and will be described further in the EIR.

e. Potentially Significant Impact. The construction of the Project would result in temporary lane and road closures. These lane and roadway closures may impede emergency access, which would be considered a potentially significant impact. This impact is considered to be potentially significant and will be described further in the EIR.

f. Potentially Significant Impact. Temporary lane and road closures could potentially affect bike lanes and pedestrian access, and haul truck traffic could increase traffic on streets served by public transit services. This impact is considered to be potentially significant and will be described further in the EIR.

XVIII. Utilities and Service Systems **Would the Project:**	**Potentially Significant Impact**	**Less Than Significant With Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
c) 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?	☐	☐	☐	☒
d) Have sufficient water supplies available to serve the Project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☒
e) Result in a determination by the wastewater treatment provider which serves or may serve the Project, that it has adequate capacity to serve the Project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
f) Be served by a landfill with sufficient permitted capacity to accommodate the Project's solid waste disposal needs?	☐	☐	☒	☐
g) Comply with federal, state, and local	☐	☐	☒	☐

XVIII. Utilities and Service Systems **Would the Project:**	**Potentially Significant Impact**	**Less Than Significant With Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
statutes and regulations related to solid waste?				

DISCUSSION

a-b and d-e. No Impact. The Project would not include or require new expanded water or wastewater treatment facilities. In addition, the Project would not require additional water supplies; rather, the Project would ensure continuation of existing water supplies by replacing existing aging infrastructure, improving reliability and providing redundancy, as needed. Therefore, there would be no impact to water or wastewater treatment facilities.

c. No Impact. Drainage patterns may be temporarily disrupted during construction. EBMUD Standard Construction Specifications require that the contractor develop and implement an erosion and sedimentation control plan for construction. Existing constructed and natural drainage features at the Project site would be re-used and improved, but the Project would not include the construction of new storm water drainage facilities or the expansion of existing facilities.

f-g. Less than Significant Impact. The Project would generate construction debris from demolition of the existing reservoir, trenching and excavation of in-place soils. Construction debris would only be generated during construction and not during operation and the impact would therefore be temporary. Some of this soil may be contaminated requiring special disposal. Impacts are anticipated to be less than significant if all applicable regulations are followed. The EIR will identify the approximate amount of debris that would be generated by the Project, will identify how the waste would be characterized and will identify the landfills that would serve the Project.

XIX. Mandatory Findings of Significance **Would the Project:**	**Potentially Significant Impact**	**Less Than Significant With Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a) Does the Project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☒	☐	☐	☐
b) Does the Project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in	☒	☐	☐	☐

XIX. Mandatory Findings of Significance **Would the Project:**	**Potentially Significant Impact**	**Less Than Significant With Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?				
c) Does the Project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☒	☐	☐	☐

DISCUSSION

a. Potentially Significant Impact. The Project is located in an urban/suburban environment; therefore, it is unlikely that the Project would substantially degrade the quality of the environment or substantially reduce habitat for special-status species. The Project would include trenching and ground disturbance. Construction of the Project, therefore, has the potential to disturb or damage previously undiscovered buried archaeological, paleontological and historic resources if they are encountered during construction. This impact is considered to be potentially significant and will be described further in the EIR.

b. Potentially Significant Impact. At this time, no other projects in the vicinity are anticipated to be underway during construction of the Project. However, the City of Oakland will be contacted during preparation of the EIR to help identify other planned projects in the vicinity of the Project. If any projects are identified, potential for cumulative traffic, noise, and air quality impacts could be significant. The EIR will include a description of projects that may overlap with the proposed Project and will include an assessment of cumulative impacts. This impact is considered to be potentially significant and will be described further in the EIR.

c. Potentially Significant Impact. Construction of the Project would result in environmental impacts that have the potential to contribute to adverse effects on human beings such as from noise generation, generation of air quality impacts, and other safety hazards. The EIR will provide a detailed evaluation of potential impacts and mitigation measures to mitigate significant impacts.

REFERENCES

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APPENDIX B

Public Comments Received on the Notice of Preparation and Initial Study

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List of Commenters on the NOP

The following agencies and individuals submitted the attached comments on the Central Reservoir Replacement Project Notice of Preparation and/or Initial Study:

Commenter	Agency	Date
State Agencies		
Patricia Maurice	California Department of Transportation	May 25, 2018
Henry Wong	Department of Toxic Substances Control	May 29, 2018
Caitlyn Oswalt	State Water Resources Control Board	May 3, 2018
		May 25, 2018
Local Agencies		
Peterson Vollmann	City of Oakland	May 9, 2018
Mary	Pacific Gas and Electric	May 21, 2018
Individuals		
Cynthia Isom		May 17, 2018
Lisa Lemus and Phillip Wong		May 29, 2018

Meryka Dirks

From: Freedman, Jake@DOT <Jake.Freedman@dot.ca.gov>
Sent: Friday, May 25, 2018 11:15 AM
To: centralreservoir
Cc: State.Clearinghouse@opr.ca.gov
Subject: Caltrans Comment Letter - Central Reservoir Replacement Project - Notice of Preparation (NOP)_SCH2018042078
Attachments: 04-ALA-2018-00281_Central Reservoir Replacement Project_NOP_2018MAY25.pdf

Dear Mr. Hope,

Please find the attached soft copy of the Caltrans comment letter regarding the Central Reservoir Replacement Project - Notice of Preparation (NOP). The original letter has been mailed to you at 375 Eleventh Street, Oakland, CA 94623-1055. Thank you for including Caltrans in the environmental review process. Should you have any questions regarding this letter or require any additional information, please feel free to contact me at (510) 286-5518 or Jake.Freedman@dot.ca.gov.

Best,

Jake Freedman
Transportation Planner
Local Development – Intergovernmental Review
(510) 286-5518

DEPARTMENT OF TRANSPORTATION
DISTRICT 4
OFFICE OF TRANSIT AND COMMUNITY PLANNING
P.O. BOX 23660, MS-10D
OAKLAND, CA 94623-0660
PHONE (510) 286-5528
FAX (510) 286-5559
TTY 711
www.dot.ca.gov

*Making Conservation
a California Way of Life.*

May 25, 2018

SCH # 2018042078
GTS # 04-ALA-2018-00281
GTS ID: 10460
PM: ALA – 580 – 41.847

Mr. Aaron Hope, Project Manager
East Bay Municipal Utilities District
375 Eleventh Street
Oakland, CA 94623-1055

Central Reservoir Replacement Project - Notice of Preparation (NOP)

Dear Mr. Hope:

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the Central Reservoir Replacement Project. In tandem with the Metropolitan Transportation Commission's (MTC) Sustainable Communities Strategy (SCS), Caltrans' mission signals a modernization of our approach to evaluate and mitigate impacts to the State Transportation Network (STN). Caltrans' *Strategic Management Plan 2015-2020* aims to reduce Vehicle Miles Traveled (VMT) by tripling bicycle and doubling both pedestrian and transit travel by 2020. Our comments are based on the April 26, 2018 NOP.

Project Understanding
The project includes demolition of the existing 154-million-gallon (MG) open-cut reservoir and material storage building; earthwork and subsurface preparation; construction of a reinforced tank foundation, three 17 MG concrete tanks within the existing reservoir basin, valve structure, drainage basin; and abandonment of existing monitoring wells. The project also includes moving an existing rate control station currently located below ground at the corner of 25th Ave and East 29th St onto the project site. The current access road around the reservoir perimeter would be retained and improved. The project will also remove vegetation, replace security fencing, and restore and landscape the site following construction. The project may also include an access driveway to connect the Redwood Day School parking area to Ardley Ave. The reservoir is adjacent to Interstate 580.

Lead Agency
As the Lead Agency, East Bay Municipal Utilities District is responsible for all project mitigation, including any needed improvements to the STN. The project's fair share contribution, financing, scheduling, implementation responsibilities and lead agency monitoring should be

fully discussed for all proposed mitigation measures.

Encroachment Permit
Please be advised that any work or traffic control that encroaches onto the state ROW requires an encroachment permit that is issued by the Department. To apply, a completed encroachment permit application, environmental documentation, and five (5) sets of plans clearly indicating state ROW must be submitted to: Office of Permits, California DOT, District 4, P.O. Box 23660, Oakland, CA 94623-0660. Traffic-related mitigation measures should be incorporated into the construction plans during the encroachment permit process. See the website link below for more information: http://www.dot.ca.gov/hq/traffops/developserv/permits/.

Thank you again for including Caltrans in the environmental review process. Should you have any questions regarding this letter, please contact Jake Freedman at 510-286-5518 or jake.freedman@dot.ca.gov.

Sincerely,

PATRICIA MAURICE
District Branch Chief
Local Development - Intergovernmental Review

c: State Clearinghouse

Meryka Dirks

From:	Gray, Rebecca@DTSC <Rebecca.Gray@dtsc.ca.gov>
Sent:	Wednesday, May 30, 2018 8:40 AM
To:	centralreservoir
Cc:	state.clearinghouse@opr.ca.gov; Wong, Henry@DTSC
Subject:	East Bay Municipal Utility District NOP DEIR for Central Reservoir Replacement Project dated April 25, 2018 No Comment Letter May 29, 2018
Attachments:	EBMUD NOP DEIR for Central Reservoir Replacement Project dated April 25, 2018 CEQA, No Comment Ltr._5.29.20180001.pdf

Hello,

Attached for your records is a document pertaining to the Site and CEQA Project above.
DTSC has no comments on this project.

Thank you,

Rebecca Gray
Office Assistant- Berkeley Field Office
Department of Toxic Substances
(510) 540-3726

Department of Toxic Substances Control

Matthew Rodriquez
Secretary for
Environmental Protection

Barbara A. Lee, Director
700 Heinz Avenue
Berkeley, California 94710-2721

Edmund G. Brown Jr.
Governor

May 29, 2018

Mr. Aaron Hope
Project Manger
East Bay Municipal Utility District
375 Eleventh Street, MS 701
Oakland, California 94607-4240
centralreservoir@ebmud.com

NOTICE OF PREPARATION OF A DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE CENTRAL RESERVOIR REPLACEMENT PROJECT, OAKLAND, CALIFORNIA

Dear Mr. Hope:

On May 7, 2018, the Department of Toxic Substances Control (DTSC) received East Bay Municipal Utility District's (EBMUD) *Notice of Preparation of a Draft Environmental Impact Report for the Central Reservoir Replacement Project* (NOP) dated April 26, 2018. EBMUD is requesting DTSC's comments regarding the environmental issues associate with construction and operation of the proposed project. DTSC reviewed the subject NOP and has no comment. DTSC appreciates the review opportunity.

Please contact me at (510) 540-3770 or henry.wong@dtsc.ca.gov for questions.

Sincerely,

Henry Wong, P.E.
Project Manager
Site Mitigation and Restoration Program

cc: State Clearinghouse
Office of Planning and Research
P.O. Box 3044
Sacramento, California 95812-3044
state.clearinghouse@opr.ca.gov

Meryka Dirks

From:	Oswalt, Caitlyn@Waterboards <Caitlyn.Oswalt@Waterboards.ca.gov>
Sent:	Thursday, May 3, 2018 3:26 PM
To:	centralreservoir
Cc:	Paiva-Lowry, Sara@Waterboards
Subject:	Initial Study for Central Reservoir Replacement Project (SCH#201802078)

Hello,

I am with the State Water Resource and Control Board. I was wondering if I could get a copy of your Initial Study that was referred to in the Notice of Preparation for the Central Reservoir Replacement Project (SCH#201802078). My unit will be issuing a water supply permit for this project in the future and I would like to understand the project better before putting together our comment letter.

Thanks,

Caitlyn Oswalt

Environmental Scientist
Environmental Review Unit
Division of Financial Assistance
State Water Resources Control Board
916.319.8574 | CWSRF – Grants and Loans Resources

State Water Resources Control Board

MAY 25 2018

East Bay Municipal Utility District
Attn: Aaron Hope
375 11th Street
Oakland, CA 94607

RE: EAST BAY MUNICIPAL UTILITY DISTRICT, NOTICE OF PREPARATION (NOP) FOR THE CENTRAL RESERVOIR REPLACEMENT PROJECT (PROJECT); SCH # 2018042078

Dear Mr. Hope:

Thank you for the opportunity to review the NOP for the proposed Project. The State Water Resources Control Board (State Water Board), Division of Drinking Water is responsible for issuing water supply permits administered under the Safe Drinking Water Act and will require a new or amended water supply permit for the above referenced Project. A project requires a permit if it includes water system consolidation or changes to a water supply source, storage, or treatment. The State Water Board is a responsible agency pursuant to the California Environmental Quality Act (CEQA) and considers the above referenced document as adequate to meet water supply permit CEQA requirements.

The proposed Project includes demolition of the existing 154-million-gallon (MG) open-cut reservoir and material storage building; earthwork and subsurface preparation; construction of a reinforced tank foundation, three 17 MG concrete tanks within the existing reservoir basin, valve structure, drainage basin; and abandonment of existing monitoring wells. The Project also includes moving an existing rate control station currently located below ground at the corner of 25th Avenue and East 29th Street onto the Project site. The current access road around the reservoir perimeter would be retained and improved. The Project will also remove vegetation, replace security fencing, and restore and landscape the site following construction. The Project may also include an access driveway to connect the Redwood Day School parking area to Ardley Avenue.

When the review process has ended, please forward the following items with your permit application to the San Francisco District Office:

- Draft and Final copy of the EIR;
- Copy of the Mitigation Monitoring and Reporting (MMRP);
- Copy of the Resolution or Board Minutes certifying and adopting the EIR;
- Copy of the stamped Notice of Determination (NOD) filed at the Alameda County Clerk's Office, and Governor's Office of Planning and Research (OPR);
- Copy of the California Department of Fish and Wildlife CEQA filing fee receipt issued by the Alameda County Clerk's Office or OPR, State Clearinghouse; and
- Copies of any comment letters received and the lead agency responses.

Please contact Marco Pacheco, San Francisco District Office, at 510-620-3474 or e-mail at Marco.Pacheco@waterboards.ca.gov if you have any questions regarding permitting requirements.

Sincerely,

Caitlyn Oswalt

Caitlyn Oswalt
Environmental Scientist

Cc: State Clearinghouse
(Re: SCH# 2018042078)
P.O. Box 3044
Sacramento, CA 95812-3044

Marco Pacheco
850 Marina Bay Parkway
Bldg. P, Second Floor
Richmond CA, 94804

Meryka Dirks

From:	Vollmann, Peterson <PVollmann@oaklandnet.com>
Sent:	Wednesday, May 9, 2018 3:32 PM
To:	centralreservoir
Cc:	Manasse, Edward; Payne, Catherine
Subject:	Central Reservoir NOP - Initial Study

I received the NOP for the Central Reservoir replacement project that was mailed to the City of Oakland. The NOP states that there was an Initial Study prepared. Would you please provide a link to that document for our review? Thanks.

Meryka Dirks

From: Delineation Map Requests <DelineationMapRequests@pge.com>
Sent: Tuesday, May 8, 2018 1:54 PM
To: centralreservoir
Subject: FW: Delineation 18-5048 - I580-ARDLEY AVE-23RD AVE-25TH AVE-E 29TH-SHEFFIELD AVE, OAKLAND
Attachments: EIM CASE#718804.pdf

We have processed your Map Request today. The normal turnaround time for requests is 2 weeks.
If you have any questions feel free to contact me anytime.

Mary
Delineation Map Requests
PG&E Corporation

PROJECT ADDRESS, CITY & ZIP: I580-ARDLEY AVE-23RD AVE-25TH AVE-E 29TH-SHEFFIELD AVE, OAKLAND, NO ZIP PROVIDED

PROJECT TYPE *(select one & remove the others)*: **DID NOT STATE, LETTER ATTACHED**

- Agriculture
- Commercial
- Commercial Development
- Commercial Temp
- Residential Single Family
- Residential Sub-Division
- Residential Temp
- Solar

PROJECT DESCRIPTION *(select one & remove the others)*:

- Eco or Environmental Survey
-

CUSTOMER NAME: AARON HOPE
(First and Last: note alternate language if applicable)

PHONE NUMBER: 510-287-1496
(Include area code)

EMAIL ADDRESS: CENTRALRESERVOIR@EBMUD.COM

RELATIONSHIP TO PROJECT *(select one & remove the others)*:

- Contractor
- Designer

- Engineer
- Owner
- Representative
- Other _UTILITY _______________

COMMODITY:

- Both Gas & Electric

Meryka Dirks

From:	Delineation Map Requests <DelineationMapRequests@pge.com>
Sent:	Monday, May 21, 2018 10:57 AM
To:	centralreservoir
Subject:	Delineation 18-5048 - I580-ARDLEY AVE-23RD AVE-25TH AVE-E 29TH-SHEFFIELD AVE, OAKLAND
Attachments:	EIM CASE#718804.pdf; 18-5048 OAKLAND Distribution Map 4.pdf; 18-5048 OAKLAND Distribution Map 3.pdf; 18-5048 OAKLAND Distribution Map 2.pdf; 18-5048 OAKLAND Distribution Map 1.pdf; Index G6211 - Gas Map - HWY 580-Ardley Ave, Oakland.pdf; GasSymbology.pdf; Gas and Electric Delineation Cover Letter.pdf; ElectricSymbology.pdf

Enclosed is one copy each of the subject map(s) showing the approximate locations of our existing electric distribution facilities only that are in or adjacent to the proposed project. There are no electric transmission facilities in the area.

Please see Index G6211 attached. Thanks!

Mary
Delineation Map Requests
PG&E Corporation

PROJECT ADDRESS, CITY & ZIP: I580-ARDLEY AVE-23RD AVE-25TH AVE-E 29TH-SHEFFIELD AVE, OAKLAND, NO ZIP PROVIDED

PROJECT TYPE *(select one & remove the others)*: **DID NOT STATE, LETTER ATTACHED**

- Agriculture
- Commercial
- Commercial Development
- Commercial Temp
- Residential Single Family
- Residential Sub-Division
- Residential Temp
- Solar

PROJECT DESCRIPTION *(select one & remove the others)*:

- Eco or Environmental Survey
-

CUSTOMER NAME: AARON HOPE
(First and Last: note alternate language if applicable)

PHONE NUMBER: 510-287-1496
(Include area code)

EMAIL ADDRESS: CENTRALRESERVOIR@EBMUD.COM

RELATIONSHIP TO PROJECT *(select one & remove the others)*:

- Contractor
- Designer
- Engineer
- Owner
- Representative
- Other _UTILITY _______________

COMMODITY:

- Both Gas & Electric

EAST BAY
MUNICIPAL UTILITY DISTRICT

X6671

NOTICE OF PREPARATION OF DRAFT ENVIRONMENTAL IMPACT REPORT CENTRAL RESERVOIR REPLACEMENT PROJECT EAST BAY MUNICIPAL UTILITY DISTRICT

APRIL 26, 2018

TO: Responsible and Trustee Agencies, Organizations, and Interested Parties

FROM: East Bay Municipal Utility District
375 Eleventh Street, MS 701
Oakland, CA 94607-4240

SUBJECT: Notice of Preparation (NOP) of a Draft Environmental Impact Report for the Central Reservoir Replacement Project

The East Bay Municipal Utility District (EBMUD), acting as lead agency under the California Environmental Quality Act (CEQA), is preparing an environmental impact report (EIR) for the Central Reservoir Replacement Project (Project).

AGENCIES: EBMUD requests your input regarding the scope and content of the environmental information that is germane to your agency's statutory responsibilities in connection with the proposed Project.

ORGANIZATIONS AND OTHER INTERESTED PARTIES: EBMUD requests comments from organizations and interested parties regarding the environmental issues associated with construction and operation of the proposed Project.

PROJECT TITLE: Central Reservoir Replacement Project

PROJECT LOCATION: Central Reservoir is located on a 27-acre site in the City of Oakland, CA. The Project site is bordered by Interstate 580 (I-580) to the north, Ardley Avenue and 23rd Avenue to the west, 25th Avenue and East 29th Street to the south, and the Central Reservoir Recreation Area and Sheffield Avenue to the east (see Figure 1).

PROJECT PURPOSE: The Project will replace the existing open-cut reservoir (108 years old), which has reached the end of its useful life and is under the California Division of Safety of Dams' (DSOD) jurisdiction, with new on-site facilities to ensure long-term reliability and redundancy of the water distribution system, meet existing and future water needs, facilitate repair and replacement of aging infrastructure, and maintain water quality by downsizing the reservoir and replacing it with optimal storage based on projected future demands. The Project will also remove the dam embankments from DSOD's jurisdiction.

PROJECT DESCRIPTION: The Project includes demolition of the existing 154-million-gallon (MG) open-cut reservoir and material storage building; earthwork and subsurface preparation; construction of a reinforced tank foundation, three 17 MG concrete tanks within the existing reservoir basin, valve structure, drainage basin; and abandonment of existing monitoring wells. The Project also includes moving an existing rate control station currently located below ground at the corner of 25th Avenue and East 29th Street onto the Project site. The current access road around the reservoir perimeter would be retained and improved. The Project will also remove vegetation, replace security fencing, and restore and landscape the site following construction. The Project may also include an access driveway to connect the Redwood Day School parking area to Ardley Avenue. Figure 2 shows the conceptual site plan.

POTENTIAL ENVIRONMENTAL EFFECTS: Based on the Initial Study completed for the Project, the following areas of potentially significant environmental impacts will be analyzed in the Draft EIR: Aesthetics, Air Quality, Biological Resources, Cultural Resources and Tribal Cultural Resources, Energy Use, Geology and Soils, Greenhouse Gas Emissions, Hazards and Hazardous Materials, Hydrology and Water Quality, Noise, Recreation, and Transportation and Traffic. Potential cumulative impacts and potential for growth inducement will be addressed; alternatives, including the No Project Alternative, will be evaluated.

PUBLIC REVIEW PERIOD: This NOP is available for public review and comment pursuant to the California Code of Regulations, Title 14, Section 15082(b) for 30 days. The comment period for the NOP begins April 26, 2018 and ends on May 29, 2018. Due to limits mandated by State Law, your response must be sent at the earliest possible date but not later than 30 days after receipt of this notice.

RESPONSES AND QUESTIONS: Responses to or questions regarding this NOP should be directed to:

Aaron Hope, Project Manager
East Bay Municipal Utility District
375 Eleventh Street, MS 701
Oakland, CA 94607-4240
(510) 287-1496
centralreservoir@ebmud.com

CEQA PROCESS: The Draft EIR is planned for publication in summer 2019, with action by EBMUD's Board of Directors expected in winter 2020. Notice will be given of public meetings, including a meeting that will be held during the Draft EIR comment period. At the end of the review and comment process, EBMUD's Board of Directors will determine whether to certify the EIR and approve the Project. The NOP and all CEQA-related documents for this Project will be available for review on the EBMUD website at: www.ebmud.com/central

Xavier Irias

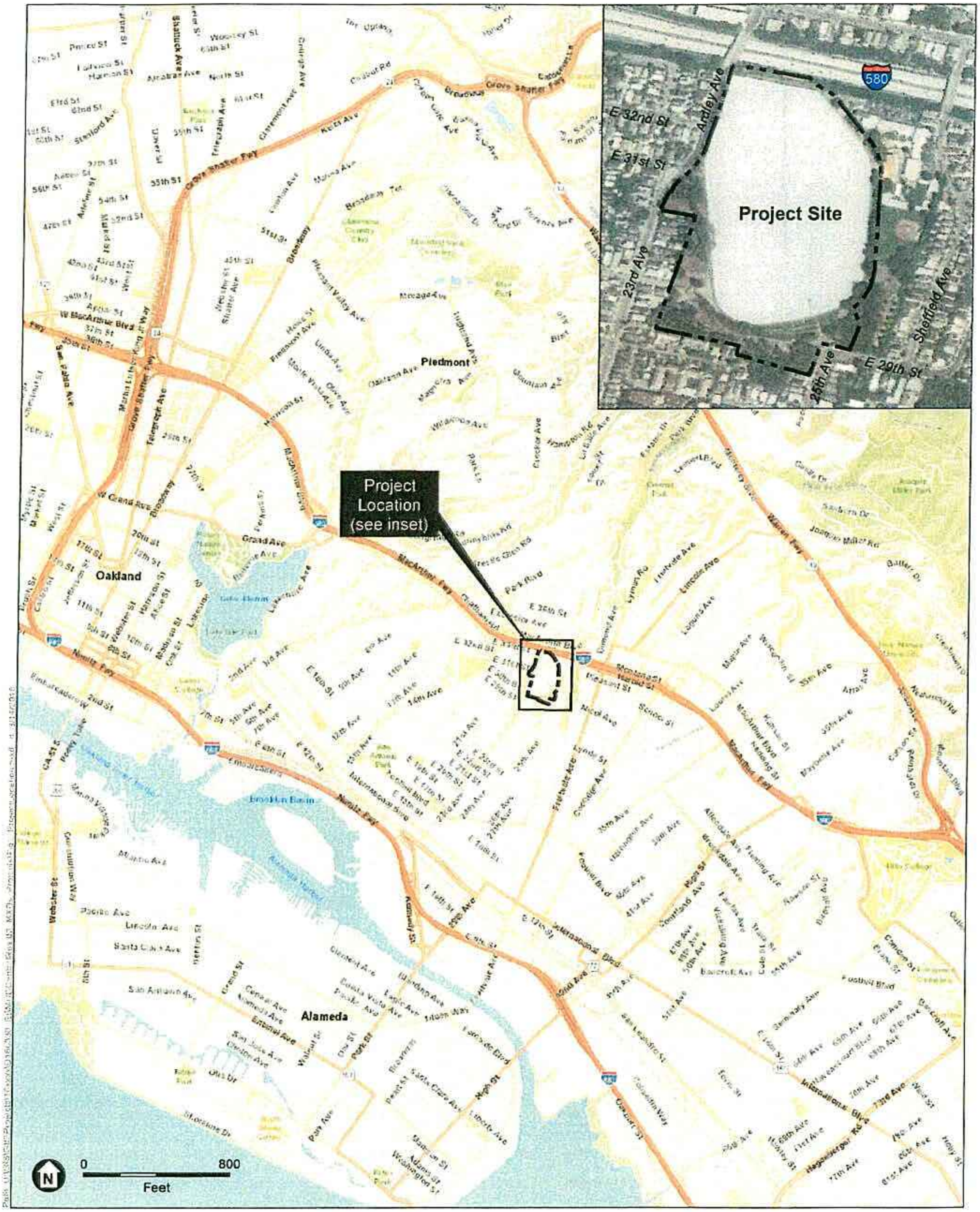
4-26-18

Xavier J. Irias
Director of Engineering and Construction
East Bay Municipal Utility District

Date

XJI:DJR:ALH:dks
sb18_050_Central Reservoir_NOP

Attachments: Figure 1 Project Location
Figure 2 Conceptual Site Plan

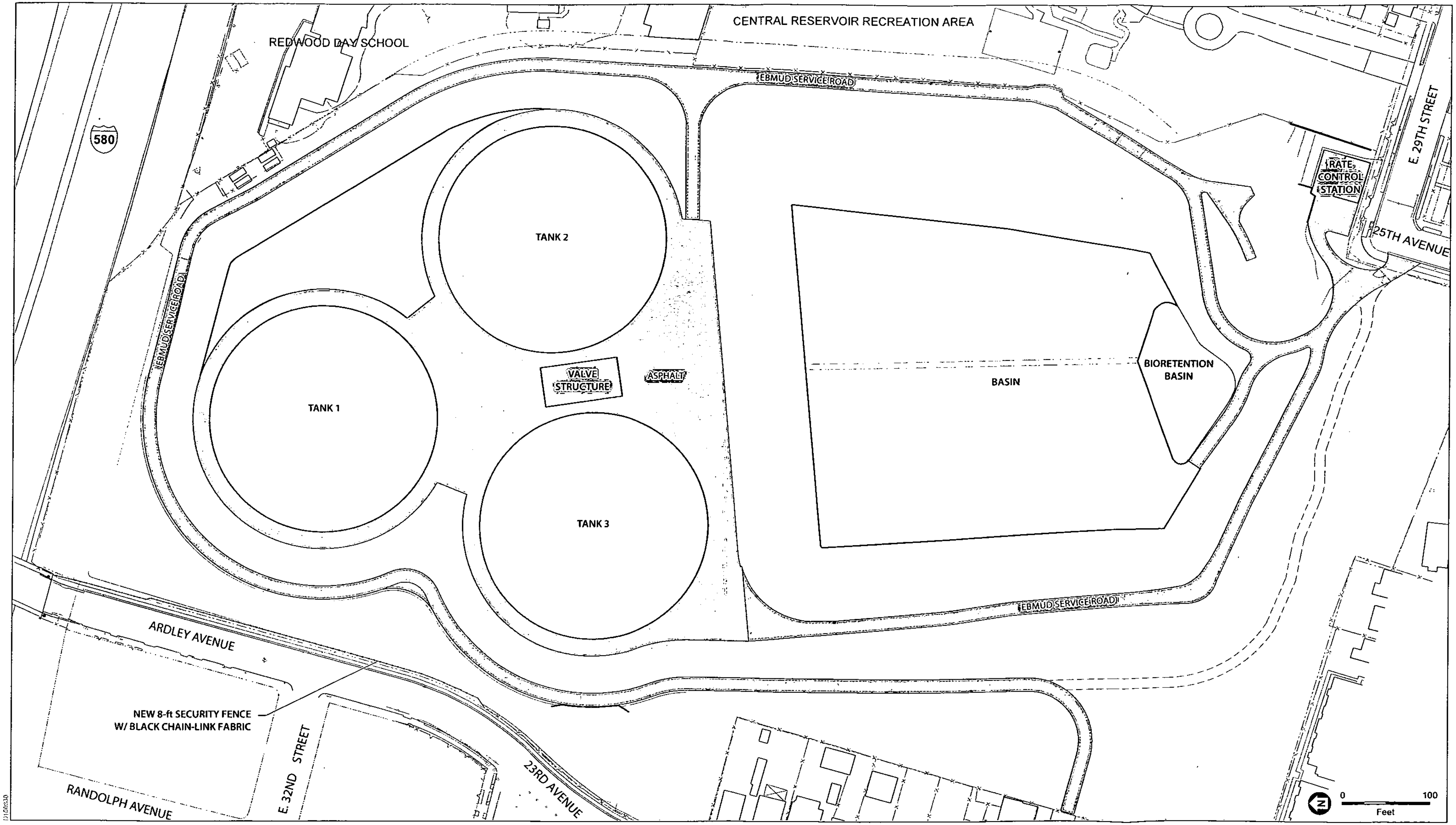


SOURCE: ESRI World Imagery; EBMUD, 2017; ESA, 2017

EBMUD Central Reservoir

Figure 1
Project Location

ESA



SOURCE: EBMUD, 2018; Muller & Caulfield, 2018

EBMUD Central Reservoir Replacement Project

Figure 2
Central Reservoir Conceptual Site Plan

ESA

Pacific Gas and Electric Company

Dear Customer,

PLEASE NOTE THE FOLLOWING INFORMATION:

Enclosed is the **Gas and/or Electric** information you requested within the subject area. **Please use these maps to confirm the location of PG&E facilities shown on your plans.**

These electronic files contain information that is proprietary and/or confidential information of Pacific Gas and Electric Company and is **intended for use only by authorized persons.** Unless specifically authorized to do so, do not make copies of these files, or distribute it to anyone other than persons authorized to use these files.

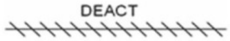
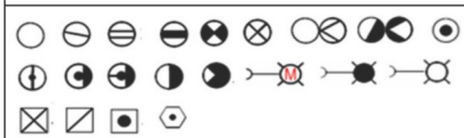
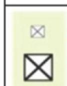
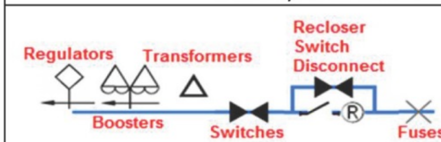
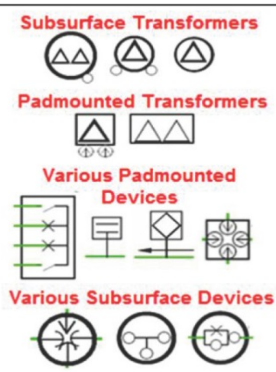
Before you start any trenching on your project, please call **Underground Service Alert (USA) at 811** at least 48 hours prior to any excavation, to have your work area marked for underground facilities. Call USA (811) to obtain exact location of facilities and pot-hole to verify depth of our lines (if required). Please note that a standby PG&E employee is required during any excavation within **10** feet of a **gas transmission line**.

If you discover a conflict or if you determine our facilities need to be lowered/raised, please contact your PG&E Representative, file an application online at www.pge.com/customerconnections, or call 877-743-7782.

PG&E does not provide depth information about our existing electric and gas facilities (i.e gas main and services, etc). Underground facilities are **generally** 24" to 36" deep. However, the depths may have changed due to street reconstruction and general area changes. If, after receiving our maps, you determine depth information is needed to better plan future street improvements, you should pothole or take appropriate action as needed.

BASIC LEGEND FOR PG&E DISTRIBUTION MAPS

<table>
<tr><th>SYMBOL</th><th colspan="2">DEFINITION</th></tr>
<tr><td colspan="3">Note: Line Segments - GREEN = UNDERGROUND / BLUE = OVERHEAD (* exceptions noted below)</td></tr>
<tr><td></td><td colspan="2">Primary Voltage Overhead Conductor</td></tr>
<tr><td></td><td colspan="2">Secondary Voltage Overhead Conductor</td></tr>
<tr><td></td><td>Primary Voltage Underground Conductor</td><td rowspan="4">APPROXIMATE LOCATIONS
VERIFY BY HAND TOOLS
PACIFIC GAS AND ELECTRIC CO.

PLEASE CALL U.S.A. AT
LEAST 48 HOURS PRIOR TO
EXCAVATING IN THIS AREA
Dial 811</td></tr>
<tr><td></td><td>Secondary Voltage Underground Conductor</td></tr>
<tr><td>DEACT
</td><td>* Deactivated Underground Conductor
(Not Energized)</td></tr>
<tr><td>6"
</td><td>* Empty Underground Conduit</td></tr>
<tr><td></td><td colspan="2">Structures that Support Overhead Facilities (e.g. Poles, Towers, etc.)</td></tr>
<tr><td>Customer Service Location (Meter Panel)
Transmission Tower</td><td colspan="2">Although they share the same symbol - Customer Service Locations are differntiated from Transmission Towers by symbol size</td></tr>
<tr><td colspan="3">Note: Symbols attached to Overhead Conductor Line Segments are Overhead devices</td></tr>
<tr><td></td><td colspan="2">Examples of some more common Overhead equipment</td></tr>
<tr><td colspan="3">Note: Symbols attached to Underground Conductor Line Segments are either Padmounted or Subsurface facilities</td></tr>
<tr><td></td><td colspan="2">Examples of some more common Underground/Padmounted Enclosures</td></tr>
<tr><td></td><td colspan="2">Examples of some more common Subsurface/Padmounted Equipment (Note: Padmounted Equipment is typically enclosed in a rectangle. Subsurface Equipment is typically enclosed in a circle.)</td></tr>
</table>

BASIC LEGEND FOR PG&E TRANSMISSION MAPS

SYMBOL	DEFINITION
	Overhead Transmission Lines (Various Voltages)
	Foreign Transmission Lines (Various Voltages)
	Structures that Support Overhead Facilities (e.g. Poles, Towers, etc.)
	Underground Transmission Lines Various Voltages
	Underground Structures (e.g. Manholes)

Gas Symbology

Pacific Gas and Electric Company

GD GIS
Release Date: 03/15/18

Controllable Fittings

Controllable Fittings	Material : Wrought Iron, Steel, Cast Iron, Copper & Unknown	Material : Plastic
Bottom Tap		
Bottom Tap TDW	TDW	
Half Line Stopper	M2	
Half Line Stopper TDW	M2/TDW	
Line Tap / Double Line Tap		
Line Stopper		
Line Stopper TDW	TDW	
Pin-Off Tee		
High Volume Punch Tee / Service Tee		
Punch Tee		
Side Tap		
Side Tap TDW	TDW	
Spherical Tee	SP	
Spherical Tee TDW	SP/TDW	
Top Tap	TT	
Top Tap TDW	TT/TDW	
Stopple Fitting	SPL	
Stopple Fitting TDW	SPL/TDW	

Regulator Station

Regulator Station	Above Ground Indicator (No)	Above Ground Indicator (Yes)
District Regulator	R	R
Low Pressure Regulator		
High Pressure Regulator		

Yes — Above Ground Indicator — No

System Relief Station

M Meter Station

Service Regulation

- Farm Tap Regulator Set
- C Customer Owned Service Regulator

NonControllable Fittings

Trans/Dist — Service

- Branch Saddle
- Clamp
- Coupling
- Cross
- Elbow
- End Cap (Service: N/A)
- Expansion Loop
- Flange
- In-Line Expansion Joint
- Insulating Joint
- Mechanical Joint
- Mechanical Expansion Coupling
- Mechanical Insulated Transition Coupling
- Mechanical Transition Coupling
- Reducer
- Riser
- Sleeve
- Tee
- Temporary Cast Iron End Cap
- Transition
- Transition Reducer
- Wedding Band
- Patch / Half Sole

Gas Valve

Open — Closed

- Valve
- Insulated
- Frame & Cover
- Frame & Cover Insulated
- CAN Canned Valve

Left — **Check Valve** — Right

- Flow
- Flow Insulated
- Service Excess Flow Valve

Active Leaks

Grade 0	Grade 2
Grade 1	Grade 3
Grade 2+	Repaired, Recheck

Inactive Leaks

Repaired	Cancelled

Linear Symbology

Service Lines

Cast Iron	Copper
Plastic	Steel
Tenite	Wrought Iron
	Non-Locatable Stub
Cast Iron, Pre-Posted	Copper, Pre-Posted
Plastic, Pre-Posted	Steel, Pre-Posted
Tenite, Pre-Posted	Wrought Iron, Pre-Posted

Distribution Mains

- High Pressure
- Semi High Pressure
- Low Pressure
- Distribution Main - Aldyl A
- Distribution Main - Pre -1941
- Warranty Survey
- High Pressure, Pre-Posted
- Semi High Pressure, Pre-Posted
- Low Pressure, Pre-Posted

Transmission Mains

- Numbered & Unnumbered
- Pre-Posted

Deactivated Pipeline

Vent Line

High Consequence Area

Pipeline Casing

- No Vents
- One Vent Left
- One Vent Right
- Two Vents

SCADA Devices

- M Auto Meter Reading
- O Remote Control Operation
- C Remote Pipe to Soil
- R Remote Rectifier
- S SCADA Information Only
- T Telemeter

SCADA Line

- Sensing Line

Service Tap

- Branch Saddle
- Bottom Tap
- Coupling
- Cross
- High Volume Punch Tee
- Pin-Off Tee
- Punch Tee
- Reducer
- Service Tap
- Service Tee
- Side Tap
- SP Spherical Tee
- Tee
- TT Top Tap

Aldyl-A Overcap

Service Location

- Above Standard Delivery
- M Curb Meter Indicator
- Service Stub End Cap
- Service Cutoff
- Standard

Pipeline Markers

- Aerial
- Aerial Horizontal
- Carsonite
- DM DAS Marker
- EM Electronic Marker
- Orange Post
- River or Bay
- Stake Or Pipe
- DM Surface Adhesive Sticker
- Water Crossing Sign
- WIG-WAG

Miscellaneous Lines

- Gas Pipe Duct

Foreign Line

- Electric
- Fences
- Fiber
- Gas
- Other
- Plates
- Telephone
- Unknown
- Wastewater
- Water

Miscellaneous Features

- Atmospheric Corrosion
- Block Break
- Blow Off
- CPR Compressor
- Drip
- Electric Substation
- Filter
- Foreign Device
- Gas Lamp
- Gas Well (active)
- Gas Well (inactive)
- Holder (no compressor)
- Holder (with compressor)
- Job Separator
- Odorizer
- Squeeze Point
- Underground Gas Storage

Miscellaneous Structures

- Foreign Structure
- Station Structure
- Vault

Cathodic Protection

Rectifier

- Below Ground
- In Pedestal
- Panel Mount
- Pole Mount

Test Point

- CPR Corrosometer Probe - Above Ground
- CPR Corrosometer Probe - Below Ground
- C Coupon – Above Ground
- C Coupon – Below Ground
- E ETS – Above Ground
- E ETS – Below Ground
- PS Unknown / Casing Vent / Wire
- MP Monitoring Point
- Anode
- Bond
- Junction
- Current Span

- CP Functional Line
- CP Wire

Instruments

- E Electronic Recorder
- P Mechanical Recorder

Conversion Flags

- PAR PAR Flag

Correction Flags

Critical	Unassigned	C1
	Assigned / In Progress	C1
	On Hold	C1
High	Unassigned	C2
	Assigned / In Progress	C2
	On Hold	C2
Medium	Unassigned	C3
	Assigned / In Progress	C3
	On Hold	C3
Low	Unassigned	C4
	Assigned / In Progress	C4
	On Hold	C4

Boundary Features

- Emergency Isolation Zone
- Leak Survey Grid
- Leak Survey Area
- Therm Billing Area
- Cathodic Protection Area

Pre-Post and Job Polygons

Cancelled	Mapping Complete
Pre-Posted	Operational Change
In Design	Planning
Found in Field	Hard to Locate

Public Assembly

- PA Confirmed
- PA Not Confirmed
- PA Beyond Gas Service Territory

Landbase Layers

Street Name Labels

TeleAtlas Street Centerlines

PG&E Temporary Streetnames

- Access Road
- City
- Lot Lines
- PG&E Easement
- PG&E Right Of Way
- Private Road
- Railways
- Stream
- Water Polygon
- PG&E Access Notes

VMS Alerts

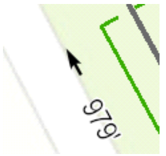
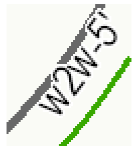
- Customer
- Customer, Help
- ? Help
- Safety
- Safety, Customer
- Safety, Customer, Help
- Safety, Help

*These layers are just a representation of some of the Landbase layers.

Deactivated Annotation

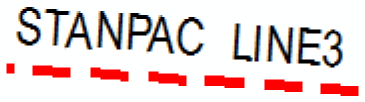
Annotation Feature Classes	Annotation Shows	Example
DeactivatedInsertAnno	Diameter + Material (when Material is not Steel)	(3/4)
DeactivatedJOAnno	Deactivation Job Number + Deactivation Year	
DeactivatedJODateAnno	Installed Job Order + Installed Completion Year	GM35226-1929
DeactivatedSizeMatDateAnno	Diameter + Material (when Material is not Steel) + Installed Completion Year	3/4 2013

Distance Note Annotation

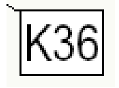
Annotation Feature Classes	Annotation Shows	
DistanceNoteAnno	1) Dimension Text showing distances between gas assets and landbase features Example: 	or 2) Distribution Main information -All Material except Steel: Diameter + Material + Offset from Lot Line -Steel Main: "w" (when welded + Diameter + Coating Type (see list) + Offset from Lot Line Examples:  

Coating Type Abbreviations	
Asphalt	ASP
Bare	Bare
Coal Tar	CT
Cold Applied Tape	CAT
Concrete	CONC
Double Wrapped	DW
Fusion Bond Epoxy	FBE
Hot Applied Tape	HAT
Plastic Coated	PLC
Paint	PNT
Somastic	SOM
Triple Wrapped	TW
X-Tru-Coat	XTR
Single Wrapped	w

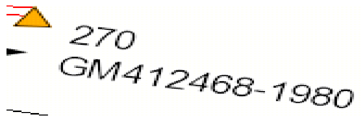
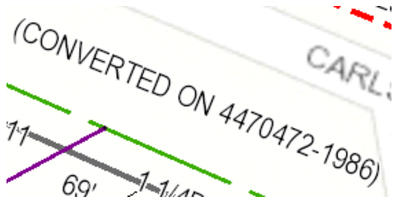
Distribution/Transmission Main Annotation

Annotation Feature Classes	Annotation Shows	Example
DistMainJODateAnno	Installed Job Order + Installed Completion Year	
DistMainJTAnno	"JT" when Joint Trench Indicator = Yes	(JT)
DistMainLWAnno	"WOW" when Locating Wire Indicator = No	(WOW)
TransMainJODateAnno	Installed Job Order + Installed Completion Year	GM1950724-1991
TransMainJTAnno	"JT" when Joint Trench Indicator = Yes	(JT)
TransMainLineNumberAnno	Transmission Line Number	
TransNameAnno	Pipe Name	
MainMLXAnno	MLX Agreement Number when populated	MLX#139893

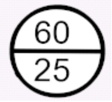
Valve Annotation

Annotation Feature Classes	Annotation Shows	Example
ValveNumberAnno	Valve Number	

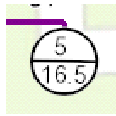
Miscellaneous Annotation

Annotation Feature Classes	Annotation Shows	Example
BlowOffAnno	BlowOff Pipe Size	2
CasingAnno	Casing Diameter + Casing Material + Length Of Casing	8-60
CPRectifierAnno	Rectifier Number + Installed Job Order + Installed Completion Year	
GasPipeDuctAnno	Duct Diameter + Duct Material + Length Of Duct	(2 PL DUCT)
MiscGasAnno	Extra text that does not fit into other annotation feature classes	

Regulator Station Annotation

Annotation Feature Classes	Annotation Shows	Example
CustomerRegulatorAnno	Inlet MAOP + Outlet MAOP	
RegulatorStationAnno	Regulator Station Type + FMID	DR 6
RegulatorStationMAOPAnno	Inlet MAOP + Outlet MAOP	

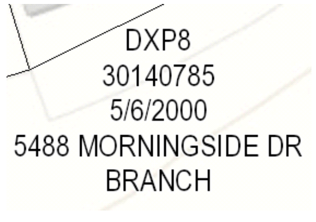
Service Annotation

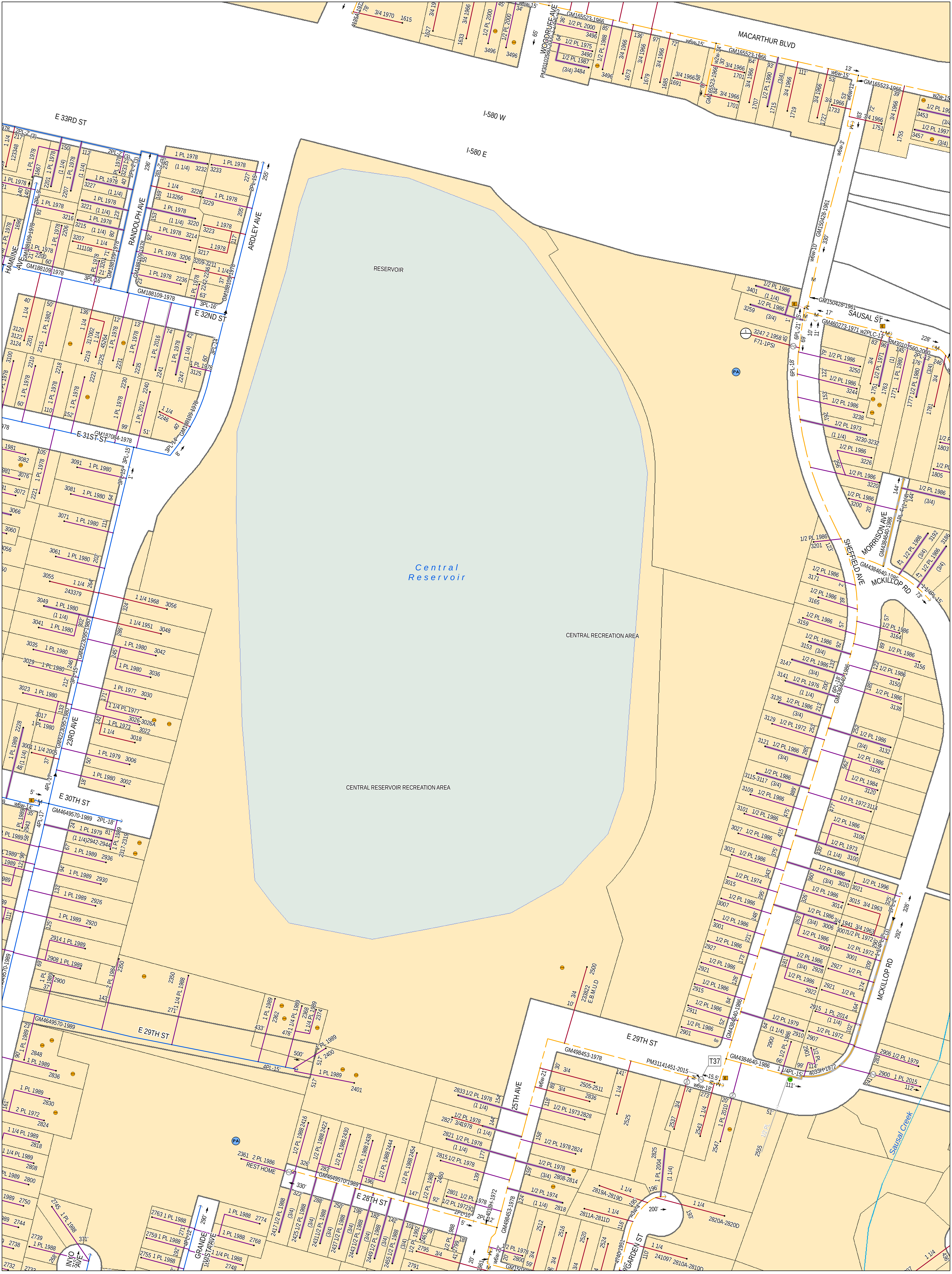
Annotation Feature Classes	Annotation Shows	Example
ServiceJOAnno	Installed Job Order	298209
ServiceJTAnno	"JT" when Joint Trench Indicator = Yes	(JT)
ServiceLocAddAnno	House Address	591
ServiceLocPressureAnno	Delivery Pressure + Delivery Load when elevated[DELIVERYPRESSURE[DELIVERYLOAD]	
ServiceLWAnno	"WOW" when Locating Wire Indicator = No	WOW
ServiceMLXAnno	MLX Agreement Number when populated	MLX#111743
ServiceSizeMatDateAnno	Diameter + Material (when Material is not Steel) + Installed Completion Year	1/2 PL 2005
ServiceSONAnno	Service Order Number	310218

Vent Annotation

Annotation Feature Classes	Annotation Shows	Example
VentAnno	Vent Size	2"
VentLineAnno	Vent Diameter	1"

WIP Cloud (Pre-Post Polygon) Annotation

Annotation Feature Classes	Annotation Shows	Example
WIPCloudAnno	LanID of user who created polygon + Job Order + Energized Date (when populated) + Date Cloud Created+ Estimator LanID + Work Description + MLX Date (when populated) + MLX Number (when populated) + Physical Description (when populated) + WC Document (when populated) + Deactivated Date (when populated) + PrePost Polygon Status	



PACIFIC GAS & ELECTRIC COMPANY

Highway 580 and Ardley Ave, Oakland

PLEASE CALL U.S.A. AT LEAST 48 HOURS PRIOR TO EXCAVATING IN THIS AREA
Dial 811

APPROXIMATE LOCATIONS
VERIFY BY HAND TOOLS
PACIFIC GAS AND ELECTRIC CO.

0 50 100 200 300 400 500 Feet

"WARNING: Confidential, Proprietary Information

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IF YOU DISCOVER A CONFLICT OR IF YOU DETERMINE OUR FACILITIES NEED TO BE LOWERED/RAISED, FILE AN APPLICATION ONLINE AT WWW.PGE.COM/CUSTOMERCONNECTIONS OR CALL: (877) 743-7782.

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EBMUD
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Pacific Gas & Electric Company

Date: 5/15/2018

[Ad-Hoc]

1 inch = 50 feet

APPROXIMATE LOCATIONS
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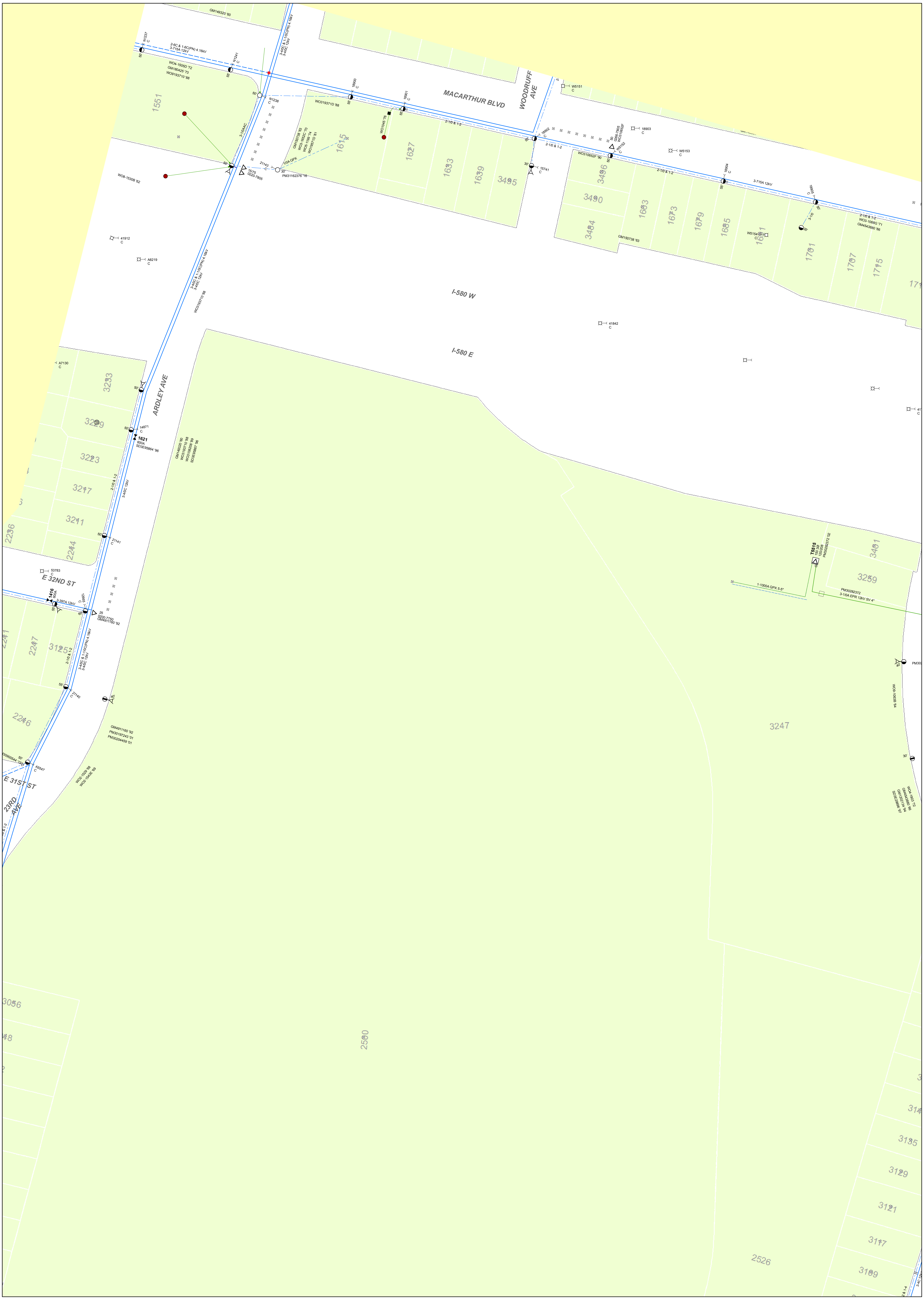

Pacific Gas & Electric Company

Date: 5/15/2018

[Ad-Hoc]

1 inch = 50 feet

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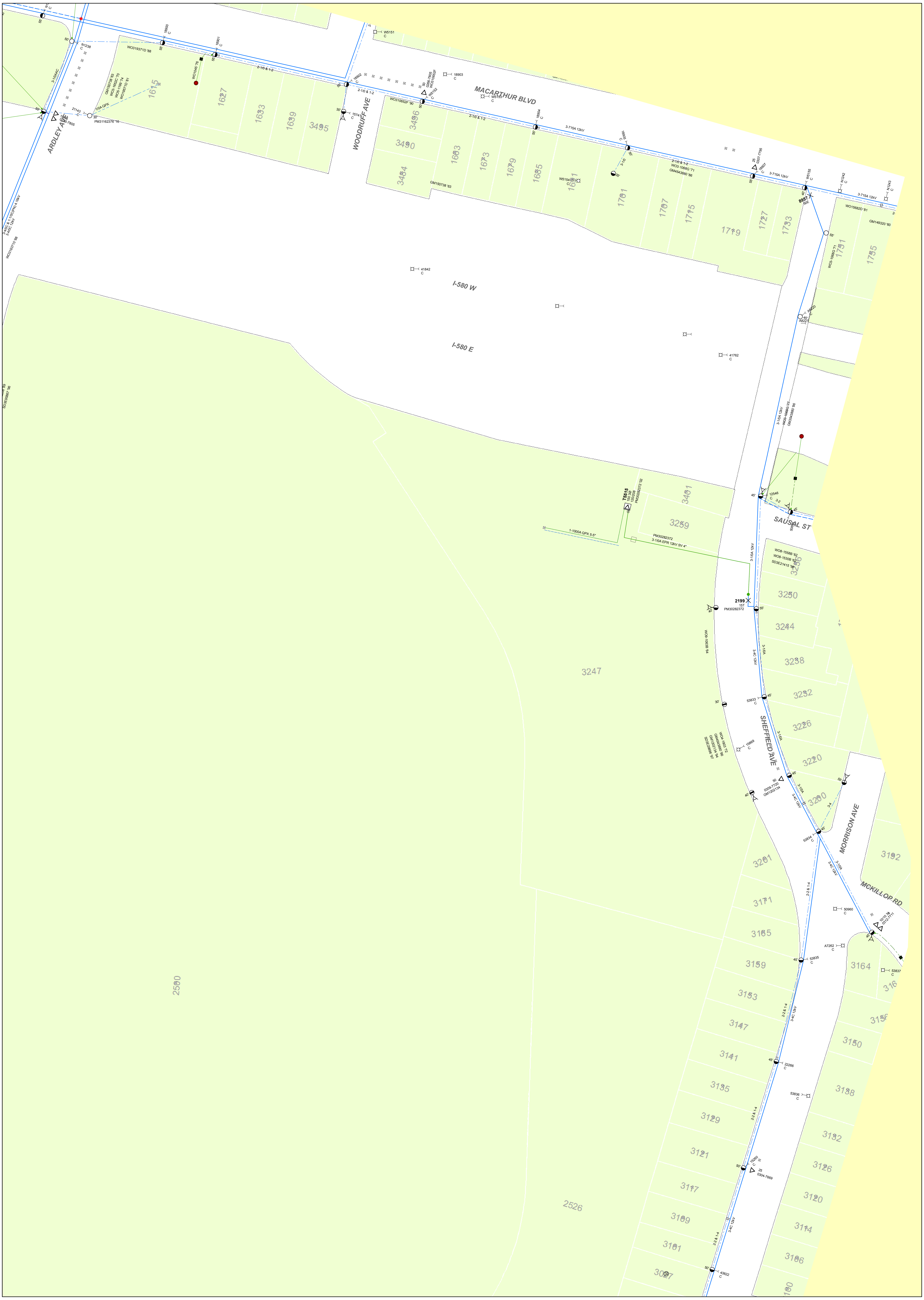

Pacific Gas & Electric Company

Date: 5/15/2018

[Ad-Hoc]

1 inch = 50 feet

**APPROXIMATE LOCATIONS
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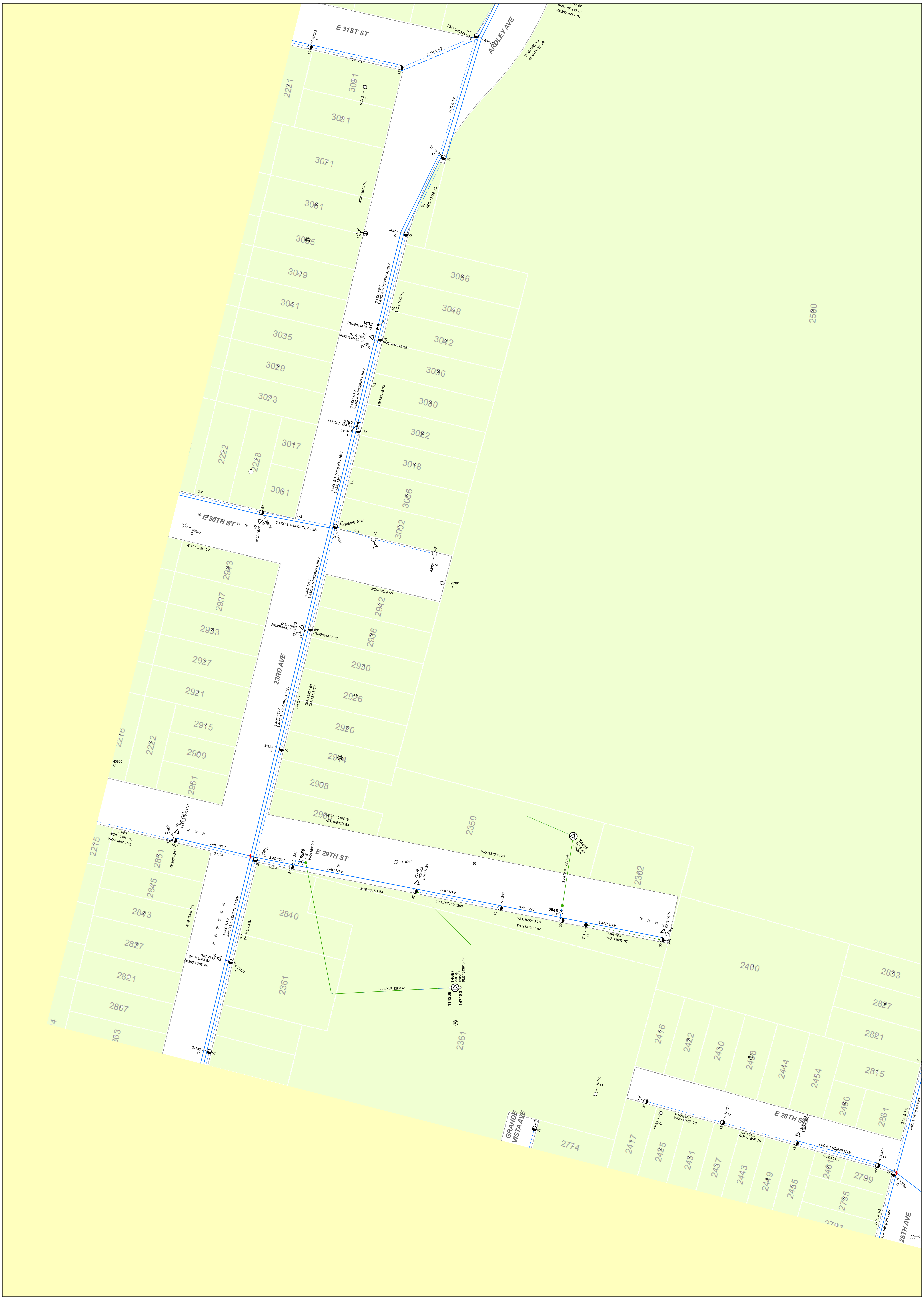

Pacific Gas & Electric Company

Date: 5/15/2018

[Ad-Hoc]

1 inch = 50 feet

**APPROXIMATE LOCATIONS
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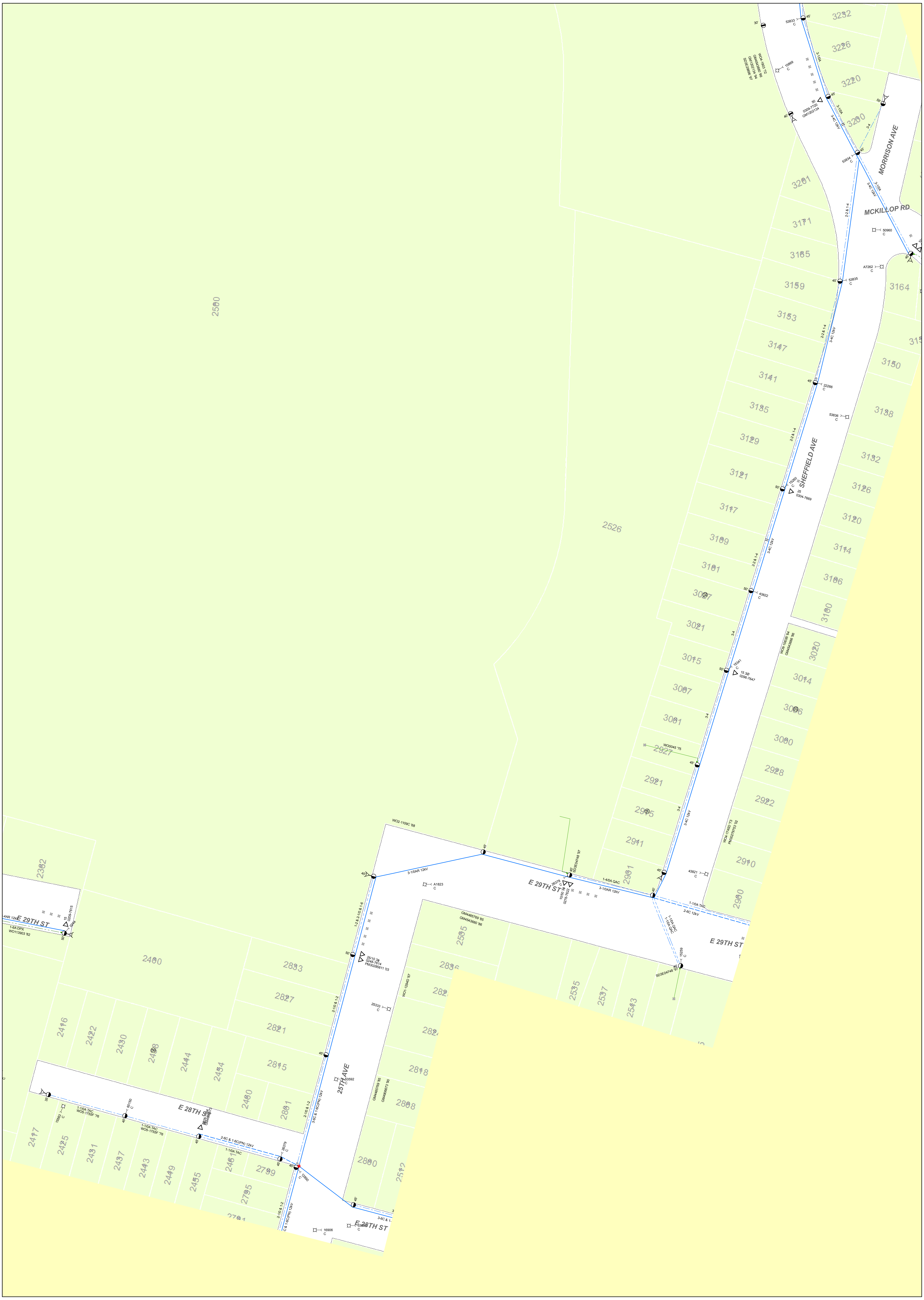

Meryka Dirks

From: Hope, Aaron <aaron.hope@ebmud.com>
Sent: Thursday, May 24, 2018 9:09 AM
To: centralreservoir
Subject: FW: URGENT: Please help ASAP: Information needed to treat termite activity

From: Cynthia Isom [mailto:marketingcd@aol.com]
Sent: Thursday, May 17, 2018 8:07 AM
To: Luong, Laura
Subject: URGENT: Please help ASAP: Information needed to treat termite activity

Hi Laura,

I own the property at 3129 Sheffield Avenue. The roof on my detached garage collapsed. Resulting in a cracked floor. During the cleanup we discovered deteriation of the wood framing around the interior of the structure. I was told it was due to dryrot. This week I had a two free termite inspections. Iwas advised by both companies there was also termite damage. Because the structure is near a waterway the companies may not be able to use pesticide. Do you know what can be done to resolve this problem?

Do you know when the reservoir was built? Do you know where the waterway begins and ends? Does it feed our water supply? I am concerned because the termites breed in moist soil. In order to protect my property the soil needs to be treated. Any help that you can provide will be greatly appreciated.

Cynthia Isom Dorsey
marketingcd@aol.com

-----Original Message-----
From: Luong, Laura <laura.luong@ebmud.com>
To: Undisclosed recipients:;
Sent: Thu, Feb 1, 2018 12:12 pm
Subject: Central Reservoir Replacemet Project Public Meeting 2/13 at 6pm

EBMUD

Central Reservoir Replacement Project Public Meeting

EBMUD has a proud history of providing high-quality drinking water in Alameda and Contra Costa counties and maintai 167 reservoirs, 136 pumping plants and 4,200 miles of water pipelines to ensure reliable delivery around the clock.

EBMUD is planning to replace Central Reservoir, which is bounded by Ardley Avenue and 23rd Avenue to the west, She Avenue to the east, and Interstate 580 to the north. Central Reservoir was constructed in 1910 and has reached the enc service life. The reservoir is important for operational and emergency storage in the area. EBMUD studies have conclude replacing the 153-million gallon reservoir with three 17-million gallon concrete tanks within the existing reservoir basin i most effective way to update the reservoir and improve water quality operations while minimizing costs and environmen impacts.

In addition to replacing Central Reservoir, the existing material storage building located on the Central Reservoir site wi demolished. The existing buried vault for the Central Rate Control Station, located on the sidewalk at the corner of 25th Avenue and East 29th Street, will also be replaced on site and expanded to make room for additional piping and val

The first public meeting was held in September 2017. Please join us for an informational meeting where EBMUD staff wil present the revised landscape design and receive your input.

Tuesday, February 13, 2018 at 6 p.m.
Manzanita Community School Auditorium
2409 E 27th Street, Oakland

Project website: www.ebmud.com/central
Questions? Laura Luong, EBMUD Community Affairs at (510) 287-0140, or centralreservoir@ebmud.com

Thank you for your patience while EBMUD works to improve your water distribution system.

Thank you,
Laura

Laura Luong
EBMUD Community Affairs
510-287-0140
laura.luong@ebmud.com

Meryka Dirks

From: Lisa Lemus <lemuswong@gmail.com>
Sent: Tuesday, May 29, 2018 9:08 AM
To: centralreservoir
Subject: Comments on the NOP

Dear Arron Hope, Civil Engineer,
The NOP captured our concerns for landscaping to be as aesthetic as possible and for the building to be as inconspicuous as possible.
Our additional comments for this project are:

1. Has an access road been discussed that would allow for RDS families to enter and exit during their busy school commute hours?
This will help alleviate the traffic congestion for the neighbors and the school

2. Have you addressed the neighbors suggestion to have the tanks beautifully decorated with a mural?

3. What is the planned flow work hours and plan for noise reduction?

4. How will you keep the neighbors informed of your work especially as they impact us.

Thank you,
Lisa Lemus and Phillip Wong
3020 Sheffield Ave
Oakland, CA 94602
510-534-1480

APPENDIX C

Planning Phase Architectural Design Report

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Planning Phase Architectural Design Report
Central Reservoir Replacement Project
East Bay Municipal Utility District

February 2019

I. EXECUTIVE SUMMARY

East Bay Municipal Utility District (EBMUD) is replacing its Central Reservoir with three 17-million gallon (MG), pre-stressed concrete tanks with concrete roofs on the north end of the existing basin, as shown on Figure ES-1. In spring 2017, EBMUD contracted with Environmental Science Associates (ESA) to provide environmental services for the Central Reservoir Replacement Project (Project). In addition, the contract with ESA included site planning services for the tanks to prepare architectural and landscape plans for the Project. As part of the ESA team, Muller & Caulfield Architects and Dillingham Associates Landscape Architects worked with EBMUD to develop a detailed landscape plan for the Project. The primary design considerations were existing topography, tank and infrastructure location, tank height and elevation, site grading (including the balance of cut and fill), tank screening, security, key observation points, site drainage, maintenance, and tree preservation.

The design team conducted internal design meetings, an arborist survey of the site, developed several preliminary plan concepts, completed 3D computer and photorealistic simulations at key observation points, and helped facilitate two public meetings to obtain community input on the concepts. The design team and EBMUD, with community input, selected a final design that incorporates existing landscaping, a mix of earthen berms (i.e., mounds), trees and shrubs (see Figure ES-1) to screen the tanks and direct the eye toward the natural setting at the perimeter of the site while balancing the cut and fill on the site.

The final design includes a planting palette primarily of drought-tolerant native tree and shrub species for screening with the inclusion of Ginko and plants that can withstand intermittent watering in the bio-retention basin. Evergreen trees and flowering shrubs are used for screening along the perimeter and on berms and two deciduous tree species were incorporated for seasonal interest in interior portions of the site. Much of the site will be mulched for weed control. Once the landscaping matures and fills in, usually 5 to 10 years after construction, the tanks will be mostly hidden.

This report provides an overview of the design process, design criteria, concepts explored, and the community's involvement in the design process. The design process goal was to minimize visual and construction related impacts of the Project on the surrounding neighborhood. By reusing soil on the site through the construction process, berms will be built to visually separate the tanks from surrounding public streets as well as neighboring land uses. Low-water-use trees and shrubs enhance the screening provided by the berms.

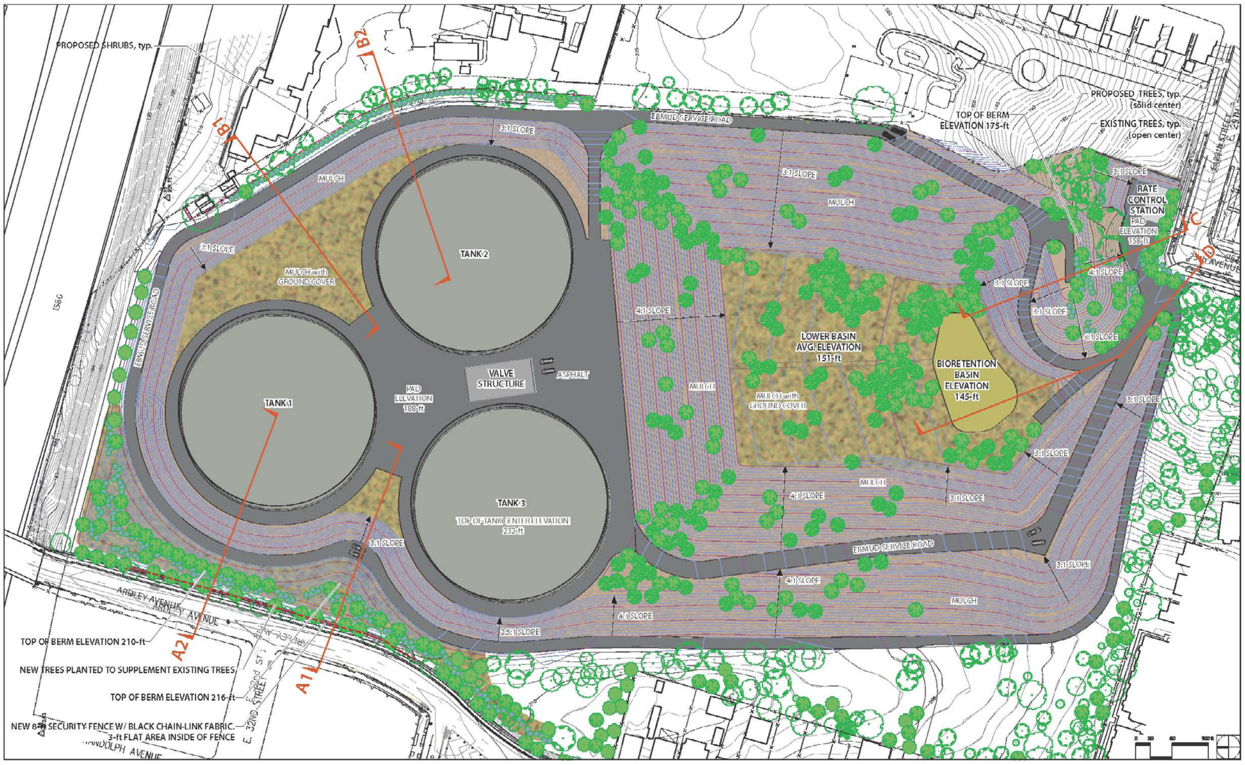

Figure ES-1 Final Concept Plan

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II. INTRODUCTION

A. Site Location

Central Reservoir is located on a 27-acre site that is bounded by Ardley and 23rd Avenues to the west, Sheffield Avenue to the east, Interstate 580 (I-580) to the north, and 25th Avenue/East 29th Street to the south as shown on Figure 1. The site is a historical tributary to Sausal Creek and is located adjacent to residences, the Redwood Day School, and the Central Reservoir Recreation Area (a City of Oakland community park). Central Reservoir is supplied (in part) using the Central Rate Control Station (RCS), which is located in a buried vault on East 29th Street immediately adjacent to the south end of the Central Reservoir site.

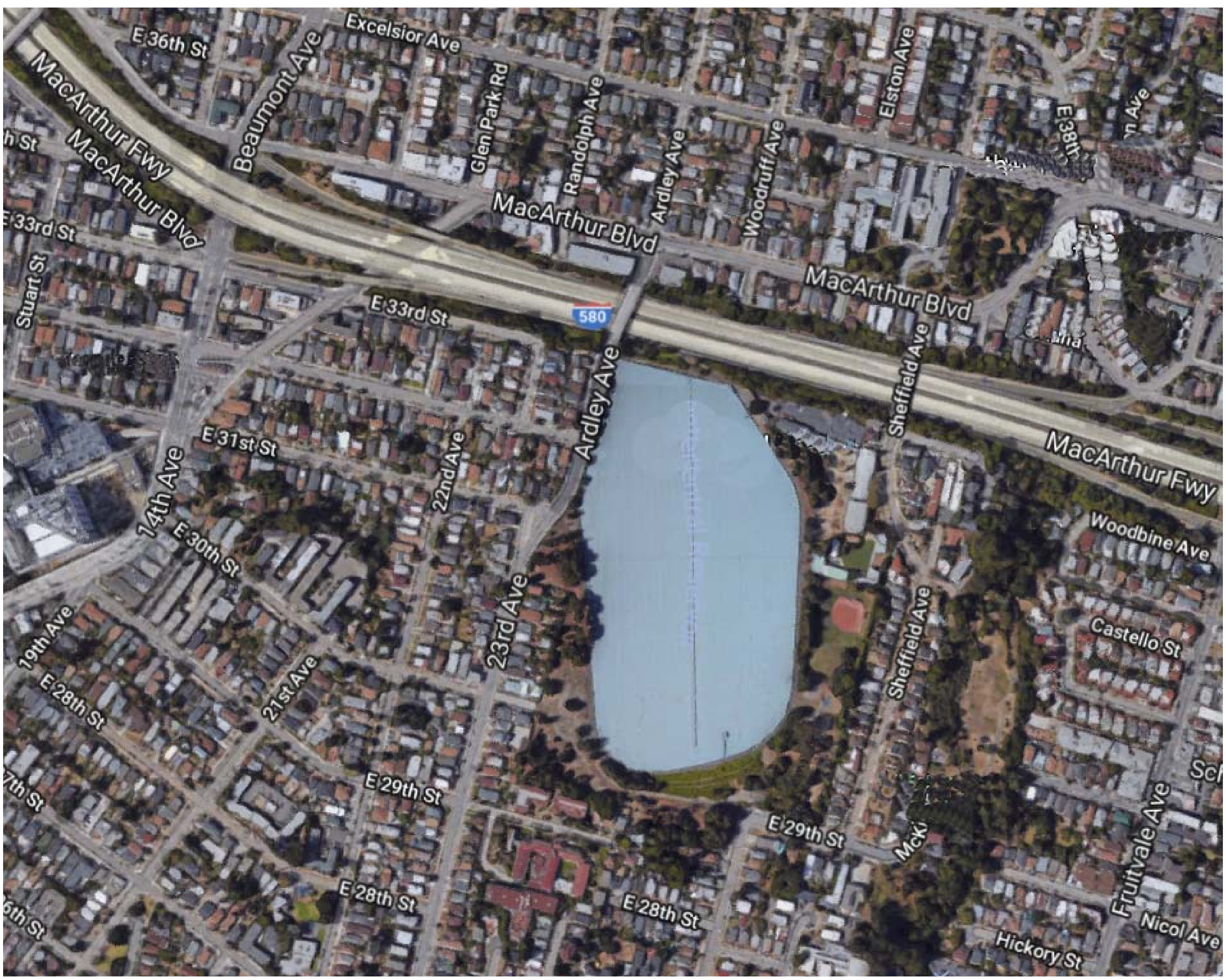


Figure 1 Aerial View of Existing Reservoir

B. Project Planning Process

In March 2017, EBMUD awarded a contract with ESA for consulting services for the preparation of an Environmental Impact Report (EIR) including landscape and architectural design services. EBMUD and the landscape and architectural design team (design team) conducted an initial phase of design meetings to establish design goals and criteria between March and August 2017 prior to developing architectural and landscape design concepts (design concepts). The effort culminated in the first community meeting on September 28, 2017 to receive community input on the design concepts. After refining the design concepts based on community input from the first community meeting, a second community meeting was held on February 13, 2018 to present the final design concept. EBMUD also solicited additional community input at the second meeting for the EIR scope. Following the publication of this design report, the environmental review process will begin. EBMUD will solicit additional community input on the Draft EIR at a public meeting anticipated to be held during the public review period of the Draft EIR.

C. Public Meetings

As discussed above, the design team and EBMUD conducted two community meetings to present the design concepts and receive community input on the proposed design concepts. The first of these meetings was conducted after development of three alternative design concepts. See sections IV-A and IV-C of this report. Comments from the public at the meeting were used to shape the final plan. These comments helped the design team focus on “berming” and plant strategies as a method to screen the tanks while ensuring the site is secure.

D. Arborist Report

In preparation for the landscape design process, an arborist survey and report was completed. The arborist report surveyed the trees currently on site and evaluated their health to determine which trees should be removed based on the health of the specimen. The final design concept reflects removal of trees based on health. Of the 380 existing trees on site, 27 will be removed because of poor health and others will be removed to accommodate grading and new facilities as part of the proposed site design, as discussed below under section V.C.

III. DESIGN CRITERIA

This chapter discusses the constraints, considerations, and criteria used to steer the site landscape design process.

A. Physical Constraints

The existing topography of the site is the foremost constraint on site development. The existing site consists of two embankments to create the existing reservoir structure, a smaller auxiliary embankment at the north end and a larger main embankment at the south end. Once the existing reservoir is removed from service and the roof, columns and lining are demolished and removed, the site will become a large basin constrained on each side by existing slopes and adjacent improvements such as service roads and fences. The bottom of the basin slopes downward from north to south, with the northern end next to the I-580 freeway about 22-feet higher than the southern end. The auxiliary embankment along I-580 constrains the northern edge of the site, while the other three sides of the site are limited by existing roads and neighboring properties (refer to Figure 1).

B. Visual Considerations

Visual simulations were created at key public viewpoints (i.e., Key Observation Points or KOPs). To identify the KOPs, the design team conducted a visual survey of the site and the surrounding area and

Figure 2 Location of Key Observation Points

selected the most prominent public views that may be affected by the Project. In total, five KOPs were selected. The KOPs included Ardley Avenue and a portion of 23rd Avenue, the intersection of 25th Avenue and 29th Street, and the play yard of the Redwood Day School. Each of the KOPs is described below and a map showing each KOP location is shown in Figure 2. Photos of the existing KOPs are shown below in Figure 3.

The design team studied the KOPs carefully using 3D computer (computer) simulations and photo-realistic (visual) simulations for the site. The 3D computer model was also used for determining the most prominent views of the site, for understanding site-grading scenarios and for quantifying earth cut and fill on the reservoir site. The visual simulations were used to show realistic "before" and "after" views of the site.

KOP 1: Ardley Avenue near I-580 Bridge: The existing view of the reservoir site consists of a 6-foot galvanized chain link fence with a row of Gum trees (Lophostemon confertus) just behind the fence. The exterior wall of the existing reservoir is set back about 4-feet from the fence and the roof surface is about 4-feet above the sidewalk. The remains of a Myrtle hedge are interwoven with the fence. The Project would be seen by vehicle occupants, bicyclists or pedestrians traveling on Ardley Avenue as it passes along the west boundary of the reservoir site. The Project would also be seen by residents who live along Ardley Avenue. KOP 1 is particularly useful in representing the Project frontage along a major visual corridor. Without screening devices such as earthen berms or landscaping, occupants of a vehicle, or bicyclists or pedestrians moving south along Ardley would have a clear view of two of the proposed tanks, projecting approximately 25-feet above the existing roadway.


Figure 3A KOP 1

KOP 2: Ardley Avenue at East 32nd Street: KOP 2 shows a direct view of the Project site and the existing reservoir due to the break in vegetation, with the roadways, sidewalks, cars, and residential structures in the foreground view, the existing reservoir roof, and fencing in the middleground view, and existing trees on the other side of the reservoir in the background view. The Project would be seen by vehicle occupants, cyclists, and pedestrians traveling east down East 32nd Street towards Ardley Avenue. The Project would also be seen by residents who live along Ardley Avenue.

Figure 3B KOP 2

As with KOP 1, KOP 2 is particularly useful as a test for various screening devices such as earthen berms and vegetation. Without screening devices such as landscaping, vehicle occupants, bicyclists or pedestrians would have a clear view of one of the proposed tanks that would be projecting approximately 25-feet above the existing roadway.


Figure 3C KOP 3

KOP 3: Ardley Avenue & 23rd Avenue: KOP 3 shows the viewpoint of vehicle occupants, bicyclists, or pedestrians traveling north on Ardley Avenue along the west side of the reservoir site, as well as residents who live along Ardley Avenue. Occupants of a car, bicyclists, or pedestrians would have views of the proposed tanks, unless these views are partially screened by the proposed planting and earthen berms. Because vehicle occupants and pedestrian will tend to look along the street and the existing trees in this area significantly screen the Project site. If the existing trees are retained, then additional screening devices such as additional trees and berms are less useful than in the KOP 1 and KOP 2 locations.


Figure 3D KOP 4

KOP 4: 25th Avenue & East 29th Street: KOP 4 shows the viewpoint of vehicle occupants, bicyclists or pedestrians traveling along 25th Avenue towards the intersection of East 29th Street, at the southern end of the reservoir site. Currently, the view of the existing reservoir site is mostly blocked by the existing vegetated embankment. If the entire embankment is removed, vehicle occupants, bicyclists or pedestrians at this location would have a clear view of two of the proposed tanks. The final design retains a portion of the existing embankment on the eastern side of the East 29th Street and 25th Avenue entrance to the reservoir site. The remaining embankment and proposed landscaping would screen views of the tanks at this location.


Figure 3E KOP 5

KOP 5: Redwood Day School: KOP 5 shows the viewpoint from the RDS school playground. The reservoir roof is slightly visible through breaks in the trees. The proposed Project area would be seen from occupants of the Redwood Day School looking west, although the tanks would be mostly screened by the existing trees located along the boundary of the Redwood Day School at this location. The lowest branches of the existing trees have been removed to a height of about 8-feet. The transparent fence could allow views of the tanks below the lowest branches of the trees.

C. Design Criteria

Through several design meetings, EBMUD and the design team developed criteria for evaluating design alternatives. The criteria are provided in the following sections.

Tanks

Three 17-MG pre-stressed concrete tanks will be located in the north end of the basin and will have a diameter of approximately 270-feet and a height of approximately 47-feet. The floor of the tanks must be at the elevation of 183-feet. The tanks will be partially buried such that the elevation of the pad surrounding the tanks will be 191-feet, 8-feet above the tank floor. The elevation of the top of the tank roof will be approximately 230-feet at the outer edge of the tank, increasing to a high point of approximately 232-feet at the center of the tank. The roof will have a 42-inch high guard rail around the perimeter. Typical railing consists of 1.5-inch posts spaced every 5-feet and 6 stainless steel cables spaced approximately every 6-inches.

The tank color will be EBMUD's standard green tank color (federal color number FS 14159). EBMUD maintenance crews keep paint in their vehicles for handling graffiti and other issues at 167 reservoirs, and hundreds of other pumping plants, treatment plants and other facilities. Standardized paint colors are necessary to minimize maintenance costs and improve the ability to respond to maintenance issues. The EBMUD green is used on tanks because it closely matches the color of native trees and blends in with its surroundings.

Valve Structure

A new concrete valve structure approximately 50-feet by 100-feet will be constructed between the three tanks at the interior of the site. The building will be approximately 15-feet high with its roof at an elevation of approximately 206-feet, and a 42-inch high guard rail around the perimeter of the roof following the same design as the tank guardrail. There will be an approximate 12-foot by 12-foot roll-up door at the entry side of the building. Parking for maintenance and other service vehicles will be provided at the tanks and valve structure. The location of the valve structure is between the tanks and its height (24-feet lower than the tanks) minimizes its visibility from outside the site. The valve structure will be painted the same color as the tanks, EBMUD's standard green tank color (federal color number FS 14159).

Rate Control Station and South Entrance Modifications

A new underground RCS that replaces the existing Central RCS will be located in a new paved work area where the material storage building is currently located, near the intersection of East 29th Street and 25th Avenue (Figure 4). The paved area will be approximately 50-feet by 90-feet. The roof of the RCS vault will project 2-feet above the paved pad and will have a size of approximately 30-feet by 50-feet. The existing concrete and rock retaining wall below the proposed RCS will be retained and separated from the new RCS site by a row of trees and shrub planting. Grading for this paved area requires a 7-foot-high retaining wall below the east property line fence. A 4-foot-high retaining wall located along the north side of the pad will preserve the roots of two existing trees that are important for natural screening. Also, a utility pole near the 25th Avenue driveway will be relocated approximately 100-feet to the north.

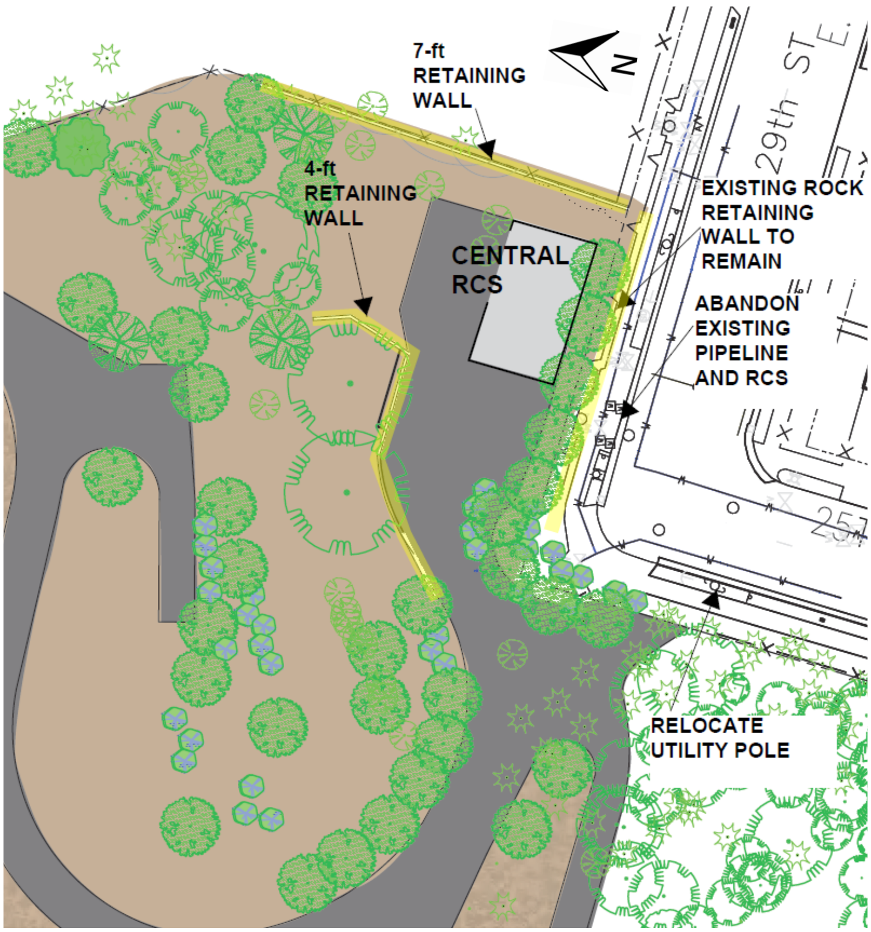


Figure 4 Rate Control Station and South Entrance Modifications

Grading and Drainage

To support the new tanks, a structural pad at the north end of the site at an elevation of approximately 183-feet will be required, which is around 10- to 30-feet above the bottom of the existing reservoir basin. The existing basin must be re-shaped in order to create space for the proposed tanks, while also removing or breaching the main embankment to reuse the embankment soil for the structural pad and remove the site from California of Division of Safety of Dams (DSOD) jurisdiction.

In order to minimize erosion and to provide safe access for maintenance, permanent cut-and-fill slopes within the proposed basin will be designed to be generally no steeper than 3:1 (3-foot horizontal to 1-foot vertical). The maximum slope between the upper and lower basins of the reservoir will be 4:1. For 3:1 slopes or steeper, 4-foot-wide benches will be incorporated into the slope every 12-feet of vertical elevation change. If the slope is 4:1, then the bench will be placed every 20-vertical-feet of drop. The landscape berms along Ardley Avenue will have a maximum 3:1 slope.

The existing basin will be re-graded to drain stormwater through a combination of "V" ditches, stormwater pipelines, and surface runoff to a 14,000 square foot stormwater treatment area (bio-retention basin). From this bioretention basin, water will be drained by gravity to the existing City of Oakland storm drain inlet at the corner of 25th Avenue and East 29th Street using an underground storm drain pipeline.

Balanced Cut and Fill

To minimize Project costs, hauling in the neighborhood, and impacts to the environment, the earth cut-and-fill on the site was balanced. “Balanced” means that soil is being moved around on the site, but no new soil is being brought in and no excess soil is being trucked away to be disposed of elsewhere. Where soil must be dug out to achieve the desired profile in one area of the site, it will be reused as fill in another area of the site. Minor unusable cut elements such as soil connected tree roots (assumed 800 cubic yards) will still need to be off-hauled. Soil used to build the tank foundation, the access areas around the tanks, and for the berms for screening will come from excavation of other areas within the site, principally from the main embankment and the southern end of the site where a lower and wider drainage basin will be created. While the lower basin (proposed elevations of approximately 148- to 155- feet) is similar to the grade at the bottom of the existing reservoir, the basin will be wider and with steeper east and west side slopes in order to supply the fill to support the tanks at the north end of the site. To create a cut-and-fill balance, side slopes on the west and north sides of the lower basin (south half of site) will be 4:1, and the east side below the Central Reservoir Recreation Area will be 3:1. Level benches on these slopes are noted on the previous page. A portion of the main embankment will remain in place to screen views of the tanks from the intersection of East 29th Street and 25th Avenue.

Trees and Plants

The existing site has approximately 380 trees; after construction, approximately 271 will remain. Approximately 27 trees in poor condition per the Arborist Report will be removed, as well as the approximately 82 trees that are in locations that conflict with Project construction. Where possible, existing mature trees will be preserved. Special care will be taken to preserve trees located on the site’s perimeter because perimeter trees provide screening for the proposed tanks.

To offset instances where the earthwork design will require that trees be removed, 337 new trees will be planted to ensure an overall increase in the number of trees on site post-construction for maximum visual screening.

To prevent intruders from using the trees and shrubs to climb the fence or to conceal entry, no trees and shrubs will be planted within 6-feet of the exterior side of the fence line for security reasons. The plants and/or shrubs near the fence line on the interior side will be low density to further promote visibility into the site so that intruders can be easily seen.

Visual Screening

The tanks and other infrastructure on the site will be screened from the surrounding neighborhood in a way to be compatible with the visual character of the neighborhood. Special consideration will be given to the KOPs, as described under section C, Visual Considerations, which represent the points with greatest site visibility from an adjacent public view.

The first strategy to screen the tanks is by creating and maximizing the height of earthen berms to block views from important vantage points. The berms will be planted with trees and shrubs to increase their visual height and screening effect. Where screening with berms is not feasible, the tanks will be screened with trees and shrubs. Screening will be accomplished by taking advantage of the existing trees where possible and adding supplementary trees and shrubs.

IV. CONCEPTUAL SITE PLAN

A. Community Meeting No. 1 Design Concepts

Based on the design criteria outlined in the previous section, the design team developed three design concepts (refer to Appendix A) that were presented to the public at a September 28, 2017 (Community Meeting No. 1).

The design team provided an overview of the history of the site, a description of the reservoir's place in the EBMUD water distribution system, and a review of the need for the Project. In addition, the design team presented the Project explaining reasons for the choice of three 17-MG concrete tanks (over one- and two-tank configurations) as the reservoir replacement. The remainder of the Project was also presented, including the demolition of the existing materials storage building, the replacement of the rate control station, the proposed stormwater treatment system for the site, and plan for access, security, and maintenance.

The three proposed design concepts were presented via a combination of visual simulations and 3D model representations from the five KOPs described in the design criteria discussion above. The visual simulations showed the existing views of the site and the simulated views of the site immediately after construction (before landscaping) and 10 years after construction when the landscaping has matured.

The three proposed design concepts are "Berming", "Planting", and "Trellis" Concepts. The layout of the access road, valve structure, rate control station, bio-retention basin, and planting palette are the same in each of the three proposed design concepts. The fence location is the same in all concepts except for the Planting Concept. Whereas in the Berming and Trellis Concepts the fence is setback about 30-feet from the property line along Ardley Avenue; in the Planting Concept the fence is setback 50- to 60-feet. The fence is located back further along Ardley Avenue in the Planting Concept to make room for more vegetation that will enhance screening.

For all three design concepts, areas of the site not covered by permeable surfaces or structures will be landscaped with mulch and low shrubs sufficient to provide soil coverage and limit weed growth. The slopes within the site will be mulched. Figure 5 shows the 3D modeled aerial view of the proposed Project components.

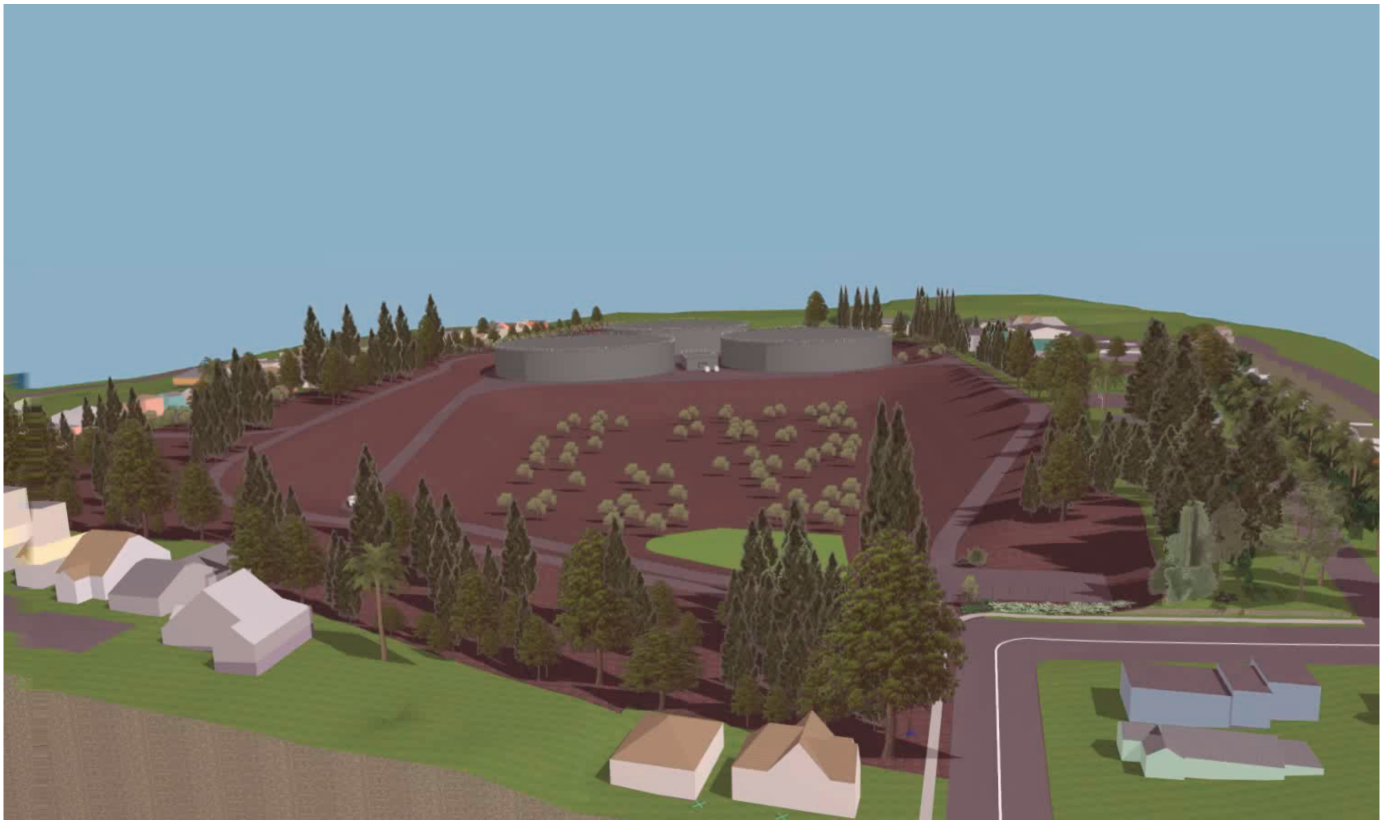


Figure 5 Modeled Aerial View of Proposed Project Site

Proposed Design Concept 1 - Berming:

The proposed Design Concept 1 – Berming, visually separates the tanks from Ardley Avenue with 5- to 6-foot tall earthen berms and uses low-density plants (both existing and new) elsewhere on the site perimeter to screen views from KOPs.

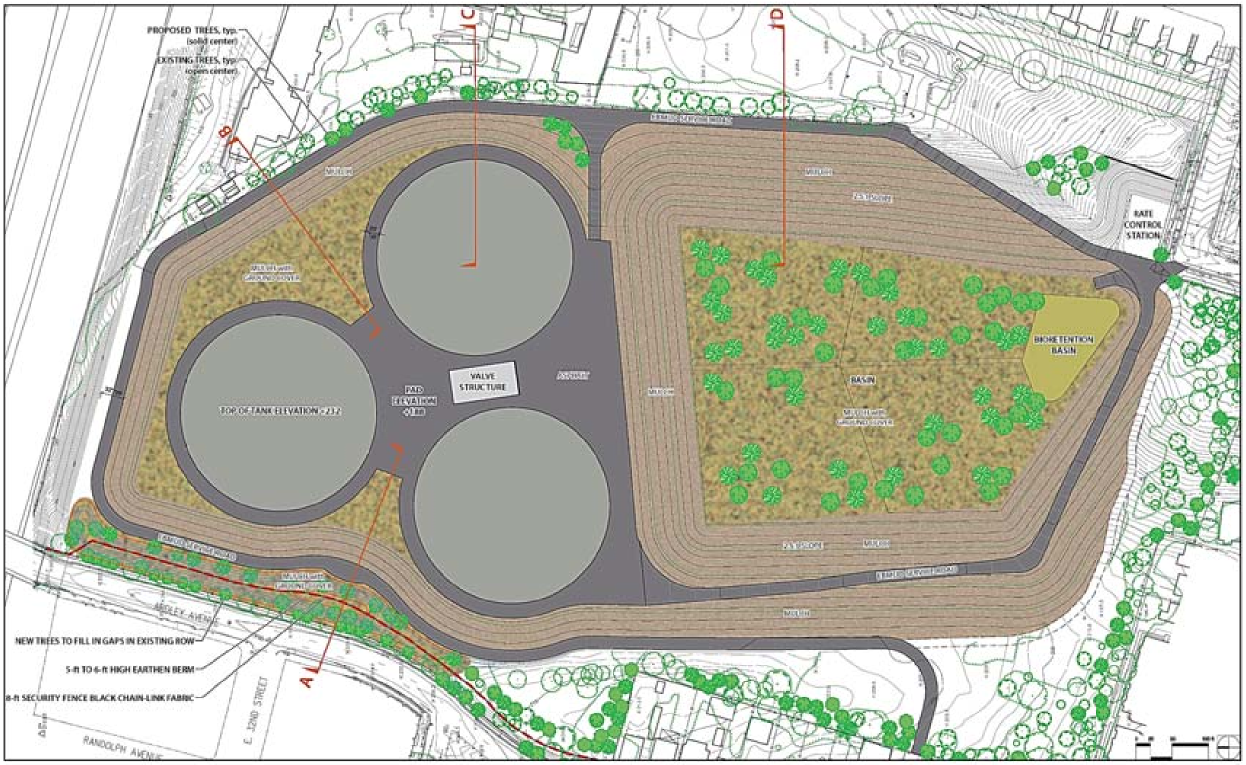
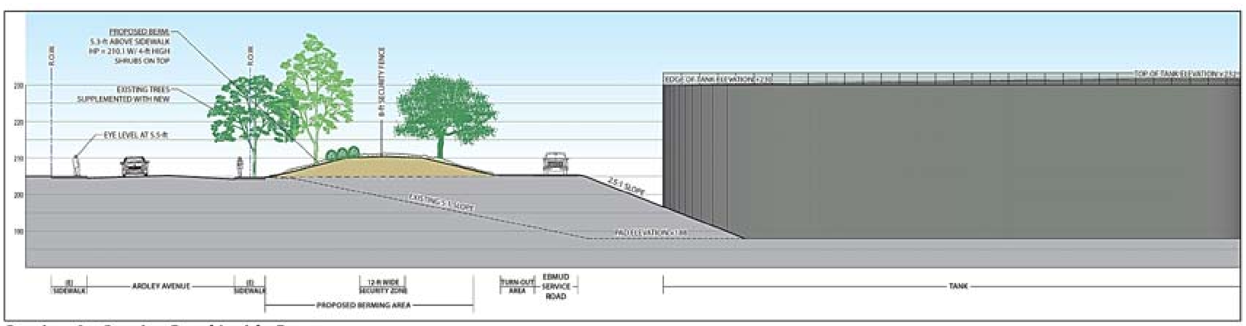
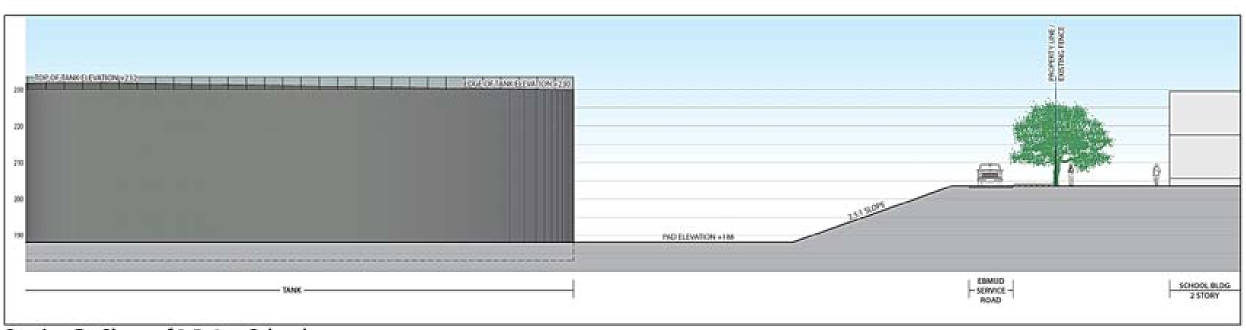


Figure 6A

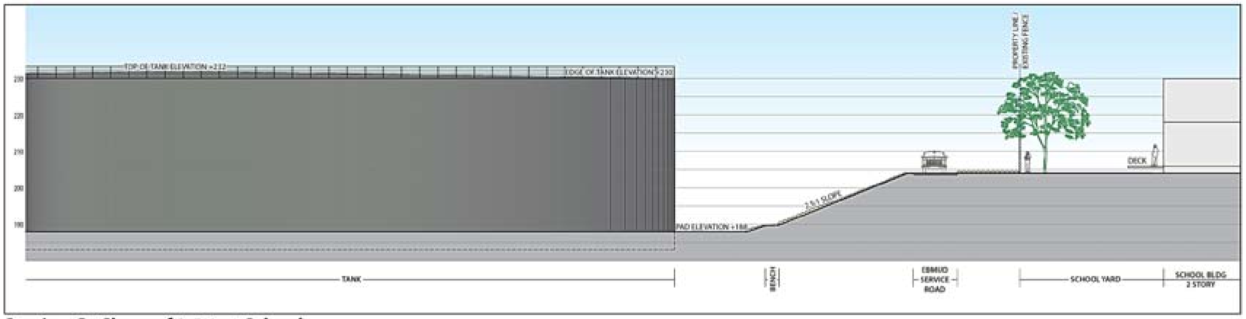


Section A - Service Road Inside Berm

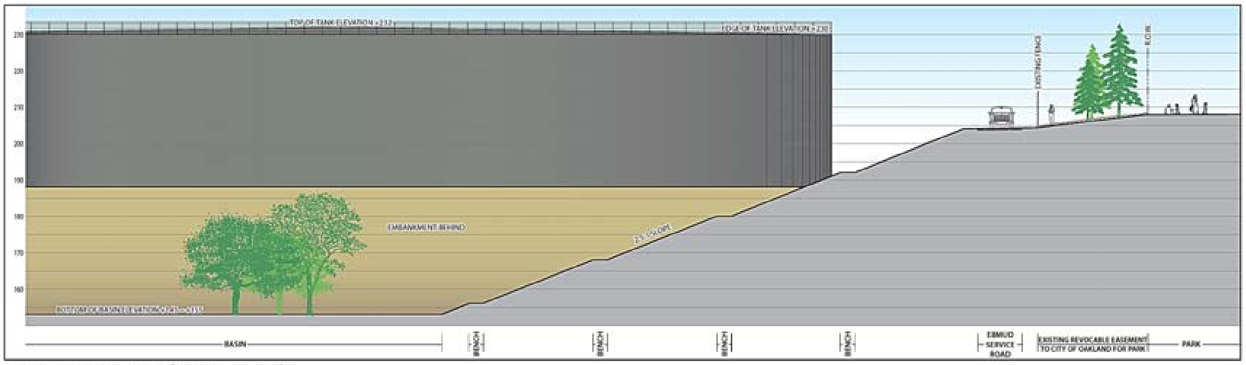


Section B - Slope of 2.5 :1 at School

Figure 6B



Section C - Slope of 2.5:1 at School



Section D - Slope of 2.5 :1 at Park

Figure 6C

Figure 6D Ardley Ave Looking South East - Visual Simulation After Construction, Before Planting

Figure 6E Intersection of 25th Avenue and East 29th Street, Before Planting

Proposed Design Concept 2 - Planting:

The proposed Design Concept 2 – Planting, includes building an earthen berm of only 2-feet in height above the elevation of Ardley Avenue, and providing screening for the tanks with a new dense stand of trees and shrubs using low-density plants (both existing and new) elsewhere on the site perimeter to screen views from KOPs.

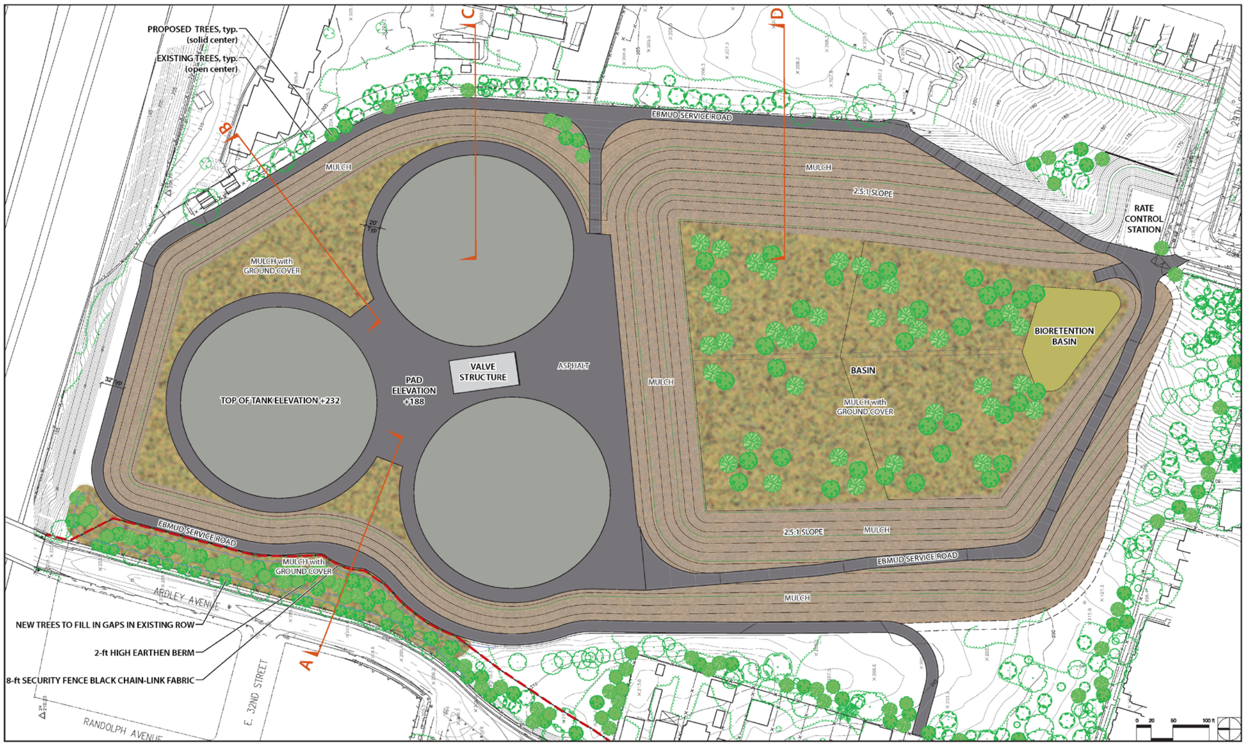
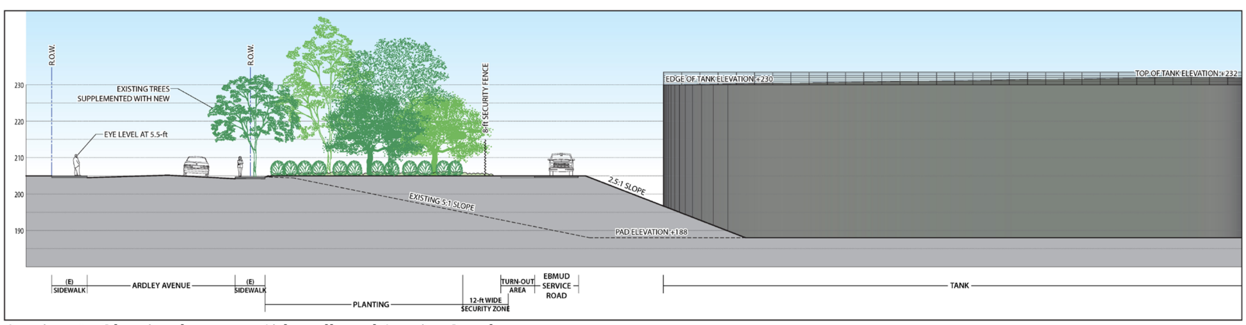
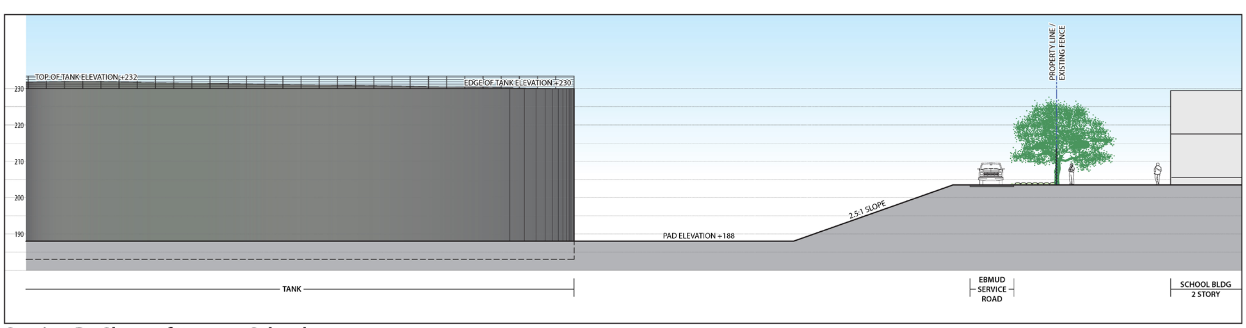


Figure 7A

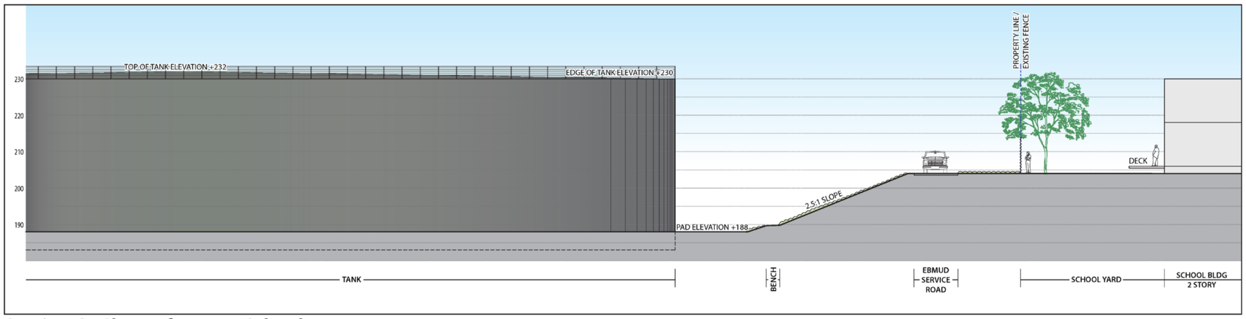


Section A - Planting between Sidewalk and Service Road

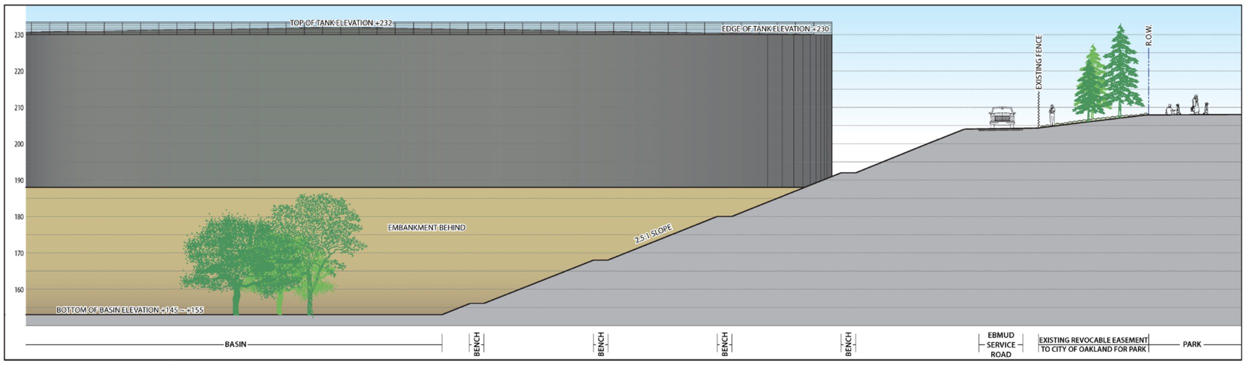


Section B - Slope of 2.5 :1 at School

Figure 7B



Section C - Slope of 2.5:1 at School



Section D - Slope of 2.5 :1 at Park

Figure 7C

Figure 7D Ardley Ave Looking South East - Visual Simulation After 10 Years

Figure 7E Intersection of 25th Avenue and East 29th Street – Visual Simulation After 10 Years

Proposed Design Concept 3 - Trellis:

The proposed Design Concept 3 – Trellis, includes screening the tanks without berms, but rather by installing an overhead trellis along Ardley Avenue supplemented with moderate planting. The basic intention of the trellis is to provide a visual distraction in front of the planting and tanks. In this case, “distraction” is used which means something that will attract the eye away from the tanks behind. The trellis would be particularly effective when seen in perspective while traveling along the street and property line (see KOP 3) rather than perpendicular to the street as shown in KOP 2.

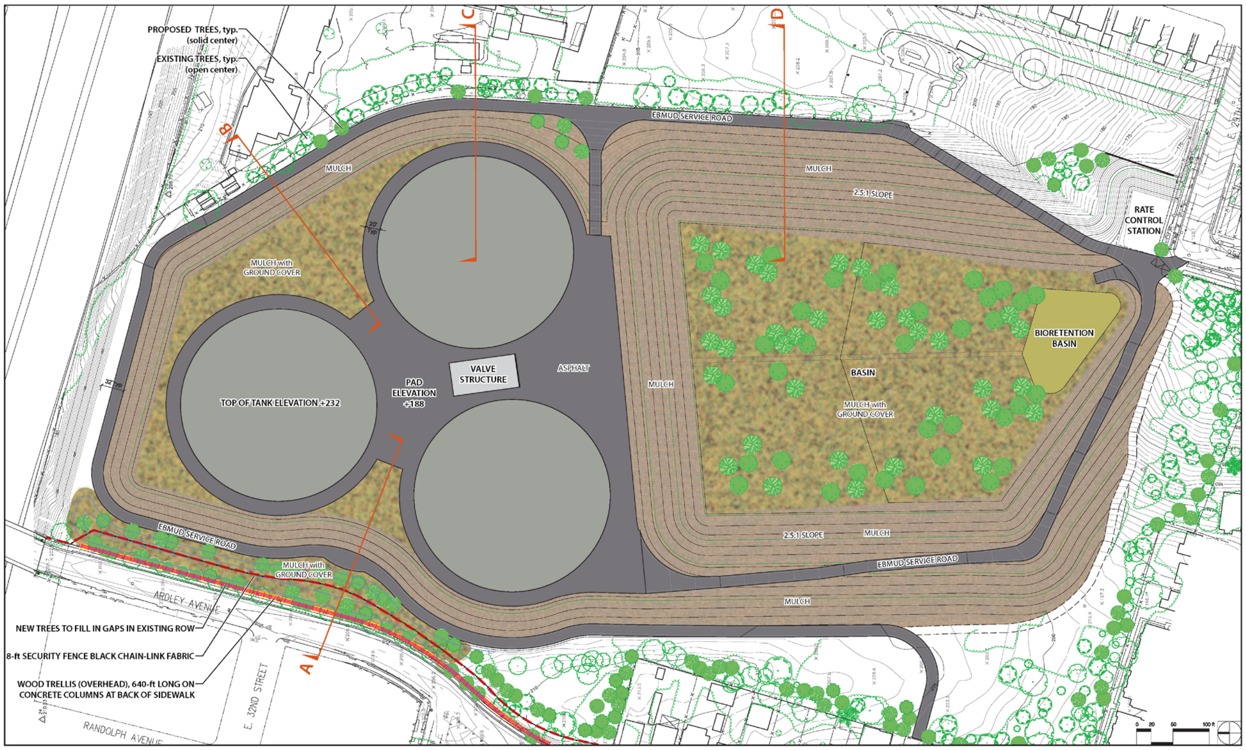
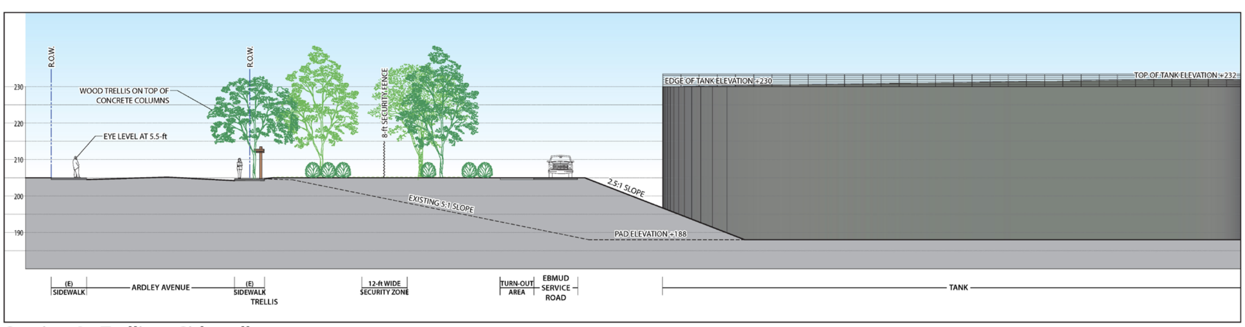
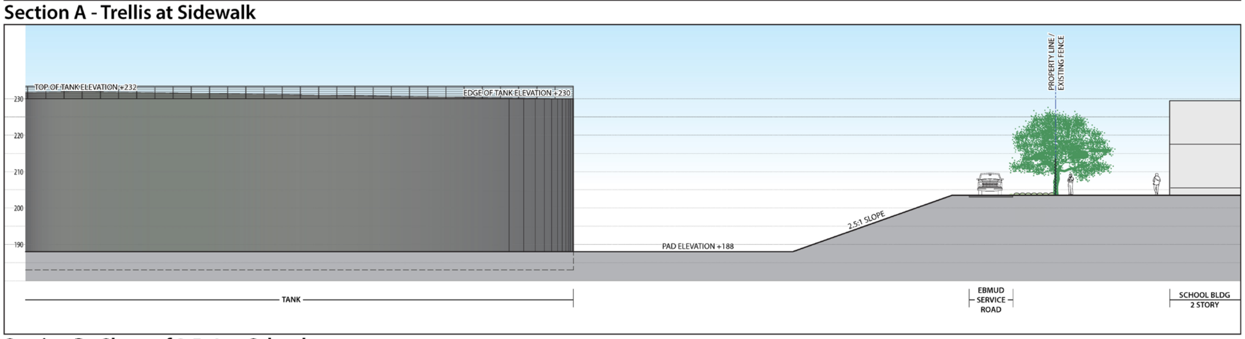


Figure 8A

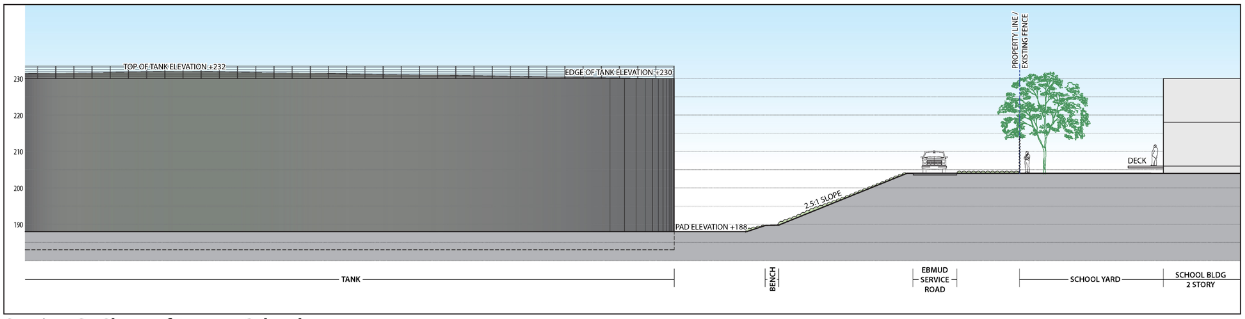


Section A - Trellis at Sidewalk

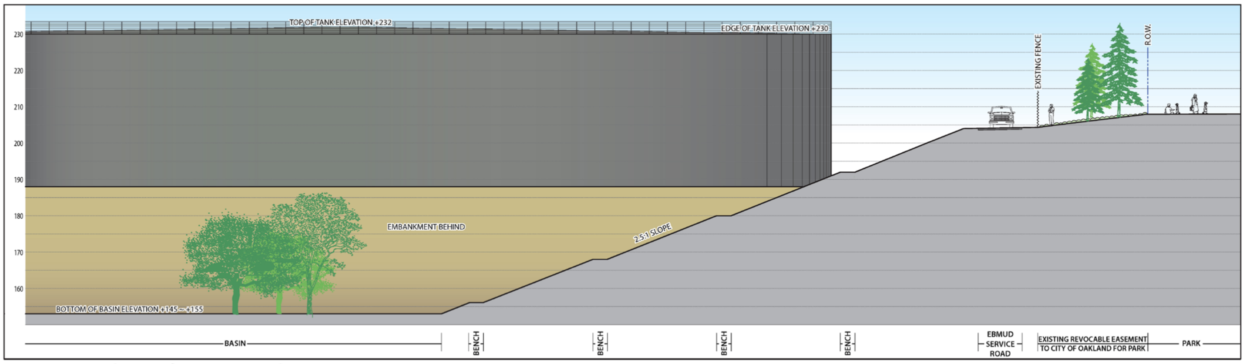


Section B - Slope of 2.5 :1 at School

Figure 8B



Section C - Slope of 2.5:1 at School



Section D - Slope of 2.5 :1 at Park

Figure 8C

Figure 8D Ardley Ave Looking South East – Visual Simulation Showing Trellis

B. Community Input

Based on the presentation to the public at the Community Meeting No. 1, the main community concerns focused on the ability of trees and landscaping to screen the tanks effectively. To this point, the community commented that they would like to see more trees in the plan with preference given to evergreen over deciduous trees around the perimeter to provide year-round screening. More screening was specifically requested at the southern end of the site at the 25th Avenue entrance because the community wanted to improve aesthetics at the southern end of the site. The community was also concerned about the existing tree removal, requesting that existing mature trees be preserved as much as possible.

Mention was made of the possibility of using murals or similar measures to beautify the tanks before the trees and shrubs grew to a maturity that provides screening. However, EBMUD staff explained that architectural treatments and murals on tanks are difficult to maintain and require special skills, tools, and materials to repair if damaged or vandalized. EBMUD's maintenance crews do not have the ability to repair architectural treatments or murals. Also, architectural treatments and murals would need to be removed and replaced when EBMUD performs maintenance on the walls of the tanks in the future.

The community also noted the need to keep the site free from graffiti, trash and other nuisances. Some members of the community were also concerned that trash could accumulate and homeless people could build shelters along Ardley Avenue where the fence was set back from the property line. Community members requested that EBMUD move the fence closer to its existing location at the property line.

V. FINAL CONCEPT AND DESIGN GUIDELINES

A. Community Meeting No. 2 Final Site Plan

Based on all criteria and public comments, Concept Plan 1 – Berming, was determined to most effectively achieve the design criteria while screening the tanks. The earthern berms along with new and existing trees and shrubs will screen the tanks and direct the eye toward the natural setting at the perimeter of the site. Concept Plan 1 – Berming, was pursued for the final plan while incorporating several key changes, including:

1. Maximize the height of the berm adjacent to Ardley Avenue to improve screening of the tanks, particularly until the landscaping has matured.
2. Improve screening of the tanks by incorporating an additional berm at the southern end of the site near the corner of 25th Avenue/East 29th Street.
3. Reduce the distance between the fence and property line and sidewalk along Ardley Avenue to discourage homeless encampments.
4. Increase the density of trees along the visible portions of the site perimeter (i.e., Ardley Avenue, the corner of 25th Avenue/East 29th Street, and the Redwood Day School) to improve screening around the site.
5. Add approximately 100 shrubs along the planting strip interior of the property line abutting Redwood Day School to increase screening between the school and the site. Due to limited space it was not possible to use earthen berms in this location.
6. Modify the locations and increase the density of plantings within the basin to resemble a more natural spread of groundcover and trees.

The concept with an architectural trellis along Ardley Avenue (presented at Community Meeting No. 1) was eliminated because the security fence was moved to the property line. The security fence was moved to the property line in response to feedback from the community and the City of Oakland who were concerned about trash and homeless encampments occupying the open space between the property line/ sidewalk and fence. In order to install a trellis with the fence at the property line, the trellis and the fence would have to be co-located (the trellis on top or immediately adjacent to the fence) which would pose a security risk because the trellis would provide potential intruders a means of scaling the security fence.

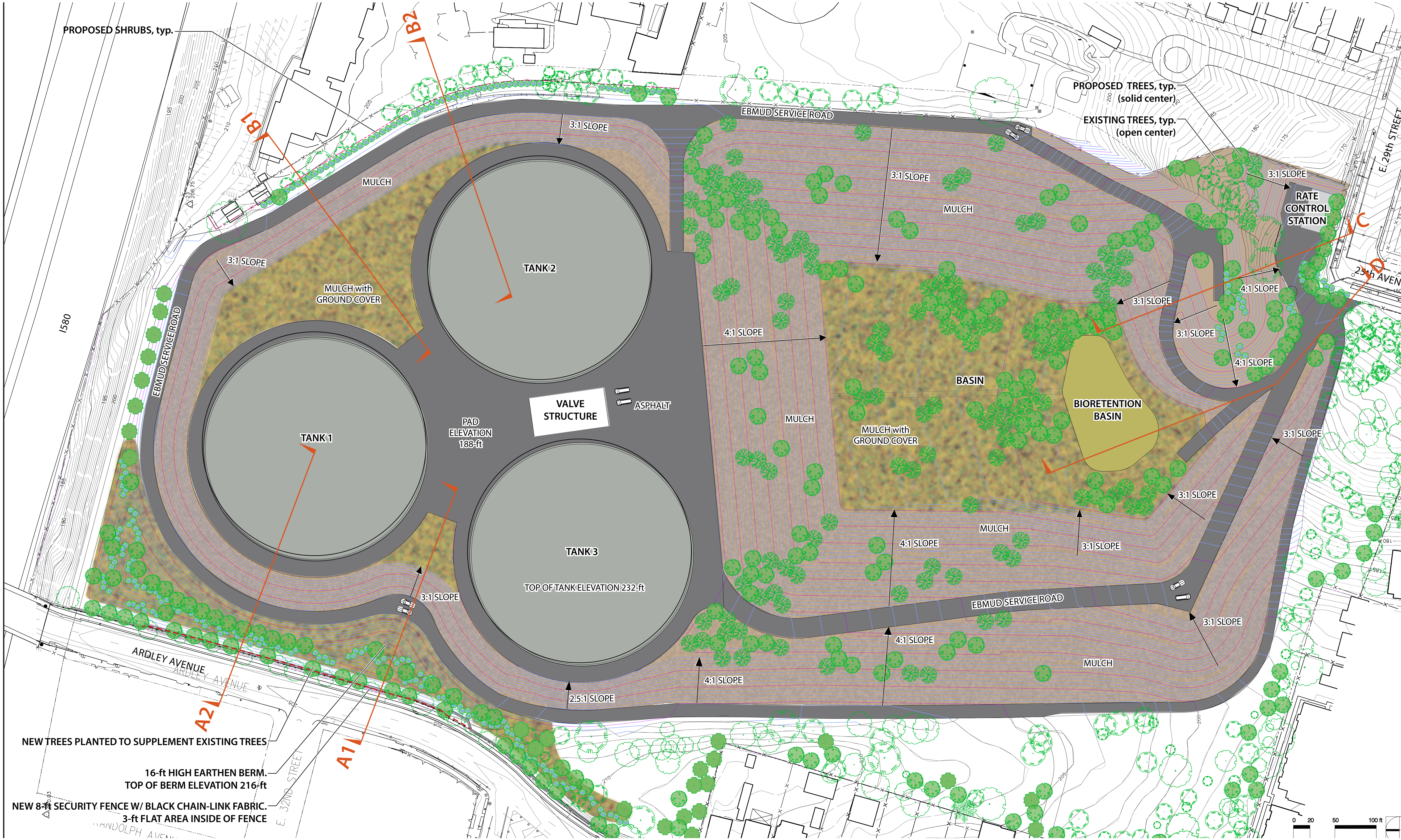
EBMUD staff and the design team presented the revised plan to the public on February 13, 2018 (Community Meeting No. 2). The community heard a brief review of the design process and the design changes made since the last meeting. Visual simulations of the final concept and plant palette were presented to demonstrate that EBMUD considered community concerns received at Community Meeting No. 1 and to determine if there were any new comments. Responses to questions and comments on the site planning from Community Meeting No. 1 and No. 2 were posted to the District's website (Appendix B).

B. Final Site Plan

The basic layout of the tanks, service road, valve structure, and rate control station remained unchanged from the proposed design concepts described above. Changes included retaining a portion of the existing main embankment on the southern side of the site near the 25th Avenue/East 29th Street entrance. Site access roads were realigned to detour around the new berm, and the bio-retention basin moved. By keeping a portion of the existing embankment and by adding more trees and shrubs around the southern entrance, the public views of the tanks from the 25th Avenue/East 29th Street entrance are significantly reduced relative to the preliminary concepts proposed at Community Meeting No. 1.

More trees and shrubs were added along Ardley Avenue. The berms along Ardley Avenue were raised as much as possible with a varying height to make use of the varying distance from the sidewalk to the curved tanks. The maximum top elevation became approximately 12-feet above the adjacent sidewalk, the maximum feasible height while maintaining a 3:1 slope on the backside, down to the tanks. In one area of cut slope south of Tank No. 3, the slope was steepened to 2.5 (horizontal) to 1.0 (vertical) in order to allow space for the maximum height of berm separating the interior of the site from Ardley Avenue. The fence along Ardley Avenue was brought closer to the property line based on feedback received in Community Meeting No. 1, from 30- to 60-feet to 3-feet. The Final Site Plan is shown in Figure 9.

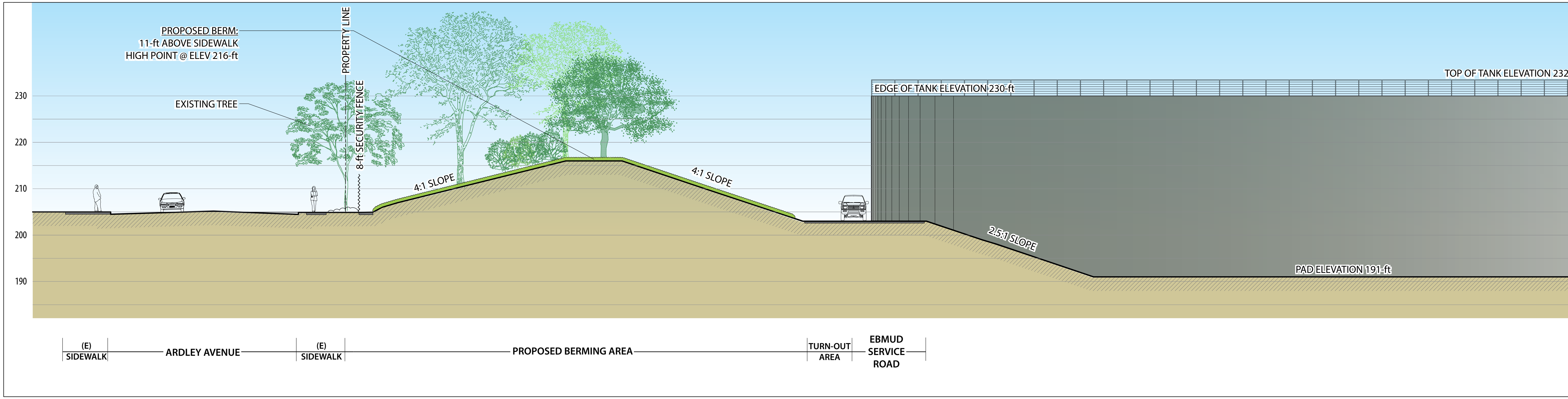
The final site plan presented at Community Meeting No. 2 included a series of visual simulations showing the projected condition of the site 5 and 10 years after construction from the five KOPs (see Section III, C. for discussion of the viewpoints). Figure 10 shows the existing views, 5-year visual simulations and 10-year visual simulations from the five KOPs. The Final Site Plan has focused on screening the proposed tanks with vegetation and earthen berms at the perimeter of the site because these elements will appear visually larger and more effectively screen the tanks from the adjacent streets. Other strategies such as painted murals or architectural elements on the tank were considered less effective because they do not screen the tanks and will require continuing, significant, and expensive maintenance operations in the future. See comments in Section III-C for additional remarks.



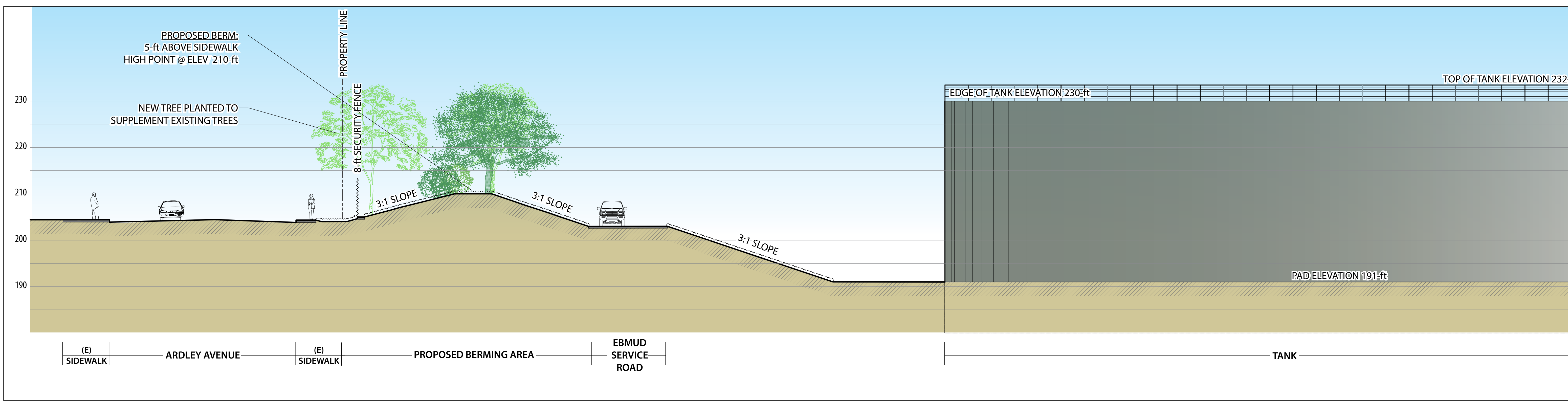
Central Reservoir Site Plan

Figure 9A Final Site Plan

Prepared for EBMUD by Dillingham Associates



Section A1 - Ardley Ave.

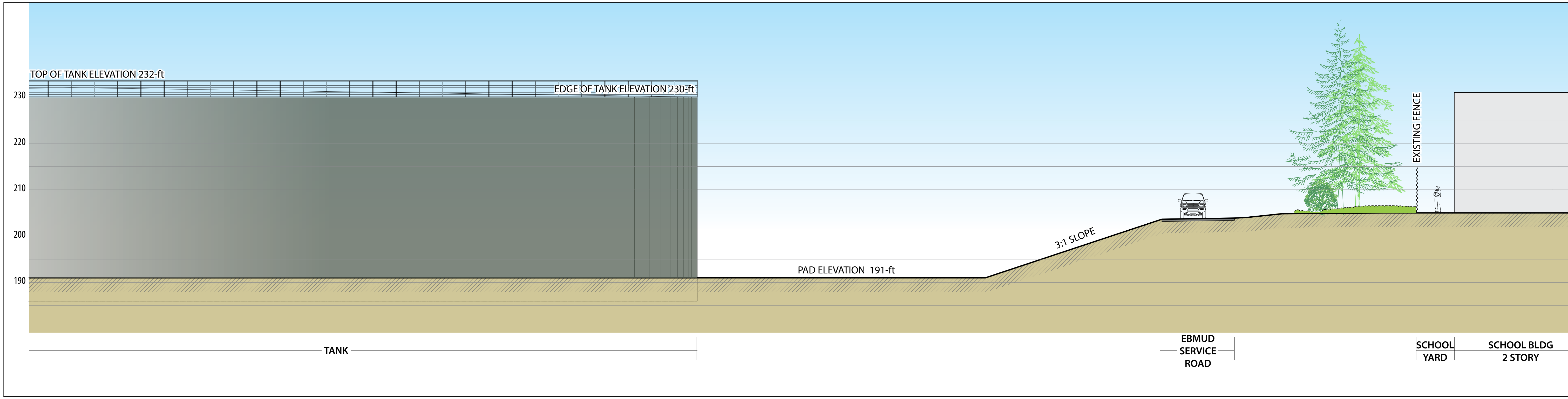


Section A2 - Ardley Ave.

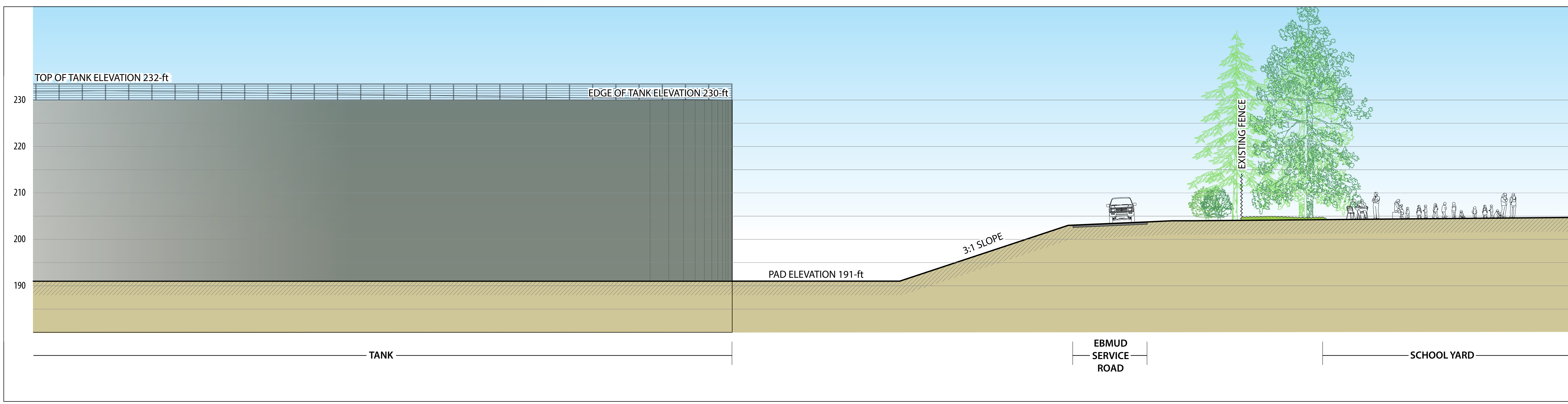
Central Reservoir Sections

Figure 9B

Prepared for EBMUD by Dillingham Associates



Section B1 - Redwood Day School

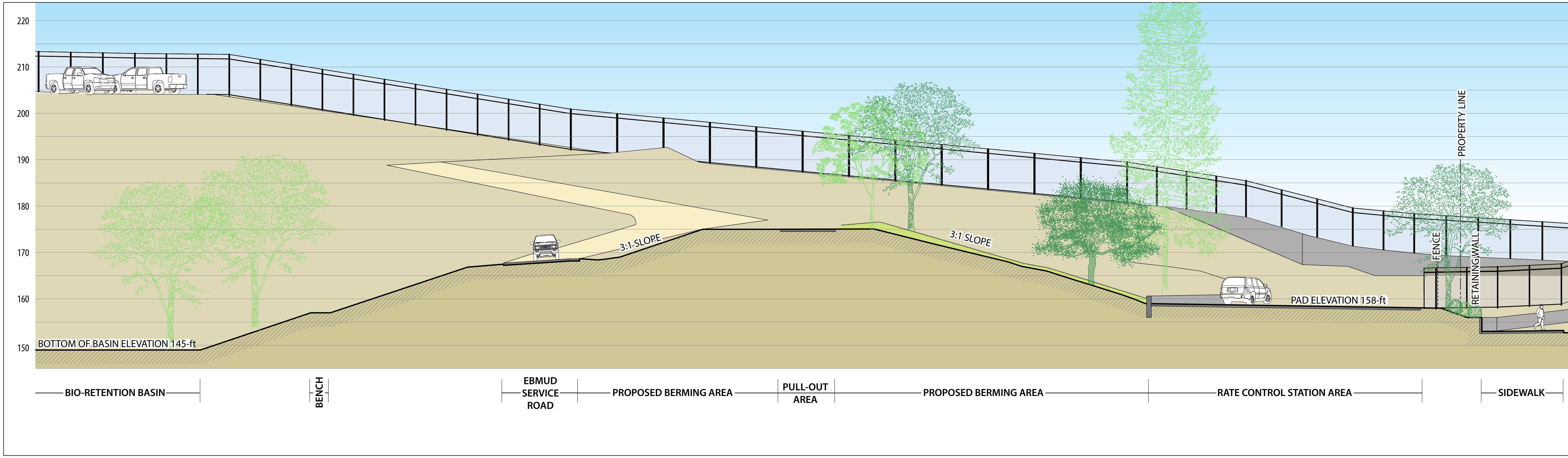


Section B2 - Redwood Day School

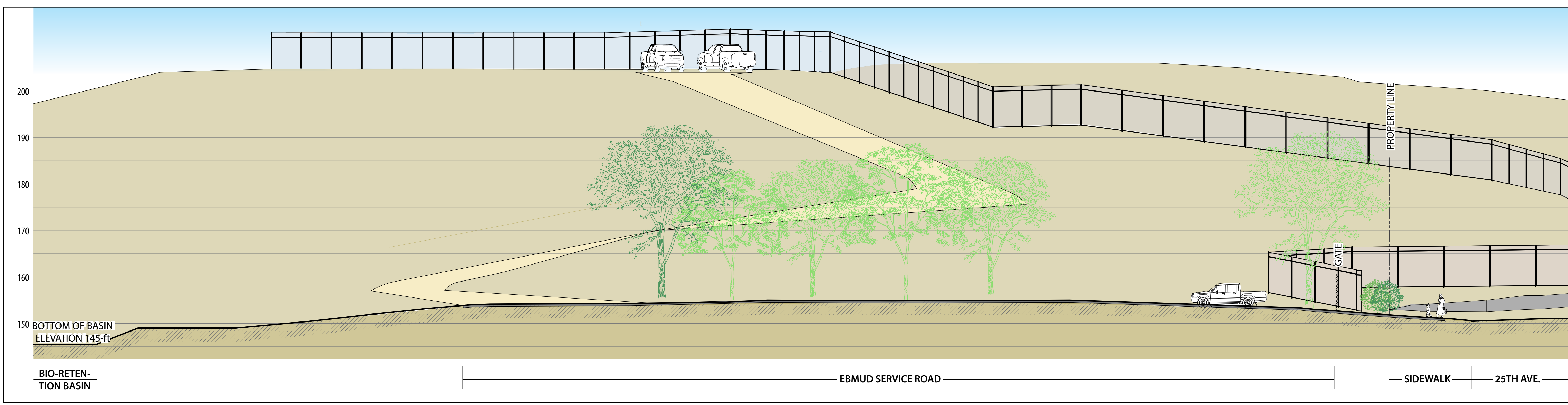
Figure 9C

Central Reservoir Sections

Prepared for EBMUD by Dillingham Associates



Section C - 25th Ave. & East 29th St.



Section D - South Entrance at 25th Ave. & East 29th St.

Central Reservoir Sections

Figure 9D

Prepared for EBMUD by Dillingham Associates

Figure 10A

Figure 10B

Figure 10C

Figure 10A Existing View - Ardley Avenue looking southeast (VP 1)
Figure 10B Visual Simulation - 5 years
Figure 10C Visual Simulation - 10 years

Figure 10D

Figure 10E

Figure 10F

Figure 10D Existing View - East 32nd Street near Ardley Avenue looking east (VP 2)
Figure 10E Visual Simulation - 5 years
Figure 10F Visual Simulation - 10 years

Figure 9G

Figure 9H

Figure 9I

Figure 10G Existing View - Ardley Avenue at East 23rd Street looking north (VP 3)
Figure 10H Visual Simulation - 5 years
Figure 10I Visual Simulation - 10 years

Figure 10J

Figure 10K

Figure 10L

Figure 10J Existing View - 25th Avenue near East 29th Street looking north (VP 4)
Figure 10K Visual Simulation - 5 years
Figure 10L Visual Simulation - 10 years

Figure 10M

Figure 10N

Figure 10O

Figure 10M Existing View - Redwood Day School looking west (VP 5)
Figure 10N Visual Simulation - 5 years
Figure 10O Visual Simulation - 10 years

C. Final Planting Plan

In the final planting plan, trees and shrubs have been used for several purposes. First and most importantly, trees are used to screen views of the tanks and other facilities from areas outside the site. Second, the tree root zones provide important erosion control for site soils, particularly those on sloping areas. Finally, for areas seen by the public, the trees make the reservoir site areas more attractive. To this end, the arrangement of proposed trees in the lower basin and elsewhere are arranged to mimic some of the natural vegetation patterns seen in the surrounding East Bay hills. For example, in the natural landscape and on the reservoir site, trees are found predominantly in low areas or gullies where water is more available.

The design team chose a plant palette that includes primarily drought-tolerant native tree and shrub species with the inclusion of Gingko (a non-native, deciduous tree) as an accent (refer to Figure 11). The tree palette includes primarily evergreen trees in order to maximize year-round screening. Evergreen trees will be used along the perimeter as “screening” trees. Two deciduous trees in the palette were incorporated for seasonal interest (refer to Figure 12) and may be used in interior portions of the site. The proposed trees provide a mix of fast and slow growing species, to ensure that screening is achieved soon after installation. Proposed fast-growing plants include: Big Leaf maple (Acer macrophyllum), and Elderberry (Sambucus mexicana). Plants with a moderate growth rate include Coast Live oak (Quercus agrifolia), and Ginkgo (Ginkgo biloba). Canyon Live oak (Quercus chrysolepis), Valley oak (Quercus lobata), and California buckeye (Aesculus californica) have slow growth rates.The dominant species in this group will be the Coast Live oak and the Canyon Live oak. Other native and/or drought-tolerant species that are listed above may also be considered depending on utility and availability. Because fast growing trees often have shorter lives, the plant mix will also include longer-lived but slower growing trees. The result will be that the


Big-leaf Maple


California Buckeye


Elderberry


Ginkgo


Canyon Live Oak


Valley Oak


Coast Live Oak

Figure 11 Proposed Tree Palette

Figure 12 Proposed Shrub Palette

volume of screening will increase over time without entirely replacing the trees and shrubs. The design is focused on landscaping with low long-term maintenance. The principal maintenance task consists of mulch placement for fire-prevention weed control.

There is an existing row of 16 Brisbane box trees (Lophostemon confertus, previously named as Tristania conferta) along Ardley Avenue adjacent to the northwest edge of the reservoir. These were incorrectly identified by the Arborist Report as Red-flowering gum or Eucalyptus ficifolia. Although these trees form an important visual screen between the reservoir site and the public street, they are nearing the end of their life span and will gradually die. The plan for the reservoir proposes to make a staged replacement of these trees by removing and replacing half during the reservoir construction. After about ten years, the other half would be removed and replaced as the original group achieves a more or less mature size.

Trees and shrubs cannot be planted prior to construction because the trees would have to be removed due to the earthwork or may be damaged during construction because they are immediately adjacent to the earthwork footprint. An Arborist Report was prepared to inventory trees within and immediately adjacent to the Project site and recommend trees to be removed based on health or safety conditions (Appendix C).

The final planting plan proposes that only existing trees in poor health be removed or if they conflict with new construction. Of the 380 existing trees, approximately 27 trees will be removed for poor health, approximately 82 trees will be removed because of conflict with construction and approximately 337 new trees will be planted, resulting in about approximately 608 total trees after construction is complete (refer to Figure 13). The proposed trees that will be planted to provide screening provide an overall greater number of trees on site than are currently on-site.

The shrub and tree palette maximize the their screening potential above ground, while below ground their root systems provide erosion control and add organic material to the soil. All proposed plants will require minimal irrigation and maintenance. Proposed shrubs include Edmunds Manzanita (Arctostaphylos edmundsi), Wayside Manzanita (Arctostaphylos hookeri), Manzanita (Arctostaphylos manzanita), Pajaro Manzanita (Arctostpahylos pajaroensis), McMinn Manzanita (Arctostaphylos Howard McMinn), Skylark ceanothus (Ceanothus 'Skylark') and Joyce Coulter ceanothus (Ceanothus coulteri). All of the proposed shrubs provide flowers for seasonal interest. The trees and shrubs also require limited maintenance in terms of pruning in a naturalized setting and provide sufficient ground coverage to mitigate the need for weed control. Temporary irrigation for trees and shrubs will be required only for plant establishment although EBMUD staff prefer permanent irrigation for durability. Depending on the time of year when plants are installed, irrigation may be required for 18 to 24 months.

Whereas the proposed trees in the lower basin and elsewhere are arranged to mimic natural vegetation patterns, it is recommended that shrubs be installed in a grid pattern so that they are not mistaken for weeds in the first couple years and sprayed with herbicide or pulled. Planting the shrubs in a grid pattern will also make the irrigation system easier to design, maintain, and inspect.

EBMUD has an obligation to manage vegetation and provide weed control in order to mitigate the risk of fire on its sites. To provide weed control, the site will be mulched with 3- to 6-inches of mulch. Because mulch breaks down to fine particles, it requires replacement approximately every three years to maintain the ground coverage required. When mulch breaks down, it ceases to prevent weed growth and requires replacement.

A chip or bark mulch can be used in flatter areas where the potential for movement is limited. Mulch on slopes above 8 percent (one in twelve) should consist of long twigs or bark to provide a stable and interlocking mulch that will form a stable barrier on a slope and should be approximately 6-inches thick. Weeds will not take over mulch if there is regular maintenance. Weeds will be managed in accordance with EBMUD's Integrated Pest Management Plan.

Weed barriers are not recommended because the weed barrier will deteriorate quickly when the area is walked on by personnel or deer; the result is shredding and lifting of the weed barrier. In addition, weed barriers on slopes forms a slippery surface for the mulch and for workers.

Where trees and shrubs will be planted on fill soil (such as above the cement-treated fill pad and on the earthen berms along Ardley Avenue) the site has been designed such that there is sufficient fill material to support a healthy root system. For example, there will be approximately 8-feet of fill soil over the cement-treated fill pad that forms the tank substructure which is sufficient to support trees growth. However, it is important to match the correct soil conditions with the correct planting palette. Soil with finer particles and more organic material is ideal and will support a much wider range of trees and shrubs. Rocky soil with little organic matter, which is the possible composition of excavated material on the Central Reservoir site will be difficult for many trees and plants and the soils may need to be improved accordingly. Two-stage planting approach, as was used at Berryman Reservoir, is one technique to add organic matter and nitrogen to improve poor soils. In the first stage, an initial hydroseed of lupine and clover is applied. Once the plants mature, typically 1-2 years, they are tilled back into the soil to increase nitrogen. The final plants are then installed and the area around the plants is mulched. Because the two-stage approach requires 1-2 years before the final landscaping can be installed, it is recommended that the perimeter of site be graded, bermed (where applicable) and hydroseeded as soon as possible. Installing the final landscaping as soon as possible is particularly important along Ardley and adjacent to the Redwood Day School where neighbors are very close and where screening is critical to obscuring views of the site.

It should be noted that even with a two-stage planting approach, additional soil amendments may be necessary pending soil tests. As was the case for Summit Reservoir, the initial hydroseeding did not fixate sufficient nitrogen into the soil and soil amendments were needed during final planting. It is also important to note that erosion control hydroseed mixes do not typically include the right composition of plants to improve nitrogen. Conversely, the lupin and clover hydroseed mixes used to add nitrogen to the soil do not provide good erosion control. Therefore, the initial hydroseed mix will need to be carefully formulated to provide a balance of erosion control and nitrogen fixating plants.

Other techniques for soil improvement that may or may not be cost-effective are: a) scarification and addition or compost or soil amendment; b) import of soils with high organic matter to overlay existing rocky soils; and c) lime treatments to break-up heavy clay soils (depending on soil types).

Where trees and plants will not be planted on fill and instead will be planted on areas previously overlain by the reservoir or the embankment, such as around the bio-retention area, over-excavation is also recommended. Over-excavation down to a depth of 2- to 3-feet will ensure the soil is able to support fast-growing, healthy trees in previously compacted areas.

Following in Table 1 are general or planning-level costs for planting and irrigation of reservoir areas. These are given in 2018 prices.

Name	Quantity / Area	Per Price	Total Price
15 gallon trees	337	$350.00	approx. $120,000
5 gallon shrubs	237	$35.00	approx. $8,300
Mulch	656,300 sq ft	$0.18	approx. $120,000
Drip Irrigation	600	$125.00	approx. $75,000
Hydroseed (2x)	656,300 sq ft	$0.35	approx. $460,000
Total (without contingencies)			approx. $780,000

Table 1 Planning-Level Costs for Planting and Irrigation

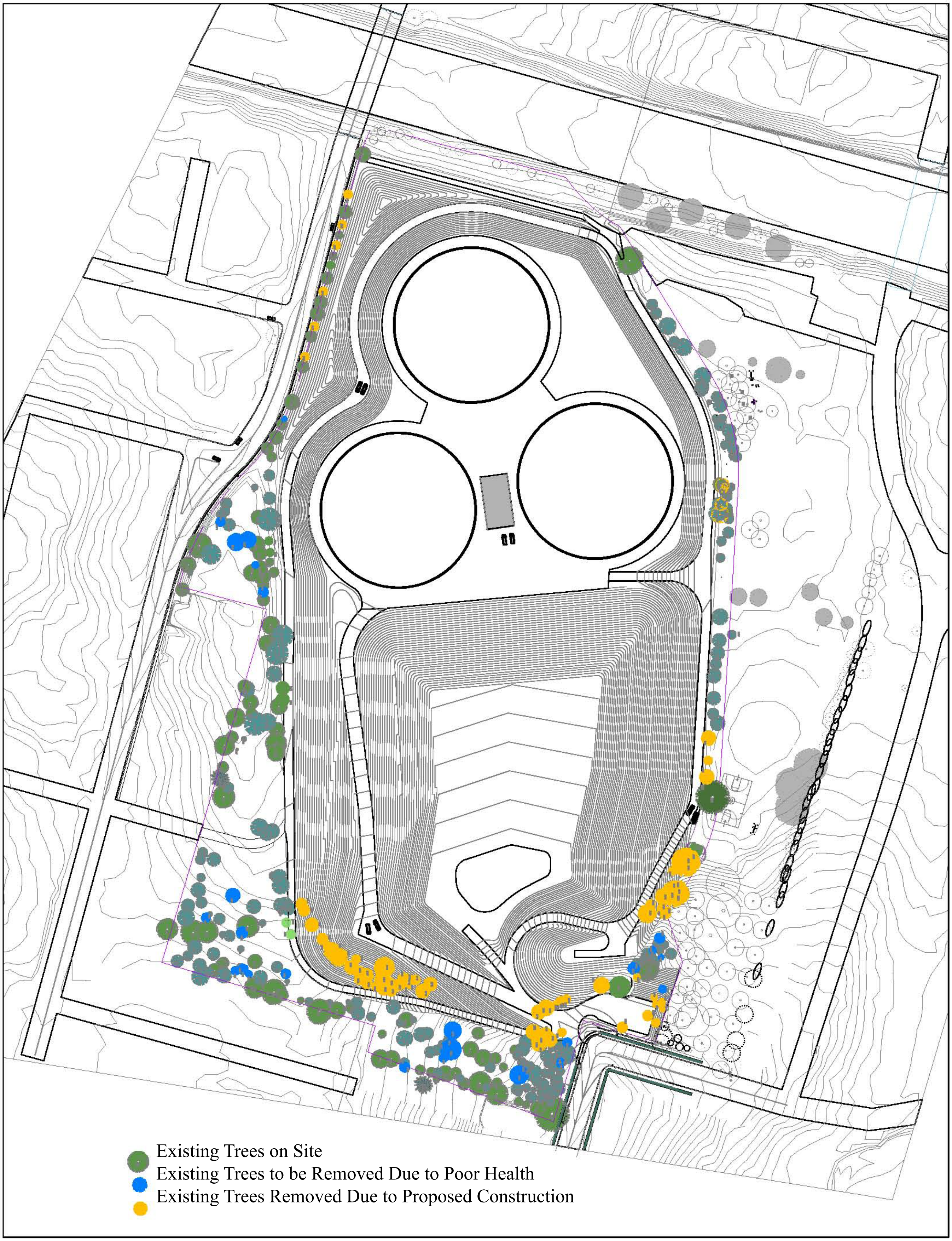


Figure 13 Proposed Tree Removals

In addition to the general planting, the bio-retention basin will be planted with plants that meet similar criteria to the overall shrub plan while having the added characteristic of withstanding intermittent water inundation. Figure 14 includes a photo of a bioretention basin that would be similar in appearance to the proposed bio-retention basin for the Project. The plant palette for the bio-retention basin will consist of Carex obnupta (Slough sedge), Carex praegracilis (Clustered Field sedge), Juncus pattens 'Elk Blue'(elk Blue California Grey rush) and Juncus phaeocephalus (California Brownhead rush). Generally, these plants can be spaced about 18- to-24 inches apart.

NOTE: This photo is included only as example of how bioretention basis may visually appear, but is not a representation of the site design for the Central Reservoir Replacement Project.

Figure 14 Photo of an Example Bioretention Basin

D. Steps to Implement the Landscape Plan

The following steps are required in order to implement the recommended landscape plan:

1. The Design Division will provide a detailed design for:
   a. The bioretention area – the bioretention area will be designed using C.3 stormwater guidelines.
   b. Irrigation system for groundcover and trees.

2. Once the site has been graded and is ready for landscaping, soil testing will be conducted. Based on the results of the soil testing, the Design Division, in coordination with the Construction Division, will confirm the specific planting palette (trees, groundcover, and bioretention area plants).

Appendix A

Design Concepts from Community Meeting No. 1

SOURCE: Dillingham Associates Landscape Architects

Design Concept #1: Berming, Plan View
Central Reservoir Replacement Project

Section A - Service Road Inside Berm

Section B - Slope of 2.5 :1 at School

Design Concept 1 - Berming

CENTRAL RESERVOIR
Prepared for EBMUD by Dillingham Associates

Section C - Slope of 2.5:1 at School

Section D - Slope of 2.5 :1 at Park

Design Concept 1 - Berming

CENTRAL RESERVOIR
Prepared for EBMUD by Dillingham Associates

SOURCE: Dillingham Associates Landscape Architects

Design Concept #2: Planting, Plan View
Central Reservoir Replacement Project

Section A - Planting between Sidewalk and Service Road

Section B - Slope of 2.5 :1 at School

Design Concept 2 - Planting

CENTRAL RESERVOIR
Prepared for EBMUD by Dillingham Associates

Section C - Slope of 2.5:1 at School

Section D - Slope of 2.5 :1 at Park

Design Concept 2 - Planting

CENTRAL RESERVOIR
Prepared for EBMUD by Dillingham Associates

SOURCE: Dillingham Associates Landscape Architects

Design Concept #3: Trellis, Plan View
Central Reservoir Replacement Project

Section A - Trellis at Sidewalk

Section B - Slope of 2.5 :1 at School

Design Concept 3 - Trellis

CENTRAL RESERVOIR
Prepared for EBMUD by Dillingham Associates

Section C - Slope of 2.5:1 at School

Section D - Slope of 2.5 :1 at Park

Design Concept 3 - Trellis

CENTRAL RESERVOIR
Prepared for EBMUD by Dillingham Associates

Appendix B

Questions/Comments and Responses from Community Meetings No. 1 and No. 2

Central Reservoir Replacement Project
Frequently Asked Questions
Updated April 2018

Tank Height

1) **How high will the tanks be?**

The top of the new tanks will be approximately 15 feet taller than the existing Central Reservoir roof at the center of the reservoir and approximately 22 feet higher than the existing Central Reservoir roof at the location closest to Ardley Avenue. There are also additional appurtenances such as fall protection railings and air vents that will extend above the top of the tank. Building the new tanks higher than the existing reservoir allows for much smaller tanks while maintaining the existing emergency storage in the distribution system. Higher tanks also will increase operational flexibility, distribution system reliability, and improve water quality.

2) **Is it possible for the design to include lower tanks instead of three higher tanks? Is it possible for the tanks to go deeper into the ground so that they will be less visible?**

The top and bottom tank elevations are set by hydraulic requirements (i.e., the ability to maintain adequate pressures to customers and accessible storage volume for emergency operations). In a gravity-fed water distribution system, pressures are directly related to elevation. Lowering the elevation of the tank would cause lower pressures and inaccessible water storage; therefore, the tanks cannot go deeper into the ground or be located at a lower elevation. Building storage at the elevations shown (base elevation of 183-feet above mean sea level) is necessary in order to provide sufficient pressure during both normal operations and during emergency conditions for the foreseeable future.

The proposed new tanks, as currently planned, can be operated down to a much lower level than the existing reservoir without impacting levels of service, significantly increasing the emergency response time before customers are impacted. The ability to fluctuate water levels also has water quality benefits.

Finally, the proposed elevation of the proposed new tanks is in line with other EBMUD reservoirs in the area (Dunsmuir and South Reservoirs). When all the reservoirs in an area (or “pressure zone”) are at the same elevation, water can be readily shared between the areas which greatly increases operational flexibility and emergency preparedness.

Tank Material

3) **Why was concrete chosen as the material for the tanks instead of steel?**

The decision to construct concrete versus steel tanks is addressed on a case by case basis. EBMUD chose pre-stressed concrete for this project because concrete tanks have lower long term project impacts. Concrete tanks have lower roofs and do not require periodic sand blasting and repainting as do steel tanks. Concrete tanks require less maintenance and are expected to last longer than steel tanks. Both materials perform well with respect to leakage. EBMUD has done a number of successful reservoir replacements using pre-stressed concrete, the most recent of which is Summit Reservoir in Kensington which was completed in 2017. EBMUD also operates several large steel tanks such as Alamo Reservoir and Castaneda Reservoir located in the Danville and San Ramon area.

Water Service during Construction

4) **Where will we get water while the reservoir is under construction?**

The existing water in the reservoir will be drained prior to constructing the new tanks. EBMUD prepared an outage plan to determine how the distribution system can be operated without Central Reservoir to ensure that water service to customers and fire flow are maintained during construction. The outage plan includes changes in system operations and temporary facilities that allow other storage reservoirs to serve customers while Central Reservoir is taken out of service.

Access Roads

5) **Where is the access road now? How will this change with the project?**

The current access road is located along the southern perimeter of the site, between the 25th Avenue/E. 29th Street entrance and the E. 30th Street entrance. The new access road will be located in generally the same areas but will extend around the site and also around the new tanks.

Dam and Tank Safety

6) **Is there a crack in the current reservoir? Has there been any past flooding of residential lots from the current reservoir?**

The California Division of Safety and Dams (DSOD) reviewed the Central Reservoir dams, including a review after the historic rain events in the winter of 2016/2017, and determined that the dams are safe. The lining system underneath the reservoir experiences minor leakage, which is captured through the reservoir's underdrain system and transported to the storm drain. There are no structural cracks in the reservoir that would make the reservoir unsafe. The reservoir has not caused any flooding to residential lots.

7) **How safe are the new tanks during an earthquake?**

The new tanks will be designed and constructed in accordance with current industry standards and the tank structures and foundation would be built to the latest seismic codes. The new tanks will include isolation valves that can be closed to prevent the reservoir from draining if the pipelines around the reservoir break. Emergency drains will also be installed to drain the reservoir to the storm drain in the event a tank structure is deemed unsuitable for storing water.

8) **How are residents notified in the event of an emergency with the existing dam?**

EBMUD prepared an Emergency Action Plan (EAP) for its dam structures to ensure effective coordination with local and state emergency management agencies in response to emergency conditions. EBMUD will use the EAP procedures to deploy emergency operation teams who will evaluate the safety of EBMUD dams following an emergency event that could threaten the integrity of a dam such as an earthquake. EBMUD emergency operation personnel are trained when to take immediate defensive actions (i.e., open valves to release water and lower water level). Inundation maps are provided to local emergency management agencies and these agencies may initiate evaluations in mapped flood zones, if needed. In the event of an emergency related to EBMUD's infrastructure, EBMUD's Public Affairs office alerts the media and will make reasonable attempts to notify residences via autodial calls for affected areas.

Hydrology & Stormwater

9) **What does EBMUD do with stormwater on the site now and how will this change with the new tanks? What does the bioretention area do?**

Similar to residential areas, stormwater from the Central Reservoir site is routed to the nearest storm drain which then transports the water to Sausal Creek. The roof of the new tanks will be slightly sloped so that rain water will be directed to storm drains which will then route the rain water to the bioretention area. A bioretention area is an engineered solution for treating water runoff – it naturally filters stormwater and reduces peak runoff from the site to Sausal Creek. The bioretention area is being integrated into the site design, consistent with Regional Water Quality Control Board regulations with the goal of reducing stormwater pollution from developed areas. The bioretention area will include plants that can survive wet conditions in the winter and dry conditions in the summer and, therefore, the bioretention area will not require irrigation.

Project Cost

10) Is this project cost effective? Will the cost of the project be passed onto residents? Will the project increase water rates?

This project was selected based on its cost effectiveness and lower overall impacts to the community. There will not be a separate assessment imposed on the current customers who benefit from the new reservoir. The revenue collected from water sales funds EBMUD's operating and capital costs throughout EBMUD without geographic restrictions. Customers throughout EBMUD share in the operating, maintenance, rehabilitation/replacement cost of each facility through water rates. In setting the water rates, EBMUD anticipates the capital improvement needs for rehabilitating and rehabilitation/replacement capital projects, which will be repaid from future water sales revenue from all customers. As EBMUD's infrastructure continues to age, spending may increase on facility rehabilitation/replacement, which will require EBMUD to increase overall water rates to all customers to fund these projects.

Easement between Sheffield and Central Reservoir Recreation Area

11) What consideration has been given to the **easement between Central Reservoir Recreation Area and the homes on Sheffield Avenue? How will this easement be maintained?**

The fenced off area between the Central Reservoir Recreation Area and the homes on Sheffield Avenue is owned by the City of Oakland and therefore the City of Oakland is responsible for addressing concerns about maintenance and security. The City of Oakland has asked that inquires related to the fenced off area be directed to their general number, 510-615-5566.

EBMUD does have an easement within the fenced off area to access monitoring wells and we will consider abandoning these wells and relinquishing the easement to the City of Oakland in later planning stages of the project.

Tank Color

12) **What color will the tanks be?**

The tank color will be one of EBMUD's two standard tank colors, a gray green or olive green. The standard federal color numbers are FS 14159. EBMUD maintenance crews keep paint in their vehicles for handling graffiti and other issues at 167 reservoirs, and hundreds of other pumping plants, treatment plants and other facilities. Standardized paint colors are necessary to minimize maintenance costs and improve the ability to respond to maintenance issues. The EBMUD greens are used on tanks because it closely matches the color of native trees.

Architectural Treatments and Screening

13) **Several of the questions from the community meetings have asked that the site design focus on screening the new tanks using earthen berms, trees, shrubs, decorative walls, walls with artistic murals, and trellises with and without climbing plants. Other questions are focused on making the tanks look more attractive using artistic murals, architectural treatments, lights, or water fountains.**

In response to questions received from the community, the site design strategy is to screen the tanks from public views rather than using architectural and artistic methods. The site design incorporates a mixture of green painted tanks, earthen berms, trees, shrubs and groundcover to create a natural setting and minimize views of the tanks.

EBMUD has incorporated natural landscaping as a way to direct the eye toward the natural setting at the perimeter of the site. Landscaping at the perimeter of the site, closest to public views, is the most effective way to screen the tanks because the landscaping at this location appears very large relative to the tanks. EBMUD has a successful history of using landscaping as for screening of its 167 tanks requiring minimal maintenance, and has maintenance crews that are trained and equipped to maintain the landscaping when needed. Once the landscaping matures and fills in, usually 5-10 years after construction, the tanks will be mostly hidden and any architectural treatments to the tank would not be visible from public viewpoints and architectural features along the property line would be redundant.

Architectural treatments on the tank, such as trellises, murals, and decorative walls have not been incorporated into the site design. Architectural treatments and murals on tanks are difficult to maintain and require special skills, tools, and materials to repair if damaged or vandalized. EBMUD's maintenance crews do not have the ability to repair architectural treatments or murals. Also, architectural treatments and murals would need to be removed and replaced when EBMUD performs maintenance on the walls of the tanks in the future.

Perimeter walls create complete visual barriers to the site, and therefore introduce a security and safety risk because complete visual barriers provide a hiding location for individuals with nefarious intent. Therefore EBMUD's standard security fencing is made of partially transparent wire mesh, allowing for the community and EBMUD staff to see into the site.

EBMUD explored an architectural trellis concept along Ardley Avenue that would be located between the security fence and the property line. However, the trellis concept was eliminated when the security fence was moved to the property line because the trellis would then be placed on top of the security fence, providing potential intruders a means of scaling the security fence. The security fence was moved to the property line along Ardley Ave in response to feedback from the community and the City of Oakland who were concerned about trash and homeless encampments.

EBMUD presented several visual simulations of the project from prominent public views around the site at the second community meeting held on February 13, 2018. The visual simulations can be found on the project website at www.ebmud.com/central

Timing of Landscaped Growth

14) **Several of the questions from the community meetings have asked that the site design include larger trees, fast growing shrubs, planting trees before demolition, temporary architectural treatments or murals on the tanks, and wildflowers to improve the aesthetics of the site immediately after construction, rather than wait until landscaping matures.**

EBMUD is considering several strategies to create landscaped visual screens in the near-term, immediately following construction. First, EBMUD may plant a range of tree sizes, some larger and more mature that will provide immediate screening, and some smaller that will complement and blend it with the larger ones and become larger tree over time. Such an approach is based on the fact that younger and smaller plants are better able to adapt to new sites. Second, EBMUD may plant a series of fast growing trees and shrubs throughout the site together with a mix of slower and longer lived trees. Faster growing trees may have shorter overall lives, but would provide for more immediate screening. Trees and shrubs cannot be planted prior to construction because the trees would have to be removed due to the earthwork or may be damaged during construction because they are immediately adjacent to the earthwork footprint.

EBMUD presented several visual simulations of the project from prominent public views around the site at the second community meeting held on February 13, 2018. The visual simulations can be found on the project website at www.ebmud.com/central

Fence Along Ardley

15) **Several questions from the community were related to the configuration and design of the fencing along Ardley Avenue. Specific questions were related to the distance between the sidewalk and the fence, how the area would be maintained, how homeless encampments would be discouraged, whether or not EBMUD could plant vines on the fence, and if the fence could be combined with a trellis.**

Several of the site design concepts presented to the community in September 2017 showed the security fence located away from the property line by as much as 30-feet. Several requests were received at the first community meeting to locate the fence on the property line as it is today in order to discourage trash accumulation and to minimize homeless encampments. After considering the community's input and discussion with EBMUD maintenance staff, EBMUD decided to keep the fence line along its current location because EBMUD does not have the resources to clean trash or move homeless encampments. EBMUD also discussed the issue with the City of Oakland, and the City does not have the resources to maintain additional open space around the Central Reservoir site. The final site plan presented to the community in February 2018 shows the fence adjacent to the property line with a 3 foot gap at some locations in order to preserve existing trees along Ardley Avenue.

A trellis along Ardley was initially considered in one of the concepts presented at the first community meeting in September 2017. However, the trellis concept was only possible if the fence can be set back from the property line by 6 or more feet so that potential intruders cannot scale the trellis to get over the fence. As discussed above, the fence will be located at the property line and, therefore, a trellis is no longer a viable option.

Vines or other shrubbery would not be planted on the security fence. Vegetation on fencing becomes a visual barrier and site security concern. A complete visual barrier would impede EBMUD's ability to see into the site and the public's ability to alert EBMUD of intruders and it can hide holes in the fence that can be used for intruders to easily access the site.

The security fence will be metal with a black vinyl coating. The fine mesh makes it difficult to climb whereas vegetation on the fence can make climbing easier.

Maintenance

16) **How will the property be maintained (how will trash, debris, graffiti, and weeds be addressed)?**

EBMUD is responsible for maintaining the site within the property boundaries. EBMUD will remove graffiti and trash as quickly as crews can respond to it where it is within the property boundaries. Weeds will be controlled through implementation of EBMUD's Integrated Pest Management Program. Trash and vandalism that occurs outside of the property boundaries including the Central Reservoir Recreation Area are the responsibility of the property owner or the City of Oakland. EBMUD has discussed the community's concerns about trash around Central Reservoir with the City of Oakland. In response to input from the community and from the City of Oakland, the site has been configured to minimize the potential for trash accumulation by locating the fence line on the property line.

Landscaping Considerations

17) **Would the mulch be replenished every six months?**

The mulch would be replenished as needed, approximately every 2- 3 years. The sun and rain break-down the wood chips and turn them into smaller and smaller pieces. After about 2-3 years, the pieces of mulch are so small that the mulch loses its efficacy as an erosion control and moisture retention tool.

18) **Are some of the trees shown for the replanting deciduous trees? Why include deciduous trees?**

Native deciduous and perennial trees are being considered for the basin to provide a well-rounded planting palette. Deciduous trees are not being considered for the perimeter "screening" trees.

19) **Will EBMUD consider planting more redwood trees?**

Redwoods are not considered part of the planting palette because compared to oak trees, redwoods are not as drought-tolerant, grow slower, and have thinner foliage.

20) **Is there a plan to have any watering systems in the plants?**

A drip irrigation system will be installed to water new trees and shrubs until the trees have matured.

Viewpoints

21) **Several comments and questions received at the community meetings were related to the aesthetics of the project (e.g., how the site would change with the proposed new tanks and how views would be affected).**

Aesthetic impacts to the surrounding neighborhood have been a key consideration during the planning phase of the project. For example, concrete tanks were selected over steel tanks because of the low profile of the concrete roof (among other advantages). The landscaping, including earthen berm, has been designed to minimize views of the future tanks.

EBMUD considered all public views when planning the project. EBMUD presented several visual simulations of the project from the most prominent public views around the site at the second community meeting held on February 13, 2018. The visual simulations can be found on the project website at www.ebmud.com/central. The project's effect on the existing visual character will be addressed in the Aesthetics section of the Draft Environmental Impact Report scheduled to be released for public review and comment in Summer 2019.

Public Space

22) **Several questions were received asking whether a portion of EBMUD's Central Reservoir property can be used as a public park and/or if EBMUD can create a path through the property.**

EBMUD will not build a park or sell property to build a park at the Central Reservoir site. The basin area will be used for a storm water retention area, access roads, pipeline, drainage facilities, the Central Rate Control Station, and to allow space to properly maintain those facilities. Additional space is reserved for EBMUD infrastructure, if needed, in the future. A portion of the Central Reservoir site was sold to the City of Oakland in the past, which is now the Central Reservoir Recreation Area which is open to the public and located immediately adjacent to Central Reservoir.

Consistent with EBMUD's practice at other facilities with respect to community access, EBMUD will not provide access through the site or adjacent to private properties. Based on EBMUD's experience at other project sites, neighbors immediately adjacent to reservoir sites are often concerned about an increase in noise, crime, trash, vandalism, and loss of privacy that may be associated with greater public access behind their homes. Furthermore, Central Reservoir is critical infrastructure and it is EBMUD's policy is to maintain a level of security sufficient to provide safe and reliable water supply as well as a safe place for operation and maintenance staff who periodically visit the reservoir. A path through the site introduces a threat to the security of the site because the path would not be completely visible to the community or EBMUD staff entering the site. Finally, increasing public access to the site would require additional improvements including fencing and paving to ensure safe public path and EBMUD and the City of Oakland do not have sufficient staffing to maintain the path.

Environmental Impacts

23) **How will EBMUD deal with any hazardous materials during construction?**

EBMUD will address hazardous materials in the Draft Environmental Impact Report scheduled to be released for public review and comment in Summer 2019.

Appendix C

FINAL Arborist Report
for
EBMUD Central Reservoir Replacement Project

FINAL

Arborist Report

for

EBMUD Central Reservoir Replacement Project

Oakland, California

Prepared for:

Environmental Science Associates

550 Kearny Street, Suite 800

San Francisco, CA 94108

Prepared by:

Orion Environmental Associates

June 2017

Final Arborist Report -

EBMUD Central Reservoir Replacement Project

Oakland, California

Table of Contents

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Project Overview

The East Bay Municipal Utility District (EBMUD) is planning to replace its existing 154-million-gallon open-cut Central Reservoir, the Central Reservoir Replacement Project (referred to as the "Proposed Project" or "Project"), which is located in the City of Oakland, Alameda County, California (**Figure 1**). Constructed in 1910, the Central Reservoir is EBMUD's largest open-cut reservoir and provides emergency and operational storage to about 52,000 metered services from Oakland and Emeryville to the north to the Oakland/San Leandro border to the south, including most of the City of Alameda. The Project is located on a 26-acre site that is bounded by 23rd Avenue to the west, Sheffield Avenue to the east, and Interstate 580 to the north. The reservoir is adjacent to residences to the south and south west, and the Redwood Day School and a recreation area to the east.

Scope of Report

This tree survey and arborist report is intended to inform planning and development processes for the Project. Specifically, this report provides:

- An inventory of trees within and immediately adjacent to the Project site within public rights-of-way, and a general description of trees immediately adjacent to the Project site on private property.
- An assessment of general health/condition for each tree surveyed.
- Recommendations on trees to be removed based on health or safety conditions.
- Tree protection recommendations.

Oakland Tree Protection Ordinances

Pursuant to California Government Code § 53091, EBMUD, as a local agency and utility district serving a broad regional area, is not subject to building and land use zoning ordinances (e.g., tree ordinances) for projects involving facilities for the production, generation, storage, or transmission of water. However, it is the practice of EBMUD to work with local jurisdictions and neighboring communities during project planning, and to consider local environmental protection policies for guidance. For that reason, the City of Oakland's tree protection policies are described below and incorporated into this report.

The City of Oakland recognizes the many intrinsic values that trees contribute to the urban environment and encourages the protection of certain trees. As such Oakland Municipal Code provides protection for certain trees and requires a removal permit for the removal of any "protected tree". A "protected tree" is defined in Oakland City Ordinance Chapter 12.36 as being:

> *1. On any property, Quercus agrifolia (California or Coast Live Oak) measuring four inches dbh or larger, and any other tree measuring nine inches dbh or larger except Eucalyptus and Pinus radiata (Monterey Pine);*
>
> *2. Pinus radiata (Monterey Pine) trees shall be protected only on city property and in development-related situations where more than five Monterey Pine trees per acre are proposed to be removed. Although Monterey Pine trees are not protected in non-development-related*

situations, nor in development-related situations involving five or fewer trees per acre, public posting of such trees and written notice of proposed tree removal to the Office of Parks and Recreation is required per Section 12.36.070A and Section 12.36.080A.

3. Except as noted above, Eucalyptus and Monterey Pine trees are not protected by this chapter.

SOURCE: ESRI World Imagery; EBMUD, 2017; ESA, 2017

EBMUD Central Reservoir

Figure 1
Project Location

ESA

Survey Methods

The tree survey for this report was conducted on March 29-31, 2017 by Orion Environmental Associates certified arborist Neal Kramer, assisted by ESA certified arborist Liz Hill.

All trees within and immediately adjacent to the Project site and having at least one woody trunk with a diameter of 4 inches or greater at 54 inches above the ground were surveyed for this report. Each surveyed tree within the Project site and immediately adjacent on public rights-of-way was marked with a permanent numbered aluminum tag. To the extent possible, tree tag numbers used for this report correspond with preexisting numbers provided by EBMUD and used for a previous tree survey on the Project site. Location coordinates for each tree were recorded using a Trimble GPS unit, and their approximate location was noted on a field aerial map. Information regarding tree species, trunk diameter at 54 inches above the ground, and the approximate canopy spread was gathered for each tree.

For trees immediately adjacent to the Project site on private property, a general description and approximate location were noted.

Health and structure for each surveyed tree were evaluated using basic visual inspection methods and a general condition rating was assigned using the categories shown below. Individual tree ratings consider a variety of factors, including overall tree vigor, evidence of decay, insects or diseases, and/or any other structural defects.

> Good: 80-100% healthy foliage and no significant defects.
>
> Fair: 50-79% healthy foliage and/or minor defects.
>
> Poor: 5-49% healthy foliage and/or other significant defects.
>
> Dead = less than 5% healthy foliage.

Each tree was assigned one of two impact codes using the following categories:

> R – Removal recommended based on tree condition. In general, these trees are in poor condition or are already dead.
>
> PITP – Potential Impact Tree Protection, tree potentially affected by Project development, tree protection measures may be necessary.

Unless expressed otherwise, this survey was limited to visual examination of accessible parts without dissection, excavation, probing, or coring. There is no warranty or guarantee, expressed or implied, that problems or deficiencies regarding the trees discussed in this report may not arise in the future.

Survey Results

A total of 380 trees were documented for this report. Fifty-eight of the 380 tree total are located outside of, but immediately adjacent to, the existing Central Reservoir perimeter fencing.

Trees documented include 20 different species. **Table 1** below lists each species by common and scientific name, includes the total number of each documented for the survey. Of the species documented, only coast live oak, coast redwood, and Douglas fir are considered native to the area.

Table 1: Tree species documented on and immediately adjacent to the EBMUD Central Reservoir Property (March 29-31, 2017)

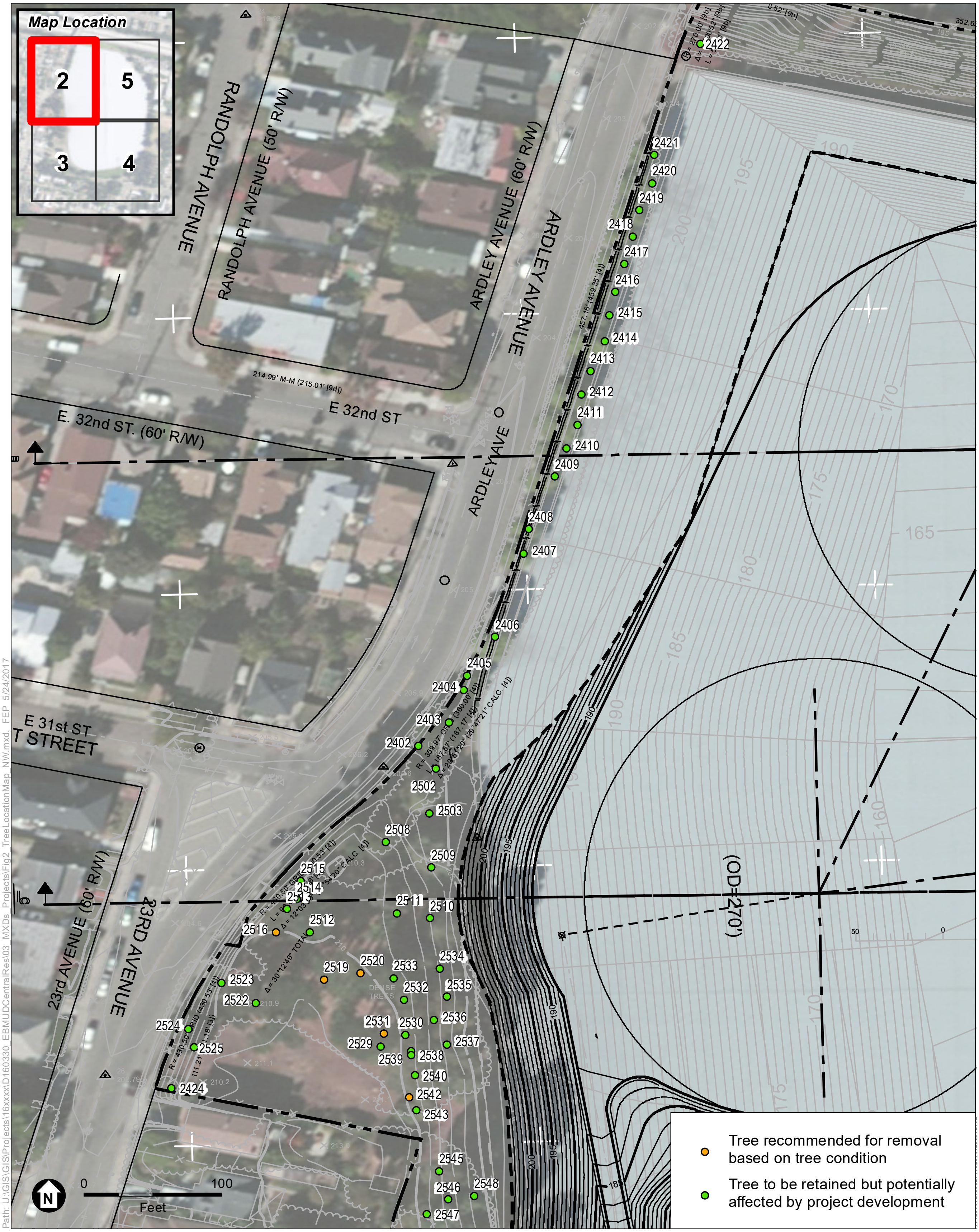
Common Name	Scientific Name	Number of Trees Documented	Native
Blackwood acacia	*Acacia melanoxylon*	35	-
Incense cedar	*Calocedrus decurrens*	10	-
Deodar cedar	*Cedrus deodara*	47	-
Redlfower gum	*Eucalyptus ficifolia*	16	-
White ironbark	*Eucalyptus leucoxylon*	1	-
Silver dollar gum	*Eucalyptus polyanthemos*	2	-
Eucalyptus	*Eucalyptus sp.*	6	-
Monterey cypress	*Hesperocyparis macrocarpa*	1	-
American sweet gum	*Liquidambar styraciflua*	1	-
Dawn redwood	*Metasequoia glyptostroboides*	1	-
Myoporum	*Myoporum laetum*	1	-
Olive	*Olea europaea*	1	-
Canary Island date palm	*Phoenix canariensis*	2	-
Canary Island pine	*Pinus canariensis*	18	-
Monterey pine	*Pinus radiata*	20	
Victorian box	*Pittosporum undulatum*	18	-
Cherry plum	*Prunus cerasifera*	3	-
Douglas fir	*Pseudotsuga menziesii*	7	yes
Coast live oak	*Quercus agrifolia*	78	yes
Peruvian pepper tree	*Schinus molle*	1	-
Coast redwood	*Sequoia sempervirens*	111	yes
	Total	380	

Of 380 trees inventoried for this report, 304 qualify as "protected trees" under Oakland City Ordinances Chapter 12.36.

A summary of all 380 trees inventoried is provided with this report as **Appendix A**. Appendix A lists each tree sequentially by tag number and includes common and scientific name, trunk diameter at 54 inches above the ground, approximate canopy spread, protected status, and a general tree condition rating. Specific comments regarding individual trees are included where relevant.

Approximate tree locations are shown on **Figure 2** (northwest project area), **Figure 3** (southwest project area)[1], **Figure 4** (southeast project area) and **Figure 5** (northeast project area).

[1] Trees 2726 and 2728 on Figure 3 were very close to the boundary and in order to be conservative, they have been included within the EBMUD boundary.

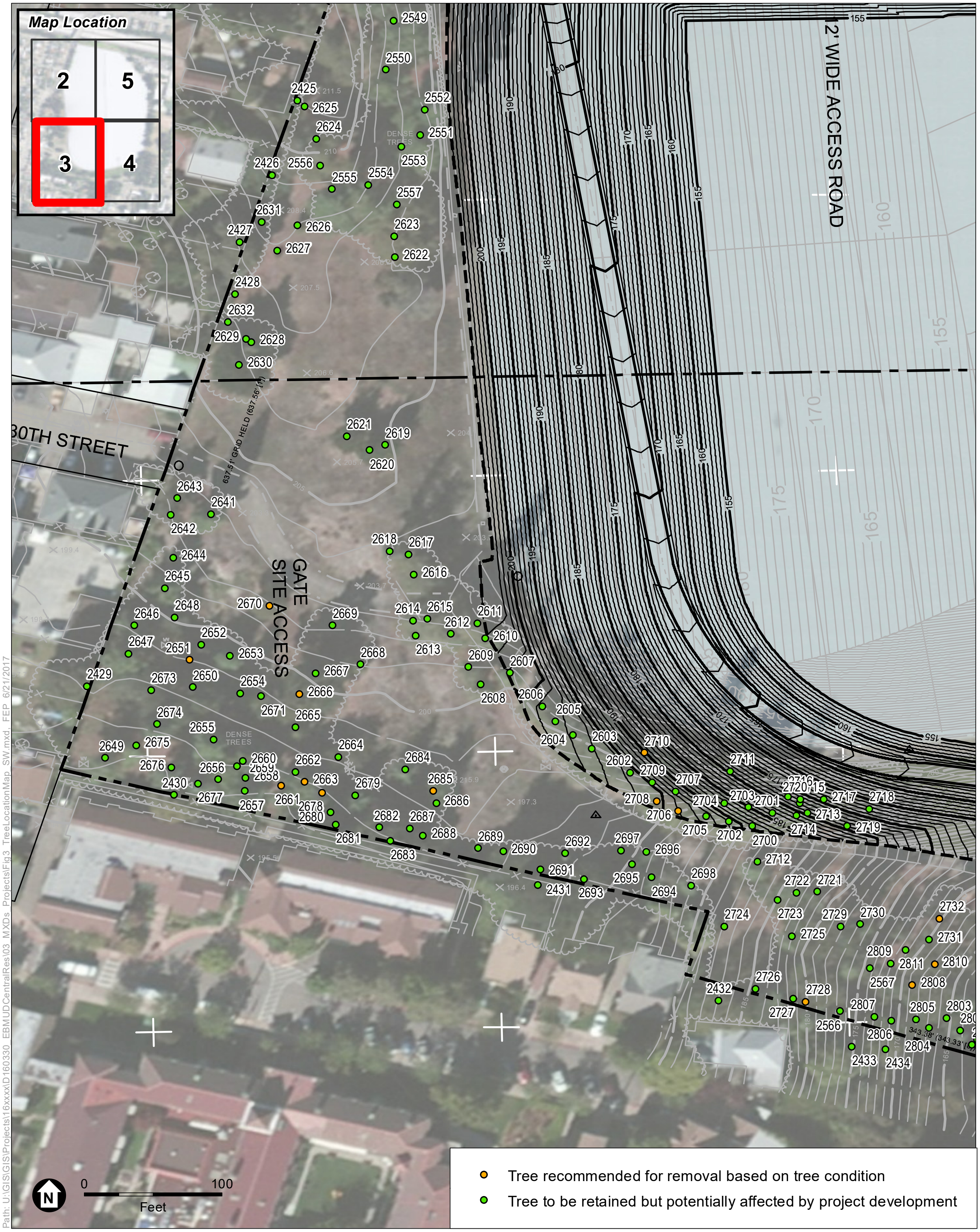


SOURCE: ESRI World Imagery; EBMUD, 2017; ESA, 2017

EBMUD Central Reservoir

Figure 2
Tree Location Map
Northwest Project Area

ESA

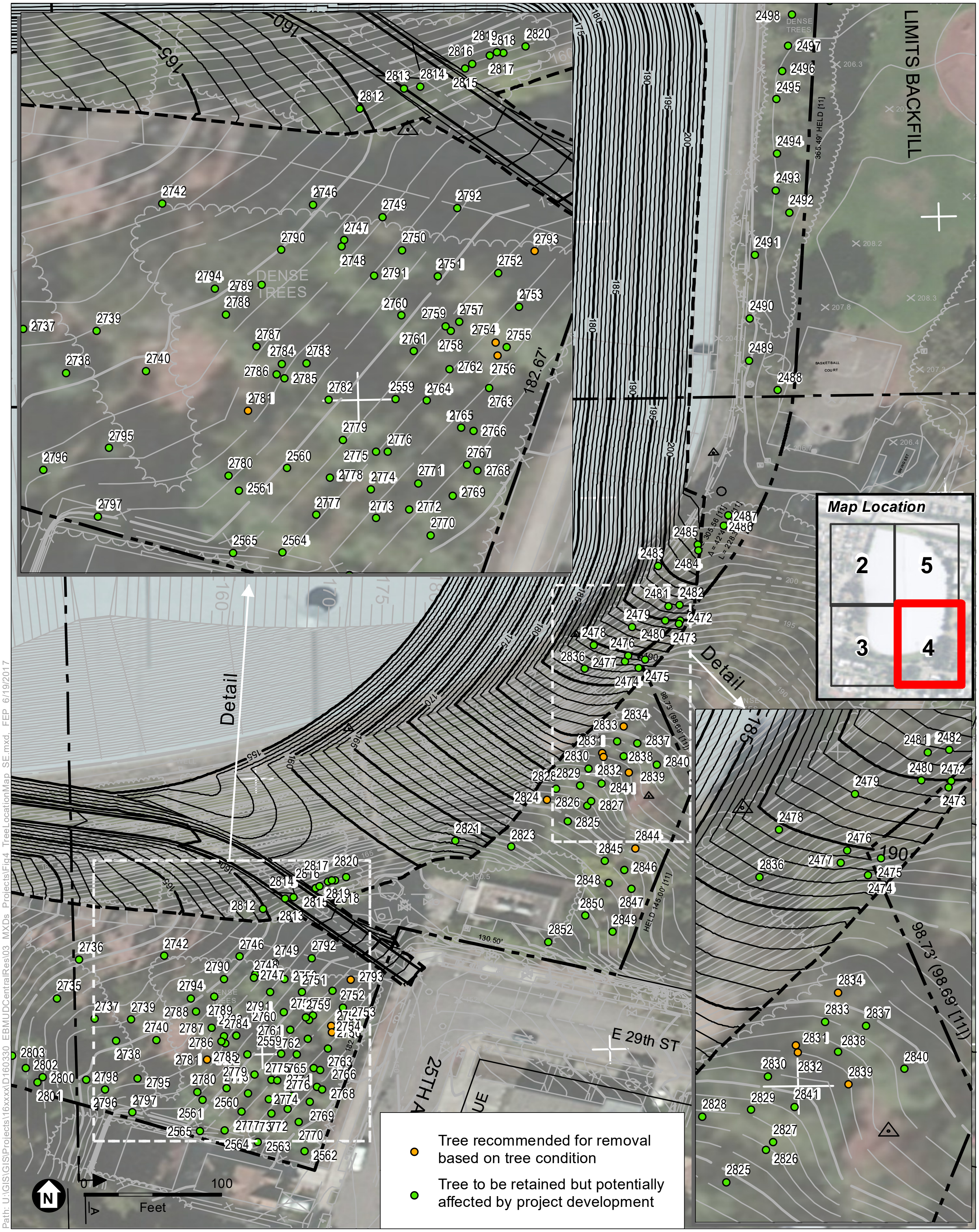


SOURCE: ESRI World Imagery; EBMUD, 2017; ESA, 2017

EBMUD Central Reservoir

Figure 3
Tree Location Map
Southwest Project Area

ESA

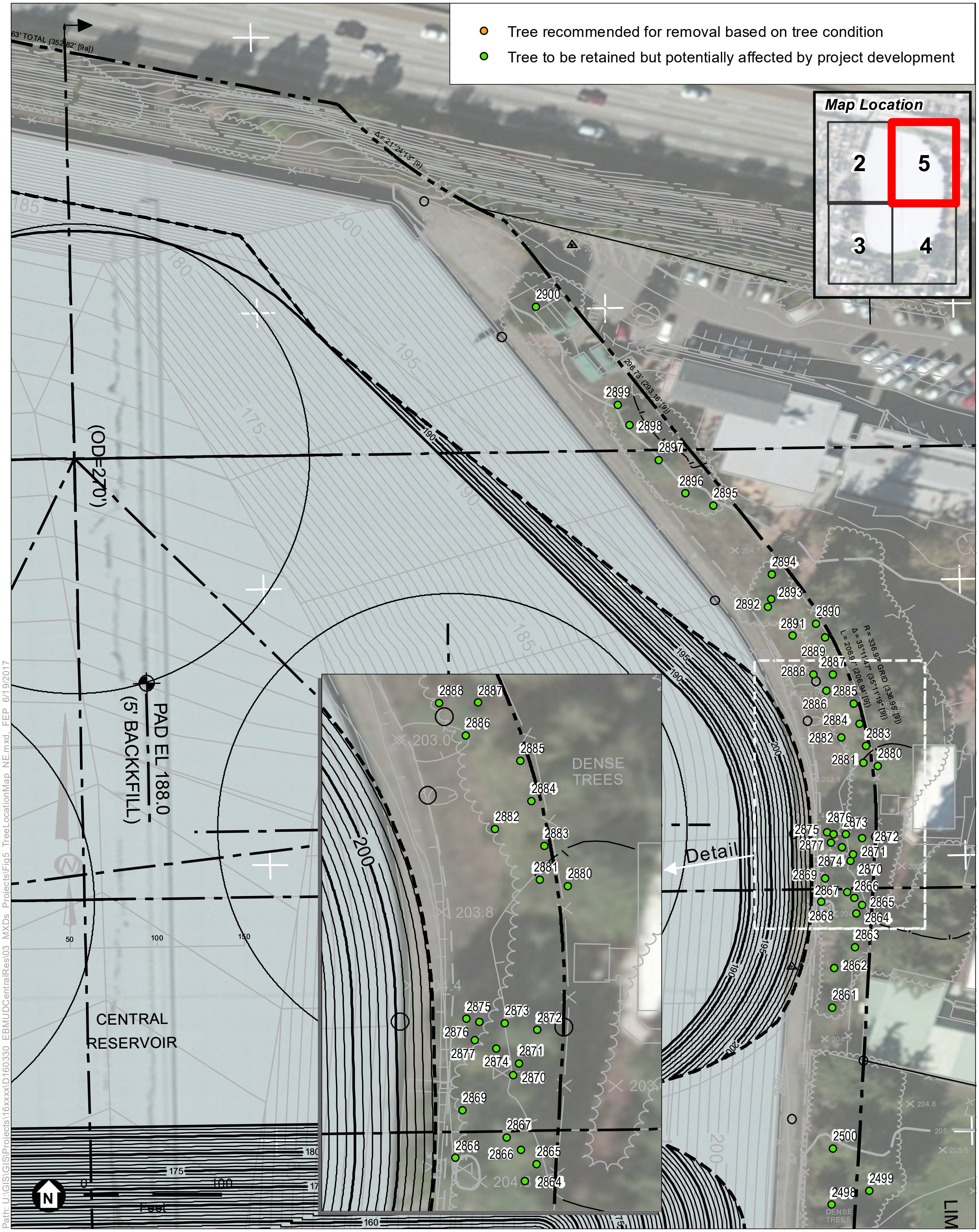


SOURCE: ESRI World Imagery; EBMUD, 2017; ESA, 2017

EBMUD Central Reservoir

Figure 4
Tree Location Map
Southeast Project Area

ESA



SOURCE: ESRI World Imagery; EBMUD, 2017; ESA, 2017

EBMUD Central Reservoir

Figure 5
Tree Location Map
Northeast Project Area

ESA

Tree Removal

Twenty-nine trees, including 6 that are dead, are recommended for removal based on tree condition. **Table 2** provides a list of the 29 trees by species and protection status. These trees are color coded orange on Figures 2 through 5, and are highlighted in orange in Appendix A. Specific defects or safety concerns leading to the recommendation for removal of each of these trees are provided under the comments column in Appendix A. Sixteen of the 29 trees recommended for removal based on tree condition qualify as "protected trees" under Oakland City Ordinance Chapter 12.36.

Table 2: Trees recommended for removal due to tree health or safety conditions

Tree Number	Common Name	Protected Tree	Tree Number	Common Name	Protected Status
2516	Monterey pine	no	2728	Monterey pine	no
2519	Monterey pine	no	2732	Monterey pine (dead)	no
2520	Monterey pine	no	2754	Coast redwood (dead)	no
2531	Blackwood acacia	yes	2756	Coast redwood (dead)	no
2542	Blackwood acacia	yes	2781	Monterey pine	no
2651	Coast live oak	yes	2793	Victorian box (dead)	no
2661	Deodar cedar	yes	2808	Monterey pine	no
2663	Victorian box	yes	2810	Monterey Pine (dead)	no
2666	Monterey pine	no	2824	Coast redwood	yes
2670	Myoprum	yes	2831	Coast redwood	yes
2678	Douglas fir	yes	2832	Coast redwood	yes
2685	Monterey cypress	yes	2834	Coast redwood	yes
2706	Coast redwood	yes	2839	Coast redwood (dead)	no
2708	Coast redwood	yes	2844	Coast redwood	yes
2710	Cherry plum	yes			

Redflower Gum Trees along Ardley Avenue

Sixteen Redflower gum trees numbered 2406 through 2421, and located along Ardley Avenue on the northwest boundary of the Project site, have trunk bases that are constrained and disfigured against a concrete gutter system that is part of existing Central Reservoir infrastructure there (Figure 6). Despite this constraint, these gum trees are in fair condition and appear to be structurally stable in their current configuration against the concrete gutter. However, if the concrete gutter system is removed, the likelihood is high that these trees would become destabilized and create a hazard risk to pedestrians and vehicles along Ardley Avenue and/or to new Central Reservoir infrastructure. Therefore, if the gutter system is removed for Project development, it is recommended that the 16 Redflower gum trees along Ardley Avenue be removed as well.

Figure 6. Redflower gum trees along northwest Project boundary constrained by concrete gutter

Trees Adjacent to the Redwood Day School Property

Construction, grading and/or paving activities may extend from the existing reservoir all the way to the line along the northeast Project boundary adjacent to the Redwood Day School. If this is the case, trees numbered 2868, 2869, 2875, 2876 and 2877 will likely need to be removed for Project development (**Figure 7**). Trees to be retained along this northeast Project boundary will require special protection measures to maximize their survivability during Project development activities.

Figure 7. Trees 2868, 2869, 2875, 2876 and 2877 (reservoir side of fence) along northeast Project boundary.

Tree Protection

Because site plans for the Project have not yet been finalized, this report assumes that all trees on-site could be affected by the Proposed Project. Potential impacts of special concern to retained trees include mechanical damage to tree trunks and canopies from inadvertent contact by construction equipment, vehicles or materials, root damage resulting from grading or excavation activities, and/or root damage resulting from soil compaction caused by heavy equipment and/or vehicle traffic.

Once final site demolition, grading and construction plans are available, the plans should be reviewed by the Project arborist to make a final determination regarding which trees can be retained and which will be removed. In order to maximize the survivability of trees to be retained, prior to the commencement of any demolition, grading or construction activities, a Tree Protection Plan will be developed and implemented in consultation with EBMUD and in consideration of EBMUD practices and procedures.

Appendix A: Tree Survey Results

Appendix A: Tree Survey Results - EBMUD Central Reservoir, Oakland, Ca March 29-31, 2017

Tree #	Common Name	*Scientific Name*	Diameter (inches) at 54" above grade	Canopy Spread (feet)	Oakland "Protected Tree"	Project Impact Code[1]	General Condition[2]	Comments
2402	Coast live oak	*Quercus agrifolia*	19.5	22	yes	PITP	Good	
2403	Coast live oak	*Quercus agrifolia*	17.5	24	yes	PITP	Good	
2404	Coast live oak	*Quercus agrifolia*	14.5	20	yes	PITP	Good	
2405	Coast live oak	*Quercus agrifolia*	6.5	10	yes	PITP	Good	
2406	Redflower gum	*Eucalyptus ficifolia*	22	28	-	PITP	Fair	root collar restricted between concrete gutter and sidewalk
2407	Redflower gum	*Eucalyptus ficifolia*	16.5	22	-	PITP	Fair	root collar restricted between concrete gutter and sidewalk
2408	Redflower gum	*Eucalyptus ficifolia*	16	18	-	PITP	Fair	root collar restricted between concrete gutter and sidewalk
2409	Redflower gum	*Eucalyptus ficifolia*	16	20	-	PITP	Fair	root collar restricted between concrete gutter and sidewalk
2410	Redflower gum	*Eucalyptus ficifolia*	16.5	20	-	PITP	Fair	root collar restricted between concrete gutter and sidewalk
2411	Redflower gum	*Eucalyptus ficifolia*	22	26	-	PITP	Fair	root collar restricted between concrete gutter and sidewalk
2412	Redflower gum	*Eucalyptus ficifolia*	21	24	-	PITP	Fair	root collar restricted between concrete gutter and sidewalk
2413	Redflower gum	*Eucalyptus ficifolia*	15.5	12	-	PITP	Fair	root collar restricted between concrete gutter and sidewalk
2414	Redflower gum	*Eucalyptus ficifolia*	19.5	22	-	PITP	Fair	root collar restricted between concrete gutter and sidewalk
2415	Redflower gum	*Eucalyptus ficifolia*	18	20	-	PITP	Fair	root collar restricted between concrete gutter and sidewalk
2416	Redflower gum	*Eucalyptus ficifolia*	17	15	-	PITP	Fair	root collar restricted between concrete gutter and sidewalk, 20% dead canopy
2417	Redflower gum	*Eucalyptus ficifolia*	20	18	-	PITP	Fair	root collar restricted between concrete gutter and sidewalk
2418	Redflower gum	*Eucalyptus ficifolia*	15.5	15	-	PITP	Fair	root collar restricted between concrete gutter and sidewalk

[1] Project Impact code: **R** = Removal recommended based on condition, **PITP** = Potential impact, tree protection may be necessary.

[2] Condition: **Good** = 80-100% healthy foliage and no significant defects; **Fair** = 50-79% healthy foliage and/or minor defects; **Poor** = 5-49% healthy foliage and/or other significant defects; **Dead** = less than 5% healthy foliage.

Tree #	Common Name	*Scientific Name*	Diameter (inches) at 54" above grade	Canopy Spread (feet)	Oakland "Protected Tree"	Project Impact Code[1]	General Condition[2]	Comments
2419	Redflower gum	*Eucalyptus ficifolia*	18	18	-	PITP	Fair	root collar restricted between concrete gutter and sidewalk
2420	Redflower gum	*Eucalyptus ficifolia*	21.5	24	-	PITP	Fair	root collar restricted between concrete gutter and sidewalk
2421	Redflower gum	*Eucalyptus ficifolia*	20.5	18	-	PITP	Fair	root collar restricted between concrete gutter and sidewalk, 30% dead canopy
2422	Liquidambar	*Liquidambar styraciflua*	22	28	yes	PITP	Fair	canopy unbalanced to NW
2424	Blackwood acacia	*Acacia melanoxylon*	29, 25	24	yes	PITP	Fair	outside, but adjacent to Central Reservoir fence
2425	Coast live oak	*Quercus agrifolia*	11	24	yes	PITP	Fair	main trunk emeshed in chain link fence
2426	Coast live oak	*Quercus agrifolia*	19	34	yes	PITP	Fair	main trunk emeshed in chain link fence
2427	Blackwood acacia	*Acacia melanoxylon*	11, 11, 10, 10, 10, 13	36	yes	PITP	Fair	approx. 5' outside Central Reservoir fence
2428	Olive	*Olea europaea*	12, 9.5, 10, 8	20	yes	PITP	Good	approx. 3' outside Central Reservoir fence
2429	Blackwood acacia	*Acacia melanoxylon*	24	38	yes	PITP	Good	approx. 8' outside Central Reservoir fence
2430	Dawn redwood	*Metasequoia glyptostroboides*	31	30	yes	PITP	Fair	approx. 3' outside Central Reservoir fence
2431	Coast live oak	*Quercus agrifolia*	36	45	yes	PITP	Good	outside Central Reservoir fence, chain link fence imbedded in north side of trunk
2432	Blackwood acacia	*Acacia melanoxylon*	21	33	-	PITP	Dead	approx. 3' outside Central Reservoir fence
2433	Canary Is. date palm	*Phoenix canariensis*	26	26	yes	PITP	Good	outside, but against Central Reservoir fence
2434	Cherry plum	*Prunus cerasifera*	9, 8	13	yes	PITP	Poor	outside, but against Central Reservoir fence, decay, multistemmed from base
2472	Coast live oak	*Quercus agrifolia*	16, 14	35	yes	PITP	Fair	approx. 25' outside Central Reservoir fence
2473	Coast live oak	*Quercus agrifolia*	16	30	yes	PITP	Fair	approx. 25' outside Central Reservoir fence
2474	Blackwood acacia	*Acacia melanoxylon*	18.5	20	yes	PITP	Fair	approx. 15' outside Central Reservoir fence
2475	Blackwood acacia	*Acacia melanoxylon*	11.5	12	yes	PITP	Fair	approx. 14' outside Central Reservoir fence
2476	Blackwood acacia	*Acacia melanoxylon*	11.5	16	yes	PITP	Fair	approx. 9' outside Central Reservoir fence
2477	Blackwood acacia	*Acacia melanoxylon*	9	12	yes	PITP	Fair	approx. 8' outside Central Reservoir fence
2478	Blackwood acacia	*Acacia melanoxylon*	11.5	16	yes	PITP	Fair	approx. 3' outside Central Reservoir fence
2479	Coast live oak	*Quercus agrifolia*	10, 4, 10, 11, 12, 5	28	yes	PITP	Fair	approx. 10' outside Central Reservoir fence
2480	Blackwood acacia	*Acacia melanoxylon*	28.5	45	yes	PITP	Fair	approx. 16' outside Central Reservoir fence
2481	Coast live oak	*Quercus agrifolia*	18.5	20	yes	PITP	Fair	approx. 12' outside Central Reservoir fence
2482	Coast live oak	*Quercus agrifolia*	18	24	yes	PITP	Fair	approx. 22' outside Central Reservoir fence
2483	Silver dollar gum	*Eucalyptus polyanthemos*	12	15	-	PITP	Fair	approx. 1' outside Central Reservoir fence

[1] Project Impact code: **R** = Removal recommended based on condition, **PITP** = Potential impact, tree protection may be necessary.

[2] Condition: **Good** = 80-100% healthy foliage and no significant defects; **Fair** = 50-79% healthy foliage and/or minor defects; **Poor** = 5-49% healthy foliage and/or other significant defects; **Dead** = less than 5% healthy foliage.

Tree #	Common Name	*Scientific Name*	Diameter (inches) at 54" above grade	Canopy Spread (feet)	Oakland "Protected Tree"	Project Impact Code[1]	General Condition[2]	Comments
2484	Eucalyptus sp.	*Eucalyptus sp.*	8, 25	25	-	PITP	Fair	approx. 12' outside Central Reservoir fence
2485	Eucalyptus sp.	*Eucalyptus sp.*	35.5	50	-	PITP	Good	approx. 3' outside Central Reservoir fence
2486	Eucalyptus sp.	*Eucalyptus sp.*	19, 10.5, 10	42	-	PITP	Fair	approx. 13' outside Central Reservoir fence
2487	Eucalyptus sp.	*Eucalyptus sp.*	11	24	-	PITP	Fair	approx. 20' outside Central Reservoir fence
2488	Eucalyptus sp.	*Eucalyptus sp.*	44.5	60	-	PITP	Good	approx. 15' outside Central Reservoir fence
2489	Eucalyptus sp.	*Eucalyptus sp.*	35	36	-	PITP	Good	approx. 1' outside Central Reservoir fence
2490	Silver dollar gum	*Eucalyptus polyanthemos*	11	15	-	PITP	Fair	approx. 1' outside Central Reservoir fence
2491	White ironbark	*Eucalyptus leucoxylon*	12, 18, 16, 17, 21	35	-	PITP	Fair	outside but against Central Reservoir fence
2492	Coast redwood	*Sequoia sempervirens*	13, 14, 12, 10, 13, 13, 11	26	yes	PITP	Good	approx. 10' outside Central Reservoir fence
2493	Coast redwood	*Sequoia sempervirens*	24.5	20	yes	PITP	Good	approx. 14' outside Central Reservoir fence
2494	Coast redwood	*Sequoia sempervirens*	19, 14, 20.5	24	yes	PITP	Good	approx. 12' outside Central Reservoir fence
2495	Coast redwood	*Sequoia sempervirens*	33	26	yes	PITP	Good	approx. 15' outside Central Reservoir fence
2496	Coast redwood	*Sequoia sempervirens*	8, 24, 11.5	20	yes	PITP	Good	approx. 14' outside Central Reservoir fence
2497	Coast redwood	*Sequoia sempervirens*	29	24	yes	PITP	Good	approx. 12' outside Central Reservoir fence
2498	Coast redwood	*Sequoia sempervirens*	22.5	242	yes	PITP	Good	approx. 12' outside Central Reservoir fence
2499	Deodar cedar	*Cedrus deodara*	11	16	yes	PITP	Fair	approx. 18' outside Central Reservoir fence
2500	Deodar cedar	*Cedrus deodara*	23, 13	38	yes	PITP	Good	approx. 18' outside Central Reservoir fence
2502	Coast live oak	*Quercus agrifolia*	7.5	12	yes	PITP	Good	
2503	Coast redwood	*Sequoia sempervirens*	31	20	yes	PITP	Good	
2508	Deodar cedar	*Cedrus deodara*	8	12	-	PITP	Good	
2509	Coast redwood	*Sequoia sempervirens*	21	22	yes	PITP	Good	
2510	Coast redwood	*Sequoia sempervirens*	31.5	40	yes	PITP	Fair	
2511	Blackwood acacia	*Acacia melanoxylon*	24	25	yes	PITP	Fair	canopy unbalanced to east
2512	Monterey pine	*Pinus radiata*	21	22	-	PITP	Good	
2513	Monterey pine	*Pinus radiata*	17	18	-	PITP	Fair	
2514	Monterey pine	*Pinus radiata*	16	18	-	PITP	Fair	lean to east
2515	Coast redwood	*Sequoia sempervirens*	12	20	yes	PITP	Fair	
2516	Monterey pine	*Pinus radiata*	13	16	-	R	Poor	approx. 45' tall, canopy top 10% only, w/dead branches
2519	Monterey pine	*Pinus radiata*	24.5	30	-	R	Poor	approx. 60' tall, canopy top 5% only
2520	Monterey pine	*Pinus radiata*	26	28	-	R	Poor	~70' tall, canopy top 10% only, unbalanced to east, pitch canker - declining health
2522	Monterey pine	*Pinus radiata*	27	35	-	PITP	Fair	canopy unbalanced to SW

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Tree #	Common Name	*Scientific Name*	Diameter (inches) at 54" above grade	Canopy Spread (feet)	Oakland "Protected Tree"	Project Impact Code[1]	General Condition[2]	Comments
2523	Blackwood acacia	*Acacia melanoxylon*	18	30	yes	PITP	Good	
2524	Coast live oak	*Quercus agrifolia*	14.5,10,9.5	28	yes	PITP	Good	
2525	Incense cedar	*Calocedrus decurrens*	7.5	10	-	PITP	Good	
2529	Blackwood acacia	*Acacia melanoxylon*	18	30	yes	PITP	Fair	
2530	Blackwood acacia	*Acacia melanoxylon*	17	26	yes	PITP	Fair	20% dead canopy
2531	Blackwood acacia	*Acacia melanoxylon*	9.5	12	yes	R	Poor	mainstem dead, bark peeling
2532	Blackwood acacia	*Acacia melanoxylon*	22	25	yes	PITP	Fair	
2533	Blackwood acacia	*Acacia melanoxylon*	23	30	yes	PITP	Fair	cavities at root crown, canopy unbalanced to NE
2534	Blackwood acacia	*Acacia melanoxylon*	17	26	yes	PITP	Fair	canopy unbalanced to east
2535	Blackwood acacia	*Acacia melanoxylon*	32	40	yes	PITP	Fair	wood chips to 10" deep around base of trunk
2536	Blackwood acacia	*Acacia melanoxylon*	15.5	15	yes	PITP	Fair	wood chips to 10" deep around base of trunk
2537	Blackwood acacia	*Acacia melanoxylon*	11	18	yes	PITP	Fair	
2538	Blackwood acacia	*Acacia melanoxylon*	10.5	15	yes	PITP	Fair	
2539	Blackwood acacia	*Acacia melanoxylon*	21	30	yes	PITP	Fair	
2540	Blackwood acacia	*Acacia melanoxylon*	12	20	yes	PITP	Fair	
2542	Blackwood acacia	*Acacia melanoxylon*	16.5	18	yes	R	Poor	split trunk, lean, 7" dia. limb broken off at 15', decay at base
2543	Blackwood acacia	*Acacia melanoxylon*	21	22	yes	PITP	Fair	
2545	Blackwood acacia	*Acacia melanoxylon*	23	32	yes	PITP	Fair	
2546	Blackwood acacia	*Acacia melanoxylon*	16	18	yes	PITP	Fair	
2547	Blackwood acacia	*Acacia melanoxylon*	19	28	yes	PITP	Fair	
2548	Canary Island Pine	*Pinus canariensis*	29.5	38	yes	PITP	Good	
2549	Canary Island Pine	*Pinus canariensis*	31.5	40	yes	PITP	Good	
2550	Canary Island Pine	*Pinus canariensis*	26.5	28	yes	PITP	Fair	
2551	Canary Island Pine	*Pinus canariensis*	26	30	yes	PITP	Fair	
2552	Canary Island Pine	*Pinus canariensis*	30.5	35	yes	PITP	Fair	
2553	Victorian box	*Pittosporum undulatum*	14.5	30	yes	PITP	Fair	
2554	Canary Island Pine	*Pinus canariensis*	20	30	yes	PITP	Fair	
2555	Canary Island Pine	*Pinus canariensis*	25	40	yes	PITP	Fair	
2556	Blackwood acacia	*Acacia melanoxylon*	20.5	20	yes	PITP	Fair	
2557	Blackwood acacia	*Acacia melanoxylon*	22.5	28	yes	PITP	Fair	
2559	Coast redwood	*Sequoia sempervirens*	20	16	yes	PITP	Fair	
2560	Coast redwood	*Sequoia sempervirens*	11.5	15	yes	PITP	Fair	
2561	Coast redwood	*Sequoia sempervirens*	17	14	yes	PITP	Fair	

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2562	Coast live oak	*Quercus agrifolia*	5, 6, 3	62	yes	PITP	Good	
2563	Coast live oak	*Quercus agrifolia*	7, 6, 6	26	yes	PITP	Good	
2564	Coast live oak	*Quercus agrifolia*	4, 5	14	yes	PITP	Good	
2565	Coast live oak	*Quercus agrifolia*	8	16	yes	PITP	Good	
2566	Coast live oak	*Quercus agrifolia*	14.5	18	yes	PITP	Fair	
2567	Deodar cedar	*Cedrus deodara*	12	20	yes	PITP	Good	
2602	Coast redwood	*Sequoia sempervirens*	30	24	yes	PITP	Fair	upper canopy thin , bronze foliage
2603	Coast redwood	*Sequoia sempervirens*	41.5	32	yes	PITP	Fair	
2604	Coast redwood	*Sequoia sempervirens*	36.5	30	yes	PITP	Fair	
2605	Coast redwood	*Sequoia sempervirens*	25	16	yes	PITP	Fair	upper canopy epicormic sprouts
2606	Coast redwood	*Sequoia sempervirens*	28	20	yes	PITP	Fair	
2607	Coast redwood	*Sequoia sempervirens*	26.5	24	yes	PITP	Fair	
2608	Coast redwood	*Sequoia sempervirens*	25	25	yes	PITP	Fair	
2609	Coast redwood	*Sequoia sempervirens*	22	18	yes	PITP	Fair	
2610	Coast redwood	*Sequoia sempervirens*	27	20	yes	PITP	Fair	
2611	Coast redwood	*Sequoia sempervirens*	31	20	yes	PITP	Good	
2612	Coast redwood	*Sequoia sempervirens*	23.5	18	yes	PITP	Fair	
2613	Coast redwood	*Sequoia sempervirens*	13	12	yes	PITP	Fair	
2614	Coast redwood	*Sequoia sempervirens*	19.5	24	yes	PITP	Good	
2615	Coast redwood	*Sequoia sempervirens*	28	24	yes	PITP	Fair	
2616	Coast redwood	*Sequoia sempervirens*	29	30	yes	PITP	Fair	
2617	Coast redwood	*Sequoia sempervirens*	30.5	27	yes	PITP	Fair	
2618	Coast redwood	*Sequoia sempervirens*	20.5	14	yes	PITP	Fair	
2619	Monterey pine	*Pinus radiata*	22.5	26	-	PITP	Fair	multi-stemed and twisted trunk @ 5', pitch canker
2620	Monterey pine	*Pinus radiata*	17	26	-	PITP	Good	
2621	Monterey pine	*Pinus radiata*	20.5	30	-	PITP	Good	
2622	Blackwood acacia	*Acacia melanoxylon*	13.5	32	yes	PITP	Fair	30% dead canopy
2623	Blackwood acacia	*Acacia melanoxylon*	25	38	yes	PITP	Fair	
2624	Blackwood acacia	*Acacia melanoxylon*	13.5	28	yes	PITP	Fair	dead bark length of main trunk, canopy unbalanced to east
2625	Canary Island Pine	*Pinus canariensis*	18	28	yes	PITP	Good	
2626	Incense cedar	*Calocedrus decurrens*	8	9	-	PITP	Good	
2627	Incense cedar	*Calocedrus decurrens*	2.5	5	-	PITP	Fair	bowed at base with corrected lean
2628	Canary Island Pine	*Pinus canariensis*	15	20	yes	PITP	Good	

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Tree #	Common Name	*Scientific Name*	Diameter (inches) at 54" above grade	Canopy Spread (feet)	Oakland "Protected Tree"	Project Impact Code[1]	General Condition[2]	Comments
2629	Coast live oak	*Quercus agrifolia*	13	18	yes	PITP	Fair	
2630	Coast live oak	*Quercus agrifolia*	21.5, 22	40	yes	PITP	Good	
2631	Coast live oak	*Quercus agrifolia*	9, 7, 11.5	22	yes	PITP	Good	
2632	Canary Is. date palm	*Phoenix canariensis*	30	30	yes	PITP	Good	
2641	Canary Island Pine	*Pinus canariensis*	23	24	yes	PITP	Good	
2642	Douglas fir	*Pseudotsuga menziesii*	14.5	18	yes	PITP	Fair	
2643	Douglas fir	*Pseudotsuga menziesii*	5.5, 10, 9	18	yes	PITP	Fair	bowed multi-stemmed trunk
2644	Incense cedar	*Calocedrus decurrens*	12	15	yes	PITP	Good	
2645	Incense cedar	*Calocedrus decurrens*	17.5	26	yes	PITP	Good	
2646	Douglas fir	*Pseudotsuga menziesii*	19	24	yes	PITP	Good	
2647	Canary Island Pine	*Pinus canariensis*	22	30	yes	PITP	Good	
2648	Douglas fir	*Pseudotsuga menziesii*	13	20	yes	PITP	Fair	
2649	Canary Island Pine	*Pinus canariensis*	19.5	22	yes	PITP	Good	
2650	Coast live oak	*Quercus agrifolia*	32	40	yes	PITP	Good	
2651	Coast live oak	*Quercus agrifolia*	11	16	yes	R	Poor	root rot, bark peeled 50% at base of trunk
2652	Incense cedar	*Calocedrus decurrens*	5	9	yes	PITP	Fair	canopy thin, likely root rot
2653	Canary Island Pine	*Pinus canariensis*	14.5	20	yes	PITP	Good	
2654	Coast redwood	*Sequoia sempervirens*	8.5	12	-	PITP	Fair	
2655	Canary Island Pine	*Pinus canariensis*	22	22	yes	PITP	Good	
2656	Coast live oak	*Quercus agrifolia*	13	25	yes	PITP	Fair	
2657	Canary Island Pine	*Pinus canariensis*	23.5	27	yes	PITP	Fair	
2658	Coast live oak	*Quercus agrifolia*	5.5	15	yes	PITP	Fair	canopy unbalanced to east, supressed under 2659
2659	Victorian box	*Pittosporum undulatum*	9, 9.5, 10	20	yes	PITP	Fair	thin, many dead interior branches
2660	Victorian box	*Pittosporum undulatum*	11.5, 10.5	20	yes	PITP	Fair	
2661	Deodar cedar	*Cedrus deodara*	11.5	15	yes	R	Poor	partially corrected lean, 25° south towards apartments, ground mounded opposite lean
2662	Douglas fir	*Pseudotsuga menziesii*	13	15	yes	PITP	Fair	lean to west, roots exposed on opposite side, but healthy foliage
2663	Victorian box	*Pittosporum undulatum*	10, 8	18	yes	R	Poor	less than 10% live canopy
2664	Coast live oak	*Quercus agrifolia*	12	26	yes	PITP	Good	
2665	Incense cedar	*Calocedrus decurrens*	10.5	12	yes	PITP	Good	
2666	Monterey pine	*Pinus radiata*	25	20	-	R	Poor	spiral scar length of trunk, canopy top 15% only, large dead branches
2667	Coast live oak	*Quercus agrifolia*	16.5, 21, 19	40	yes	PITP	Fair	

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2668	Incense cedar	*Calocedrus decurrens*	9	12	yes	PITP	Good	
2669	Deodar cedar	*Cedrus deodara*	12	25	yes	PITP	Fair	
2670	Myoporum	*Myoporum laetum*	13.5	25	yes	R	Poor	heavy thrips infestation, decay at base
2671	Deodar cedar	*Cedrus deodara*	10.5	20	yes	PITP	Good	
2673	Coast live oak	*Quercus agrifolia*	30	45	yes	PITP	Fair	
2674	Canary Island Pine	*Pinus canariensis*	17.5	25	yes	PITP	Good	
2675	Canary Island Pine	*Pinus canariensis*	16	18	yes	PITP	Fair	
2676	Canary Island Pine	*Pinus canariensis*	21	24	yes	PITP	Fair	
2677	Deodar cedar	*Cedrus deodara*	15.5	18	yes	PITP	Fair	
2678	Douglas fir	*Pseudotsuga menziesii*	12	12	yes	R	Poor	decay > 50% at base, near apartments
2679	Deodar cedar	*Cedrus deodara*	12.5	25	yes	PITP	Fair	
2680	Coast live oak	*Quercus agrifolia*	7.5	18	yes	PITP	Fair	suppressed, bowed and unbalanced to north
2681	Coast live oak	*Quercus agrifolia*	25	38	yes	PITP	Good	
2682	Coast live oak	*Quercus agrifolia*	7.5	14	yes	PITP	Fair	suppressed, bowed and unbalanced to west
2683	Coast live oak	*Quercus agrifolia*	28, 22	45	yes	PITP	Good	
2684	Deodar cedar	*Cedrus deodara*	13.5	20	yes	PITP	Good	
2685	Monterey cypress	*Hesperocyparis macrocarpa*	12	17	yes	R	Poor	decay at base, declining health with bronzing canopy
2686	Incense cedar	*Calocedrus decurrens*	6	9	-	PITP	Good	
2687	Coast live oak	*Quercus agrifolia*	6	10	-	PITP	Fair	
2688	Coast live oak	*Quercus agrifolia*	11, 8.5	15	yes	PITP	Fair	unbalanced to northeast, branches to south and east sides with significant decay at 3-14'
2689	Coast live oak	*Quercus agrifolia*	6.5, 5	12	yes	PITP	Fair	
2690	Douglas fir	*Pseudotsuga menziesii*	15	15	yes	PITP	Fair	
2691	Coast live oak	*Quercus agrifolia*	4.5	10	yes	PITP	Fair	
2692	Deodar cedar	*Cedrus deodara*	9	12	yes	PITP	Fair	
2693	Coast live oak	*Quercus agrifolia*	17.5	30	yes	PITP	Good	
2694	Deodar cedar	*Cedrus deodara*	11	24	yes	PITP	Fair	
2695	Coast live oak	*Quercus agrifolia*	11.5	22	yes	PITP	Good	
2696	Coast redwood	*Sequoia sempervirens*	12.5	20	yes	PITP	Fair	
2697	Deodar cedar	*Cedrus deodara*	5.5	9	-	PITP	Fair	
2698	Deodar cedar	*Cedrus deodara*	10	16	yes	PITP	Good	
2700	Coast redwood	*Sequoia sempervirens*	20	20	yes	PITP	Fair	foliage thin & bronze, deep vertical trunk scar
2701	Coast redwood	*Sequoia sempervirens*	33.5	20	yes	PITP	Fair	foliage thin, top 1/3 dead
2702	Coast redwood	*Sequoia sempervirens*	20	24	yes	PITP	Fair	

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2703	Coast redwood	*Sequoia sempervirens*	19.5	18	yes	PITP	Fair	
2704	Coast redwood	*Sequoia sempervirens*	28	28	yes	PITP	Fair	
2705	Coast redwood	*Sequoia sempervirens*	19	16	yes	PITP	Fair	
2706	Coast redwood	*Sequoia sempervirens*	24	18	yes	R	Poor	top 1/3 canopy bare, lower canopy foliage thin and bronze, deep trunk scar at 4-8' NE side with beetle pinholes
2707	Coast redwood	*Sequoia sempervirens*	27.5	26	yes	PITP	Good	
2708	Coast redwood	*Sequoia sempervirens*	28	18	yes	R	Poor	trunk scar from base to 15' w/ decay and beetle pin holes, dead top at 45', codominant stems at 35' - 1 dead
2709	Coast redwood	*Sequoia sempervirens*	30	20	yes	PITP	Fair	
2710	Cherry plum	*Prunus cerasifera*	10	16	yes	R	Poor	60% dead canopy, 30° lean to northwest
2711	Coast live oak	*Quercus agrifolia*	28.5	36	yes	PITP	Fair	
2712	Deodar cedar	*Cedrus deodara*	12	25	yes	PITP	Fair	significant lean to south with mounded soil on opposite side
2713	Coast live oak	*Quercus agrifolia*	8.5	12	yes	PITP	Fair	
2714	Coast live oak	*Quercus agrifolia*	6.5	10	yes	PITP	Fair	
2715	Coast live oak	*Quercus agrifolia*	8, 9, 7, 7, 19	18	yes	PITP	Fair	
2716	Coast live oak	*Quercus agrifolia*	6	12	yes	PITP	Fair	
2717	Coast live oak	*Quercus agrifolia*	13	18	yes	PITP	Fair	
2718	Monterey pine	*Pinus radiata*	15.5	24	-	PITP	Good	
2719	Coast live oak	*Quercus agrifolia*	10.5, 9	25	yes	PITP	Good	
2720	Coast live oak	*Quercus agrifolia*	6	10	yes	PITP	Fair	
2721	Deodar cedar	*Cedrus deodara*	8.5	12	-	PITP	Fair	
2722	Peruvian pepper tree	*Schinus molle*	12.5, 10.5	28	yes	PITP	Fair	
2723	Deodar cedar	*Cedrus deodara*	8.5	14	-	PITP	Fair	
2724	Coast live oak	*Quercus agrifolia*	6, 3.5	15	yes	PITP	Good	
2725	Deodar cedar	*Cedrus deodara*	11.5	29	yes	PITP	Good	
2726	Coast live oak	*Quercus agrifolia*	18	30	yes	PITP	Good	
2727	Deodar cedar	*Cedrus deodara*	13	18	yes	PITP	Fair	
2728	Monterey pine	*Pinus radiata*	19	18	-	R	Poor	pitch canker and dead branches in canopy, declining health, 12' from house
2729	Monterey pine	*Pinus radiata*	23	25	-	PITP	Fair	ptich canker
2730	Deodar cedar	*Cedrus deodara*	10	22	yes	PITP	Good	
2731	Monterey pine	*Pinus radiata*	35	24	-	PITP	Fair	

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2732	Monterey pine	*Pinus radiata*	24.5		-	R	Dead	remove
2735	Coast live oak	*Quercus agrifolia*	15.5, 11.5, 7	28	yes	PITP	Good	
2736	Coast live oak	*Quercus agrifolia*	13	22	yes	PITP	Good	
2737	Coast live oak	*Quercus agrifolia*	15	30	yes	PITP	Good	
2738	Deodar cedar	*Cedrus deodara*	12	18	yes	PITP	Good	
2739	Coast live oak	*Quercus agrifolia*	6.5, 5	20	yes	PITP	Good	
2740	Coast live oak	*Quercus agrifolia*	6	15	yes	PITP	Good	
2746	Coast redwood	*Sequoia sempervirens*	18.5	25	yes	PITP	Fair	
2747	Coast redwood	*Sequoia sempervirens*	15.5	27	yes	PITP	Fair	trunks fused at base
2748	Coast redwood	*Sequoia sempervirens*	17		yes	PITP	Fair	
2749	Coast redwood	*Sequoia sempervirens*	29.5	20	yes	PITP	Fair	
2750	Coast redwood	*Sequoia sempervirens*	34.5	25	yes	PITP	Good	
2751	Coast redwood	*Sequoia sempervirens*	6, 10.5	14	yes	PITP	Fair	
2752	Coast redwood	*Sequoia sempervirens*	25, 12.5, 15	30	yes	PITP	Fair	
2753	Coast redwood	*Sequoia sempervirens*	59	36	yes	PITP	Good	
2754	Coast redwood	*Sequoia sempervirens*	12.5		-	R	Dead	
2755	Coast redwood	*Sequoia sempervirens*	19	10	yes	PITP	Fair	tight cluster
2756	Coast redwood	*Sequoia sempervirens*	13.5		-	R	Dead	
2757	Coast redwood	*Sequoia sempervirens*	12.5		yes	PITP	Fair	
2758	Coast redwood	*Sequoia sempervirens*	12.5	16	yes	PITP	Fair	tight cluster
2759	Coast redwood	*Sequoia sempervirens*	14.5		yes	PITP	Fair	
2760	Coast redwood	*Sequoia sempervirens*	23	20	yes	PITP	Fair	
2761	Coast redwood	*Sequoia sempervirens*	18	15	yes	PITP	Fair	
2762	Coast redwood	*Sequoia sempervirens*	17	16	yes	PITP	Fair	
2763	Coast redwood	*Sequoia sempervirens*	16.5	15	yes	PITP	Fair	
2764	Coast redwood	*Sequoia sempervirens*	24	18	yes	PITP	Fair	
2765	Coast redwood	*Sequoia sempervirens*	20.5	18	yes	PITP	Fair	tight cluster
2766	Coast redwood	*Sequoia sempervirens*	21		yes	PITP	Fair	
2767	Coast redwood	*Sequoia sempervirens*	33	25	yes	PITP	Fair	
2768	Coast redwood	*Sequoia sempervirens*	22.5		yes	PITP	Fair	
2769	Coast redwood	*Sequoia sempervirens*	18	18	yes	PITP	Fair	
2770	Coast redwood	*Sequoia sempervirens*	17, 9	16	yes	PITP	Fair	
2771	Coast redwood	*Sequoia sempervirens*	28.5	20	yes	PITP	Good	
2772	Coast redwood	*Sequoia sempervirens*	14.5	10	yes	PITP	Fair	
2773	Coast redwood	*Sequoia sempervirens*	23.5	15	yes	PITP	Fair	

[1] Project Impact code: **R** = Removal recommended based on condition, **PITP** = Potential impact, tree protection may be necessary.

[2] Condition: **Good** = 80-100% healthy foliage and no significant defects; **Fair** = 50-79% healthy foliage and/or minor defects; **Poor** = 5-49% healthy foliage and/or other significant defects; **Dead** = less than 5% healthy foliage.

Tree #	Common Name	*Scientific Name*	Diameter (inches) at 54" above grade	Canopy Spread (feet)	Oakland "Protected Tree"	Project Impact Code[1]	General Condition[2]	Comments
2774	Coast redwood	*Sequoia sempervirens*	14	13	yes	PITP	Fair	
2775	Coast redwood	*Sequoia sempervirens*	17	20	yes	PITP	Fair	tight cluster
2776	Coast redwood	*Sequoia sempervirens*	22.5		yes	PITP	Fair	
2777	Coast redwood	*Sequoia sempervirens*	28	20	yes	PITP	Fair	
2778	Coast redwood	*Sequoia sempervirens*	9.5	10	yes	PITP	Fair	supressed
2779	Coast redwood	*Sequoia sempervirens*	18	14	yes	PITP	Fair	
2780	Coast redwood	*Sequoia sempervirens*	16, 24.5	20	yes	PITP	Good	
2781	Monterey pine	*Pinus radiata*	27	32	-	R	Poor	canopy unbalanced to southeast towards homes with 50% dead branches in the canopy
2782	Coast redwood	*Sequoia sempervirens*	33.5	30	yes	PITP	Good	
2783	Coast redwood	*Sequoia sempervirens*	18.5	15	yes	PITP	Fair	
2784	Coast redwood	*Sequoia sempervirens*	12	18	yes	PITP	Fair	tight cluster
2785	Coast redwood	*Sequoia sempervirens*	12		yes	PITP	Fair	fresh green flush on bronze canopy
2786	Coast redwood	*Sequoia sempervirens*	10.5		yes	PITP	Fair	fresh green flush on bronze canopy
2787	Coast redwood	*Sequoia sempervirens*	18.5	16	yes	PITP	Fair	
2788	Coast redwood	*Sequoia sempervirens*	20	15	yes	PITP	Fair	
2789	Coast redwood	*Sequoia sempervirens*	23	24	yes	PITP	Fair	lean and canopy unbalanced to NE
2790	Coast redwood	*Sequoia sempervirens*	26.5	25	yes	PITP	Fair	30% bronze foliage, thin top
2791	Coast redwood	*Sequoia sempervirens*	22.5	18	yes	PITP	Fair	
2792	Victorian box	*Pittosporum undulatum*	7.5	15	-	PITP	Good	
2793	Victorian box	*Pittosporum undulatum*	8, 5.5		-	R	Dead	
2794	Victorian box	*Pittosporum undulatum*	10	18	yes	PITP	Fair	
2795	Blackwood acacia	*Acacia melanoxylon*	9.5	18	yes	PITP	Good	
2796	Deodar cedar	*Cedrus deodara*	9	15	yes	PITP	Fair	canopy unbalanced to SE, supressed
2797	Coast live oak	*Quercus agrifolia*	14.5, 9.5, 11.5	40	yes	PITP	Good	
2798	Coast live oak	*Quercus agrifolia*	24	42	yes	PITP	Good	
2800	Coast live oak	*Quercus agrifolia*	6, 9	15	yes	PITP	Fair	
2801	Coast live oak	*Quercus agrifolia*	12.5, 7.5	20	yes	PITP	Good	
2802	Deodar cedar	*Cedrus deodara*	11.5	15	yes	PITP	Fair	
2803	Coast live oak	*Quercus agrifolia*	9.5, 8.5, 5.5	20	yes	PITP	Fair	
2804	Coast live oak	*Quercus agrifolia*	9.5, 6	12	yes	PITP	Fair	
2805	Coast live oak	*Quercus agrifolia*	18	28	yes	PITP	Good	
2806	Deodar cedar	*Cedrus deodara*	11.5	18	yes	PITP	Fair	
2807	Coast live oak	*Quercus agrifolia*	10.5	18	yes	PITP	Good	

2808	Monterey pine	*Pinus radiata*	18	15	-	R	Poor	isolated tall tree with canopy only top 5%

[1] Project Impact code: **R** = Removal recommended based on condition, **PITP** = Potential impact, tree protection may be necessary.

[2] Condition: **Good** = 80-100% healthy foliage and no significant defects; **Fair** = 50-79% healthy foliage and/or minor defects; **Poor** = 5-49% healthy foliage and/or other significant defects; **Dead** = less than 5% healthy foliage.

Tree #	Common Name	*Scientific Name*	Diameter (inches) at 54" above grade	Canopy Spread (feet)	Oakland "Protected Tree"	Project Impact Code[1]	General Condition[2]	Comments
2809	Monterey pine	*Pinus radiata*	18.5	18	-	PITP	Fair	
2810	Monterey pine	*Pinus radiata*	29		-	R	Dead	
2811	Deodar cedar	*Cedrus deodara*	6	15	-	PITP	Fair	significant bark damage on trunk at 3'
2812	Victorian box	*Pittosporum undulatum*	11.5, 10	26	yes	PITP	Fair	thin, 35% dead canopy
2813	Coast live oak	*Quercus agrifolia*	15, 13	28	yes	PITP	Fair	
2814	Victorian box	*Pittosporum undulatum*	8, 8.5	20	-	PITP	Fair	
2815	Victorian box	*Pittosporum undulatum*	7.5	12	-	PITP	Fair	
2816	Victorian box	*Pittosporum undulatum*	5.5	10	-	PITP	Fair	
2817	Victorian box	*Pittosporum undulatum*	6.5	16	-	PITP	Fair	unruley structure
2818	Victorian box	*Pittosporum undulatum*	4.5	12	-	PITP	Fair	bowed, unbalanced to NW
2819	Victorian box	*Pittosporum undulatum*	5	15	-	PITP	Fair	unbalanced to SE
2820	Victorian box	*Pittosporum undulatum*	7, 6.5	16	-	PITP	Fair	
2821	Coast live oak	*Quercus agrifolia*	13, 15, 21, 11, 23, 22	33	yes	PITP	Good	
2823	Incense cedar	*Calocedrus decurrens*	26	42	yes	PITP	Good	
2824	Coast redwood	*Sequoia sempervirens*	22	20	yes	R	Poor	top 2/3 dead
2825	Coast redwood	*Sequoia sempervirens*	13.5	16	yes	PITP	Fair	
2826	Coast live oak	*Quercus agrifolia*	20	38	yes	PITP	Fair	
2827	Coast live oak	*Quercus agrifolia*	18, 16, 14	36	yes	PITP	Good	
2828	Coast redwood	*Sequoia sempervirens*	9.5	18	yes	PITP	Fair	
2829	Coast redwood	*Sequoia sempervirens*	20.5	24	yes	PITP	Fair	
2830	Coast redwood	*Sequoia sempervirens*	26	26	yes	PITP	Fair	
2831	Coast redwood	*Sequoia sempervirens*	12.5	10	yes	R	Poor	most of canopy declining or dead
2832	Coast redwood	*Sequoia sempervirens*	17.5	12	yes	R	Poor	most of canopy declining or dead
2833	Coast redwood	*Sequoia sempervirens*	19.5	18	yes	PITP	Fair	topped, foliage thin
2834	Coast redwood	*Sequoia sempervirens*	28	18	yes	R	Poor	most of canopy declining or dead
2836	Coast live oak	*Quercus agrifolia*	28	32	yes	PITP	Good	
2837	Coast redwood	*Sequoia sempervirens*	19.5	15	yes	PITP	Fair	
2838	Coast redwood	*Sequoia sempervirens*	12	15	yes	PITP	Fair	split top, supressed
2839	Coast redwood	*Sequoia sempervirens*	15.5	-	-	R	Dead	
2840	Coast redwood	*Sequoia sempervirens*	29	20	yes	PITP	Fair	
2841	Coast redwood	*Sequoia sempervirens*	34.5	24	yes	PITP	Fair	

2844	Coast redwood	*Sequoia sempervirens*	14.5	14	yes	R	Poor	decay at base, dead top at 16', trunk bowed 10° to northwest
2845	Victorian box	*Pittosporum undulatum*	6, 5, 6	18	-	PITP	Fair	

[1] Project Impact code: **R** = Removal recommended based on condition, **PITP** = Potential impact, tree protection may be necessary.

[2] Condition: **Good** = 80-100% healthy foliage and no significant defects; **Fair** = 50-79% healthy foliage and/or minor defects; **Poor** = 5-49% healthy foliage and/or other significant defects; **Dead** = less than 5% healthy foliage.

Tree #	Common Name	*Scientific Name*	Diameter (inches) at 54" above grade	Canopy Spread (feet)	Oakland "Protected Tree"	Project Impact Code[1]	General Condition[2]	Comments
2846	Victorian box	*Pittosporum undulatum*	5, 5.5	16	-	PITP	Fair	
2847	Cherry plum	*Prunus cerasifera*	4, 6, 6, 5, 5	18	-	PITP	Fair	
2848	Victorian box	*Pittosporum undulatum*	3, 4, 6	15	-	PITP	Fair	
2849	Coast redwood	*Sequoia sempervirens*	17.5	24	yes	PITP	Fair	dead top, ivy up trunk
2850	Coast live oak	*Quercus agrifolia*	6.5, 8, 4.5 7, 10	26	yes	PITP	Good	
2852	Coast live oak	*Quercus agrifolia*	12.5	20	yes	PITP	Good	
2861	Deodar cedar	*Cedrus deodara*	17	16	yes	PITP	Good	
2862	Deodar cedar	*Cedrus deodara*	10.5	17	yes	PITP	Good	
2863	Deodar cedar	*Cedrus deodara*	11	20	yes	PITP	Good	approx. 9' outside Central reservoir fence
2864	Deodar cedar	*Cedrus deodara*	12	18	yes	PITP	Fair	
2865	Coast live oak	*Quercus agrifolia*	4	9	yes	PITP	Fair	supressed
2866	Coast live oak	*Quercus agrifolia*	5	15	yes	PITP	Fair	
2867	Deodar cedar	*Cedrus deodara*	14, 15	24	yes	PITP	Fair	
2868	Deodar cedar	*Cedrus deodara*	18, 21	30	yes	PITP	Good	
2869	Deodar cedar	*Cedrus deodara*	16.5	22	yes	PITP	Fair	
2870	Deodar cedar	*Cedrus deodara*	13	18	yes	PITP	Fair	
2871	Coast redwood	*Sequoia sempervirens*	9	15	yes	PITP	Fair	
2872	Deodar cedar	*Cedrus deodara*	11	14	yes	PITP	Fair	
2873	Deodar cedar	*Cedrus deodara*	11	12	yes	PITP	Fair	
2874	Coast live oak	*Quercus agrifolia*	8.5, 6.5	18	yes	PITP	Fair	
2875	Coast live oak	*Quercus agrifolia*	9.5, 9.5	24	yes	PITP	Fair	
2876	Deodar cedar	*Cedrus deodara*	18	10	yes	PITP	Fair	
2877	Deodar cedar	*Cedrus deodara*	22	12	yes	PITP	Fair	
2880	Coast redwood	*Sequoia sempervirens*	26	18	yes	PITP	Fair	
2881	Coast live oak	*Quercus agrifolia*	4, 5	12	yes	PITP	Fair	
2882	Coast live oak	*Quercus agrifolia*	7	12	yes	PITP	Fair	
2883	Coast redwood	*Sequoia sempervirens*	26	20	yes	PITP	Good	
2884	Coast redwood	*Sequoia sempervirens*	28	20	yes	PITP	Good	
2885	Coast redwood	*Sequoia sempervirens*	28	24	yes	PITP	Good	approx. 16' outside Central reservoir fence
2886	Coast live oak	*Quercus agrifolia*	5, 3	8	yes	PITP	Fair	approx. 5' outside Central Reservoir fence
2887	Deodar cedar	*Cedrus deodara*	11	15	yes	PITP	Fair	approx. 10' outside Central Reservoir fence

2888	Deodar cedar	*Cedrus deodara*	9	14	yes	PITP	Good	
2889	Coast redwood	*Sequoia sempervirens*	34	25	yes	PITP	Good	approx. 15' outside Central Reservoir fence
2890	Coast redwood	*Sequoia sempervirens*	28	22	yes	PITP	Good	approx. 16' outside Central Reservoir fence

[1] Project Impact code: **R** = Removal recommended based on condition, **PITP** = Potential impact, tree protection may be necessary.

[2] Condition: **Good** = 80-100% healthy foliage and no significant defects; **Fair** = 50-79% healthy foliage and/or minor defects; **Poor** = 5-49% healthy foliage and/or other significant defects; **Dead** = less than 5% healthy foliage.

Tree #	Common Name	*Scientific Name*	Diameter (inches) at 54" above grade	Canopy Spread (feet)	Oakland "Protected Tree"	Project Impact Code[1]	General Condition[2]	Comments
2891	Deodar cedar	*Cedrus deodara*	7.5	10	-	PITP	Good	
2892	Coast live oak	*Quercus agrifolia*	13.5	24	yes	PITP	Good	
2893	Deodar cedar	*Cedrus deodara*	15.5	20	yes	PITP	Good	
2894	Deodar cedar	*Cedrus deodara*	15	20	yes	PITP	Good	
2895	Deodar cedar	*Cedrus deodara*	12	20	yes	PITP	Good	
2896	Deodar cedar	*Cedrus deodara*	12.5	15	yes	PITP	Good	
2897	Deodar cedar	*Cedrus deodara*	21.5	35	yes	PITP	Good	
2898	Deodar cedar	*Cedrus deodara*	12.5	18	yes	PITP	Good	
2899	Deodar cedar	*Cedrus deodara*	9	16	yes	PITP	Good	
2900	Coast live oak	*Quercus agrifolia*	18, 23, 16, 11	50	yes	PITP	Good	storage container and construction debris against base of tree

[1] Project Impact code: **R** = Removal recommended based on condition, **PITP** = Potential impact, tree protection may be necessary.

[2] Condition: **Good** = 80-100% healthy foliage and no significant defects; **Fair** = 50-79% healthy foliage and/or minor defects; **Poor** = 5-49% healthy foliage and/or other significant defects; **Dead** = less than 5% healthy foliage.

24) **What will happen to the wall along I-580 on the north end of the site?**

The project will remove the wall at the north end of the site. The wall is part of the roof support structure for the existing reservoir and will be unnecessary after the existing reservoir is demolished. The Environmental Impact Report will consider the potential impact of removing the wall, including the resulting noise impacts, if any, to the surrounding neighborhood.

25) **How are construction trucks going to get to the site?**

EBMUD will address potential construction impacts in the Draft Environmental Impact Report scheduled to be released for public review and comment in Summer 2019.

26) **How will the Project affect local geology?**

EBMUD will address hydrology, geology, and soil related hazards in the Draft Environmental Impact Report scheduled to be released for public review and comment in Summer 2019.

27) **Will any of the existing trees be removed? If so, what types of trees will be removed?**

The goal is to keep as many existing trees as possible. As part of the project, trees that are in poor condition or trees located within the proposed construction area will be removed. The number and extent of tree removal will be addressed in the Draft Environmental Impact Report scheduled to be released for public review and comment in Summer 2019.

Other/General Questions

28) **Please provide the names of individuals involved in project.**

The presentations from Community Meeting #1 and #2 include the names of the EBMUD project team members and consultants. The presentations are posted on EBMUD's website, www.ebmud.com/central

29) **Can EBMUD put solar panels at the site?**

EBMUD is committed to sustainability and alternative energy. EBMUD spends $200,000 per year on alternative energy projects including solar power and looks at all opportunities to utilize alternative energy where it is most cost effective. EBMUD considered solar panels at the Central Reservoir site; however, there is very little electricity demand at the site and the solar energy generated would go mostly unused resulting in the solar panels being economically unviable; therefore, solar panels will not be installed at the site.

30) **Can we comment on anything before June 2019?**

Written comments can be emailed to centralreservoir@ebmud.com or mailed to:

Laura Luong, EBMUD
375 11th Street,
MS 802, Oakland, CA 94607

31) **When is the next project meeting?**

The next project meeting will be scheduled in Summer 2019 when the Draft Environmental Impact Report is released for public review and comment. A notification will be emailed to individuals who supplied their contact information at the September 2017 and February 2018 community meetings. A notification will also be mailed to nearby residences a couple weeks in advance of the meeting.

APPENDIX D

Arborist Report

It should be noted that a number of trees were removed since the original survey was completed (March, 2017). Further, additional trees have been removed since the drafting of the Arborist Report in this appendix was completed. As such, the surveyed tree IDs have been revised subsequent to the original tree survey.

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FINAL

Arborist Report

for

EBMUD Central Reservoir Replacement Project

Oakland, California

Prepared for:
Environmental Science Associates
550 Kearny Street, Suite 800
San Francisco, CA 94108

Prepared by:
Orion Environmental Associates

June 2017

Final Arborist Report -

EBMUD Central Reservoir Replacement Project

Oakland, California

Table of Contents

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Project Overview

The East Bay Municipal Utility District (EBMUD) is planning to replace its existing 154-million-gallon open-cut Central Reservoir, the Central Reservoir Replacement Project (referred to as the "Proposed Project" or "Project"), which is located in the City of Oakland, Alameda County, California (**Figure 1**). Constructed in 1910, the Central Reservoir is EBMUD's largest open-cut reservoir and provides emergency and operational storage to about 52,000 metered services from Oakland and Emeryville to the north to the Oakland/San Leandro border to the south, including most of the City of Alameda. The Project is located on a 26-acre site that is bounded by 23rd Avenue to the west, Sheffield Avenue to the east, and Interstate 580 to the north. The reservoir is adjacent to residences to the south and south west, and the Redwood Day School and a recreation area to the east.

Scope of Report

This tree survey and arborist report is intended to inform planning and development processes for the Project. Specifically, this report provides:

- An inventory of trees within and immediately adjacent to the Project site within public rights-of-way, and a general description of trees immediately adjacent to the Project site on private property.
- An assessment of general health/condition for each tree surveyed.
- Recommendations on trees to be removed based on health or safety conditions.
- Tree protection recommendations.

Oakland Tree Protection Ordinances

Pursuant to California Government Code § 53091, EBMUD, as a local agency and utility district serving a broad regional area, is not subject to building and land use zoning ordinances (e.g., tree ordinances) for projects involving facilities for the production, generation, storage, or transmission of water. However, it is the practice of EBMUD to work with local jurisdictions and neighboring communities during project planning, and to consider local environmental protection policies for guidance. For that reason, the City of Oakland's tree protection policies are described below and incorporated into this report.

The City of Oakland recognizes the many intrinsic values that trees contribute to the urban environment and encourages the protection of certain trees. As such Oakland Municipal Code provides protection for certain trees and requires a removal permit for the removal of any "protected tree". A "protected tree" is defined in Oakland City Ordinance Chapter 12.36 as being:

> *1. On any property, Quercus agrifolia (California or Coast Live Oak) measuring four inches dbh or larger, and any other tree measuring nine inches dbh or larger except Eucalyptus and Pinus radiata (Monterey Pine);*
>
> *2. Pinus radiata (Monterey Pine) trees shall be protected only on city property and in development-related situations where more than five Monterey Pine trees per acre are proposed to be removed. Although Monterey Pine trees are not protected in non-development-related*

situations, nor in development-related situations involving five or fewer trees per acre, public posting of such trees and written notice of proposed tree removal to the Office of Parks and Recreation is required per Section 12.36.070A and Section 12.36.080A.

3. Except as noted above, Eucalyptus and Monterey Pine trees are not protected by this chapter.

SOURCE: ESRI World Imagery; EBMUD, 2017; ESA, 2017

EBMUD Central Reservoir

Figure 1
Project Location

ESA

Survey Methods

The tree survey for this report was conducted on March 29-31, 2017 by Orion Environmental Associates certified arborist Neal Kramer, assisted by ESA certified arborist Liz Hill.

All trees within and immediately adjacent to the Project site and having at least one woody trunk with a diameter of 4 inches or greater at 54 inches above the ground were surveyed for this report. Each surveyed tree within the Project site and immediately adjacent on public rights-of-way was marked with a permanent numbered aluminum tag. To the extent possible, tree tag numbers used for this report correspond with preexisting numbers provided by EBMUD and used for a previous tree survey on the Project site. Location coordinates for each tree were recorded using a Trimble GPS unit, and their approximate location was noted on a field aerial map. Information regarding tree species, trunk diameter at 54 inches above the ground, and the approximate canopy spread was gathered for each tree.

For trees immediately adjacent to the Project site on private property, a general description and approximate location were noted.

Health and structure for each surveyed tree were evaluated using basic visual inspection methods and a general condition rating was assigned using the categories shown below. Individual tree ratings consider a variety of factors, including overall tree vigor, evidence of decay, insects or diseases, and/or any other structural defects.

> Good: 80-100% healthy foliage and no significant defects.
>
> Fair: 50-79% healthy foliage and/or minor defects.
>
> Poor: 5-49% healthy foliage and/or other significant defects.
>
> Dead = less than 5% healthy foliage.

Each tree was assigned one of two impact codes using the following categories:

> R – Removal recommended based on tree condition. In general, these trees are in poor condition or are already dead.
>
> PITP – Potential Impact Tree Protection, tree potentially affected by Project development, tree protection measures may be necessary.

Unless expressed otherwise, this survey was limited to visual examination of accessible parts without dissection, excavation, probing, or coring. There is no warranty or guarantee, expressed or implied, that problems or deficiencies regarding the trees discussed in this report may not arise in the future.

Survey Results

A total of 380 trees were documented for this report. Fifty-eight of the 380 tree total are located outside of, but immediately adjacent to, the existing Central Reservoir perimeter fencing.

Trees documented include 20 different species. **Table 1** below lists each species by common and scientific name, includes the total number of each documented for the survey. Of the species documented, only coast live oak, coast redwood, and Douglas fir are considered native to the area.

Table 1: Tree species documented on and immediately adjacent to the EBMUD Central Reservoir Property (March 29-31, 2017)

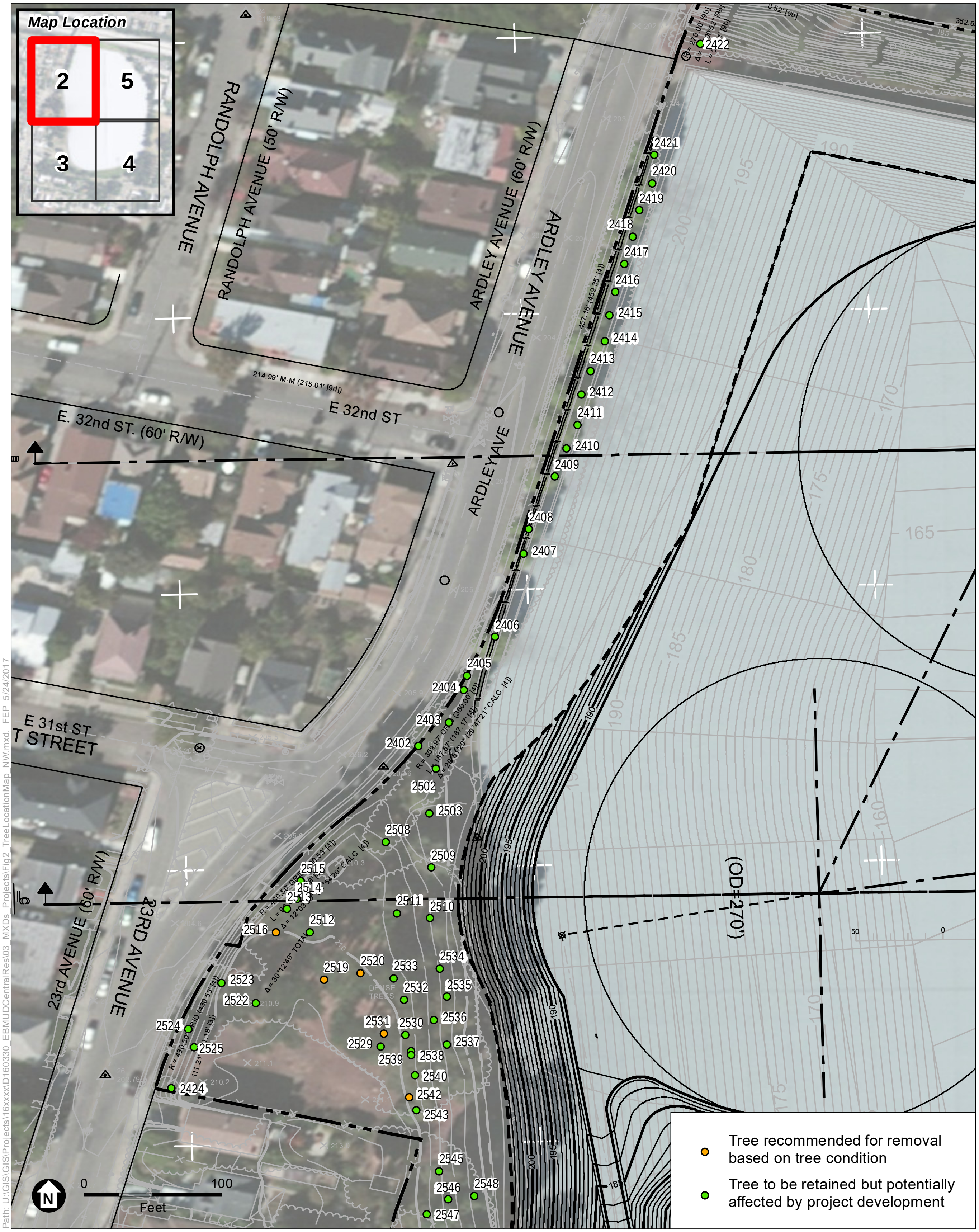
Common Name	Scientific Name	Number of Trees Documented	Native
Blackwood acacia	*Acacia melanoxylon*	35	-
Incense cedar	*Calocedrus decurrens*	10	-
Deodar cedar	*Cedrus deodara*	47	-
Redlfower gum	*Eucalyptus ficifolia*	16	-
White ironbark	*Eucalyptus leucoxylon*	1	-
Silver dollar gum	*Eucalyptus polyanthemos*	2	-
Eucalyptus	*Eucalyptus sp.*	6	-
Monterey cypress	*Hesperocyparis macrocarpa*	1	-
American sweet gum	*Liquidambar styraciflua*	1	-
Dawn redwood	*Metasequoia glyptostroboides*	1	-
Myoporum	*Myoporum laetum*	1	-
Olive	*Olea europaea*	1	-
Canary Island date palm	*Phoenix canariensis*	2	-
Canary Island pine	*Pinus canariensis*	18	-
Monterey pine	*Pinus radiata*	20	
Victorian box	*Pittosporum undulatum*	18	-
Cherry plum	*Prunus cerasifera*	3	-
Douglas fir	*Pseudotsuga menziesii*	7	yes
Coast live oak	*Quercus agrifolia*	78	yes
Peruvian pepper tree	*Schinus molle*	1	-
Coast redwood	*Sequoia sempervirens*	111	yes
	Total	380	

Of 380 trees inventoried for this report, 304 qualify as "protected trees" under Oakland City Ordinances Chapter 12.36.

A summary of all 380 trees inventoried is provided with this report as **Appendix A**. Appendix A lists each tree sequentially by tag number and includes common and scientific name, trunk diameter at 54 inches above the ground, approximate canopy spread, protected status, and a general tree condition rating. Specific comments regarding individual trees are included where relevant.

Approximate tree locations are shown on **Figure 2** (northwest project area), **Figure 3** (southwest project area)[1], **Figure 4** (southeast project area) and **Figure 5** (northeast project area).

[1] Trees 2726 and 2728 on Figure 3 were very close to the boundary and in order to be conservative, they have been included within the EBMUD boundary.

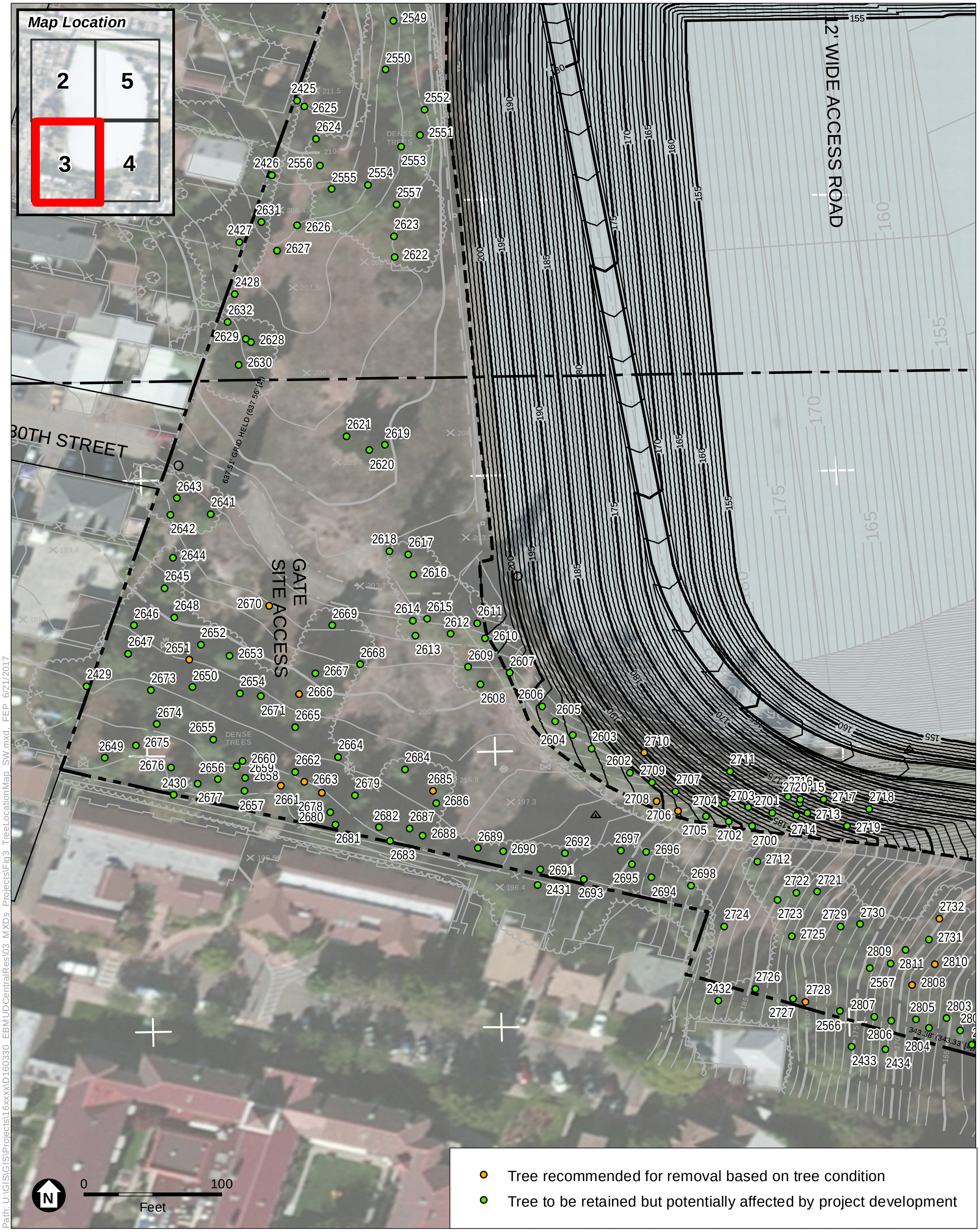


SOURCE: ESRI World Imagery; EBMUD, 2017; ESA, 2017

EBMUD Central Reservoir

Figure 2
Tree Location Map
Northwest Project Area

ESA

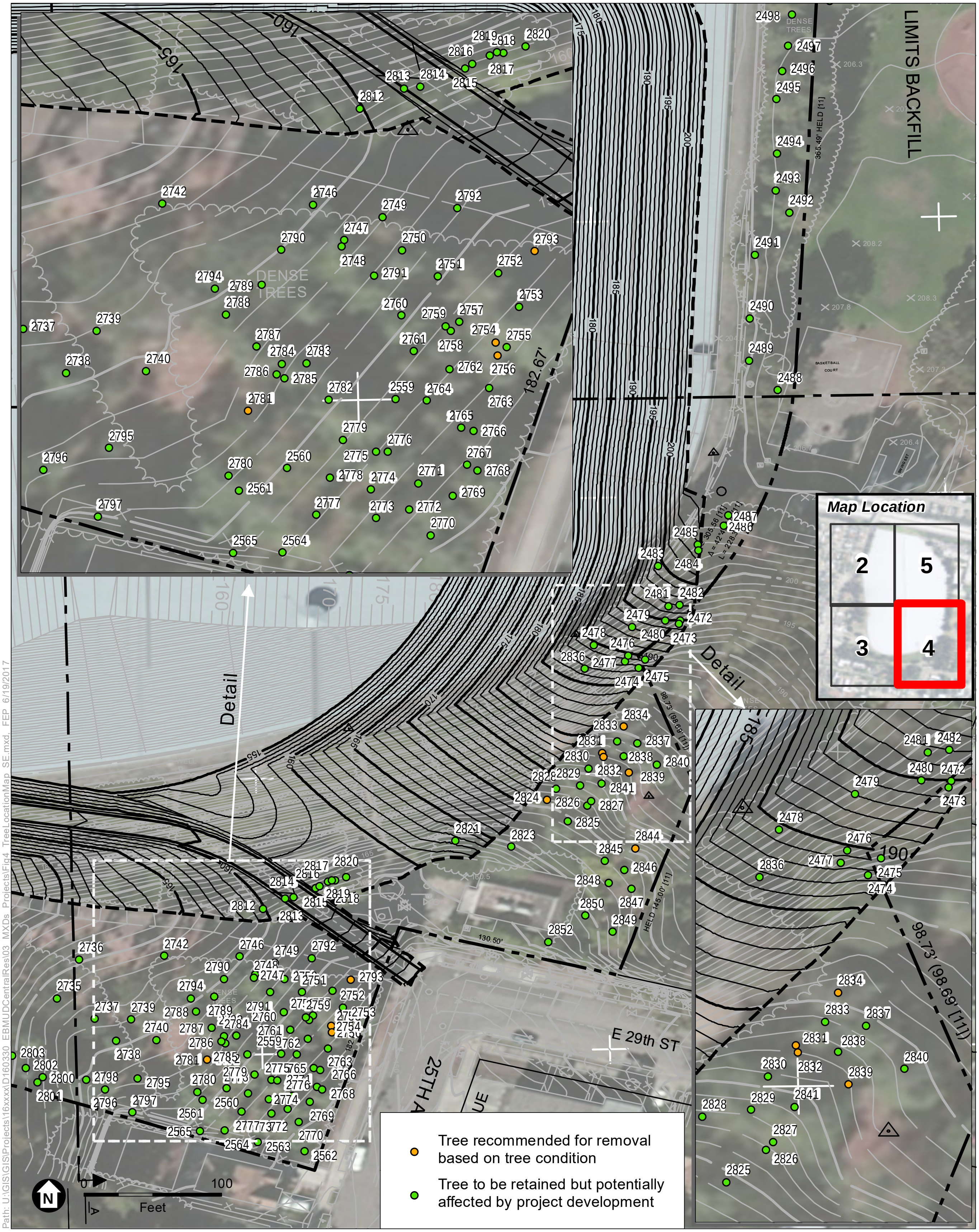


SOURCE: ESRI World Imagery; EBMUD, 2017; ESA, 2017

EBMUD Central Reservoir

Figure 3
Tree Location Map
Southwest Project Area

ESA

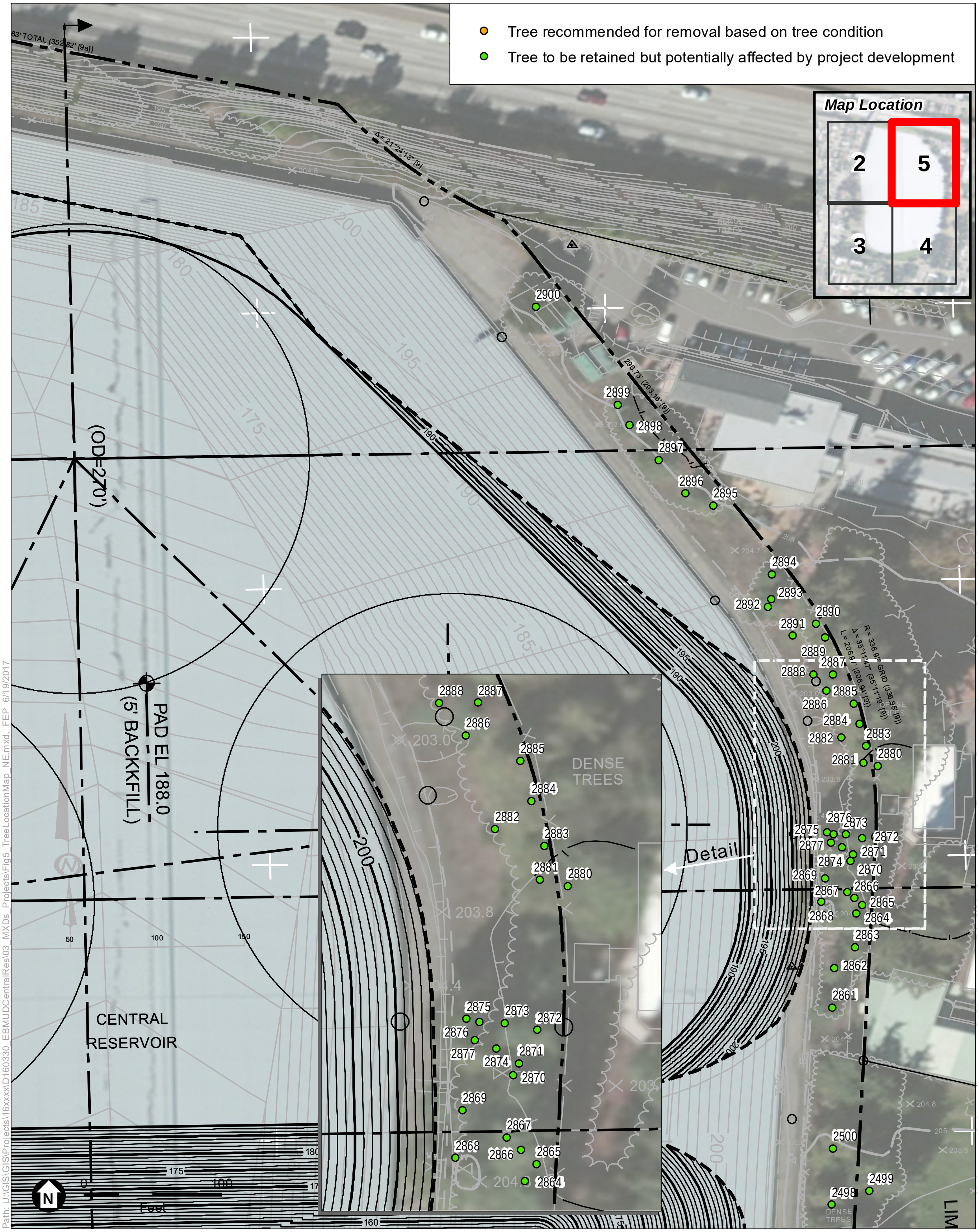


SOURCE: ESRI World Imagery; EBMUD, 2017; ESA, 2017

EBMUD Central Reservoir

Figure 4
Tree Location Map
Southeast Project Area

ESA



Path: U:\GIS\GIS\Projects\16xxxx\D160330_EBMUDCentralRes\03_MXDs_Projects\Fig5_TreeLocationMap_NE.mxd, FEP 6/19/2017

SOURCE: ESRI World Imagery; EBMUD, 2017; ESA, 2017

EBMUD Central Reservoir

Figure 5
Tree Location Map
Northeast Project Area

ESA

Tree Removal

Twenty-nine trees, including 6 that are dead, are recommended for removal based on tree condition. **Table 2** provides a list of the 29 trees by species and protection status. These trees are color coded orange on Figures 2 through 5, and are highlighted in orange in Appendix A. Specific defects or safety concerns leading to the recommendation for removal of each of these trees are provided under the comments column in Appendix A. Sixteen of the 29 trees recommended for removal based on tree condition qualify as "protected trees" under Oakland City Ordinance Chapter 12.36.

Table 2: Trees recommended for removal due to tree health or safety conditions

Tree Number	Common Name	Protected Tree	Tree Number	Common Name	Protected Status
2516	Monterey pine	no	2728	Monterey pine	no
2519	Monterey pine	no	2732	Monterey pine (dead)	no
2520	Monterey pine	no	2754	Coast redwood (dead)	no
2531	Blackwood acacia	yes	2756	Coast redwood (dead)	no
2542	Blackwood acacia	yes	2781	Monterey pine	no
2651	Coast live oak	yes	2793	Victorian box (dead)	no
2661	Deodar cedar	yes	2808	Monterey pine	no
2663	Victorian box	yes	2810	Monterey Pine (dead)	no
2666	Monterey pine	no	2824	Coast redwood	yes
2670	Myoprum	yes	2831	Coast redwood	yes
2678	Douglas fir	yes	2832	Coast redwood	yes
2685	Monterey cypress	yes	2834	Coast redwood	yes
2706	Coast redwood	yes	2839	Coast redwood (dead)	no
2708	Coast redwood	yes	2844	Coast redwood	yes
2710	Cherry plum	yes			

Redflower Gum Trees along Ardley Avenue

Sixteen Redflower gum trees numbered 2406 through 2421, and located along Ardley Avenue on the northwest boundary of the Project site, have trunk bases that are constrained and disfigured against a concrete gutter system that is part of existing Central Reservoir infrastructure there (Figure 6). Despite this constraint, these gum trees are in fair condition and appear to be structurally stable in their current configuration against the concrete gutter. However, if the concrete gutter system is removed, the likelihood is high that these trees would become destabilized and create a hazard risk to pedestrians and vehicles along Ardley Avenue and/or to new Central Reservoir infrastructure. Therefore, if the gutter system is removed for Project development, it is recommended that the 16 Redflower gum trees along Ardley Avenue be removed as well.

Figure 6. Redflower gum trees along northwest Project boundary constrained by concrete gutter

Trees Adjacent to the Redwood Day School Property

Construction, grading and/or paving activities may extend from the existing reservoir all the way to the line along the northeast Project boundary adjacent to the Redwood Day School. If this is the case, trees numbered 2868, 2869, 2875, 2876 and 2877 will likely need to be removed for Project development (**Figure 7**). Trees to be retained along this northeast Project boundary will require special protection measures to maximize their survivability during Project development activities.

Figure 7. Trees 2868, 2869, 2875, 2876 and 2877 (reservoir side of fence) along northeast Project boundary.

Tree Protection

Because site plans for the Project have not yet been finalized, this report assumes that all trees on-site could be affected by the Proposed Project. Potential impacts of special concern to retained trees include mechanical damage to tree trunks and canopies from inadvertent contact by construction equipment, vehicles or materials, root damage resulting from grading or excavation activities, and/or root damage resulting from soil compaction caused by heavy equipment and/or vehicle traffic.

Once final site demolition, grading and construction plans are available, the plans should be reviewed by the Project arborist to make a final determination regarding which trees can be retained and which will be removed. In order to maximize the survivability of trees to be retained, prior to the commencement of any demolition, grading or construction activities, a Tree Protection Plan will be developed and implemented in consultation with EBMUD and in consideration of EBMUD practices and procedures.

Appendix A: Tree Survey Results

Appendix A: Tree Survey Results - EBMUD Central Reservoir, Oakland, Ca March 29-31, 2017

Tree #	Common Name	*Scientific Name*	Diameter (inches) at 54" above grade	Canopy Spread (feet)	Oakland "Protected Tree"	Project Impact Code[1]	General Condition[2]	Comments
2402	Coast live oak	*Quercus agrifolia*	19.5	22	yes	PITP	Good	
2403	Coast live oak	*Quercus agrifolia*	17.5	24	yes	PITP	Good	
2404	Coast live oak	*Quercus agrifolia*	14.5	20	yes	PITP	Good	
2405	Coast live oak	*Quercus agrifolia*	6.5	10	yes	PITP	Good	
2406	Redflower gum	*Eucalyptus ficifolia*	22	28	-	PITP	Fair	root collar restricted between concrete gutter and sidewalk
2407	Redflower gum	*Eucalyptus ficifolia*	16.5	22	-	PITP	Fair	root collar restricted between concrete gutter and sidewalk
2408	Redflower gum	*Eucalyptus ficifolia*	16	18	-	PITP	Fair	root collar restricted between concrete gutter and sidewalk
2409	Redflower gum	*Eucalyptus ficifolia*	16	20	-	PITP	Fair	root collar restricted between concrete gutter and sidewalk
2410	Redflower gum	*Eucalyptus ficifolia*	16.5	20	-	PITP	Fair	root collar restricted between concrete gutter and sidewalk
2411	Redflower gum	*Eucalyptus ficifolia*	22	26	-	PITP	Fair	root collar restricted between concrete gutter and sidewalk
2412	Redflower gum	*Eucalyptus ficifolia*	21	24	-	PITP	Fair	root collar restricted between concrete gutter and sidewalk
2413	Redflower gum	*Eucalyptus ficifolia*	15.5	12	-	PITP	Fair	root collar restricted between concrete gutter and sidewalk
2414	Redflower gum	*Eucalyptus ficifolia*	19.5	22	-	PITP	Fair	root collar restricted between concrete gutter and sidewalk
2415	Redflower gum	*Eucalyptus ficifolia*	18	20	-	PITP	Fair	root collar restricted between concrete gutter and sidewalk
2416	Redflower gum	*Eucalyptus ficifolia*	17	15	-	PITP	Fair	root collar restricted between concrete gutter and sidewalk, 20% dead canopy
2417	Redflower gum	*Eucalyptus ficifolia*	20	18	-	PITP	Fair	root collar restricted between concrete gutter and sidewalk
2418	Redflower gum	*Eucalyptus ficifolia*	15.5	15	-	PITP	Fair	root collar restricted between concrete gutter and sidewalk

[1] Project Impact code: **R** = Removal recommended based on condition, **PITP** = Potential impact, tree protection may be necessary.

[2] Condition: **Good** = 80-100% healthy foliage and no significant defects; **Fair** = 50-79% healthy foliage and/or minor defects; **Poor** = 5-49% healthy foliage and/or other significant defects; **Dead** = less than 5% healthy foliage.

Tree #	Common Name	*Scientific Name*	Diameter (inches) at 54" above grade	Canopy Spread (feet)	Oakland "Protected Tree"	Project Impact Code[1]	General Condition[2]	Comments
2419	Redflower gum	*Eucalyptus ficifolia*	18	18	-	PITP	Fair	root collar restricted between concrete gutter and sidewalk
2420	Redflower gum	*Eucalyptus ficifolia*	21.5	24	-	PITP	Fair	root collar restricted between concrete gutter and sidewalk
2421	Redflower gum	*Eucalyptus ficifolia*	20.5	18	-	PITP	Fair	root collar restricted between concrete gutter and sidewalk, 30% dead canopy
2422	Liquidambar	*Liquidambar styraciflua*	22	28	yes	PITP	Fair	canopy unbalanced to NW
2424	Blackwood acacia	*Acacia melanoxylon*	29, 25	24	yes	PITP	Fair	outside, but adjacent to Central Reservoir fence
2425	Coast live oak	*Quercus agrifolia*	11	24	yes	PITP	Fair	main trunk emeshed in chain link fence
2426	Coast live oak	*Quercus agrifolia*	19	34	yes	PITP	Fair	main trunk emeshed in chain link fence
2427	Blackwood acacia	*Acacia melanoxylon*	11, 11, 10, 10, 10, 13	36	yes	PITP	Fair	approx. 5' outside Central Reservoir fence
2428	Olive	*Olea europaea*	12, 9.5, 10, 8	20	yes	PITP	Good	approx. 3' outside Central Reservoir fence
2429	Blackwood acacia	*Acacia melanoxylon*	24	38	yes	PITP	Good	approx. 8' outside Central Reservoir fence
2430	Dawn redwood	*Metasequoia glyptostroboides*	31	30	yes	PITP	Fair	approx. 3' outside Central Reservoir fence
2431	Coast live oak	*Quercus agrifolia*	36	45	yes	PITP	Good	outside Central Reservoir fence, chain link fence imbedded in north side of trunk
2432	Blackwood acacia	*Acacia melanoxylon*	21	33	-	PITP	Dead	approx. 3' outside Central Reservoir fence
2433	Canary Is. date palm	*Phoenix canariensis*	26	26	yes	PITP	Good	outside, but against Central Reservoir fence
2434	Cherry plum	*Prunus cerasifera*	9, 8	13	yes	PITP	Poor	outside, but against Central Reservoir fence, decay, multistemmed from base
2472	Coast live oak	*Quercus agrifolia*	16, 14	35	yes	PITP	Fair	approx. 25' outside Central Reservoir fence
2473	Coast live oak	*Quercus agrifolia*	16	30	yes	PITP	Fair	approx. 25' outside Central Reservoir fence
2474	Blackwood acacia	*Acacia melanoxylon*	18.5	20	yes	PITP	Fair	approx. 15' outside Central Reservoir fence
2475	Blackwood acacia	*Acacia melanoxylon*	11.5	12	yes	PITP	Fair	approx. 14' outside Central Reservoir fence
2476	Blackwood acacia	*Acacia melanoxylon*	11.5	16	yes	PITP	Fair	approx. 9' outside Central Reservoir fence
2477	Blackwood acacia	*Acacia melanoxylon*	9	12	yes	PITP	Fair	approx. 8' outside Central Reservoir fence
2478	Blackwood acacia	*Acacia melanoxylon*	11.5	16	yes	PITP	Fair	approx. 3' outside Central Reservoir fence
2479	Coast live oak	*Quercus agrifolia*	10, 4, 10, 11, 12, 5	28	yes	PITP	Fair	approx. 10' outside Central Reservoir fence
2480	Blackwood acacia	*Acacia melanoxylon*	28.5	45	yes	PITP	Fair	approx. 16' outside Central Reservoir fence
2481	Coast live oak	*Quercus agrifolia*	18.5	20	yes	PITP	Fair	approx. 12' outside Central Reservoir fence
2482	Coast live oak	*Quercus agrifolia*	18	24	yes	PITP	Fair	approx. 22' outside Central Reservoir fence
2483	Silver dollar gum	*Eucalyptus polyanthemos*	12	15	-	PITP	Fair	approx. 1' outside Central Reservoir fence

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[2] Condition: **Good** = 80-100% healthy foliage and no significant defects; **Fair** = 50-79% healthy foliage and/or minor defects; **Poor** = 5-49% healthy foliage and/or other significant defects; **Dead** = less than 5% healthy foliage.

Tree #	Common Name	*Scientific Name*	Diameter (inches) at 54" above grade	Canopy Spread (feet)	Oakland "Protected Tree"	Project Impact Code[1]	General Condition[2]	Comments
2484	Eucalyptus sp.	*Eucalyptus sp.*	8, 25	25	-	PITP	Fair	approx. 12' outside Central Reservoir fence
2485	Eucalyptus sp.	*Eucalyptus sp.*	35.5	50	-	PITP	Good	approx. 3' outside Central Reservoir fence
2486	Eucalyptus sp.	*Eucalyptus sp.*	19, 10.5, 10	42	-	PITP	Fair	approx. 13' outside Central Reservoir fence
2487	Eucalyptus sp.	*Eucalyptus sp.*	11	24	-	PITP	Fair	approx. 20' outside Central Reservoir fence
2488	Eucalyptus sp.	*Eucalyptus sp.*	44.5	60	-	PITP	Good	approx. 15' outside Central Reservoir fence
2489	Eucalyptus sp.	*Eucalyptus sp.*	35	36	-	PITP	Good	approx. 1' outside Central Reservoir fence
2490	Silver dollar gum	*Eucalyptus polyanthemos*	11	15	-	PITP	Fair	approx. 1' outside Central Reservoir fence
2491	White ironbark	*Eucalyptus leucoxylon*	12, 18, 16, 17, 21	35	-	PITP	Fair	outside but against Central Reservoir fence
2492	Coast redwood	*Sequoia sempervirens*	13, 14, 12, 10, 13, 13, 11	26	yes	PITP	Good	approx. 10' outside Central Reservoir fence
2493	Coast redwood	*Sequoia sempervirens*	24.5	20	yes	PITP	Good	approx. 14' outside Central Reservoir fence
2494	Coast redwood	*Sequoia sempervirens*	19, 14, 20.5	24	yes	PITP	Good	approx. 12' outside Central Reservoir fence
2495	Coast redwood	*Sequoia sempervirens*	33	26	yes	PITP	Good	approx. 15' outside Central Reservoir fence
2496	Coast redwood	*Sequoia sempervirens*	8, 24, 11.5	20	yes	PITP	Good	approx. 14' outside Central Reservoir fence
2497	Coast redwood	*Sequoia sempervirens*	29	24	yes	PITP	Good	approx. 12' outside Central Reservoir fence
2498	Coast redwood	*Sequoia sempervirens*	22.5	242	yes	PITP	Good	approx. 12' outside Central Reservoir fence
2499	Deodar cedar	*Cedrus deodara*	11	16	yes	PITP	Fair	approx. 18' outside Central Reservoir fence
2500	Deodar cedar	*Cedrus deodara*	23, 13	38	yes	PITP	Good	approx. 18' outside Central Reservoir fence
2502	Coast live oak	*Quercus agrifolia*	7.5	12	yes	PITP	Good	
2503	Coast redwood	*Sequoia sempervirens*	31	20	yes	PITP	Good	
2508	Deodar cedar	*Cedrus deodara*	8	12	-	PITP	Good	
2509	Coast redwood	*Sequoia sempervirens*	21	22	yes	PITP	Good	
2510	Coast redwood	*Sequoia sempervirens*	31.5	40	yes	PITP	Fair	
2511	Blackwood acacia	*Acacia melanoxylon*	24	25	yes	PITP	Fair	canopy unbalanced to east
2512	Monterey pine	*Pinus radiata*	21	22	-	PITP	Good	
2513	Monterey pine	*Pinus radiata*	17	18	-	PITP	Fair	
2514	Monterey pine	*Pinus radiata*	16	18	-	PITP	Fair	lean to east
2515	Coast redwood	*Sequoia sempervirens*	12	20	yes	PITP	Fair	
2516	Monterey pine	*Pinus radiata*	13	16	-	R	Poor	approx. 45' tall, canopy top 10% only, w/dead branches
2519	Monterey pine	*Pinus radiata*	24.5	30	-	R	Poor	approx. 60' tall, canopy top 5% only
2520	Monterey pine	*Pinus radiata*	26	28	-	R	Poor	~70' tall, canopy top 10% only, unbalanced to east, pitch canker - declining health
2522	Monterey pine	*Pinus radiata*	27	35	-	PITP	Fair	canopy unbalanced to SW

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Tree #	Common Name	*Scientific Name*	Diameter (inches) at 54" above grade	Canopy Spread (feet)	Oakland "Protected Tree"	Project Impact Code[1]	General Condition[2]	Comments
2523	Blackwood acacia	*Acacia melanoxylon*	18	30	yes	PITP	Good	
2524	Coast live oak	*Quercus agrifolia*	14.5,10,9.5	28	yes	PITP	Good	
2525	Incense cedar	*Calocedrus decurrens*	7.5	10	-	PITP	Good	
2529	Blackwood acacia	*Acacia melanoxylon*	18	30	yes	PITP	Fair	
2530	Blackwood acacia	*Acacia melanoxylon*	17	26	yes	PITP	Fair	20% dead canopy
2531	Blackwood acacia	*Acacia melanoxylon*	9.5	12	yes	R	Poor	mainstem dead, bark peeling
2532	Blackwood acacia	*Acacia melanoxylon*	22	25	yes	PITP	Fair	
2533	Blackwood acacia	*Acacia melanoxylon*	23	30	yes	PITP	Fair	cavities at root crown, canopy unbalanced to NE
2534	Blackwood acacia	*Acacia melanoxylon*	17	26	yes	PITP	Fair	canopy unbalanced to east
2535	Blackwood acacia	*Acacia melanoxylon*	32	40	yes	PITP	Fair	wood chips to 10" deep around base of trunk
2536	Blackwood acacia	*Acacia melanoxylon*	15.5	15	yes	PITP	Fair	wood chips to 10" deep around base of trunk
2537	Blackwood acacia	*Acacia melanoxylon*	11	18	yes	PITP	Fair	
2538	Blackwood acacia	*Acacia melanoxylon*	10.5	15	yes	PITP	Fair	
2539	Blackwood acacia	*Acacia melanoxylon*	21	30	yes	PITP	Fair	
2540	Blackwood acacia	*Acacia melanoxylon*	12	20	yes	PITP	Fair	
2542	Blackwood acacia	*Acacia melanoxylon*	16.5	18	yes	R	Poor	split trunk, lean, 7" dia. limb broken off at 15', decay at base
2543	Blackwood acacia	*Acacia melanoxylon*	21	22	yes	PITP	Fair	
2545	Blackwood acacia	*Acacia melanoxylon*	23	32	yes	PITP	Fair	
2546	Blackwood acacia	*Acacia melanoxylon*	16	18	yes	PITP	Fair	
2547	Blackwood acacia	*Acacia melanoxylon*	19	28	yes	PITP	Fair	
2548	Canary Island Pine	*Pinus canariensis*	29.5	38	yes	PITP	Good	
2549	Canary Island Pine	*Pinus canariensis*	31.5	40	yes	PITP	Good	
2550	Canary Island Pine	*Pinus canariensis*	26.5	28	yes	PITP	Fair	
2551	Canary Island Pine	*Pinus canariensis*	26	30	yes	PITP	Fair	
2552	Canary Island Pine	*Pinus canariensis*	30.5	35	yes	PITP	Fair	
2553	Victorian box	*Pittosporum undulatum*	14.5	30	yes	PITP	Fair	
2554	Canary Island Pine	*Pinus canariensis*	20	30	yes	PITP	Fair	
2555	Canary Island Pine	*Pinus canariensis*	25	40	yes	PITP	Fair	
2556	Blackwood acacia	*Acacia melanoxylon*	20.5	20	yes	PITP	Fair	
2557	Blackwood acacia	*Acacia melanoxylon*	22.5	28	yes	PITP	Fair	
2559	Coast redwood	*Sequoia sempervirens*	20	16	yes	PITP	Fair	
2560	Coast redwood	*Sequoia sempervirens*	11.5	15	yes	PITP	Fair	
2561	Coast redwood	*Sequoia sempervirens*	17	14	yes	PITP	Fair	

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Tree #	Common Name	*Scientific Name*	Diameter (inches) at 54" above grade	Canopy Spread (feet)	Oakland "Protected Tree"	Project Impact Code[1]	General Condition[2]	Comments
2562	Coast live oak	*Quercus agrifolia*	5, 6, 3	62	yes	PITP	Good	
2563	Coast live oak	*Quercus agrifolia*	7, 6, 6	26	yes	PITP	Good	
2564	Coast live oak	*Quercus agrifolia*	4, 5	14	yes	PITP	Good	
2565	Coast live oak	*Quercus agrifolia*	8	16	yes	PITP	Good	
2566	Coast live oak	*Quercus agrifolia*	14.5	18	yes	PITP	Fair	
2567	Deodar cedar	*Cedrus deodara*	12	20	yes	PITP	Good	
2602	Coast redwood	*Sequoia sempervirens*	30	24	yes	PITP	Fair	upper canopy thin , bronze foliage
2603	Coast redwood	*Sequoia sempervirens*	41.5	32	yes	PITP	Fair	
2604	Coast redwood	*Sequoia sempervirens*	36.5	30	yes	PITP	Fair	
2605	Coast redwood	*Sequoia sempervirens*	25	16	yes	PITP	Fair	upper canopy epicormic sprouts
2606	Coast redwood	*Sequoia sempervirens*	28	20	yes	PITP	Fair	
2607	Coast redwood	*Sequoia sempervirens*	26.5	24	yes	PITP	Fair	
2608	Coast redwood	*Sequoia sempervirens*	25	25	yes	PITP	Fair	
2609	Coast redwood	*Sequoia sempervirens*	22	18	yes	PITP	Fair	
2610	Coast redwood	*Sequoia sempervirens*	27	20	yes	PITP	Fair	
2611	Coast redwood	*Sequoia sempervirens*	31	20	yes	PITP	Good	
2612	Coast redwood	*Sequoia sempervirens*	23.5	18	yes	PITP	Fair	
2613	Coast redwood	*Sequoia sempervirens*	13	12	yes	PITP	Fair	
2614	Coast redwood	*Sequoia sempervirens*	19.5	24	yes	PITP	Good	
2615	Coast redwood	*Sequoia sempervirens*	28	24	yes	PITP	Fair	
2616	Coast redwood	*Sequoia sempervirens*	29	30	yes	PITP	Fair	
2617	Coast redwood	*Sequoia sempervirens*	30.5	27	yes	PITP	Fair	
2618	Coast redwood	*Sequoia sempervirens*	20.5	14	yes	PITP	Fair	
2619	Monterey pine	*Pinus radiata*	22.5	26	-	PITP	Fair	multi-stemed and twisted trunk @ 5', pitch canker
2620	Monterey pine	*Pinus radiata*	17	26	-	PITP	Good	
2621	Monterey pine	*Pinus radiata*	20.5	30	-	PITP	Good	
2622	Blackwood acacia	*Acacia melanoxylon*	13.5	32	yes	PITP	Fair	30% dead canopy
2623	Blackwood acacia	*Acacia melanoxylon*	25	38	yes	PITP	Fair	
2624	Blackwood acacia	*Acacia melanoxylon*	13.5	28	yes	PITP	Fair	dead bark length of main trunk, canopy unbalanced to east
2625	Canary Island Pine	*Pinus canariensis*	18	28	yes	PITP	Good	
2626	Incense cedar	*Calocedrus decurrens*	8	9	-	PITP	Good	
2627	Incense cedar	*Calocedrus decurrens*	2.5	5	-	PITP	Fair	bowed at base with corrected lean
2628	Canary Island Pine	*Pinus canariensis*	15	20	yes	PITP	Good	

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Tree #	Common Name	*Scientific Name*	Diameter (inches) at 54" above grade	Canopy Spread (feet)	Oakland "Protected Tree"	Project Impact Code[1]	General Condition[2]	Comments
2629	Coast live oak	*Quercus agrifolia*	13	18	yes	PITP	Fair	
2630	Coast live oak	*Quercus agrifolia*	21.5, 22	40	yes	PITP	Good	
2631	Coast live oak	*Quercus agrifolia*	9, 7, 11.5	22	yes	PITP	Good	
2632	Canary Is. date palm	*Phoenix canariensis*	30	30	yes	PITP	Good	
2641	Canary Island Pine	*Pinus canariensis*	23	24	yes	PITP	Good	
2642	Douglas fir	*Pseudotsuga menziesii*	14.5	18	yes	PITP	Fair	
2643	Douglas fir	*Pseudotsuga menziesii*	5.5, 10, 9	18	yes	PITP	Fair	bowed multi-stemmed trunk
2644	Incense cedar	*Calocedrus decurrens*	12	15	yes	PITP	Good	
2645	Incense cedar	*Calocedrus decurrens*	17.5	26	yes	PITP	Good	
2646	Douglas fir	*Pseudotsuga menziesii*	19	24	yes	PITP	Good	
2647	Canary Island Pine	*Pinus canariensis*	22	30	yes	PITP	Good	
2648	Douglas fir	*Pseudotsuga menziesii*	13	20	yes	PITP	Fair	
2649	Canary Island Pine	*Pinus canariensis*	19.5	22	yes	PITP	Good	
2650	Coast live oak	*Quercus agrifolia*	32	40	yes	PITP	Good	
2651	Coast live oak	*Quercus agrifolia*	11	16	yes	R	Poor	root rot, bark peeled 50% at base of trunk
2652	Incense cedar	*Calocedrus decurrens*	5	9	yes	PITP	Fair	canopy thin, likely root rot
2653	Canary Island Pine	*Pinus canariensis*	14.5	20	yes	PITP	Good	
2654	Coast redwood	*Sequoia sempervirens*	8.5	12	-	PITP	Fair	
2655	Canary Island Pine	*Pinus canariensis*	22	22	yes	PITP	Good	
2656	Coast live oak	*Quercus agrifolia*	13	25	yes	PITP	Fair	
2657	Canary Island Pine	*Pinus canariensis*	23.5	27	yes	PITP	Fair	
2658	Coast live oak	*Quercus agrifolia*	5.5	15	yes	PITP	Fair	canopy unbalanced to east, supressed under 2659
2659	Victorian box	*Pittosporum undulatum*	9, 9.5, 10	20	yes	PITP	Fair	thin, many dead interior branches
2660	Victorian box	*Pittosporum undulatum*	11.5, 10.5	20	yes	PITP	Fair	
2661	Deodar cedar	*Cedrus deodara*	11.5	15	yes	R	Poor	partially corrected lean, 25° south towards apartments, ground mounded opposite lean
2662	Douglas fir	*Pseudotsuga menziesii*	13	15	yes	PITP	Fair	lean to west, roots exposed on opposite side, but healthy foliage
2663	Victorian box	*Pittosporum undulatum*	10, 8	18	yes	R	Poor	less than 10% live canopy
2664	Coast live oak	*Quercus agrifolia*	12	26	yes	PITP	Good	
2665	Incense cedar	*Calocedrus decurrens*	10.5	12	yes	PITP	Good	
2666	Monterey pine	*Pinus radiata*	25	20	-	R	Poor	spiral scar length of trunk, canopy top 15% only, large dead branches
2667	Coast live oak	*Quercus agrifolia*	16.5, 21, 19	40	yes	PITP	Fair	

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Tree #	Common Name	*Scientific Name*	Diameter (inches) at 54" above grade	Canopy Spread (feet)	Oakland "Protected Tree"	Project Impact Code[1]	General Condition[2]	Comments
2668	Incense cedar	*Calocedrus decurrens*	9	12	yes	PITP	Good	
2669	Deodar cedar	*Cedrus deodara*	12	25	yes	PITP	Fair	
2670	Myoporum	*Myoporum laetum*	13.5	25	yes	R	Poor	heavy thrips infestation, decay at base
2671	Deodar cedar	*Cedrus deodara*	10.5	20	yes	PITP	Good	
2673	Coast live oak	*Quercus agrifolia*	30	45	yes	PITP	Fair	
2674	Canary Island Pine	*Pinus canariensis*	17.5	25	yes	PITP	Good	
2675	Canary Island Pine	*Pinus canariensis*	16	18	yes	PITP	Fair	
2676	Canary Island Pine	*Pinus canariensis*	21	24	yes	PITP	Fair	
2677	Deodar cedar	*Cedrus deodara*	15.5	18	yes	PITP	Fair	
2678	Douglas fir	*Pseudotsuga menziesii*	12	12	yes	R	Poor	decay > 50% at base, near apartments
2679	Deodar cedar	*Cedrus deodara*	12.5	25	yes	PITP	Fair	
2680	Coast live oak	*Quercus agrifolia*	7.5	18	yes	PITP	Fair	suppressed, bowed and unbalanced to north
2681	Coast live oak	*Quercus agrifolia*	25	38	yes	PITP	Good	
2682	Coast live oak	*Quercus agrifolia*	7.5	14	yes	PITP	Fair	suppressed, bowed and unbalanced to west
2683	Coast live oak	*Quercus agrifolia*	28, 22	45	yes	PITP	Good	
2684	Deodar cedar	*Cedrus deodara*	13.5	20	yes	PITP	Good	
2685	Monterey cypress	*Hesperocyparis macrocarpa*	12	17	yes	R	Poor	decay at base, declining health with bronzing canopy
2686	Incense cedar	*Calocedrus decurrens*	6	9	-	PITP	Good	
2687	Coast live oak	*Quercus agrifolia*	6	10	-	PITP	Fair	
2688	Coast live oak	*Quercus agrifolia*	11, 8.5	15	yes	PITP	Fair	unbalanced to northeast, branches to south and east sides with significant decay at 3-14'
2689	Coast live oak	*Quercus agrifolia*	6.5, 5	12	yes	PITP	Fair	
2690	Douglas fir	*Pseudotsuga menziesii*	15	15	yes	PITP	Fair	
2691	Coast live oak	*Quercus agrifolia*	4.5	10	yes	PITP	Fair	
2692	Deodar cedar	*Cedrus deodara*	9	12	yes	PITP	Fair	
2693	Coast live oak	*Quercus agrifolia*	17.5	30	yes	PITP	Good	
2694	Deodar cedar	*Cedrus deodara*	11	24	yes	PITP	Fair	
2695	Coast live oak	*Quercus agrifolia*	11.5	22	yes	PITP	Good	
2696	Coast redwood	*Sequoia sempervirens*	12.5	20	yes	PITP	Fair	
2697	Deodar cedar	*Cedrus deodara*	5.5	9	-	PITP	Fair	
2698	Deodar cedar	*Cedrus deodara*	10	16	yes	PITP	Good	
2700	Coast redwood	*Sequoia sempervirens*	20	20	yes	PITP	Fair	foliage thin & bronze, deep vertical trunk scar
2701	Coast redwood	*Sequoia sempervirens*	33.5	20	yes	PITP	Fair	foliage thin, top 1/3 dead
2702	Coast redwood	*Sequoia sempervirens*	20	24	yes	PITP	Fair	

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Tree #	Common Name	*Scientific Name*	Diameter (inches) at 54" above grade	Canopy Spread (feet)	Oakland "Protected Tree"	Project Impact Code[1]	General Condition[2]	Comments
2703	Coast redwood	*Sequoia sempervirens*	19.5	18	yes	PITP	Fair	
2704	Coast redwood	*Sequoia sempervirens*	28	28	yes	PITP	Fair	
2705	Coast redwood	*Sequoia sempervirens*	19	16	yes	PITP	Fair	
2706	Coast redwood	*Sequoia sempervirens*	24	18	yes	R	Poor	top 1/3 canopy bare, lower canopy foliage thin and bronze, deep trunk scar at 4-8' NE side with beetle pinholes
2707	Coast redwood	*Sequoia sempervirens*	27.5	26	yes	PITP	Good	
2708	Coast redwood	*Sequoia sempervirens*	28	18	yes	R	Poor	trunk scar from base to 15' w/ decay and beetle pin holes, dead top at 45', codominant stems at 35' - 1 dead
2709	Coast redwood	*Sequoia sempervirens*	30	20	yes	PITP	Fair	
2710	Cherry plum	*Prunus cerasifera*	10	16	yes	R	Poor	60% dead canopy, 30° lean to northwest
2711	Coast live oak	*Quercus agrifolia*	28.5	36	yes	PITP	Fair	
2712	Deodar cedar	*Cedrus deodara*	12	25	yes	PITP	Fair	significant lean to south with mounded soil on opposite side
2713	Coast live oak	*Quercus agrifolia*	8.5	12	yes	PITP	Fair	
2714	Coast live oak	*Quercus agrifolia*	6.5	10	yes	PITP	Fair	
2715	Coast live oak	*Quercus agrifolia*	8, 9, 7, 7, 19	18	yes	PITP	Fair	
2716	Coast live oak	*Quercus agrifolia*	6	12	yes	PITP	Fair	
2717	Coast live oak	*Quercus agrifolia*	13	18	yes	PITP	Fair	
2718	Monterey pine	*Pinus radiata*	15.5	24	-	PITP	Good	
2719	Coast live oak	*Quercus agrifolia*	10.5, 9	25	yes	PITP	Good	
2720	Coast live oak	*Quercus agrifolia*	6	10	yes	PITP	Fair	
2721	Deodar cedar	*Cedrus deodara*	8.5	12	-	PITP	Fair	
2722	Peruvian pepper tree	*Schinus molle*	12.5, 10.5	28	yes	PITP	Fair	
2723	Deodar cedar	*Cedrus deodara*	8.5	14	-	PITP	Fair	
2724	Coast live oak	*Quercus agrifolia*	6, 3.5	15	yes	PITP	Good	
2725	Deodar cedar	*Cedrus deodara*	11.5	29	yes	PITP	Good	
2726	Coast live oak	*Quercus agrifolia*	18	30	yes	PITP	Good	
2727	Deodar cedar	*Cedrus deodara*	13	18	yes	PITP	Fair	
2728	Monterey pine	*Pinus radiata*	19	18	-	R	Poor	pitch canker and dead branches in canopy, declining health, 12' from house
2729	Monterey pine	*Pinus radiata*	23	25	-	PITP	Fair	ptich canker
2730	Deodar cedar	*Cedrus deodara*	10	22	yes	PITP	Good	
2731	Monterey pine	*Pinus radiata*	35	24	-	PITP	Fair	

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2732	Monterey pine	*Pinus radiata*	24.5		-	R	Dead	remove
2735	Coast live oak	*Quercus agrifolia*	15.5, 11.5, 7	28	yes	PITP	Good	
2736	Coast live oak	*Quercus agrifolia*	13	22	yes	PITP	Good	
2737	Coast live oak	*Quercus agrifolia*	15	30	yes	PITP	Good	
2738	Deodar cedar	*Cedrus deodara*	12	18	yes	PITP	Good	
2739	Coast live oak	*Quercus agrifolia*	6.5, 5	20	yes	PITP	Good	
2740	Coast live oak	*Quercus agrifolia*	6	15	yes	PITP	Good	
2746	Coast redwood	*Sequoia sempervirens*	18.5	25	yes	PITP	Fair	
2747	Coast redwood	*Sequoia sempervirens*	15.5	27	yes	PITP	Fair	trunks fused at base
2748	Coast redwood	*Sequoia sempervirens*	17		yes	PITP	Fair	
2749	Coast redwood	*Sequoia sempervirens*	29.5	20	yes	PITP	Fair	
2750	Coast redwood	*Sequoia sempervirens*	34.5	25	yes	PITP	Good	
2751	Coast redwood	*Sequoia sempervirens*	6, 10.5	14	yes	PITP	Fair	
2752	Coast redwood	*Sequoia sempervirens*	25, 12.5, 15	30	yes	PITP	Fair	
2753	Coast redwood	*Sequoia sempervirens*	59	36	yes	PITP	Good	
2754	Coast redwood	*Sequoia sempervirens*	12.5		-	R	Dead	
2755	Coast redwood	*Sequoia sempervirens*	19	10	yes	PITP	Fair	tight cluster
2756	Coast redwood	*Sequoia sempervirens*	13.5		-	R	Dead	
2757	Coast redwood	*Sequoia sempervirens*	12.5		yes	PITP	Fair	
2758	Coast redwood	*Sequoia sempervirens*	12.5	16	yes	PITP	Fair	tight cluster
2759	Coast redwood	*Sequoia sempervirens*	14.5		yes	PITP	Fair	
2760	Coast redwood	*Sequoia sempervirens*	23	20	yes	PITP	Fair	
2761	Coast redwood	*Sequoia sempervirens*	18	15	yes	PITP	Fair	
2762	Coast redwood	*Sequoia sempervirens*	17	16	yes	PITP	Fair	
2763	Coast redwood	*Sequoia sempervirens*	16.5	15	yes	PITP	Fair	
2764	Coast redwood	*Sequoia sempervirens*	24	18	yes	PITP	Fair	
2765	Coast redwood	*Sequoia sempervirens*	20.5	18	yes	PITP	Fair	tight cluster
2766	Coast redwood	*Sequoia sempervirens*	21		yes	PITP	Fair	
2767	Coast redwood	*Sequoia sempervirens*	33	25	yes	PITP	Fair	
2768	Coast redwood	*Sequoia sempervirens*	22.5		yes	PITP	Fair	
2769	Coast redwood	*Sequoia sempervirens*	18	18	yes	PITP	Fair	
2770	Coast redwood	*Sequoia sempervirens*	17, 9	16	yes	PITP	Fair	
2771	Coast redwood	*Sequoia sempervirens*	28.5	20	yes	PITP	Good	
2772	Coast redwood	*Sequoia sempervirens*	14.5	10	yes	PITP	Fair	
2773	Coast redwood	*Sequoia sempervirens*	23.5	15	yes	PITP	Fair	

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Tree #	Common Name	*Scientific Name*	Diameter (inches) at 54" above grade	Canopy Spread (feet)	Oakland "Protected Tree"	Project Impact Code[1]	General Condition[2]	Comments
2774	Coast redwood	*Sequoia sempervirens*	14	13	yes	PITP	Fair	
2775	Coast redwood	*Sequoia sempervirens*	17	20	yes	PITP	Fair	tight cluster
2776	Coast redwood	*Sequoia sempervirens*	22.5		yes	PITP	Fair	
2777	Coast redwood	*Sequoia sempervirens*	28	20	yes	PITP	Fair	
2778	Coast redwood	*Sequoia sempervirens*	9.5	10	yes	PITP	Fair	supressed
2779	Coast redwood	*Sequoia sempervirens*	18	14	yes	PITP	Fair	
2780	Coast redwood	*Sequoia sempervirens*	16, 24.5	20	yes	PITP	Good	
2781	Monterey pine	*Pinus radiata*	27	32	-	R	Poor	canopy unbalanced to southeast towards homes with 50% dead branches in the canopy
2782	Coast redwood	*Sequoia sempervirens*	33.5	30	yes	PITP	Good	
2783	Coast redwood	*Sequoia sempervirens*	18.5	15	yes	PITP	Fair	
2784	Coast redwood	*Sequoia sempervirens*	12	18	yes	PITP	Fair	tight cluster
2785	Coast redwood	*Sequoia sempervirens*	12		yes	PITP	Fair	fresh green flush on bronze canopy
2786	Coast redwood	*Sequoia sempervirens*	10.5		yes	PITP	Fair	fresh green flush on bronze canopy
2787	Coast redwood	*Sequoia sempervirens*	18.5	16	yes	PITP	Fair	
2788	Coast redwood	*Sequoia sempervirens*	20	15	yes	PITP	Fair	
2789	Coast redwood	*Sequoia sempervirens*	23	24	yes	PITP	Fair	lean and canopy unbalanced to NE
2790	Coast redwood	*Sequoia sempervirens*	26.5	25	yes	PITP	Fair	30% bronze foliage, thin top
2791	Coast redwood	*Sequoia sempervirens*	22.5	18	yes	PITP	Fair	
2792	Victorian box	*Pittosporum undulatum*	7.5	15	-	PITP	Good	
2793	Victorian box	*Pittosporum undulatum*	8, 5.5		-	R	Dead	
2794	Victorian box	*Pittosporum undulatum*	10	18	yes	PITP	Fair	
2795	Blackwood acacia	*Acacia melanoxylon*	9.5	18	yes	PITP	Good	
2796	Deodar cedar	*Cedrus deodara*	9	15	yes	PITP	Fair	canopy unbalanced to SE, supressed
2797	Coast live oak	*Quercus agrifolia*	14.5, 9.5, 11.5	40	yes	PITP	Good	
2798	Coast live oak	*Quercus agrifolia*	24	42	yes	PITP	Good	
2800	Coast live oak	*Quercus agrifolia*	6, 9	15	yes	PITP	Fair	
2801	Coast live oak	*Quercus agrifolia*	12.5, 7.5	20	yes	PITP	Good	
2802	Deodar cedar	*Cedrus deodara*	11.5	15	yes	PITP	Fair	
2803	Coast live oak	*Quercus agrifolia*	9.5, 8.5, 5.5	20	yes	PITP	Fair	
2804	Coast live oak	*Quercus agrifolia*	9.5, 6	12	yes	PITP	Fair	
2805	Coast live oak	*Quercus agrifolia*	18	28	yes	PITP	Good	
2806	Deodar cedar	*Cedrus deodara*	11.5	18	yes	PITP	Fair	
2807	Coast live oak	*Quercus agrifolia*	10.5	18	yes	PITP	Good	

2808	Monterey pine	*Pinus radiata*	18	15	-	R	Poor	isolated tall tree with canopy only top 5%

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2809	Monterey pine	*Pinus radiata*	18.5	18	-	PITP	Fair	
2810	Monterey pine	*Pinus radiata*	29		-	R	Dead	
2811	Deodar cedar	*Cedrus deodara*	6	15	-	PITP	Fair	significant bark damage on trunk at 3'
2812	Victorian box	*Pittosporum undulatum*	11.5, 10	26	yes	PITP	Fair	thin, 35% dead canopy
2813	Coast live oak	*Quercus agrifolia*	15, 13	28	yes	PITP	Fair	
2814	Victorian box	*Pittosporum undulatum*	8, 8.5	20	-	PITP	Fair	
2815	Victorian box	*Pittosporum undulatum*	7.5	12	-	PITP	Fair	
2816	Victorian box	*Pittosporum undulatum*	5.5	10	-	PITP	Fair	
2817	Victorian box	*Pittosporum undulatum*	6.5	16	-	PITP	Fair	unruley structure
2818	Victorian box	*Pittosporum undulatum*	4.5	12	-	PITP	Fair	bowed, unbalanced to NW
2819	Victorian box	*Pittosporum undulatum*	5	15	-	PITP	Fair	unbalanced to SE
2820	Victorian box	*Pittosporum undulatum*	7, 6.5	16	-	PITP	Fair	
2821	Coast live oak	*Quercus agrifolia*	13, 15, 21, 11, 23, 22	33	yes	PITP	Good	
2823	Incense cedar	*Calocedrus decurrens*	26	42	yes	PITP	Good	
2824	Coast redwood	*Sequoia sempervirens*	22	20	yes	R	Poor	top 2/3 dead
2825	Coast redwood	*Sequoia sempervirens*	13.5	16	yes	PITP	Fair	
2826	Coast live oak	*Quercus agrifolia*	20	38	yes	PITP	Fair	
2827	Coast live oak	*Quercus agrifolia*	18, 16, 14	36	yes	PITP	Good	
2828	Coast redwood	*Sequoia sempervirens*	9.5	18	yes	PITP	Fair	
2829	Coast redwood	*Sequoia sempervirens*	20.5	24	yes	PITP	Fair	
2830	Coast redwood	*Sequoia sempervirens*	26	26	yes	PITP	Fair	
2831	Coast redwood	*Sequoia sempervirens*	12.5	10	yes	R	Poor	most of canopy declining or dead
2832	Coast redwood	*Sequoia sempervirens*	17.5	12	yes	R	Poor	most of canopy declining or dead
2833	Coast redwood	*Sequoia sempervirens*	19.5	18	yes	PITP	Fair	topped, foliage thin
2834	Coast redwood	*Sequoia sempervirens*	28	18	yes	R	Poor	most of canopy declining or dead
2836	Coast live oak	*Quercus agrifolia*	28	32	yes	PITP	Good	
2837	Coast redwood	*Sequoia sempervirens*	19.5	15	yes	PITP	Fair	
2838	Coast redwood	*Sequoia sempervirens*	12	15	yes	PITP	Fair	split top, supressed
2839	Coast redwood	*Sequoia sempervirens*	15.5	-	-	R	Dead	
2840	Coast redwood	*Sequoia sempervirens*	29	20	yes	PITP	Fair	
2841	Coast redwood	*Sequoia sempervirens*	34.5	24	yes	PITP	Fair	

2844	Coast redwood	*Sequoia sempervirens*	14.5	14	yes	R	Poor	decay at base, dead top at 16', trunk bowed 10° to northwest
2845	Victorian box	*Pittosporum undulatum*	6, 5, 6	18	-	PITP	Fair	

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2846	Victorian box	*Pittosporum undulatum*	5, 5.5	16	-	PITP	Fair	
2847	Cherry plum	*Prunus cerasifera*	4, 6, 6, 5, 5	18	-	PITP	Fair	
2848	Victorian box	*Pittosporum undulatum*	3, 4, 6	15	-	PITP	Fair	
2849	Coast redwood	*Sequoia sempervirens*	17.5	24	yes	PITP	Fair	dead top, ivy up trunk
2850	Coast live oak	*Quercus agrifolia*	6.5, 8, 4.5 7, 10	26	yes	PITP	Good	
2852	Coast live oak	*Quercus agrifolia*	12.5	20	yes	PITP	Good	
2861	Deodar cedar	*Cedrus deodara*	17	16	yes	PITP	Good	
2862	Deodar cedar	*Cedrus deodara*	10.5	17	yes	PITP	Good	
2863	Deodar cedar	*Cedrus deodara*	11	20	yes	PITP	Good	approx. 9' outside Central reservoir fence
2864	Deodar cedar	*Cedrus deodara*	12	18	yes	PITP	Fair	
2865	Coast live oak	*Quercus agrifolia*	4	9	yes	PITP	Fair	supressed
2866	Coast live oak	*Quercus agrifolia*	5	15	yes	PITP	Fair	
2867	Deodar cedar	*Cedrus deodara*	14, 15	24	yes	PITP	Fair	
2868	Deodar cedar	*Cedrus deodara*	18, 21	30	yes	PITP	Good	
2869	Deodar cedar	*Cedrus deodara*	16.5	22	yes	PITP	Fair	
2870	Deodar cedar	*Cedrus deodara*	13	18	yes	PITP	Fair	
2871	Coast redwood	*Sequoia sempervirens*	9	15	yes	PITP	Fair	
2872	Deodar cedar	*Cedrus deodara*	11	14	yes	PITP	Fair	
2873	Deodar cedar	*Cedrus deodara*	11	12	yes	PITP	Fair	
2874	Coast live oak	*Quercus agrifolia*	8.5, 6.5	18	yes	PITP	Fair	
2875	Coast live oak	*Quercus agrifolia*	9.5, 9.5	24	yes	PITP	Fair	
2876	Deodar cedar	*Cedrus deodara*	18	10	yes	PITP	Fair	
2877	Deodar cedar	*Cedrus deodara*	22	12	yes	PITP	Fair	
2880	Coast redwood	*Sequoia sempervirens*	26	18	yes	PITP	Fair	
2881	Coast live oak	*Quercus agrifolia*	4, 5	12	yes	PITP	Fair	
2882	Coast live oak	*Quercus agrifolia*	7	12	yes	PITP	Fair	
2883	Coast redwood	*Sequoia sempervirens*	26	20	yes	PITP	Good	
2884	Coast redwood	*Sequoia sempervirens*	28	20	yes	PITP	Good	
2885	Coast redwood	*Sequoia sempervirens*	28	24	yes	PITP	Good	approx. 16' outside Central reservoir fence
2886	Coast live oak	*Quercus agrifolia*	5, 3	8	yes	PITP	Fair	approx. 5' outside Central Reservoir fence
2887	Deodar cedar	*Cedrus deodara*	11	15	yes	PITP	Fair	approx. 10' outside Central Reservoir fence

2888	Deodar cedar	*Cedrus deodara*	9	14	yes	PITP	Good	
2889	Coast redwood	*Sequoia sempervirens*	34	25	yes	PITP	Good	approx. 15' outside Central Reservoir fence
2890	Coast redwood	*Sequoia sempervirens*	28	22	yes	PITP	Good	approx. 16' outside Central Reservoir fence

[1] Project Impact code: **R** = Removal recommended based on condition, **PITP** = Potential impact, tree protection may be necessary.

[2] Condition: **Good** = 80-100% healthy foliage and no significant defects; **Fair** = 50-79% healthy foliage and/or minor defects; **Poor** = 5-49% healthy foliage and/or other significant defects; **Dead** = less than 5% healthy foliage.

Tree #	**Common Name**	***Scientific Name***	**Diameter (inches) at 54" above grade**	**Canopy Spread (feet)**	**Oakland "Protected Tree"**	**Project Impact Code[1]**	**General Condition[2]**	**Comments**
2891	Deodar cedar	*Cedrus deodara*	7.5	10	-	PITP	Good	
2892	Coast live oak	*Quercus agrifolia*	13.5	24	yes	PITP	Good	
2893	Deodar cedar	*Cedrus deodara*	15.5	20	yes	PITP	Good	
2894	Deodar cedar	*Cedrus deodara*	15	20	yes	PITP	Good	
2895	Deodar cedar	*Cedrus deodara*	12	20	yes	PITP	Good	
2896	Deodar cedar	*Cedrus deodara*	12.5	15	yes	PITP	Good	
2897	Deodar cedar	*Cedrus deodara*	21.5	35	yes	PITP	Good	
2898	Deodar cedar	*Cedrus deodara*	12.5	18	yes	PITP	Good	
2899	Deodar cedar	*Cedrus deodara*	9	16	yes	PITP	Good	
2900	Coast live oak	*Quercus agrifolia*	18, 23, 16, 11	50	yes	PITP	Good	storage container and construction debris against base of tree

[1] Project Impact code: **R** = Removal recommended based on condition, **PITP** = Potential impact, tree protection may be necessary.

[2] Condition: **Good** = 80-100% healthy foliage and no significant defects; **Fair** = 50-79% healthy foliage and/or minor defects; **Poor** = 5-49% healthy foliage and/or other significant defects; **Dead** = less than 5% healthy foliage.

APPENDIX E

EBMUD Practices and Procedures Monitoring and Reporting Plan, Mitigation Monitoring and Reporting Program

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TABLE E-1
EBMUD PRACTICES AND PROCEDURES MONITORING AND REPORTING PLAN

Impact Area	EBMUD Practices and Procedures[1]	Responsibility for Implementation	Responsibility for Monitoring and/or Enforcement	Timing of Implementation
Aesthetics				
Impact AES-3: In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings (Public views are those that are experienced from publicly accessible vantage points), or in an urbanized area, conflict with applicable zoning and other regulations governing scenic quality.	**EBMUD's Standard Construction Specification 01 35 44, Environmental Requirements** *Section 1.1, Summary* B. Site Activities 1. No debris including, but not limited to, demolition material, treated wood waste, stockpile leachate, soil, silt, sand, bark, slash, sawdust, asphalt, rubbish, paint, oil, cement, concrete or washings thereof, oil or petroleum products, or other organic or earthen materials from construction activities shall be allowed to enter into storm drains or surface waters or be placed where it may be washed by rainfall or runoff outside the construction limits. When operations are completed, excess materials or debris shall be removed from the work area as specified in the Construction and Demolition Waste Disposal Plan. 2. Excess material shall be disposed of in locations approved by the Engineer consistent with all applicable legal requirements and disposal facility permits. 3. Do not create a nuisance or pollution as defined in the California Water Code. Do not cause a violation of any applicable water quality standards for receiving waters adopted by the Regional Board or the State Water Resources Control Board, as required by the Clean Water Act. 4. Clean up all spills and immediately notify the Engineer in the event of a spill. 5. Stationary equipment such as motors, pumps, and generators, shall be equipped with drip pans. 6. Divert or otherwise control surface water and waters flowing from existing projects, structures, or surrounding areas from coming onto the work and staging areas. The method of diversions or control shall be adequate to ensure the safety of stored materials and of personnel using these areas. Following completion of Work, ditches, dikes, or other ground alterations made by the Contractor shall be removed and the ground surfaces shall be returned to their former condition, or as near as practicable, in the Engineer's opinion. 7. Maintain construction sites to ensure that drainage from these sites will minimize erosion of stockpiled or stored materials and the adjacent native soil material. 8. Furnish all labor, equipment, and means required and shall carry out effective measures wherever, and as often as necessary, to prevent Contractor's operations from causing visible dust emissions to leave the work areas. These measures shall include, but are not limited to, providing additional watering equipment, reducing vehicle speeds on haul roads, restricting traffic on haul roads, covering haul vehicles, and applying a dust palliative to well-traveled haul roads. The Contractor shall provide the specifications of the dust palliative for Engineer approval prior to use. The Contractor shall be responsible for damage resulting from dust originating from its operations. The dust abatement measures shall be continued for the duration of the Contract. Water the site in the morning and evening, and as often as necessary, and clean vehicles leaving the site as necessary to prevent the transportation of dust and dirt onto public roads. Dust control involving water shall be done in such a manner as to minimize waste and runoff from the site.	EBMUD and EBMUD's Contractors	EBMUD	Prior to and During Construction

TABLE E-1 (CONTINUED)
EBMUD PRACTICES AND PROCEDURES MONITORING AND REPORTING PLAN

Impact Area	EBMUD Practices and Procedures[1]	Responsibility for Implementation	Responsibility for Monitoring and/or Enforcement	Timing of Implementation
Aesthetics (cont.)				
Impact AES-3 (cont.)	9. Construction staging areas shall be graded, or otherwise protected with Best Management Practices (BMPs), to contain surface runoff so that contaminants such as oil, grease, and fuel products do not drain towards receiving waters including wetlands, drainages, and creeks. 10. All construction equipment shall be properly serviced and maintained in good operating condition to reduce emissions. Contractor shall make copies of equipment service logs available upon request. 11. Any chemical or hazardous material used in the performance of the Work shall be handled, stored, applied, and disposed of in a manner consistent with all applicable federal, state, and local laws and regulations. 12. Contaminated materials excavated and/or removed from the construction area shall be disposed of in a manner consistent with all applicable local, state, and federal laws and regulations. *Section 3.7, Protection of Native and Non-Native Protected Trees* A. Tree Protection 1. Locations of trees to be removed and protected are shown in the construction drawings. Pruning and trimming shall be completed by the Contractor and approved by the Engineer. Pruning shall adhere to the Tree Pruning Guidelines of the International Society of Arboriculture. 2. Erect exclusion fencing five feet outside of the drip lines of trees to be protected. Erect and maintain a temporary minimum 3-foot high orange plastic mesh exclusion fence at the locations as shown in the drawings. The fence posts shall be six-foot minimum length steel shapes, installed at 10-feet minimum on center, and be driven into the ground. The Contractor shall be prohibited from entering or disturbing the protected area within the fence except as directed by the Engineer. Exclusion fencing shall remain in place until construction is completed and the Engineer approves its removal. 3. No grading, construction, demolition, trenching for irrigation, planting or other work, except as specified herein, shall occur within the tree protection zone established by the exclusion fencing installed shown in the drawings. In addition, no excess soil, chemicals, debris, equipment or other materials shall be dumped or stored within the tree protection zone. 4. In areas that are within the tree drip line and outside the tree protection zone that are to be traveled over by vehicles and equipment, the areas shall be covered with a protective mat composed of a 12-inch thickness of wood chips or gravel and covered by a minimum ¾-inch-thick steel traffic plate. The protective mat shall remain in place until construction is completed and the Engineer approves its removal. 5. Tree roots exposed during trench excavation shall be pruned cleanly at the edge of the excavation and treated to the satisfaction of a certified arborist provided by the District. 6. Any tree injured during construction shall be evaluated as soon as possible by a certified arborist provided by the District, and replaced as deemed necessary by the certified arborist.			

TABLE E-1 (CONTINUED)
EBMUD PRACTICES AND PROCEDURES MONITORING AND REPORTING PLAN

Impact Area	EBMUD Practices and Procedures[1]	Responsibility for Implementation	Responsibility for Monitoring and/or Enforcement	Timing of Implementation
Aesthetics (cont.)				
Impact AES-3 (cont.)	**EBMUD's Standard Construction Specification 01 74 05, Cleaning** *Section 1.1, Description* A. Work included: Perform the work necessary for cleaning during construction and final cleaning on completion of the work. B. Cleaning for specific products or work is specified in the individual specification sections. *Section 3.1, General* A. At all times maintain areas covered by the Contract and public properties free from accumulations of waste, debris, and rubbish caused by construction operations. B. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws. Do not burn or bury rubbish and waste materials on project site. Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains. Do not dispose of wastes into streams or waterways. C. Use only cleaning materials recommended by manufacturer of surface to be cleaned. D. Use cleaning materials only on surfaces recommended by cleaning material manufacturers. *Section 3.2, Cleaning During Construction* A. During execution of work, clean site and public properties and legally dispose of waste materials, debris, and rubbish to assure that buildings, grounds, and public properties are maintained free from accumulations of waste materials and rubbish. All soil and any other material tracked onto the streets by the Contractor shall be cleaned immediately. The Contractor shall comply with all rules and regulations as applicable for its cleaning method. B. Dispose of all refuse off District property as often as necessary so that at no time shall there be any unsightly or unsafe accumulation of rubbish. 1. Pine needles, leaves, sticks, and other vegetative debris on the ground shall be removed if they are in the way of construction, present a safety hazard, or present a fire hazard. Otherwise they shall be left in place during construction and final cleaning C. Wet down dry materials and rubbish to lay dust and prevent blowing dust. D. Provide approved containers for collection and disposal of waste materials, debris, and rubbish. E. Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials from exposed and semi exposed surfaces. F. Repair, patch, and touch up marred surfaces to specified finish to match adjacent surfaces. G. Vacuum clean all interior spaces, including inside cabinets. Broom clean paved surfaces; rake clean other surfaces of grounds. H. Handle materials in a controlled manner with as few handlings as possible; do not drop or throw materials from heights.			

TABLE E-1 (CONTINUED)
EBMUD PRACTICES AND PROCEDURES MONITORING AND REPORTING PLAN

Impact Area	EBMUD Practices and Procedures[1]	Responsibility for Implementation	Responsibility for Monitoring and/or Enforcement	Timing of Implementation
Aesthetics (cont.)				
Impact AES-3 (cont.)	I. Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not fall on wet, newly painted surfaces. J. Vacuum clean interior of shop building areas when ready to receive finish painting and continue vacuum cleaning on an as needed basis until successful completion of the Startup Test as defined in Section 01 75 17 Field Startup and Testing. *Section 3.3, Final Cleaning* A. At the completion of work on all portions of the contract and immediately prior to final inspection, cleaning of the entire project will be accomplished according to the following provisions: 1. Thoroughly clean, sweep, wash, and polish all work and equipment, including finishes. The cleaning shall leave the structures and site in a complete and finished condition to the satisfaction of the Engineer. 2. Should the Contractor not remove rubbish or debris or not clean buildings and site as specified above, the District reserves the right to have the cleaning done at the expense of the Contractor. B. Employ professional cleaners for final cleaning. C. In preparation for contract completion, conduct final inspection of sight exposed interior and exterior surfaces, and of concealed spaces. D. Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials from sight exposed interior and exterior finished surfaces; polish surfaces so designated to shine finish. E. Repair, patch, and touch up marred surfaces to specified finish, to match adjacent surfaces. F. Broom clean paved surfaces; rake clean other surfaces of grounds. G. Replace air handling filters if units were operated during construction. H. Clean ducts, blowers, and coils, if air handling units were operated without filters during construction. I. Clean luminaires in accordance with manufacturer's recommendations and relamp. Clean all light fixtures. J. Clean debris from roofs, gutters, and downspouts. K. Remove from District property all temporary structures and all material, equipment, and appurtenances not required as a part of, or appurtenant to, the completed work. L. Leave watercourses, storm drains, inlets, and ditches open and clear.			

TABLE E-1 (CONTINUED)
EBMUD PRACTICES AND PROCEDURES MONITORING AND REPORTING PLAN

Impact Area	EBMUD Practices and Procedures[1]	Responsibility for Implementation	Responsibility for Monitoring and/or Enforcement	Timing of Implementation
Air Quality				
Impact AIR-1: Conflict with or obstruct implementation of the applicable air quality plan.	**EBMUD's Standard Construction Specification 01 35 44, Environmental Requirements** *Section 1.3.E Dust Control and Monitoring Plan* 1. Submit a plan detailing the means and methods for controlling and monitoring dust generated by demolition and other work on the site for the Engineer's acceptance prior to any work at the jobsite. The plan shall comply with all applicable regulations including but not limited to the Bay Area Air Quality Management District (BAAQMD) visible emissions regulation and Public Nuisance Rule. The plan shall include items such as mitigation measures to control fugitive dust emissions generated by construction activities. The Plan shall outline best management practices for preventing dust emissions, provide guidelines for training of employees, and procedures to be used during operations and maintenance activities. The plan shall also include measures for the control of paint overspray generated during the painting of exterior surfaces. The plan shall detail the equipment and methods used to monitor compliance with the plan. The handling and disposal of water used in compliance with the Dust Control Plan shall be addressed in the Water Control and Disposal Plan. 2. Containment, as described in Article 3.3, shall be utilized during any abrasive blasting of the exterior of structures. *Section 3.3. Dust Control and Monitoring* B. Dust Control 1. Contractor shall implement all necessary dust control measures, including but not limited to the following: a. All exposed surfaces with the potential of dust-generating shall be watered at least twice daily, or be covered with coarse rock, or as directed by the Engineer to reduce the potential for airborne dust from leaving the site. b. The simultaneous occurrence of more than two ground disturbing construction phases on the same area at any one time shall be limited. Activities shall be phased to reduce the amount of disturbed surfaces at any one time, as appropriate. c. Cover all haul trucks entering/leaving the site and trim their loads as necessary. d. Using wet power vacuum street sweepers to: 1) Sweep all paved access road, parking areas and staging areas at the construction site daily or as often as necessary. 2) Sweep public roads adjacent to the site at least twice daily or as often as necessary. e. The use of dry power sweeping is prohibited. f. All trucks and equipment, including their tires, shall be washed off prior to leaving the site. g. Gravel or apply non-toxic soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites.	EBMUD and EBMUD's Contractors	EBMUD	During Construction

TABLE E-1 (CONTINUED)
EBMUD PRACTICES AND PROCEDURES MONITORING AND REPORTING PLAN

Impact Area	EBMUD Practices and Procedures[1]	Responsibility for Implementation	Responsibility for Monitoring and/or Enforcement	Timing of Implementation
Air Quality (cont.)				
Impact AIR-1 (cont.)	h. Water and/or cover soil stockpiles daily. i. Site accesses to a distance of 100 feet from the paved road shall be treated with 12-inches layer of compacted coarse rock. j. Sandbags or other erosion control measures shall be installed to prevent silt runoff to public roadways from sites with a slope greater than one percent. k. All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. l. Building pads shall be laid as soon as possible after grading. m. Vegetative ground cover (e.g., fast-germinating native grass seed) shall be planted in disturbed areas as soon as possible and watered appropriately until vegetation is established. n. Wind breaks (e.g., fences) shall be installed on the windward sides(s) of actively disturbed areas of construction. Wind breaks should have a maximum 50 percent air porosity. o. All vehicle speeds shall be limited to fifteen (15) mph or less on the construction site and any adjacent unpaved roads. C. Dust Monitoring During Demolition and Construction 1. Provide air monitoring per the Dust Control and Monitoring Plan along the perimeter of the job site. A minimum of 4 stations, one on each side of the District property, shall be established, capable of continuous measurement of total particulate concentration when any dust generating activity is occurring. a. Ringelmann No. 1 Limitation: Contractor shall not emit from any source for a period or periods aggregating more than three minutes in any hour, a visible emission which is as dark or darker than No. 1 on the Ringelmann Chart, or of such opacity as to obscure an observer's view to an equivalent or greater degree. b. Opacity Limitation: Contractor shall not emit from any source for a period or periods aggregating more than three minutes in an hour an emission equal to or greater than 20% opacity as perceived by an opacity sensing device, where such device is required by Air Quality Management District regulations. c. All environmental and personal air sampling equipment shall be in conformance with the Association of Industrial Hygiene and National Institute of Safety and Health (NIOSH) standards. d. All analysis shall be completed by a California Department of Health Services certified laboratory for the specific parameters of interest. e. The Contractor shall provide to the Engineer, within 72 hours of sampling all test results. D. The dust control system shall comply with the Dust Control and Monitoring Plan, the requirements of this section, and any applicable laws and regulations.			

TABLE E-1 (CONTINUED)
EBMUD PRACTICES AND PROCEDURES MONITORING AND REPORTING PLAN

Impact Area	EBMUD Practices and Procedures[1]	Responsibility for Implementation	Responsibility for Monitoring and/or Enforcement	Timing of Implementation
Air Quality (cont.)				
Impact AIR-1 (cont.)	*Section 3.4. Emissions Control* A. Air Quality and Emissions Control 1. The Contractor shall ensure that line power is used instead of diesel generators at all construction sites where line power is available. 2. The Contractor shall ensure that for operation of any stationary, compression-ignition engines as part of construction, comply with Section 93115, Title 17, California Code of Regulations, Airborne Toxic Control Measure for Stationary Compression Ignition Engines, which specifies fuel and fuel additive requirements as well as emission standards. 3. Fixed temporary sources of air emissions (such as portable pumps, compressors, generators, etc.) shall be electrically powered unless the Contractor submits documentation and receives approval from the Engineer that the use of such equipment is not practical, feasible, or available. All portable engines and equipment units used as part of construction shall be properly registered with the California Air Resources Board or otherwise permitted by the appropriate local air district, as required. 4. Contractor shall implement standard air emissions controls such as: a. Minimize the use of diesel generators where possible. b. 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 (ATCM) Title 13, Section 2485 of California Code of Regulations. Clear signage shall be provided for construction workers at all access points. c. Follow applicable regulations for fuel, fuel additives, and emission standards for stationary, diesel-fueled engines. d. Locate generators at least 100 feet away from adjacent homes and ball fields. e. Perform regular low-emission tune-ups on all construction equipment, particularly haul trucks and earthwork equipment. 5. Contractor shall implement the following measures to reduce greenhouse gas emissions from fuel combustion: a. On road and off-road vehicle tire pressures shall be maintained to manufacturer specifications. Tires shall be checked and re-inflated at regular intervals. b. Construction equipment engines shall be maintained to manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation. c. All construction equipment, diesel trucks, and generators shall be equipped with Best Available Control Technology for emission reductions of Oxide of Nitrogen (NOx) and Particulate Matter (PM).			

TABLE E-1 (CONTINUED)
EBMUD PRACTICES AND PROCEDURES MONITORING AND REPORTING PLAN

Impact Area	EBMUD Practices and Procedures[1]	Responsibility for Implementation	Responsibility for Monitoring and/or Enforcement	Timing of Implementation
Air Quality (cont.)				
Impact AIR-1 (cont.)	d. Demolition debris shall be recycled for reuse to the extent feasible. See the Construction and Demolition Waste Disposal Plan paragraphs above for requirements on wood treated with preservatives. A. Architectural Coatings 1. Architectural coatings used shall comply with appropriate Volatile Organic Compound limits as established in the Bay Area Air Quality Management District's Regulation 8, Rule 3 and/or the San Joaquin Valley Air Pollution Control District's Regulation IV, Rule 4601, and any amendments thereto. **EBMUD's Standard Construction Specification 02 82 13, Asbestos Control Activities** *Section 1.1, Compliance and Intent* A. Furnish all labor, materials, facilities, equipment, services, employee training and testing, permits, and agreements necessary to perform the lead removal in accordance with these specification and with the latest regulations from the U.S. Environmental Protection Agency (EPA), the Occupational Safety and Health Administration (OSHA), the Air Quality Management District with authority over the project, the Cal/EPA Department of Toxic Substance Control, the California Occupational Safety and Health Administration (Cal/OSHA), and other federal, state, county, and local agencies. Whenever there is a conflict or overlap of the above references, the most stringent provision is applicable. B. The Central Reservoir is known to contain asbestos materials. Notify the BAAQMD at (415) 749-4762 regarding the demolition of the Central Reservoir at least ten (10) work days prior to beginning demolition activities. *Section 1.5, Submittals (Pre-Job)* B. Plan of Action 1. Asbestos Abatement: a. Submit a detailed plan of the procedures proposed for use in complying with the regulations included in this specification. The plan shall include the location and layout of decontamination areas, the sequencing of asbestos work, the interface of trades involved in the performance of work, disposal plan including location of approved disposal site, and a detailed description of the methods to be employed to control pollution. Expand upon the use of portable HEPA ventilation system, method of removal to prohibit visible emissions in work area, and packaging of removed asbestos debris. Include asbestos abatement in the Construction and Demolition Waste Disposal Plan, in accordance with Section 01 35 44.			
Impact AIR-2: Expose sensitive receptors to substantial pollutant concentrations.	**EBMUD's Standard Construction Specification 01 35 44, Environmental Requirements** *Section 3.4(A) Air Quality and Emissions Control* (Details as listed under Impact AIR-1)	EBMUD and EBMUD's Contractors	EBMUD	Prior to and During Construction

**TABLE E-1 (CONTINUED)
EBMUD PRACTICES AND PROCEDURES MONITORING AND REPORTING PLAN**

Impact Area	EBMUD Practices and Procedures[1]	Responsibility for Implementation	Responsibility for Monitoring and/or Enforcement	Timing of Implementation
Biological Resources				
Impact BIO-1: Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations or by the CDFW or USFWS.	**EBMUD's Standard Construction Specification 01 35 44, Environmental Requirements** *Section 1.1(B), Site Activities* (Details as listed under Impact AES-3) *Section 1.3, Submittals* A. Storm Water Management 1. Construction General Permit a. The Contractor shall create a user account on the SWRCB's Storm Water Multi-Application & Report Tracking System (SMARTS). The Engineer will link the Contractor to the District's account as a Data Submitter. The Contractor shall prepare and upload to SMARTS Permit Registration Documents (PRDs), including, but not limited to, a Notice of Intent, a Site Specific Risk Assessment, a Site Map, and a Storm Water Pollution Prevention Plan (SWPPP) for the Engineer's review which meets the requirements of the SWRCB, for coverage under the General Construction Stormwater Permit (Order No. 2009-0009-DWQ) and amendments thereto. Upon acceptance by the Engineer, the Engineer will electronically certify and file the PRDs to gain permit coverage and the Contractor shall submit the registration and the subsequent annual fees as required by the SWRCB. b. The Contractor shall be responsible for complying with the requirements of the Construction General Permit. The Contractor's responsibilities include, but are not limited to, providing qualified professionals as described in the permit to prepare and certify all permit-required documents/submittals and to implement effective stormwater/non-stormwater management practices, and conducting inspections and monitoring as required by the permit. The Contractor shall, in compliance with the permit, prepare and upload to SMARTS all required documents, photos, data, and/or reports (including the Annual Reports) and ensure permit coverage termination upon construction completion by preparing a Notice of Termination on SMARTS. The Contractor shall inform the Engineer when documents/reports are available on SMARTS for Engineer certification and submittal. 2. Storm Water Pollution Prevention Plan a. Submit a Stormwater Pollution Prevention Plan that describes measures that shall be implemented to prevent the discharge of contaminated storm water runoff from the jobsite. Contaminants to be addressed include, but are not limited to, soil, sediment, concrete residue, pH less than 6.5 or greater than 8.5, and chlorine residual and all other contaminants known to exist at the jobsite location as described in Document 00 31 24 - Material Assessment Information. B. Water Control and Disposal Plan 1. The Contractor shall submit a detailed Water Control and Disposal Plan for the Engineer's acceptance prior to any work at the jobsite.	EBMUD and EBMUD's Contractors	EBMUD	Prior to and During Construction

TABLE E-1 (CONTINUED)
EBMUD PRACTICES AND PROCEDURES MONITORING AND REPORTING PLAN

Impact Area	EBMUD Practices and Procedures[1]	Responsibility for Implementation	Responsibility for Monitoring and/or Enforcement	Timing of Implementation
Biological Resources (cont.)				
Impact BIO-1 (cont.)	a. Plan shall comply with all requirements of the Specification and applicable discharge permits. Table 1 summarizes discharge permits that may be applicable to District projects. b. Contractor shall maintain proper control of the discharge at the discharge point to prevent erosion, scouring of bank, nuisance, contamination, and excess sedimentation in the receiving waters. 2. Drinking Water System Discharges a. Plan shall include the estimated flow rate and volume of all proposed discharges to surface waters, including discharges to storm drains. All receiving waters shall be clearly identified. b. Contractor shall track all discharges directly to a surface water body or a storm drain system that drains to a surface water body. A record consisting of discharge locations and volumes shall be submitted to the Engineer prior to Contract Acceptance. c. A monitoring program is required for drinking water system discharges greater than 325,850 gallons in conformance with Attachment E, Monitoring and Reporting Program, of the General Drinking Water Discharges Permit, when the water will be discharged either directly into a surface water body or a storm drain system that drains to a surface water body. A record consisting of discharge locations, volumes and Water Quality (WQ) data shall be submitted to the Engineer. The Planned Discharge Tracking Form, attached to the end of this section, may be used to fulfill this requirement. All monitoring results shall be submitted to the Engineer prior to Contract Acceptance. 1. Contractor shall notify the Engineer, at least one week prior to the start of a planned discharge equal to or greater than 325,850 gallons, of the following: a) The discharge start date; b) The discharge location and the applicable receiving water; c) The flow rate and volume to be discharged; and d) The reason(s) for discharge. d. Contractor shall dechlorinate all drinking water system discharges to achieve a total chlorine residual concentration of < 0.1 mg/L measured with a handheld chlorine meter utilizing a US EPA approved method and provide effective erosion & sediment control to achieve a visual turbidity concentration of ≤ 100 NTU by implementing BMPs which meet the District minimum standards (see Figure 1 attached to the end of this section) or better. e. Instead of discharging to surface waters, where feasible, Contractor shall beneficially reuse water derived from drinking water systems as defined in the General Drinking Water Discharges Permit. Potential reuse strategies include, but are not limited to, landscape irrigation, agricultural irrigation, dust control, and discharge to stormwater capture basins or other groundwater recharge systems. Contractor shall do so without impacting property or the environment. Contractor shall provide a record of reuse location(s) and volume(s) and submit it to the Engineer prior to Contract Acceptance.			

TABLE E-1 (CONTINUED)
EBMUD PRACTICES AND PROCEDURES MONITORING AND REPORTING PLAN

Impact Area	EBMUD Practices and Procedures[1]	Responsibility for Implementation	Responsibility for Monitoring and/or Enforcement	Timing of Implementation
Biological Resources (cont.)				
Impact BIO-1 (cont.)	f. Contractor shall ensure that the pH level of any discharges shall not be depressed below 6.5, nor elevated above 8.5. If there is potential for discharges to be below 6.5 or above 8.5, Contractor shall employ pH adjustment best management practices to ensure discharges are within the range of 6.5 and 8.5. Contractor shall conduct onsite field measurements for pH per quality assurance and quality control (QA/QC) protocol that conform to U.S. EPA guidelines, or procedures approved by the American Water Works Association or other professional drinking water industry association. Contractor shall submit all monitoring results to the Engineer prior to Contract Acceptance. 3. Non-Stormwater Discharges a. Plan shall describe measures for containment, handling, treatment (as necessary), and disposal of discharges such as groundwater (if encountered), runoff of water used for dust control, stockpile leachate, tank heel water, wash water, sawcut slurry, test water and construction water or other liquid that has been in contact with any interior surfaces of District facilities. Contractor shall provide the Engineer with containment, handling, treatment and disposal designs and a sampling & analysis plan for approval before commencing the Work. Sampling and analysis shall be in conformance with Sections 1.3 (K) Analytical Test Results and 3.1 SAMPLING AND ANALYSIS. 4. Sanitary Sewer Discharges a. It is District policy to send superchlorinated discharges from pipeline disinfection to the sanitary sewer system. Plan shall include a sampling and analytical program for superchlorinated discharges in conformance with the Sanitary Sewer Discharge Permit. All monitoring results shall be submitted to the Engineer prior to the end of the Work. b. Obtain and provide to the Engineer documentation from the agency (e.g., wastewater treatment plant, local sewer owner) having jurisdiction, authorizing the Contractor to dispose of the liquid and describing the method of disposal. Discharges destined for the District's main wastewater treatment plant in Oakland can reference Special Discharge Permit (SDP) #50333261, issued to the District's Regulatory Compliance Office, when obtaining authorization from the pertinent local jurisdiction that owns the sewers to be used. Contractor shall, prior to the end of the Work, report to the Engineer the volumes of all discharges performed pursuant to the said SDP along with copies of any profile forms and/or correspondence between Contractor and disposal facility. *Section 3.6, Noise Control* (Details as listed under Impact NOI-1) *Section 3.8, Protection of Birds Protected under the Migratory Treaty Act and Roosting Bats* A. The District will conduct biological reconnaissance in advance of construction and will conduct biologic monitoring during construction as necessary. B. Protected Species 1. If protected species or suitable habitat for protected species is found during biological reconnaissance surveys:			

TABLE E-1 (CONTINUED)
EBMUD PRACTICES AND PROCEDURES MONITORING AND REPORTING PLAN

Impact Area	EBMUD Practices and Procedures[1]	Responsibility for Implementation	Responsibility for Monitoring and/or Enforcement	Timing of Implementation
Biological Resources (cont.)				
Impact BIO-1 (cont.)	a. Before beginning construction, all Contractor construction personnel are required to attend an environmental training program provided by the District of up to one-day for site supervisors, foreman and project managers, and up to 30-minutes for non-supervisory contractor personnel. The training program will be completed in person or by watching a video at a District-designated location, conducted by a qualified biologist provided by the District. The program will discuss all sensitive habitats and sensitive species that may occur within the project work limits, including the responsibilities of Contractor's construction personnel, applicable mitigation measures, and notification requirements. The Contractor is responsible for ensuring that all workers requiring training are identified to the District. Prior to accessing or performing construction work, all Contractor personnel shall: 1) Sign a wallet card provided by the Engineer verifying that all Contractor construction personnel have attended the appropriate level of training relative to their position; have read and understood the contents of the environmental training: and shall comply with all project environmental requirements. 2) Display an environmental training hard hat decal (provided by the District after completion of the training) at all times. b. Birds Protected under the Migratory Bird Treaty Act (MBTA): 1) It is unlawful to pursue, hunt, take, capture, or kill any migratory bird without a permit issued by the U.S. Department of the Interior. 2) If construction commences between February 1 and August 31, during the nesting season, the District will conduct a preconstruction survey for nesting birds within 7 days prior to construction to ensure that no nest will be disturbed during construction. 3) If active nests of migratory bird species (listed in the MBTA) are found within the project site, or in areas subject to disturbance from construction activities, an avoidance buffer to avoid nest disturbance shall be constructed. The buffer size will be determined by the District in consultation with California Department of Fish and Wildlife (CDFW) and is based on the nest location, topography, cover and species' tolerance to disturbance. 4) If an avoidance buffer is not achievable, a qualified biologist provided by the District will monitor the nest(s) to document that no take of the nest (nest failure) has occurred. Active nests shall not be taken or destroyed under the MBTA and, for raptors, under the CDFW Code. If it is determined that construction activity is resulting in nest disturbance, work should cease immediately and the Contractor shall notify the Engineer who will consult with the qualified biologist and appropriate regulatory agencies. 5) If preconstruction surveys indicate that nests are inactive or potential habitat is unoccupied during the construction period, no further action is required. Trees and shrubs within the construction footprint that have been determined to be unoccupied by special-status birds or that are located outside the avoidance buffer for active			

TABLE E-1 (CONTINUED)
EBMUD PRACTICES AND PROCEDURES MONITORING AND REPORTING PLAN

Impact Area	EBMUD Practices and Procedures[1]	Responsibility for Implementation	Responsibility for Monitoring and/or Enforcement	Timing of Implementation
Biological Resources (cont.)				
Impact BIO-1 (cont.)	nests may be removed. Nests initiated during construction (while significant disturbance from construction activities persist) may be presumed to be unaffected, and only a minimal buffer, determined by District's biologist, would be necessary. c. Roosting Bats: 1) If construction commences between March 1 and July 31, during the bat maternity period, the District will conduct a preconstruction survey for roosting bats within two weeks prior to construction to ensure that no roosting bats will be disturbed during construction. 2) If roosting surveys indicate potential occupation by a special-status bat species, and/or identify a large day roosting population or maternity roost by any bat species within 200 feet of a construction work area, a qualified biologist provided by the District will conduct focused day- and/or night-emergence surveys, as appropriate. 3) If active maternity roosts or day roosts are found within the project site, or in areas subject to disturbance from construction activities, an avoidance buffers shall be constructed. The buffer size will be determined by the District in consultation with CDFW. 4) If a non-breeding bat roost is found in a structure scheduled for modification or removal, the bats shall be safety evicted, under the direction of a qualified biologist provided by the District in consultation with CDFW to ensure that the bats are not injured. 5) If preconstruction surveys indicate that no roosting is present, or potential roosting habitat is unoccupied during the construction period, no further action is required. Trees and shrubs within the construction footprint that have been determined to be unoccupied by roosting bats, or that are located outside the avoidance buffer for active roosting sites may be removed. Roosting initiated during construction is presumed to be unaffected, and no buffer would be necessary.			
Impact BIO-2: Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the CDFW or USFWS.	**EBMUD's Standard Construction Specification 01 35 44, Environmental Requirements** *Section 1.1(B), Site Activities* (Details as listed under Impact AES-3) *Section 1.3(A), Storm Water Management* (Details as listed under Impact BIO-1) *Section 1.3(B), Water Control and Disposal Plan* (Details as listed under Impact BIO-1)	EBMUD and EBMUD's Contractors	EBMUD	Prior to and During Construction

TABLE E-1 (CONTINUED)
EBMUD PRACTICES AND PROCEDURES MONITORING AND REPORTING PLAN

Impact Area	EBMUD Practices and Procedures[1]	Responsibility for Implementation	Responsibility for Monitoring and/or Enforcement	Timing of Implementation
Biological Resources (cont.)				
Impact BIO-3: Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.	**EBMUD's Standard Construction Specification 01 35 44, Environmental Requirements** *Section 1.1(B), Site Activities* (Details as listed under Impact AES-3) *Section 1.3(A), Storm Water Management* (Details as listed under Impact BIO-1) *Section 1.3(B), Water Control and Disposal Plan* (Details as listed under Impact BIO-1)	EBMUD and EBMUD's Contractors	EBMUD	Prior to and During Construction
Impact BIO-5: Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.	**EBMUD's Standard Construction Specification 01 35 44, Environmental Requirements** *Section 1.1(B), Site Activities* (Details as listed under Impact AES-3) *Section 1.3(A), Storm Water Management* (Details as listed under Impact BIO-1) *Section 1.3(B), Water Control and Disposal Plan* (Details as listed under Impact BIO-1) *Section 3.7, Protection of Native and Non-Native Protected Trees* (Details as listed under Impact AES-3) *Section 3.8, Protection of Birds Protected Under the Migratory Bird Treaty Act and Roosting Bats* (Details as listed under Impact BIO-1)	EBMUD and EBMUD's Contractors	EBMUD	Prior to and During Construction
Cultural Resources				
Impact CUL-2: Cause a substantial adverse change in the significance of an archaeological resource, pursuant to *CEQA Guidelines* Section 15064.5.	**EBMUD's Standard Construction Specification 01 35 44, Environmental Requirements** *Section 3.9, Protection of Cultural and Paleontological Resources* A. Confidentiality of Information on Cultural Resources 1. Prior to, or during the course of the Contractor's performance under this contract, the Contractor may obtain information as to the location and/or nature of certain cultural resources, including Native American artifacts and remains. This information may be provided to the Contractor by the District or a third party, or may be discovered directly by the Contractor through its performance under the contract. All such information shall be considered "Confidential Information" for the purposes of this Article. 2. The Contractor agrees that the Contractor, its subcontractors of any tiers, and their respective agents and employees shall not publish or disclose any Confidential Information to any person, unless specifically authorized in advance, in writing by the Engineer. 3. The indemnity obligations of Document 00 72 00 - General Conditions Article 4.7.5 shall apply to any breach of this Article.	EBMUD and EBMUD's Contractors	EBMUD	Prior to and During Construction

TABLE E-1 (CONTINUED)
EBMUD PRACTICES AND PROCEDURES MONITORING AND REPORTING PLAN

Impact Area	EBMUD Practices and Procedures[1]	Responsibility for Implementation	Responsibility for Monitoring and/or Enforcement	Timing of Implementation
Cultural Resources (cont.)				
Impact CUL-2 (cont.)	B. Conform to the requirements of statutes as they relate to the protection and preservation of cultural and paleontological resources. Unauthorized collection of prehistoric or historic artifacts or fossils along the Work Area, or at Work facilities, is strictly prohibited. C. Before beginning construction, all Contractor construction personnel shall attend a cultural resources training course provided by the District of up to two hours for site supervisors, foreman, project managers, and non-supervisory contractor personnel. The training program will be completed in person or by watching a video, at a District designated location, conducted by a qualified archaeologist provided by the District, or by District staff. The program will discuss cultural resources awareness within the project work limits, including the responsibilities of Contractor’s construction personnel, applicable mitigation measures, confidentiality, and notification requirements. The Contractor is responsible for ensuring that all workers requiring training are identified to the District. Prior to accessing the construction site, or performing site work, all Contractor personnel shall: 1. Sign an attendance sheet provided by the Engineer verifying that all Contractor construction personnel have attended the appropriate level of training; have read and understood the contents of the training; have read and understood the contents of the “Confidentiality of Information on Archaeological Resources” and shall comply with all project environmental requirements. D. In the event that potential cultural or paleontological resources are discovered at the site of construction, the following procedures shall be instituted: 1. Discovery of prehistoric or historic-era archaeological resources requires that all construction activities shall immediately cease at the location of discovery and within 100 feet of the discovery. a. The Contractor shall immediately notify the Engineer who will engage a qualified archaeologist provided by the District to evaluate the find. The Contractor is responsible for stopping work and notifying the Engineer, and shall not recommence work until authorized to do so by the Engineer. b. The District will retain a qualified archaeologist to inspect the findings within 24 hours of discovery. If it is determined that the Project could damage a historical resource as defined by CEQA (or a historic property as defined by the National Historic Preservation Act of 1966, as amended), construction shall cease in an area determined by the archaeologist until a management plan has been prepared, approved by the District, and implemented to the satisfaction of the archaeologist (and Native American representative if the resource is prehistoric, who shall be identified by the Native American Heritage Commission [NAHC]). In consultation with the District, the archaeologist (and Native American representative) will determine when construction can resume. 2. Discovery of human remains requires that all construction activities immediately cease at, and within 100 feet of the location of discovery.			

TABLE E-1 (CONTINUED)
EBMUD PRACTICES AND PROCEDURES MONITORING AND REPORTING PLAN

Impact Area	EBMUD Practices and Procedures[1]	Responsibility for Implementation	Responsibility for Monitoring and/or Enforcement	Timing of Implementation
Cultural Resources (cont.)				
Impact CUL-2 (cont.)	a. The Contractor shall immediately notify the Engineer who will engage a qualified archaeologist provided by the District to evaluate the find. The Contractor is responsible for stopping work and notifying the Engineer, and shall not recommence work until authorized to do so by the Engineer. b. The District will contact the County Coroner to determine whether or not the remains are Native American. If the remains are determined to be Native American, the Coroner will contact the Native American Heritage Commission (NAHC). The NAHC will then identify the person or persons it believes to be the most likely descendant from the deceased Native American, who in turn would make recommendations to the District for the appropriate means of treating the human remains and any associated funerary objects. 3. Discovery of paleontological resources requires that all construction activities immediately cease at, and within 100 feet of the location of discovery. a. The Contractor shall immediately notify the Engineer who will engage a qualified paleontologist provided by the District to evaluate the find. The Contractor is responsible for stopping work and notifying the Engineer, and shall not recommence work until authorized to do so by the Engineer. b. The District will retain a qualified paleontologist to inspect the findings within 24 hours of discovery. The qualified paleontologist, in accordance with Society of Vertebrate Paleontology guidelines (Society of Vertebrate Paleontology 2010), will assess the nature and importance of the find and recommend appropriate salvage, treatment, and future monitoring and management. If it is determined that construction activities could damage a paleontological resource as defined by the Society of Vertebrate Paleontology guidelines (Society of Vertebrate Paleontology 2010), construction shall cease in an area determined by the paleontologist until a salvage, treatment, and future monitoring and management plan has been prepared, approved by the District, and implemented to the satisfaction of the paleontologist. In consultation with the paleontologist, the District will determine when construction can resume. E. If the District determines that the find requires further evaluation, at the direction of Engineer, the Contractor shall suspend all construction activities at the location of the find and within a larger radius, as required.			
Impact CUL-3: Disturb any human remains, including those interred outside of dedicated cemeteries.	**EBMUD's Standard Construction Specification 01 35 44, Environmental Requirements** *Section 3.9, Protection of Cultural and Paleontological Resources* (Details as listed under Impact CUL-2)	EBMUD and EBMUD's Contractors	EBMUD	Prior to and During Construction

TABLE E-1 (CONTINUED)
EBMUD PRACTICES AND PROCEDURES MONITORING AND REPORTING PLAN

Impact Area	EBMUD Practices and Procedures[1]	Responsibility for Implementation	Responsibility for Monitoring and/or Enforcement	Timing of Implementation
Cultural Resources (cont.)				
Impact CUL-4: Cause a substantial adverse change in the significance of a tribal cultural resource as defined in PRC Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe.	**EBMUD's Standard Construction Specification 01 35 44, Environmental Requirements** *Section 3.9, Protection of Cultural and Paleontological Resources* (Details as listed under Impact CUL-2)	EBMUD and EBMUD's Contractors	EBMUD	Prior to and During Construction
Energy				
Impact EN-1: Result in wasteful, inefficient, or unnecessary consumption of energy resources during Project construction or operation.	**EBMUD's Standard Construction Specification 01 35 44, Environmental Requirements** *Section 3.4(A), Air Quality and Emissions Control* (Details as listed under Impact AIR-1)	EBMUD and EBMUD's Contractors	EBMUD	Prior to and During Construction
Geology and Soils				
Impact GEO-1: Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving: strong seismic groundshaking; seismic-related ground failure (liquefaction, lateral spreading); or landslides.	**EBMUD's Engineering Standard Practice 550.1, Seismic Design Requirements and 512.1, Water Main and Services Design Criteria** EBMUD uses two primary Engineering Standard Practices for the design of water pipelines in its distribution system to address geologic hazards. Engineering Standard Practice 512.1, Water Main and Services Design Criteria, establishes basic criteria for the design of water pipelines and establishes minimum requirements for pipeline construction materials. Engineering Standard Practice 550.1, Seismic Design Requirements, addresses seismic design of the pipelines to withstand seismic hazards, including fault rupture, ground shaking, liquefaction-related phenomena, landslides, seiches and tsunamis and requires that EBMUD establish project-specific seismic design criteria for pipelines with a diameter of greater than 12 inches.	EBMUD and EBMUD's Contractors	EBMUD	Prior to and During Construction
Impact GEO-2: Result in substantial soil erosion or the loss of topsoil.	**EBMUD's Standard Construction Specification 01 35 44, Environmental Requirements** *Section 1.1(B), Site Activities* (Details as listed under Impact AES-1) *Section 1.3(A) Storm Water Management* (Details as listed under Impact BIO-1)	EBMUD and EBMUD's Contractors	EBMUD	Prior to and During Construction

TABLE E-1 (CONTINUED)
EBMUD PRACTICES AND PROCEDURES MONITORING AND REPORTING PLAN

Impact Area	EBMUD Practices and Procedures[1]	Responsibility for Implementation	Responsibility for Monitoring and/or Enforcement	Timing of Implementation
Geology and Soils (cont.)				
Impact GEO-3: Be located on strata or soil that is unstable or that would become unstable as a result of the Project, and potentially could result in on-site or off-site landslides, lateral spreading, subsidence (i.e., settlement), liquefaction, or collapse.	**EBMUD's Standard Construction Specification 01 35 24, Project Safety Requirements** *Section 1.3(C), Excavation Safety Plan* 1. Submit detailed plan for worker protection and control of ground movement for the Engineer's review prior to any excavation work at jobsite. Include drawings and details of system or systems to be used, area in which each type of system will be used, de-watering, means of access and egress, storage of materials, and equipment restrictions. If plan is modified or changed, submit revised plan. 2. All surface encumbrances that are located and determined to create a hazard to employees shall be removed or supported, as necessary, to safeguard employees. 3. Tunnel work shall comply with the Tunnel Safety Orders.	EBMUD and EBMUD's Contractors	EBMUD	Prior to and During Construction
Impact GEO-4: Be located on expansive soil creating substantial direct or indirect risks to life or property.	**EBMUD's Engineering Standard Practice 550.1, Seismic Design Requirements and 512.1, Water Main and Services Design Criteria** (Details as listed under Impact GEO-1)	EBMUD and EBMUD's Contractors	EBMUD	Prior to and During Construction
Impact GEO-5: Directly or indirectly destroy a unique paleontological resources or site or unique geologic feature.	**EBMUD's Standard Construction Specification 01 35 44, Environmental Requirements** *Section 3.9, Protection of Cultural and Paleontological Resources* (Details as listed under Impact CUL-2)	EBMUD and EBMUD's Contractors	EBMUD	Prior to and During Construction
Greenhouse Gas Emissions				
Impact GHG-1: Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment.	**EBMUD's Standard Construction Specification 01 35 44, Environmental Requirements** *Section 3.4(A), Air Quality and Emissions Control* (Details as previously under Impact AIR-1)	EBMUD and EBMUD's Contractors	EBMUD	Prior to and During Construction
Impact GHG-2: Conflict with a plan, policy, or regulation adopted for the purpose of reducing GHG emissions.	**EBMUD's Standard Construction Specification 01 35 44, Environmental Requirements** *Section 3.4(A), Air Quality and Emissions Control* (Details as previously under Impact AIR-1)	EBMUD and EBMUD's Contractors	EBMUD	Prior to and During Construction

TABLE E-1 (CONTINUED)
EBMUD PRACTICES AND PROCEDURES MONITORING AND REPORTING PLAN

Impact Area	EBMUD Practices and Procedures[1]	Responsibility for Implementation	Responsibility for Monitoring and/or Enforcement	Timing of Implementation
Hazards and Hazardous Materials				
Impact HAZ-1 and **HAZ-2:** Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the likely release of hazardous materials into the environment.	**EBMUD's Standard Construction Specification 01 35 24, Project Safety Requirements** *Section 1.3, Submittal of Plans and Procedures* B. Project Safety and Health Plan 1. Submit prior to start of the Work for the Engineer's review a Project Safety and Health Plan for the Work to be performed only if actual, potential, or anticipated hazards include: a) hazardous substances; b) fall protection issues; c) confined spaces; d) trenches or excavations; or, e) lockout/tagout. If the actual, potential, or anticipated hazards do not include one or more of these five hazards, no Plan is required 2. Submit prior to start of Work the name of individual(s) who has been designated as: a. Contractor's Project Safety and Health Representative b. Submit principal and alternate Competent/Qualified Persons for: 1) scaffolding; 2) fall protection systems and equipment; and 3) employee protective systems for trenches and excavations. c. Qualified person to conduct and take samples and air measurements of known or suspect hazardous substance for personnel and environmental exposure. Sample results shall be submitted to the Engineer in writing and electronic format. 3. Plan shall include an emergency action plan in the event of an accident, or serious unplanned event (e.g.: gasoline break, fire, structure collapse, etc.) that requires notifying any responsive agencies (e.g.: fire departments, PG&E, rescue teams, etc.). **EBMUD's Standard Construction Specification 01 35 44, Environmental Requirements** *Section 1.1(B) Site Activities* (Details as listed under Impact AES-1) *Section 1.3(A), Storm Water Management* (Details as listed under Impact BIO-1) *Section 1.3(B), Water Control and Disposal Plan* (Details as listed under Impact BIO-1) *Section 1.3(C) Construction and Demolition Waste Disposal Plan* 1. Prepare a Construction and Demolition Waste Disposal Plan and submit a copy of the plan for the Engineer's acceptance prior to disposing of any material (except for water wastes which shall be addressed in the Water Control and Disposal Plan). a. The plan shall identify how the Contractor will remove, handle, transport, and dispose of all materials required to be removed under this contract in a safe, appropriate, and lawful manner in compliance with all applicable regulations of local, state, and federal agencies having jurisdiction over the disposal of removed materials. b. The Contractor shall procure the necessary permits required by the local, state, and federal agencies having jurisdiction over the handling, transportation, and disposal of construction and demolition waste.	EBMUD and EBMUD's Contractors	EBMUD	Prior to and During Construction

TABLE E-1 (CONTINUED)
EBMUD PRACTICES AND PROCEDURES MONITORING AND REPORTING PLAN

Impact Area	EBMUD Practices and Procedures[1]	Responsibility for Implementation	Responsibility for Monitoring and/or Enforcement	Timing of Implementation
Hazards and Hazardous Materials (cont.)				
Impact HAZ-1 and **HAZ-2** (cont.)	c. Include a list of reuse facilities, recycling facilities and processing facilities that will be receiving recovered materials. d. Identify materials that are not recyclable or not recovered which will be disposed of in a landfill (or other means acceptable by the State of California and local ordinance and regulations). e. Identify how the Contractor will comply with The California Department of Toxic Substances Control's (DTSC) Alternative Management Strategies (AMS) when handling and disposing of treated wood waste (TWW) in compliance with 22 CCR 66261.9.5. f. TWW records including but not limited to manifests, bills of lading should be submitted to the Engineer within 5 working days of off-haul. Records should include: (1) name and address of the TWW facility to which the TWW was sent; (2) estimated weight of TWW, or the weight of the TWW as measured by the receiving TWW facility; and (3) date of the shipment of TWW. (Cal. Code Regs., tit. 22, §§ 67386.8(a) and (e)(1)). g. List the permitted landfill, or other permitted disposal facilities, that will be accepting the disposed waste materials. h. Identify each type of waste material to be reused, recycled or disposed of and estimate the amount, by weight. i. Plan shall include the sampling and analytical program for characterization of any waste material, as needed, prior to reuse, recycle or disposal. 2. Materials or wastes shall only be recycled, reused, reclaimed, or disposed of at facilities approved of by the District. 3. Submit permission to reuse, recycle, reclaim, or dispose of material from reuse, recycling, reclamation, or disposal site owner along with any other information needed by the District to evaluate the acceptability of the proposed reuse, recycling, or disposal site and obtain acceptance of the Engineer prior to removing any material from the project site. 4. All information pertinent to the characterization of the material or waste shall be disclosed to the District and the reuse, recycling, reclamation, or disposal facility. Submit copies of any profile forms and/or correspondence between the Contractor and the reuse, recycling, reclamation, or disposal facility. 5. Submit name and Environmental Laboratory Accreditation Program Certificate number of laboratory that will analyze samples for suspected hazardous substances. Include statement of laboratory's certified testing areas and analyses that laboratory is qualified to perform. Submit prior to any laboratory testing.			

TABLE E-1 (CONTINUED)
EBMUD PRACTICES AND PROCEDURES MONITORING AND REPORTING PLAN

Impact Area	EBMUD Practices and Procedures[1]	Responsibility for Implementation	Responsibility for Monitoring and/or Enforcement	Timing of Implementation
Hazards and Hazardous Materials (cont.)				
Impact HAZ-1 and **HAZ-2** (cont.)	*Section 1.3(D), Spill Prevention and Response Plan* 1. Submit plan detailing the means and methods for preventing and controlling the spilling of known hazardous substances used on the jobsite or staging areas. The plan shall include a list of the hazardous substances proposed for use or generated by the Contractor on site, including petroleum products, and measures that will be taken to prevent spills, monitor hazardous substances, and provide immediate response to spills. Spill response measures shall address notification of the Engineer and appropriate agencies including phone numbers; spill-related worker, public health, and safety issues; spill control, and spill cleanup. 2. Submit a Safety Data Sheet (SDS) for each hazardous substance proposed to be used prior to delivery of the material to the jobsite. **EBMUD's Standard Construction Specification 02 82 13, Asbestos Control Activities** *Section 1.1, Compliance and Intent* (As detailed under Impact AIR-1) *Section 1.5(B), Plan of Action* (As detailed under Impact AIR-1) **EBMUD's Standard Construction Specification 02 83 13, Lead Hazard Control Activities** *Section 1.1, Compliance and Intent* A. Furnish all labor, materials, facilities, equipment, services, employee training and testing, permits, and agreements necessary to perform the lead removal in accordance with these specifications and with the latest regulations from the U.S. Environmental Protection Agency (EPA), the Occupational Safety and Health Administration (OSHA), the Air Quality Management District with authority over the project, the Cal/EPA Department of Toxic Substance Control, the California Occupational Safety and Health Administration (Cal/OSHA), and other federal, state, county, and local agencies. Whenever there is a conflict or overlap of the above references, the most stringent provision is applicable. B. During demolition procedures, the Contractor shall protect against contamination of soils, water, adjacent buildings and properties, and the airborne release of hazardous materials and dusts. The costs associated with the implementation of controls will be incurred by the Contractor. C. Any information developed from exploratory work done by the District and any investigation done by the Contractor to acquaint himself with available information will not relieve the Contractor from the responsibility of properly estimating the difficulty or cost of successfully performing the work. The District is not responsible for any conclusions or interpretations made by the Contractor based on the information made available by the District or District's representative. D. Hazardous materials uncovered during the demolition activities shall be disposed of in an approved manner complying with all applicable federal, state, and local regulations. Appropriate waste manifests shall be furnished to the Engineer as per Section 01 35 44, Environmental Requirements. Materials are conveyed to the Contractor "as is," without any warranty, expressed or implied, including but not limited to, any warranty to marketability or fitness for a particular purpose, or any purpose.			

TABLE E-1 (CONTINUED)
EBMUD PRACTICES AND PROCEDURES MONITORING AND REPORTING PLAN

Impact Area	EBMUD Practices and Procedures[1]	Responsibility for Implementation	Responsibility for Monitoring and/or Enforcement	Timing of Implementation
Hazards and Hazardous Materials (cont.)				
Impact HAZ-1 and **HAZ-2** (cont.)	*Section 1.4, Submittals (Pre-Job)* A. Site safety plan: The Contractor shall provide a site safety plan prior to project initiation as specified in Section 01 35 24. B. Lead Demolition Plan: Lead-containing coating handling, engineering control, removal, and disposal procedures. C. Cal/OSHA Lead Work Pre-Job Notification, if required. D. Submittal of worker documentation for employees used on the job. 1. Lead-Containing Coating Demolition Work: All Contractor's supervisors and workers performing lead-containing coating work shall meet the requirements of the California Department of Health Services (DHS) lead-related construction interim certification (17 CCR 350001). E. Licenses: Submit copies of state and local licenses and evidence of Cal-OSHA certification and permits necessary to perform the work of this contract. F. Submit name and Environmental Laboratory Accreditation Program Certificate number of laboratory that will test samples collected during air monitoring. See Article 3.2 below.			
Impact HAZ-3: Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.	**EBMUD's Standard Construction Specification 01 35 24, Project Safety Requirements** *Section 1.3(B), Project Safety and Health Plan* (Details as listed under Impact HAZ-1 and HAZ-2) **EBMUD's Standard Construction Specification 01 35 44, Environmental Requirements** *Section 1.3(C) Construction and Demolition Waste Disposal Plan* (Details as listed under Impact HAZ-1 and HAZ-2) *Section 1.3(D), Spill Prevention and Response Plan* (Details as listed under Impact HAZ-1 and HAZ-2)	EBMUD and EBMUD's Contractors	EBMUD	Prior to and During Construction
Impact HAZ-4: Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.	**EBMUD's Standard Construction Specification 01 35 24, Project Safety Requirements** *Section 1.3(B), Project Safety and Health Plan* (Details as listed under Impact HAZ-1 and HAZ-2) **EBMUD's Standard Construction Specification 01 55 26, Traffic Regulation** *Section 1.2, Submittals* (Details listed under Impact TRA-1)	EBMUD and EBMUD's Contractors	EBMUD	Prior to and During Construction
Hydrology and Water Quality				
Impact HYD-1: Violate water quality standards or waste discharge requirements, or otherwise substantially degrade water quality.	**EBMUD's Standard Construction Specification 01 35 44, Environmental Requirements** *Section 1.1(B), Site Activities* (Details as previously listed under Impact AES-3) *Section 1.3(A), Storm Water Management* (Details as previously listed under Impact BIO-1) *Section 1.3(B), Water Control and Disposal Plan* (Details as previously listed under Impact BIO-1)	EBMUD and EBMUD's Contractors	EBMUD	Prior to and During Construction

TABLE E-1 (CONTINUED)
EBMUD PRACTICES AND PROCEDURES MONITORING AND REPORTING PLAN

Impact Area	EBMUD Practices and Procedures[1]	Responsibility for Implementation	Responsibility for Monitoring and/or Enforcement	Timing of Implementation
Hydrology and Water Quality (cont.)				
Impact HYD-3a: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner that would result in substantial erosion or siltation on or off site.	**EBMUD's Standard Construction Specification 01 35 44, Environmental Requirements** *Section 1.3(A), Storm Water Management* (Details as previously listed under Impact BIO-1) *Section 1.3(B), Water Control and Disposal Plan* (Details as previously listed under Impact BIO-1)	EBMUD and EBMUD's Contractors	EBMUD	Prior to and During Construction
Impact HYD-3b: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or through the addition of impervious surfaces, in a manner that would substantially increase the rate or amount of surface run-off and result in flooding on or off site.	**EBMUD's Standard Construction Specification 01 35 44, Environmental Requirements** *Section 1.1(B), Site Activities* (Details as listed under Impact AES-3)	EBMUD and EBMUD's Contractors	EBMUD	Prior to and During Construction
Impact HYD-3c: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or through the addition of impervious surfaces, in a manner that would create or contribute run-off water that exceeds the capacity of existing or planned stormwater drainage systems, or provide substantial additional sources of polluted run-off.	**EBMUD's Standard Construction Specification 01 35 44, Environmental Requirements** *Section 1.1(B), Site Activities* (Details as previously listed under Impact AES-3) *Section 1.3(A), Storm Water Management* (Details as previously listed under Impact BIO-1) *Section 1.3(B), Water Control and Disposal Plan* (Details as previously listed under Impact BIO-1) *Section 1.3(D), Spill Prevention and Response Plan* (Details as previously listed under Impact HAZ-1 and HAZ-2)	EBMUD and EBMUD's Contractors	EBMUD	Prior to and During Construction

TABLE E-1 (CONTINUED)
EBMUD PRACTICES AND PROCEDURES MONITORING AND REPORTING PLAN

Impact Area	EBMUD Practices and Procedures[1]	Responsibility for Implementation	Responsibility for Monitoring and/or Enforcement	Timing of Implementation
Hydrology and Water Quality (cont.)				
Impact HYD-3d: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or through the addition of impervious surfaces, in a manner that would impede or redirect flood flows.	**EBMUD's Standard Construction Specification 01 35 44, Environmental Requirements** *Section 1.3(A), Storm Water Management* (Details as listed under Impact BIO-1) *Section 1.3(B), Water Control and Disposal Plan* (Details as listed under Impact BIO-1) *Section 1.3(D), Spill Prevention and Response Plan* (Details as listed under Impact HAZ-1 and HAZ-2)	EBMUD and EBMUD's Contractors	EBMUD	Prior to and During Construction
Impact HYD-4: Conflict with or obstruct implementation of a Water Quality Control Plan or Sustainable Groundwater Management Plan.	**EBMUD's Standard Construction Specification 01 35 44, Environmental Requirements** *Section 1.1(B), Site Activities* (Details as listed under Impact AES-3)	EBMUD and EBMUD's Contractors	EBMUD	Prior to and During Construction
Noise				
Impact NOI-1: Result in the generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.	**EBMUD's Standard Construction Specification 01 14 00, Work Restrictions** *Section 1.8, Construction Noise* A. Noise-generating activities greater than 90 dBA (impact construction such as concrete breaking, concrete crushing, tree grinding, etc.) shall be limited to the hours of 8:00 a.m. and 4:00 p.m., Monday through Friday. **EBMUD's Standard Construction Specification 01 35 44, Environmental Requirements** *Section 1.3(G), Noise Control and Monitoring Plan* 1. Submit a plan detailing the means and methods for controlling and monitoring noise generated by construction activities, including demolition, alteration, repair or remodeling of or to existing structures and construction of new structures, as well as by items of machinery, equipment or devices used during construction activities on the site for the Engineer's acceptance prior to any work at the jobsite. The plan shall detail the equipment and methods used to monitor compliance with the plan. *Section 3.6, Noise Control* A. Comply with sound control and noise level rules, regulations and ordinances as required herein and in the CEQA documents which apply to any work performed pursuant to the contract. B. Contractor is responsible for taking appropriate measures, including muffling of equipment, selecting quieter equipment, erecting noise barriers, modifying work operations, and other measures as needed to bring construction noise into compliance.	EBMUD and EBMUD's Contractors	EBMUD	Prior to and During Construction

TABLE E-1 (CONTINUED)
EBMUD PRACTICES AND PROCEDURES MONITORING AND REPORTING PLAN

Impact Area	EBMUD Practices and Procedures[1]	Responsibility for Implementation	Responsibility for Monitoring and/or Enforcement	Timing of Implementation
Noise (cont.)				
Impact NOI-1 (cont.)	C. Each internal combustion engine, used for any purpose on the job or related to the job, shall be equipped with a muffler of a type recommended by the manufacturer. No internal combustion engine shall be operated on the project without said muffler. D. Best available noise control techniques (including mufflers, intake silencers, ducts, engine enclosures, and acoustically attenuating shields or shrouds) shall be used for all equipment and trucks, as necessary. E. Truck operations (haul trucks and concrete delivery trucks) will be limited to the daytime hours specified in Section 01 14 00. F. Stationary noise sources (e.g. chippers, grinders, compressors) shall be located as far from sensitive receptors as possible. If they must be located near receptors, adequate muffling (with enclosures) shall be used. Enclosure opening or venting shall face away from sensitive receptors. Enclosures shall be designed by a registered engineer regularly involved in noise control analysis and design. G. Material stockpiles as well as maintenance/equipment staging and parking areas (all on-site) shall be located as far as practicable from residential receptors. H. If impact equipment (e.g., jack hammers, pavement breakers, rock drills etc.) is used during project construction, Contractor is responsible for taking appropriate measures, including but not limited to the following: 1. Hydraulically or electric-powered equipment shall be used wherever feasible to avoid the noise associated with compressed-air exhaust from pneumatically powered tools. However, where use of pneumatically powered tools is unavoidable, an exhaust muffler on the compressed-air exhaust shall be used (a muffler can lower noise levels from the exhaust by up to about 10 dB). External jackets on the tools themselves shall be used, where feasible, which could achieve a reduction of 5 dB. Quieter procedures, such as drilling rather than impact equipment, will be used whenever feasible. It is the Contractor's responsibility to implement any measures necessary to meet applicable noise requirements. 2. Impact construction including jackhammers, hydraulic backhoe, concrete crushing/recycling activities, vibratory pile drivers etc. shall be limited to the day time hours specified in Section 01 14 00. 3. Limit the noisiest phases of construction to 10 work days at a time, where feasible. 4. Notify neighbors/occupants within 300 feet of project construction at least thirty days in advance of extreme noise generating activities about the estimated duration of the activity. 5. Noise Monitoring shall be conducted periodically during noise generating activities. Monitoring shall be conducted using a precision sound-level meter that is in conformance with the American National Standards Institute (ANSI) Standard S1.4, Specification for Sound Level Meters. Monitoring results shall be submitted weekly to the Engineer.			

TABLE E-1 (CONTINUED)
EBMUD PRACTICES AND PROCEDURES MONITORING AND REPORTING PLAN

Impact Area	EBMUD Practices and Procedures[1]	Responsibility for Implementation	Responsibility for Monitoring and/or Enforcement	Timing of Implementation
Noise (cont.)				
Impact NOI-2: Result in the generation of excessive groundborne vibration or groundborne noise levels.	**EBMUD's Standard Construction Specification 01 35 44, Environmental Requirements** *Section 1.3(H), Vibration Control and Monitoring Plan* 1. Submit a plan detailing the means and methods for controlling and monitoring surface vibration generated by demolition or other work on site for the Engineer's acceptance prior to any work at the jobsite. The plan shall detail the equipment and methods used to monitor compliance with the plan. *Section 3.5, Vibration Control* A. Limit surface vibration to no more than 0.5 in/sec PPV, measured at the nearest residence or other sensitive structure. See Section 01 14 00. B. Upon homeowner request, and with homeowner permission, the District will conduct preconstruction surveys of homes, sensitive structures and other areas of concern within 15 feet of continuous vibration-generating activities (i.e. vibratory compaction). Any new cracks or other changes in structures will be compared to preconstruction conditions and a determination made as to whether the proposed project could have caused such damage. In the event that the project is demonstrated to have caused the damage, the District will have the damage repaired to the pre-existing condition.	EBMUD and EBMUD's Contractors	EBMUD	Prior to and During Construction
Transportation				
Impact TRA-1: Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities.	**EBMUD's Standard Construction Specification 01 55 26, Traffic Regulation** *Section 1.1, Description* A. All proposed street closures shall be clearly identified in the Traffic Control Plan (TCP) and shall conform to the section "Traffic Control Devices" below. Construction area signs for street closure and detours shall be posted a minimum of forty-eight (48) hours prior to the commencement of street closure. Contractor shall maintain safe access around the project limit at all times. Street closures shall be limited to those locations indicated on the construction documents. *Section 1.2 Submittals* A. Submit at least 15 calendar days prior to work a detailed traffic control plan, that is approved by all agencies having jurisdiction and that conforms to all requirements of these specifications and the most recently adopted edition of the California Manual on Uniform Control Devices. Traffic Control Plan shall include: 1. Circulation and detour plans to minimize impacts to local street circulation. Use haul routes minimizing truck traffic on local roadways to the extent possible. 2. A description of emergency response vehicle access. If the road or area is completely blocked, preventing access by an emergency responder, a contingency plan must be included. 3. Procedures, to the extent feasible, to schedule construction of project elements to minimize overlapping construction phases that require truck hauling.	EBMUD and EBMUD's Contractors	EBMUD	Prior to and During Construction

TABLE E-1 (CONTINUED)
EBMUD PRACTICES AND PROCEDURES MONITORING AND REPORTING PLAN

Impact Area	EBMUD Practices and Procedures[1]	Responsibility for Implementation	Responsibility for Monitoring and/or Enforcement	Timing of Implementation
Transportation (cont.)				
Impact TRA-1 (cont.)	4. Designated Contractor staging areas for storage of all equipment and materials, in such a manner to minimize obstruction to traffic. 5. Locations for parking by construction workers. *Section 2.1, Traffic Control Devices* A. Traffic signs, flashing lights, barricades and other traffic safety devices used to control traffic shall conform to the requirements of the most recently adopted edition of the California Manual on Uniform Control Devices and the agency having jurisdiction. 1. Portable signals shall not be used unless permission is given in writing by the agency having jurisdiction. 2. Warning signs used for nighttime conditions shall be reflectorized or illuminated. "Reflectorized signs" shall have a reflectorized background and shall conform to the current State of California Department of Transportation specification for reflective sheeting on highway signs. *Section 3.1, General* A. Install temporary traffic markings where required to direct the flow of traffic. Maintain the traffic markings for the duration of need and remove by abrasive blasting when no longer required. *Section 3.2, Alternating On-Way Traffic* A. Where alternating one-way traffic has been authorized, the following shall be posted at each end of the one-way traffic section at least one week prior to start of work: 1. The approximate beginning and ending dates that traffic delays will be encountered. 2. The maximum time that traffic will be delayed. *Section 3.3, Flagging* A. Provide flaggers to control traffic where required by the approved traffic control plan. 1. Flaggers shall perform their duties and shall be provided with the necessary equipment in accordance with the current "Instructions to Flaggers" of the California Department of Transportation.			
Impact TRA-3: Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).	**EBMUD's Standard Construction Specification 01 55 26, Traffic Regulation** (Details as listed under Impact TRA-1)	EBMUD and EBMUD's Contractors	EBMUD	Prior to and During Construction

TABLE E-1 (CONTINUED)
EBMUD PRACTICES AND PROCEDURES MONITORING AND REPORTING PLAN

Impact Area	EBMUD Practices and Procedures[1]	Responsibility for Implementation	Responsibility for Monitoring and/or Enforcement	Timing of Implementation
Transportation (cont.)				
Impact TRA-4: Result in inadequate emergency access.	**EBMUD's Standard Construction Specification 01 55 26, Traffic Regulation** (Details as listed under Impact TRA-1)	EBMUD and EBMUD's Contractors	EBMUD	Prior to and During Construction

NOTES:

1 In EBMUD Standard Specifications, "District" = EBMUD; "Engineer" = EBMUD Engineer; "Contractor" = EBMUD Contractor; "Work" = Scope of Work for the Project

TABLE E-2
MITIGATION MONITORING AND REPORTING PROGRAM

Impact Area	Mitigation Measure	Responsible for Implementation	Responsible for Monitoring and/or Enforcement	Timing of Implementation
Aesthetics				
Impact AES-4: Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.	**Mitigation Measure AES-1: Nighttime Lighting Controls.** To the extent possible, EBMUD shall ensure that temporary stationary lighting used during nighttime construction is of limited duration, shielded, and directed downward or oriented such that little or no light is directly visible from nearby residences.	EBMUD and EBMUD's Construction Contractor	EBMUD	For the duration of nighttime construction
Biological Resources				
Impact BIO-1: Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations or by the CDFW or USFWS.	**Mitigation Measure AES-1: Nighttime Lighting Controls.** (Details as listed under Impact AES-4)	EBMUD and EBMUD's Construction Contractor	EBMUD	For the duration of nighttime construction
Noise				
Impact NOI-1: Result in the generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.	**Mitigation Measure NOI-1: Noise Control Measures** EBMUD shall erect a 16-foot tall temporary noise barrier along EBMUD's property adjacent to the Redwood Day School for the entire construction duration. The noise barrier will be Sound Transmission Class (STC) rated and specific to sound attenuation applications. There may be some periods of construction when the noise barrier may be temporarily moved or dismantled to accommodate the Project construction area. EBMUD will schedule construction activities outside of normal school hours when it is feasible to do so if heavy construction equipment, including but not limited to impact equipment, is operated within 100 feet of the closest classroom or if the noise barrier needs to be temporarily removed to accommodate construction.	EBMUD and EBMUD's Construction Contractor	EBMUD	During construction
	Mitigation Measure NOI-2: Off-site Accommodations for Affected Nighttime Receptors At least ten (10) days in advance, EBMUD will notify residents of the Southern Residences that could be affected by nighttime (10:00 p.m. to 7:00 a.m.) pipeline connection construction near the 25th Avenue/East 29th Street intersection. Residences within 500-feet of the pipeline connection construction may request alternative lodging for the night(s) of the potential nighttime construction from EBMUD; alternative lodging will consist of a standard room at a hotel located within 5 miles of the affected residence or as close as feasible. Alternative lodging will be provided and approved by EBMUD the day before the known nighttime construction occurs, or sooner, based upon the types of construction activities that may occur during the nighttime hours (10:00 p.m. to 7:00 a.m.). This measure would only be implemented if nighttime construction occurs.	EBMUD	EBMUD	10 days before and through the duration of nighttime pipeline connection construction

TABLE E-2 (CONTINUED)
MITIGATION MONITORING AND REPORTING PROGRAM

Impact Area	Mitigation Measure	Responsible for Implementation	Responsible for Monitoring and/or Enforcement	Timing of Implementation
Transportation and Circulation				
Impact TRA-1: Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities.	**Mitigation Measure TRA-1: Conduct an operational and safety analysis by a traffic engineer for the Ardley Avenue/new Redwood Day School Driveway intersection for the Redwood Day School Access Driveway Design Option**. To minimize potential conflicts between the existing traffic on Ardley Avenue and the diverted traffic exiting onto Ardley Avenue from the new Redwood Day School Access Driveway Design Option, EBMUD shall as part of any agreement with Redwood Day School require that the school conduct an operational and safety analysis by a traffic engineer for the Ardley Avenue/new Redwood Day School access driveway intersection. The performance standard for the analysis is to minimize potential vehicular, pedestrian, and bicycle conflicts, based on the professional opinion of the traffic engineer and in accordance with City of Oakland Public Works Department standards. At a minimum, the analysis would evaluate the following: • Traffic operational analysis consistent with City of Oakland Public Works Department standards to determine what type of stop-control (e.g., stop sign, traffic signal, etc.) is appropriate. • An evaluation of sight distances for vehicles turning out of the Redwood Day School access driveway to ensure that any turns out of the driveway can be made safely. • An evaluation of pedestrian and bicycle volumes along Ardley Avenue to determine whether signage and/or flashing beacons are warranted to alert driveway users to the presence of pedestrians and bicyclists on Ardley Avenue. • An evaluation of whether signage is warranted along both travel directions of Ardley Avenue in advance of the driveway to alert roadway users of “Driveway Ahead.” • An evaluation of vehicular travel speeds on Ardley Avenue to determine whether traffic calming features such as school signage and/or speed bumps are warranted to slow traffic in the vicinity of the driveway. If the operational and safety analysis concludes that turns out of the driveway can be safely accommodated, and this finding is endorsed by City of Oakland Public Works Department staff, then EBMUD could allow vehicular movements from the driveway onto Ardley Avenue.	EBMUD and EBMUD’s Traffic Engineer	EBMUD	Prior to construction
Impact TRA-3: Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).	**Mitigation Measure TRA-2: As part of the Traffic Control Plan, include traffic control measures for trucks traveling along East 27th Street.** The following measures shall be implemented during the entire duration of the Project construction, to reduce the Project’s temporary impacts on traffic circulation: • Hauling and material delivery trucks and equipment delivery trucks traveling to and from the Project site during construction shall be restricted in both travel directions along East 27th Street between Fruitvale Avenue and 23rd Avenue during the typical Manzanita Community School (2409 East 27th Street) drop-off and pick-up hours. Manzanita Community School is open between 8:30 a.m. and 3:00 p.m., and the peak drop-off and pick-up hours are from 7:30 a.m. to 8:30 a.m. and from 3:00 p.m. to 4:00 p.m., respectively. The construction contractor shall confirm the start and dismissal times prior to the beginning of each school year.	EBMUD and EBMUD’s Construction Contractor	EBMUD	During construction

Impact Area	Mitigation Measure	Responsible for Implementation	Responsible for Monitoring and/or Enforcement	Timing of Implementation
Transportation and Circulation (cont.)				
Impact TRA-3 (cont.)	• If it is not feasible to avoid hauling and material delivery trucks and equipment delivery trucks during school drop-off and pick-up hours, the construction contractor shall provide flaggers at the crosswalks of the East 27th Street/25th Avenue intersections to manage traffic flow and maintain traffic safety. If construction trucks travel along East 27th Street, between 25th Avenue and 23rd Avenue, the construction contractor shall also provide flaggers near the existing white passenger loading zone on East 27th Street between the gate of Manzanita Community School and 25th Avenue.			

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APPENDIX F

Air Quality and Greenhouse Gases Model Output

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NOTE: Cells in PURPLE Have been updated in RFI 4 on June 7, 2018

NOTE: Cells in BLUE Have been updated on June 21, 2018

NOTE: Cells in RED updated on September 5, 2018

DETAILS OF CONSTRUCTION EQUIPMENT AND ACTIVITY (The Phases/Components included below are a draft list; please revise/update as necessary)

Please fill out areas highlighted in yellow

Note that some cells have formulas and will auto populate

Demolition

Site preperation, well abandoment, demo materials bldg.

Construction duration:	15	days
Construction timeline:	match to "Const Phasing" tab	
Construction workers/day:	9	
Worker trips/day	18	
Material Trucks Total	93	
Material Truck Trips/day	12	

Equipment NOTE: Please click on a cell and select equipment from the drop down list	Number	% Useage/day	Hours/day	Total Work Days	Total Run Time (hours)	Assumption (hp)
Air Compressor (1)	1	90%	7.2	15	108	350
Generator – 113 KW (1)	1	90%	7.2	15	108	174
Backhoe - CAT 430F2 (1)	1	80%	6.4	15	96	108
Wheel Loader - CAT 910K (1)	1	80%	6.4	15	96	93
12-in Wood Chipper (1)	1	70%	5.6	15	84	95
Portable Dewatering Pump	1	100%	12.0	14	168	80

DETAILS OF CONSTRUCTION EQUIPMENT AND ACTIVITY (The Phases/Components included below are a draft list; please revise/update as necessary)

Please fill out areas highlighted in yellow

Note that some cells have formulas and will auto populate

Liner Removal

Construction duration:	30	days	
Construction timeline:	match to "Const Phasing" tab		Portable Pump
Construction workers/day:	9		
Worker trips/day	18		
Material Trucks Total	2,962		
Material Truck Trips/day	197		

Equipment NOTE: Please click on a cell and select equipment from the drop down list	Number	% Useage/day	Hours/day	Total Work Days	Total Run Time (hours)	Assumption (hp)
Air Compressor (1)	1	90%	7.2	30	216	350
Generator – 113 KW (1)	1	90%	7.2	30	216	174
Backhoe with Impact Hammer – CAT 430F2 (1)	1	70%	5.6	30	168	108
Wheel Loader - CAT 910K (1)	1	80%	6.4	30	192	93
Volvo Excavators EC350EL (4)	4	70%	5.6	30	168	303
Hitachi Zaxis Excavator (1)	1	70%	5.6	30	168	164
Terex Finlay Crusher J-1170 (1)	1	80%	6.4	30	192	350
Single Axle Portable Conveyor	1	80%	6.4	30	192	67
Water Truck	1	80%	6.4	30	192	300

DETAILS OF CONSTRUCTION EQUIPMENT AND ACTIVITY (The Phases/Components included below are a draft list; please revise/update as necessary)

Please fill out areas highlighted in yellow

Note that some cells have formulas and will auto populate

Roof Removal

Construction duration:	180	days
Construction timeline:	match to "Const Phasing" tab	
Construction workers/day:	9	
Worker trips/day	18	
Material Trucks Total	327	
Material Truck Trips/day	4	

Equipment NOTE: Please click on a cell and select equipment from the drop down list	Number	% Useage/day	Hours/day	Total Work Days	Total Run Time (hours)	Assumption (hp)
Air Compressor (1)	1	90%	7.2	180	1,296	350
Generator – 113 KW (1)	1	90%	7.2	180	1,296	174
Telehandler – CAT TL943D with Stabilizer (1)	1	70%	5.6	180	1,008	111
Backhoe - CAT 430F2 (1)	1	80%	6.4	180	1,152	108
Wheel Loader - CAT 910K (1)	1	80%	6.4	180	1,152	93
Volvo Excavators EC350EL (4)	4	70%	5.6	180	1,008	303
Hitachi Zaxis Excavator (1)	1	70%	5.6	180	1,008	164
Terex Finlay Crusher J-1170 (1)	1	80%	6.4	180	1,152	350
Single Axle Portable Conveyor	1	80%	6.4	180	1,152	67
Water Truck	1	80%	6.4	180	1,152	300

Column Removal

Construction duration:	80	days
Construction timeline:	match to "Const Phasing" tab	
Construction workers/day:	9	
Worker trips/day	18	
Material Trucks Total	281	
Material Truck Trips/day	7	

Equipment NOTE: Please click on a cell and select equipment from the drop down list	Number	% Useage/day	Hours/day	Total Work Days	Total Run Time (hours)	Assumption (hp)
Air Compressor (1)	1	90%	7.2	80	576	350
Generator – 113 KW (1)	1	90%	7.2	80	576	174
Backhoe with Impact Hammer – CAT 430F2 (1)	1	80%	6.4	80	512	108
Wheel Loader - CAT 910K (1)	1	80%	6.4	80	512	93
Terex Finlay Crusher J-1170 (1)	1	80%	6.4	80	512	350
Single Axle Portable Conveyor	1	80%	6.4	80	512	67
Water Truck	1	80%	6.4	80	512	200

DETAILS OF CONSTRUCTION EQUIPMENT AND ACTIVITY (The Phases/Components included below are a draft list; please revise/update as necessary)

Please fill out areas highlighted in yellow

Note that some cells have formulas and will auto populate

Substructure

Excavation

Construction duration:	131	days
Construction timeline:	match to "Const Phasing" tab	
Construction workers/day:	13	
Worker trips/day	26	
Material Trucks Total	0	
Material Truck Trips/day	0	

Equipment NOTE: Please click on a cell and select equipment from the drop down list	Number	% Useage/day	Hours/day	Total Work Days	Total Run Time (hours)	Assumption (hp)
Air Compressor (1)	1	90%	7.2	131	943	350
Generator – 113 KW (1)	1	90%	7.2	131	943	174
Excavator - CAT 330F (2)	2	80%	6.4	131	838	239
Wheel Loader - CAT 910K (2)	2	80%	6.4	131	838	93
Water Truck	1	80%	6.4	131	838	300

CDSM

Construction duration:	196	days
Construction timeline:	match to "Const Phasing" tab	
Construction workers/day:	12	
Worker trips/day	24	
Material Trucks Total	1,046	
Material Truck Trips/day	11	

Equipment NOTE: Please click on a cell and select equipment from the drop down list	Number	% Useage/day	Hours/day	Total Work Days	Total Run Time (hours)	Assumption (hp)
Air Compressor (1)	1	90%	7.2	196	1,411	350
Generator – 113 KW (1)	1	90%	7.2	196	1,411	174
Soil Mixing Rig (1)	1	80%	12.0	196	2,352	755
Wheel Loader - CAT 910K (1)	1	80%	6.4	196	1,254	93
Water Truck	1	80%	6.4	196	1,254	300

DETAILS OF CONSTRUCTION EQUIPMENT AND ACTIVITY (The Phases/Components included below are a draft list; please revise/update as necessary)

Please fill out areas highlighted in yellow

Note that some cells have formulas and will auto populate

Cement Treated Fill

Construction duration:	79	days
Construction timeline:	match to "Const Phasing" tab	
Construction workers/day:	7	
Worker trips/day	14	
Material Trucks Total	1,760	
Material Truck Trips/day	45	

Equipment NOTE: Please click on a cell and select equipment from the drop down list	Number	% Useage/day	Hours/day	Total Work Days	Total Run Time (hours)	Assumption (hp)
Air Compressor (1)	1	90%	7.2	79	569	350
Generator – 113 KW (1)	1	90%	7.2	79	569	174
Soil Mixer/Reclaimer (1)	1	80%	6.4	79	506	500
Spreader Truck (1)	1	80%	6.4	79	506	450
Soil Compactor (1)	1	80%	6.4	79	506	400
Bulk Reagent Tractor/Trailer (1)	1	80%	6.4	79	506	450
Water Truck	1	80%	6.4	79	506	300

Superstructure

Foundation

Construction duration:	72	days
Construction timeline:	match to "Const Phasing" tab	
Construction workers/day:	11	
Worker trips/day	22	
Material Trucks Total	682	
Material Truck Trips/day	19	

Equipment NOTE: Please click on a cell and select equipment from the drop down list	Number	% Useage/day	Hours/day	Total Work Days	Total Run Time (hours)	Assumption (hp)
Air Compressor (1)	1	90%	7.2	72	518	350
Generator – 113 KW (1)	1	90%	7.2	72	518	174
Backhoe - CAT 430F2 (1)	1	80%	6.4	72	461	108
Telehandler – CAT TL943D with Stabilizer (1)	1	70%	5.6	72	403	111
Water Truck	1	80%	6.4	72	461	300

DETAILS OF CONSTRUCTION EQUIPMENT AND ACTIVITY (The Phases/Components included below are a draft list; please revise/update as necessary)

Please fill out areas highlighted in yellow

Note that some cells have formulas and will auto populate

Walls

Construction duration:	97	days
Construction timeline:	match to "Const Phasing" tab	
Construction workers/day:	13	
Worker trips/day	26	
Material Trucks Total	682	
Material Truck Trips/day	14	

Equipment NOTE: Please click on a cell and select equipment from the drop down list	**Number**	**% Useage/day**	**Hours/day**	**Total Work Days**	**Total Run Time (hours)**	**Assumption (hp)**
Air Compressor (1)	1	90%	7.20	97	698	350
Generator – 113 KW (1)	1	90%	7.20	97	698	174
Telehandler – CAT TL943D with Stabilizer (1)	1	80%	6.40	97	621	93
Crane - Liebherr LR1300SX (1)	1	80%	6.40	97	621	523

Roof

Construction duration:	182	days
Construction timeline:	match to "Const Phasing" tab	
Construction workers/day:	11	
Worker trips/day	22	
Material Trucks Total	682	
Material Truck Trips/day	7	

Equipment NOTE: Please click on a cell and select equipment from the drop down list	**Number**	**% Useage/day**	**Hours/day**	**Total Work Days**	**Total Run Time (hours)**	**Assumption (hp)**
Air Compressor (2)	2	90%	7.20	182	1,310	350
Generator – 113 KW (2)	2	90%	7.20	182	1,310	174
Telehandler – CAT TL943D with Stabilizer (2)	2	80%	6.40	182	1,165	93
Crane - Liebherr LR1300SX (1)	1	80%	6.40	182	1,165	523

DETAILS OF CONSTRUCTION EQUIPMENT AND ACTIVITY (The Phases/Components included below are a draft list; please revise/update as necessary)

Please fill out areas highlighted in yellow

Note that some cells have formulas and will auto populate

Shotcrete and Prestressing

Construction duration:	72	days
Construction timeline:	match to "Const Phasing" tab	
Construction workers/day:	11	
Worker trips/day	22	
Material Trucks Total	682	
Material Truck Trips/day	19	

Equipment NOTE: Please click on a cell and select equipment from the drop down list	Number	% Useage/day	Hours/day	Total Work Days	Total Run Time (hours)	Assumption (hp)
Wire-Winding Machine	1	80%	6.4	72	461	325

Valve Structure

Construction duration:	120	days
Construction timeline:	match to "Const Phasing" tab	
Construction workers/day:	3	
Worker trips/day	6	
Material Trucks Total	74	
Material Truck Trips/day	1	Note that the material will likely all be delivered over 1 week

Equipment NOTE: Please click on a cell and select equipment from the drop down list	Number	% Usage/day	Hours/day	Total Work Days	Total Run Time (hours)	Assumption (hp)
Air Compressor (1)	1	90%	7	90	648	350
Generator – 113 KW (1)	1	90%	7	90	648	174
Backhoe - CAT 430F2 (1)	1	80%	6	90	576	108
Crane - Liebherr LR1300SX (1)	1	80%	6	90	576	523

DETAILS OF CONSTRUCTION EQUIPMENT AND ACTIVITY (The Phases/Components included below are a draft list; please revise/update as necessary)

Please fill out areas highlighted in yellow

Note that some cells have formulas and will auto populate

Rate Control Station

Construction duration:	120	days
Construction timeline:	match to "Const Phasing" tab	
Construction workers/day:	5	
Worker trips/day	10	
Material Trucks Total	16	
Material Truck Trips/day	0	Note that the material will likely all be delivered in two days

Equipment NOTE: Please click on a cell and select equipment from the drop down list	Number	% Usage/day	Hours/day	Total Work Days	Total Run Time (hours)	Assumption (hp)
Air Compressor (1)	1	90%	7	90	648	350
Generator – 113 KW (1)	1	90%	7	90	648	174
Backhoe - CAT 430F2 (1)	1	80%	6	90	576	108
Dewatering Pump	1	90%	8	90	720	50

Site Restoration

Final Excavation & Grading

Construction duration:	53	days
Construction timeline:	match to "Const Phasing" tab	
Construction workers/day:	13	
Worker trips/day	26	
Material Trucks Total	0	
Material Truck Trips/day	0	

Equipment NOTE: Please click on a cell and select equipment from the drop down list	Number	% Useage/day	Hours/day	Total Work Days	Total Run Time (hours)	Assumption (hp)
Air Compressor (1)	1	90%	7.2	53	382	350
Generator – 113 KW (1)	1	90%	7.2	53	382	174
Excavator - CAT 330F (2)	2	80%	6.4	53	339	239
Wheel Loader - CAT 910K (2)	2	80%	6.4	53	339	93
Water Truck	1	80%	6.4	53	339	300

DETAILS OF CONSTRUCTION EQUIPMENT AND ACTIVITY (The Phases/Components included below are a draft list; please revise/update as necessary)

Please fill out areas highlighted in yellow

Note that some cells have formulas and will auto populate

Landscaping, Irrigation System, Bio-retention area, Security fence

Construction duration:	15	days
Construction timeline:	match to "Const Phasing" tab	
Construction workers/day:	7	
Worker trips/day	14	
Material Trucks Total	47	
Material Truck Trips/day	6	

Equipment NOTE: Please click on a cell and select equipment from the drop down list	Number	% Useage/day	Hours/day	Total Work Days	Total Run Time (hours)	Assumption (hp)
Air Compressor (1)	1	90%	7.2	15	108	350
Generator – 113 KW (1)	1	90%	7.2	15	108	174
Soil Compactor – CAT 815K (1)	1	75%	6.0	15	90	248
Wheel Loader - CAT 910K (1)	1	80%	6.4	15	96	93
Backhoe - CAT 430F2 (1)	1	80%	6.4	15	96	108

Access Roads & Paving

Construction duration:	15	days
Construction timeline:	match to "Const Phasing" tab	
Construction workers/day:	7	
Worker trips/day	14	
Material Trucks Total	481	
Material Truck Trips/day	64	

Equipment NOTE: Please click on a cell and select equipment from the drop down list	Number	% Useage/day	Hours/day	Total Work Days	Total Run Time (hours)	Assumption (hp)
Air Compressor (1)	1	90%	7.2	15	108	350
Generator – 113 KW (1)	1	90%	7.2	15	108	174
Soil Compactor – CAT 815K (1)	1	75%	6.0	15	90	248
Wheel Loader - CAT 910K (1)	1	80%	6.4	15	96	93
Backhoe - CAT 430F2 (1)	1	80%	6.4	15	96	108
Pavers (1)	1	80%	6.4	15	96	125
Paving Equipment (1)	1	80%	6.4	15	96	130
Rollers (1)	1	80%	6.4	15	96	80

DETAILS OF CONSTRUCTION EQUIPMENT AND ACTIVITY (The Phases/Components included below are a draft list; please revise/update as necessary)

Please fill out areas highlighted in yellow

Note that some cells have formulas and will auto populate

Redwood Day School Access Driveway

Construction duration:	15	days
Construction timeline:	match to "Const Phasing" tab	
Construction workers/day:	7	
Worker trips/day	14	
Material Trucks Total	30	
Material Truck Trips/day	4	

Equipment NOTE: Please click on a cell and select equipment from the drop down list	Number	% Useage/day	Hours/day	Total Work Days	Total Run Time (hours)	Assumption (hp)
Air Compressor (1)	1	90%	7.2	15	108	350
Generator – 113 KW (1)	1	90%	7.2	15	108	174
Soil Compactor – CAT 815K (1)	1	75%	6.0	15	90	248
Wheel Loader - CAT 910K (1)	1	80%	6.4	15	96	93
Backhoe - CAT 430F2 (1)	1	80%	6.4	15	96	108
Pavers (1)	1	80%	6.4	15	96	125
Paving Equipment (1)	1	80%	6.4	15	96	130
Rollers (1)	1	80%	6.4	15	96	80
	8					

CRITERIA AIR POLLUTANT EMISSIONS - CONSTRUCTION

UNCONTROLLED CONSTRUCTION EMISSIONS

No. of Construction Days	Tons over Construction Period				Average Pounds per day			
	ROG	NOx	Exhaust PM-10	Exhaust PM-2.5	ROG	NOx	Exhaust PM-10	Exhaust PM-2.5
1352	1.51	10.82	0.38	0.36	2.2	16.0	0.6	0.5

MITIGATED CONSTRUCTION EMISSIONS - ALL TIER 4 EQUIPMENT

No. of Construction Days	Tons over Construction Period				Average Pounds per day			
	ROG	NOx	Exhaust PM-10	Exhaust PM-2.5	ROG	NOx	Exhaust PM-10	Exhaust PM-2.5
1352	0.51	3.60	0.06	0.06	0.7	5.3	0.1	0.1
% reduction	66.5	66.7	84.3	83.6	66.5	66.7	84.3	83.6

GHG EMISSIONS - CONSTRUCTION

Construction Year	Metric Tons per Year			
	CO_2	CH_4	N_2O	CO_2e
2024	1032.3	0.16	0.0	1036.2
2025	563.0	0.06	0.0	564.6
2026	568.6	0.06	0.0	570.3
2027	746.5	0.09	0.0	748.7
2028	693.7	0.06	0.0	695.2
2029	551.8	0.06	0.0	553.3
	4156.0	0.5	0.0	4168.3
Amortized over 30 years				138.9

EMISSION RATE CALCULATION FOR AERMOD - EBMUD Central Reservoir

UNCONTROLLED CONSTRUCTION EMISSIONS FROM CalEEMod

No. of Construction Days	Emissions over Construction Period (tons)		Emission rate (g/s)	
	Exhaust PM-10	Exhaust PM-2.5	Exhaust PM-10	Exhaust PM-2.5
1352	0.38	0.36	0.0059	0.0056

TIER 4 MITIGATED CONSTRUCTION EMISSIONS FROM CalEEMod

No. of Construction Days	Emissions over Construction Period (tons)		Emission rate (g/s)	
	Exhaust PM-10	Exhaust PM-2.5	Exhaust PM-10	Exhaust PM-2.5
1352	0.06	0.06	0.0009	0.0009

CONCENTRATIONS BASED ON AERMOD RESULTS

Maximum Exposed Offsite Receptor	Residential		School	
	Uncontrolled	Tier 4	Uncontrolled	Tier 4
Max PM_{10} conc. from AERMOD ($\mu g/m^3$)	0.039	0.006	0.045	0.007
Max. $PM_{2.5}$ conc. ($\mu g/m^3$)	0.037	0.006	0.042	0.007

NOTES:

1. Total emissions during each project phase were divided by the number of workdays in the construction period (1352 assuming 5 days a week, accounting for overlapping phases) and 12 hours per day for the emission rate calculation.

2. Hourly variable emission rate was used in AERMOD assuming construction emissions would be limited to the hours between 7 a.m. and 7 p.m., Monday - Friday.

HEALTH RISK CALCULATIONS USING 2015 OEHHA GUIDANCE MANUAL - EBMUD Central Reservoir

Cancer Risk

The only exposure pathway for DPM is through inhalation.

$Risk_{inh\text{-}res}$ = $DOSE_{air}$ x CPF x ASF x ED/AT x FAH

where

$Risk_{inh\text{-}res}$ = Residential inhalation cancer risk

$DOSE_{air}$ = Daily Inhalation Dose (mg/kg-day)

CPF = Inhalation Cancer Potency Factor $(mg/kg\text{-}day)^{-1}$	1.1
ASF = Age Sensitivity Factors for specified age groups	from Table 1 below
ED = Exposure duration (in years) for a specified age group	5.58
AT = Averaging time for lifetime cancer risk (years)	70
FAH = Fraction of time spent at home	from Table 2 below

Table 1: Age Sensitivity Factors by Age Group

Age Group	Age Sensitivity Factor
3rd trimester	10
0-2	10
2-9	3
2-16	3
16-30	1
16-70	1

Source: Table 8.3 on page 8-5 of OEHHA 2015 Guidance Manual

Table 2: Fraction of Time at Home (FAH)

Age	FAH
3rd trimester - 2	0.85
2 - 16	0.72
16 - 70	0.73

Source: Table 8.3 on page 8-4 of OEHHA 2015 Guidance Manual

$DOSE_{air} = C_{air}$ x DBR x A x EF x 10^{-6}

where

C_{air} = Concentration in air ($\mu g/m^3$)	from AERMOD
DBR = Daily breathing rates by age group (L/kg of body weight-day)	from Table 3 below
A = Inhalation Absorption factor (unitless) =	1.0
EF = Exposure Frequency (days/365 days - unitless) =	0.96

Table 3: Daily Breathing Rates (DBR) by age for residential exposure

Percentile	3rd trimester	0-2 years	2-9 years	2-16 years	16-30 years	16-70 years
5	127	416	328	216	96	86
10	142	454	367	259	118	104
25	179	525	427	331	161	141
50	212	618	504	432	207	181
75	260	723	602	545	252	222
80	273	758	631	572	261	233
90	333	934	732	659	307	262
95	361	1090	861	745	335	290
99	412	1430	1140	996	432	361

Source: Table 5.7 on page 5-25 of OEHHA 2015 Guidance Manual

NOTES:

1. BAAQMD Air Toxics NSR Program HRA Guidelines recommend using the 95th percentile rate for age groups less than 2 years old and the 80th percentile rate for age groups that are greater than or equal to 2 years old. Using the high-end point estimate (i.e., the 95th percentiles) breathing rates for the inhalation pathway avoids underestimating cancer risk to the public, including children, and is more appropriate when inhalation is the only primary pathway of exposure.

Table 4: 8-hour Breathing Rates (DBR) by age for school exposure

Percentile	3rd trimester	0-2 years	2-9 years	2-16 years	16-30 years	16-70 years
5	127	416	328	216	96	86
10	142	454	367	259	118	104
25	179	525	427	331	161	141
50	212	618	504	432	207	181
75	260	723	602	545	252	222
80	273	758	631	572	261	233
90	333	934	732	659	307	262
95	361	1090	861	745	335	290
99	412	1430	1140	996	432	361

Source: Table 5.7 on page 5-25 of OEHHA 2015 Guidance Manual

Chronic Hazard Index

Chronic Hazard Index = C_{air}/REL

where

C_{air} = Annual Average Concentration during the 70 year exposure period ($\mu g/m^3$)	From AERMOD
REL = Concentration at which no adverse health effects are anticipated ($\mu g/m^3$)	5

Table 4: ESTIMATION OF HEALTH RISKS - from exposure to 6 years of project construction

Maximum Exposed Individual Receptor (MEIR)	Residential		School	
	Uncontrolled	Tier 4 Final for ALL equipment	Uncontrolled	Tier 4 Final for ALL equipment
Emission rate (g/s)	0.0059	0.0009	0.0059	0.0009
C_{air} ($\mu g/m^3$) - from AERMOD	0.0386	0.0059	0.0447	0.0068
$DOSE_{air\ third\ trimester}$ = Daily Inhalation Dose (mg/kg-day)	1.33E-05	2.04E-06	1.55E-05	2.36E-06
$DOSE_{air\ 0\text{-}2\ years}$ = Daily Inhalation Dose (mg/kg-day)	4.03E-05	6.15E-06	4.67E-05	7.13E-06
$DOSE_{air\ 2\text{-}9\ years}$ = Daily Inhalation Dose (mg/kg-day)	2.33E-05	3.56E-06	2.70E-05	4.13E-06
$DOSE_{air\ 16\text{-}30\ years}$ = Daily Inhalation Dose (mg/kg-day)	9.65E-06	1.47E-06	1.12E-05	1.71E-06
Cancer Risk (in a million) - Infant	**14.2**	2.2	--	--
Cancer Risk (in a million) - Child	4.8	0.7	5.5	0.8
Cancer Risk (in a million) - Adult	0.7	0.10	0.8	0.1
Hazard Index	0.0077	0.0012	0.0089	0.0014
$PM_{2.5}$ ($\mu g/m^3$)	0.0366	0.0059	0.0424	0.0068

EBMUD Central Reservoir

Alameda County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	10.00	1000sqft	2.00	10,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	63
Climate Zone	5			**Operational Year**	2030
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	294	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - PG&E GHG emission factor for 2016
https://www.pgecurrents.com/2018/03/26/independent-registry-confirms-record-low-carbon-emissions-for-pge/

Land Use - Project data

Construction Phase - Project data from applicant

Off-road Equipment - Project data from applicant

Off-road Equipment - Project data from applicant

Off-road Equipment - Project data from applicant

Off-road Equipment - Project data from applicant

Off-road Equipment - Project data from applicant

Off-road Equipment - Project data from applicant

Off-road Equipment - Project data from applicant

Off-road Equipment - Project data from applicant

Off-road Equipment - Project data from applicant

Off-road Equipment - Project data from applicant

Off-road Equipment - Project data from applicant

Off-road Equipment - Project data from applicant

Off-road Equipment - Project data from applicant

Off-road Equipment - Project data from applicant

Off-road Equipment - Project data from applicant

Off-road Equipment - Project data from applicant

Off-road Equipment - Project data from applicant

Grading - Project data

Trips and VMT - Project data from applicant

Energy Use -

Construction Off-road Equipment Mitigation - Tier 4 equipment for BACT

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	17.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	9.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	10.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	17.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	14.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	9.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
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tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final

tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
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tblConstructionPhase	NumDays	20.00	30.00
tblConstructionPhase	NumDays	200.00	79.00
tblConstructionPhase	NumDays	200.00	72.00
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tblConstructionPhase	NumDays	200.00	182.00
tblConstructionPhase	NumDays	200.00	72.00
tblConstructionPhase	NumDays	200.00	120.00
tblConstructionPhase	NumDays	200.00	120.00
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tblConstructionPhase	PhaseEndDate	12/10/2024	12/30/2026
tblConstructionPhase	PhaseEndDate	11/12/2024	1/29/2025
tblConstructionPhase	PhaseEndDate	1/29/2024	1/22/2024
tblConstructionPhase	PhaseEndDate	2/6/2024	10/9/2024
tblConstructionPhase	PhaseEndDate	11/26/2024	4/1/2026
tblConstructionPhase	PhaseEndDate	1/31/2024	3/15/2025

tblConstructionPhase	PhaseStartDate	11/27/2024	4/1/2026
tblConstructionPhase	PhaseStartDate	2/7/2024	10/10/2024
tblConstructionPhase	PhaseStartDate	11/13/2024	10/1/2025
tblConstructionPhase	PhaseStartDate	1/30/2024	2/1/2025
tblGrading	AcresOfGrading	0.00	2.00
tblGrading	AcresOfGrading	0.00	2.00
tblGrading	AcresOfGrading	0.00	2.00
tblLandUse	LotAcreage	0.23	2.00
tblOffRoadEquipment	HorsePower	172.00	755.00
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tblOffRoadEquipment	HorsePower	78.00	350.00
tblOffRoadEquipment	HorsePower	84.00	50.00

tblOffRoadEquipment	HorsePower	78.00	350.00
tblOffRoadEquipment	HorsePower	84.00	174.00
tblOffRoadEquipment	HorsePower	158.00	239.00
tblOffRoadEquipment	HorsePower	203.00	93.00
tblOffRoadEquipment	HorsePower	402.00	300.00
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tblOffRoadEquipment	HorsePower	8.00	248.00
tblOffRoadEquipment	HorsePower	203.00	93.00
tblOffRoadEquipment	HorsePower	78.00	350.00
tblOffRoadEquipment	HorsePower	84.00	174.00
tblOffRoadEquipment	HorsePower	8.00	248.00
tblOffRoadEquipment	HorsePower	203.00	93.00
tblOffRoadEquipment	HorsePower	78.00	350.00
tblOffRoadEquipment	HorsePower	84.00	174.00
tblOffRoadEquipment	HorsePower	8.00	248.00
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tblOffRoadEquipment	HorsePower	97.00	108.00
tblOffRoadEquipment	HorsePower	97.00	108.00
tblOffRoadEquipment	HorsePower	97.00	108.00
tblOffRoadEquipment	HorsePower	78.00	350.00

tblOffRoadEquipment	HorsePower	84.00	174.00
tblOffRoadEquipment	HorsePower	203.00	93.00
tblOffRoadEquipment	HorsePower	85.00	95.00
tblOffRoadEquipment	HorsePower	84.00	80.00
tblOffRoadEquipment	HorsePower	78.00	350.00
tblOffRoadEquipment	HorsePower	84.00	174.00
tblOffRoadEquipment	HorsePower	203.00	93.00
tblOffRoadEquipment	HorsePower	158.00	303.00
tblOffRoadEquipment	HorsePower	158.00	164.00
tblOffRoadEquipment	HorsePower	85.00	350.00
tblOffRoadEquipment	HorsePower	168.00	67.00
tblOffRoadEquipment	HorsePower	402.00	300.00
tblOffRoadEquipment	HorsePower	78.00	350.00
tblOffRoadEquipment	HorsePower	84.00	174.00
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tblOffRoadEquipment	HorsePower	203.00	93.00
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tblOffRoadEquipment	HorsePower	168.00	67.00
tblOffRoadEquipment	HorsePower	402.00	300.00
tblOffRoadEquipment	HorsePower	78.00	350.00
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tblOffRoadEquipment	HorsePower	85.00	350.00
tblOffRoadEquipment	HorsePower	168.00	67.00
tblOffRoadEquipment	HorsePower	402.00	200.00
tblOffRoadEquipment	HorsePower	78.00	350.00

tblOffRoadEquipment	HorsePower	84.00	174.00
tblOffRoadEquipment	HorsePower	158.00	239.00
tblOffRoadEquipment	HorsePower	203.00	93.00
tblOffRoadEquipment	HorsePower	402.00	300.00
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tblOffRoadEquipment	HorsePower	231.00	111.00
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tblOffRoadEquipment	HorsePower	130.00	125.00
tblOffRoadEquipment	HorsePower	130.00	125.00
tblOffRoadEquipment	OffRoadEquipmentType		Other Construction Equipment
tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Air Compressors

tblOffRoadEquipment	OffRoadEquipmentType		Other Construction Equipment
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Plate Compactors
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tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
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tblOffRoadEquipment	OffRoadEquipmentType		Generator Sets
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
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tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Air Compressors
tblOffRoadEquipment	OffRoadEquipmentType		Generator Sets
tblOffRoadEquipment	OffRoadEquipmentType		Plate Compactors
tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Air Compressors
tblOffRoadEquipment	OffRoadEquipmentType		Generator Sets
tblOffRoadEquipment	OffRoadEquipmentType		Plate Compactors

tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Air Compressors
tblOffRoadEquipment	OffRoadEquipmentType		Generator Sets
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tblOffRoadEquipment	OffRoadEquipmentType		Rubber Tired Loaders
tblOffRoadEquipment	OffRoadEquipmentType		Cranes
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tblOffRoadEquipment	PhaseName		CDSM
tblOffRoadEquipment	PhaseName		CDSM

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tblOffRoadEquipment	PhaseName		Cement Treated Fill
tblOffRoadEquipment	PhaseName		Cement Treated Fill
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tblOffRoadEquipment	PhaseName		Cement Treated Fill
tblOffRoadEquipment	PhaseName		Cement Treated Fill
tblOffRoadEquipment	PhaseName		Cement Treated Fill
tblOffRoadEquipment	PhaseName		Foundation for Superstructure
tblOffRoadEquipment	PhaseName		Foundation for Superstructure
tblOffRoadEquipment	PhaseName		Walls for Superstructure
tblOffRoadEquipment	PhaseName		Roof for Superstructure
tblOffRoadEquipment	PhaseName		Shotcrete and Prestressing
tblOffRoadEquipment	PhaseName		Valve Structure
tblOffRoadEquipment	PhaseName		Rate Control Station
tblOffRoadEquipment	PhaseName		Rate Control Station
tblOffRoadEquipment	PhaseName		Final Excavation & Grading
tblOffRoadEquipment	PhaseName		Final Excavation & Grading
tblOffRoadEquipment	PhaseName		Final Excavation & Grading
tblOffRoadEquipment	PhaseName		Final Excavation & Grading
tblOffRoadEquipment	PhaseName		Final Excavation & Grading
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tblOffRoadEquipment	PhaseName		Landscaping, Irrigation System, Bio-retention area, security fence
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tblOffRoadEquipment	PhaseName		Access roads & paving
tblOffRoadEquipment	PhaseName		Access roads & paving

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tblOffRoadEquipment	PhaseName		Redwood Day School Access driveway
tblOffRoadEquipment	PhaseName		Redwood Day School Access driveway
tblOffRoadEquipment	PhaseName		Liner removal
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tblOffRoadEquipment	PhaseName		Site Preparation, well abandonment, demo materials building
tblOffRoadEquipment	PhaseName		Site Preparation, well abandonment, demo materials building
tblOffRoadEquipment	PhaseName		Site Preparation, well abandonment, demo materials building
tblOffRoadEquipment	PhaseName		Site Preparation, well abandonment, demo materials building
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tblTripsAndVMT	HaulingTripNumber	0.00	148.00
tblTripsAndVMT	HaulingTripNumber	0.00	32.00

tblTripsAndVMT	HaulingTripNumber	0.00	3,520.00
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tblTripsAndVMT	WorkerTripNumber	4.00	6.00
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tblTripsAndVMT	WorkerTripNumber	18.00	26.00

tblTripsAndVMT	WorkerTripNumber	20.00	14.00
tblTripsAndVMT	WorkerTripNumber	20.00	14.00
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2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2024	0.4257	2.7830	3.4883	0.0110	0.0296	0.1106	0.1403	7.9600e-003	0.1056	0.1135	0.0000	1,028.4482	1,028.4482	0.1557	0.0000	1,032.3399
2025	0.1571	1.3453	1.3590	5.9600e-003	0.0655	0.0353	0.1009	0.0177	0.0337	0.0514	0.0000	561.4315	561.4315	0.0629	0.0000	563.0048
2026	0.2123	1.3959	1.8724	6.1100e-003	0.0441	0.0501	0.0942	0.0117	0.0481	0.0598	0.0000	567.0235	567.0235	0.0647	0.0000	568.6409
2027	0.2347	1.9079	2.0052	7.9900e-003	0.0735	0.0575	0.1310	0.0200	0.0548	0.0749	0.0000	744.3135	744.3135	0.0873	0.0000	746.4954
2028	0.2651	1.8911	2.2928	7.4000e-003	0.0452	0.0714	0.1165	0.0122	0.0685	0.0807	0.0000	692.0678	692.0678	0.0636	0.0000	693.6581
2029	0.2180	1.5009	2.0811	5.9600e-003	0.0286	0.0546	0.0833	7.3800e-003	0.0527	0.0600	0.0000	550.3238	550.3238	0.0600	0.0000	551.8229
Maximum	**0.4257**	**2.7830**	**3.4883**	**0.0110**	**0.0735**	**0.1106**	**0.1403**	**0.0200**	**0.1056**	**0.1135**	**0.0000**	**1,028.4482**	**1,028.4482**	**0.1557**	**0.0000**	**1,032.3399**

2.1 Overall Construction

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2024	0.1346	0.7507	5.4125	0.0110	0.0296	0.0167	0.0463	7.9600e-003	0.0167	0.0246	0.0000	1,028.4470	1,028.4470	0.1557	0.0000	1,032.3388
2025	0.0618	0.6996	2.0313	5.9600e-003	0.0655	6.6400e-003	0.0722	0.0177	6.6000e-003	0.0243	0.0000	561.4311	561.4311	0.0629	0.0000	563.0044
2026	0.0716	0.4256	2.7775	6.1100e-003	0.0441	8.3200e-003	0.0524	0.0117	8.2900e-003	0.0200	0.0000	567.0230	567.0230	0.0647	0.0000	568.6404
2027	0.0854	0.7671	2.9948	7.9900e-003	0.0735	9.5600e-003	0.0831	0.0200	9.5200e-003	0.0296	0.0000	744.3129	744.3129	0.0873	0.0000	746.4948
2028	0.0836	0.5205	3.3703	7.4000e-003	0.0452	9.9800e-003	0.0552	0.0122	9.9600e-003	0.0222	0.0000	692.0671	692.0671	0.0636	0.0000	693.6574
2029	0.0697	0.4365	2.9511	5.9600e-003	0.0286	8.3900e-003	0.0370	7.3800e-003	8.3700e-003	0.0158	0.0000	550.3233	550.3233	0.0600	0.0000	551.8223
Maximum	**0.1346**	**0.7671**	**5.4125**	**0.0110**	**0.0735**	**0.0167**	**0.0831**	**0.0200**	**0.0167**	**0.0296**	**0.0000**	**1,028.4470**	**1,028.4470**	**0.1557**	**0.0000**	**1,032.3388**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**66.50**	**66.74**	**-49.16**	**0.00**	**0.00**	**84.31**	**48.04**	**0.00**	**83.65**	**69.02**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**1-2-2024**	**4-1-2024**	0.7486	0.2007
2	**4-2-2024**	**7-1-2024**	0.9029	0.2450
3	**7-2-2024**	**10-1-2024**	0.9128	0.2477
4	**10-2-2024**	**1-1-2025**	0.6532	0.1946
5	**1-2-2025**	**4-1-2025**	1.0426	0.6665

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7	**7-2-2025**	**10-1-2025**	0.0051	0.0012
8	**10-2-2025**	**1-1-2026**	0.4706	0.1070
9	**1-2-2026**	**4-1-2026**	0.4643	0.1059
10	**4-2-2026**	**7-1-2026**	0.3783	0.1291
11	**7-2-2026**	**10-1-2026**	0.3825	0.1306
12	**10-2-2026**	**1-1-2027**	0.3838	0.1328
13	**1-2-2027**	**4-1-2027**	0.7571	0.3514
14	**4-2-2027**	**7-1-2027**	0.4878	0.1967
15	**7-2-2027**	**10-1-2027**	0.5212	0.1793
16	**10-2-2027**	**1-1-2028**	0.3841	0.1251
17	**1-2-2028**	**4-1-2028**	0.6884	0.1691
18	**4-2-2028**	**7-1-2028**	0.6876	0.1683
19	**7-2-2028**	**10-1-2028**	0.6217	0.1749
20	**10-2-2028**	**1-1-2029**	0.1677	0.0944
21	**1-2-2029**	**4-1-2029**	0.5312	0.1520
22	**4-2-2029**	**7-1-2029**	0.4475	0.1276
23	**7-2-2029**	**9-30-2029**	0.3725	0.0840
		Highest	1.0426	0.6665

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0443	0.0000	9.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.8000e-004	1.8000e-004	0.0000	0.0000	1.9000e-004
Energy	1.3300e-003	0.0121	0.0102	7.0000e-005		9.2000e-004	9.2000e-004		9.2000e-004	9.2000e-004	0.0000	23.2893	23.2893	1.2500e-003	4.5000e-004	23.4539
Mobile	9.8500e-003	0.0749	0.1148	6.0000e-004	0.0574	3.8000e-004	0.0578	0.0154	3.5000e-004	0.0158	0.0000	56.0876	56.0876	1.9300e-003	0.0000	56.1357
Waste						0.0000	0.0000		0.0000	0.0000	2.5171	0.0000	2.5171	0.1488	0.0000	6.2360
Water						0.0000	0.0000		0.0000	0.0000	0.7337	1.6687	2.4023	0.0755	1.8100e-003	4.8306
Total	**0.0555**	**0.0870**	**0.1251**	**6.7000e-004**	**0.0574**	**1.3000e-003**	**0.0587**	**0.0154**	**1.2700e-003**	**0.0167**	**3.2507**	**81.0457**	**84.2964**	**0.2275**	**2.2600e-003**	**90.6565**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0443	0.0000	9.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.8000e-004	1.8000e-004	0.0000	0.0000	1.9000e-004
Energy	1.3300e-003	0.0121	0.0102	7.0000e-005		9.2000e-004	9.2000e-004		9.2000e-004	9.2000e-004	0.0000	23.2893	23.2893	1.2500e-003	4.5000e-004	23.4539
Mobile	9.8500e-003	0.0749	0.1148	6.0000e-004	0.0574	3.8000e-004	0.0578	0.0154	3.5000e-004	0.0158	0.0000	56.0876	56.0876	1.9300e-003	0.0000	56.1357
Waste						0.0000	0.0000		0.0000	0.0000	2.5171	0.0000	2.5171	0.1488	0.0000	6.2360
Water						0.0000	0.0000		0.0000	0.0000	0.7337	1.6687	2.4023	0.0755	1.8100e-003	4.8306
Total	**0.0555**	**0.0870**	**0.1251**	**6.7000e-004**	**0.0574**	**1.3000e-003**	**0.0587**	**0.0154**	**1.2700e-003**	**0.0167**	**3.2507**	**81.0457**	**84.2964**	**0.2275**	**2.2600e-003**	**90.6565**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation, well abandonment, demo materials building	Demolition	1/2/2024	1/22/2024	5	15	
2	Roof removal	Demolition	2/1/2024	10/9/2024	5	180	
3	Column removal	Demolition	10/10/2024	1/29/2025	5	80	
4	Liner removal	Demolition	2/1/2025	3/15/2025	5	30	
5	Excavation for Substructure	Grading	10/1/2025	4/1/2026	5	131	
6	CDSM	Building Construction	4/1/2026	12/30/2026	5	196	
7	Cement Treated Fill	Building Construction	1/1/2027	4/21/2027	5	79	
8	Foundation for Superstructure	Building Construction	5/1/2027	8/10/2027	5	72	
9	Walls for Superstructure	Building Construction	8/1/2027	12/14/2027	5	97	
10	Roof for Superstructure	Building Construction	1/1/2028	9/12/2028	5	182	
11	Shotcrete and Prestressing	Building Construction	9/1/2028	12/11/2028	5	72	
12	Valve Structure	Building Construction	1/1/2029	6/15/2029	5	120	
13	Rate Control Station	Building Construction	1/1/2029	6/15/2029	5	120	
14	Final Excavation & Grading	Grading	7/1/2029	9/12/2029	5	53	
15	Landscaping, Irrigation System, Bio-retention area, security fence	Site Preparation	10/1/2029	10/19/2029	5	15	
16	Access roads & paving	Paving	11/1/2029	11/21/2029	5	15	
17	Redwood Day School Access driveway	Paving	12/1/2029	12/21/2029	5	15	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

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Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Roof removal	Generator Sets	1	7.20	174	0.74
Roof removal	Cranes	1	5.60	111	0.29
Roof removal	Rubber Tired Loaders	1	6.40	93	0.36
Roof removal	Excavators	4	5.60	303	0.38
Roof removal	Excavators	1	5.60	164	0.38
Roof removal	Crushing/Proc. Equipment	1	6.40	350	0.78
Roof removal	Other Material Handling Equipment	1	6.40	67	0.40
Roof removal	Off-Highway Trucks	1	6.40	300	0.38
Column removal	Air Compressors	1	7.20	350	0.48
Column removal	Rubber Tired Loaders	1	6.40	93	0.36
Column removal	Crushing/Proc. Equipment	1	6.40	350	0.78
Column removal	Other Material Handling Equipment	1	6.40	67	0.40
Column removal	Off-Highway Trucks	1	6.40	200	0.38
Excavation for Substructure	Air Compressors	1	7.20	350	0.48
Excavation for Substructure	Generator Sets	1	7.20	174	0.74
Excavation for Substructure	Excavators	2	6.40	239	0.38
Excavation for Substructure	Rubber Tired Loaders	2	6.40	93	0.36
Excavation for Substructure	Off-Highway Trucks	1	6.40	300	0.38
CDSM	Other Construction Equipment	1	12.00	755	0.42
CDSM	Rubber Tired Loaders	1	6.40	93	0.36
CDSM	Off-Highway Trucks	1	6.40	300	0.38
Cement Treated Fill	Air Compressors	1	7.20	350	0.48
Cement Treated Fill	Other Construction Equipment	1	6.40	500	0.42
Cement Treated Fill	Off-Highway Trucks	1	6.40	450	0.38
Cement Treated Fill	Plate Compactors	1	6.40	400	0.43
Cement Treated Fill	Off-Highway Tractors	1	6.40	450	0.44

Cement Treated Fill	Off-Highway Trucks	1	6.40	300	0.38
Foundation for Superstructure	Air Compressors	1	7.20	350	0.48
Foundation for Superstructure	Off-Highway Trucks	1	6.40	300	0.38
Walls for Superstructure	Air Compressors	1	7.20	350	0.48
Walls for Superstructure	Cranes	1	6.40	523	0.29
Roof for Superstructure	Air Compressors	2	7.20	350	0.48
Roof for Superstructure	Cranes	1	6.40	523	0.29
Shotcrete and Prestressing	Other Material Handling Equipment	1	6.40	325	0.40
Valve Structure	Air Compressors	1	5.40	350	0.48
Rate Control Station	Air Compressors	1	5.40	350	0.48
Rate Control Station	Pumps	1	6.00	50	0.74
Final Excavation & Grading	Air Compressors	1	7.20	350	0.48
Final Excavation & Grading	Generator Sets	1	7.20	174	0.74
Final Excavation & Grading	Excavators	2	6.40	239	0.38
Final Excavation & Grading	Rubber Tired Loaders	2	6.40	93	0.36
Final Excavation & Grading	Off-Highway Trucks	1	6.40	300	0.38
Landscaping, Irrigation System, Bio-retention area, security fence	Air Compressors	1	7.20	350	0.48
Landscaping, Irrigation System, Bio-retention area, security fence	Generator Sets	1	7.20	174	0.74
Landscaping, Irrigation System, Bio-retention area, security fence	Plate Compactors	1	6.00	248	0.43
Landscaping, Irrigation System, Bio-retention area, security fence	Rubber Tired Loaders	1	6.40	93	0.36
Access roads & paving	Air Compressors	1	7.20	350	0.48
Access roads & paving	Generator Sets	1	7.20	174	0.74
Access roads & paving	Plate Compactors	1	6.00	248	0.43
Access roads & paving	Rubber Tired Loaders	1	6.40	93	0.36
Redwood Day School Access driveway	Air Compressors	1	7.20	350	0.48
Redwood Day School Access driveway	Generator Sets	1	7.20	174	0.74

Redwood Day School Access driveway	Plate Compactors	1	6.00	248	0.43
Redwood Day School Access driveway	Rubber Tired Loaders	1	6.40	93	0.36
Liner removal	Cranes	1	5.60	111	0.29
Landscaping, Irrigation System, Bio-retention area, security fence	Graders	0	0.00	187	0.41
Access roads & paving	Pavers	1	6.40	125	0.42
Redwood Day School Access driveway	Pavers	1	6.40	125	0.42
Access roads & paving	Paving Equipment	1	6.40	130	0.36
Redwood Day School Access driveway	Paving Equipment	1	6.40	130	0.36
Access roads & paving	Rollers	1	6.40	80	0.38
Redwood Day School Access driveway	Rollers	1	6.40	80	0.38
Liner removal	Rubber Tired Dozers	0	0.00	247	0.40
Column removal	Rubber Tired Dozers	0	0.00	247	0.40
Final Excavation & Grading	Rubber Tired Dozers	0	0.00	247	0.40
Excavation for Substructure	Rubber Tired Dozers	0	0.00	247	0.40
Landscaping, Irrigation System, Bio-retention area, security fence	Scrapers	0	0.00	367	0.48
Roof for Superstructure	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Shotcrete and Prestressing	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Valve Structure	Tractors/Loaders/Backhoes	1	4.80	108	0.37
Rate Control Station	Tractors/Loaders/Backhoes	1	4.80	108	0.37
CDSM	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Cement Treated Fill	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Foundation for Superstructure	Tractors/Loaders/Backhoes	1	6.40	108	0.37
Walls for Superstructure	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Final Excavation & Grading	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Access roads & paving	Tractors/Loaders/Backhoes	1	6.40	108	0.37
Redwood Day School Access driveway	Tractors/Loaders/Backhoes	1	6.40	108	0.37

Landscaping, Irrigation System, Bio-retention area, security fence	Tractors/Loaders/Backhoes	1	6.40	108	0.37
Roof for Superstructure	Welders	0	0.00	46	0.45
Shotcrete and Prestressing	Welders	0	0.00	46	0.45
Valve Structure	Welders	0	0.00	46	0.45
Rate Control Station	Welders	0	0.00	46	0.45
CDSM	Welders	0	0.00	46	0.45
Cement Treated Fill	Welders	0	0.00	46	0.45
Foundation for Superstructure	Welders	0	0.00	46	0.45
Walls for Superstructure	Welders	0	0.00	46	0.45
Site Preparation, well abandonment, demo materials building	Air Compressors	1	7.20	350	0.48
Site Preparation, well abandonment, demo materials building	Generator Sets	1	7.20	174	0.74
Site Preparation, well abandonment, demo materials building	Rubber Tired Loaders	1	6.40	93	0.36
Site Preparation, well abandonment, demo materials building	Crushing/Proc. Equipment	1	5.60	95	0.78
Site Preparation, well abandonment, demo materials building	Pumps	1	12.00	80	0.74
Liner removal	Air Compressors	1	7.20	350	0.48
Liner removal	Generator Sets	1	7.20	174	0.74
Liner removal	Rubber Tired Loaders	1	6.40	93	0.36
Liner removal	Excavators	4	5.60	303	0.38
Liner removal	Excavators	1	5.60	164	0.38
Liner removal	Crushing/Proc. Equipment	1	6.40	350	0.78
Liner removal	Other Material Handling Equipment	1	6.40	67	0.40
Liner removal	Off-Highway Trucks	1	6.40	300	0.38
Roof removal	Air Compressors	1	7.20	350	0.48
CDSM	Air Compressors	1	7.20	350	0.48
Excavation for Substructure	Cement and Mortar Mixers	0	0.00	9	0.56

Site Preparation, well abandonment, demo materials building	Concrete/Industrial Saws		0	0.00	81	0.73
Column removal	Generator Sets		1	7.20	174	0.74
Column removal	Cranes		0	0.00	231	0.29
Column removal	Forklifts		0	0.00	89	0.20
Liner removal	Graders		0	0.00	187	0.41
Excavation for Substructure	Pavers		0	0.00	130	0.42
Excavation for Substructure	Rollers		0	0.00	80	0.38
Site Preparation, well abandonment, demo materials building	Rubber Tired Dozers		0	0.00	247	0.40
Roof removal	Rubber Tired Dozers		0	0.00	247	0.40
Column removal	Tractors/Loaders/Backhoes		1	6.40	108	0.37
Site Preparation, well abandonment, demo materials building	Tractors/Loaders/Backhoes		1	6.40	108	0.37
Roof removal	Tractors/Loaders/Backhoes		1	6.40	108	0.37
Excavation for Substructure	Tractors/Loaders/Backhoes		0	0.00	97	0.37
Liner removal	Tractors/Loaders/Backhoes		1	5.60	108	0.37
Roof removal	Graders		0	0.00	187	0.41
Excavation for Substructure	Paving Equipment		0	0.00	132	0.36
Liner removal	Scrapers		0	0.00	367	0.48
Column removal	Welders		0	0.00	46	0.45
Access roads & paving	Cement and Mortar Mixers		0	0.00	9	0.56
Redwood Day School Access driveway	Cement and Mortar Mixers		0	0.00	9	0.56
Liner removal	Concrete/Industrial Saws		0	0.00	81	0.73
Roof removal	Concrete/Industrial Saws		0	0.00	81	0.73
Column removal	Concrete/Industrial Saws		0	0.00	81	0.73
Roof for Superstructure	Cranes		2	6.40	93	0.29
Shotcrete and Prestressing	Cranes		0	0.00	231	0.29
Valve Structure	Cranes		1	4.80	523	0.29

Rate Control Station	Cranes		0	0.00	231	0.29
CDSM	Cranes		0	0.00	231	0.29
Cement Treated Fill	Cranes		0	0.00	231	0.29
Foundation for Superstructure	Cranes		1	5.60	111	0.29
Walls for Superstructure	Cranes		1	6.40	93	0.29
Roof for Superstructure	Forklifts		0	0.00	89	0.20
Shotcrete and Prestressing	Forklifts		0	0.00	89	0.20
Valve Structure	Forklifts		0	0.00	89	0.20
Rate Control Station	Forklifts		0	0.00	89	0.20
CDSM	Forklifts		0	0.00	89	0.20
Cement Treated Fill	Forklifts		0	0.00	89	0.20
Foundation for Superstructure	Forklifts		0	0.00	89	0.20
Walls for Superstructure	Forklifts		0	0.00	89	0.20
Roof for Superstructure	Generator Sets		2	7.20	174	0.74
Shotcrete and Prestressing	Generator Sets		0	0.00	84	0.74
Valve Structure	Generator Sets		1	5.40	174	0.74
Rate Control Station	Generator Sets		1	5.40	174	0.74
CDSM	Generator Sets		1	7.20	174	0.74
Cement Treated Fill	Generator Sets		1	7.20	174	0.74
Foundation for Superstructure	Generator Sets		1	7.20	174	0.74
Walls for Superstructure	Generator Sets		1	7.20	174	0.74
Final Excavation & Grading	Graders		0	0.00	187	0.41
Excavation for Substructure	Graders		0	0.00	187	0.41

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation, well abandonment, demo	6	18.00	0.00	186.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Liner removal	13	18.00	0.00	5,924.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Roof removal	13	18.00	0.00	654.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Column removal	7	18.00	0.00	562.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Excavation for Substructure	7	26.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
CDSM	5	24.00	0.00	2,092.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Roof for Superstructure	7	22.00	0.00	1,363.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Shotcrete and Prestressing	1	22.00	0.00	1,363.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Valve Structure	4	6.00	0.00	148.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Rate Control Station	4	10.00	0.00	32.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Cement Treated Fill	7	14.00	0.00	3,520.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Foundation for Superstructure	5	22.00	0.00	1,363.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Walls for Superstructure	4	26.00	0.00	1,363.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Final Excavation & Grading	7	26.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Access roads & paving	8	14.00	0.00	962.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Redwood Day School Access driveway	8	14.00	0.00	60.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Landscaping, Irrigation System, Bio-	5	14.00	0.00	94.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

3.2 Site Preparation, well abandonment, demo materials building - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0157	0.1109	0.1597	3.4000e-004		4.9600e-003	4.9600e-003		4.8600e-003	4.8600e-003	0.0000	31.1363	31.1363	2.1400e-003	0.0000	31.1899
Total	**0.0157**	**0.1109**	**0.1597**	**3.4000e-004**		**4.9600e-003**	**4.9600e-003**		**4.8600e-003**	**4.8600e-003**	**0.0000**	**31.1363**	**31.1363**	**2.1400e-003**	**0.0000**	**31.1899**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	4.7000e-004	0.0152	3.9700e-003	7.0000e-005	1.5800e-003	3.0000e-005	1.6000e-003	4.3000e-004	3.0000e-005	4.6000e-004	0.0000	6.6234	6.6234	2.8000e-004	0.0000	6.6305
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.5000e-004	2.2000e-004	2.4900e-003	1.0000e-005	1.0700e-003	1.0000e-005	1.0700e-003	2.8000e-004	1.0000e-005	2.9000e-004	0.0000	0.8152	0.8152	2.0000e-005	0.0000	0.8156
Total	**8.2000e-004**	**0.0154**	**6.4600e-003**	**8.0000e-005**	**2.6500e-003**	**4.0000e-005**	**2.6700e-003**	**7.1000e-004**	**4.0000e-005**	**7.5000e-004**	**0.0000**	**7.4386**	**7.4386**	**3.0000e-004**	**0.0000**	**7.4461**

3.2 Site Preparation, well abandonment, demo materials building - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.7000e-003	0.0160	0.1983	3.4000e-004		4.9000e-004	4.9000e-004		4.9000e-004	4.9000e-004	0.0000	31.1363	31.1363	2.1400e-003	0.0000	31.1898
Total	**3.7000e-003**	**0.0160**	**0.1983**	**3.4000e-004**		**4.9000e-004**	**4.9000e-004**		**4.9000e-004**	**4.9000e-004**	**0.0000**	**31.1363**	**31.1363**	**2.1400e-003**	**0.0000**	**31.1898**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	4.7000e-004	0.0152	3.9700e-003	7.0000e-005	1.5800e-003	3.0000e-005	1.6000e-003	4.3000e-004	3.0000e-005	4.6000e-004	0.0000	6.6234	6.6234	2.8000e-004	0.0000	6.6305
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.5000e-004	2.2000e-004	2.4900e-003	1.0000e-005	1.0700e-003	1.0000e-005	1.0700e-003	2.8000e-004	1.0000e-005	2.9000e-004	0.0000	0.8152	0.8152	2.0000e-005	0.0000	0.8156
Total	**8.2000e-004**	**0.0154**	**6.4600e-003**	**8.0000e-005**	**2.6500e-003**	**4.0000e-005**	**2.6700e-003**	**7.1000e-004**	**4.0000e-005**	**7.5000e-004**	**0.0000**	**7.4386**	**7.4386**	**3.0000e-004**	**0.0000**	**7.4461**

3.3 Roof removal - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3265	2.1126	2.6884	8.3600e-003		0.0871	0.0871		0.0827	0.0827	0.0000	777.2624	777.2624	0.1367	0.0000	780.6796
Total	**0.3265**	**2.1126**	**2.6884**	**8.3600e-003**		**0.0871**	**0.0871**		**0.0827**	**0.0827**	**0.0000**	**777.2624**	**777.2624**	**0.1367**	**0.0000**	**780.6796**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.6400e-003	0.0535	0.0140	2.4000e-004	5.5400e-003	9.0000e-005	5.6300e-003	1.5200e-003	9.0000e-005	1.6100e-003	0.0000	23.2887	23.2887	1.0000e-003	0.0000	23.3137
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.1800e-003	2.6700e-003	0.0299	1.1000e-004	0.0128	8.0000e-005	0.0129	3.4100e-003	7.0000e-005	3.4800e-003	0.0000	9.7819	9.7819	1.9000e-004	0.0000	9.7867
Total	**5.8200e-003**	**0.0562**	**0.0439**	**3.5000e-004**	**0.0184**	**1.7000e-004**	**0.0185**	**4.9300e-003**	**1.6000e-004**	**5.0900e-003**	**0.0000**	**33.0707**	**33.0707**	**1.1900e-003**	**0.0000**	**33.1004**

3.3 Roof removal - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1016	0.5159	4.2751	8.3600e-003		0.0133	0.0133		0.0133	0.0133	0.0000	777.2615	777.2615	0.1367	0.0000	780.6786
Total	**0.1016**	**0.5159**	**4.2751**	**8.3600e-003**		**0.0133**	**0.0133**		**0.0133**	**0.0133**	**0.0000**	**777.2615**	**777.2615**	**0.1367**	**0.0000**	**780.6786**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.6400e-003	0.0535	0.0140	2.4000e-004	5.5400e-003	9.0000e-005	5.6300e-003	1.5200e-003	9.0000e-005	1.6100e-003	0.0000	23.2887	23.2887	1.0000e-003	0.0000	23.3137
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.1800e-003	2.6700e-003	0.0299	1.1000e-004	0.0128	8.0000e-005	0.0129	3.4100e-003	7.0000e-005	3.4800e-003	0.0000	9.7819	9.7819	1.9000e-004	0.0000	9.7867
Total	**5.8200e-003**	**0.0562**	**0.0439**	**3.5000e-004**	**0.0184**	**1.7000e-004**	**0.0185**	**4.9300e-003**	**1.6000e-004**	**5.0900e-003**	**0.0000**	**33.0707**	**33.0707**	**1.1900e-003**	**0.0000**	**33.1004**

3.4 Column removal - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0743	0.4531	0.5713	1.6800e-003		0.0183	0.0183		0.0177	0.0177	0.0000	161.5746	161.5746	0.0147	0.0000	161.9411
Total	**0.0743**	**0.4531**	**0.5713**	**1.6800e-003**		**0.0183**	**0.0183**		**0.0177**	**0.0177**	**0.0000**	**161.5746**	**161.5746**	**0.0147**	**0.0000**	**161.9411**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0400e-003	0.0339	8.8500e-003	1.5000e-004	4.4400e-003	6.0000e-005	4.5000e-003	1.2000e-003	6.0000e-005	1.2500e-003	0.0000	14.7593	14.7593	6.3000e-004	0.0000	14.7751
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.3700e-003	8.7000e-004	9.7900e-003	4.0000e-005	4.2000e-003	3.0000e-005	4.2200e-003	1.1200e-003	2.0000e-005	1.1400e-003	0.0000	3.2063	3.2063	6.0000e-005	0.0000	3.2079
Total	**2.4100e-003**	**0.0348**	**0.0186**	**1.9000e-004**	**8.6400e-003**	**9.0000e-005**	**8.7200e-003**	**2.3200e-003**	**8.0000e-005**	**2.3900e-003**	**0.0000**	**17.9656**	**17.9656**	**6.9000e-004**	**0.0000**	**17.9830**

3.4 Column removal - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0202	0.1124	0.8701	1.6800e-003		2.6100e-003	2.6100e-003		2.6100e-003	2.6100e-003	0.0000	161.5744	161.5744	0.0147	0.0000	161.9409
Total	**0.0202**	**0.1124**	**0.8701**	**1.6800e-003**		**2.6100e-003**	**2.6100e-003**		**2.6100e-003**	**2.6100e-003**	**0.0000**	**161.5744**	**161.5744**	**0.0147**	**0.0000**	**161.9409**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0400e-003	0.0339	8.8500e-003	1.5000e-004	4.4400e-003	6.0000e-005	4.5000e-003	1.2000e-003	6.0000e-005	1.2500e-003	0.0000	14.7593	14.7593	6.3000e-004	0.0000	14.7751
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.3700e-003	8.7000e-004	9.7900e-003	4.0000e-005	4.2000e-003	3.0000e-005	4.2200e-003	1.1200e-003	2.0000e-005	1.1400e-003	0.0000	3.2063	3.2063	6.0000e-005	0.0000	3.2079
Total	**2.4100e-003**	**0.0348**	**0.0186**	**1.9000e-004**	**8.6400e-003**	**9.0000e-005**	**8.7200e-003**	**2.3200e-003**	**8.0000e-005**	**2.3900e-003**	**0.0000**	**17.9656**	**17.9656**	**6.9000e-004**	**0.0000**	**17.9830**

3.4 Column removal - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0248	0.1419	0.2024	6.0000e-004		5.4500e-003	5.4500e-003		5.2700e-003	5.2700e-003	0.0000	57.5126	57.5126	5.1400e-003	0.0000	57.6410
Total	**0.0248**	**0.1419**	**0.2024**	**6.0000e-004**		**5.4500e-003**	**5.4500e-003**		**5.2700e-003**	**5.2700e-003**	**0.0000**	**57.5126**	**57.5126**	**5.1400e-003**	**0.0000**	**57.6410**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.7000e-004	0.0119	3.1400e-003	5.0000e-005	3.8700e-003	2.0000e-005	3.8900e-003	9.9000e-004	2.0000e-005	1.0100e-003	0.0000	5.2164	5.2164	2.2000e-004	0.0000	5.2220
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.6000e-004	2.8000e-004	3.2200e-003	1.0000e-005	1.4900e-003	1.0000e-005	1.5000e-003	4.0000e-004	1.0000e-005	4.1000e-004	0.0000	1.0946	1.0946	2.0000e-005	0.0000	1.0951
Total	**8.3000e-004**	**0.0121**	**6.3600e-003**	**6.0000e-005**	**5.3600e-003**	**3.0000e-005**	**5.3900e-003**	**1.3900e-003**	**3.0000e-005**	**1.4200e-003**	**0.0000**	**6.3111**	**6.3111**	**2.4000e-004**	**0.0000**	**6.3172**

3.4 Column removal - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	7.2000e-003	0.0400	0.3097	6.0000e-004		9.3000e-004	9.3000e-004		9.3000e-004	9.3000e-004	0.0000	57.5125	57.5125	5.1400e-003	0.0000	57.6410
Total	**7.2000e-003**	**0.0400**	**0.3097**	**6.0000e-004**		**9.3000e-004**	**9.3000e-004**		**9.3000e-004**	**9.3000e-004**	**0.0000**	**57.5125**	**57.5125**	**5.1400e-003**	**0.0000**	**57.6410**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.7000e-004	0.0119	3.1400e-003	5.0000e-005	3.8700e-003	2.0000e-005	3.8900e-003	9.9000e-004	2.0000e-005	1.0100e-003	0.0000	5.2164	5.2164	2.2000e-004	0.0000	5.2220
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.6000e-004	2.8000e-004	3.2200e-003	1.0000e-005	1.4900e-003	1.0000e-005	1.5000e-003	4.0000e-004	1.0000e-005	4.1000e-004	0.0000	1.0946	1.0946	2.0000e-005	0.0000	1.0951
Total	**8.3000e-004**	**0.0121**	**6.3600e-003**	**6.0000e-005**	**5.3600e-003**	**3.0000e-005**	**5.3900e-003**	**1.3900e-003**	**3.0000e-005**	**1.4200e-003**	**0.0000**	**6.3111**	**6.3111**	**2.4000e-004**	**0.0000**	**6.3172**

3.5 Liner removal - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0510	0.3078	0.4424	1.3900e-003		0.0123	0.0123		0.0117	0.0117	0.0000	129.1283	129.1283	0.0225	0.0000	129.6916
Total	**0.0510**	**0.3078**	**0.4424**	**1.3900e-003**		**0.0123**	**0.0123**		**0.0117**	**0.0117**	**0.0000**	**129.1283**	**129.1283**	**0.0225**	**0.0000**	**129.6916**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0147	0.4758	0.1260	2.1700e-003	0.0502	8.3000e-004	0.0510	0.0138	7.9000e-004	0.0146	0.0000	209.4705	209.4705	9.0100e-003	0.0000	209.6958
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.6000e-004	4.0000e-004	4.6000e-003	2.0000e-005	2.1300e-003	1.0000e-005	2.1500e-003	5.7000e-004	1.0000e-005	5.8000e-004	0.0000	1.5638	1.5638	3.0000e-005	0.0000	1.5645
Total	**0.0154**	**0.4762**	**0.1306**	**2.1900e-003**	**0.0523**	**8.4000e-004**	**0.0532**	**0.0144**	**8.0000e-004**	**0.0152**	**0.0000**	**211.0342**	**211.0342**	**9.0400e-003**	**0.0000**	**211.2603**

3.5 Liner removal - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0169	0.0857	0.7086	1.3900e-003		2.2000e-003	2.2000e-003		2.2000e-003	2.2000e-003	0.0000	129.1282	129.1282	0.0225	0.0000	129.6914
Total	**0.0169**	**0.0857**	**0.7086**	**1.3900e-003**		**2.2000e-003**	**2.2000e-003**		**2.2000e-003**	**2.2000e-003**	**0.0000**	**129.1282**	**129.1282**	**0.0225**	**0.0000**	**129.6914**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0147	0.4758	0.1260	2.1700e-003	0.0502	8.3000e-004	0.0510	0.0138	7.9000e-004	0.0146	0.0000	209.4705	209.4705	9.0100e-003	0.0000	209.6958
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.6000e-004	4.0000e-004	4.6000e-003	2.0000e-005	2.1300e-003	1.0000e-005	2.1500e-003	5.7000e-004	1.0000e-005	5.8000e-004	0.0000	1.5638	1.5638	3.0000e-005	0.0000	1.5645
Total	**0.0154**	**0.4762**	**0.1306**	**2.1900e-003**	**0.0523**	**8.4000e-004**	**0.0532**	**0.0144**	**8.0000e-004**	**0.0152**	**0.0000**	**211.0342**	**211.0342**	**9.0400e-003**	**0.0000**	**211.2603**

3.6 Excavation for Substructure - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.0600e-003	0.0000	1.0600e-003	1.1000e-004	0.0000	1.1000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0629	0.4060	0.5625	1.6700e-003		0.0167	0.0167		0.0158	0.0158	0.0000	152.4760	152.4760	0.0259	0.0000	153.1232
Total	**0.0629**	**0.4060**	**0.5625**	**1.6700e-003**	**1.0600e-003**	**0.0167**	**0.0177**	**1.1000e-004**	**0.0158**	**0.0160**	**0.0000**	**152.4760**	**152.4760**	**0.0259**	**0.0000**	**153.1232**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0900e-003	1.2800e-003	0.0146	5.0000e-005	6.7800e-003	4.0000e-005	6.8300e-003	1.8000e-003	4.0000e-005	1.8400e-003	0.0000	4.9693	4.9693	9.0000e-005	0.0000	4.9716
Total	**2.0900e-003**	**1.2800e-003**	**0.0146**	**5.0000e-005**	**6.7800e-003**	**4.0000e-005**	**6.8300e-003**	**1.8000e-003**	**4.0000e-005**	**1.8400e-003**	**0.0000**	**4.9693**	**4.9693**	**9.0000e-005**	**0.0000**	**4.9716**

3.6 Excavation for Substructure - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.0600e-003	0.0000	1.0600e-003	1.1000e-004	0.0000	1.1000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0195	0.0843	0.8614	1.6700e-003		2.5900e-003	2.5900e-003		2.5900e-003	2.5900e-003	0.0000	152.4758	152.4758	0.0259	0.0000	153.1230
Total	**0.0195**	**0.0843**	**0.8614**	**1.6700e-003**	**1.0600e-003**	**2.5900e-003**	**3.6500e-003**	**1.1000e-004**	**2.5900e-003**	**2.7000e-003**	**0.0000**	**152.4758**	**152.4758**	**0.0259**	**0.0000**	**153.1230**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0900e-003	1.2800e-003	0.0146	5.0000e-005	6.7800e-003	4.0000e-005	6.8300e-003	1.8000e-003	4.0000e-005	1.8400e-003	0.0000	4.9693	4.9693	9.0000e-005	0.0000	4.9716
Total	**2.0900e-003**	**1.2800e-003**	**0.0146**	**5.0000e-005**	**6.7800e-003**	**4.0000e-005**	**6.8300e-003**	**1.8000e-003**	**4.0000e-005**	**1.8400e-003**	**0.0000**	**4.9693**	**4.9693**	**9.0000e-005**	**0.0000**	**4.9716**

3.6 Excavation for Substructure - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.0600e-003	0.0000	1.0600e-003	1.1000e-004	0.0000	1.1000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0620	0.3999	0.5540	1.6400e-003		0.0164	0.0164		0.0156	0.0156	0.0000	150.1657	150.1657	0.0255	0.0000	150.8032
Total	**0.0620**	**0.3999**	**0.5540**	**1.6400e-003**	**1.0600e-003**	**0.0164**	**0.0175**	**1.1000e-004**	**0.0156**	**0.0157**	**0.0000**	**150.1657**	**150.1657**	**0.0255**	**0.0000**	**150.8032**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.9400e-003	1.1500e-003	0.0134	5.0000e-005	6.6800e-003	4.0000e-005	6.7200e-003	1.7800e-003	4.0000e-005	1.8100e-003	0.0000	4.7119	4.7119	8.0000e-005	0.0000	4.7139
Total	**1.9400e-003**	**1.1500e-003**	**0.0134**	**5.0000e-005**	**6.6800e-003**	**4.0000e-005**	**6.7200e-003**	**1.7800e-003**	**4.0000e-005**	**1.8100e-003**	**0.0000**	**4.7119**	**4.7119**	**8.0000e-005**	**0.0000**	**4.7139**

3.6 Excavation for Substructure - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.0600e-003	0.0000	1.0600e-003	1.1000e-004	0.0000	1.1000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0192	0.0830	0.8483	1.6400e-003		2.5500e-003	2.5500e-003		2.5500e-003	2.5500e-003	0.0000	150.1655	150.1655	0.0255	0.0000	150.8030
Total	**0.0192**	**0.0830**	**0.8483**	**1.6400e-003**	**1.0600e-003**	**2.5500e-003**	**3.6100e-003**	**1.1000e-004**	**2.5500e-003**	**2.6600e-003**	**0.0000**	**150.1655**	**150.1655**	**0.0255**	**0.0000**	**150.8030**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.9400e-003	1.1500e-003	0.0134	5.0000e-005	6.6800e-003	4.0000e-005	6.7200e-003	1.7800e-003	4.0000e-005	1.8100e-003	0.0000	4.7119	4.7119	8.0000e-005	0.0000	4.7139
Total	**1.9400e-003**	**1.1500e-003**	**0.0134**	**5.0000e-005**	**6.6800e-003**	**4.0000e-005**	**6.7200e-003**	**1.7800e-003**	**4.0000e-005**	**1.8100e-003**	**0.0000**	**4.7119**	**4.7119**	**8.0000e-005**	**0.0000**	**4.7139**

3.7 CDSM - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1378	0.8266	1.2234	3.5100e-003		0.0333	0.0333		0.0321	0.0321	0.0000	325.5265	325.5265	0.0357	0.0000	326.4196
Total	**0.1378**	**0.8266**	**1.2234**	**3.5100e-003**		**0.0333**	**0.0333**		**0.0321**	**0.0321**	**0.0000**	**325.5265**	**325.5265**	**0.0357**	**0.0000**	**326.4196**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.1600e-003	0.1651	0.0444	7.6000e-004	0.0177	2.9000e-004	0.0180	4.8800e-003	2.8000e-004	5.1500e-003	0.0000	73.5042	73.5042	3.1700e-003	0.0000	73.5835
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.4100e-003	3.2100e-003	0.0373	1.4000e-004	0.0186	1.1000e-004	0.0187	4.9500e-003	1.0000e-004	5.0500e-003	0.0000	13.1152	13.1152	2.3000e-004	0.0000	13.1209
Total	**0.0106**	**0.1683**	**0.0816**	**9.0000e-004**	**0.0363**	**4.0000e-004**	**0.0367**	**9.8300e-003**	**3.8000e-004**	**0.0102**	**0.0000**	**86.6194**	**86.6194**	**3.4000e-003**	**0.0000**	**86.7043**

3.7 CDSM - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0399	0.1731	1.8341	3.5100e-003		5.3200e-003	5.3200e-003		5.3200e-003	5.3200e-003	0.0000	325.5262	325.5262	0.0357	0.0000	326.4192
Total	**0.0399**	**0.1731**	**1.8341**	**3.5100e-003**		**5.3200e-003**	**5.3200e-003**		**5.3200e-003**	**5.3200e-003**	**0.0000**	**325.5262**	**325.5262**	**0.0357**	**0.0000**	**326.4192**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.1600e-003	0.1651	0.0444	7.6000e-004	0.0177	2.9000e-004	0.0180	4.8800e-003	2.8000e-004	5.1500e-003	0.0000	73.5042	73.5042	3.1700e-003	0.0000	73.5835
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.4100e-003	3.2100e-003	0.0373	1.4000e-004	0.0186	1.1000e-004	0.0187	4.9500e-003	1.0000e-004	5.0500e-003	0.0000	13.1152	13.1152	2.3000e-004	0.0000	13.1209
Total	**0.0106**	**0.1683**	**0.0816**	**9.0000e-004**	**0.0363**	**4.0000e-004**	**0.0367**	**9.8300e-003**	**3.8000e-004**	**0.0102**	**0.0000**	**86.6194**	**86.6194**	**3.4000e-003**	**0.0000**	**86.7043**

3.8 Cement Treated Fill - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0856	0.5608	0.6940	2.3700e-003		0.0207	0.0207		0.0196	0.0196	0.0000	214.9397	214.9397	0.0415	0.0000	215.9766
Total	**0.0856**	**0.5608**	**0.6940**	**2.3700e-003**		**0.0207**	**0.0207**		**0.0196**	**0.0196**	**0.0000**	**214.9397**	**214.9397**	**0.0415**	**0.0000**	**215.9766**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	8.6100e-003	0.2730	0.0744	1.2700e-003	0.0298	4.8000e-004	0.0303	8.2100e-003	4.6000e-004	8.6600e-003	0.0000	122.9452	122.9452	5.3200e-003	0.0000	123.0781
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.2000e-003	6.9000e-004	8.1800e-003	3.0000e-005	4.3700e-003	2.0000e-005	4.4000e-003	1.1600e-003	2.0000e-005	1.1900e-003	0.0000	2.9777	2.9777	5.0000e-005	0.0000	2.9789
Total	**9.8100e-003**	**0.2737**	**0.0826**	**1.3000e-003**	**0.0342**	**5.0000e-004**	**0.0347**	**9.3700e-003**	**4.8000e-004**	**9.8500e-003**	**0.0000**	**125.9228**	**125.9228**	**5.3700e-003**	**0.0000**	**126.0569**

3.8 Cement Treated Fill - 2027

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0277	0.1201	1.1374	2.3700e-003		3.7000e-003	3.7000e-003		3.7000e-003	3.7000e-003	0.0000	214.9394	214.9394	0.0415	0.0000	215.9764
Total	**0.0277**	**0.1201**	**1.1374**	**2.3700e-003**		**3.7000e-003**	**3.7000e-003**		**3.7000e-003**	**3.7000e-003**	**0.0000**	**214.9394**	**214.9394**	**0.0415**	**0.0000**	**215.9764**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	8.6100e-003	0.2730	0.0744	1.2700e-003	0.0298	4.8000e-004	0.0303	8.2100e-003	4.6000e-004	8.6600e-003	0.0000	122.9452	122.9452	5.3200e-003	0.0000	123.0781
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.2000e-003	6.9000e-004	8.1800e-003	3.0000e-005	4.3700e-003	2.0000e-005	4.4000e-003	1.1600e-003	2.0000e-005	1.1900e-003	0.0000	2.9777	2.9777	5.0000e-005	0.0000	2.9789
Total	**9.8100e-003**	**0.2737**	**0.0826**	**1.3000e-003**	**0.0342**	**5.0000e-004**	**0.0347**	**9.3700e-003**	**4.8000e-004**	**9.8500e-003**	**0.0000**	**125.9228**	**125.9228**	**5.3700e-003**	**0.0000**	**126.0569**

3.9 Foundation for Superstructure - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0555	0.3551	0.5113	1.3800e-003		0.0146	0.0146		0.0140	0.0140	0.0000	127.2589	127.2589	0.0156	0.0000	127.6490
Total	**0.0555**	**0.3551**	**0.5113**	**1.3800e-003**		**0.0146**	**0.0146**		**0.0140**	**0.0140**	**0.0000**	**127.2589**	**127.2589**	**0.0156**	**0.0000**	**127.6490**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.3300e-003	0.1057	0.0288	4.9000e-004	0.0116	1.8000e-004	0.0117	3.1800e-003	1.8000e-004	3.3500e-003	0.0000	47.6063	47.6063	2.0600e-003	0.0000	47.6578
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.7200e-003	9.9000e-004	0.0117	5.0000e-005	6.2600e-003	4.0000e-005	6.3000e-003	1.6700e-003	3.0000e-005	1.7000e-003	0.0000	4.2646	4.2646	7.0000e-005	0.0000	4.2663
Total	**5.0500e-003**	**0.1067**	**0.0405**	**5.4000e-004**	**0.0178**	**2.2000e-004**	**0.0180**	**4.8500e-003**	**2.1000e-004**	**5.0500e-003**	**0.0000**	**51.8709**	**51.8709**	**2.1300e-003**	**0.0000**	**51.9241**

3.9 Foundation for Superstructure - 2027

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0157	0.0681	0.7389	1.3800e-003		2.1000e-003	2.1000e-003		2.1000e-003	2.1000e-003	0.0000	127.2587	127.2587	0.0156	0.0000	127.6489
Total	**0.0157**	**0.0681**	**0.7389**	**1.3800e-003**		**2.1000e-003**	**2.1000e-003**		**2.1000e-003**	**2.1000e-003**	**0.0000**	**127.2587**	**127.2587**	**0.0156**	**0.0000**	**127.6489**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.3300e-003	0.1057	0.0288	4.9000e-004	0.0116	1.8000e-004	0.0117	3.1800e-003	1.8000e-004	3.3500e-003	0.0000	47.6063	47.6063	2.0600e-003	0.0000	47.6578
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.7200e-003	9.9000e-004	0.0117	5.0000e-005	6.2600e-003	4.0000e-005	6.3000e-003	1.6700e-003	3.0000e-005	1.7000e-003	0.0000	4.2646	4.2646	7.0000e-005	0.0000	4.2663
Total	**5.0500e-003**	**0.1067**	**0.0405**	**5.4000e-004**	**0.0178**	**2.2000e-004**	**0.0180**	**4.8500e-003**	**2.1000e-004**	**5.0500e-003**	**0.0000**	**51.8709**	**51.8709**	**2.1300e-003**	**0.0000**	**51.9241**

3.10 Walls for Superstructure - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0727	0.5043	0.6293	1.8400e-003		0.0212	0.0212		0.0203	0.0203	0.0000	169.9251	169.9251	0.0205	0.0000	170.4383
Total	**0.0727**	**0.5043**	**0.6293**	**1.8400e-003**		**0.0212**	**0.0212**		**0.0203**	**0.0203**	**0.0000**	**169.9251**	**169.9251**	**0.0205**	**0.0000**	**170.4383**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.3300e-003	0.1057	0.0288	4.9000e-004	0.0116	1.8000e-004	0.0117	3.1800e-003	1.8000e-004	3.3500e-003	0.0000	47.6063	47.6063	2.0600e-003	0.0000	47.6578
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.7400e-003	1.5800e-003	0.0187	7.0000e-005	9.9700e-003	6.0000e-005	0.0100	2.6500e-003	5.0000e-005	2.7000e-003	0.0000	6.7899	6.7899	1.1000e-004	0.0000	6.7927
Total	**6.0700e-003**	**0.1073**	**0.0475**	**5.6000e-004**	**0.0215**	**2.4000e-004**	**0.0218**	**5.8300e-003**	**2.3000e-004**	**6.0500e-003**	**0.0000**	**54.3963**	**54.3963**	**2.1700e-003**	**0.0000**	**54.4505**

3.10 Walls for Superstructure - 2027

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0210	0.0912	0.9479	1.8400e-003		2.8100e-003	2.8100e-003		2.8100e-003	2.8100e-003	0.0000	169.9249	169.9249	0.0205	0.0000	170.4381
Total	**0.0210**	**0.0912**	**0.9479**	**1.8400e-003**		**2.8100e-003**	**2.8100e-003**		**2.8100e-003**	**2.8100e-003**	**0.0000**	**169.9249**	**169.9249**	**0.0205**	**0.0000**	**170.4381**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.3300e-003	0.1057	0.0288	4.9000e-004	0.0116	1.8000e-004	0.0117	3.1800e-003	1.8000e-004	3.3500e-003	0.0000	47.6063	47.6063	2.0600e-003	0.0000	47.6578
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.7400e-003	1.5800e-003	0.0187	7.0000e-005	9.9700e-003	6.0000e-005	0.0100	2.6500e-003	5.0000e-005	2.7000e-003	0.0000	6.7899	6.7899	1.1000e-004	0.0000	6.7927
Total	**6.0700e-003**	**0.1073**	**0.0475**	**5.6000e-004**	**0.0215**	**2.4000e-004**	**0.0218**	**5.8300e-003**	**2.3000e-004**	**6.0500e-003**	**0.0000**	**54.3963**	**54.3963**	**2.1700e-003**	**0.0000**	**54.4505**

3.11 Roof for Superstructure - 2028

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2393	1.5736	2.1133	5.9400e-003		0.0665	0.0665		0.0640	0.0640	0.0000	554.5755	554.5755	0.0502	0.0000	555.8300
Total	**0.2393**	**1.5736**	**2.1133**	**5.9400e-003**		**0.0665**	**0.0665**		**0.0640**	**0.0640**	**0.0000**	**554.5755**	**554.5755**	**0.0502**	**0.0000**	**555.8300**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.3100e-003	0.1043	0.0287	4.9000e-004	0.0116	1.8000e-004	0.0117	3.1800e-003	1.7000e-004	3.3500e-003	0.0000	47.3741	47.3741	2.0500e-003	0.0000	47.4253
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.1000e-003	2.3000e-003	0.0278	1.2000e-004	0.0158	8.0000e-005	0.0159	4.2100e-003	8.0000e-005	4.2900e-003	0.0000	10.4409	10.4409	1.6000e-004	0.0000	10.4449
Total	**7.4100e-003**	**0.1066**	**0.0565**	**6.1000e-004**	**0.0274**	**2.6000e-004**	**0.0276**	**7.3900e-003**	**2.5000e-004**	**7.6400e-003**	**0.0000**	**57.8150**	**57.8150**	**2.2100e-003**	**0.0000**	**57.8703**

3.11 Roof for Superstructure - 2028

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0673	0.2915	3.1288	5.9400e-003		8.9700e-003	8.9700e-003		8.9700e-003	8.9700e-003	0.0000	554.5749	554.5749	0.0502	0.0000	555.8293
Total	**0.0673**	**0.2915**	**3.1288**	**5.9400e-003**		**8.9700e-003**	**8.9700e-003**		**8.9700e-003**	**8.9700e-003**	**0.0000**	**554.5749**	**554.5749**	**0.0502**	**0.0000**	**555.8293**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.3100e-003	0.1043	0.0287	4.9000e-004	0.0116	1.8000e-004	0.0117	3.1800e-003	1.7000e-004	3.3500e-003	0.0000	47.3741	47.3741	2.0500e-003	0.0000	47.4253
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.1000e-003	2.3000e-003	0.0278	1.2000e-004	0.0158	8.0000e-005	0.0159	4.2100e-003	8.0000e-005	4.2900e-003	0.0000	10.4409	10.4409	1.6000e-004	0.0000	10.4449
Total	**7.4100e-003**	**0.1066**	**0.0565**	**6.1000e-004**	**0.0274**	**2.6000e-004**	**0.0276**	**7.3900e-003**	**2.5000e-004**	**7.6400e-003**	**0.0000**	**57.8150**	**57.8150**	**2.2100e-003**	**0.0000**	**57.8703**

3.12 Shotcrete and Prestressing - 2028

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0135	0.1057	0.0832	3.2000e-004		4.4000e-003	4.4000e-003		4.0500e-003	4.0500e-003	0.0000	28.1727	28.1727	9.1100e-003	0.0000	28.4005
Total	**0.0135**	**0.1057**	**0.0832**	**3.2000e-004**		**4.4000e-003**	**4.4000e-003**		**4.0500e-003**	**4.0500e-003**	**0.0000**	**28.1727**	**28.1727**	**9.1100e-003**	**0.0000**	**28.4005**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.3100e-003	0.1043	0.0287	4.9000e-004	0.0116	1.8000e-004	0.0117	3.1800e-003	1.7000e-004	3.3500e-003	0.0000	47.3741	47.3741	2.0500e-003	0.0000	47.4253
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.6200e-003	9.1000e-004	0.0110	5.0000e-005	6.2600e-003	3.0000e-005	6.3000e-003	1.6700e-003	3.0000e-005	1.7000e-003	0.0000	4.1305	4.1305	6.0000e-005	0.0000	4.1321
Total	**4.9300e-003**	**0.1052**	**0.0397**	**5.4000e-004**	**0.0178**	**2.1000e-004**	**0.0180**	**4.8500e-003**	**2.0000e-004**	**5.0500e-003**	**0.0000**	**51.5046**	**51.5046**	**2.1100e-003**	**0.0000**	**51.5574**

3.12 Shotcrete and Prestressing - 2028

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.9600e-003	0.0172	0.1453	3.2000e-004		5.3000e-004	5.3000e-004		5.3000e-004	5.3000e-004	0.0000	28.1727	28.1727	9.1100e-003	0.0000	28.4004
Total	**3.9600e-003**	**0.0172**	**0.1453**	**3.2000e-004**		**5.3000e-004**	**5.3000e-004**		**5.3000e-004**	**5.3000e-004**	**0.0000**	**28.1727**	**28.1727**	**9.1100e-003**	**0.0000**	**28.4004**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.3100e-003	0.1043	0.0287	4.9000e-004	0.0116	1.8000e-004	0.0117	3.1800e-003	1.7000e-004	3.3500e-003	0.0000	47.3741	47.3741	2.0500e-003	0.0000	47.4253
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.6200e-003	9.1000e-004	0.0110	5.0000e-005	6.2600e-003	3.0000e-005	6.3000e-003	1.6700e-003	3.0000e-005	1.7000e-003	0.0000	4.1305	4.1305	6.0000e-005	0.0000	4.1321
Total	**4.9300e-003**	**0.1052**	**0.0397**	**5.4000e-004**	**0.0178**	**2.1000e-004**	**0.0180**	**4.8500e-003**	**2.0000e-004**	**5.0500e-003**	**0.0000**	**51.5046**	**51.5046**	**2.1100e-003**	**0.0000**	**51.5574**

3.13 Valve Structure - 2029

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0648	0.4506	0.6076	1.7400e-003		0.0174	0.0174		0.0167	0.0167	0.0000	161.3518	161.3518	0.0202	0.0000	161.8578
Total	**0.0648**	**0.4506**	**0.6076**	**1.7400e-003**		**0.0174**	**0.0174**		**0.0167**	**0.0167**	**0.0000**	**161.3518**	**161.3518**	**0.0202**	**0.0000**	**161.8578**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.5000e-004	0.0111	3.0900e-003	5.0000e-005	1.2500e-003	2.0000e-005	1.2700e-003	3.5000e-004	2.0000e-005	3.6000e-004	0.0000	5.1139	5.1139	2.2000e-004	0.0000	5.1195
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.9000e-004	3.8000e-004	4.6800e-003	2.0000e-005	2.8500e-003	1.0000e-005	2.8600e-003	7.6000e-004	1.0000e-005	7.7000e-004	0.0000	1.8237	1.8237	3.0000e-005	0.0000	1.8243
Total	**1.0400e-003**	**0.0115**	**7.7700e-003**	**7.0000e-005**	**4.1000e-003**	**3.0000e-005**	**4.1300e-003**	**1.1100e-003**	**3.0000e-005**	**1.1300e-003**	**0.0000**	**6.9376**	**6.9376**	**2.5000e-004**	**0.0000**	**6.9438**

3.13 Valve Structure - 2029

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0200	0.0868	0.9100	1.7400e-003		2.6700e-003	2.6700e-003		2.6700e-003	2.6700e-003	0.0000	161.3516	161.3516	0.0202	0.0000	161.8577
Total	**0.0200**	**0.0868**	**0.9100**	**1.7400e-003**		**2.6700e-003**	**2.6700e-003**		**2.6700e-003**	**2.6700e-003**	**0.0000**	**161.3516**	**161.3516**	**0.0202**	**0.0000**	**161.8577**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.5000e-004	0.0111	3.0900e-003	5.0000e-005	1.2500e-003	2.0000e-005	1.2700e-003	3.5000e-004	2.0000e-005	3.6000e-004	0.0000	5.1139	5.1139	2.2000e-004	0.0000	5.1195
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.9000e-004	3.8000e-004	4.6800e-003	2.0000e-005	2.8500e-003	1.0000e-005	2.8600e-003	7.6000e-004	1.0000e-005	7.7000e-004	0.0000	1.8237	1.8237	3.0000e-005	0.0000	1.8243
Total	**1.0400e-003**	**0.0115**	**7.7700e-003**	**7.0000e-005**	**4.1000e-003**	**3.0000e-005**	**4.1300e-003**	**1.1100e-003**	**3.0000e-005**	**1.1300e-003**	**0.0000**	**6.9376**	**6.9376**	**2.5000e-004**	**0.0000**	**6.9438**

3.14 Rate Control Station - 2029

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0625	0.3965	0.6008	1.4800e-003		0.0138	0.0138		0.0136	0.0136	0.0000	135.4071	135.4071	8.1000e-003	0.0000	135.6096
Total	**0.0625**	**0.3965**	**0.6008**	**1.4800e-003**		**0.0138**	**0.0138**		**0.0136**	**0.0136**	**0.0000**	**135.4071**	**135.4071**	**8.1000e-003**	**0.0000**	**135.6096**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	8.0000e-005	2.4000e-003	6.7000e-004	1.0000e-005	2.7000e-004	0.0000	2.8000e-004	7.0000e-005	0.0000	8.0000e-005	0.0000	1.1057	1.1057	5.0000e-005	0.0000	1.1069
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1500e-003	6.3000e-004	7.8000e-003	3.0000e-005	4.7400e-003	2.0000e-005	4.7700e-003	1.2600e-003	2.0000e-005	1.2800e-003	0.0000	3.0394	3.0394	4.0000e-005	0.0000	3.0405
Total	**1.2300e-003**	**3.0300e-003**	**8.4700e-003**	**4.0000e-005**	**5.0100e-003**	**2.0000e-005**	**5.0500e-003**	**1.3300e-003**	**2.0000e-005**	**1.3600e-003**	**0.0000**	**4.1452**	**4.1452**	**9.0000e-005**	**0.0000**	**4.1475**

3.14 Rate Control Station - 2029

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0178	0.1422	0.8068	1.4800e-003		2.1300e-003	2.1300e-003		2.1300e-003	2.1300e-003	0.0000	135.4069	135.4069	8.1000e-003	0.0000	135.6094
Total	**0.0178**	**0.1422**	**0.8068**	**1.4800e-003**		**2.1300e-003**	**2.1300e-003**		**2.1300e-003**	**2.1300e-003**	**0.0000**	**135.4069**	**135.4069**	**8.1000e-003**	**0.0000**	**135.6094**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	8.0000e-005	2.4000e-003	6.7000e-004	1.0000e-005	2.7000e-004	0.0000	2.8000e-004	7.0000e-005	0.0000	8.0000e-005	0.0000	1.1057	1.1057	5.0000e-005	0.0000	1.1069
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1500e-003	6.3000e-004	7.8000e-003	3.0000e-005	4.7400e-003	2.0000e-005	4.7700e-003	1.2600e-003	2.0000e-005	1.2800e-003	0.0000	3.0394	3.0394	4.0000e-005	0.0000	3.0405
Total	**1.2300e-003**	**3.0300e-003**	**8.4700e-003**	**4.0000e-005**	**5.0100e-003**	**2.0000e-005**	**5.0500e-003**	**1.3300e-003**	**2.0000e-005**	**1.3600e-003**	**0.0000**	**4.1452**	**4.1452**	**9.0000e-005**	**0.0000**	**4.1475**

3.15 Final Excavation & Grading - 2029

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.0600e-003	0.0000	1.0600e-003	1.1000e-004	0.0000	1.1000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0506	0.3260	0.4517	1.3400e-003		0.0134	0.0134		0.0127	0.0127	0.0000	122.4428	122.4428	0.0208	0.0000	122.9626
Total	**0.0506**	**0.3260**	**0.4517**	**1.3400e-003**	**1.0600e-003**	**0.0134**	**0.0144**	**1.1000e-004**	**0.0127**	**0.0128**	**0.0000**	**122.4428**	**122.4428**	**0.0208**	**0.0000**	**122.9626**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.3200e-003	7.3000e-004	8.9600e-003	4.0000e-005	5.4500e-003	3.0000e-005	5.4700e-003	1.4500e-003	2.0000e-005	1.4700e-003	0.0000	3.4903	3.4903	5.0000e-005	0.0000	3.4916
Total	**1.3200e-003**	**7.3000e-004**	**8.9600e-003**	**4.0000e-005**	**5.4500e-003**	**3.0000e-005**	**5.4700e-003**	**1.4500e-003**	**2.0000e-005**	**1.4700e-003**	**0.0000**	**3.4903**	**3.4903**	**5.0000e-005**	**0.0000**	**3.4916**

3.15 Final Excavation & Grading - 2029

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.0600e-003	0.0000	1.0600e-003	1.1000e-004	0.0000	1.1000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0156	0.0677	0.6917	1.3400e-003		2.0800e-003	2.0800e-003		2.0800e-003	2.0800e-003	0.0000	122.4427	122.4427	0.0208	0.0000	122.9624
Total	**0.0156**	**0.0677**	**0.6917**	**1.3400e-003**	**1.0600e-003**	**2.0800e-003**	**3.1400e-003**	**1.1000e-004**	**2.0800e-003**	**2.1900e-003**	**0.0000**	**122.4427**	**122.4427**	**0.0208**	**0.0000**	**122.9624**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.3200e-003	7.3000e-004	8.9600e-003	4.0000e-005	5.4500e-003	3.0000e-005	5.4700e-003	1.4500e-003	2.0000e-005	1.4700e-003	0.0000	3.4903	3.4903	5.0000e-005	0.0000	3.4916
Total	**1.3200e-003**	**7.3000e-004**	**8.9600e-003**	**4.0000e-005**	**5.4500e-003**	**3.0000e-005**	**5.4700e-003**	**1.4500e-003**	**2.0000e-005**	**1.4700e-003**	**0.0000**	**3.4903**	**3.4903**	**5.0000e-005**	**0.0000**	**3.4916**

3.16 Landscaping, Irrigation System, Bio-retention area, security fence - 2029

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.0600e-003	0.0000	1.0600e-003	1.1000e-004	0.0000	1.1000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.2900e-003	0.0593	0.0943	2.3000e-004		2.4500e-003	2.4500e-003		2.3700e-003	2.3700e-003	0.0000	21.5453	21.5453	1.6400e-003	0.0000	21.5864
Total	**9.2900e-003**	**0.0593**	**0.0943**	**2.3000e-004**	**1.0600e-003**	**2.4500e-003**	**3.5100e-003**	**1.1000e-004**	**2.3700e-003**	**2.4800e-003**	**0.0000**	**21.5453**	**21.5453**	**1.6400e-003**	**0.0000**	**21.5864**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.2000e-004	7.0400e-003	1.9600e-003	3.0000e-005	8.0000e-004	1.0000e-005	8.1000e-004	2.2000e-004	1.0000e-005	2.3000e-004	0.0000	3.2480	3.2480	1.4000e-004	0.0000	3.2516
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-004	1.1000e-004	1.3700e-003	1.0000e-005	8.3000e-004	0.0000	8.3000e-004	2.2000e-004	0.0000	2.2000e-004	0.0000	0.5319	0.5319	1.0000e-005	0.0000	0.5321
Total	**4.2000e-004**	**7.1500e-003**	**3.3300e-003**	**4.0000e-005**	**1.6300e-003**	**1.0000e-005**	**1.6400e-003**	**4.4000e-004**	**1.0000e-005**	**4.5000e-004**	**0.0000**	**3.7799**	**3.7799**	**1.5000e-004**	**0.0000**	**3.7837**

3.16 Landscaping, Irrigation System, Bio-retention area, security fence - 2029

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.0600e-003	0.0000	1.0600e-003	1.1000e-004	0.0000	1.1000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.5900e-003	0.0112	0.1295	2.3000e-004		3.4000e-004	3.4000e-004		3.4000e-004	3.4000e-004	0.0000	21.5452	21.5452	1.6400e-003	0.0000	21.5863
Total	**2.5900e-003**	**0.0112**	**0.1295**	**2.3000e-004**	**1.0600e-003**	**3.4000e-004**	**1.4000e-003**	**1.1000e-004**	**3.4000e-004**	**4.5000e-004**	**0.0000**	**21.5452**	**21.5452**	**1.6400e-003**	**0.0000**	**21.5863**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.2000e-004	7.0400e-003	1.9600e-003	3.0000e-005	8.0000e-004	1.0000e-005	8.1000e-004	2.2000e-004	1.0000e-005	2.3000e-004	0.0000	3.2480	3.2480	1.4000e-004	0.0000	3.2516
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-004	1.1000e-004	1.3700e-003	1.0000e-005	8.3000e-004	0.0000	8.3000e-004	2.2000e-004	0.0000	2.2000e-004	0.0000	0.5319	0.5319	1.0000e-005	0.0000	0.5321
Total	**4.2000e-004**	**7.1500e-003**	**3.3300e-003**	**4.0000e-005**	**1.6300e-003**	**1.0000e-005**	**1.6400e-003**	**4.4000e-004**	**1.0000e-005**	**4.5000e-004**	**0.0000**	**3.7799**	**3.7799**	**1.5000e-004**	**0.0000**	**3.7837**

3.17 Access roads & paving - 2029

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0120	0.0846	0.1371	3.0000e-004		3.6800e-003	3.6800e-003		3.5000e-003	3.5000e-003	0.0000	27.4233	27.4233	3.5500e-003	0.0000	27.5119
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0120**	**0.0846**	**0.1371**	**3.0000e-004**		**3.6800e-003**	**3.6800e-003**		**3.5000e-003**	**3.5000e-003**	**0.0000**	**27.4233**	**27.4233**	**3.5500e-003**	**0.0000**	**27.5119**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.3000e-003	0.0721	0.0201	3.4000e-004	8.1500e-003	1.3000e-004	8.2800e-003	2.2400e-003	1.2000e-004	2.3600e-003	0.0000	33.2405	33.2405	1.4400e-003	0.0000	33.2766
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-004	1.1000e-004	1.3700e-003	1.0000e-005	8.3000e-004	0.0000	8.3000e-004	2.2000e-004	0.0000	2.2000e-004	0.0000	0.5319	0.5319	1.0000e-005	0.0000	0.5321
Total	**2.5000e-003**	**0.0722**	**0.0215**	**3.5000e-004**	**8.9800e-003**	**1.3000e-004**	**9.1100e-003**	**2.4600e-003**	**1.2000e-004**	**2.5800e-003**	**0.0000**	**33.7724**	**33.7724**	**1.4500e-003**	**0.0000**	**33.8087**

3.17 Access roads & paving - 2029

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.4100e-003	0.0148	0.1803	3.0000e-004		4.5000e-004	4.5000e-004		4.5000e-004	4.5000e-004	0.0000	27.4232	27.4232	3.5500e-003	0.0000	27.5119
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.4100e-003**	**0.0148**	**0.1803**	**3.0000e-004**		**4.5000e-004**	**4.5000e-004**		**4.5000e-004**	**4.5000e-004**	**0.0000**	**27.4232**	**27.4232**	**3.5500e-003**	**0.0000**	**27.5119**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.3000e-003	0.0721	0.0201	3.4000e-004	8.1500e-003	1.3000e-004	8.2800e-003	2.2400e-003	1.2000e-004	2.3600e-003	0.0000	33.2405	33.2405	1.4400e-003	0.0000	33.2766
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-004	1.1000e-004	1.3700e-003	1.0000e-005	8.3000e-004	0.0000	8.3000e-004	2.2000e-004	0.0000	2.2000e-004	0.0000	0.5319	0.5319	1.0000e-005	0.0000	0.5321
Total	**2.5000e-003**	**0.0722**	**0.0215**	**3.5000e-004**	**8.9800e-003**	**1.3000e-004**	**9.1100e-003**	**2.4600e-003**	**1.2000e-004**	**2.5800e-003**	**0.0000**	**33.7724**	**33.7724**	**1.4500e-003**	**0.0000**	**33.8087**

3.18 Redwood Day School Access driveway - 2029

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0120	0.0846	0.1371	3.0000e-004		3.6800e-003	3.6800e-003		3.5000e-003	3.5000e-003	0.0000	27.4233	27.4233	3.5500e-003	0.0000	27.5119
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0120**	**0.0846**	**0.1371**	**3.0000e-004**		**3.6800e-003**	**3.6800e-003**		**3.5000e-003**	**3.5000e-003**	**0.0000**	**27.4233**	**27.4233**	**3.5500e-003**	**0.0000**	**27.5119**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.4000e-004	4.4900e-003	1.2500e-003	2.0000e-005	5.1000e-004	1.0000e-005	5.2000e-004	1.4000e-004	1.0000e-005	1.5000e-004	0.0000	2.0732	2.0732	9.0000e-005	0.0000	2.0755
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-004	1.1000e-004	1.3700e-003	1.0000e-005	8.3000e-004	0.0000	8.3000e-004	2.2000e-004	0.0000	2.2000e-004	0.0000	0.5319	0.5319	1.0000e-005	0.0000	0.5321
Total	**3.4000e-004**	**4.6000e-003**	**2.6200e-003**	**3.0000e-005**	**1.3400e-003**	**1.0000e-005**	**1.3500e-003**	**3.6000e-004**	**1.0000e-005**	**3.7000e-004**	**0.0000**	**2.6051**	**2.6051**	**1.0000e-004**	**0.0000**	**2.6076**

3.18 Redwood Day School Access driveway - 2029

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.4100e-003	0.0148	0.1803	3.0000e-004		4.5000e-004	4.5000e-004		4.5000e-004	4.5000e-004	0.0000	27.4232	27.4232	3.5500e-003	0.0000	27.5119
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.4100e-003**	**0.0148**	**0.1803**	**3.0000e-004**		**4.5000e-004**	**4.5000e-004**		**4.5000e-004**	**4.5000e-004**	**0.0000**	**27.4232**	**27.4232**	**3.5500e-003**	**0.0000**	**27.5119**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.4000e-004	4.4900e-003	1.2500e-003	2.0000e-005	5.1000e-004	1.0000e-005	5.2000e-004	1.4000e-004	1.0000e-005	1.5000e-004	0.0000	2.0732	2.0732	9.0000e-005	0.0000	2.0755
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-004	1.1000e-004	1.3700e-003	1.0000e-005	8.3000e-004	0.0000	8.3000e-004	2.2000e-004	0.0000	2.2000e-004	0.0000	0.5319	0.5319	1.0000e-005	0.0000	0.5321
Total	**3.4000e-004**	**4.6000e-003**	**2.6200e-003**	**3.0000e-005**	**1.3400e-003**	**1.0000e-005**	**1.3500e-003**	**3.6000e-004**	**1.0000e-005**	**3.7000e-004**	**0.0000**	**2.6051**	**2.6051**	**1.0000e-004**	**0.0000**	**2.6076**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	9.8500e-003	0.0749	0.1148	6.0000e-004	0.0574	3.8000e-004	0.0578	0.0154	3.5000e-004	0.0158	0.0000	56.0876	56.0876	1.9300e-003	0.0000	56.1357
Unmitigated	9.8500e-003	0.0749	0.1148	6.0000e-004	0.0574	3.8000e-004	0.0578	0.0154	3.5000e-004	0.0158	0.0000	56.0876	56.0876	1.9300e-003	0.0000	56.1357

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	69.70	13.20	6.80	153,691	153,691
Total	69.70	13.20	6.80	153,691	153,691

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.566339	0.035990	0.189848	0.102849	0.012430	0.005068	0.026569	0.050520	0.002280	0.001770	0.005305	0.000389	0.000644

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	10.0817	10.0817	9.9000e-004	2.1000e-004	10.1679
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	10.0817	10.0817	9.9000e-004	2.1000e-004	10.1679
NaturalGas Mitigated	1.3300e-003	0.0121	0.0102	7.0000e-005		9.2000e-004	9.2000e-004		9.2000e-004	9.2000e-004	0.0000	13.2075	13.2075	2.5000e-004	2.4000e-004	13.2860
NaturalGas Unmitigated	1.3300e-003	0.0121	0.0102	7.0000e-005		9.2000e-004	9.2000e-004		9.2000e-004	9.2000e-004	0.0000	13.2075	13.2075	2.5000e-004	2.4000e-004	13.2860

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	247500	1.3300e-003	0.0121	0.0102	7.0000e-005		9.2000e-004	9.2000e-004		9.2000e-004	9.2000e-004	0.0000	13.2075	13.2075	2.5000e-004	2.4000e-004	13.2860
Total		**1.3300e-003**	**0.0121**	**0.0102**	**7.0000e-005**		**9.2000e-004**	**9.2000e-004**		**9.2000e-004**	**9.2000e-004**	**0.0000**	**13.2075**	**13.2075**	**2.5000e-004**	**2.4000e-004**	**13.2860**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	247500	1.3300e-003	0.0121	0.0102	7.0000e-005		9.2000e-004	9.2000e-004		9.2000e-004	9.2000e-004	0.0000	13.2075	13.2075	2.5000e-004	2.4000e-004	13.2860
Total		**1.3300e-003**	**0.0121**	**0.0102**	**7.0000e-005**		**9.2000e-004**	**9.2000e-004**		**9.2000e-004**	**9.2000e-004**	**0.0000**	**13.2075**	**13.2075**	**2.5000e-004**	**2.4000e-004**	**13.2860**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	75600	10.0817	9.9000e-004	2.1000e-004	10.1679
Total		**10.0817**	**9.9000e-004**	**2.1000e-004**	**10.1679**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	75600	10.0817	9.9000e-004	2.1000e-004	10.1679
Total		**10.0817**	**9.9000e-004**	**2.1000e-004**	**10.1679**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0443	0.0000	9.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.8000e-004	1.8000e-004	0.0000	0.0000	1.9000e-004
Unmitigated	0.0443	0.0000	9.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.8000e-004	1.8000e-004	0.0000	0.0000	1.9000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	5.2100e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0391					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	9.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.8000e-004	1.8000e-004	0.0000	0.0000	1.9000e-004
Total	**0.0443**	**0.0000**	**9.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.8000e-004**	**1.8000e-004**	**0.0000**	**0.0000**	**1.9000e-004**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	5.2100e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0391					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	9.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.8000e-004	1.8000e-004	0.0000	0.0000	1.9000e-004
Total	**0.0443**	**0.0000**	**9.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.8000e-004**	**1.8000e-004**	**0.0000**	**0.0000**	**1.9000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	2.4023	0.0755	1.8100e-003	4.8306
Unmitigated	2.4023	0.0755	1.8100e-003	4.8306

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	2.3125 / 0	2.4023	0.0755	1.8100e-003	4.8306
Total		**2.4023**	**0.0755**	**1.8100e-003**	**4.8306**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	2.3125 / 0	2.4023	0.0755	1.8100e-003	4.8306
Total		**2.4023**	**0.0755**	**1.8100e-003**	**4.8306**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	2.5171	0.1488	0.0000	6.2360
Unmitigated	2.5171	0.1488	0.0000	6.2360

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	12.4	2.5171	0.1488	0.0000	6.2360
Total		**2.5171**	**0.1488**	**0.0000**	**6.2360**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	12.4	2.5171	0.1488	0.0000	6.2360
Total		**2.5171**	**0.1488**	**0.0000**	**6.2360**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

School Receptor - Uncontrolled Scenario

```
**************************************
**
** AERMOD Input Produced by:
** AERMOD View Ver. 9.5.0
** Lakes Environmental Software Inc.
** Date: 9/9/2019
** File: C:\Lakes\AERMOD View\EBMUD Central Reservoir\EBMUD Central Reservoir.ADI
**
**************************************
**
**
**************************************
** AERMOD Control Pathway
**************************************
**
**
CO STARTING
   TITLEONE C:\Lakes\AERMOD View\EBMUD Central Reservoir\EBMUD Central Reservoir
   MODELOPT DFAULT CONC
   AVERTIME ANNUAL
   POLLUTID PM_10
   RUNORNOT RUN
   ERRORFIL "EBMUD Central Reservoir.err"
CO FINISHED
**
**************************************
** AERMOD Source Pathway
**************************************
**
**
SO STARTING
** Source Location **
** Source ID - Type - X Coord. - Y Coord. **
   LOCATION PAREA1       AREAPOLY   568297.417  4183874.529      63.880
** Source Parameters **
   SRCPARAM PAREA1       5.4792E-08     5.000       21
   AREAVERT PAREA1       568297.417 4183874.529 568256.149 4183721.932
   AREAVERT PAREA1       568237.914 4183696.019 568218.719 4183669.147
   AREAVERT PAREA1       568203.363 4183641.314 568257.108 4183623.080
   AREAVERT PAREA1       568208.162 4183434.013 568334.847 4183391.784
   AREAVERT PAREA1       568331.008 4183375.469 568406.826 4183357.234
   AREAVERT PAREA1       568421.222 4183399.462 568475.927 4183386.026
   AREAVERT PAREA1       568478.806 4183386.986 568496.081 4183447.449
   AREAVERT PAREA1       568480.726 4183469.523 568495.122 4183480.080
   AREAVERT PAREA1       568481.685 4183654.751 568472.088 4183725.771
   AREAVERT PAREA1       568452.893 4183766.080 568445.216 4183789.113
   AREAVERT PAREA1       568412.585 4183847.657

** Variable Emissions Type: "By Hour / Seven Days (HRDOW7)"
** Variable Emission Scenario: "Scenario 1"
   EMISFACT PAREA1       HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 1.0
   EMISFACT PAREA1       HRDOW7 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0
```

```
   EMISFACT PAREA1      HRDOW7 1.0 1.0 1.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PAREA1      HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 1.0
   EMISFACT PAREA1      HRDOW7 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0
   EMISFACT PAREA1      HRDOW7 1.0 1.0 1.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PAREA1      HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 1.0
   EMISFACT PAREA1      HRDOW7 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0
   EMISFACT PAREA1      HRDOW7 1.0 1.0 1.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PAREA1      HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 1.0
   EMISFACT PAREA1      HRDOW7 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0
   EMISFACT PAREA1      HRDOW7 1.0 1.0 1.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PAREA1      HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 1.0
   EMISFACT PAREA1      HRDOW7 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0
   EMISFACT PAREA1      HRDOW7 1.0 1.0 1.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PAREA1      HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PAREA1      HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PAREA1      HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PAREA1      HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PAREA1      HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PAREA1      HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   SRCGROUP ALL
SO FINISHED
**
****************************************
** AERMOD Receptor Pathway
****************************************
**
**
RE STARTING
   INCLUDED "EBMUD Central Reservoir.rou"
RE FINISHED
**
****************************************
** AERMOD Meteorology Pathway
****************************************
**
**
ME STARTING
   SURFFILE "C:\Users\jni\Desktop\EBMUD Central Reservoir\HRA\724930\724930.SFC"
   PROFFILE "C:\Users\jni\Desktop\EBMUD Central Reservoir\HRA\724930\724930.PFL"
   SURFDATA 23230 2009 OAKLAND/WSO_AP
   UAIRDATA 23230 2009 OAKLAND/WSO_AP
   PROFBASE 10.0 METERS
ME FINISHED
**
****************************************
** AERMOD Output Pathway
****************************************
**
**
OU STARTING
** Auto-Generated Plotfiles
   PLOTFILE ANNUAL ALL "EBMUD Central Reservoir.AD\AN00GALL.PLT" 31
   SUMMFILE "EBMUD Central Reservoir.sum"
OU FINISHED
```

****
*** SETUP Finishes Successfully ***
****

*** AERMOD - VERSION 16216r *** *** C:\Lakes\AERMOD View\EBMUD Central Reservoir\EBMUD Central Reservoir *** 09/09/19
*** AERMET - VERSION 14134 *** *** *** 09:04:57
PAGE 1
*** MODELOPTs: RegDFAULT CONC ELEV RURAL

*** MODEL SETUP OPTIONS SUMMARY ***
- -

**Model Is Setup For Calculation of Average CONCentration Values.

-- DEPOSITION LOGIC --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION. DRYDPLT = F
**Model Uses NO WET DEPLETION. WETDPLT = F

**Model Uses RURAL Dispersion Only.

**Model Uses Regulatory DEFAULT Options:
1. Stack-tip Downwash.
2. Model Accounts for ELEVated Terrain Effects.
3. Use Calms Processing Routine.
4. Use Missing Data Processing Routine.
5. No Exponential Decay.

**Other Options Specified:
CCVR_Sub - Meteorological data includes CCVR substitutions
TEMP_Sub - Meteorological data includes TEMP substitutions

**Model Assumes No FLAGPOLE Receptor Heights.

**The User Specified a Pollutant Type of: PM_10

**Model Calculates ANNUAL Averages Only

**This Run Includes: 1 Source(s); 1 Source Group(s); and 11 Receptor(s)

with: 0 POINT(s), including
0 POINTCAP(s) and 0 POINTHOR(s)
and: 0 VOLUME source(s)
and: 1 AREA type source(s)
and: 0 LINE source(s)
and: 0 OPENPIT source(s)
and: 0 BUOYANT LINE source(s) with 0 line(s)

**Model Set To Continue RUNning After the Setup Testing.

**The AERMET Input Meteorological Data Version Date: 14134

**Output Options Selected:
Model Outputs Tables of ANNUAL Averages by Receptor
Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours
m for Missing Hours
b for Both Calm and Missing Hours

**Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) = 10.00 ; Decay Coef. = 0.000 ; Rot. Angle = 0.0
Emission Units = GRAMS/SEC ; Emission Rate Unit Factor = 0.10000E+07
Output Units = MICROGRAMS/M**3

**Approximate Storage Requirements of Model = 3.5 MB of RAM.

**Detailed Error/Message File: EBMUD Central Reservoir.err
**File for Summary of Results: EBMUD Central Reservoir.sum

*** AREAPOLY SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC /METER**2)	LOCATION OF AREA X (METERS)	LOCATION OF AREA Y (METERS)	BASE ELEV. (METERS)	RELEASE HEIGHT (METERS)	NUMBER OF VERTS.	INIT. SZ (METERS)	URBAN SOURCE	EMISSION RATE SCALAR VARY BY
PAREA1	0	0.54792E-07	568297.4	4183874.5	63.9	5.00	21	0.00	NO	HRDOW7

*** SOURCE IDs DEFINING SOURCE GROUPS ***

SRCGROUP ID	SOURCE IDs
ALL	PAREA1 ,

*** MODELOPTs: RegDFAULT CONC ELEV RURAL

* SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY AND BY DAY OF WEEK (HRDOW7) *

SOURCE ID = PAREA1 ; SOURCE TYPE = AREAPOLY :
HOUR SCALAR HOUR SCALAR HOUR SCALAR HOUR SCALAR HOUR SCALAR HOUR SCALAR HOUR SCALAR HOUR SCALAR
- -
DAY OF WEEK = MONDAY
1 .0000E+00 2 .0000E+00 3 .0000E+00 4 .0000E+00 5 .0000E+00 6 .0000E+00 7 .0000E+00 8 .1000E+01
9 .1000E+01 10 .1000E+01 11 .1000E+01 12 .1000E+01 13 .1000E+01 14 .1000E+01 15 .1000E+01 16 .1000E+01
17 .1000E+01 18 .1000E+01 19 .1000E+01 20 .0000E+00 21 .0000E+00 22 .0000E+00 23 .0000E+00 24 .0000E+00
DAY OF WEEK = TUESDAY
1 .0000E+00 2 .0000E+00 3 .0000E+00 4 .0000E+00 5 .0000E+00 6 .0000E+00 7 .0000E+00 8 .1000E+01
9 .1000E+01 10 .1000E+01 11 .1000E+01 12 .1000E+01 13 .1000E+01 14 .1000E+01 15 .1000E+01 16 .1000E+01
17 .1000E+01 18 .1000E+01 19 .1000E+01 20 .0000E+00 21 .0000E+00 22 .0000E+00 23 .0000E+00 24 .0000E+00
DAY OF WEEK = WEDNESDY
1 .0000E+00 2 .0000E+00 3 .0000E+00 4 .0000E+00 5 .0000E+00 6 .0000E+00 7 .0000E+00 8 .1000E+01
9 .1000E+01 10 .1000E+01 11 .1000E+01 12 .1000E+01 13 .1000E+01 14 .1000E+01 15 .1000E+01 16 .1000E+01
17 .1000E+01 18 .1000E+01 19 .1000E+01 20 .0000E+00 21 .0000E+00 22 .0000E+00 23 .0000E+00 24 .0000E+00
DAY OF WEEK = THURSDAY
1 .0000E+00 2 .0000E+00 3 .0000E+00 4 .0000E+00 5 .0000E+00 6 .0000E+00 7 .0000E+00 8 .1000E+01
9 .1000E+01 10 .1000E+01 11 .1000E+01 12 .1000E+01 13 .1000E+01 14 .1000E+01 15 .1000E+01 16 .1000E+01
17 .1000E+01 18 .1000E+01 19 .1000E+01 20 .0000E+00 21 .0000E+00 22 .0000E+00 23 .0000E+00 24 .0000E+00
DAY OF WEEK = FRIDAY
1 .0000E+00 2 .0000E+00 3 .0000E+00 4 .0000E+00 5 .0000E+00 6 .0000E+00 7 .0000E+00 8 .1000E+01
9 .1000E+01 10 .1000E+01 11 .1000E+01 12 .1000E+01 13 .1000E+01 14 .1000E+01 15 .1000E+01 16 .1000E+01
17 .1000E+01 18 .1000E+01 19 .1000E+01 20 .0000E+00 21 .0000E+00 22 .0000E+00 23 .0000E+00 24 .0000E+00
DAY OF WEEK = SATURDAY
1 .0000E+00 2 .0000E+00 3 .0000E+00 4 .0000E+00 5 .0000E+00 6 .0000E+00 7 .0000E+00 8 .0000E+00
9 .0000E+00 10 .0000E+00 11 .0000E+00 12 .0000E+00 13 .0000E+00 14 .0000E+00 15 .0000E+00 16 .0000E+00
17 .0000E+00 18 .0000E+00 19 .0000E+00 20 .0000E+00 21 .0000E+00 22 .0000E+00 23 .0000E+00 24 .0000E+00
DAY OF WEEK = SUNDAY
1 .0000E+00 2 .0000E+00 3 .0000E+00 4 .0000E+00 5 .0000E+00 6 .0000E+00 7 .0000E+00 8

.0000E+00
9 .0000E+00 10 .0000E+00 11 .0000E+00 12 .0000E+00 13 .0000E+00 14 .0000E+00 15 .0000E+00 16 .0000E+00
17 .0000E+00 18 .0000E+00 19 .0000E+00 20 .0000E+00 21 .0000E+00 22 .0000E+00 23 .0000E+00 24 .0000E+00

*** DISCRETE CARTESIAN RECEPTORS ***
(X-COORD, Y-COORD, ZELEV, ZHILL, ZFLAG)
(METERS)

```
( 568257.6, 4183852.5,    63.6,    63.6,     0.0);      ( 568238.1, 4183758.8,    62.5,    62.5,     0.0);
( 568215.4, 4183619.8,    61.8,    61.8,     0.0);      ( 568222.6, 4183416.0,    60.3,    60.3,     0.0);
( 568470.7, 4183783.5,    65.7,   472.0,     0.0);      ( 568547.9, 4183530.3,    61.6,    61.6,     0.0);
( 568575.9, 4183647.4,    65.4,   472.0,     0.0);      ( 568503.7, 4183391.2,    54.7,    58.0,     0.0);
( 568435.9, 4183372.0,    47.3,    62.0,     0.0);      ( 568301.6, 4183386.6,    56.3,    61.0,     0.0);
( 568210.1, 4183519.9,    61.6,    61.6,     0.0);
```


*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

```
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1
```

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: C:\Users\jni\Desktop\EBMUD Central Reservoir\HRA\724930\724930.SFC Met Version: 14134
Profile file: C:\Users\jni\Desktop\EBMUD Central Reservoir\HRA\724930\724930.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 23230 Upper air station no.: 23230
Name: OAKLAND/WSO_AP Name: OAKLAND/WSO_AP
Year: 2009 Year: 2009

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
09	01	01	1	01	-17.2	0.303	-9.000	-9.000	-999.	401.	147.2	0.63	0.86	1.00	2.36	81.	10.0	282.5	2.0
09	01	01	1	02	-21.8	0.383	-9.000	-9.000	-999.	569.	234.6	0.63	0.86	1.00	2.86	68.	10.0	282.0	2.0
09	01	01	1	03	-26.3	0.460	-9.000	-9.000	-999.	749.	337.1	0.63	0.86	1.00	3.36	84.	10.0	280.9	2.0
09	01	01	1	04	-15.4	0.270	-9.000	-9.000	-999.	368.	116.1	0.47	0.86	1.00	2.36	53.	10.0	280.9	2.0
09	01	01	1	05	-26.3	0.460	-9.000	-9.000	-999.	749.	336.3	0.63	0.86	1.00	3.36	73.	10.0	280.4	2.0
09	01	01	1	06	-21.9	0.383	-9.000	-9.000	-999.	573.	232.9	0.63	0.86	1.00	2.86	82.	10.0	280.4	2.0
09	01	01	1	07	-22.0	0.383	-9.000	-9.000	-999.	569.	232.5	0.63	0.86	1.00	2.86	95.	10.0	279.9	2.0
09	01	01	1	08	-11.2	0.196	-9.000	-9.000	-999.	238.	60.6	0.63	0.86	0.76	1.76	73.	10.0	279.9	2.0
09	01	01	1	09	-2.2	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.45	0.86	0.39	0.00	0.	10.0	280.4	2.0
09	01	01	1	10	6.8	0.266	0.264	0.016	98.	329.	-250.8	0.63	0.86	0.27	1.76	91.	10.0	280.9	2.0
09	01	01	1	11	15.5	-9.000	-9.000	-9.000	177.	-999.	-99999.0	0.45	0.86	0.22	0.00	0.	10.0	282.0	2.0
09	01	01	1	12	96.1	0.393	1.019	0.014	401.	591.	-57.4	0.22	0.86	0.21	3.36	266.	10.0	281.4	2.0
09	01	01	1	13	102.5	0.395	1.092	0.014	462.	595.	-54.4	0.22	0.86	0.20	3.36	283.	10.0	282.0	2.0
09	01	01	1	14	89.9	0.297	1.066	0.015	489.	394.	-26.5	0.22	0.86	0.21	2.36	249.	10.0	282.0	2.0
09	01	01	1	15	62.1	0.383	0.954	0.014	507.	569.	-82.1	0.22	0.86	0.24	3.36	242.	10.0	282.5	2.0
09	01	01	1	16	23.1	0.665	0.690	0.006	513.	1300.	-1150.4	0.52	0.86	0.33	4.86	304.	10.0	282.5	2.0
09	01	01	1	17	-37.0	0.486	-9.000	-9.000	-999.	846.	280.6	0.22	0.86	0.56	4.86	291.	10.0	281.4	2.0
09	01	01	1	18	-52.2	0.480	-9.000	-9.000	-999.	799.	191.9	0.52	0.86	1.00	3.86	307.	10.0	280.9	2.0
09	01	01	1	19	-25.6	0.224	-9.000	-9.000	-999.	327.	39.8	0.52	0.86	1.00	2.36	334.	10.0	280.4	2.0
09	01	01	1	20	-11.1	0.119	-9.000	-9.000	-999.	115.	13.8	0.52	0.86	1.00	1.76	317.	10.0	280.4	2.0
09	01	01	1	21	-10.3	0.119	-9.000	-9.000	-999.	98.	14.7	0.52	0.86	1.00	1.76	320.	10.0	280.4	2.0
09	01	01	1	22	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.45	0.86	1.00	0.00	0.	10.0	280.9	2.0
09	01	01	1	23	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.45	0.86	1.00	0.00	0.	10.0	281.4	2.0
09	01	01	1	24	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.45	0.86	1.00	0.00	0.	10.0	281.4	2.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
09	01	01	01	10.0	1	81.	2.36	282.6	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

*** AERMOD - VERSION 16216r *** *** C:\Lakes\AERMOD View\EBMUD Central Reservoir\EBMUD Central Reservoir *** 09/09/19
*** AERMET - VERSION 14134 *** *** *** 09:04:57
PAGE 8
*** MODELOPTs: RegDFAULT CONC ELEV RURAL

*** THE ANNUAL AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: ALL ***

INCLUDING SOURCE(S): PAREA1 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM_10 IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
568257.63	4183852.47	0.00804	568238.07	4183758.79	0.01074
568215.43	4183619.82	0.01106	568222.63	4183416.00	0.00785
568470.72	4183783.50	0.04468	568547.93	4183530.26	0.03855
568575.90	4183647.45	0.02738	568503.65	4183391.16	0.03393
568435.90	4183371.96	0.02987	568301.55	4183386.64	0.01401
568210.10	4183519.87	0.01048			

*** THE SUMMARY OF MAXIMUM ANNUAL RESULTS AVERAGED OVER 5 YEARS ***

** CONC OF PM_10 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	NETWORK RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG) OF TYPE GRID-ID
ALL	1ST HIGHEST VALUE IS	0.04468	AT (568470.72, 4183783.50, 65.71, 472.00, 0.00) DC
	2ND HIGHEST VALUE IS	0.03855	AT (568547.93, 4183530.26, 61.64, 61.64, 0.00) DC
	3RD HIGHEST VALUE IS	0.03393	AT (568503.65, 4183391.16, 54.69, 58.00, 0.00) DC
	4TH HIGHEST VALUE IS	0.02987	AT (568435.90, 4183371.96, 47.27, 62.00, 0.00) DC
	5TH HIGHEST VALUE IS	0.02738	AT (568575.90, 4183647.45, 65.37, 472.00, 0.00) DC
	6TH HIGHEST VALUE IS	0.01401	AT (568301.55, 4183386.64, 56.32, 61.00, 0.00) DC
	7TH HIGHEST VALUE IS	0.01106	AT (568215.43, 4183619.82, 61.85, 61.85, 0.00) DC
	8TH HIGHEST VALUE IS	0.01074	AT (568238.07, 4183758.79, 62.49, 62.49, 0.00) DC
	9TH HIGHEST VALUE IS	0.01048	AT (568210.10, 4183519.87, 61.56, 61.56, 0.00) DC
	10TH HIGHEST VALUE IS	0.00804	AT (568257.63, 4183852.47, 63.60, 63.60, 0.00) DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)
A Total of 1 Warning Message(s)
A Total of 7953 Informational Message(s)

A Total of 43872 Hours Were Processed

A Total of 7152 Calm Hours Identified

A Total of 801 Missing Hours Identified (1.83 Percent)

******** FATAL ERROR MESSAGES ********
*** NONE ***

******** WARNING MESSAGES ********
MX W481 43873 MAIN: Data Remaining After End of Year. Number of Hours= 48

****
*** AERMOD Finishes Successfully ***
****

School Receptor - With all Tier 4 Final Equipment
```
**************************************
**
** AERMOD Input Produced by:
** AERMOD View Ver. 9.5.0
** Lakes Environmental Software Inc.
** Date: 9/9/2019
** File: C:\Lakes\AERMOD View\EBMUD Central Reservoir\EBMUD Central Reservoir.ADI
**
**************************************
**
**
**************************************
** AERMOD Control Pathway
**************************************
**
**
CO STARTING
   TITLEONE C:\Lakes\AERMOD View\EBMUD Central Reservoir\EBMUD Central Reservoir
   MODELOPT DFAULT CONC
   AVERTIME ANNUAL
   POLLUTID PM_10
   RUNORNOT RUN
   ERRORFIL "EBMUD Central Reservoir.err"
CO FINISHED
**
**************************************
** AERMOD Source Pathway
**************************************
**
**
SO STARTING
** Source Location **
** Source ID - Type - X Coord. - Y Coord. **
   LOCATION PAREA1       AREAPOLY   568297.417  4183874.529       63.880
** Source Parameters **
   SRCPARAM PAREA1       8.3582E-09     5.000       21
   AREAVERT PAREA1       568297.417 4183874.529 568256.149 4183721.932
   AREAVERT PAREA1       568237.914 4183696.019 568218.719 4183669.147
   AREAVERT PAREA1       568203.363 4183641.314 568257.108 4183623.080
   AREAVERT PAREA1       568208.162 4183434.013 568334.847 4183391.784
   AREAVERT PAREA1       568331.008 4183375.469 568406.826 4183357.234
   AREAVERT PAREA1       568421.222 4183399.462 568475.927 4183386.026
   AREAVERT PAREA1       568478.806 4183386.986 568496.081 4183447.449
   AREAVERT PAREA1       568480.726 4183469.523 568495.122 4183480.080
   AREAVERT PAREA1       568481.685 4183654.751 568472.088 4183725.771
   AREAVERT PAREA1       568452.893 4183766.080 568445.216 4183789.113
   AREAVERT PAREA1       568412.585 4183847.657

** Variable Emissions Type: "By Hour / Seven Days (HRDOW7)"
** Variable Emission Scenario: "Scenario 1"
   EMISFACT PAREA1       HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 1.0
   EMISFACT PAREA1       HRDOW7 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0
```

```
  EMISFACT PAREA1      HRDOW7 1.0 1.0 1.0 0.0 0.0 0.0 0.0 0.0
  EMISFACT PAREA1      HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 1.0
  EMISFACT PAREA1      HRDOW7 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0
  EMISFACT PAREA1      HRDOW7 1.0 1.0 1.0 0.0 0.0 0.0 0.0 0.0
  EMISFACT PAREA1      HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 1.0
  EMISFACT PAREA1      HRDOW7 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0
  EMISFACT PAREA1      HRDOW7 1.0 1.0 1.0 0.0 0.0 0.0 0.0 0.0
  EMISFACT PAREA1      HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 1.0
  EMISFACT PAREA1      HRDOW7 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0
  EMISFACT PAREA1      HRDOW7 1.0 1.0 1.0 0.0 0.0 0.0 0.0 0.0
  EMISFACT PAREA1      HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 1.0
  EMISFACT PAREA1      HRDOW7 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0
  EMISFACT PAREA1      HRDOW7 1.0 1.0 1.0 0.0 0.0 0.0 0.0 0.0
  EMISFACT PAREA1      HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
  EMISFACT PAREA1      HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
  EMISFACT PAREA1      HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
  EMISFACT PAREA1      HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
  EMISFACT PAREA1      HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
  EMISFACT PAREA1      HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
  SRCGROUP ALL
SO FINISHED
**
****************************************
** AERMOD Receptor Pathway
****************************************
**
**
RE STARTING
  INCLUDED "EBMUD Central Reservoir.rou"
RE FINISHED
**
****************************************
** AERMOD Meteorology Pathway
****************************************
**
**
ME STARTING
  SURFFILE "C:\Users\jni\Desktop\EBMUD Central Reservoir\HRA\724930\724930.SFC"
  PROFFILE "C:\Users\jni\Desktop\EBMUD Central Reservoir\HRA\724930\724930.PFL"
  SURFDATA 23230 2009 OAKLAND/WSO_AP
  UAIRDATA 23230 2009 OAKLAND/WSO_AP
  PROFBASE 10.0 METERS
ME FINISHED
**
****************************************
** AERMOD Output Pathway
****************************************
**
**
OU STARTING
** Auto-Generated Plotfiles
  PLOTFILE ANNUAL ALL "EBMUD Central Reservoir.AD\AN00GALL.PLT" 31
  SUMMFILE "EBMUD Central Reservoir.sum"
OU FINISHED
```

****
*** SETUP Finishes Successfully ***
****

*** AERMOD - VERSION 16216r *** *** C:\Lakes\AERMOD View\EBMUD Central Reservoir\EBMUD Central Reservoir *** 09/09/19
*** AERMET - VERSION 14134 *** *** *** 09:08:10
PAGE 1
*** MODELOPTs: RegDFAULT CONC ELEV RURAL

*** MODEL SETUP OPTIONS SUMMARY ***
- -

**Model Is Setup For Calculation of Average CONCentration Values.

-- DEPOSITION LOGIC --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION. DRYDPLT = F
**Model Uses NO WET DEPLETION. WETDPLT = F

**Model Uses RURAL Dispersion Only.

**Model Uses Regulatory DEFAULT Options:
1. Stack-tip Downwash.
2. Model Accounts for ELEVated Terrain Effects.
3. Use Calms Processing Routine.
4. Use Missing Data Processing Routine.
5. No Exponential Decay.

**Other Options Specified:
CCVR_Sub - Meteorological data includes CCVR substitutions
TEMP_Sub - Meteorological data includes TEMP substitutions

**Model Assumes No FLAGPOLE Receptor Heights.

**The User Specified a Pollutant Type of: PM_10

**Model Calculates ANNUAL Averages Only

**This Run Includes: 1 Source(s); 1 Source Group(s); and 11 Receptor(s)

with: 0 POINT(s), including
0 POINTCAP(s) and 0 POINTHOR(s)
and: 0 VOLUME source(s)
and: 1 AREA type source(s)
and: 0 LINE source(s)
and: 0 OPENPIT source(s)
and: 0 BUOYANT LINE source(s) with 0 line(s)

**Model Set To Continue RUNning After the Setup Testing.

**The AERMET Input Meteorological Data Version Date: 14134

**Output Options Selected:
Model Outputs Tables of ANNUAL Averages by Receptor
Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours
m for Missing Hours
b for Both Calm and Missing Hours

**Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) = 10.00 ; Decay Coef. = 0.000 ; Rot. Angle = 0.0
Emission Units = GRAMS/SEC ; Emission Rate Unit Factor = 0.10000E+07
Output Units = MICROGRAMS/M**3

**Approximate Storage Requirements of Model = 3.5 MB of RAM.

**Detailed Error/Message File: EBMUD Central Reservoir.err
**File for Summary of Results: EBMUD Central Reservoir.sum

*** AREAPOLY SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC /METER**2)	LOCATION OF AREA X (METERS)	LOCATION OF AREA Y (METERS)	BASE ELEV. (METERS)	RELEASE HEIGHT (METERS)	NUMBER OF VERTS.	INIT. SZ (METERS)	URBAN SOURCE	EMISSION RATE SCALAR VARY BY
PAREA1	0	0.83582E-08	568297.4	4183874.5	63.9	5.00	21	0.00	NO	HRDOW7

*** SOURCE IDs DEFINING SOURCE GROUPS ***

SRCGROUP ID	SOURCE IDs
ALL	PAREA1 ,

*** MODELOPTs: RegDFAULT CONC ELEV RURAL

* SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY AND BY DAY OF WEEK (HRDOW7) *

SOURCE ID = PAREA1 ; SOURCE TYPE = AREAPOLY :
HOUR SCALAR HOUR SCALAR HOUR SCALAR HOUR SCALAR HOUR SCALAR HOUR SCALAR HOUR SCALAR HOUR SCALAR
- -
DAY OF WEEK = MONDAY
1 .0000E+00 2 .0000E+00 3 .0000E+00 4 .0000E+00 5 .0000E+00 6 .0000E+00 7 .0000E+00 8 .1000E+01
9 .1000E+01 10 .1000E+01 11 .1000E+01 12 .1000E+01 13 .1000E+01 14 .1000E+01 15 .1000E+01 16 .1000E+01
17 .1000E+01 18 .1000E+01 19 .1000E+01 20 .0000E+00 21 .0000E+00 22 .0000E+00 23 .0000E+00 24 .0000E+00
DAY OF WEEK = TUESDAY
1 .0000E+00 2 .0000E+00 3 .0000E+00 4 .0000E+00 5 .0000E+00 6 .0000E+00 7 .0000E+00 8 .1000E+01
9 .1000E+01 10 .1000E+01 11 .1000E+01 12 .1000E+01 13 .1000E+01 14 .1000E+01 15 .1000E+01 16 .1000E+01
17 .1000E+01 18 .1000E+01 19 .1000E+01 20 .0000E+00 21 .0000E+00 22 .0000E+00 23 .0000E+00 24 .0000E+00
DAY OF WEEK = WEDNESDY
1 .0000E+00 2 .0000E+00 3 .0000E+00 4 .0000E+00 5 .0000E+00 6 .0000E+00 7 .0000E+00 8 .1000E+01
9 .1000E+01 10 .1000E+01 11 .1000E+01 12 .1000E+01 13 .1000E+01 14 .1000E+01 15 .1000E+01 16 .1000E+01
17 .1000E+01 18 .1000E+01 19 .1000E+01 20 .0000E+00 21 .0000E+00 22 .0000E+00 23 .0000E+00 24 .0000E+00
DAY OF WEEK = THURSDAY
1 .0000E+00 2 .0000E+00 3 .0000E+00 4 .0000E+00 5 .0000E+00 6 .0000E+00 7 .0000E+00 8 .1000E+01
9 .1000E+01 10 .1000E+01 11 .1000E+01 12 .1000E+01 13 .1000E+01 14 .1000E+01 15 .1000E+01 16 .1000E+01
17 .1000E+01 18 .1000E+01 19 .1000E+01 20 .0000E+00 21 .0000E+00 22 .0000E+00 23 .0000E+00 24 .0000E+00
DAY OF WEEK = FRIDAY
1 .0000E+00 2 .0000E+00 3 .0000E+00 4 .0000E+00 5 .0000E+00 6 .0000E+00 7 .0000E+00 8 .1000E+01
9 .1000E+01 10 .1000E+01 11 .1000E+01 12 .1000E+01 13 .1000E+01 14 .1000E+01 15 .1000E+01 16 .1000E+01
17 .1000E+01 18 .1000E+01 19 .1000E+01 20 .0000E+00 21 .0000E+00 22 .0000E+00 23 .0000E+00 24 .0000E+00
DAY OF WEEK = SATURDAY
1 .0000E+00 2 .0000E+00 3 .0000E+00 4 .0000E+00 5 .0000E+00 6 .0000E+00 7 .0000E+00 8 .0000E+00
9 .0000E+00 10 .0000E+00 11 .0000E+00 12 .0000E+00 13 .0000E+00 14 .0000E+00 15 .0000E+00 16 .0000E+00
17 .0000E+00 18 .0000E+00 19 .0000E+00 20 .0000E+00 21 .0000E+00 22 .0000E+00 23 .0000E+00 24 .0000E+00
DAY OF WEEK = SUNDAY
1 .0000E+00 2 .0000E+00 3 .0000E+00 4 .0000E+00 5 .0000E+00 6 .0000E+00 7 .0000E+00 8

.0000E+00
9 .0000E+00 10 .0000E+00 11 .0000E+00 12 .0000E+00 13 .0000E+00 14 .0000E+00 15 .0000E+00 16 .0000E+00
17 .0000E+00 18 .0000E+00 19 .0000E+00 20 .0000E+00 21 .0000E+00 22 .0000E+00 23 .0000E+00 24 .0000E+00

*** DISCRETE CARTESIAN RECEPTORS ***
(X-COORD, Y-COORD, ZELEV, ZHILL, ZFLAG)
(METERS)

(568257.6, 4183852.5, 63.6, 63.6, 0.0); (568238.1, 4183758.8, 62.5, 62.5, 0.0);
(568215.4, 4183619.8, 61.8, 61.8, 0.0); (568222.6, 4183416.0, 60.3, 60.3, 0.0);
(568470.7, 4183783.5, 65.7, 472.0, 0.0); (568547.9, 4183530.3, 61.6, 61.6, 0.0);
(568575.9, 4183647.4, 65.4, 472.0, 0.0); (568503.7, 4183391.2, 54.7, 58.0, 0.0);
(568435.9, 4183372.0, 47.3, 62.0, 0.0); (568301.6, 4183386.6, 56.3, 61.0, 0.0);
(568210.1, 4183519.9, 61.6, 61.6, 0.0);

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
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1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: C:\Users\jni\Desktop\EBMUD Central Reservoir\HRA\724930\724930.SFC Met Version: 14134
Profile file: C:\Users\jni\Desktop\EBMUD Central Reservoir\HRA\724930\724930.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 23230 Upper air station no.: 23230
Name: OAKLAND/WSO_AP Name: OAKLAND/WSO_AP
Year: 2009 Year: 2009

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
09	01	01	1	01	-17.2	0.303	-9.000	-9.000	-999.	401.	147.2	0.63	0.86	1.00	2.36	81.	10.0	282.5	2.0
09	01	01	1	02	-21.8	0.383	-9.000	-9.000	-999.	569.	234.6	0.63	0.86	1.00	2.86	68.	10.0	282.0	2.0
09	01	01	1	03	-26.3	0.460	-9.000	-9.000	-999.	749.	337.1	0.63	0.86	1.00	3.36	84.	10.0	280.9	2.0
09	01	01	1	04	-15.4	0.270	-9.000	-9.000	-999.	368.	116.1	0.47	0.86	1.00	2.36	53.	10.0	280.9	2.0
09	01	01	1	05	-26.3	0.460	-9.000	-9.000	-999.	749.	336.3	0.63	0.86	1.00	3.36	73.	10.0	280.4	2.0
09	01	01	1	06	-21.9	0.383	-9.000	-9.000	-999.	573.	232.9	0.63	0.86	1.00	2.86	82.	10.0	280.4	2.0
09	01	01	1	07	-22.0	0.383	-9.000	-9.000	-999.	569.	232.5	0.63	0.86	1.00	2.86	95.	10.0	279.9	2.0
09	01	01	1	08	-11.2	0.196	-9.000	-9.000	-999.	238.	60.6	0.63	0.86	0.76	1.76	73.	10.0	279.9	2.0
09	01	01	1	09	-2.2	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.45	0.86	0.39	0.00	0.	10.0	280.4	2.0
09	01	01	1	10	6.8	0.266	0.264	0.016	98.	329.	-250.8	0.63	0.86	0.27	1.76	91.	10.0	280.9	2.0
09	01	01	1	11	15.5	-9.000	-9.000	-9.000	177.	-999.	-99999.0	0.45	0.86	0.22	0.00	0.	10.0	282.0	2.0
09	01	01	1	12	96.1	0.393	1.019	0.014	401.	591.	-57.4	0.22	0.86	0.21	3.36	266.	10.0	281.4	2.0
09	01	01	1	13	102.5	0.395	1.092	0.014	462.	595.	-54.4	0.22	0.86	0.20	3.36	283.	10.0	282.0	2.0
09	01	01	1	14	89.9	0.297	1.066	0.015	489.	394.	-26.5	0.22	0.86	0.21	2.36	249.	10.0	282.0	2.0
09	01	01	1	15	62.1	0.383	0.954	0.014	507.	569.	-82.1	0.22	0.86	0.24	3.36	242.	10.0	282.5	2.0
09	01	01	1	16	23.1	0.665	0.690	0.006	513.	1300.	-1150.4	0.52	0.86	0.33	4.86	304.	10.0	282.5	2.0
09	01	01	1	17	-37.0	0.486	-9.000	-9.000	-999.	846.	280.6	0.22	0.86	0.56	4.86	291.	10.0	281.4	2.0
09	01	01	1	18	-52.2	0.480	-9.000	-9.000	-999.	799.	191.9	0.52	0.86	1.00	3.86	307.	10.0	280.9	2.0
09	01	01	1	19	-25.6	0.224	-9.000	-9.000	-999.	327.	39.8	0.52	0.86	1.00	2.36	334.	10.0	280.4	2.0
09	01	01	1	20	-11.1	0.119	-9.000	-9.000	-999.	115.	13.8	0.52	0.86	1.00	1.76	317.	10.0	280.4	2.0
09	01	01	1	21	-10.3	0.119	-9.000	-9.000	-999.	98.	14.7	0.52	0.86	1.00	1.76	320.	10.0	280.4	2.0
09	01	01	1	22	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.45	0.86	1.00	0.00	0.	10.0	280.9	2.0
09	01	01	1	23	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.45	0.86	1.00	0.00	0.	10.0	281.4	2.0
09	01	01	1	24	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.45	0.86	1.00	0.00	0.	10.0	281.4	2.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
09	01	01	01	10.0	1	81.	2.36	282.6	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

*** AERMOD - VERSION 16216r *** *** C:\Lakes\AERMOD View\EBMUD Central Reservoir\EBMUD Central Reservoir *** 09/09/19
*** AERMET - VERSION 14134 *** *** *** 09:08:10
PAGE 8
*** MODELOPTs: RegDFAULT CONC ELEV RURAL

*** THE ANNUAL AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: ALL ***

INCLUDING SOURCE(S): PAREA1 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM_10 IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
568257.63	4183852.47	0.00123	568238.07	4183758.79	0.00164
568215.43	4183619.82	0.00169	568222.63	4183416.00	0.00120
568470.72	4183783.50	0.00682	568547.93	4183530.26	0.00588
568575.90	4183647.45	0.00418	568503.65	4183391.16	0.00518
568435.90	4183371.96	0.00456	568301.55	4183386.64	0.00214
568210.10	4183519.87	0.00160			

*** MODELOPTs: RegDFAULT CONC ELEV RURAL

*** THE SUMMARY OF MAXIMUM ANNUAL RESULTS AVERAGED OVER 5 YEARS ***

** CONC OF PM_10 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	NETWORK RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG) OF TYPE GRID-ID
ALL	1ST HIGHEST VALUE IS	0.00682	AT (568470.72, 4183783.50, 65.71, 472.00, 0.00) DC
	2ND HIGHEST VALUE IS	0.00588	AT (568547.93, 4183530.26, 61.64, 61.64, 0.00) DC
	3RD HIGHEST VALUE IS	0.00518	AT (568503.65, 4183391.16, 54.69, 58.00, 0.00) DC
	4TH HIGHEST VALUE IS	0.00456	AT (568435.90, 4183371.96, 47.27, 62.00, 0.00) DC
	5TH HIGHEST VALUE IS	0.00418	AT (568575.90, 4183647.45, 65.37, 472.00, 0.00) DC
	6TH HIGHEST VALUE IS	0.00214	AT (568301.55, 4183386.64, 56.32, 61.00, 0.00) DC
	7TH HIGHEST VALUE IS	0.00169	AT (568215.43, 4183619.82, 61.85, 61.85, 0.00) DC
	8TH HIGHEST VALUE IS	0.00164	AT (568238.07, 4183758.79, 62.49, 62.49, 0.00) DC
	9TH HIGHEST VALUE IS	0.00160	AT (568210.10, 4183519.87, 61.56, 61.56, 0.00) DC
	10TH HIGHEST VALUE IS	0.00123	AT (568257.63, 4183852.47, 63.60, 63.60, 0.00) DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

*** MODELOPTs: RegDFAULT CONC ELEV RURAL

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)
A Total of 1 Warning Message(s)
A Total of 7953 Informational Message(s)

A Total of 43872 Hours Were Processed

A Total of 7152 Calm Hours Identified

A Total of 801 Missing Hours Identified (1.83 Percent)

******** FATAL ERROR MESSAGES ********
*** NONE ***

******** WARNING MESSAGES ********
MX W481 43873 MAIN: Data Remaining After End of Year. Number of Hours= 48

****
*** AERMOD Finishes Successfully ***
****

APPENDIX G

Special-Status Species Lists: CDFW, USFWS, and CNPS

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Summary Table Report

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Oakland East (3712272) OR San Leandro (3712262) OR Hayward (3712261) OR Las Trampas Ridge (3712271) OR Oakland West (3712273) OR Briones Valley (3712282))

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks A	B	C	D	X	U	Population Status Historic > 20 yr	Recent <= 20 yr	Presence Extant	Poss. Extirp.	Extirp.
Accipiter cooperii Cooper's hawk	G5 S4	None None	CDFW_WL-Watch List IUCN_LC-Least Concern	30 950	118 S:3	0	0	1	0	0	2	0	3	3	0	0
Accipiter striatus sharp-shinned hawk	G5 S4	None None	CDFW_WL-Watch List IUCN_LC-Least Concern	1,180 1,180	22 S:1	1	0	0	0	0	0	1	0	1	0	0
Ambystoma californiense California tiger salamander	G2G3 S2S3	Threatened Threatened	CDFW_WL-Watch List IUCN_VU-Vulnerable	20 1,111	1205 S:3	0	1	0	0	1	1	2	1	2	0	1
Amsinckia lunaris bent-flowered fiddleneck	G3 S3	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive	550 1,611	93 S:28	0	5	1	0	0	22	6	22	28	0	0
Anomobryum julaceum slender silver moss	G5? S2	None None	Rare Plant Rank - 4.2		13 S:1	0	0	0	0	0	1	0	1	1	0	0
Antrozous pallidus pallid bat	G5 S3	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFS_S-Sensitive WBWG_H-High Priority	30 770	420 S:10	0	0	0	0	0	10	10	0	10	0	0
Aquila chrysaetos golden eagle	G5 S3	None None	BLM_S-Sensitive CDF_S-Sensitive CDFW_FP-Fully Protected CDFW_WL-Watch List IUCN_LC-Least Concern USFWS_BCC-Birds of Conservation Concern	950 1,560	321 S:2	1	1	0	0	0	0	2	0	2	0	0
Archoplites interruptus Sacramento perch	G2G3 S1	None None	AFS_TH-Threatened CDFW_SSC-Species of Special Concern	794 794	5 S:1	0	0	0	0	0	1	1	0	1	0	0
Arctostaphylos pallida pallid manzanita	G1 S1	Threatened Endangered	Rare Plant Rank - 1B.1	950 1,500	9 S:8	0	0	4	3	1	0	1	7	7	1	0

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks A	B	C	D	X	U	Population Status Historic > 20 yr	Recent <= 20 yr	Presence Extant	Poss. Extirp.	Extirp.
Ardea herodias great blue heron	G5 S4	None None	CDF_S-Sensitive IUCN_LC-Least Concern	300 300	155 S:1	0	1	0	0	0	0	1	0	1	0	0
Astragalus tener var. tener alkali milk-vetch	G2T1 S1	None None	Rare Plant Rank - 1B.2	5 70	65 S:6	0	0	0	0	6	0	6	0	0	2	4
Athene cunicularia burrowing owl	G4 S3	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFWS_BCC-Birds of Conservation Concern	2 5	1987 S:3	0	0	1	0	0	2	3	0	3	0	0
Balsamorhiza macrolepis big-scale balsamroot	G2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive USFS_S-Sensitive	500 500	51 S:2	1	0	0	0	0	1	1	1	2	0	0
Bombus caliginosus obscure bumble bee	G4? S1S2	None None	IUCN_VU-Vulnerable	10 1,200	181 S:5	0	0	0	0	0	5	5	0	5	0	0
Bombus crotchii Crotch bumble bee	G3G4 S1S2	None Candidate Endangered		700 700	234 S:1	0	0	0	0	0	1	1	0	1	0	0
Bombus occidentalis western bumble bee	G2G3 S1	None Candidate Endangered	USFS_S-Sensitive XERCES_IM-Imperiled	10 1,000	282 S:11	0	0	0	0	0	11	11	0	11	0	0
Branta hutchinsii leucopareia cackling (=Aleutian Canada) goose	G5T3 S3	Delisted None	CDFW_WL-Watch List	690 690	19 S:1	0	0	0	0	0	1	1	0	1	0	0
Calochortus pulchellus Mt. Diablo fairy-lantern	G2 S2	None None	Rare Plant Rank - 1B.2	700 1,250	52 S:6	0	2	0	0	0	4	4	2	6	0	0
Carex comosa bristly sedge	G5 S2	None None	Rare Plant Rank - 2B.1	0 0	29 S:1	0	0	0	0	1	0	1	0	0	1	0
Centromadia parryi ssp. congdonii Congdon's tarplant	G3T1T2 S1S2	None None	Rare Plant Rank - 1B.1 BLM_S-Sensitive SB_RSABG-Rancho Santa Ana Botanic Garden	9 40	98 S:4	0	0	2	0	1	1	2	2	3	0	1

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks A	B	C	D	X	U	Population Status Historic > 20 yr	Recent <= 20 yr	Presence Extant	Poss. Extirp.	Extirp.
Charadrius alexandrinus nivosus western snowy plover	G3T3 S2S3	Threatened None	CDFW_SSC-Species of Special Concern NABCI_RWL-Red Watch List USFWS_BCC-Birds of Conservation Concern	3 5	138 S:2	1	0	0	0	0	1	1	1	2	0	0
Chloropyron maritimum ssp. palustre Point Reyes salty bird's-beak	G4?T2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive	5 5	68 S:3	0	0	0	0	3	0	3	0	0	3	0
Chorizanthe cuspidata var. cuspidata San Francisco Bay spineflower	G2T1 S1	None None	Rare Plant Rank - 1B.2	20 20	17 S:1	0	0	0	0	1	0	1	0	0	0	1
Chorizanthe robusta var. robusta robust spineflower	G2T1 S1	Endangered None	Rare Plant Rank - 1B.1 BLM_S-Sensitive	30 30	20 S:1	0	0	0	0	1	0	1	0	0	1	0
Cicindela hirticollis gravida sandy beach tiger beetle	G5T2 S2	None None		10 10	34 S:1	0	0	0	0	1	0	1	0	0	0	1
Cicuta maculata var. bolanderi Bolander's water-hemlock	G5T4T5 S2?	None None	Rare Plant Rank - 2B.1		17 S:1	0	0	0	0	0	1	1	0	1	0	0
Circus hudsonius northern harrier	G5 S3	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern	5 5	53 S:2	0	1	0	0	0	1	0	2	2	0	0
Cirsium andrewsii Franciscan thistle	G3 S3	None None	Rare Plant Rank - 1B.2	490 970	31 S:2	0	0	1	0	0	1	0	2	2	0	0
Clarkia concinna ssp. automixa Santa Clara red ribbons	G5?T3 S3	None None	Rare Plant Rank - 4.3	400 400	20 S:1	0	0	0	0	0	1	1	0	1	0	0
Clarkia franciscana Presidio clarkia	G1 S1	Endangered Endangered	Rare Plant Rank - 1B.1 SB_UCBBG-UC Berkeley Botanical Garden	1,000 1,000	4 S:1	0	1	0	0	0	0	0	1	1	0	0
Corynorhinus townsendii Townsend's big-eared bat	G3G4 S2	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFS_S-Sensitive WBWG_H-High Priority	710 710	635 S:1	0	0	0	0	1	0	1	0	0	1	0

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks A	B	C	D	X	U	Population Status Historic > 20 yr	Recent <= 20 yr	Presence Extant	Poss. Extirp.	Extirp.
Coturnicops noveboracensis yellow rail	G4 S1S2	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern NABCI_RWL-Red Watch List USFS_S-Sensitive USFWS_BCC-Birds of Conservation Concern	0 200	45 S:3	0	0	0	0	0	3	2	1	3	0	0
Danaus plexippus pop. 1 monarch - California overwintering population	G4T2T3 S2S3	None None	USFS_S-Sensitive	5 200	383 S:7	0	1	1	0	0	5	0	7	7	0	0
Dipodomys heermanni berkeleyensis Berkeley kangaroo rat	G3G4T1 S1	None None		580 1,400	8 S:5	0	0	0	0	0	5	4	1	5	0	0
Dirca occidentalis western leatherwood	G2 S2	None None	Rare Plant Rank - 1B.2 SB_RSABG-Rancho Santa Ana Botanic Garden	320 1,700	71 S:22	1	8	4	1	0	8	6	16	22	0	0
Efferia antiochi Antioch efferian robberfly	G1G2 S1S2	None None		350 350	4 S:1	0	0	0	0	0	1	1	0	1	0	0
Elanus leucurus white-tailed kite	G5 S3S4	None None	BLM_S-Sensitive CDFW_FP-Fully Protected IUCN_LC-Least Concern	5 5	180 S:1	0	1	0	0	0	0	1	0	1	0	0
Emys marmorata western pond turtle	G3G4 S3	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_VU-Vulnerable USFS_S-Sensitive	201 794	1376 S:6	3	0	1	0	0	2	2	4	6	0	0
Eriogonum luteolum var. caninum Tiburon buckwheat	G5T2 S2	None None	Rare Plant Rank - 1B.2	850 950	26 S:3	0	0	1	0	0	2	0	3	3	0	0
Eryngium jepsonii Jepson's coyote-thistle	G2 S2	None None	Rare Plant Rank - 1B.2	330 675	19 S:3	0	0	0	0	0	3	1	2	3	0	0
Eucyclogobius newberryi tidewater goby	G3 S3	Endangered None	AFS_EN-Endangered CDFW_SSC-Species of Special Concern IUCN_VU-Vulnerable	5 10	127 S:2	0	0	0	0	1	1	2	0	1	0	1

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks A	B	C	D	X	U	Population Status Historic > 20 yr	Recent <= 20 yr	Presence Extant	Poss. Extirp.	Extirp.
Eumops perotis californicus western mastiff bat	G5T4 S3S4	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern WBWG_H-High Priority	120 120	296 S:1	0	0	0	0	0	1	1	0	1	0	0
Euphydryas editha bayensis Bay checkerspot butterfly	G5T1 S1	Threatened None	XERCES_CI-Critically Imperiled	500 1,300	30 S:2	0	0	0	0	2	0	2	0	0	0	2
Extriplex joaquinana San Joaquin spearscale	G2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive SB_RSABG-Rancho Santa Ana Botanic Garden		127 S:2	0	0	0	0	2	0	2	0	0	2	0
Falco peregrinus anatum American peregrine falcon	G4T4 S3S4	Delisted Delisted	CDF_S-Sensitive CDFW_FP-Fully Protected USFWS_BCC-Birds of Conservation Concern	0 0	56 S:1	0	1	0	0	0	0	0	1	1	0	0
Fissidens pauperculus minute pocket moss	G3? S2	None None	Rare Plant Rank - 1B.2 USFS_S-Sensitive	985 985	22 S:1	0	0	0	0	0	1	1	0	1	0	0
Fritillaria liliacea fragrant fritillary	G2 S2	None None	Rare Plant Rank - 1B.2 USFS_S-Sensitive	200 550	82 S:7	0	0	1	1	1	4	4	3	6	1	0
Geothlypis trichas sinuosa saltmarsh common yellowthroat	G5T3 S3	None None	CDFW_SSC-Species of Special Concern USFWS_BCC-Birds of Conservation Concern	0 7	112 S:2	1	0	1	0	0	0	2	0	2	0	0
Gilia capitata ssp. chamissonis blue coast gilia	G5T2 S2	None None	Rare Plant Rank - 1B.1	100 100	37 S:1	0	0	0	1	0	0	1	0	1	0	0
Gilia millefoliata dark-eyed gilia	G2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive		54 S:1	0	0	0	0	1	0	1	0	0	0	1
Haliaeetus leucocephalus bald eagle	G5 S3	Delisted Endangered	BLM_S-Sensitive CDF_S-Sensitive CDFW_FP-Fully Protected IUCN_LC-Least Concern USFS_S-Sensitive USFWS_BCC-Birds of Conservation Concern	590 590	327 S:1	1	0	0	0	0	0	0	1	1	0	0

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks A	B	C	D	X	U	Population Status Historic > 20 yr	Recent <= 20 yr	Presence Extant	Poss. Extirp.	Extirp.
Helianthella castanea Diablo helianthella	G2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive	350 1,800	107 S:45	5	14	7	1	0	18	12	33	45	0	0
Helminthoglypta nickliniana bridgesi Bridges' coast range shoulderband	G3T1 S1S2	None None	IUCN_DD-Data Deficient	1,400 1,400	6 S:1	0	0	0	0	0	1	1	0	1	0	0
Hemizonia congesta ssp. congesta congested-headed hayfield tarplant	G5T2 S2	None None	Rare Plant Rank - 1B.2		52 S:1	0	0	0	0	0	1	1	0	1	0	0
Heteranthera dubia water star-grass	G5 S2	None None	Rare Plant Rank - 2B.2		9 S:1	0	0	0	0	0	1	1	0	1	0	0
Hoita strobilina Loma Prieta hoita	G2? S2?	None None	Rare Plant Rank - 1B.1		34 S:1	0	0	0	0	0	1	1	0	1	0	0
Holocarpha macradenia Santa Cruz tarplant	G1 S1	Threatened Endangered	Rare Plant Rank - 1B.1 SB_RSABG-Rancho Santa Ana Botanic Garden	100 640	37 S:6	0	0	0	0	6	0	6	0	0	4	2
Horkelia cuneata var. sericea Kellogg's horkelia	G4T1? S1?	None None	Rare Plant Rank - 1B.1 USFS_S-Sensitive	20 20	58 S:2	0	0	0	0	2	0	2	0	0	2	0
Isocoma arguta Carquinez goldenbush	G1 S1	None None	Rare Plant Rank - 1B.1		14 S:1	0	0	0	0	0	1	1	0	1	0	0
Lasionycteris noctivagans silver-haired bat	G5 S3S4	None None	IUCN_LC-Least Concern WBWG_M-Medium Priority	400 400	139 S:1	0	0	0	0	0	1	1	0	1	0	0
Lasiurus cinereus hoary bat	G5 S4	None None	IUCN_LC-Least Concern WBWG_M-Medium Priority	325 660	238 S:4	0	0	0	0	0	4	4	0	4	0	0
Lasthenia conjugens Contra Costa goldfields	G1 S1	Endangered None	Rare Plant Rank - 1B.1 SB_UCBBG-UC Berkeley Botanical Garden	5 5	36 S:1	0	0	0	0	0	1	1	0	1	0	0

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks A	B	C	D	X	U	Population Status Historic > 20 yr	Recent <= 20 yr	Presence Extant	Poss. Extirp.	Extirp.
Laterallus jamaicensis coturniculus California black rail	G3G4T1 S1	None Threatened	BLM_S-Sensitive CDFW_FP-Fully Protected IUCN_NT-Near Threatened NABCI_RWL-Red Watch List USFWS_BCC-Birds of Conservation Concern	1 19	303 S:6	1	1	1	0	2	1	4	2	4	2	0
Layia carnosa beach layia	G2 S2	Endangered Endangered	Rare Plant Rank - 1B.1 SB_RSABG-Rancho Santa Ana Botanic Garden	40 40	25 S:1	0	0	0	0	1	0	1	0	0	0	1
Leptosiphon rosaceus rose leptosiphon	G1 S1	None None	Rare Plant Rank - 1B.1		31 S:1	0	0	0	0	1	0	1	0	0	1	0
Masticophis lateralis euryxanthus Alameda whipsnake	G4T2 S2	Threatened Threatened		175 1,600	164 S:70	14	23	9	2	2	20	29	41	68	2	0
Meconella oregana Oregon meconella	G2G3 S2	None None	Rare Plant Rank - 1B.1	1,300 1,600	9 S:4	0	0	0	0	0	4	2	2	4	0	0
Melospiza melodia maxillaris Suisun song sparrow	G5T3 S3	None None	CDFW_SSC-Species of Special Concern USFWS_BCC-Birds of Conservation Concern		36 S:1	0	0	0	0	0	1	1	0	1	0	0
Melospiza melodia pusillula Alameda song sparrow	G5T2? S2S3	None None	CDFW_SSC-Species of Special Concern USFWS_BCC-Birds of Conservation Concern	5 1,300	38 S:11	0	4	0	0	0	7	6	5	11	0	0
Microcina leei Lee's micro-blind harvestman	G1 S1	None None		600 600	2 S:1	0	0	0	0	0	1	1	0	1	0	0
Microcina lumi Lum's micro-blind harvestman	G1 S1	None None		400 600	2 S:2	0	0	0	0	0	2	2	0	2	0	0
Monolopia gracilens woodland woollythreads	G3 S3	None None	Rare Plant Rank - 1B.2		68 S:1	0	0	0	0	0	1	1	0	1	0	0
Neotoma fuscipes annectens San Francisco dusky-footed woodrat	G5T2T3 S2S3	None None	CDFW_SSC-Species of Special Concern	210 713	41 S:4	2	1	1	0	0	0	0	4	4	0	0
Northern Coastal Salt Marsh Northern Coastal Salt Marsh	G3 S3.2	None None		10 10	53 S:2	0	0	0	0	0	2	2	0	2	0	0

Summary Table Report

California Department of Fish and Wildlife

California Natural Diversity Database

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks A	B	C	D	X	U	Population Status Historic > 20 yr	Recent <= 20 yr	Presence Extant	Poss. Extirp.	Extirp.
Northern Maritime Chaparral Northern Maritime Chaparral	G1 S1.2	None None		800 1,300	17 S:2	0	1	0	0	0	1	2	0	2	0	0
Nyctinomops macrotis big free-tailed bat	G5 S3	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern WBWG_MH-Medium-High Priority	175 200	32 S:2	0	0	0	0	0	2	2	0	2	0	0
Phalacrocorax auritus double-crested cormorant	G5 S4	None None	CDFW_WL-Watch List IUCN_LC-Least Concern	30 30	39 S:1	0	0	0	0	0	1	1	0	1	0	0
Plagiobothrys chorisianus var. chorisianus Choris' popcornflower	G3T1Q S1	None None	Rare Plant Rank - 1B.2	20 20	42 S:1	0	0	0	0	1	0	1	0	0	0	1
Plagiobothrys diffusus San Francisco popcornflower	G1Q S1	None Endangered	Rare Plant Rank - 1B.1	920 920	17 S:1	0	0	1	0	0	0	1	0	1	0	0
Plagiobothrys glaber hairless popcornflower	GH SH	None None	Rare Plant Rank - 1A	20 20	9 S:1	0	0	0	0	1	0	1	0	0	1	0
Polygonum marinense Marin knotweed	G2Q S2	None None	Rare Plant Rank - 3.1		32 S:1	0	0	0	0	0	1	1	0	1	0	0
Rallus obsoletus obsoletus California Ridgway's rail	G5T1 S1	Endangered Endangered	CDFW_FP-Fully Protected NABCI_RWL-Red Watch List	0 10	99 S:10	0	6	3	1	0	0	1	9	10	0	0
Rana boylii foothill yellow-legged frog	G3 S3	None Candidate Threatened	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_NT-Near Threatened USFS_S-Sensitive	120 1,101	2467 S:8	0	1	0	0	7	0	8	0	1	1	6
Rana draytonii California red-legged frog	G2G3 S2S3	Threatened None	CDFW_SSC-Species of Special Concern IUCN_VU-Vulnerable	180 1,300	1531 S:22	6	9	4	2	0	1	7	15	22	0	0
Reithrodontomys raviventris salt-marsh harvest mouse	G1G2 S1S2	Endangered Endangered	CDFW_FP-Fully Protected IUCN_EN-Endangered	1 3	144 S:5	2	0	0	0	0	3	3	2	5	0	0

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks A	B	C	D	X	U	Population Status Historic > 20 yr	Recent <= 20 yr	Presence Extant	Poss. Extirp.	Extirp.
Rynchops niger black skimmer	G5 S2	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern NABCI_YWL-Yellow Watch List USFWS_BCC-Birds of Conservation Concern	3 3	7 S:1	1	0	0	0	0	0	1	0	1	0	0
Sanicula maritima adobe sanicle	G2 S2	None Rare	Rare Plant Rank - 1B.1 USFS_S-Sensitive		17 S:1	0	0	0	0	1	0	1	0	0	0	1
Scapanus latimanus parvus Alameda Island mole	G5THQ SH	None None	CDFW_SSC-Species of Special Concern	10 30	8 S:8	0	0	0	0	0	8	8	0	8	0	0
Serpentine Bunchgrass Serpentine Bunchgrass	G2 S2.2	None None		1,120 1,120	22 S:1	0	0	0	0	0	1	1	0	1	0	0
Setophaga petechia yellow warbler	G5 S3S4	None None	CDFW_SSC-Species of Special Concern USFWS_BCC-Birds of Conservation Concern	280 280	73 S:1	0	1	0	0	0	0	0	1	1	0	0
Sorex vagrans halicoetes salt-marsh wandering shrew	G5T1 S1	None None	CDFW_SSC-Species of Special Concern	1 2	12 S:3	0	0	0	0	0	3	3	0	3	0	0
Spergularia macrotheca var. longistyla long-styled sand-spurrey	G5T2 S2	None None	Rare Plant Rank - 1B.2	200 200	22 S:2	0	0	0	0	0	2	2	0	2	0	0
Spirinchus thaleichthys longfin smelt	G5 S1	Candidate Threatened		0 0	46 S:2	0	0	0	0	0	2	1	1	2	0	0
Sternula antillarum browni California least tern	G4T2T3Q S2	Endangered Endangered	CDFW_FP-Fully Protected NABCI_RWL-Red Watch List	5 10	75 S:4	1	1	0	0	1	1	3	1	3	0	1
Streptanthus albidus ssp. peramoenus most beautiful jewelflower	G2T2 S2	None None	Rare Plant Rank - 1B.2 SB_RSABG-Rancho Santa Ana Botanic Garden USFS_S-Sensitive	800 900	103 S:6	0	0	1	0	0	5	3	3	6	0	0
Stuckenia filiformis ssp. alpina slender-leaved pondweed	G5T5 S2S3	None None	Rare Plant Rank - 2B.2	1,600 1,600	21 S:1	0	0	0	0	0	1	1	0	1	0	0
Suaeda californica California seablite	G1 S1	Endangered None	Rare Plant Rank - 1B.1		18 S:4	0	0	0	0	2	2	2	2	2	1	1

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks A	B	C	D	X	U	Population Status Historic > 20 yr	Recent <= 20 yr	Presence Extant	Poss. Extirp.	Extirp.
Taxidea taxus American badger	G5 S3	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern	700 1,000	590 S:2	0	0	0	0	0	2	2	0	2	0	0
Trachusa gummifera San Francisco Bay Area leaf-cutter bee	G1 S1	None None		200 200	2 S:1	0	0	0	0	0	1	1	0	1	0	0
Trifolium hydrophilum saline clover	G2 S2	None None	Rare Plant Rank - 1B.2		49 S:3	0	0	0	0	3	0	3	0	0	0	3
Tryonia imitator mimic tryonia (=California brackishwater snail)	G2 S2	None None	IUCN_DD-Data Deficient	0 0	39 S:2	0	0	0	0	2	0	2	0	0	0	2
Valley Needlegrass Grassland Valley Needlegrass Grassland	G3 S3.1	None None		500 500	45 S:1	0	0	1	0	0	0	1	0	1	0	0
Viburnum ellipticum oval-leaved viburnum	G4G5 S3?	None None	Rare Plant Rank - 2B.3	500 600	38 S:3	0	0	0	0	0	3	1	2	3	0	0

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
Phone: (916) 414-6600 Fax: (916) 414-6713

In Reply Refer To: September 09, 2019
Consultation Code: 08ESMF00-2019-SLI-0156
Event Code: 08ESMF00-2019-E-09525
Project Name: EBMUD Central Reservoir

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, under the jurisdiction of the U.S. Fish and Wildlife Service (Service) that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Please follow the link below to see if your proposed project has the potential to affect other species or their habitats under the jurisdiction of the National Marine Fisheries Service:

http://www.nwr.noaa.gov/protected_species/species_list/species_lists.html

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
(916) 414-6600

Project Summary

Consultation Code: 08ESMF00-2019-SLI-0156

Event Code: 08ESMF00-2019-E-09525

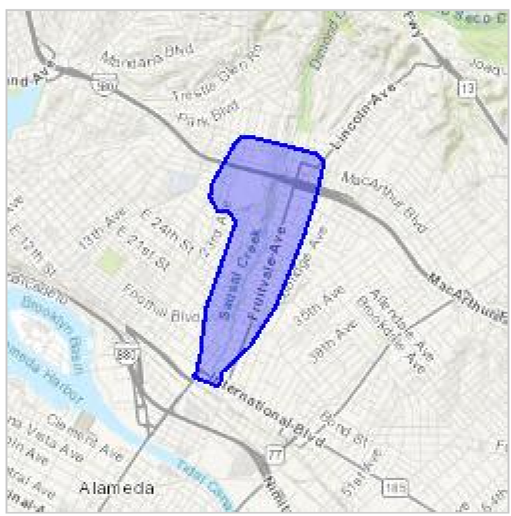
Project Name: EBMUD Central Reservoir

Project Type: WATER SUPPLY / DELIVERY

Project Description: The Central Reservoir Replacement Project (Project) includes demolition of the existing
reservoir, roof, lining, and material storage building, followed by construction
of a reinforced tank foundation system, three 17-MG concrete tanks, a new rate control
station (RCS), a valve structure, service road and site paving, landscaping, a bioretention
area, and security fencing all within the existing reservoir property.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/37.790318656084004N122.22171719206796W



Counties: Alameda, CA

Endangered Species Act Species

There is a total of 16 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Salt Marsh Harvest Mouse *Reithrodontomys raviventris* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/613	Endangered

Birds

NAME	STATUS
California Clapper Rail *Rallus longirostris obsoletus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4240	Endangered
California Least Tern *Sterna antillarum browni* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8104	Endangered
Western Snowy Plover *Charadrius nivosus nivosus* Population: Pacific Coast population DPS-U.S.A. (CA, OR, WA), Mexico (within 50 miles of Pacific coast) There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8035	Threatened

Reptiles

NAME	STATUS
Alameda Whipsnake (=striped Racer) *Masticophis lateralis euryxanthus* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5524	Threatened

Amphibians

NAME	STATUS
California Red-legged Frog *Rana draytonii* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2891 Species survey guidelines: https://ecos.fws.gov/ipac/guideline/survey/population/205/office/11420.pdf	Threatened
California Tiger Salamander *Ambystoma californiense* Population: U.S.A. (Central CA DPS) There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2076	Threatened

Fishes

NAME	STATUS
Delta Smelt *Hypomesus transpacificus* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/321	Threatened
Tidewater Goby *Eucyclogobius newberryi* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/57	Endangered

Insects

NAME	STATUS
Bay Checkerspot Butterfly *Euphydryas editha bayensis* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2320	Threatened
Callippe Silverspot Butterfly *Speyeria callippe callippe* There is **proposed** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/3779	Endangered
San Bruno Elfin Butterfly *Callophrys mossii bayensis* There is **proposed** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/3394	Endangered

Crustaceans

NAME	STATUS
Vernal Pool Fairy Shrimp *Branchinecta lynchi* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/498	Threatened

Flowering Plants

NAME	STATUS
Pallid Manzanita *Arctostaphylos pallida* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8292	Threatened
Presidio Clarkia *Clarkia franciscana* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/3890	Endangered
Robust Spineflower *Chorizanthe robusta var. robusta* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/9287	Endangered

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

California Native Plant Society, Rare Plant Program. 2019. Inventory of Rare and Endangered Plants of California (online edition, v8-03 0.45). Website http://www.rareplants.cnps.org [accessed 09 September 2019].

Scientific Name	Common Name	Family	Lifeform	CRPR	Blooming Per	Habitat	Micro Habitat	Elevation Low (m)	Elevation Low (ft)	Elevation High (m)	Elevation High (ft)	CA Endemic
Amsinckia lunaris	bent-flowered fiddleneck	Boraginaceae	annual herb	1B.2	Mar-Jun	Coastal bluff scrub, Cismontane woodland, Valley and foothill grassland		3	5	500	1640	T
Androsace elongata ssp. acuta	California androsace	Primulaceae	annual herb	4.2	Mar-Jun	Chaparral, Cismontane woodland, Coastal scrub, Meadows and seeps, Pinyon and juniper woodland, Valley and foothill grassland		150	490	1305	4280	F
Arctostaphylos pallida	pallid manzanita	Ericaceae	perennial evergreen shrub	1B.1	Dec-Mar	Broadleafed upland forest, Closed-cone coniferous forest, Chaparral, Cismontane woodland, Coastal scrub	siliceous shale, sandy or gravelly	185	605	465	1525	T
Astragalus tener var. tener	alkali milk-vetch	Fabaceae	annual herb	1B.2	Mar-Jun	Playas, Valley and foothill grassland (adobe clay), Vernal pools	alkaline	1	0	60	195	T
Balsamorhiza macrolepis	big-scale balsamroot	Asteraceae	perennial herb	1B.2	Mar-Jun	Chaparral, Cismontane woodland, Valley and foothill grassland	sometimes serpentinite	45	145	1555	5100	T

Calochortus pulchellus	Mt. Diablo fairy-lantern	Liliaceae	perennial bulbiferous herb	1B.2	Apr-Jun	Chaparral, Cismontane woodland, Riparian woodland, Valley and foothill grassland		30	95	840	2755	T
Calochortus umbellatus	Oakland star-tulip	Liliaceae	perennial bulbiferous herb	4.2	Mar-May	Broadleafed upland forest, Chaparral, Cismontane woodland, Lower montane coniferous forest, Valley and foothill grassland	often serpentinite	100	325	700	2295	T
Castilleja ambigua var. ambigua	johnny-nip	Orobanchaceae	annual herb (hemiparasitic)	4.2	Mar-Aug	Coastal bluff scrub, Coastal prairie, Coastal scrub, Marshes and swamps, Valley and foothill grassland, Vernal pools margins		0	0	435	1425	F
Centromadia parryi ssp. congdonii	Congdon's tarplant	Asteraceae	annual herb	1B.1	May-Oct(Nov)	Valley and foothill grassland (alkaline)		0	0	230	755	T
Chloropyron maritimum ssp. palustre	Point Reyes bird's-beak	Orobanchaceae	annual herb (hemiparasitic)	1B.2	Jun-Oct	Marshes and swamps (coastal salt)		0	0	10	35	F
Chorizanthe cuspidata var. cuspidata	San Francisco Bay spineflower	Polygonaceae	annual herb	1B.2	Apr-Jul(Aug)	Coastal bluff scrub, Coastal dunes, Coastal prairie, Coastal scrub	sandy	3	5	215	705	T

Chorizanthe robusta var. robusta	robust spineflower	Polygonaceae	annual herb	1B.1	Apr-Sep	Chaparral (maritime), Cismontane woodland (openings), Coastal dunes, Coastal scrub	sandy or gravelly	3	5	300	985	T
Cirsium andrewsii	Franciscan thistle	Asteraceae	perennial herb	1B.2	Mar-Jul	Broadleafed upland forest, Coastal bluff scrub, Coastal prairie, Coastal scrub	mesic, sometimes serpentinite	0	0	150	490	T
Clarkia concinna ssp. automixa	Santa Clara red ribbons	Onagraceae	annual herb	4.3	(Apr)May-Jun	Chaparral, Cismontane woodland		90	295	1500	4920	T
Clarkia franciscana	Presidio clarkia	Onagraceae	annual herb	1B.1	May-Jul	Coastal scrub, Valley and foothill grassland (serpentinite)		25	80	335	1100	T
Dirca occidentalis	western leatherwood	Thymelaeaceae	perennial deciduous shrub	1B.2	Jan-Mar(Apr)	Broadleafed upland forest, Closed-cone coniferous forest, Chaparral, Cismontane woodland, North Coast coniferous forest, Riparian forest, Riparian woodland	mesic	25	80	425	1395	T
Eriogonum luteolum var. caninum	Tiburon buckwheat	Polygonaceae	annual herb	1B.2	May-Sep	Chaparral, Cismontane woodland, Coastal prairie, Valley and foothill grassland	serpentinite, sandy to gravelly	0	0	700	2295	T
Eryngium jepsonii	Jepson's coyote thistle	Apiaceae	perennial herb	1B.2	Apr-Aug	Valley and foothill grassland, Vernal pools	clay	3	5	300	985	T

Extriplex joaquinana	San Joaquin spearscale	Chenopodiaceae	annual herb	1B.2	Apr-Oct	Chenopod scrub, Meadows and seeps, Playas, Valley and foothill grassland	alkaline	1	0	835	2740	T
Fissidens pauperculus	minute pocket moss	Fissidentaceae	moss	1B.2		North Coast coniferous forest (damp coastal soil)		10	30	1024	3360	F
Fritillaria liliacea	fragrant fritillary	Liliaceae	perennial bulbiferous herb	1B.2	Feb-Apr	Cismontane woodland, Coastal prairie, Coastal scrub, Valley and foothill grassland	Often serpentinite	3	5	410	1345	T
Gilia capitata ssp. chamissonis	blue coast gilia	Polemoniaceae	annual herb	1B.1	Apr-Jul	Coastal dunes, Coastal scrub		2	5	200	655	T
Gilia millefoliata	dark-eyed gilia	Polemoniaceae	annual herb	1B.2	Apr-Jul	Coastal dunes		2	5	30	100	F
Helianthella castanea	Diablo helianthella	Asteraceae	perennial herb	1B.2	Mar-Jun	Broadleafed upland forest, Chaparral, Cismontane woodland, Coastal scrub, Riparian woodland, Valley and foothill grassland	Usually rocky, axonal soils. Often in partial shade	60	195	1300	4265	T
Hoita strobilina	Loma Prieta hoita	Fabaceae	perennial herb	1B.1	May-Jul(Aug-(	Chaparral, Cismontane woodland, Riparian woodland	usually serpentinite, mesic	30	95	860	2820	T
Holocarpha macradenia	Santa Cruz tarplant	Asteraceae	annual herb	1B.1	Jun-Oct	Coastal prairie, Coastal scrub, Valley and foothill grassland	often clay, sandy	10	30	220	720	T

Horkelia cuneata var. sericea	Kellogg's horkelia	Rosaceae	perennial herb	1B.1	Apr-Sep	Closed-cone coniferous forest, Chaparral (maritime), Coastal dunes, Coastal scrub	sandy or gravelly, openings	10	30	200	655	T
Iris longipetala	coast iris	Iridaceae	perennial rhizomatous herb	4.2	Mar-May	Coastal prairie, Lower montane coniferous forest, Meadows and seeps	mesic	0	0	600	1970	T
Juglans hindsii	Northern California black walnut	Juglandaceae	perennial deciduous tree	1B.1	Apr-May	Riparian forest, Riparian woodland		0	0	440	1445	T
Lasthenia conjugens	Contra Costa goldfields	Asteraceae	annual herb	1B.1	Mar-Jun	Cismontane woodland, Playas (alkaline), Valley and foothill grassland, Vernal pools	mesic	0	0	470	1540	T
Lathyrus jepsonii var. jepsonii	Delta tule pea	Fabaceae	perennial herb	1B.2	May-Jul(Aug-S	Marshes and swamps (freshwater and brackish)		0	0	5	15	T
Leptosiphon acicularis	bristly leptosiphon	Polemoniaceae	annual herb	4.2	Apr-Jul	Chaparral, Cismontane woodland, Coastal prairie, Valley and foothill grassland		55	180	1500	4920	T
Meconella oregana	Oregon meconella	Papaveraceae	annual herb	1B.1	Mar-Apr	Coastal prairie, Coastal scrub		250	820	620	2035	F
Micropus amphibolus	Mt. Diablo cottonweed	Asteraceae	annual herb	3.2	Mar-May	Broadleafed upland forest, Chaparral, Cismontane woodland, Valley and foothill grassland	rocky	45	145	825	2705	T

Monardella antonina ssp. antonina	San Antonio Hills monardella	Lamiaceae	perennial rhizomatous herb	3	Jun-Aug	Chaparral, Cismontane woodland		320	1045	1000	3280	T
Monolopia gracilens	woodland woolythreads	Asteraceae	annual herb	1B.2	(Feb)Mar-Jul	Broadleafed upland forest (openings), Chaparral (openings), Cismontane woodland, North Coast coniferous forest (openings), Valley and foothill grassland	Serpentine	100	325	1200	3935	T
Piperia michaelii	Michael's rein orchid	Orchidaceae	perennial herb	4.2	Apr-Aug	Coastal bluff scrub, Closed-cone coniferous forest, Chaparral, Cismontane woodland, Coastal scrub, Lower montane coniferous forest		3	5	915	3000	T
Plagiobothrys chorisianus var. chorisianus	Choris' popcornflower	Boraginaceae	annual herb	1B.2	Mar-Jun	Chaparral, Coastal prairie, Coastal scrub	mesic	3	5	160	525	T
Plagiobothrys diffusus	San Francisco popcornflower	Boraginaceae	annual herb	1B.1	Mar-Jun	Coastal prairie, Valley and foothill grassland		60	195	360	1180	T
Plagiobothrys glaber	hairless popcornflower	Boraginaceae	annual herb	1A	Mar-May	Meadows and seeps (alkaline), Marshes and swamps (coastal salt)		15	45	180	590	T
Polygonum marinense	Marin knotweed	Polygonaceae	annual herb	3.1	(Apr)May-Aug	Marshes and swamps (coastal salt or brackish)		0	0	10	35	T

Ranunculus lobbii	Lobb's aquatic buttercup	Ranunculaceae	annual herb (aquatic)	4.2	Feb-May	Cismontane woodland, North Coast coniferous forest, Valley and foothill grassland, Vernal pools	mesic	15	45	470	1540	F
Sanicula maritima	adobe sanicle	Apiaceae	perennial herb	1B.1	Feb-May	Chaparral, Coastal prairie, Meadows and seeps, Valley and foothill grassland	clay, serpentinite	30	95	240	785	T
Spergularia macrotheca var. longistyla	long-styled sand-spurrey	Caryophyllaceae	perennial herb	1B.2	Feb-May(Jun)	Meadows and seeps, Marshes and swamps	Alkaline	0	0	255	835	T
Streptanthus albidus ssp. peramoenus	most beautiful jewelflower	Brassicaceae	annual herb	1B.2	(Mar)Apr-Sep	Chaparral, Cismontane woodland, Valley and foothill grassland	serpentinite	95	310	1000	3280	T
Stuckenia filiformis ssp. alpina	slender-leaved pondweed	Potamogetonaceae	perennial rhizomatous herb (aquatic)	2B.2	May-Jul	Marshes and swamps (assorted shallow freshwater)		300	980	2150	7055	F
Suaeda californica	California seablite	Chenopodiaceae	perennial evergreen shrub	1B.1	Jul-Oct	Marshes and swamps (coastal salt)		0	0	15	50	T
Trifolium hydrophilum	saline clover	Fabaceae	annual herb	1B.2	Apr-Jun	Marshes and swamps, Valley and foothill grassland (mesic, alkaline), Vernal pools		0	0	300	985	T
Viburnum ellipticum	oval-leaved viburnum	Adoxaceae	perennial deciduous shrub	2B.3	May-Jun	Chaparral, Cismontane woodland, Lower montane coniferous forest		215	705	1400	4595	F

APPENDIX H

Historic Resources Evaluation Report

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CENTRAL RESERVOIR REPLACEMENT PROJECT

Draft Historic Resources Evaluation Report

City of Oakland
Alameda County

Prepared for
East Bay Municipal Utility District

November 2018

ESA

CENTRAL RESERVOIR REPLACEMENT PROJECT

Historic Resources Evaluation Report

City of Oakland
Alameda County

Prepared for
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November 2018

Prepared by
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SUMMARY

Environmental Science Associates (ESA) has prepared this Historic Resources Evaluation Report (HRER) for the East Bay Municipal Utility District (EBMUD). This report documents the historic resources inventory for the Central Reservoir Replacement Project (Project). The 1910 Central Reservoir is a 154-million-gallon (MG) open cut reservoir under the jurisdiction of the California Division of Safety of Dams (DSOD). Central Reservoir is located on a 27-acre site that is bounded by 23rd Avenue and Ardley Avenue to the west, Sheffield Avenue to the east, Interstate 580 (I-580) to the north and 25th Avenue and East 29th Street intersection to the south in Oakland, CA. The Project is subject to review under the California Environmental Quality Act (CEQA), with EBMUD acting as the lead reviewing agency for CEQA compliance.

This HRER documents the existing conditions of the Project site with regard to historic resources, for use in the CEQA analysis. ESA cultural resources staff conducted a records search at the Northwest Information Center (NWIC) of the California Historical Resources Information System (CHRIS), background and archival research at local repositories in Alameda County and various online archives, and an intensive pedestrian survey of the Project site.

ESA staff documented and evaluated the eligibility of the 1910 Central Reservoir, including the associated 1922 maintenance building, for listing in the California Register of Historical Resources (California Register). It was determined that the site does not reflect any significant historical associations that would support eligibility for listing in the California Register, nor does it possess the physical integrity necessary to reflect such associations due to significant modernization and modification in the 1960s. Therefore, the site is recommended ineligible for listing in the California Register and would not be considered a historical resource under CEQA.

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Central Reservoir Replacement Project HRER

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SECTION 1
Introduction

ESA prepared this HRER for the EBMUD. This report documents the historic resources inventory for the Project. The Project is in the City of Oakland in Alameda County, in the unsectioned Rancho San Antonio land grant as shown on the Oakland East, United States Geological Survey (USGS) 7.5-minute topographic quadrangles (Figure 1 and Figure 2).

The Project is subject to review under the CEQA. EBMUD is the lead reviewing agency for CEQA compliance. In accordance with CEQA, this HRER was conducted in order to:

- identify historic-era buildings and structures within the Project site;
- preliminarily evaluate historic resources according to the criteria set forth by the California Register of Historical Resources (California Register);
- determine whether the Project would have a substantial adverse change in the significance of California Register-listed or eligible resources; and
- recommend procedures for avoidance or mitigation of substantial adverse changes in the significance to California Register-listed or eligible resources.

Kathy Cleveland, who has an M.A. in Public History, completed the historic architectural analysis. Kathy meets the Secretary of the Interior's Professional Qualifications Standards for Architectural History. Amber Grady, MA, provided QA/QC, and also meets the Secretary of the Interior's Professional Qualifications Standards for Architectural History. Resumes are included in **Appendix A**.

1.1 Project Location

The Central Reservoir site is located at 2500 E 29th Street in the City of Oakland. The 27-acre Project site is bordered by I-580 to the north, Ardley Avenue and 23rd Avenue to the west, 25th Avenue and East 29th Street intersection to the south, and Sheffield Avenue to the east. The Project site is located within an unsectioned portion of the San Antonio land grant, on the Oakland East USGS 7.5-minute topographic quadrangle (Figure 1 and Figure 2).

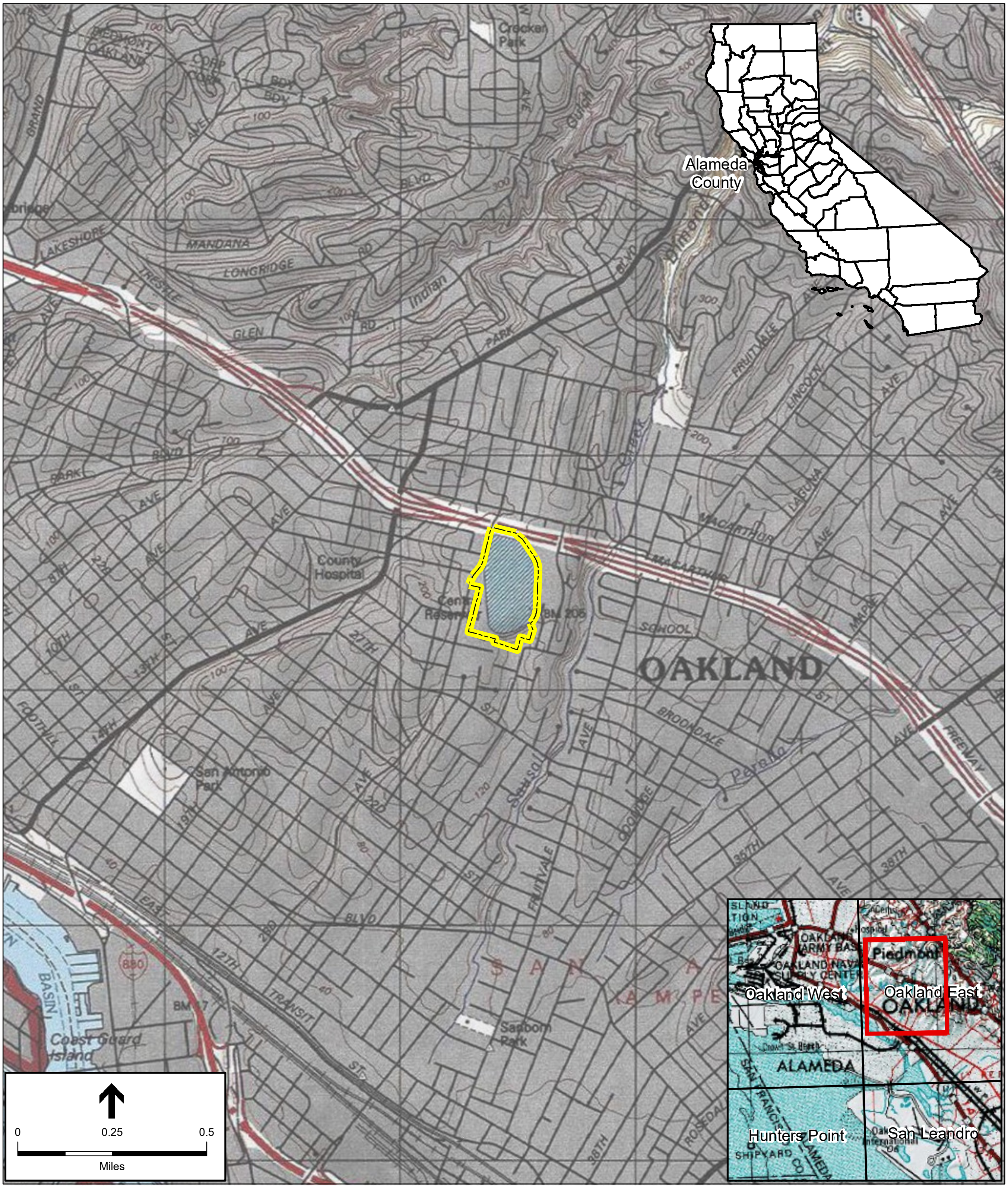
Path: U:\GIS\GIS\Projects\16xxx\D160330_EBMUDCentralRes\03_MXDs_Projects\Fig2-1_ProjectLocation.mxd, rt 6/7/2018

SOURCE: ESRI World Imagery; EBMUD, 2017; ESA, 2017

EBMUD Central Reservoir Replacement Project

Figure 1
Project Location

ESA



SOURCE: USGS Oakland East, Calif.

EBMUD Central Reservoir Replacement Project

Figure 2
Project Site

1.2 Project Description

The Project includes demolition of the existing reservoir, roof, lining, and material storage building, followed by construction of a reinforced tank foundation system, three 17-MG concrete tanks, a new rate control station (RCS), a valve structure, access road and site paving, landscaping, a bioretention area, and security fencing all within the existing reservoir property. The Project would also demolish the existing Central RCS which is currently located below ground at the corner of 25th Avenue and East 29th Street and abandon groundwater monitoring wells located on site and in the Central Reservoir Recreation Area. The Project may also include a new access driveway to connect the Redwood Day School parking area to Ardley Avenue.

SECTION 2
Regulatory Context

The Project is subject to review under CEQA, with EBMUD as lead reviewing agency for CEQA purposes. The State implements provisions in CEQA through its statewide comprehensive cultural resources surveys and preservation programs. The California Office of Historic Preservation (OHP), as an office of the California Department of Parks and Recreation, oversees adherence to CEQA regulations. The OHP also maintains the California Historic Resources Inventory. The State Historic Preservation Officer (SHPO) is an appointed official who implements historic preservation programs within the State's jurisdiction. Typically, a resource must be more than 50 years old to be considered as a potential historic resource. The OHP advises recordation of any resource 45 years or older, since "there is commonly a five-year lag between resource identification and the date that planning decisions are made" (OHP, 1995).

2.1 Historical Resources

CEQA Guidelines recognize that a historical resource includes: (1) a resource in the California Register of Historical Resources [California Register]; (2) a resource included in a local register of historical resources, as defined in Public Resources Code (PRC) § 5020.1(k) or identified as significant in a historical resource survey meeting the requirements of PRC § 5024.1(g); and (3) any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California by the lead agency, provided the lead agency's determination is supported by substantial evidence in light of the whole record.

2.2 The California Register of Historical Resources

The California Register is "an authoritative listing and guide to be used by State and local agencies, private groups, and citizens in identifying the existing historical resources of the State and to indicate which resources deserve to be protected, to the extent prudent and feasible, from substantial adverse change" (PRC § 5024.1[a]). The criteria for eligibility for the California Register are based upon National Register criteria (PRC § 5024.1[b]). Certain resources are determined by the statute to be automatically included in the California Register, including California properties formally determined eligible for, or listed in, the National Register.

To be eligible for the California Register, a cultural resource must be significant at the local, State, and/or federal level under one or more of the following four criteria:

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;

2. Is associated with the lives of persons important in our past;

3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or

4. Has yielded, or may be likely to yield, information important in prehistory or history.

A resource eligible for the California Register must be of sufficient age, and retain enough of its historic character or appearance (integrity) to convey the reason for its significance.

SECTION 3
Background Research

3.1 Records Search and Literature Review

On June 4, 2018, ESA staff conducted a records search of the Project site and immediate vicinity at the NWIC at Sonoma State University (NWIC #17-2912). The NWIC is the California Historical Resource Inventory System (CHRIS) repository housing records for the study area which includes the Project site and areas within 1/8 mile for built resources. The records search included a review of NWIC base maps (primarily the Oakland East, California 7.5-minute USGS quadrangle), previously recorded site records, and previous cultural resources study reports for the study area. Additional sources reviewed during the records search included historic maps, the Directory of Properties in the Historic Property Data File for Alameda County, the National Register, the California Register, the *California Inventory of Historic Resources* (1976), the *California Historical Landmarks* (1996), and the *California Points of Historical Interest* (1992). Historic-period topographic maps (1915, 1949, 1959, 1968) and aerial imagery (1946, 1958, 1968) were also reviewed.

The objectives of the records search were to: (1) determine whether known historic resources had been recorded within or adjacent to the Project site; (2) assess the likelihood of unrecorded historic resources based on historical references and the distribution of environmental settings of nearby sites; and (3) develop a context for identification and preliminary evaluation of historic resources.

3.1.1 Records Search and Literature Findings

The records search indicated that one cultural resource study has been completed within 1/8-mile of the Project site (a survey of portions of Highlands Hospital by Siegel & Strain Architects, 2010). The records search failed to identify any historic period built resources documented within the immediate Project vicinity. Review of the records search results and Historic Properties Directory for Alameda County identified no architectural resources within the records search radius.

3.1.2 Organizational Contacts

ESA contacted the Alameda Historical Society (AHS) on May 30, 2018, who reviewed their files for any significant information or knowledge regarding the Central Reservoir. Response from the AHS on the May 31, 2018 stated that they had no information on the site or its history. ESA also contacted the Oakland History Room of the Oakland Public

Library (May 31, 2018), who provided some detail regarding materials they maintain on site, including histories of EBMUD (see Section 4, Historical Setting).

SECTION 4
Historical Setting

The first Europeans to visit the East Bay area were the Spanish explorers Pedro Fages and Reverend Juan Crespí, who passed through during their exploration in 1772. After Mexico won independence from Spain in 1821, large tracts of land in California were granted to military heroes and loyalists. The project site was part of the 17,939-acre San Pablo landgrant given in 1823 by Governor Luís Antonio Argüello to Francisco María Castro, a former soldier at the San Francisco Presidio and one-time *alcalde* of the Pueblo of San José.

The discovery of gold in 1848 led to a huge population boom in California, with settlers establishing themselves on parts of the ranchos. The 1851 California Land Claims Act required Mexican landowners in California to prove the validity of their claim on land held under Mexican titles. Lands under rejected claims were deemed public and available for arriving settlers. As the average length of time required to prove ownership was 17 years after submitting a claim, many landowners were bankrupted and forced to sell large portions of their land to the settlers they had been attempting to evict (Rawls and Bean, 2002). After legal conflicts lasting more than 30 years, the San Pablo land grant was patented to Joaquín Ysidro Castro in 1878 and the El Sobrante land grant was patented to Juan José Castro and Victor Castro in 1883.

The Project site is within the Rancho San Antonio land grant that was granted to Luis Maria Peralta on August 3, 1820 for his service to the Spanish government. The nearly 44,000-acre rancho (eventually divided between Peralta's four sons) included the present-day cities of Oakland, Piedmont, Berkeley, Alameda, Emeryville, Albany, and parts of San Leandro. Peralta's land grant was confirmed after Mexico's independence from Spain in 1822, and the title was honored when California entered the Union by the Treaty of Guadalupe Hidalgo in 1848. Despite the confirmation of his ownership, by the middle of the 19th century, squatters had moved in to occupy portions of Peralta's undeveloped land. The Gold Rush and California statehood brought miners, businessmen, lumbermen and other speculators to the area in search of opportunities. Early settlers of that period include Edson Adams, Andrew Moon, and Horace Carpentier, who squatted on 480 acres of Vicente Peralta's (one of Luis Peralta's sons) land. Adams, Moon, and Carpentier subsequently hired Julius Kellsersberger, an Austrian-educated Swiss military engineer, to plot a new city – Oakland – which was incorporated in 1852.

The City of Oakland (City) originally encompassed the area roughly bordered by the Oakland Estuary on the south, Market Street on the west, 14th Street on the north, and the Lake Merritt Channel (estuary) on the east. Broadway served as the main street. The majority of the early city dwellers, numbering under one hundred, lived near the foot of

Broadway in proximity to the estuary. From there, city development moved north along the street car lines of Broadway and Telegraph Avenue towards the Oakland Hills and ultimately connecting with the separate towns that came to form East Oakland. The Central Reservoir is located within the historic boundary of the town of Brooklyn (est. 1856), which was annexed as part of Oakland in 1872. The town, located just east of Lake Merritt, was named for the shop Brooklyn that brought a community of Mormon setters to California in 1846. In 1872, Oakland annexed the area from about 22nd Street to 36th Street.

Ferry service to San Francisco was established in 1854. A telegraph line to Sacramento was strung in the early 1860s along the route that would become Telegraph Avenue, further connecting the community to the larger region. With the selection of Oakland as the western land terminus of the first transcontinental railroad, the city population more than tripled in the decade between 1870 and 1880. Commercial development continued up Broadway, and construction of houses rapidly expanded to keep up with the growing and increasingly diverse population of railroad workers, dock workers, laborers, business owners, and San Francisco commuters. Oakland was named the county seat of Alameda County in 1873.

The 1906 earthquake and subsequent fires that ravaged San Francisco generated further growth in Oakland for several decades, as the City absorbed refugees displaced by the disasters across the Bay. The first several years of the post-earthquake boom resulted in almost total development of the remaining unbuilt areas of North Oakland, as well as many other outlying portions of the City. Colonial Revival and Arts and Crafts-style houses sprung up in new neighborhoods. Civic improvements during this time included several major parks, fire stations, and civic buildings influenced by the “City Beautiful” movement design philosophy. This design philosophy in architecture and urban planning promoted beautification and architectural grandeur in cities in order to foster moral and civic virtue, ideally resulting in a more harmonious social order and increased quality of life.

After the Great Depression of the 1930s, Oakland became a major shipbuilding center during World War II, encouraging a new wave of growth. The City’s African-American population increased about fivefold as immigrants from southern states joined the ranks of shipyard workers. The census of 1945 shows the City’s population at 405,301 residents. After the war ended and the shipyards closed, many of the City’s residents found themselves unemployed, and the downtown and West Oakland areas began to experience an economic slide which was exacerbated during the 1950s and 1960s with the proliferation of the automobile, construction of major freeways through the urban fabric, and the flight of wealthier (primarily White) residents to the outlying suburbs.

4.1 East Bay Municipal Utility District

Several East Bay water companies were in existence as early as the 1860s. Among them were the Contra Costa Water Company, Syndicate Water Company, and Richmond Water Company. In 1906, these three companies were absorbed by the People’s Water Company. Land was purchased and the area surrounding many creeks was developed for use as reservoirs, aqueducts, and mains to serve parts of Alameda and Contra Costa

Counties. In 1917, the People's Water Company was purchased by the East Bay Water Company (EBMUD, 1991, 2005).

EBMUD was formed on May 8, 1923, the product of a bond issue passed by the voters of Oakland, Berkeley, Alameda, Emeryville, Albany, San Leandro, and El Cerrito. Richmond and Piedmont would later become part of the system. EBMUD was formed under the California Municipal Utilities District Act, which permitted the formation of multi-purpose government agencies to provide public services on a regional basis. EBMUD engineers Arthur Powell Davis, General Goethals, and William Mulholland selected the Mokelumne River as the water supply source and Lancha Plana in the Sierra Nevada mountains as the site for the reservoir (Noble, 1970).

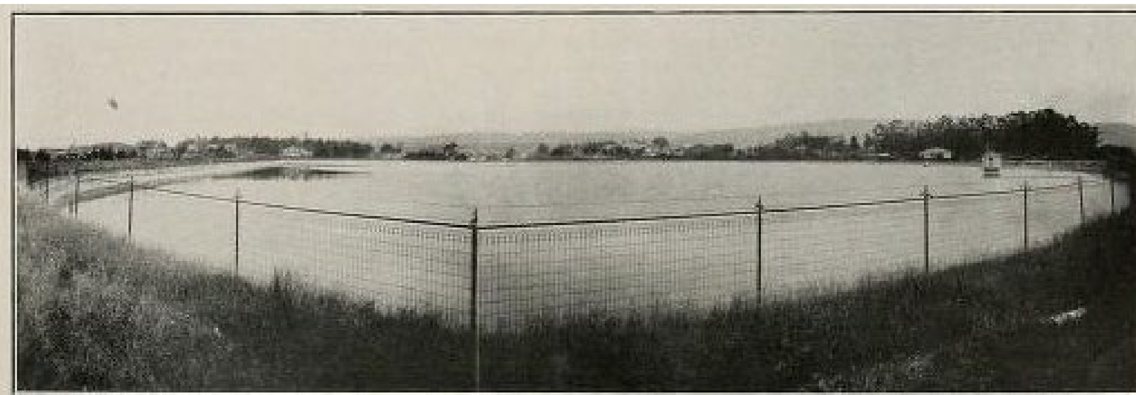
As originally designed, water from the Mokelumne River in the Sierra Nevada mountains, collected behind Pardee Dam at Lancha Plana, flowed via gravity into a series of pipelines built across California's Central Valley and Delta region. The water flowed to a pumping plant in Walnut Creek, which pushed the water to East Bay customers; some of the water was delivered by a pipeline tunnel into a storage reservoir in Lafayette, and then directed into San Pablo Creek in Orinda where it could fill San Pablo Reservoir or be diverted into the Claremont Tunnel in the Oakland-Berkeley Hills (Noble, 1970).

In 1928, five years after the EBMUD was formed, a $26 million bond was used to purchase the existing facilities of the East Bay Water Company. With the facilities came 40,000 acres of land in Alameda and Contra Costa counties and all of the East Bay Water Company's previously completed reservoirs and treatment plants (EBMUD, 2003). In the year EBMUD was formed, the Lafayette Reservoir was completed as a terminal storage reservoir in the EBMUD system. The Pardee Dam and the first Mokelumne Aqueduct were completed in 1929, with the first water deliveries from the Sierra Nevada mountains to the East Bay in June of that year.

By 1930, EBMUD was serving 35 million gallons per day (mgd) to a population of 460,000. A study of EBMUD lands commissioned in the same year indicated that 7,000 to 10,000 acres were not needed for watershed protection purposes and were suitable for parks and recreation use. In 1934, the East Bay Regional Park District (EBRPD) was created to acquire and manage EBMUD lands not needed for water quality protection. In 1936, EBMUD agreed to sell 2,162 acres of watershed land in Wildcat Canyon, Tilden Park, Roundtop Peak, and Temescal Reservoir to the EBRPD (EBMUD, 2003). EBMUD constructed the Art Deco–style Orinda Filter Plant (Orinda Water Treatment Plant [WTP]) in 1934, which continues to be the largest of EBMUD's six water treatment plants.

EBMUD continued to grow during the post-war period. Populations in the East Bay grew to 850,000, necessitating a second Mokelumne Aqueduct, which was completed in 1950. In 1958, Pardee Reservoir was opened for public recreation. In 1964, EBMUD constructed the Sobrante WTP. In 1966, the Lafayette and Chabot Reservoirs were opened for public recreation; the Upper San Leandro WTP underwent a major expansion in the same year. By 1967, a third Mokelumne Aqueduct and the new Camanche Dam and Reservoir were completed; in the same year, EBMUD constructed the Walnut Creek WTP. By 1970, EBMUD was supplying 220 mgd to an East Bay population of 1,100,000 (Noble, 1970; EBMUD, 2005).

Central Reservoir



CENTRAL RESERVOIR, OAKLAND, CALIFORNIA.
Capacity 158,000,000 gallons. The principal distributing and equalizing reservoir for the lower residence and business districts.

5

SOURCE: East Bay Water Company, 1920

Insert 1
Central Reservoir, 1920

Constructed in 1910, the Central Reservoir is EBMUD's oldest and largest distribution reservoir in operation (Insert 1). Plans for construction of the reservoir dates back as far as the 1889, when the Contra Costa Water Company (a predecessor of EBMUD) purchased the land for a central reservoir near Fruitvale for approximately $16,500 (Oakland Tribune, 01/28/1890). Approximately 66,666 cubic yards of material was removed from the site, and the site partially lined in 1891. However, construction of the reservoir was abandoned soon afterwards for unclear reasons (Oakland Tribune, 10/31/1900) and by 1906 the Contra Costa Water Company was near bankrupt. In August 1906, the People's Water Company was formed, combining the Contra Costa Water Company, the Richmond Water Company, and the Syndicate Water Company. The new company's financial troubles remained, however, with the post-earthquake boom in population covered within the company's service area overextending the limited water storage facilities existing in the East Bay. New lands were purchased, with reservoirs (including Central Reservoir) and facilities constructed to store and transport water.

The People's Water Company constructed the approximately 150-million-gallon capacity, concrete lined reservoir at a cost of approximately $352,000 to serve the water needs of Oakland and Alameda County (Oakland Tribune, 03/01/1910). An article discussing the new reservoir in 1911 describes it as a concrete-lined distributing and equalizing reservoir of 150,000,000 gallons capacity. The reservoir was designed by M. [sic] Kempkey,[a] under the direction of A. L. Adams, and construction completed by the Piedmont Construction Company under the supervision of G. H. Wilhelm, chief engineer of the People's Water Company. Newspaper articles at the time described it as potentially the largest concrete reservoir on the Pacific Coast (Unknown, 1911).

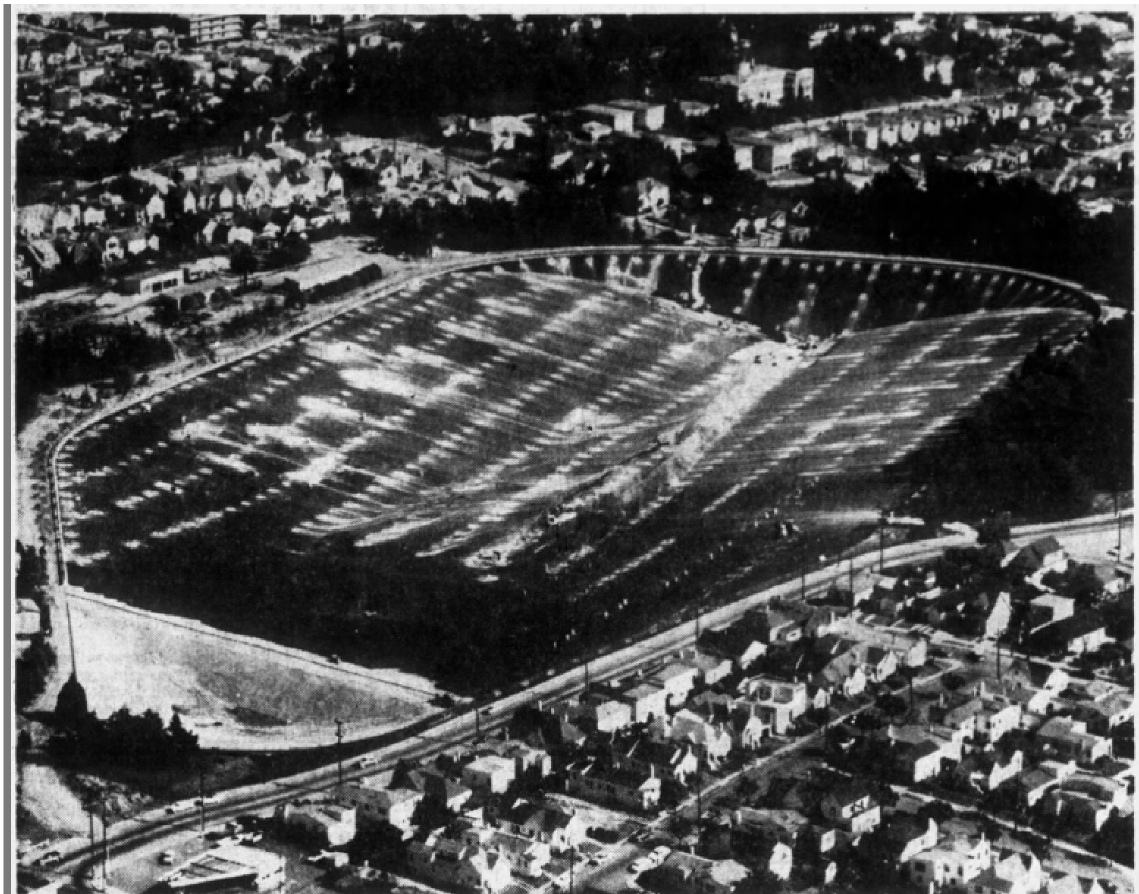
[a] Additional archival review determined that "M Kempkey" likely was a mis-identification of Augustus Kempkey who worked on several projects in Alameda County under Adams.

SOURCE: Bancroft Library, nd

Insert 2
Central Reservoir, pre-1960

The reservoir had been constructed within the natural drainage of Sausal Creek, with the sides and base graded and covered in a layer of concrete. The basin's final measurements spanned 1,500 feet long by 800 feet wide, covering nearly 20 acres. The reservoir's dam measured 25 feet wide at the top, 56 feet high and about 900 feet long, topped by a concrete gate tower (measuring 6 feet in diameter, with 2-foot thick walls, and extending 56 feet high). Both the basin and interior slope of the dam consisted of concrete arranged in 12-foot square slabs. The rim of the basin was enclosed by a 4-foot tall concrete wall, built in 12-foot sections, topped with an ornamental iron fence and surrounded by a driveway (Insert 2) (Unknown, 1911; Unknown, 1917).

The reservoir was anticipated to be expanded to meet future water needs, and was intended as a backup water supply in case of the loss of primary water sources (Alvarado pumping station or Lake Chabot) (Oakland Tribune, 05/06/1911; Daniels, 1920). In 1922, EBMUD constructed a maintenance and storage building at the south end of the reservoir (EBMUD, 1922).



Tribune photo by Russ Reed from plane flown by Warren Boggess. Pacific States Aviation. Concord

BATHTUB—This aerial view of EBMUD's Central Reservoir off MacArthur Blvd., shows renovation work being done as part of the water company's $283,000,000 expansion. Lower left shows earth dam constructed to permit through access for MacArthur freeway, which cut five acres from reservoir. New watertight seal and cover is being put over 150,000,000 gallon distribution reservoir, which will be finished in April.

SOURCE: Oakland Tribune, 1960

Insert 3
Central Reservoir Improvements Construction

The reservoir was originally lined with 4-inch-thick concrete slabs. Lining repairs were done in 1955 (at a cost of approximately $28,000), and in 1958 EBMUD began improvements to the reservoir, resulting from the construction of the MacArthur Freeway (I-580) on the north portion of the reservoir (Insert 3). This new construction required constructing an auxiliary embankment for the facility in order to maintain its capacity. Improvements also included a complete relining and draining system, as well as the installation of a reservoir roof cover for additional protection of the water supply (Oakland Tribune, 10/29/1958). These improvements were funded via the sale of $2.5 million in Water Bonds through EBMUD, and construction was completed by 1961 at a cost of $3 million. In the 2000s, the roof was covered with the corrugated metal which is currently in place today (Maggiore, 2018).

SECTION 5
Survey Methods and Results

ESA cultural resources staff surveyed the Project site on June 18, 2018 and recorded the buildings and structures at the Central Reservoir through field notes and digital photography. Evaluation of the reservoir under the criteria of the California Register is included below.

5.1 Description

The Central Reservoir is a multi-component site on 27 acres, built to store water from the Orinda WTP. Figure 3 includes a map of the location of the components within the site. The site includes two components: the reservoir basin and the maintenance storage building. Both of these components are described separately below. The evaluation that follows discusses the Central Reservoir site as a single resource, rather than each individual component.

5.1.1 Central Reservoir Basin

SOURCE: ESA 2018

Insert 4
Central Reservoir basin, southern elevation

SOURCE: ESRI, ESA, 2018

EBMUD Central Reservoir Replacement Project

Figure 3
Historic Built Resources

ESA

The Central Reservoir basin is a 154-million gallon open-cut reservoir. The reservoir basin is trapezoidal shaped, concrete lined with pre-cast columns, timber beam/girders and covered by a corrugated metal roof. The Central Reservoir basin is impounded by an earthen embankment on the southern end of the basin (Insert 4). The corrugated metal walls range in height from 2 to 10 feet, with rectangular maintenance sheds interspersed along the basin perimeter, and a modern metal gate tower located on the southern end of the reservoir above the embankment.

Maintenance Storage Building

SOURCE: ESA 2018

Insert 5
1922 Maintenance Storage Building

Located on the south end of the Central Reservoir site is the 1922 Maintenance Storage Building (Insert 5). The building has historically been used for maintenance and storage since its original construction in 1922. The steel-reinforced concrete building consists of the original structure, and an L-shaped addition that wraps around the north and east facades (constructed, per aerial photographs, between 1946 and 1958). The current building footprint is approximately 40 by 60 feet, with the original building measuring 25 by 45 feet, oriented east/west paralleling East 29th Street.

The original structure is approximately 1.5 stories tall, with a flat roof with recessed concrete panels framing each façade. The original structure reflects classical elements, including symmetrical design, flat roof, dentilled cornice,[a] and a decorated roofline panel imprinted with geometric designs. Fenestration[b] consists of 12-lite multi-pane windows set in concrete frames (on the original structure) and covered with iron bars, and flush metal doors. A corrugated metal awning extends over the primary entrance on the western facade.

The single story wrap around addition was designed in a sympathetic style to the original 1922 structure, with a flat roof, flush metal double doors, and 12-lite multi-pane windows with iron bars. However, unlike the original structure, the addition reflects no decorative elements.

5.1.2 California Register Evaluation

The following discussion evaluates the Central Reservoir site as a single resource against the criteria of the California Register.

California Register Criterion 1: Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage

Archival review indicated that the Central Reservoir is significant in its association with the development of water supply and distribution in the East Bay. While not the first reservoir in the East Bay (in 1869, Anthony Chabot created Lake Temescal, the Temescal Reservoir, as the East Bay's first artificial reservoir, and in 1875 Lake Chabot was constructed), the Central Reservoir is one of EBMUD's oldest water storage facilities. It was, at the time of its construction, toted as the largest man-made lake for filtered water west of Chicago (Oakland Tribune 05/01/1952). This distinction, however, does not raise the Central Reservoir site to a level of significance for its association with historical events (Criterion 1). While a component of the EBMUD system providing water for Oakland and the surrounding community, the Central Reservoir was not the largest nor most significant reservoir in the East Bay. Nor did it rise to national significance as a result of its construction as the largest man-made reservoir in the West. As such, the Central Reservoir site is ineligible under Criterion 1.

California Register Criterion 2: Is associated with the lives of persons important in our past

Archival research identified several engineers and contractors associated with the development of the Central Reservoir, including G. H. Wilhelm, chief engineer of the People's Water Company, Augustus Kempkey (under the direction of A. L. Adams), and the Piedmont Construction Company. Further archival review failed to indicate any strong regional or local significance for either Wilhelm, Kempkey, Adams, or the

[a] a series of small projecting rectangular blocks forming a molding
[b] the arrangement of windows and doors on the elevations of a building

Piedmont Construction Company. Archival review identified the Piedmont Construction Company as a local construction company involved in civic improvements including street and pipeline construction, but failed to identify any significant local works completed by the company.

Historic newspaper articles and company journals identified Wilhelm as working for the People's Water Company or East Bay Water Company from 1909 through 1927, but little other detail regarding his personal or employment history. Wilhelm completed a study on the water quality of the Sacramento River for the City of Sacramento in 1916, but no other projects or works of note were identified during archival review.

Arthur Lincoln Adams (b. 1864, d. 1913), a Bay Area water engineer, directed the design of the Central Reservoir through collaboration with Augustus Kempsey. Adams, originally from Indiana, received a civil engineering degree from Kansas State University before relocating to Los Angeles and then the Bay Area. Adams worked as a chief engineer for the Contra Costa Water Company, general manager and consulting engineer for the People's Water Company, and hydraulic civil engineer with the Spring Valley Water Company of San Francisco before his death at 49 from pneumonia (Oakland Tribune, 09/18/1913).

Augustus Kempkey (b.1880, d 1975), acted under Adams as the project engineer. Kempkey graduated from the UC Berkeley College of Civil Engineering in 1902, and was hired to work as assistant engineer for the Contra Costa Water Works (Oakland Tribune 07/15/1902). Archival review determined that prior to his work on the Central Reservoir, Kempkey worked with Adams supervising the design and construction of the Rockland Water Tower in Victoria, British Columbia. This project was featured at a conference of the American Society of Civil Engineers held in March 1910. Archival review failed to identify any other significant works associated with Kempkey, who died in 1975 (Oakland Tribune 05/24/1975).

Archival research failed to indicate that Wilhelm, Adams, and Kempkey were significant persons in local or state history (Criterion 2). Archival research did not identify any significant associations between the Central Reservoir site and any other noteworthy individuals in history; therefore, it does not meet Criterion 2.

California Register Criterion 3: Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values

The Central Reservoir site does not rise to the level of distinction needed for eligibility under Criterion 3. The reservoir basin is a simple vernacular mid-century structure, with little ornamentation or architectural distinction. Rather it is a typical understated example of the style used in municipal architecture in the mid-20th century. Additionally, the reservoir basin has undergone significant alteration since its 1910 construction, detailed above, resulting in a lack of physical integrity to convey its early 20th century design. As such, it does not display distinctive characteristics of a type, period, or method of construction and, therefore, does not meet Criterion 3. While the 1922 maintenance building reflects some classical elements, the building has been modified since its original construction and does not reflect distinctive architectural characteristics that would elevate its significance under Criterion 3. Additionally, as noted below, the 1922 maintenance building falls outside the period of significance for the reservoir site (1910-1919).

The Central Reservoir site also does not rise to distinction as the work of a master. Wilhelm, Adams, and Kempkey all contributed to the design and construction of the reservoir basin, but, as described above, archival review failed to indicate significant prominence for any one of these in their field. As such, the Central Reservoir does not meet the Criterion 3 requirements for the work of a master.

California Register Criterion 4: Has yielded, or may be likely to yield, information important in prehistory or history.

Lastly, the Central Reservoir does not have the potential to yield more information and therefore, is not eligible under Criterion 4.

Period of Significance

The Period of Significance is the period under which the Central Reservoir was most likely to have achieved significance and is the standard against which the physical integrity of the resource is compared (i.e. "Does is still appear as it did between 1909-1919?"). The Period of Significance is defined as the length of time when a property was directly associated with important events, activities, or persons, or attained the physical features and architectural characteristics which qualify it for California Register listing. With initial construction completed at the site by 1910, the Central Reservoir meets the fifty-year threshold for age in consideration for listing in the California Register. Its period of significance is recommended as spanning from its completion in 1910 to the 1919 opening of the San Pablo Reservoir.

Integrity

The Central Reservoir has undergone significant change to its physical integrity since its period of significance. The seven aspects of integrity include location, design, setting, materials, workmanship, feeling, and association.

Nearly all components of the site have undergone noticeable alteration since 1919. The reservoir has been reconfigured with the construction of the MacArthur Freeway in 1958, as well as the introduction of a roof cover in the early 1960s. Virtually no portion of the Central Reservoir remains as it appeared in 1919. Additionally, the 1922 maintenance building has undergone significant modification through the introduction of the mid-century wrap around addition. As such the maintenance storage building has also undergone a significant change of integrity, and does not reflect its historical appearance.

The cumulative impact of these changes to nearly every component of the site results in the overall Central Reservoir lacking integrity of setting, design, materials, workmanship, and feeling. While the integrity of location and association remain, the impacts to the site's physical integrity have resulted in an overall loss of the site as it would have appeared in 1919. Additionally, the Central Reservoir site does not appear to possess any significant associations with historic events or people, or architectural distinction. Therefore, the Central Reservoir is ineligible for listing in the California Register.

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SECTION 6
Conclusions and Recommendations

Based on the results of the historic resources evaluation, the Central Reservoir is ineligible for listing in the California Resister and is therefore not a historical resource for the purposes of CEQA. No additional mitigation is required.

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SECTION 7
References

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Appendix A
Resumes

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Katherine Cleveland

Managing Associate I

EDUCATION

Masters of Arts in Public History, California State University, Sacramento

B.A., History, Minor in Women's Studies and Anthropology/Geography, California Polytechnic State University, San Luis Obispo

10 YEARS EXPERIENCE

CERTIFICATIONS/ REGISTRATION

Section 106 training, Advisory Council for Historic Preservation

GIS for Resource Managers, UC Davis

PROFESSIONAL AFFILIATIONS

California Council for the Promotion of History

California Preservation Foundation

Kathy is a cultural resources analyst and project manager involved with a variety of ESA projects involving historic period structures, buildings, and districts. Her role entails establishing a base historical context for the respective projects, conducting archival review at regional and state repositories, documenting and evaluating historic resources for eligibility for the National and California Registers, and drafting technical reports meeting Federal, State, and Local requirements. Kathy has completed evaluations for pre and post-World War II residential and commercial buildings, water conveyance systems, mining and industrial buildings and structures, airports, as well as historic period roads, trails, and railway features. Kathy has experience working in projects located throughout the Central Valley, as well as Sierra Nevada, Southern California, and western Nevada.

Relevant Experience

Berry Street Bridge Replacement Project, Davis, CA. *Architectural Historian* The City of Calistoga (City) proposes to replace the existing Berry Street Bridge (Bridge No. 21C0115) that crosses the Napa River, widen the bridge approaches, and realign the intersection of Berry Street and Washington Street. For this project, ESA is a sub-consultant to Mark Thomas & Company. ESA completed an Archaeological Survey Report, a Historical Resources Evaluation Report, and a Historic Properties Survey Report in coordination Caltrans and the City. Kathy completed the HRER, which documented archival review, field survey, consultation with the City, and eligibility recommendations for the historic period houses and bridge within the APE.

DWR, Division of Flood Management, Evaluation of Environmental Permitting for Operations and Management (EPOM) of the Sacramento River Flood Control Program, Sacramento, CA. *Architectural Historian.* ESA is working with DWR DFM to prepare an Environmental Impact Report that evaluates the impacts of implementing operation and maintenance (O&M) activities associated with maintaining the proper functioning of the Sacramento River Flood Control Project flood protection facilities in accordance with their original design. The Environmental Impact Report will analyze impacts of conducting O&M activities including: (1) levee maintenance to insure serviceability in times of floods; (2) channel maintenance (e.g., sediment removal, debris/obstruction and wild growth removal, vegetation management, and channel and bank scour repair); (3) flood control structure maintenance and repair (e.g., pumping plants, weirs and outfall gates, and bridge maintenance and repair, and pipe/culvert repair, replacement and abandonment); and (4) data collection. Kathy is conducting analysis of potential impacts to architectural built resources within the project area, and providing mitigation recommendations for treatment of historic built resources during ongoing maintenance activities.

Yolo County Flood Control & Water Conservation District, Capay Dam Restoration Project, Capay, CA. *Cultural Resource Analyst.* Kathy assisted in providing the cultural resources analysis of impacts relating to the construction of the Capay Dam Restoration, which included identification and evaluation of any potential historic structures within the project area (including Capay Dam and Adams Ditch), as well as any impacts to cultural resources resulting from the implementation of the project.

Woodbridge Irrigation District Stockton Water Transfer, Stockton, CA. *Section Writer.* Kathy assisted in providing the cultural resources analysis of impacts relating to the construction of the Woodbridge Irrigation District project, which included identification and evaluation of any potential historic structures within the project area (including the Woodbridge Canal), as well as any impacts to cultural resources resulting from the implementation of the project.

RD2035 Fish Screen Project, Yolo County, CA. *Architectural Historian.* ESA prepared NEPA environmental documentation for the construction and operation of a joint use intake facility to supply surface water to Davis-Woodland Water Supply Partners and Reclamation District 2035. Kathy's responsibilities included archival review and field survey, identification and evaluation of historic structures within the project APE (early twentieth century irrigation pump house and ancillary structures), and mitigation of potential adverse effects to historic properties.

Kings River Intake Permitting Support, Fresno, CA. *Cultural Resource Analyst and Architectural Historian.* ESA completed an Environmental Impact Report for the City of Fresno Metropolitan Water Resources Management Plan (Metro Plan) Update. A component of the Metro Plan was the installation of a new intake and pipeline to direct water to a proposed surface water treatment facility. Several options for this component were identified in the Environmental Impact Report. In order to facilitate selection of the best option, ESA was retained by the City's Metro Plan Implementation Program Managers to conduct reconnaissance field investigation to identify any constraints or opportunities that would inform selection of the route and final design of the infrastructure. Kathy managed the completion of a Section 106 compliant cultural resources report that documented archival review, field survey, native American coordination, and mitigation recommendations for the proposed project alignment. Several historic period canals were determined to intersect the project alignment, but were recommended ineligible for listing in the National Register.

California Department of Water Resources, Flood Maintenance Office, Collecting Canals Cultural Resources Evaluation, Sutter County, CA . *Architectural Historian.* ESA is working with DWR DFM to prepare an Environmental Impact Report that evaluates the impacts of implementing maintenance activities associated with maintaining the proper functioning of the collecting canals along and east of the Sutter Bypass along with associated structures. Kathy managed cultural resources staff to prepare the supporting environmental documentation detailing potential project impacts on archaeological and built historical resources. This included conducting a records search, field survey, and evaluation of both the canal system and its ancillary features (3 bridges).

Amber L. Grady

Senior Architectural Historian

EDUCATION

M.A., Historic Preservation, Savannah College of Art & Design, Savannah, GA

B.A., Interior Design with a minor in Art History, California State University, Chico

16 YEARS EXPERIENCE

PROFESSIONAL AFFILIATIONS

California Preservation Foundation

Society of Architectural Historians

Amber Grady is an expert in NEPA, CEQA, and Section 106 of the NHPA compliance with over 16 years of experience in cultural resources management. Amber has extensive experience in California architectural history with an emphasis on northern California. Her cultural resources management experience includes archival research, historic building and structure surveys and evaluations, and cultural resources documentation for NEPA and CEQA projects ranging from single building evaluations to district-wide surveys. Previously, Amber served as the Cultural Resources Manager for the State of California for the California Army National Guard (CA ARNG). At the CA ARNG Amber managed the cultural resources program, which included the management of over 100 archaeological sites as well as the State's historic armories and supervising three full time archaeologists. Prior to joining the CA ARNG Amber worked for the California Energy Commission as an Architectural Historian where she worked on a variety of energy project including one of the largest solar projects in California as the Cultural Resources lead. Prior to that Amber worked as an Architectural Historian and Project Manager foranother employer on a variety of projects throughout California and Nevada completing project for City's, school districts, and private sector clients. Amber began her career in the public sector working as a planner for both the County of Santa Clara and the City and County of San Francisco. Amber's expertise includes all phases of environmental compliance from documentation to compliance during construction.

Relevant Experience

260 E San Antonio Road Local Landmark Evaluation, Long Beach, CA. ESA evaluated the property for City of Long Beach Local Landmark status. Amber was the Lead Architectural Historian on the project, who was responsible for the research, survey, evaluation, and report completion.

VIP Records Sign, Long Beach, CA. *Senior Architectural Historian.* ESA evaluated the property for City of Long Beach Local Landmark status. Amber was the Lead Architectural Historian on the project, who was responsible for the research, survey, evaluation, and report completion.

Fly DC Jets Sign, Long Beach, CA. *Senior Architectural Historian.* ESA evaluated the property for City of Long Beach Local Landmark status. Amber was the Lead Architectural Historian on the project, who was responsible for the research, survey, evaluation, and report completion.

Los Angeles Unified School District (LAUSD) President Elementary School Historic Resources Evaluation, Harbor City, CA. *Senior Architectural Historian*. This is one of many historic resources evaluations that ESA has done for LAUSD. Amber assisted in the completion of the Historic Resources Evaluation report, which will be used in support of the Environmental Compliance documents.

LAUSD 6th Avenue Elementary School, Los Angeles, CA. *Senior Architectural Historian*. This is one of many historic resources evaluations that ESA has done for LAUSD. Amber assisted in the completion of the Historic Resources Evaluation report, which will be used in support of the Environmental Compliance documents.

California Department of Water Resources (DWR), Oroville Spillway Emergency Repair Project, Oroville Dam, CA. *Senior Architectural Historian.* Amber and her staff have been assisting DWR with Section 106 compliance for built environment resources for the emergency spillway repair project. She routinely advises DWR staff on portions of the project that affect contributing elements of the National Register eligible Oroville Division Historic District, and preparing Finding of Effect documents to ensure construction is not delayed. The project is ongoing and expected to extend through 2018.

730 Stanyan, San Francisco, CA. *Senior Architectural Historian.* ESA is currently assisting the MOHCD with Section 106 compliance for their 730 Stanyan project. Amber is the Lead Architectural Historian on the project and was responsible for research, survey, and evaluation of the historic-age properties within the APE. This project is in progress and ESA will also be preparing the HRE.

City of Sacramento, Swanston Station Transit Village Specific Plan EIR, Sacramento, CA. The Swanston Station Transit Village Plan (SSTVP) was prepared to implement transit-oriented development around the Swanston Light Rail Station in Sacramento's North Sacramento Community Plan Area by providing goals, policies and objectives, and implementation measures that will guide land use and development decisions around the station for 20 years. A series of concepts to construct an intermodal transit center linking the light rail service with bus service at the Swanston Station for the Sacramento Regional Transit District was developed. Amber was responsible for preparing the cultural resources and visual quality sections of the EIR.

California High-Speed Rail Project, Environmental Compliance for San Francisco to San Jose Segment, CA. *Senior Architectural historian, Topic Leader for Cultural Resources, Task Leader for Historic Architecture.* Amber was the Senior Architectural Historian on the project as well as the Topic Leader for Cultural Resources. Topic leader duties included coordinating the recording/evaluating efforts for Archaeological, Historic Architectural, and Paleontological resources. As the Senior Architectural Historian Amber and her team surveyed over 6,000 buildings/structures resulting in the evaluation of over 300 for National Register of Historic Places (National Register) and California Register of Historical Resources (California Register) eligibility.

Rio Mesa Solar Project. *Cultural Resources Lead/Built Environment Specialist.* The Rio Mesa Solar Electric Generating Facility consisted of two 250-megawatt solar concentration thermal power plants situated on the Palo Verde Mesa in Riverside County, California. A common facilities area included a combined administration, control, and maintenance facilities, a water treatment facility, and switchyard. The project total area, including the shared facilities and gen-tie line, was approximately 3,960 acres. Amber was responsible for coordinating the work of 3-4 staff and completing the built environment analysis of the Cultural Resources Section of the Staff Assessment.

Appendix B
Department of Parks and Recreation Forms

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State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code

Other Listings
Review Code Reviewer Date

Page 1 **of** 7 ***Resource Name or #:** (Assigned by recorder) Central Reservoir
P1. Other Identifier:
*P2. **Location:** ☐ **Not for Publication** ☒ **Unrestricted**
***a. County** Alameda **and** (P2c, P2e, and P2b or P2d. Attach a Location Map as necessary.)
***b. USGS 7.5' Quad** Oakland East **Date** 1980 **T** __; **R** __; __ ☐ **of** __ ☐ **of Sec** __; ____**B.M.**
c. Address 2500 E 29TH ST City Oakland Zip 94602
d. UTM: (Give more than one for large and/or linear resources) Zone __, ______ mE/ ______ mN
e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, decimal degrees, etc., as appropriate)

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

The Central Reservoir is a multi-component site on 27 acres, built to store water from the Orinda Water Treatment Plant. The site includes two components: the reservoir basin and the maintenance storage building. The Central Reservoir basin is a 154-million gallon open-cut reservoir. The reservoir basin is approximately oval shaped (albeit truncated on the north end by the MacArthur Expressway), concrete lined with pre-cast girders, columns and is covered by a corrugated metal roof. Central Reservoir basin is impounded by an earthen embankment dam on the southern end of the basin. The corrugated metal walls range in height from 2 to 10 feet, with rectangular maintenance sheds interspersed along the basin perimeter, and a modern metal gate tower located on the southern end of the reservoir above the dam.

(see continuation sheet)
***P3b. Resource Attributes:** (List attributes and codes) HP22. Reservoir
***P4. Resources Present:** ■ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5a. Photograph or Drawing (Photograph required for buildings, structures, and objects.)

P5b. Description of Photo: (view, date, accession #) reservoir basin, facing northwest

***P6. Date Constructed/Age and Source:** ☒ Historic ☐ Prehistoric ☐ Both
1910

***P7. Owner and Address:**
EBMUD
375 11TH ST
Oakland, CA 94602-1502

***P8. Recorded by:** (Name, affiliation, and address) Kathy Cleveland | ESA
2600 Capitol Ave, Ste 200
Sacramento, CA 95816

***P9. Date Recorded:** 06/2018

***P10. Survey Type:** (Describe) intensive

***P11. Report Citation**: (Cite survey report and other sources, or enter "none.")
ESA, 2018. Central Reservoir Replacement Project Draft Historic Resources Evaluation Report. Prepared for East Bay Municipal Utility District. June, 2018

***Attachments:** ☐NONE ☒Location Map ☒Continuation Sheet ☒Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐Other (List):

BUILDING, STRUCTURE, AND OBJECT RECORD

***Resource Name or #** (Assigned by recorder) Central Reservoir ***NRHP Status Code** 6y

B1. Historic Name: Central Reservoir
B2. Common Name: same
B3. Original Use: reservoir B4. Present Use: reservoir
***B5. Architectural Style:** mid-century industrial vernacular
***B6. Construction History:** (Construction date, alterations, and date of alterations)
1890 original reservoir construction begun
1909-1910 reservoir construction completed
1922 maintenance building constructed
Ca 1950 maintenance building addition constructed
1958-1961 reservoir modernization, construction of MacArthur Freeway to north, relining, installation of roof

***B7. Moved?** ☒**No** ☐**Yes** ☐**Unknown** **Date:** ______ **Original Location:**______
***B8. Related Features:**
1922 maintenance storage building

B9a. Architect: Augustus Kempkey **b. Builder**: Piedmont Construction Company
***B10. Significance: Theme** water development **Area** Bay Area
Period of Significance 1910-1919 **Property Type** utility **Applicable Criteria** n/a
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

Constructed in 1910, the Central Reservoir is EBMUD's oldest and largest distribution reservoir in operation. Plans for construction of the reservoir dates back as far as the 1889, when the Contra Costa Water Company (a predecessor of EBMUD) purchased the land for a central reservoir near Fruitvale for approximately $16,500 (Oakland Tribune, 01/28/1890). Approximately 66,666 cubic yards of material was removed from the site, and the site partially lined in 1891. However, construction of the reservoir was abandoned soon afterwards for unclear reasons (Oakland Tribune, 10/31/1900) and by 1906 the Contra Costa Water Company was near bankrupt. In August of that year, the People's Water Company was formed, combining the Contra Costa Water Company, the Richmond Water Company, and the Syndicate Water Company. The new company's financial troubles remained, however, with the post-earthquake boom in population covered within the company's service area overextending the limited water storage facilities existing in the East Bay. New lands were purchased, with reservoirs (including Central Reservoir) and facilities constructed to store and transport water.

The People's Water Company constructed the 17 acre, approximately 150-million-gallon capacity, concrete lined reservoir at a cost of approximately $352,000 to serve the water needs of Oakland and Alameda County (Oakland Tribune, 03/01/1910). An article discussing the new reservoir in 1911 describes it as a concrete-lined distributing and equalizing reservoir of 150,000,000 gallons capacity. The reservoir was designed by M. [sic] Kempkey, under the direction of A. L. Adams, and construction completed by the Piedmont Construction Company under the supervision of G. H. Wilhelm, chief engineer of the People's Water Company. Newspaper articles at the time described it as potentially the largest concrete reservoir on the Pacific Coast (Unknown, 1911).

(See continuation sheet)

B11. Additional Resource Attributes: (List attributes and codes)
HP8. Industrial building
***B12. References:**
(See continuation sheet)

B13. Remarks:

***B14. Evaluator:** Kathy Cleveland
***Date of Evaluation:** June 2018

(This space reserved for official comments.)

(Sketch Map with north arrow required.)
See location and sketch maps attached

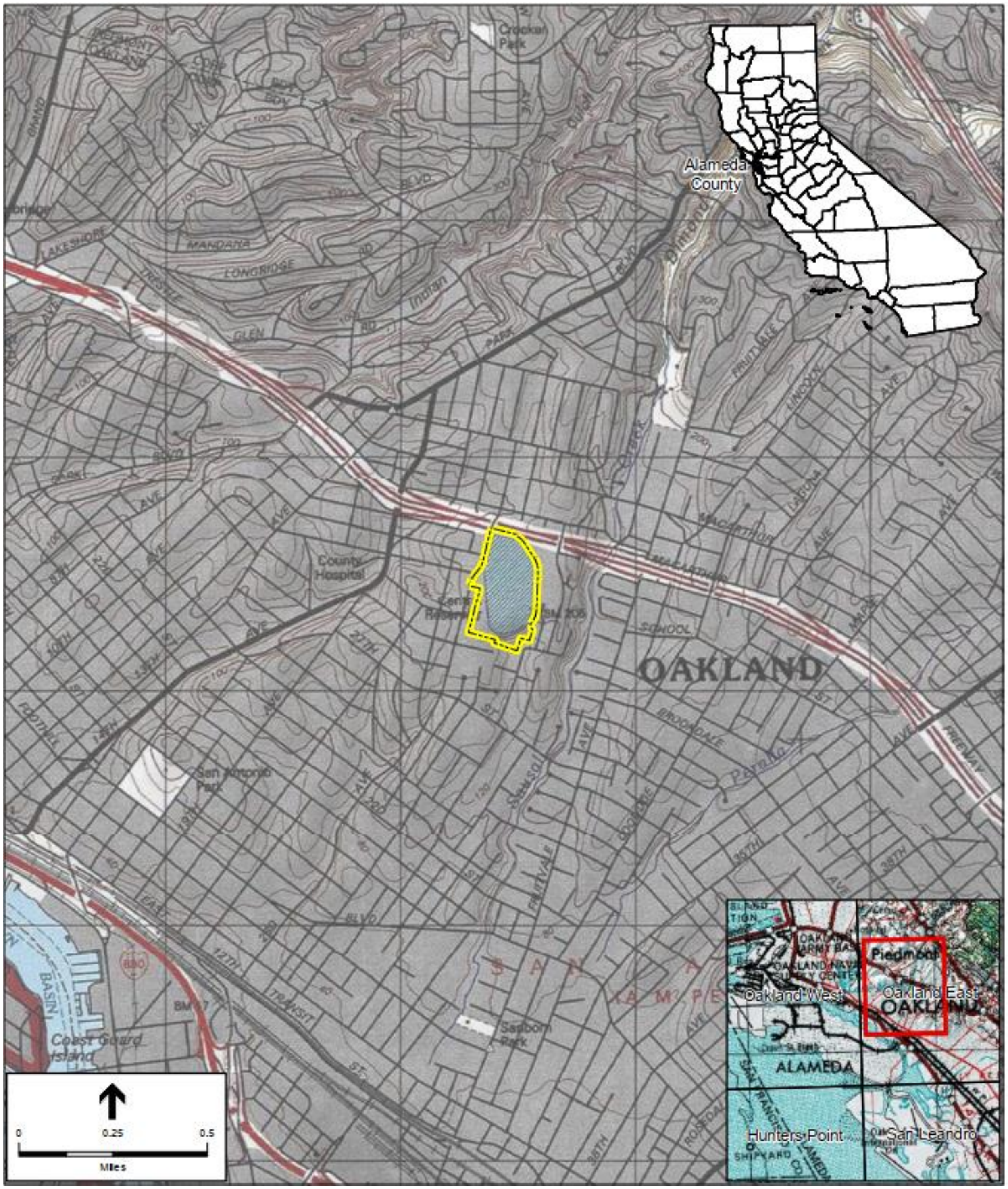
Primary #
HRI#

LOCATION MAP

Trinomial

Page 3 **of** 7 ***Resource Name or #** (Assigned by recorder) Central Reservoir

***Map Name:** Oakland East ***Scale:** 1:24k ***Date of map:** 1980



State of California -- Natural Resources Agency
DEPARTMENT OF PARKS AND RECREATION
SKETCH MAP

Primary #
HRI#
Trinomial

Page 4 **of** 7 ***Resource Name or #** (Assigned by recorder) Central Reservoir

***Drawn by:** ESA ***Date of map:** 2018

***P3a. Description:** Located on the south end of the Central Reservoir site is the 1922 Maintenance Storage Building. The building has historically been used for maintenance and storage since its original construction in 1922. The steel-reinforced concrete building consists of the original structure, and an L-shaped addition that wraps around the north and east facades (constructed, per aerial photographs, between 1946 and 1958). The current building footprint is approximately 40 by 60 feet, with the original building measuring 25 by 45 feet, oriented east/west paralleling E 29th Street.

The original structure is approximately 1.5 stories tall, with a flat roof with recessed concrete panels framing each façade. The original structure reflects classical elements, including symmetrical design, flat roof, dentilled cornice, and a decorated roofline panel imprinted with geometric designs. Fenestration consists of 12-lite multi-pane windows set in concrete frames (on the original structure) and covered with iron bars, and flush metal doors. A corrugated metal awning extends over the primary entrance on the western façade.

The single story wrap around addition was designed in a sympathetic style to the original 1922 structure, with a flat roof, flush metal double doors, and 12-lite multi-pane windows with iron bars. However, unlike the original structure, the addition reflects no decorative elements.

***B10. Significance:**

The reservoir had been constructed within the natural drainage of Sausal Creek, with the sides and base graded and covered in a layer of concrete. The basin's final measurements spanned 1,500 feet long by 800 feet wide, covering nearly 20 acres. The reservoir's dam measured 25 feet wide at the top, 56 feet high and about 900 feet long, topped by a concrete gate tower (measuring 6 feet in diameter, with 2-foot thick walls, and extending 56 feet high). Both the basin and interior slope of the dam consisted of concrete arranged in 12-foot square slabs. The rim of the basin was enclosed by a 4-foot tall concrete wall, built in 12-foot sections, topped with an ornamental iron fence and surrounded by a driveway (Unknown, 1911; Unknown, 1917).

The reservoir was anticipated to be expanded to meet future water needs, and was intended as a backup water supply in case of the loss of primary water sources (Alvarado pumping station or Lake Chabot) (Oakland Tribune, 05/06/1911; Daniels, 1920). In 1922, EBMUD constructed a maintenance and storage building at the south end of the reservoir (EBMUD, 1922).

The reservoir was originally lined with 4-inch-thick concrete slabs. Lining repairs to were done in 1955 (at a cost of approximately $28,000), and in 1958 EBMUD began improvements to the reservoir, resulting from the construction of the MacArthur Freeway (Interstate 580) on the north portion of the reservoir. This new construction required the facility to be reshaped in order to maintain its capacity. Improvements also included a complete relining and draining system, as well as cover for additional protection of the water supply (Oakland Tribune, 10/29/1958), These improvements were funding via the sale of $2.5 million in Water Bonds through EBMUD, and construction was completed by 1961 at a cost of $3 million.

<u>Evaluation</u>
California Register Criterion 1.
Archival review indicated that the Central Reservoir is significant in its association with the development of water supply and distribution in the East Bay. While not the first reservoir in the East Bay (in 1869, Anthony Chabot created Lake Temescal, the Temescal Reservoir, as the East Bay's first artificial reservoir, and in 1875 Lake Chabot was constructed), the Central Reservoir is one of EBMUD's oldest water storage facilities. It was, at the time of its construction, toted as the largest man-made lake for filtered water west of Chicago (Oakland Tribune 05/01/1952). This distinction, however, does not raise the Central Reservoir site to a level of significance for its association with historical events (Criterion 1). While a component of the EBMUD system providing water for Oakland and the surrounding community, the Central Reservoir was not the largest nor most significant reservoir in the East Bay. Nor did it rise to national significance as a result of its construction as the largest man-made reservoir in the West. As such, ESA recommends the Central Reservoir site as ineligible under Criterion 1.

California Register Criterion 2
Archival research identified several engineers and contractors associated with the development of the Central Reservoir, including G. H. Wilhelm, chief engineer of the People's Water Company, Augustus Kempkey (under the

direction of A. L. Adams), and the Piedmont Construction Company. Further archival review failed to indicate any strong regional or local significance for either Wilhelm, Kempkey, Adams, or the Piedmont Construction Company. Archival review identified the Piedmont Construction Company as a local construction company involved in civic improvements including street and pipeline construction, but failed to identify any significant local works completed by the company.

Historic newspaper articles and company journals identified Wilhelm as working for the People's Water Company or East Bay Water Company from 1909 through 1927, but little other detail regarding his personal or employment history. Wilhelm completed a study on the water quality of the Sacramento River for the City of Sacramento in 1916, but no other projects or works of note were identified during archival review.
Arthur Lincoln Adams (b. 1864, d. 1913), a Bay Area water engineer, directed the design of the Central Reservoir through collaboration with Augustus Kempsey. Adams, originally from Indiana, received a civil engineering degree from Kansas State University before relocating to Los Angeles and then the Bay Area. Adams worked as a chief engineer for the Contra Costa Water Company, general manager and consulting engineer for the People's Water Company, and hydraulic civil engineer with the Spring Valley Water Company of San Francisco before his death at 49 from pneumonia (Oakland Tribune, 09/18/1913).

Augustus Kempkey (b.1880, d 1975), acted under Adams as the project engineer. Kempkey graduated from the UC Berkeley College of Civil Engineering in 1902, and was hired to work as assistant engineer for the Contra Costa Water Works (Oakland Tribune 07/15/1902). Archival review determined that prior to his work on the Central Reservoir, Kempkey worked with Adams supervising the design and construction of the Rockland Water Tower in Victoria, British Columbia. This project was featured at a conference of the American Society of Civil Engineers held in March 1910. Archival review failed to identify any other significant works associated with Kempkey, who died in 1975 (Oakland Tribune 05/24/1975).

Archival research failed to indicate that Wilhelm, Adams, and Kempkey were significant persons in local or state history (Criterion 2). Archival research did not identify any significant associations between the Central Reservoir site and any other noteworthy individuals in history; therefore, it does not appear to meet Criterion 2.

California Register Criterion 3
The Central Reservoir site does not appear to rise to the level of distinction needed for eligibility under Criterion 3. The reservoir basin is a simple vernacular mid-century structure, with little ornamentation or architectural distinction. Rather it is a typical understated example of the style used in municipal architecture in the mid-20th century. Additionally, the reservoir basin has undergone significant alteration since its 1910 construction, detailed above, resulting in a lack of physical integrity to convey its early 20th century design. As such, it does not display distinctive characteristics of a type, period, or method of construction and, therefore, does not appear to meet Criterion 3. While the 1922 maintenance building reflects some classical elements, the building has been modified since its original construction and does not reflect distinctive architectural characteristics that would elevate its significance under Criterion 3. Additionally, as noted below, the 1922 maintenance building falls outside the period of significance for the reservoir site (1910-1919).
Nor does the Central Reservoir site rise to distinction as the work of a master. Wilhelm, Adams, and Kempkey all contributed to the design and construction of the reservoir basin, but, as described above, archival review failed to indicate significant prominence for any one of these in their field. As such, the Central Reservoir does not appear to meet the Criterion 3 requirements for the work of a master.

California Register Criterion 4
Lastly, the Central Reservoir does not appear to have the potential to yield more information and therefore, does not appear eligible under Criterion 4.

Period of Significance
With initial construction completed at the site by 1910, the Central Reservoir meets the fifty-year threshold for age in consideration for listing in the California Register. Its period of significance is recommended as spanning from its completion in 1910 to the 1919 opening of the San Pablo Reservoir.

Integrity

The Central Reservoir has undergone significant change to its physical integrity since its period of significance. The seven aspects of integrity include location, design, setting, materials, workmanship, feeling, and association. Nearly all components of the site have undergone noticeable alteration since 1919. The reservoir has been reconfigured with the construction of the MacArthur Freeway in 1958, as well as the introduction of a metal roof cover in the early 1960s. Virtually no portion of the Central Reservoir remains as it appeared in 1919. Additionally, the 1922 maintenance building has undergone significant modification through the introduction of the mid-century wrap around addition. As such the maintenance storage building has also undergone a significant loss of integrity

The cumulative impact of these changes to nearly every component of the site results in the overall Central Reservoir lacking integrity of setting, design, materials, workmanship, and feeling. While the integrity of location and association remain, the impacts to the site's physical integrity have resulted in an overall loss of the site as it would have appeared in 1919. Additionally, the Central Reservoir site does not appear to possess any significant associations with historic events or people, or architectural distinction. Therefore, ESA recommends the Central Reservoir ineligible for listing in the California Register.

***B12. References:**

Unknown, 1917. "Central Reservoir." EBWC Journal: Bubbles. September 1917.

Daniels, Paul, 1920. "Collecting and Distributing a Domestic Water Supply." EBWC Journal: Bubbles. April 1920.

Unknown, 1911. "The New Reservoir at Oakland" Fire and Water Engineering, Volume 49. February 1, 1911.

Newspapers:

Oakland Tribune, 01/28/1890
Oakland Tribune, 10/31/1900
Oakland Tribune, 03/01/1910
Oakland Tribune, 05/06/1911
Oakland Tribune, 10/29/1958

APPENDIX I

Hydrology Report

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Final

CENTRAL RESERVOIR REPLACEMENT PROJECT

Hydrology Report

Prepared for
East Bay Municipal Utility District

October 2018

Final

CENTRAL RESERVOIR REPLACEMENT PROJECT

Hydrology Report

Prepared for
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October 2018

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Central Reservoir Replacement Project Hydrology Report

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HYDROLOGY REPORT

1.0 Introduction and Purpose

ESA is completing an Environmental Impact Report (EIR) in accordance with the California Environmental Quality Act (CEQA) for the East Bay Municipal Utility District (EBMUD) Central Reservoir Replacement Project (Project). EBMUD plans to replace the existing covered open-cut reservoir with three prestressed concrete tanks. To inform the CEQA documentation, ESA is assessing the hydrologic effects of the proposed changes for the Project EIR as well as providing design support on managing onsite stormwater. The information in this report will be used to inform the geology, biology, hydrology and water quality sections of the EIR.

This report addresses two questions:

1) Will the Project significantly change the balance between stormwater runoff and groundwater infiltration at the Project site by changing the area of impervious surface and the site topography? This question was addressed using a watershed hydrology model of existing and with-Project conditions.

2) Will the Project result in significant flow changes in nearby Sausal Creek? This question was addressed by characterizing existing and with-Project flows to Sausal Creek during wet and dry seasons.

2.0 Project Location and Description

EBMUD's Central Reservoir is located in East Oakland, south of Highway 580 and east of 23rd Avenue, within the Sausal Creek watershed. Sausal Creek has a 3.9 square mile watershed (2,500 acres) upstream of the point where the Central Reservoir site stormwater enters the creek. 73 percent of the watershed is classified as developed/urban, of which 21 percent is impervious. 27 percent of the watershed is classified as undeveloped (USGS StreamStats using NLCD landuse data from 2011).

The existing Central Reservoir (see **Figure 1**) was constructed in 1910 as an open-cut reservoir, damming and widening a tributary valley of Sausal Creek. Central Reservoir currently has a nominal capacity of approximately 154 million gallons (MG). The reservoir was subsequently covered by an impervious roof in 1961, and the overall site now has approximately 18 acres of impervious surface. Rain falling on the roof is collected in a stormwater system that drains to the 25th Avenue storm drain and is discharged via the East 27th Street storm drain directly into Sausal Creek (see **Figure 2**). Water that leaks through the reservoir lining is captured by an underdrain system and also discharges to the same stormwater system used for stormwater runoff.

The Project (see **Figure 3**) would replace the existing reservoir with three 17-MG, prestressed concrete tanks with concrete roofs on the north end of the existing reservoir basin. To support the new tanks, a structural pad at the north end of the site at anelevation of approximately 183 feet will be required, which is around ten to 25-feet abovethe bottom of the existing reservoir basin. The southern half of the basin will be widerwith steeper side slopes in order to provide fill for the pad to support the tanks at thenorth end of the site The southern half of the basin will also include a new bioretention area to treat site stormwater. The site will be landscaped with primarily drought-tolerant native tree and shrub species. The Project will significantly reduce the amount of total impervious surfaces on the site from approximately 20 to 8 acres. The Project will reduce the surface area of roof on the site from 19 to 4 acres. The reduction in impervious areas will reduce peak stormwater runoff when it rains and the reduction will provide additional opportunities for rainfall to percolate and evaporate within the landscaped area, restoring a more natural water balance to the site. At the same time, existing leakage through the reservoir lining will cease with the new tanks, eliminating a small, but perennial, source of flow to Sausal Creek. These potential hydrologic changes have been analyzed in the following sections of this report.

3.0 Project Hydrologic Goals

The following three main project design goals were identified to manage stormwater and groundwater infiltration onsite:

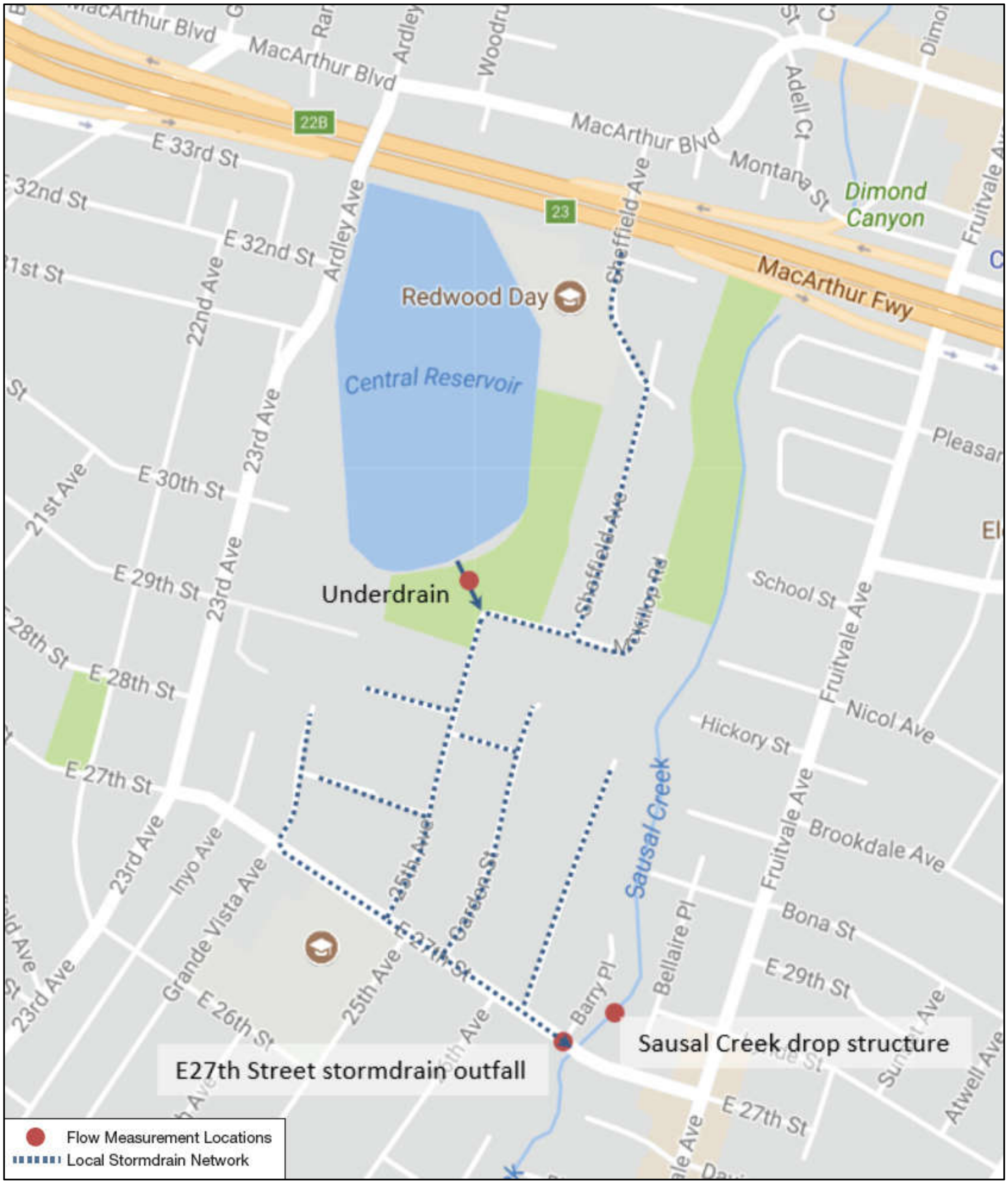
- Include appropriate site design and stormwater treatment measures to reduce stormwater runoff pollutant discharges and runoff flows using low impact development (LID) techniques;
- Manage groundwater percolation to avoid increasing offsite groundwater levels; and
- Manage stormwater runoff to avoid changes in hydrology in Sausal Creek.

The first section of this report addresses the conceptual design of the stormwater management system that would be implemented under the Project; the following sections analyze the existing and Project hydrology to evaluate potential effects on watershed hydrology and flows to Sausal Creek.

SOURCE: ESRI BaseMap

Central Reservoir Replacement Project / D160330

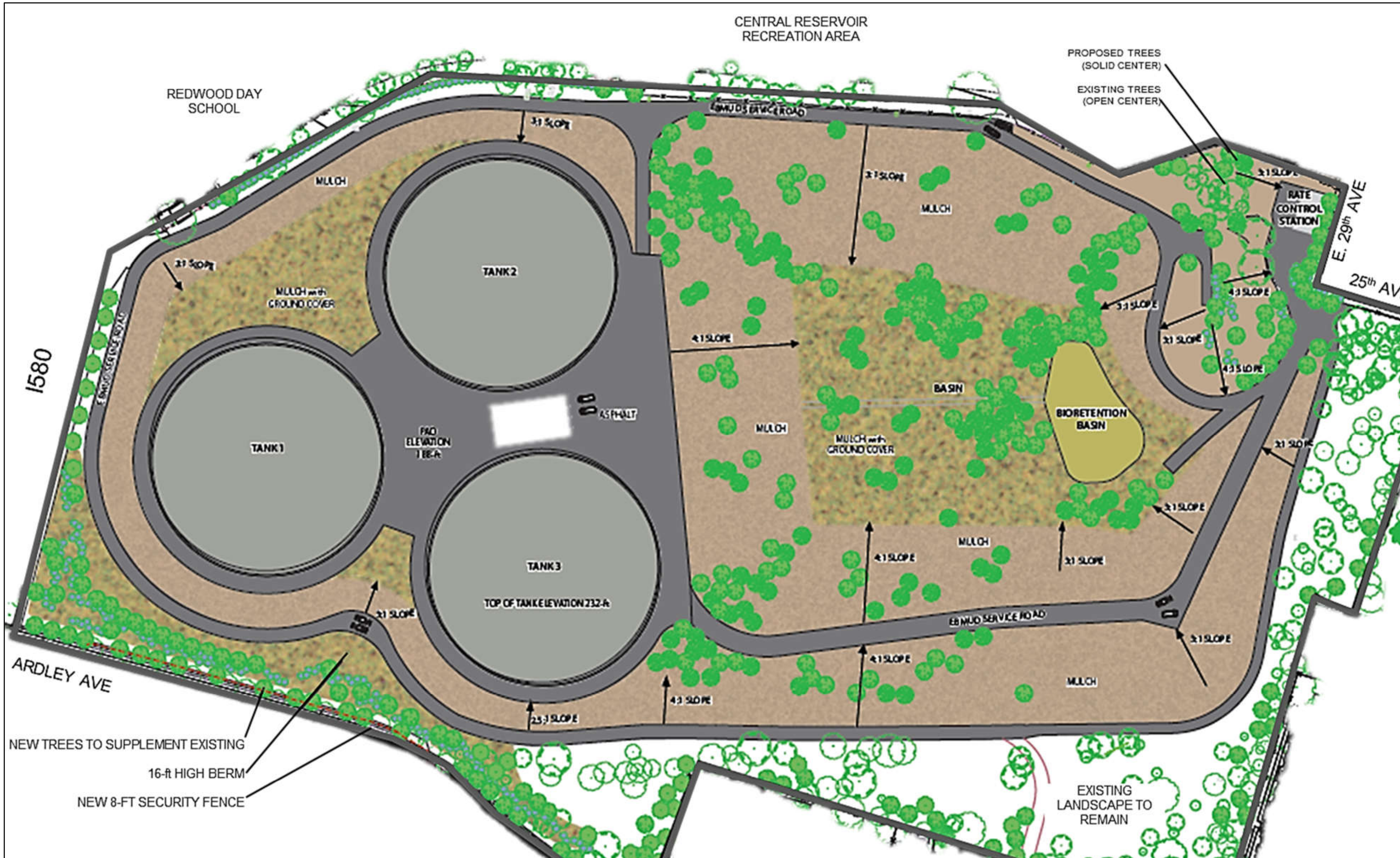
Figure 1
Existing Conditions



SOURCE: ESA

Central Reservoir Replacement Project / D160330

Figure 2
Location of Flow Measurements and Storm drain Network (Central Reservoir to Sausal Creek)



SOURCE: EBMUD, 2018; Dillingham Associates, 2018.

Central Reservoir Replacement Project / D160330

Figure 3
With-Project Site Plan

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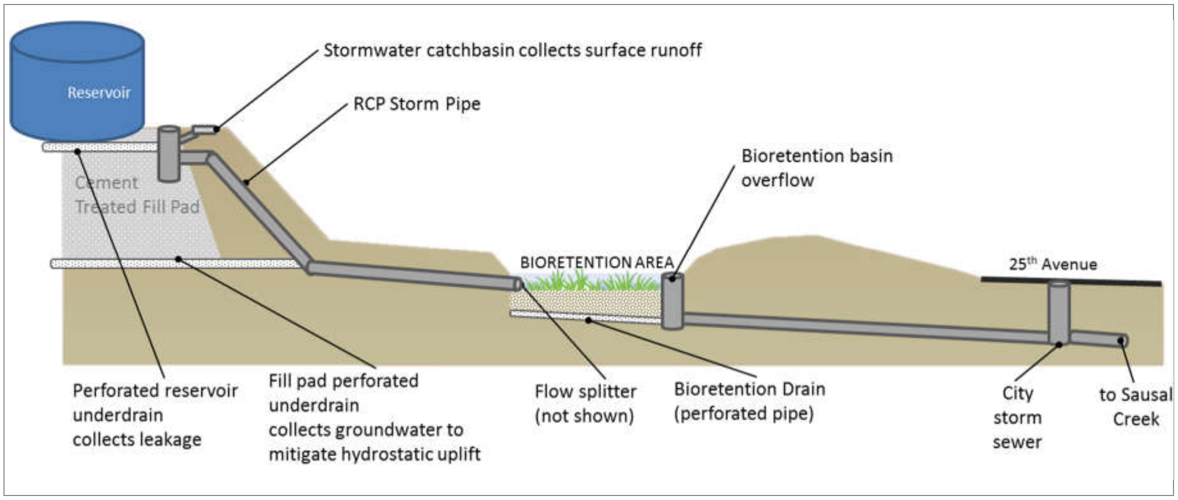
4.0 Bioretention Area Conceptual Design

Under existing conditions, water running off the reservoir roof and surrounding impervious paved areas is conveyed to the storm drain system. As part of the Project, retention and water quality treatment facilities are planned to reduce stormwater runoff pollutant discharges and runoff flows through a bioretention area, to be located at the south end of the Project site near the existing storm drain catch basin (corner of 25th Avenue/East 29th Street). A bioretention area was selected as the preferred stormwater facility because bioretention areas both slow down delivery of stormwater to the storm drain system and provide filtration and water quality treatment, mimicking the natural watershed. All surface runoff from impervious areas would be captured in the bioretention area.

The bioretention area is a LID facility and will be designed to reduce stormwater runoff pollutant discharges and runoff flows. The bioretention area would be hydraulically sized (bioretention area equal to approximately 4 percent of the total impervious area). The bioretention area is approximately 14,000 square feet. Small to medium-size flows that make up the majority of annual runoff are passed through the bioretention area and treated. Large flows that would otherwise exceed the treatment capacity of the bioretention area are bypassed around the bioretention area directly to the storm drain system. Capturing all low and medium-sized flows while bypassing large flows treats the flows that carry most pollutants (e.g., first flush flows) while also preventing large, more dilute flows from overwhelming the bioretention area. Capturing low flows and bypassing large flows is standard practice in stormwater management. The bioretention area would be designed to treat stormwater from the impervious areas through bioretention and plant phytoremediation (phytoremediation is the direct use of living green plants for in-situ removal, breakdown, or containment of contaminants in surface water). Stormwater for most events would drain to the bioretention area through a pipeline. In addition, should tank leakage or groundwater upwelling occur in the fill pad beneath the new tanks, seepage would be collected in a perforated pipeline and directed to the bioretention area and treated. Flows larger than the treatment threshold would bypass the bioretention area in a flow splitter structure and overflow pipeline. The bioretention area would be landscaped with native plants less than 6 inches tall in compliance with Oakland Fire Code. To promote water retention and filtration, plants would be in at least 18 inches of bio-treatment soil overlaying at least 12 inches of Class II permeable rock. The bioretention area includes a 6-inch riser above the treatment soil to promote ponding and retention. To prevent vector issues (e.g., mosquito breeding), the bioretention area would be designed to drain within 72 hours of a storm event. An underdrain below the bioretention area would prevent excess seepage to groundwater. **Figure 4** shows a schematic profile of a conceptual bioretention area and storm drain network design.



SOURCE: ESA

Central Reservoir Replacement Project / D160330

Figure 4
Conceptual Bioretention Area and Storm Drain Network Design – Profile View

5.0 Management of Stormwater Runoff and Groundwater Infiltration

A Project goal is to avoid causing increases in groundwater level, and to avoid changes in surface flow that adversely affect Sausal Creek. The Project would convert approximately 12.6 acres of impervious surface that drains directly to the storm drain system, to landscaping which would provide more opportunities for water to be detained, infiltrated, evaporated or transpired within the Project footprint, restoring a more natural hydrograph compared with the existing 'flashy' hydrograph. Infiltration refers to surface water seeping into the soil. Transpiration is the process by which moisture is carried through plants from roots to small pores on the underside of leaves, where it changes to vapor and is released to the atmosphere. A hydrograph plots the rate of surface water flow versus time: in a 'flashy' hydrograph the time lag between the start of a rainstorm and the peak surface flow is very short. Surface flow then declines rapidly once rain stops. By contrast, in a non-urbanized watershed the hydrograph rises and falls more gently, reducing creek erosion and creating better habitat for most aquatic species. In addition, creating a more permeable, less 'flashy', more vegetated site is expected to improve the quality of runoff. These water volume and quality changes as a result of the Project are all environmental benefits.

The potential for the Project to change the balance between surface runoff and groundwater infiltration was investigated as described below under Section 6.2 and 7.1. The balance between stormwater runoff and groundwater infiltration for existing and with-Project conditions was characterized using the Bay Area Hydrology Model (BAHM). The modeling approach and results are presented in the following sections.

5.1 Approach

ESA analyzed existing and with-Project hydrology (surface water and groundwater) conditions for the Project site. The following sections outline existing and with-Project surface water hydrology, existing and with-Project groundwater hydrology, stormwater facility design, and hydrologic modeling.

5.1.1 Surface Water Hydrology

Under existing conditions almost all rainfall on the Project site is captured via the roof of the reservoir, which drains to concrete ditches and stormwater pipelines and flows to the to the City of Oakland's storm drain system at the corner of 25th Avenue/East 29th Street. Stormwater flows into Sausal Creek at the 27th Street outfall. As with most stormwater systems designed prior to the last decade, the existing system was designed to drain water off the site and into the storm drain as fast as possible. While efficient drainage prevents the site from collecting standing water, rapidly transporting water to Sausal Creek can cause erosion and deliver pollutants before they have time to biodegrade.

The Project will greatly reduce the area of impervious surface on the Project site (from approximately 20.4 to 7.8 acres) which will slow down the speed with which runoff reaches the storm drain (and Sausal Creek, as discussed later), as well as reducing the peak rate and total volume of stormwater runoff from the site. Runoff from the with-Project site's impervious area (the three concrete tanks and surrounding impervious pad) will be directed into a bioretention area at the southern end of the site, slowing the discharge into the storm drain system and providing water quality treatment before conveying it to the stormwater system and hence Sausal Creek. Runoff from the concrete tanks and landscaped area will have the opportunity to infiltrate and be evaporated before excess runoff is collected into the storm drain system. The new stormwater system will connect to the City of Oakland's storm system at the same location as existing (corner of 25th Avenue/East 29th Street).

5.1.2 Groundwater Hydrology

Under existing conditions, Central Reservoir's underdrain system runs down the central axis of the reservoir, just beneath the reservoir lining. The underdrain is gaged, and typically conveys approximately 0.04-0.07 cubic feet per second (cfs) of flow to the 25th Avenue storm drain based on EBMUD's underdrain flow records from 2006 to 2017.

The underdrain captures two sources of water:

- Treated water that leaks through the reservoir lining and enters the underdrain system which is evidenced by a historic correlation between higher water levels in the reservoir and higher discharges from the underdrain.

- Groundwater that is captured by the underdrain when groundwater levels are at or above the bottom of the reservoir which is evidenced by piezometers that show higher groundwater surface elevations upstream (north) of the reservoir drawing down to the same elevation as the underdrain at the downstream (south) end of the reservoir (groundwater naturally flows from north to south in the vicinity of the reservoir). Groundwater enters the underdrain system through “weep” holes. The purpose of the weep holes is to reduce hydrostatic uplift pressures beneath the existing concrete liner.

The balance between reservoir leakage and groundwater has not been quantified because the water becomes commingled before it can be captured and measured.

Under with-Project conditions, the new concrete tanks are not expected to leak, but a new underdrain would be built beneath the new tanks to intercept any leakage that might occur and direct it to the bioretention area. Depending on actual geotechnical conditions, a separate underdrain system beneath the fill pads (as shown in Figure) may also be constructed to capture groundwater above elevation 150-feet (approximate) to mitigate hydrostatic uplift pressure beneath the tanks foundation – this is similar to the how the existing reservoir underdrain system is configured.

The bioretention area itself would have a bioretention drain so that any excess water that percolates through the bioretention area would be intercepted and directed to the storm drain system instead of allowing to percolate to groundwater. Thus, the Project is not expected to result in any increase in the volume of groundwater infiltration, or the height of the water table.

6.0 Hydrologic Modeling

A hydrologic model of the Project site was developed using Clear Water Solutions Inc. BAHM 2013 software for continuous hydrologic modeling. The model uses parameters including watershed area, basin slope, land use and soil hydrologic type, and long-term precipitation data, to model surface water runoff, groundwater infiltration, and evaporation. The model was developed specifically to assess the impacts of unmitigated land use changes on watershed hydrology, and to develop stormwater management practices to prevent such impacts, making it well suited to the analysis of Project changes. The model accounts for the surface hydrologic processes that the Project is likely to affect (e.g., changes in impervious surface, landuse, slope grading, etc.) and their contributions to groundwater, but does not explicitly model contributions to groundwater from elsewhere in the watershed since contributions to groundwater from upslope are outside EBMUDs control and independent of the Project.

6.1 Hydrologic Modeling Methodology

This section describes the general model development methodologies including watershed area, basin slope, land use classification, soil classification, and precipitation data.

6.1.1 Watershed Parameters

The existing site consists of a large reservoir with an impervious roof, a service road surrounding the reservoir, and an open space margin made up of grass with trees and shrubs between the property boundary and service road. All underlying soils are classified as Natural Resources Conservation Service (NRCS) hydrologic soil group (HSG) C or D signifying clayey content and low permeability based on soil maps for the area. The areas and slopes (based on existing site plan drawings) associated with the roof, roads and grass areas are tabulated in **Table 1**.

TABLE 1
BASIN AREA PARAMETERS

Land Use	Percent Slope (%)	Existing Area (ac)	With-Project Area (ac)
Impervious Area		**20.4**	**7.8**
Roof	<5	18.9	4.0
Road	<5	1.5	3.8
Road	5-10	0.2	0.0
Road	10-20	0.2	0.0
Road	>20	0.1	0.0
Pervious Area		**6.9**	**19.6**
Grass	<5	4.9	12.4
Grass	5-10	1.0	1.1
Grass	10-20	1.0	0.6
Grass	>20	0.1	5.6
Total		**27.4**	**27.4**

SOURCE: ESA, 2018.

6.1.2 Precipitation

BAHM 2013 uses one or more long-term local precipitation gages; Berkeley, CA is the closest precipitation gage to the Project site. The Berkeley, CA data was then scaled to the Project site using mean annual precipitation maps developed by local flood control districts or the National Oceanic and Atmospheric Administration (NOAA). The model was run with a 15-minute continuous time step from October 1, 1959 to September 30, 2003, the historic rainfall period that is used as a standard time series within the model to provide a representative time range. The wettest water year within this record was October 1982 to September 1983.

6.1.3 Model Scenarios

Three scenarios were modeled: existing condition, with-Project (with no bioretention drain) conditions, and with-Project (with a bioretention drain) conditions. The with-Project (with no bioretention drain) condition was modeled in order to assess conditions above the water table and identify the volume of water flowing to groundwater in a non-drained condition; it is not intended as an alternative in its own right. The bioretention area was simulated with a drain, which captures water that percolates through the area and conveys it to the storm drain system and is typical in poorly drained

C and D-type soils like those underlying the Project site. The bioretention drain has the added benefit of preventing the buildup of groundwater.

6.2 Hydrologic Modeling Results

Hydrologic model results were analyzed for the average annual water year and the wettest water year within the model record. Average annual rainfall (mean annual precipitation) is 21 inches and rainfall for the wettest year was 43 inches. The annual water volume for the average and wettest year is shown in **Figure 5** and **Figure 6**. Water volumes are shown in inches per unit area.

6.2.1 Existing Conditions

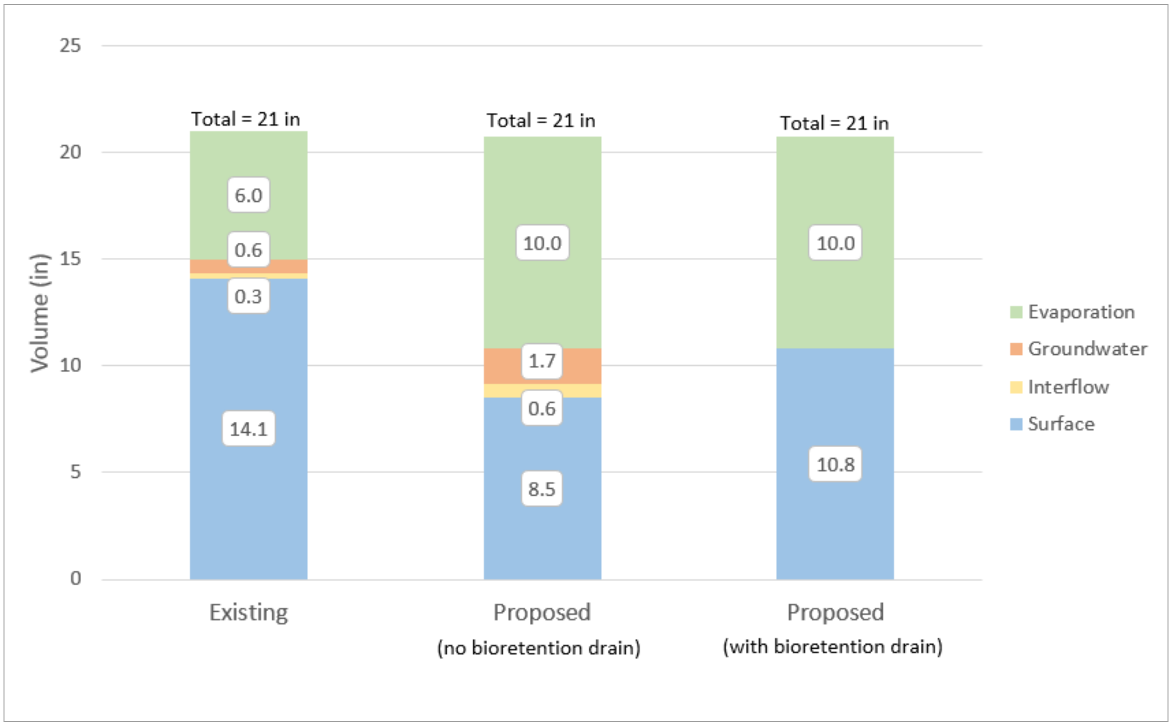
During an average year, approximately 67 percent of rainfall results in surface flow, 1 percent in interflow, 3 percent goes to groundwater, and 29 percent evaporates. The high surface flow proportion reflects the large impervious roof area. During the wettest year, the percent contribution to surface flow increases and evaporation decreases compared to annual conditions: 75 percent of rainfall results in surface flow, 2 percent in interflow (flow between the surface and groundwater), 3 percent in groundwater, and 20 percent evaporates.

6.2.2 With-Project (without a bioretention drain) Conditions

The with-Project (without a bioretention drain) conditions result in a decrease in surface water flow and increase in interflow, groundwater flow and evaporation for both the average annual year and wettest year, as would be expected with a reduction in impervious area and an increase in landscaped area. During an average year, 40 percent of rainfall results in surface flow, 4 percent in interflow, 8 percent in groundwater, and 48 percent evaporates. During the wettest year, percent contribution to surface flow increases and evaporation decreases compared to annual conditions: 55 percent of rainfall results in surface flow, 5 percent in interflow, 8 percent in groundwater, and 32 percent evaporates. These results show that if a bioretention drain was not included in the Project there would be the potential for a slight rise in the groundwater table beneath the site, in the order of a few inches in a wet year (see Figure 2 and Figure 3 for detailed values).

6.2.3 With-Project (with a bioretention drain) Conditions

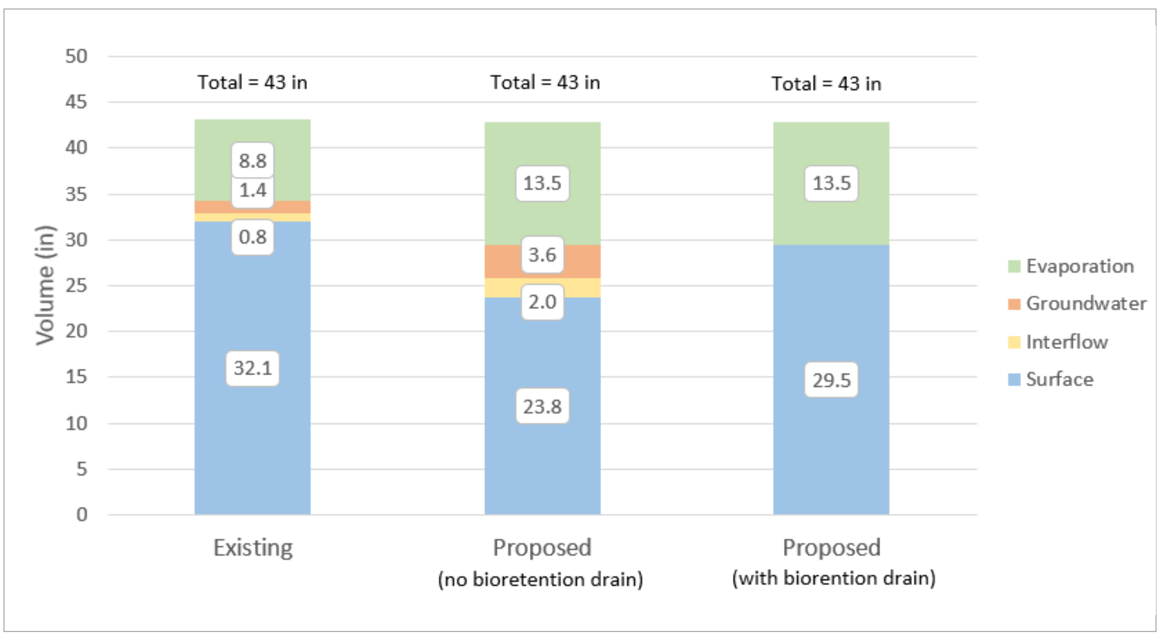
In order to prevent a net increase in groundwater contribution for with-Project conditions, the bioretention area would include a bioretention drain that will capture all interflow and groundwater flow. As shown in Figure 2 and Figure 3, a bioretention drain eliminates all groundwater and interflow and results in 52 percent of rainfall going to surface water runoff and 48 percent evaporating for the average annual year. For the wettest year, 68 percent of rainfall results in surface water runoff and 32 percent evaporates.



SOURCE: ESA

Central Reservoir Replacement Project / D160330

Figure 5
Water Balance for Central Reservoir – Average Annual Volume Runoff



SOURCE: ESA

Central Reservoir Replacement Project / D160330

Figure 6
Water Balance for Central Reservoir – Average Annual Volume Runoff for Wettest Water Year (October 1982 to September 1983)

7.0 Flows to Sausal Creek

Sausal Creek, located downstream of the Project site, is a mixture of a natural and engineered channel reaches which flow to the San Francisco Bay. Runoff from theProject site discharges to the creek via the East 27th Street storm drain outfall. **Figure 7** shows Sausal Creek downstream of Central Reservoir, with the watershed shown without a filter and the neighboring watersheds masked by translucent filters. Natural (soft bottom) reaches are shown in blue and make up approximately 1,075 feet of channel, with engineered reaches (concrete lined channel and culverts) in red and brown making up approximately 7,300 feet. The section of Sausal Creek just downstream of the E27th Street storm drain outfall is a natural channel.

The Project is expected to affect flows to Sausal Creek in three ways:

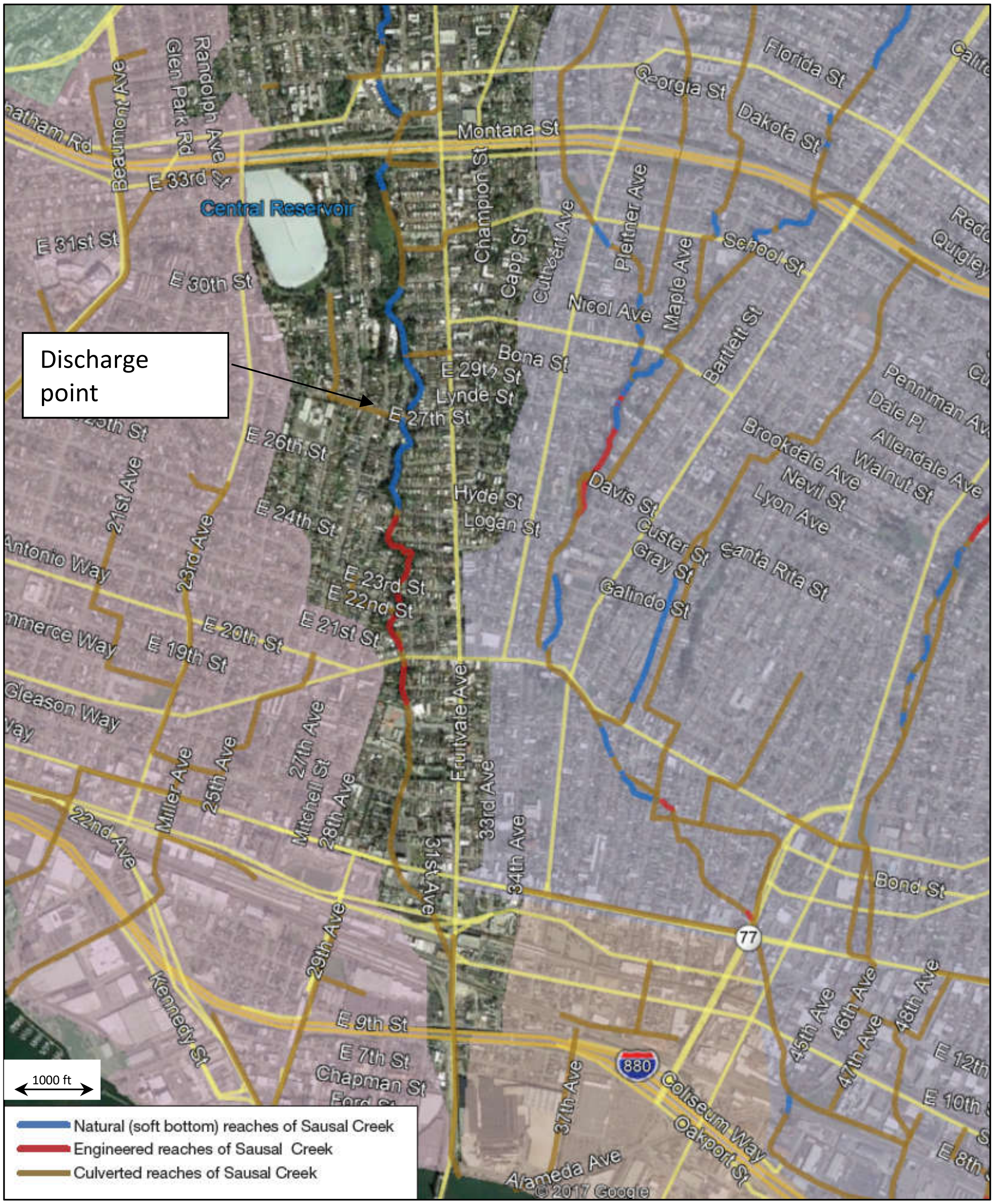
- Reducing the 'flashiness' of the hydrograph from the Central Reservoir site during the wet season by reducing the amount of impervious surface and adding the stormwater bioretention area which is expected to reduce erosion potential in the creek and result in a more natural hydrograph that benefits aquatic habitat. Habitat is expected to benefit because high flows that can stress aquatic life will be reduced, and low flows (that tend to benefit aquatic life) will be extended for longer periods following rainfall. Note that since the Project site only represents 1 percent of the Sausal Creek watershed area at East 27th Street the overall beneficial effect on creek flows will be relatively small.

- Reducing the volume of dry season flows by eliminating leakage from Central Reservoir that is currently discharged to the creek via the underdrain and storm drain system will restore a discharge pattern that is more natural for creeks in the San Francisco Bay. Restoring a natural discharge pattern has the potential to affect habitat that may exist in Sausal Creek downstream of the 27th Street outfall that have become adjusted to higher summer flows typical in urban watersheds. Although dry season flows will be lower than under existing conditions, habitat is not expected to be impacted by reduced summer flows because there is sufficient low flow from other sources (described in Section 7.2).

- Improve the quality of water running off the Project site into Sausal Creek by adding a bioretention area and replacing impervious surfaces with landscaped surfaces which is expected to be a benefit to the creek environment.

The Project is not expected to affect Sausal Creek flows in the wet season, because wet season flows are dominated by surface runoff and the Project only affects 1 percent of the watershed area.

These topics were investigated by reviewing and analyzing flow data from the creek and from the hydrology model used to develop the water balance and are discussed below.



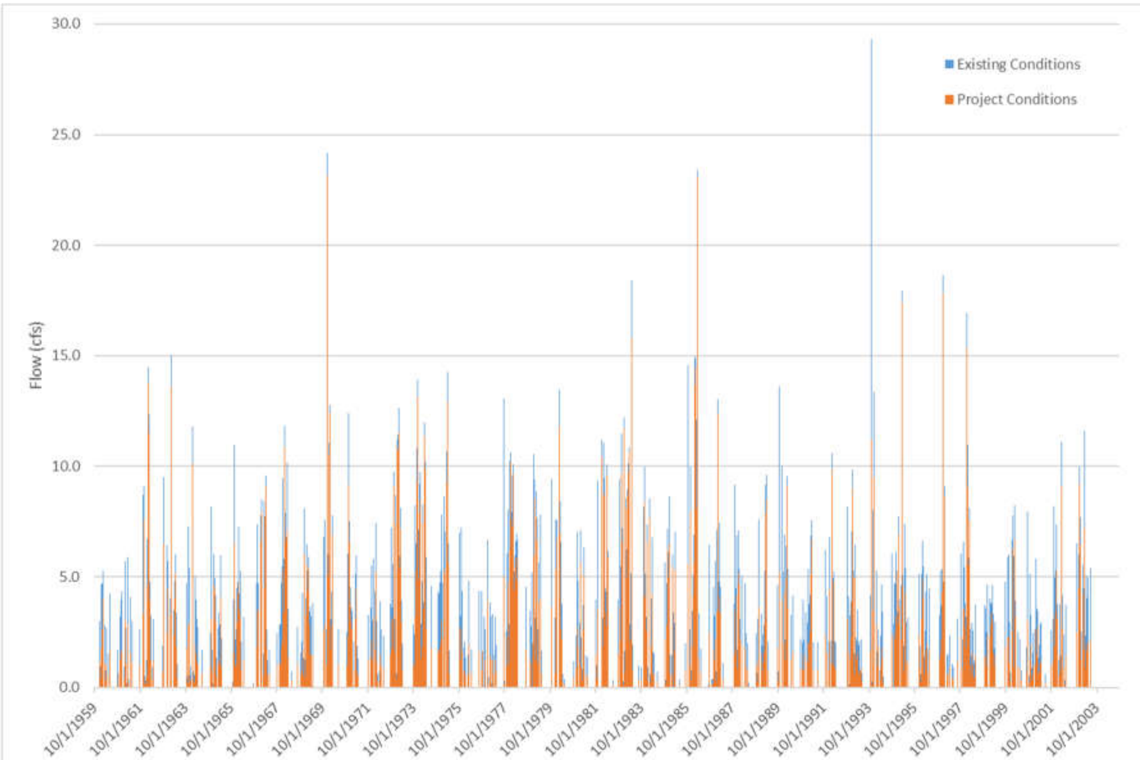
SOURCE: Alameda County Flood Control District

Central Reservoir Replacement Project / D160330

Figure 7
Reaches of Sausal Creek Downstream of the Project Site

7.1 Surface Flows

The pattern of daily surface flows for existing and with-Project conditions were analyzed for the period of rainfall record using the BAHM model described above. (As noted above, the BAHM runs a historic period of rainfall dating from October 1, 1959 through September 30, 2003 to simulate a wide range of wet and dry year types.) Project conditions would decrease peak runoff for all rainfall events because of reductions in the amount of impervious surface. A daily surface runoff hydrograph output from the hydrologic model is shown in **Figure 8**, which shows the reduction in peak flows.

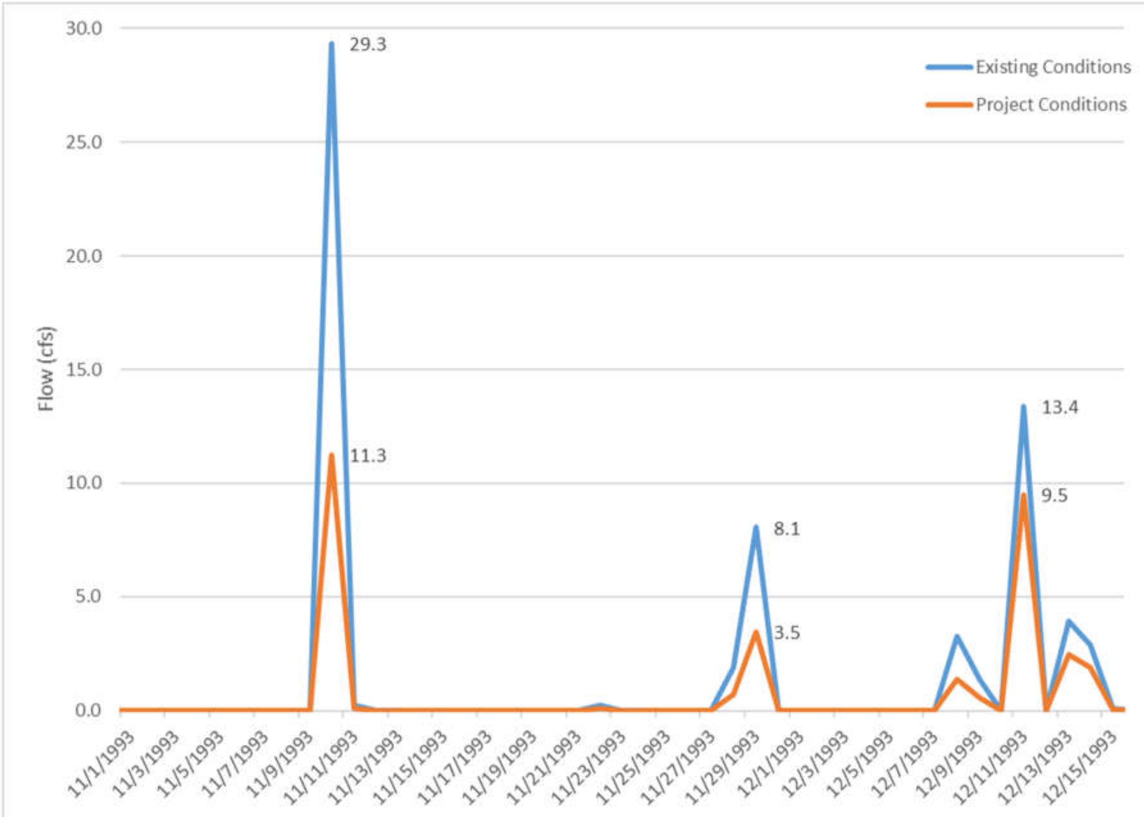


SOURCE: ESA

Central Reservoir Replacement Project / D160330

Figure 8
Daily Surface Runoff Hydrograph from Project Site as Modelled in BAHM (October 1, 1959 through September 30, 2003)

To show the pattern in more detail for a series of individual rainfall events, a shorter time period was highlighted (**Figure 9**). For the largest event on record, occurring in November 1993, the peak surface runoff decreased by a factor of over 2.5.



SOURCE: ESA Central Reservoir Replacement Project / D160330

Figure 9
Daily Surface Runoff Hydrograph from Project Site (November 1, 1993 through December 15, 1993) as Modelled in BAHM

A summary of average surface runoff volumes for the wet season (October through March), dry season (April through September), and annual (wet and dry season combined) are included in **Table 2**. As shown in Table 2, the Project will have little effect in the dry season (because little rain falls in this season) but will mostly reduce flows in the wet season. Overall, the Project will result in a more natural hydrograph leaving the Project site, with less ‘flashy’ peaks.

TABLE 2
SURFACE RUNOFF VOLUMES MODELLED IN BAHM

	Rainfall Volume (ac-ft/yr)	Existing Runoff Volume (ac-ft/yr)	With-Project Runoff Volume[1] (ac-ft/yr)	Project Effect[2] (ac-ft/yr)
Dry (April - September)	7.3	3.0	1.5	-1.5
Wet (October – March)	41.7	23.0	15.0	-8.0
Annual	49.0	26.0	16.5	-9.5

NOTE: [1] This analysis assumes the bioretention area is built with an underdrain

[2] Negative values signify a reduction in runoff compared to existing conditions
SOURCE: ESA, 2018.

7.2 Subsurface (Reservoir Underdrain Capture) Flows

Groundwater and reservoir seepage flows captured by the reservoir underdrain have historically contributed about 20 gallons per minute (gpm) (0.05 cfs) to Sausal Creek based on EBMUD's underdrain flow monitoring data. While this volume is insignificant during the winter when flows in Sausal Creek from upstream of the Project site are higher, it makes up a larger proportion of dry season flow. It is unknown how much of the underdrain flows are groundwater and how much is reservoir seepage because the two sources are comingled below ground, before they can be measured. The reservoir seepage component is expected to be reduced or eliminated by the new tanks because of their construction materials and methods but the groundwater component will continue.

ESA measured dry season flows in Sausal Creek to better understand the contribution of flows to Sausal Creek from the Central Reservoir underdrain. Flow measurement locations and the local storm drain network connecting Central Reservoir to Sausal Creek are shown in Error! Reference source not found..

Flow measurements were taken at the Sausal Creek drop structure and East 27th Street storm drain outfall (see Figure 4) on October 4, 2017 by ESA staff. October was chosen for field measurements as it is typically one of the lowest flow months for San Francisco Bay area creeks, and therefore this period shows the condition in which reducing underdrain flows would have proportionately the largest effect on total creek flow. It is therefore a conservative assessment of Project effects, which would be less during the wet season. **Table 3** shows the average measured flow rates and, for comparison, typical measured flow rates from the Central Reservoir underdrain as reported in the Central Reservoir Seismic Stability Evaluation Report (EBMUD 2008).

TABLE 3
MEASURED DRY SEASON FLOW RATES IN SAUSAL CREEK (10/4/2017)

Land Use	Flow Rate (cfs)	Flow Rate (gpm)	Percent of creek flow below East 27th Street
Flow in Sausal Creek above East 27th Street outfall	0.050	22.4	54%
Flow from East 27th Street storm drain into Sausal Creek	0.043	19.1	46%
Typical flow range from Central Reservoir underdrain into East 27th Street storm drain (2001-08)	0.033 - 0.044	15 - 20	

SOURCE: ESA, 2017

The results show that on October 4, 2017, flows from East 27th Street storm drain made up almost half of all flow in Sausal Creek immediately downstream of that location. Three lines of evidence suggest that most of the flow measured on October 4, 2017 came from the underdrain rather than other watershed sources such as residential areas that drain to the same storm drain. Firstly, measured flows from the East 27th Street storm drain on October 4, 2017 were very similar to the range of flows measured from the underdrain when Central Reservoir was operated around its current water surface elevation (as shown in Figure). Secondly, a brief visual reconnaissance of the watershed draining to the East 27th Street storm drain did not reveal any other obvious sources of dry season runoff such as heavily irrigated landscaping areas, car wash facilities, etc. Thirdly, flows from the underdrain were reported by EBMUD field staff to be approximately 20 gpm the day of measurement (October 4, 2017). Because data are not available on the proportion of the underdrain that is reservoir seepage versus groundwater (which would not be affected by the Project), the exact reduction in flows resulting from the Project cannot be estimated. However, the measured results can be used as the maximum potential impact to dry season flows by conservatively assuming that 100 percent of the underdrain flows came from seepage and will be reduced to zero. Were this assumption to be the case, it would infer that during the driest part of the year flows immediately downstream of East 27th Street would be about half their current level, equivalent to the flow currently found in the reach immediately upstream. Further downstream, the inputs from other storm drains would reduce the relative effect of the East 27th Street discharge.

The Project effects would be proportionately much less during the wet season when background flows are much higher than in the summer. The average annual peak flow for Sausal Creek (the average size of the largest flow occurring in a one-year period) has been estimated as 59 cfs (Friends of Sausal Creek, 2010).

7.3 Summary of Potential Project Effects on Site Water Balance and Sausal Creek Hydrology

The Project is expected to have the following effects on the site water balance and the hydrology of Sausal Creek:

- A reduction in impervious area and increase in permeable, vegetated landscape area.
- Lower, less ‘flashy’ winter flows that are more representative of the pre-urban watershed.
- Less potential for creek erosion and flood risk due to flood peak reduction.
- Improved storm water quality due to more landscaping and the treatment of runoff via a bioretention area.
- A reduction in dry season base flows below East 27th Street by a value that could be as high as 50 percent of existing values.

7.4 Potential Biological Effects to Sausal Creek

The following section describes a visual assessment of creek aquatic conditions conducted as part of the hydrologic assessment. The purpose of the visual assessment was to compare biological conditions in Sausal Creek upstream and downstream of the East 27th Street outfall and see if there were marked differences that merited a more detailed quantitative investigation. The reach immediately upstream of the East 27th Street outfall has almost the same watershed area (within 1 percent) as the reach downstream, with the main difference being that it does not receive seepage from the reservoir underdrain during the dry season. As a result, the upstream reach provides a template for expected future conditions downstream following the Project. The visual assessment focused on habitat that is most sensitive to changes in flow, such as the number and depth of pools, the presence or absence of dry channel sections, and the condition of riparian vegetation along the creek edges. If habitat had been noticeably lower quality upstream (where reservoir seepage is not present) than downstream of the outfall (where seepage is present), a more detailed biological assessment would have been conducted. Observations that would have triggered a more detailed assessment had they been observed include; dried out or shallow pools, dried out sections of channel, or less dense vegetation growing along the banks of the creek. Such conditions were not observed.

ESA staff walked the soft bottom portion of Sausal Creek from East 27th Street downstream to Logan Street, where the creek enters a culvert, and for comparison walked a soft bottom reach for 1,700 feet upstream from East 27th Street to Hickory Street. The creek reconnaissance took place on October 18, 2017, at the end of the summer dry season, prior to the first rainfall event of Water Year 2017-18. The goal of walking the creek at this time of year was to assess conditions at a time when background watershed flows were lowest and flows from the reservoir underdrain were proportionately at their highest. Assessing the creek during dry season conditions provides the most conservative assessment of potential Project effects; during wetter periods the Project effect would be smaller.

As previously stated, the project may reduce dry season base flows below East 27th Street by a value that could be as high as 50 percent of existing values. The reduction in flows could potentially favor some drought-adapted organisms (e.g., sycamore trees) and negatively affect some organisms (e.g., fish) that require more perennial conditions if they were to exist in Sausal Creek downstream of the 27th Street outfall. However, the visual assessment revealed similar quality aquatic and riparian habitat downstream of the East 27th Street storm drain outfall and in the upstream reach. For example, the number and residual depth of pools (which play an important role as summer refugia for aquatic species) was similar in both reaches, and there were no dry sections of creek upstream of the outfall. Although the upper reach had only half as much flow as the lower reach during the field day, pool depth was controlled by the elevation of the pool tail and there was sufficient flow to fill all pools to that controlling depth. Similarly, the wetted area of riffles appeared to be similar in both reaches.

The conclusion of the visual assessment is that since habitat quality is similar above and below the point where the underdrain discharges into the creek under existing conditions, habitat quality is unlikely to be impacted by reducing flows to the creek associated with the Project.

8.0 Prepared By

Andy Collison, Ph.D., ESA

Annika Sullivan, E.I.T., ESA

9.0 References

Alameda County Flood Control and Water Conservation District and Fugro Consultants. Creek & Watershed Map of Western Alameda County in Google Earth, version 2.0, 2014.

Chow, V.T., 1959, Open-channel hydraulics: New York, McGraw-Hill, 680 p.

Clear Creek Solutions Inc., 2013. Bay Area Hydrology Model 2013, User Manual.

EBMUD, 2008. Seismic Stability Evaluation Report Central Reservoir Main Dam Oakland, CA.

Friends of Sausal Creek, 2010. The Sausal Creek Watershed Enhancement Plan (March 2010)

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APPENDIX J

Noise Modeling Data

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J1: Noise Monitoring Output

Calculated Ldn from long-term noise monitoring data Location LT-1

			TIME	dBA	Remove LOG	10 dBA Penalized Values	5 dBA Penalized Values
9/27/2018	Midnight		0 / 24	52.2	165959	1659587	524807
	am	1:00	100	52.6	181970	1819701	575440
		2:00	200	53.6	229087	2290868	724436
		3:00	300	57.2	524807	5248075	1659587
		4:00	400	59.6	912011	9120108	2884032
		5:00	500	60	1000000	10000000	3162278
		6:00	600	60.4	1096478	10964782	3467369
		7:00	700	57.5	562341	5623413	1778279
		8:00	800	60.9	1230269	12302688	3890451
		9:00	900	70.1	10232930	########	32359366
		10:00	1000	58.5	707946	7079458	2238721
		11:00	1100	57.9	616595	6165950	1949845
		12:00	1200	57.1	512861	5128614	1621810
	pm	1:00	1300	59.1	812831	8128305	2570396
		2:00	1400	59	794328	7943282	2511886
		3:00	1500	60.3	1071519	10715193	3388442
		4:00	1600	60.8	1202264	12022644	3801894
		5:00	1700	61.6	1445440	14454398	4570882
		6:00	1800	62.7	1862087	18620871	5888437
		7:00	1900	61.9	1548817	15488166	4897788
		8:00	2000	59.3	851138	8511380	2691535
		9:00	2100	57.3	537032	5370318	1698244
		10:00	2200	55.6	363078	3630781	1148154
	pm	11:00	2300	54.3	269153	2691535	851138

Leq Morning Peak Hour 7:00-10:00 a.m.
66 dBA

Leq Evening Peak Hour 4:00-8:00 p.m.
62 dBA

Leq Nighttime 10:00 pm-7:00 a.m. (not penalized)
57 dBA

Leq Daytime 7:00 am-10:00 p.m.
62 dBA

Leq 24-Hour
61 dBA

Ldn: 10 dBA penalty for noise between 10:00 p.m. and 7:00 a.m.
65 dBA

CNEL: 5 dBA penalty for noise between 7:00p.m. and 10:00 p.m., and 10 dBA penalty for noise between 10:00 p.m. and 7:00 a.m.
65 dBA

CNEL - Ldn 0.36998555

Calculated Ldn from long-term noise monitoring data Location LT-2

			TIME	dBA	Remove LOG	10 dBA Penalized Values	5 dBA Penalized Values
9/26/2018	Midnight		0 / 24	45.6	36308	363078	114815
	am	1:00	100	45.7	37154	371535	117490
		2:00	200	45.5	35481	354813	112202
		3:00	300	46.2	41687	416869	131826
		4:00	400	49	79433	794328	251189
		5:00	500	44.5	28184	281838	89125
		6:00	600	46.2	41687	416869	131826
		7:00	700	46.6	45709	457088	144544
		8:00	800	47.5	56234	562341	177828
		9:00	900	49.8	95499	954993	301995
		10:00	1000	44.7	29512	295121	93325
		11:00	1100	45.7	37154	371535	117490
		12:00	1200	47	50119	501187	158489
	pm	1:00	1300	45.1	32359	323594	102329
		2:00	1400	46.9	48978	489779	154882
		3:00	1500	49.4	87096	870964	275423
		4:00	1600	56.2	416869	4168694	1318257
		5:00	1700	51.2	131826	1318257	416869
		6:00	1800	53.3	213796	2137962	676083
		7:00	1900	53.1	204174	2041738	645654
		8:00	2000	49.7	93325	933254	295121
		9:00	2100	46.6	45709	457088	144544
		10:00	2200	47.5	56234	562341	177828
	pm	11:00	2300	44.8	30200	301995	95499

Leq Morning Peak Hour 7:00-10:00 a.m.
48 dBA

Leq Evening Peak Hour 4:00-8:00 p.m.
54 dBA

Leq Nighttime 10:00 pm-7:00 a.m. (not penalized)
46 dBA

Leq Daytime 7:00 am-10:00 p.m.
50 dBA

Leq 24-Hour
49 dBA

Ldn: 10 dBA penalty for noise between 10:00 p.m. and 7:00 a.m.
54 dBA

CNEL: 5 dBA penalty for noise between 7:00p.m. and 10:00 p.m.,
54 dBA **and 10 dBA penalty for noise between**
10:00 p.m. and 7:00 a.m.

CNEL - Ldn 0.55422876

Calculated Ldn from long-term noise monitoring data Location LT-3

			TIME	dBA	Remove LOG	10 dBA Penalized Values	5 dBA Penalized Values
9/27/2018	Midnight		0 / 24	50.4	109648	1096478	346737
	am	1:00	100	48.3	67608	676083	213796
		2:00	200	49.2	83176	831764	263027
		3:00	300	50.9	123027	1230269	389045
		4:00	400	53.8	239883	2398833	758578
		5:00	500	55.5	354813	3548134	1122018
		6:00	600	55.7	371535	3715352	1174898
		7:00	700	55.3	338844	3388442	1071519
		8:00	800	52.5	177828	1778279	562341
		9:00	900	51.4	138038	1380384	436516
		10:00	1000	49.2	83176	831764	263027
		11:00	1100	49.2	83176	831764	263027
		12:00	1200	50.1	102329	1023293	323594
	pm	1:00	1300	50.2	104713	1047129	331131
		2:00	1400	51.7	147911	1479108	467735
		3:00	1500	52.4	173780	1737801	549541
		4:00	1600	57.4	549541	5495409	1737801
		5:00	1700	57	501187	5011872	1584893
		6:00	1800	57.9	616595	6165950	1949845
		7:00	1900	58.8	758578	7585776	2398833
		8:00	2000	57.4	549541	5495409	1737801
		9:00	2100	53.8	239883	2398833	758578
		10:00	2200	51.3	134896	1348963	426580
	pm	11:00	2300	50	100000	1000000	316228

Leq Morning Peak Hour 7:00-10:00 a.m.
53 dBA

Leq Evening Peak Hour 4:00-8:00 p.m.
58 dBA

Leq Nighttime 10:00 pm-7:00 a.m. (not penalized)
52 dBA

Leq Daytime 7:00 am-10:00 p.m.
55 dBA

Leq 24-Hour
54 dBA

Ldn: 10 dBA penalty for noise between 10:00 p.m. and 7:00 a.m.
59 dBA

CNEL: 5 dBA penalty for noise between 7:00p.m. and 10:00 p.m., and 10 dBA penalty for noise between 10:00 p.m. and 7:00 a.m.
60 dBA

CNEL - Ldn 0.65949436

Summary

File Name on Meter	LxT_Data.037	
File Name on PC	SLM_0004337_LxT_Data_037.00.ldbin	
Serial Number	0004337	
Model	SoundTrack LxT®	
Firmware Version	2.302	
User	Sanchez	
Location	ntral Reservoir Location 2 South	
Job Description	EBMUD Central Reservoir	
Note		

Measurement

Description		
Start	2018-09-25 10:08:27	
Stop	2018-09-27 14:27:48	
Duration	52:19:20.906	
Run Time	52:19:20.906	
Pause	00:00:00.0	
Pre Calibration	2018-09-25 09:57:43	
Post Calibration	None	
Calibration Deviation	---	

Overall Settings

RMS Weight	A Weighting			
Peak Weight	Z Weighting			
Detector	Slow			
Preamp	PRMLxT2B			
Microphone Correction	Off			
Integration Method	Exponential			
Overload	142.6 dB			
	A	**C**	**Z**	
Under Range Peak	98.8	95.8	**100.8**	dB
Under Range Limit	**47.8**	45.8	53.8	dB
Noise Floor	34.7	35.4	43.0	dB

Results

LASeq	52.9 dB		
LASE	105.6 dB		
EAS	4.059 mPa²h		
EAS8	620.649 µPa²h		
EAS40	3.103 mPa²h		
LZSpeak (max)	2018-09-25 15:41:29	108.8	dB
LASmax	2018-09-26 16:28:31	84.4	dB
LASmin	2018-09-27 08:28:12	37.6	dB
SEA	-99.9 dB		
LAS > 85.0 dB (Exceedance Counts / Duration)	0	0.0	s
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0	s
LZSpeak > 135.0 dB (Exceedance Counts / Duration)	0	0.0	s
LZSpeak > 137.0 dB (Exceedance Counts / Duration)	0	0.0	s
LZSpeak > 140.0 dB (Exceedance Counts / Duration)	0	0.0	s
LCSeq	63.1 dB		
LASeq	52.9 dB		
LCSeq - LASeq	10.2 dB		
LAIeq	55.3 dB		
LAeq	52.9 dB		
LAIeq - LAeq	2.5 dB		

Record #	Record Type	Date	Time	LASeq	LZpeak	LASmax	LASmin	OVLD	OBA OVLD	Marker
1	alibration Chang	2018-09-25	9:57:43							
2	Run	2018-09-25	10:08:27							
3		2018-09-25	10:08:27	62.6	97.4	75.9	40.3	No	No	
4		2018-09-25	11:08:27	55.4	99.4	72.8	39.9	No	No	
5		2018-09-25	12:08:27	62.4	100.5	83.8	40.7	No	No	
6		2018-09-25	13:08:27	60.8	107.1	79.4	42.4	No	No	
7		2018-09-25	14:08:27	60.7	105.5	80.0	46.0	No	No	
8		2018-09-25	15:08:27	54.3	108.8	67.3	48.6	No	No	
9		2018-09-25	16:08:27	51.6	105.3	71.3	46.0	No	No	
10		2018-09-25	17:08:27	50.2	106.6	65.2	45.4	No	No	
11		2018-09-25	18:08:27	50.4	99.9	69.6	44.8	No	No	
12		2018-09-25	19:08:27	50.7	94.9	59.9	47.1	No	No	
13		2018-09-25	20:08:27	50.6	95.0	60.3	45.2	No	No	
14		2018-09-25	21:08:27	47.0	85.5	60.2	44.0	No	No	
15		2018-09-25	22:08:27	46.6	86.9	64.6	43.3	No	No	
16		2018-09-25	23:08:27	45.5	88.2	57.4	42.6	No	No	
17		2018-09-26	0:08:27	45.6	85.6	54.9	40.7	No	No	
18		2018-09-26	1:08:27	45.7	92.4	61.5	39.6	No	No	
19		2018-09-26	2:08:27	45.5	89.1	54.4	40.5	No	No	
20		2018-09-26	3:08:27	46.2	88.8	53.1	41.6	No	No	
21		2018-09-26	4:08:27	49.0	90.6	63.0	43.0	No	No	
22		2018-09-26	5:08:27	44.5	89.8	56.2	40.7	No	No	
23		2018-09-26	6:08:27	46.2	86.0	60.1	40.9	No	No	
24		2018-09-26	7:08:27	46.6	92.1	59.8	39.9	No	No	
25		2018-09-26	8:08:27	47.5	88.4	63.9	39.7	No	No	
26		2018-09-26	9:08:27	49.8	92.2	68.4	40.7	No	No	
27		2018-09-26	10:08:27	44.7	88.9	57.9	38.8	No	No	
28		2018-09-26	11:08:27	45.7	96.3	58.8	39.0	No	No	
29		2018-09-26	12:08:27	47.0	92.4	66.1	38.3	No	No	
30		2018-09-26	13:08:27	45.1	93.5	58.4	38.1	No	No	
31		2018-09-26	14:08:27	46.9	96.2	66.7	39.6	No	No	
32		2018-09-26	15:08:27	49.4	101.0	71.5	40.5	No	No	
33		2018-09-26	16:08:27	56.2	104.6	84.4	45.0	No	No	
34		2018-09-26	17:08:27	51.2	98.4	64.5	45.9	No	No	
35		2018-09-26	18:08:27	53.3	104.9	64.0	49.6	No	No	
36		2018-09-26	19:08:27	53.1	102.0	64.6	48.5	No	No	
37		2018-09-26	20:08:27	49.7	102.6	60.8	45.8	No	No	
38		2018-09-26	21:08:27	46.6	92.3	61.4	40.6	No	No	
39		2018-09-26	22:08:27	47.5	92.4	64.6	41.6	No	No	
40		2018-09-26	23:08:27	44.8	88.7	64.7	41.1	No	No	
41		2018-09-27	0:08:27	44.3	84.4	54.1	41.1	No	No	
42		2018-09-27	1:08:27	46.4	89.9	63.9	40.9	No	No	
43		2018-09-27	2:08:27	45.4	84.0	52.0	40.5	No	No	
44		2018-09-27	3:08:27	45.3	88.8	64.5	40.3	No	No	
45		2018-09-27	4:08:27	41.2	88.9	58.8	38.0	No	No	
46		2018-09-27	5:08:27	42.0	89.5	55.7	38.7	No	No	
47		2018-09-27	6:08:27	44.6	86.4	59.2	40.0	No	No	
48		2018-09-27	7:08:27	46.7	86.6	57.8	39.2	No	No	
49		2018-09-27	8:08:27	46.5	87.3	60.7	37.6	No	No	
50		2018-09-27	9:08:27	47.9	87.8	62.4	39.9	No	No	
51		2018-09-27	10:08:27	48.6	93.2	62.4	43.2	No	No	
52		2018-09-27	11:08:27	47.7	99.7	62.2	43.0	No	No	
53		2018-09-27	12:08:27	54.3	102.3	81.0	43.0	No	No	
54		2018-09-27	13:08:27	49.1	103.2	68.1	42.3	No	No	
55		2018-09-27	14:08:27	50.5	98.1	69.1	42.3	No	No	
56	Stop	2018-09-27	14:27:48							

Summary

File Name on Meter	LxT_Data.014			
File Name on PC	SLM_0004435_LxT_Data_014.00.ldbin			
Serial Number	0004435			
Model	SoundTrack LxT®			
Firmware Version	2.302			
User	Sanchez			
Location	Central Reservoir Location 2			
Job Description	EBMUD Central Reservoir			
Note				

Measurement

Description				
Start	2018-09-25 10:44:06			
Stop	2018-09-27 14:43:31			
Duration	51:59:24.703			
Run Time	51:59:24.703			
Pause	00:00:00.0			
Pre Calibration	2018-09-25 10:39:47			
Post Calibration	None			
Calibration Deviation	---			

Overall Settings

RMS Weight	A Weighting			
Peak Weight	Z Weighting			
Detector	Slow			
Preamp	PRMLxT2B			
Microphone Correction	Off			
Integration Method	Exponential			
Overload	143.0 dB			
	A	**C**	**Z**	
Under Range Peak	99.2	96.2	**101.2**	dB
Under Range Limit	**48.2**	46.2	54.2	dB
Noise Floor	35.1	35.7	43.3	dB

Results

LASeq	61.7 dB		
LASE	114.4 dB		
EAS	30.845 mPa²h		
EAS8	4.746 mPa²h		
EAS40	23.731 mPa²h		
LZSpeak (max)	2018-09-25 10:44:50	117.6	dB
LASmax	2018-09-27 10:26:57	88.9	dB
LASmin	2018-09-26 01:54:47	44.8	dB
SEA	-99.9 dB		
LAS > 85.0 dB (Exceedance Counts / Duration)	82	260.1	s
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0	s
LZSpeak > 135.0 dB (Exceedance Counts / Duration)	0	0.0	s
LZSpeak > 137.0 dB (Exceedance Counts / Duration)	0	0.0	s
LZSpeak > 140.0 dB (Exceedance Counts / Duration)	0	0.0	s
LCSeq	68.2 dB		
LASeq	61.7 dB		
LCSeq - LASeq	6.5 dB		
LAIeq	64.8 dB		
LAeq	61.7 dB		
LAIeq - LAeq	3.1 dB		

Record #	Record Type	Date	Time	LASeq	LZpeak	LASmax	LASmin	OVLD	OBA OVLD	Marker
1	alibration Chang	2018-09-25	10:39:47							
2	Run	2018-09-25	10:44:06							
3		2018-09-25	10:44:06	67.7	117.6	87.2	49.3	No	No	
4		2018-09-25	11:44:06	57.6	96.2	65.8	52.7	No	No	
5		2018-09-25	12:44:06	61.1	95.4	71.4	56.2	No	No	
6		2018-09-25	13:44:06	62.4	96.8	68.6	58.5	No	No	
7		2018-09-25	14:44:06	62.8	97.9	70.9	58.9	No	No	
8		2018-09-25	15:44:06	62.2	97.1	68.2	58.0	No	No	
9		2018-09-25	16:44:06	62.2	100.4	81.0	57.3	No	No	
10		2018-09-25	17:44:06	61.3	96.8	69.4	56.9	No	No	
11		2018-09-25	18:44:06	61.1	94.9	71.7	56.9	No	No	
12		2018-09-25	19:44:06	60.9	103.9	72.3	57.2	No	No	
13		2018-09-25	20:44:06	58.7	92.3	66.0	55.0	No	No	
14		2018-09-25	21:44:06	57.3	97.2	63.7	52.7	No	No	
15		2018-09-25	22:44:06	56.8	95.1	73.9	52.0	No	No	
16		2018-09-25	23:44:06	55.4	85.9	66.2	49.1	No	No	
17		2018-09-26	0:44:06	52.2	84.7	59.8	46.7	No	No	
18		2018-09-26	1:44:06	52.6	84.0	63.6	44.8	No	No	
19		2018-09-26	2:44:06	53.6	87.9	63.3	47.2	No	No	
20		2018-09-26	3:44:06	57.2	87.2	67.3	50.6	No	No	
21		2018-09-26	4:44:06	59.6	89.7	71.1	54.1	No	No	
22		2018-09-26	5:44:06	60.0	90.2	68.4	55.8	No	No	
23		2018-09-26	6:44:06	60.4	94.0	70.7	55.8	No	No	
24		2018-09-26	7:44:06	57.5	97.2	67.5	53.4	No	No	
25		2018-09-26	8:44:06	60.9	105.5	81.3	52.4	No	No	
26		2018-09-26	9:44:06	70.1	98.4	87.6	51.4	No	No	
27		2018-09-26	10:44:06	58.5	102.0	76.5	51.0	No	No	
28		2018-09-26	11:44:06	57.9	95.0	73.0	52.5	No	No	
29		2018-09-26	12:44:06	57.1	94.2	68.9	53.2	No	No	
30		2018-09-26	13:44:06	59.1	98.9	72.3	54.5	No	No	
31		2018-09-26	14:44:06	59.0	95.8	69.5	53.6	No	No	
32		2018-09-26	15:44:06	60.3	95.1	74.8	55.7	No	No	
33		2018-09-26	16:44:06	60.8	95.1	69.0	57.4	No	No	
34		2018-09-26	17:44:06	61.6	96.1	68.9	58.1	No	No	
35		2018-09-26	18:44:06	62.7	96.4	72.9	58.3	No	No	
36		2018-09-26	19:44:06	61.9	97.7	68.1	58.3	No	No	
37		2018-09-26	20:44:06	59.3	97.3	65.6	54.0	No	No	
38		2018-09-26	21:44:06	57.3	94.1	70.6	52.9	No	No	
39		2018-09-26	22:44:06	55.6	91.8	64.5	50.4	No	No	
40		2018-09-26	23:44:06	54.3	88.6	66.6	48.9	No	No	
41		2018-09-27	0:44:06	53.1	88.5	66.0	45.2	No	No	
42		2018-09-27	1:44:06	52.4	88.7	64.2	46.9	No	No	
43		2018-09-27	2:44:06	53.0	85.5	61.3	47.7	No	No	
44		2018-09-27	3:44:06	56.2	88.1	63.4	48.7	No	No	
45		2018-09-27	4:44:06	59.3	90.3	71.4	52.4	No	No	
46		2018-09-27	5:44:06	59.4	92.2	66.0	54.5	No	No	
47		2018-09-27	6:44:06	58.9	96.0	65.1	54.0	No	No	
48		2018-09-27	7:44:06	56.6	90.7	72.4	52.5	No	No	
49		2018-09-27	8:44:06	54.8	97.7	64.8	49.1	No	No	
50		2018-09-27	9:44:06	72.3	101.2	88.9	52.0	No	No	
51		2018-09-27	10:44:06	62.6	111.7	81.2	52.5	No	No	
52		2018-09-27	11:44:06	63.5	98.8	82.7	53.9	No	No	
53		2018-09-27	12:44:06	61.3	97.0	77.2	55.6	No	No	
54		2018-09-27	13:44:06	59.8	102.4	75.3	55.4	No	No	
55	Stop	2018-09-27	14:43:31							

Summary

File Name on Meter	18092500.LD0			
File Name on PC	SLM_0004437_18092500_LD0.00.ldbin			
Serial Number	0004437			
Model	SoundTrack LxT®			
Firmware Version	2.302			
User	sanchez			
Location	Central Reservoir Location 3			
Job Description	EBMUD Central reservoir			
Note				

Measurement

Description				
Start	2018-09-25 10:30:46			
Stop	2018-09-26 00:00:00			
Duration	13:29:13.5			
Run Time	13:29:11.3			
Pause	00:00:02.2			
Pre Calibration	2018-09-25 10:23:41			
Post Calibration	None			
Calibration Deviation	---			

Overall Settings

RMS Weight	A Weighting			
Peak Weight	Z Weighting			
Detector	Slow			
Preamp	PRMLxT2B			
Microphone Correction	Off			
Integration Method	Exponential			
Overload	142.4 dB			
	A	**C**	**Z**	
Under Range Peak	98.6	95.6	**100.6**	dB
Under Range Limit	**47.6**	45.6	53.6	dB
Noise Floor	34.5	35.2	42.8	dB

Results

LASeq	55.7 dB		
LASE	102.6 dB		
EAS	2.025 mPa²h		
EAS8	1.201 mPa²h		
EAS40	6.006 mPa²h		
LZSpeak (max)	2018-09-25 15:56:14	115.2	dB
LASmax	2018-09-25 10:31:26	77.8	dB
LASmin	2018-09-25 10:53:34	44.9	dB
SEA	-99.9 dB		
LAS > 85.0 dB (Exceedance Counts / Duration)	0	0.0 s	
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0 s	
LZSpeak > 135.0 dB (Exceedance Counts / Duration)	0	0.0 s	
LZSpeak > 137.0 dB (Exceedance Counts / Duration)	0	0.0 s	
LZSpeak > 140.0 dB (Exceedance Counts / Duration)	0	0.0 s	
LCSeq	68.4 dB		
LASeq	55.7 dB		
LCSeq - LASeq	12.7 dB		
LAIeq	57.2 dB		
LAeq	55.7 dB		
LAIeq - LAeq	1.4 dB		

Record #	Record Type	Date	Time	LASeq	LZpeak	LASmax	LASmin	OVLD	OBA OVLD	Marker
1	Run	2018-09-25	10:30:46							
2		2018-09-25	10:30:46	47.2	73.9	47.3	47.1	No	No	
3	Pause	2018-09-25	10:30:47							
4	Resume	2018-09-25	10:30:49							
5		2018-09-25	10:30:49	51.3	105.1	77.8	44.9	No	No	
6		2018-09-25	11:30:49	50.2	95.6	65.7	45.8	No	No	
7		2018-09-25	12:30:49	54.0	109.7	61.3	47.3	No	No	
8		2018-09-25	13:30:49	57.2	111.0	66.3	52.9	No	No	
9		2018-09-25	14:30:49	58.2	113.9	64.9	54.3	No	No	
10		2018-09-25	15:30:49	58.5	115.2	69.4	54.4	No	No	
11		2018-09-25	16:30:49	57.1	111.8	66.9	53.4	No	No	
12		2018-09-25	17:30:49	56.3	107.8	66.4	53.0	No	No	
13		2018-09-25	18:30:49	56.7	101.9	74.0	53.1	No	No	
14		2018-09-25	19:30:49	57.3	99.9	66.1	53.5	No	No	
15		2018-09-25	20:30:49	54.6	99.5	63.2	50.4	No	No	
16		2018-09-25	21:30:49	53.0	90.2	61.5	49.1	No	No	
17		2018-09-25	22:30:49	52.1	90.6	64.3	48.9	No	No	
18		2018-09-25	23:30:49	52.8	92.2	60.2	49.3	No	No	
19	Stop	2018-09-26	0:00:00							

Summary

File Name on Meter	18092600.LD0			
File Name on PC	SLM_0004437_18092600_LD0.00.ldbin			
Serial Number	0004437			
Model	SoundTrack LxT®			
Firmware Version	2.302			
User	Sanchez			
Location	Central Reservoir Location 3			
Job Description	EBMUD Central Reservoir			
Note				

Measurement

Description				
Start	2018-09-26 00:00:00			
Stop	2018-09-27 00:00:00			
Duration	24:00:00.0			
Run Time	24:00:00.0			
Pause	00:00:00.0			
Pre Calibration	2018-09-25 10:23:41			
Post Calibration	None			
Calibration Deviation	---			

Overall Settings

RMS Weight	A Weighting			
Peak Weight	Z Weighting			
Detector	Slow			
Preamp	PRMLxT2B			
Microphone Correction	Off			
Integration Method	Exponential			
Overload	142.4 dB			
	A	**C**	**Z**	
Under Range Peak	98.6	95.6	**100.6**	dB
Under Range Limit	**47.6**	45.6	53.6	dB
Noise Floor	34.5	35.2	42.8	dB

Results

LASeq	54.1 dB		
LASE	103.4 dB		
EAS	2.451 mPa²h		
EAS8	816.903 µPa²h		
EAS40	4.085 mPa²h		
LZSpeak (max)	2018-09-26 17:59:28	112.2	dB
LASmax	2018-09-26 16:33:45	79.2	dB
LASmin	2018-09-26 01:06:56	44.0	dB
SEA	-99.9 dB		
LAS > 85.0 dB (Exceedance Counts / Duration)	0	0.0	s
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0	s
LZSpeak > 135.0 dB (Exceedance Counts / Duration)	0	0.0	s
LZSpeak > 137.0 dB (Exceedance Counts / Duration)	0	0.0	s
LZSpeak > 140.0 dB (Exceedance Counts / Duration)	0	0.0	s
LCSeq	65.9 dB		
LASeq	54.1 dB		
LCSeq - LASeq	11.8 dB		
LAIeq	55.1 dB		
LAeq	54.1 dB		
LAIeq - LAeq	1.0 dB		

Record #	Record Type	Date	Time	LASeq	LZpeak	LASmax	LASmin	OVLD	OBA OVLD	Marker
1	Run	2018-09-26	0:00:00							
2		2018-09-26	0:00:00	50.4	91.3	55.6	45.6	No	No	
3		2018-09-26	1:00:00	48.3	84.4	64.0	44.0	No	No	
4		2018-09-26	2:00:00	49.2	89.0	60.8	45.5	No	No	
5		2018-09-26	3:00:00	50.9	94.8	60.4	46.7	No	No	
6		2018-09-26	4:00:00	53.8	93.9	62.2	48.2	No	No	
7		2018-09-26	5:00:00	55.5	95.0	64.8	50.4	No	No	
8		2018-09-26	6:00:00	55.7	93.6	72.8	50.2	No	No	
9		2018-09-26	7:00:00	55.3	95.7	68.4	50.0	No	No	
10		2018-09-26	8:00:00	52.5	90.3	63.2	48.6	No	No	
11		2018-09-26	9:00:00	51.4	92.0	72.0	47.5	No	No	
12		2018-09-26	10:00:00	49.2	91.7	58.6	46.1	No	No	
13		2018-09-26	11:00:00	49.2	92.3	58.3	45.8	No	No	
14		2018-09-26	12:00:00	50.1	97.6	64.2	45.7	No	No	
15		2018-09-26	13:00:00	50.2	96.8	61.0	45.8	No	No	
16		2018-09-26	14:00:00	51.7	102.1	67.5	47.4	No	No	
17		2018-09-26	15:00:00	52.4	105.3	61.8	46.9	No	No	
18		2018-09-26	16:00:00	57.4	107.6	79.2	51.6	No	No	
19		2018-09-26	17:00:00	57.0	112.2	68.5	52.9	No	No	
20		2018-09-26	18:00:00	57.9	111.2	61.9	54.7	No	No	
21		2018-09-26	19:00:00	58.8	111.0	65.0	55.0	No	No	
22		2018-09-26	20:00:00	57.4	107.1	64.4	53.3	No	No	
23		2018-09-26	21:00:00	53.8	99.7	64.0	49.8	No	No	
24		2018-09-26	22:00:00	51.3	91.0	63.8	48.5	No	No	
25		2018-09-26	23:00:00	50.0	89.3	56.9	47.2	No	No	
26	Stop	2018-09-27	0:00:00							

Summary	
File Name on Meter	18092700.LD0
File Name on PC	SLM_0004437_18092700_LD0.00.ldbin
Serial Number	0004437
Model	SoundTrack LxT®
Firmware Version	2.302
User	Sanchez
Location	Central Reservoir Location 3
Job Description	EBMUD Central Reservoir
Note	

Measurement	
Description	
Start	2018-09-27 00:00:00
Stop	2018-09-27 14:36:28
Duration	14:36:28.1
Run Time	14:36:28.1
Pause	00:00:00.0
Pre Calibration	2018-09-25 10:23:41
Post Calibration	None
Calibration Deviation	---

Overall Settings				
RMS Weight	A Weighting			
Peak Weight	Z Weighting			
Detector	Slow			
Preamp	PRMLxT2B			
Microphone Correction	Off			
Integration Method	Exponential			
Overload	142.4 dB			
	A	**C**	**Z**	
Under Range Peak	98.6	95.6	**100.6**	dB
Under Range Limit	**47.6**	45.6	53.6	dB
Noise Floor	34.5	35.2	42.8	dB

Results			
LASeq	52.7		dB
LASE	100.0		dB
EAS	1.100		mPa²h
EAS8	602.281		µPa²h
EAS40	3.011		mPa²h
LZSpeak (max)	2018-09-27 14:36:16	115.9	dB
LASmax	2018-09-27 14:36:16	84.7	dB
LASmin	2018-09-27 03:00:34	44.8	dB
SEA	-99.9		dB
LAS > 85.0 dB (Exceedance Counts / Duration)	0	0.0	s
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0	s
LZSpeak > 135.0 dB (Exceedance Counts / Duration)	0	0.0	s
LZSpeak > 137.0 dB (Exceedance Counts / Duration)	0	0.0	s
LZSpeak > 140.0 dB (Exceedance Counts / Duration)	0	0.0	s
LCSeq	64.5		dB
LASeq	52.7		dB
LCSeq - LASeq	11.7		dB
LAIeq	56.1		dB
LAeq	52.7		dB
LAIeq - LAeq	3.4		dB

Record #	Record Type	Date	Time	LASeq	LZpeak	LASmax	LASmin	OVLD	OBA OVLD	Marker
1	Run	2018-09-27	0:00:00							
2		2018-09-27	0:00:00	49.0	88.9	57.6	46.1	No	No	
3		2018-09-27	1:00:00	49.0	91.0	62.7	45.2	No	No	
4		2018-09-27	2:00:00	48.6	84.4	55.2	44.8	No	No	
5		2018-09-27	3:00:00	48.8	87.7	55.8	44.8	No	No	
6		2018-09-27	4:00:00	52.4	92.3	60.3	47.3	No	No	
7		2018-09-27	5:00:00	53.7	92.0	59.6	48.8	No	No	
8		2018-09-27	6:00:00	54.7	92.7	68.8	48.7	No	No	
9		2018-09-27	7:00:00	52.9	95.5	59.6	47.6	No	No	
10		2018-09-27	8:00:00	50.7	88.5	64.2	45.5	No	No	
11		2018-09-27	9:00:00	56.8	93.7	70.5	45.2	No	No	
12		2018-09-27	10:00:00	50.9	91.1	60.9	47.2	No	No	
13		2018-09-27	11:00:00	51.1	100.3	61.6	47.8	No	No	
14		2018-09-27	12:00:00	53.4	101.0	61.6	49.7	No	No	
15		2018-09-27	13:00:00	53.9	101.8	71.8	49.7	No	No	
16		2018-09-27	14:00:00	55.7	115.9	84.7	49.4	No	No	
17	Stop	2018-09-27	14:36:28							

Summary

File Name on Meter	LxT_Data.043		
File Name on PC	SLM_0004337_LxT_Data_043.00.ldbin		
Serial Number	0004337		
Model	SoundTrack LxT®		
Firmware Version	2.302		
User	Sanchez		
Location	ST-1 25th		
Job Description	Central Reservoir		
Note			

Measurement

Description	
Start	2018-11-01 11:31:30
Stop	2018-11-01 11:46:31
Duration	00:15:01.1
Run Time	00:15:01.1
Pause	00:00:00.0
Pre Calibration	2018-11-01 11:26:42
Post Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting			
Peak Weight	Z Weighting			
Detector	Slow			
Preamp	PRMLxT2B			
Microphone Correction	Off			
Integration Method	Exponential			
Overload	142.5 dB			
	A	**C**	**Z**	
Under Range Peak	98.8	95.8	**100.8**	dB
Under Range Limit	**47.8**	45.8	53.8	dB
Noise Floor	34.7	35.3	42.9	dB

Results

LASeq	57.5 dB		
LASE	87.1 dB		
EAS	56.931 µPa²h		
EAS8	1.820 mPa²h		
EAS40	9.098 mPa²h		
LZSpeak (max)	2018-11-01 11:37:06	95.6	dB
LASmax	2018-11-01 11:31:37	78.0	dB
LASmin	2018-11-01 11:45:22	40.6	dB
SEA	-99.9 dB		
LAS > 85.0 dB (Exceedance Counts / Duration)	0	0.0 s	
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0 s	
LZSpeak > 135.0 dB (Exceedance Counts / Duration)	0	0.0 s	
LZSpeak > 137.0 dB (Exceedance Counts / Duration)	0	0.0 s	
LZSpeak > 140.0 dB (Exceedance Counts / Duration)	0	0.0 s	
LCSeq	69.2 dB		
LASeq	57.5 dB		
LCSeq - LASeq	11.6 dB		
LAIeq	59.0 dB		
LAeq	57.5 dB		
LAIeq - LAeq	1.5 dB		

Record #	Record Type	Date	Time	LASeq	LZpeak	LASmax	LASmin	OVLD	OBA OVLD	Marker
1	Run	2018-11-01	11:31:29							
2		2018-11-01	11:31:30	66.6	94.3	78.0	43.9	No	No	
3		2018-11-01	11:32:30	52.4	78.0	58.9	44.4	No	No	
4		2018-11-01	11:33:30	48.5	84.3	56.1	43.8	No	No	
5		2018-11-01	11:34:30	57.7	89.3	65.1	44.9	No	No	
6		2018-11-01	11:35:30	49.1	79.9	55.6	44.1	No	No	
7		2018-11-01	11:36:30	61.6	95.6	71.0	43.3	No	No	
8		2018-11-01	11:37:30	57.1	87.7	66.0	47.3	No	No	
9		2018-11-01	11:38:30	49.9	84.1	55.6	44.9	No	No	
10		2018-11-01	11:39:30	52.8	80.9	59.1	46.9	No	No	
11		2018-11-01	11:40:30	51.7	84.1	57.6	47.5	No	No	
12		2018-11-01	11:41:30	52.0	83.3	56.9	45.2	No	No	
13		2018-11-01	11:42:30	51.1	91.5	57.4	42.8	No	No	
14		2018-11-01	11:43:30	54.2	83.8	61.7	45.5	No	No	
15		2018-11-01	11:44:30	43.8	78.1	48.0	40.6	No	No	
16		2018-11-01	11:45:30	50.2	81.6	54.9	43.6	No	No	
17		2018-11-01	11:46:30	45.8	72.7	46.8	44.7	No	No	
18	Stop	2018-11-01	11:46:31							

Summary

File Name on Meter	LxT_Data.044	
File Name on PC	SLM_0004337_LxT_Data_044.00.ldbin	
Serial Number	0004337	
Model	SoundTrack LxT®	
Firmware Version	2.302	
User	Sanchez	
Location	23rd at 26th ave	
Job Description	Central Reservoir	
Note		

Measurement

Description		
Start	2018-11-01 11:51:12	
Stop	2018-11-01 12:06:13	
Duration	00:15:01.3	
Run Time	00:15:01.3	
Pause	00:00:00.0	
Pre Calibration	2018-11-01 11:26:42	
Post Calibration	None	
Calibration Deviation	---	

Overall Settings

RMS Weight	A Weighting			
Peak Weight	Z Weighting			
Detector	Slow			
Preamp	PRMLxT2B			
Microphone Correction	Off			
Integration Method	Exponential			
Overload	142.5 dB			
	A	**C**	**Z**	
Under Range Peak	98.8	95.8	**100.8**	dB
Under Range Limit	**47.8**	45.8	53.8	dB
Noise Floor	34.7	35.3	42.9	dB

Results

LASeq	63.7 dB		
LASE	93.2 dB		
EAS	234.600 µPa²h		
EAS8	7.496 mPa²h		
EAS40	37.482 mPa²h		
LZSpeak (max)	2018-11-01 11:59:13	108.2	dB
LASmax	2018-11-01 11:59:14	83.8	dB
LASmin	2018-11-01 12:00:12	41.9	dB
SEA	-99.9 dB		
LAS > 85.0 dB (Exceedance Counts / Duration)	0	0.0	s
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0	s
LZSpeak > 135.0 dB (Exceedance Counts / Duration)	0	0.0	s
LZSpeak > 137.0 dB (Exceedance Counts / Duration)	0	0.0	s
LZSpeak > 140.0 dB (Exceedance Counts / Duration)	0	0.0	s
LCSeq	74.7 dB		
LASeq	63.7 dB		
LCSeq - LASeq	11.0 dB		
LAIeq	65.8 dB		
LAeq	63.7 dB		
LAIeq - LAeq	2.1 dB		

Record #	Record Type	Date	Time	LASeq	LZpeak	LASmax	LASmin	OVLD	OBA OVLD	Marker
1	Run	2018-11-01	11:51:12							
2		2018-11-01	11:51:12	62.0	90.5	69.2	47.5	No	No	
3		2018-11-01	11:52:12	65.2	106.1	78.0	42.6	No	No	
4		2018-11-01	11:53:12	62.8	91.4	69.7	47.0	No	No	
5		2018-11-01	11:54:12	63.1	91.9	71.2	44.9	No	No	
6		2018-11-01	11:55:12	62.1	90.5	70.9	45.4	No	No	
7		2018-11-01	11:56:12	59.3	88.8	64.5	49.1	No	No	
8		2018-11-01	11:57:12	55.7	86.4	66.3	44.1	No	No	
9		2018-11-01	11:58:12	58.7	105.8	74.8	44.5	No	No	
10		2018-11-01	11:59:12	71.4	108.2	83.8	41.9	No	No	
11		2018-11-01	12:00:12	62.0	87.6	69.6	42.3	No	No	
12		2018-11-01	12:01:12	63.6	96.7	72.4	50.3	No	No	
13		2018-11-01	12:02:12	63.7	92.6	69.4	54.4	No	No	
14		2018-11-01	12:03:12	58.8	91.8	67.4	44.1	No	No	
15		2018-11-01	12:04:12	61.0	91.9	69.5	45.5	No	No	
16		2018-11-01	12:05:12	59.2	87.6	67.4	44.4	No	No	
17		2018-11-01	12:06:12	45.6	72.5	46.9	44.5	No	No	
18	Stop	2018-11-01	12:06:13							

Summary

File Name on Meter	LxT_Data.042
File Name on PC	SLM_0004337_LxT_Data_042.00.ldbin
Serial Number	0004337
Model	SoundTrack LxT®
Firmware Version	2.302
User	Sanchez
Location	ST-3 Fruitvale at Hyde
Job Description	EBMUD Central Reservoir
Note	

Measurement

Description	
Start	2018-11-01 11:09:59
Stop	2018-11-01 11:25:32
Duration	00:15:32.4
Run Time	00:15:32.4
Pause	00:00:00.0
Pre Calibration	2018-10-12 08:17:22
Post Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting			
Peak Weight	Z Weighting			
Detector	Slow			
Preamp	PRMLxT2B			
Microphone Correction	Off			
Integration Method	Exponential			
Overload	142.3 dB			
	A	**C**	**Z**	
Under Range Peak	98.6	95.6	**100.6**	dB
Under Range Limit	**47.6**	45.6	53.6	dB
Noise Floor	34.5	35.1	42.7	dB

Results

LASeq	62.0 dB	
LASE	91.7 dB	
EAS	164.562 µPa²h	
EAS8	5.083 mPa²h	
EAS40	25.415 mPa²h	
LZSpeak (max)	2018-11-01 11:20:18	94.5 dB
LASmax	2018-11-01 11:23:19	72.4 dB
LASmin	2018-11-01 11:15:16	44.8 dB
SEA	-99.9 dB	

LAS > 85.0 dB (Exceedance Counts / Duration)	0	0.0 s
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZSpeak > 135.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZSpeak > 137.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZSpeak > 140.0 dB (Exceedance Counts / Duration)	0	0.0 s

LCSeq	70.3 dB
LASeq	62.0 dB
LCSeq - LASeq	8.3 dB
LAIeq	63.4 dB
LAeq	62.0 dB
LAIeq - LAeq	1.4 dB

Record #	Record Type	Date	Time	LASeq	LZpeak	LASmax	LASmin	OVLD	OBA OVLD	Marker
1	Fault	2018-11-01	10:09:52							
2	Run	2018-11-01	11:09:59							
3		2018-11-01	11:09:59	61.9	86.4	65.2	51.7	No	No	
4		2018-11-01	11:10:59	62.4	86.1	66.8	45.2	No	No	
5		2018-11-01	11:11:59	61.5	93.3	67.2	48.0	No	No	
6		2018-11-01	11:12:59	61.9	89.5	68.1	49.0	No	No	
7		2018-11-01	11:13:59	63.2	90.5	71.5	54.6	No	No	
8		2018-11-01	11:14:59	59.9	85.9	67.2	44.8	No	No	
9		2018-11-01	11:15:59	60.9	90.2	68.9	49.3	No	No	
10		2018-11-01	11:16:59	60.6	92.2	66.2	51.6	No	No	
11		2018-11-01	11:17:59	62.5	88.9	69.1	54.6	No	No	
12		2018-11-01	11:18:59	61.5	89.9	67.8	48.8	No	No	
13		2018-11-01	11:19:59	63.5	94.5	68.2	50.5	No	No	
14		2018-11-01	11:20:59	61.5	85.8	67.9	45.8	No	No	
15		2018-11-01	11:21:59	61.7	89.0	68.3	48.4	No	No	
16		2018-11-01	11:22:59	64.0	94.5	72.4	51.7	No	No	
17		2018-11-01	11:23:59	62.0	86.1	66.2	51.8	No	No	
18		2018-11-01	11:24:59	59.9	86.8	64.9	51.5	No	No	
19	Stop	2018-11-01	11:25:32							

Summary			
File Name on Meter	LxT_Data.046		
File Name on PC	SLM_0004337_LxT_Data_046.00.ldbin		
Serial Number	0004337		
Model	SoundTrack LxT®		
Firmware Version	2.302		
User	Sanchez		
Location	ST-4 FV 17th		
Job Description	Central Reservior		
Note			

Measurement			
Description			
Start	2018-11-01 12:38:43		
Stop	2018-11-01 12:53:46		
Duration	00:15:02.9		
Run Time	00:15:02.9		
Pause	00:00:00.0		
Pre Calibration	2018-11-01 11:26:42		
Post Calibration	None		
Calibration Deviation	---		

Overall Settings				
RMS Weight	A Weighting			
Peak Weight	Z Weighting			
Detector	Slow			
Preamp	PRMLxT2B			
Microphone Correction	Off			
Integration Method	Exponential			
Overload	142.5 dB			
	A	**C**	**Z**	
Under Range Peak	98.8	95.8	**100.8**	dB
Under Range Limit	**47.8**	45.8	53.8	dB
Noise Floor	34.7	35.3	42.9	dB

Results		
LASeq	64.8 dB	
LASE	94.3 dB	
EAS	300.691 µPa²h	
EAS8	9.591 mPa²h	
EAS40	47.956 mPa²h	
LZSpeak (max)	2018-11-01 12:51:48	107.8 dB
LASmax	2018-11-01 12:42:36	75.1 dB
LASmin	2018-11-01 12:45:34	50.9 dB
SEA	-99.9 dB	
LAS > 85.0 dB (Exceedance Counts / Duration)	0	0.0 s
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZSpeak > 135.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZSpeak > 137.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZSpeak > 140.0 dB (Exceedance Counts / Duration)	0	0.0 s
LCSeq	73.2 dB	
LASeq	64.8 dB	
LCSeq - LASeq	8.5 dB	
LAIeq	66.4 dB	
LAeq	64.8 dB	
LAIeq - LAeq	1.6 dB	

Record #	Record Type	Date	Time	LASeq	LZpeak	LASmax	LASmin	OVLD	OBA OVLD	Marker
1	Run	2018-11-01	12:38:43							
2		2018-11-01	12:38:43	65.1	94.9	70.3	55.7	No	No	
3		2018-11-01	12:39:43	60.4	88.9	67.9	52.9	No	No	
4		2018-11-01	12:40:43	63.7	97.2	69.8	57.7	No	No	
5		2018-11-01	12:41:43	67.9	96.4	75.1	60.5	No	No	
6		2018-11-01	12:42:43	65.2	90.1	69.8	54.4	No	No	
7		2018-11-01	12:43:43	63.0	92.6	69.0	51.2	No	No	
8		2018-11-01	12:44:43	64.6	97.6	74.2	50.9	No	No	
9		2018-11-01	12:45:43	67.1	96.8	71.6	55.3	No	No	
10		2018-11-01	12:46:43	61.9	88.9	67.7	52.4	No	No	
11		2018-11-01	12:47:43	65.2	95.7	71.3	52.2	No	No	
12		2018-11-01	12:48:43	63.7	95.9	72.3	53.3	No	No	
13		2018-11-01	12:49:43	64.5	89.7	70.7	54.1	No	No	
14		2018-11-01	12:50:43	64.4	96.0	69.4	59.0	No	No	
15		2018-11-01	12:51:43	65.2	107.8	71.8	57.5	No	No	
16		2018-11-01	12:52:43	63.3	92.4	71.4	53.1	No	No	
17		2018-11-01	12:53:43	71.2	94.2	71.6	70.8	No	No	
18	Stop	2018-11-01	12:53:46							

Summary			
File Name on Meter	LxT_Data.045		
File Name on PC	SLM_0004337_LxT_Data_045.00.ldbin		
Serial Number	0004337		
Model	SoundTrack LxT®		
Firmware Version	2.302		
User	Sanchez		
Location	ST-5 23rd 15th		
Job Description	Central Reservoir		
Note			

Measurement			
Description			
Start	2018-11-01 12:15:03		
Stop	2018-11-01 12:30:05		
Duration	00:15:01.9		
Run Time	00:15:01.9		
Pause	00:00:00.0		
Pre Calibration	2018-11-01 11:26:42		
Post Calibration	None		
Calibration Deviation	---		

Overall Settings			
RMS Weight	A Weighting		
Peak Weight	Z Weighting		
Detector	Slow		
Preamp	PRMLxT2B		
Microphone Correction	Off		
Integration Method	Exponential		
Overload	142.5 dB		
	A	**C**	**Z**
Under Range Peak	98.8	95.8	**100.8** dB
Under Range Limit	**47.8**	45.8	53.8 dB
Noise Floor	34.7	35.3	42.9 dB

Results		
LASeq	63.5 dB	
LASE	93.0 dB	
EAS	223.127 µPa²h	
EAS8	7.125 mPa²h	
EAS40	35.625 mPa²h	
LZSpeak (max)	2018-11-01 12:22:51	105.7 dB
LASmax	2018-11-01 12:27:18	78.9 dB
LASmin	2018-11-01 12:25:16	51.1 dB
SEA	-99.9 dB	
LAS > 85.0 dB (Exceedance Counts / Duration)	0	0.0 s
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZSpeak > 135.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZSpeak > 137.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZSpeak > 140.0 dB (Exceedance Counts / Duration)	0	0.0 s
LCSeq	75.3 dB	
LASeq	63.5 dB	
LCSeq - LASeq	11.8 dB	
LAIeq	65.0 dB	
LAeq	63.5 dB	
LAIeq - LAeq	1.5 dB	

Record #	Record Type	Date	Time	LASeq	LZpeak	LASmax	LASmin	OVLD	OBA OVLD	Marker
1	Run	2018-11-01	12:15:03							
2		2018-11-01	12:15:03	61.7	92.4	69.6	53.3	No	No	
3		2018-11-01	12:16:03	62.1	91.8	68.6	52.6	No	No	
4		2018-11-01	12:17:03	60.8	100.8	67.1	52.7	No	No	
5		2018-11-01	12:18:03	65.1	93.9	73.1	53.0	No	No	
6		2018-11-01	12:19:03	61.8	89.8	69.3	54.4	No	No	
7		2018-11-01	12:20:03	64.3	91.8	72.5	54.1	No	No	
8		2018-11-01	12:21:03	62.5	95.1	67.7	52.4	No	No	
9		2018-11-01	12:22:03	63.7	105.7	68.4	54.4	No	No	
10		2018-11-01	12:23:03	66.9	95.6	73.4	57.9	No	No	
11		2018-11-01	12:24:03	63.1	92.9	69.4	54.9	No	No	
12		2018-11-01	12:25:03	60.4	92.6	68.0	51.1	No	No	
13		2018-11-01	12:26:03	60.4	92.8	64.7	54.0	No	No	
14		2018-11-01	12:27:03	68.1	99.4	78.9	55.7	No	No	
15		2018-11-01	12:28:03	58.3	86.5	67.1	52.6	No	No	
16		2018-11-01	12:29:03	60.8	89.7	66.7	55.9	No	No	
17		2018-11-01	12:30:03	67.1	92.7	67.7	65.9	No	No	
18	Stop	2018-11-01	12:30:05							

J2: Noise Modeling Output from the Roadway Construction Noise Model (2-D)

Roadway Construction Noise Model (RCNM),Version 1.1

Report dat 7/25/2019
Case Descr Central Reservior

---- Receptor #1 ----

		Baselines (dBA)		
Descriptior	Land Use	Daytime	Evening	Night
Ardley Ave	Residential	55	55	52

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Backhoe	No	40		77.6	75	0
Front End Loader	No	40		79.1	75	0
Mounted Impact Hamm	Yes	20		90.3	75	0
Excavator	No	40		80.7	75	0
Concrete Saw	No	20		89.6	150	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	74	70.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	75.6	71.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mounted Impact Hamm	86.8	79.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	77.2	73.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Saw	80	73	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	86.8	82.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Descriptior	Land Use	Daytime	Evening	Night
23rd Avenu	Residential	55	55	52

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Backhoe	No	40		77.6	100	0

Front End Loader	No	40		79.1	100	0
Mounted Impact Hamm	Yes	20		90.3	100	0
Excavator	No	40		80.7	100	0
Concrete Saw	No	20		89.6	150	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	71.5	67.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	73.1	69.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mounted Impact Hamm	84.3	77.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	74.7	70.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Saw	80	73	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	84.3	80	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

		Baselines (dBA)		
Descriptior	Land Use	Daytime	Evening	Night
Redwood [	Commercial	62	62	57

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Backhoe	No	40		77.6	50	0
Front End Loader	No	40		79.1	50	0
Mounted Impact Hamm	Yes	20		90.3	50	0
Excavator	No	40		80.7	50	0
Concrete Saw	No	20		89.6	150	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	77.6	73.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	79.1	75.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mounted Impact Hamm	90.3	83.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	80.7	76.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Saw	80	73	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	90.3	85.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

		Baselines (dBA)		
Descriptior	Land Use	Daytime	Evening	Night
East 29th S	Residential	50	50	46

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	160	0
Front End Loader	No	40		79.1	160	0
Mounted Impact Hamm	Yes	20		90.3	160	0
Excavator	No	40		80.7	160	0
Concrete Saw	No	20		89.6	160	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	67.5	63.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	69	65	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mounted Impact Hamm	80.2	73.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	70.6	66.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Saw	79.5	72.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	80.2	76.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report dat 8/22/2019
Case Descr Pipeline Connection

---- Receptor #1 ----

		Baselines (dBA)		
Descriptior	Land Use	Daytime	Evening	Night
29th Street	Residential	55	55	52

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Concrete Saw	No	20		89.6	80	0
Compactor (ground)	No	20		83.2	80	0
Backhoe	No	40		77.6	80	0
Pickup Truck	No	40		75	80	0

			Results													
	Calculated (dBA)			Noise Limits (dBA)						Noise Limit Exceedance (dBA)						
			Day		Evening		Night		Day		Evening		Night			
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq		
Concrete Saw	85.5	78.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Compactor (ground)	79.1	72.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Backhoe	73.5	69.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Pickup Truck	70.9	66.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Total	85.5	80.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 8/22/2019
Case Description: Pipeline Connection Night

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
29th Street	Residential	55	55	52

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Welder / Torch	No	40		74	80	0
Pickup Truck	No	40		75	80	0

Results

Equipment		Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Noise Limit Exceedance (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Welder / Torch		69.9	65.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck		70.9	66.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	70.9	69.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 4/29/2019
Case Description: RCS Demolition

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Redwood Day Sch	Residential	60	55	50

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	900	0
Compressor (air)	No	40		77.7	900	0
Generator	No	50		80.6	900	0
Generator	No	50		80.6	900	0
Gradall	No	40		83.4	900	0
Gradall	No	40		83.4	900	0
Crane	No	16		80.6	900	0

Results

		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Compressor (air)		52.6	48.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Compressor (air)		52.6	48.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator		55.5	52.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator		55.5	52.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Gradall		58.3	54.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Gradall		58.3	54.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Crane		55.4	47.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	58.3	60.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Ardley Avenue	Residential	55	55	52

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	1100	20
Compressor (air)	No	40		77.7	1100	20
Generator	No	50		80.6	1100	20
Generator	No	50		80.6	1100	20
Gradall	No	40		83.4	1100	20
Gradall	No	40		83.4	1100	20
Crane	No	16		80.6	1100	20

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Compressor (air)	30.8	26.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Compressor (air)	30.8	26.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator	33.8	30.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator	33.8	30.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Gradall	36.6	32.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Gradall	36.6	32.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Crane	33.7	25.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

	Total	36.6	38.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
23rd Avenue	Residential	55	55	52

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	800	9
Compressor (air)	No	40		77.7	800	9
Generator	No	50		80.6	800	9
Generator	No	50		80.6	800	9
Gradall	No	40		83.4	800	9
Gradall	No	40		83.4	800	9
Crane	No	16		80.6	800	9

Results

		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Compressor (air)		44.6	40.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Compressor (air)		44.6	40.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator		47.5	44.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator		47.5	44.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Gradall		50.3	46.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Gradall		50.3	46.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Crane		47.5	39.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	50.3	52.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
29th Street	Residential	55	55	52

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	100	0
Compressor (air)	No	40		77.7	100	0
Generator	No	50		80.6	100	0
Generator	No	50		80.6	100	0
Gradall	No	40		83.4	100	0
Gradall	No	40		83.4	100	0
Crane	No	16		80.6	100	0

Results

		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Compressor (air)		71.6	67.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Compressor (air)		71.6	67.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator		74.6	71.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator		74.6	71.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Gradall		77.4	73.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Gradall		77.4	73.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Crane		74.5	66.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	77.4	79.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 7/29/2019
Case Description: Central Reservior Site Restoration

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Ardley Avenue	Residential	55	55	52

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	75	0
Front End Loader	No	40		79.1	75	0
Excavator	No	40		80.7	75	0
Compactor (ground)	No	20		83.2	75	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	74	70.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	75.6	71.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	77.2	73.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Compactor (ground)	79.7	72.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	79.7	78.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
23rd Avenue	Residential	55	55	52

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	100	0
Front End Loader	No	40		79.1	100	0
Excavator	No	40		80.7	100	0
Compactor (ground)	No	20		83.2	100	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	71.5	67.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	73.1	69.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	74.7	70.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Compactor (ground)	77.2	70.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	77.2	75.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Redwood Day Sch	Residential	62	62	57

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	50	0
Front End Loader	No	40		79.1	50	0

Excavator	No	40		80.7	50	0
Compactor (ground)	No	20		83.2	50	0

Results

Equipment	Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq	Noise Limit Exceedance (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq
Backhoe	77.6	73.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	79.1	75.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	80.7	76.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Compactor (ground)	83.2	76.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	83.2	81.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
East 29th Street	Residential	50	50	46

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	160	0
Front End Loader	No	40		79.1	160	0
Excavator	No	40		80.7	160	0
Compactor (ground)	No	20		83.2	160	0

Results

Equipment	Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq	Noise Limit Exceedance (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq
Backhoe	67.5	63.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	69	65	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	70.6	66.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Compactor (ground)	73.1	66.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	73.1	71.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #5 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Reservoir Recreat	Commercial	50	50	46

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	65	0
Front End Loader	No	40		79.1	65	0
Excavator	No	40		80.7	65	0
Compactor (ground)	No	20		83.2	65	0

Results

Equipment	Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq	Noise Limit Exceedance (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq
Backhoe	75.3	71.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	76.8	72.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	78.4	74.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Compactor (ground)	81	74	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	81	79.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 1/10/2019
Case Descriptior CDSM Unmitigated

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Redwood Day Sc	Residential	60	55	50

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	140	6
Generator	No	50		80.6	140	6
Front End Loader	No	40		79.1	140	6
Soil Mix Drill Rig	No	50	80		140	6
Soil Mix Drill Rig	No	50	80		140	6

Results

Equipment	Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Noise Limit Exceedance (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Compressor (air)	62.7	58.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator	65.7	62.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	64.2	60.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Soil Mix Drill Rig	65.1	62	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Soil Mix Drill Rig	65.1	62	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	65.7	65.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Ardley Avenue	Residential	55	55	52

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	170	31
Generator	No	50		80.6	170	31
Front End Loader	No	40		79.1	170	31
Soil Mix Drill Rig	No	50	80		170	31
Soil Mix Drill Rig	No	50	80		170	31

Results

Equipment	Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Noise Limit Exceedance (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Compressor (air)	36	32.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator	39	36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	37.5	33.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Soil Mix Drill Rig	38.4	35.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Soil Mix Drill Rig	38.4	35.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	39	38.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
23rd Avenue	Residential	55	55	52

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	420	28
Generator	No	50		80.6	420	28
Front End Loader	No	40		79.1	420	28
Soil Mix Drill Rig	No	50	80		420	28
Soil Mix Drill Rig	No	50	80		420	28

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Compressor (air)	31.2	27.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator	34.1	31.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	32.6	28.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Soil Mix Drill Rig	33.5	30.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Soil Mix Drill Rig	33.5	30.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	34.1	34.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
29th Street	Residential	55	55	52

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	980	28
Generator	No	50		80.6	980	28
Front End Loader	No	40		79.1	980	28
Soil Mix Drill Rig	No	50	80		980	28
Soil Mix Drill Rig	No	50	80		980	28

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Compressor (air)	23.8	19.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator	26.8	23.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	25.3	21.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Soil Mix Drill Rig	26.2	23.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Soil Mix Drill Rig	26.2	23.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	26.8	29.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 4/29/2019
Case Description: Tank and Valve Unmitigated

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Redwood Day Sc	Residential	60	55	50

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	65	17
Compressor (air)	No	40		77.7	65	17
Generator	No	50		80.6	65	17
Generator	No	50		80.6	65	17
Gradall	No	40		83.4	65	17
Gradall	No	40		83.4	65	17
Crane	No	16		80.6	65	17
Concrete Mixer Truck	No	40		78.8	65	17

Results

Equipment	Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Noise Limit Exceedance (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Compressor (air)	58.4	54.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Compressor (air)	58.4	54.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator	61.4	58.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator	61.4	58.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Gradall	64.1	60.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Gradall	64.1	60.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Crane	61.3	53.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Mixer Truck	59.5	55.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	64.1	66.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Ardley Avenue	Residential	55	55	52

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	140	20
Compressor (air)	No	40		77.7	140	20
Generator	No	50		80.6	140	20
Generator	No	50		80.6	140	20
Gradall	No	40		83.4	140	20
Gradall	No	40		83.4	140	20
Crane	No	16		80.6	140	20
Concrete Mixer Truck	No	40		78.8	140	20

Results

Equipment	Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Noise Limit Exceedance (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Compressor (air)	48.7	44.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Compressor (air)	48.7	44.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator	51.7	48.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator	51.7	48.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Gradall	54.5	50.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Gradall	54.5	50.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Crane	51.6	43.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Mixer Truck	49.9	45.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	54.5	56.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
23rd Avenue	Residential	55	55	52

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	225	9
Compressor (air)	No	40		77.7	225	9
Generator	No	50		80.6	225	9
Generator	No	50		80.6	225	9
Gradall	No	40		83.4	225	9
Gradall	No	40		83.4	225	9

Crane	No	16		80.6	225	9
Concrete Mixer Truck	No	40		78.8	225	9

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Compressor (air)	55.6	51.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Compressor (air)	55.6	51.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator	58.6	55.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator	58.6	55.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Gradall	61.3	57.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Gradall	61.3	57.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Crane	58.5	50.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Mixer Truck	56.7	52.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	61.3	63.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
29th Street	Residential	55	55	52

			Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Description	Impact Device	Usage(%)				
Compressor (air)	No	40		77.7	675	26
Compressor (air)	No	40		77.7	675	26
Generator	No	50		80.6	675	26
Generator	No	50		80.6	675	26
Gradall	No	40		83.4	675	26
Gradall	No	40		83.4	675	26
Crane	No	16		80.6	675	26
Concrete Mixer Truck	No	40		78.8	675	26

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Compressor (air)	29.1	25.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Compressor (air)	29.1	25.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator	32	29	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator	32	29	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Gradall	34.8	30.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Gradall	34.8	30.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Crane	31.9	24	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Mixer Truck	30.2	26.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	34.8	37.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #5 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Central Reservo	Commercial	55	55	52

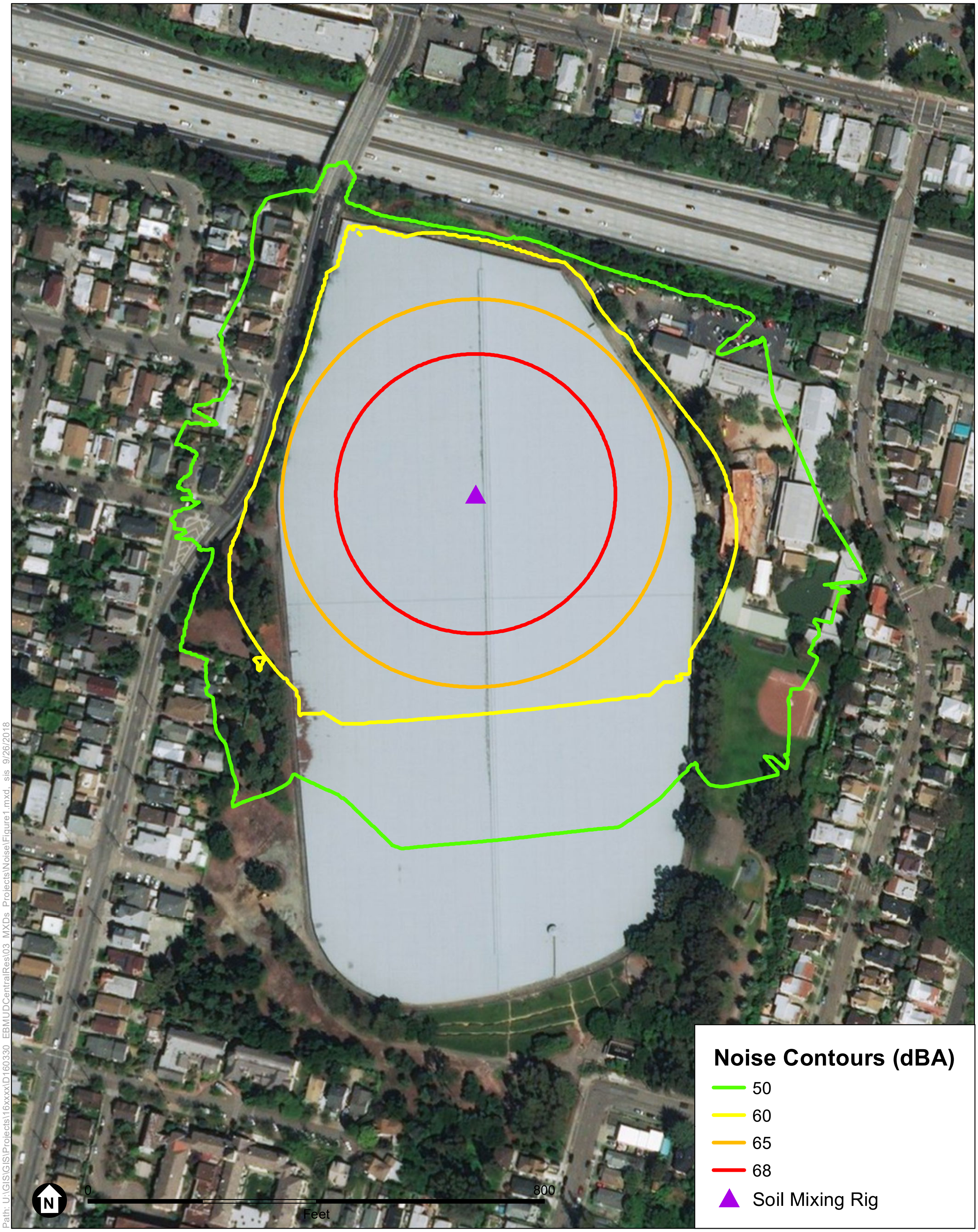
			Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Description	Impact Device	Usage(%)				
Compressor (air)	No	40		77.7	250	17
Compressor (air)	No	40		77.7	250	17
Generator	No	50		80.6	250	17
Generator	No	50		80.6	250	17
Gradall	No	40		83.4	250	17
Gradall	No	40		83.4	250	17
Crane	No	16		80.6	250	17
Concrete Mixer Truck	No	40		78.8	250	17

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Compressor (air)	46.7	42.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Compressor (air)	46.7	42.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator	49.7	46.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator	49.7	46.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Gradall	52.4	48.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Gradall	52.4	48.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Crane	49.6	41.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Mixer Truck	47.8	43.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	52.4	54.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

J3: Contours generated by CadnaA 3-D Model

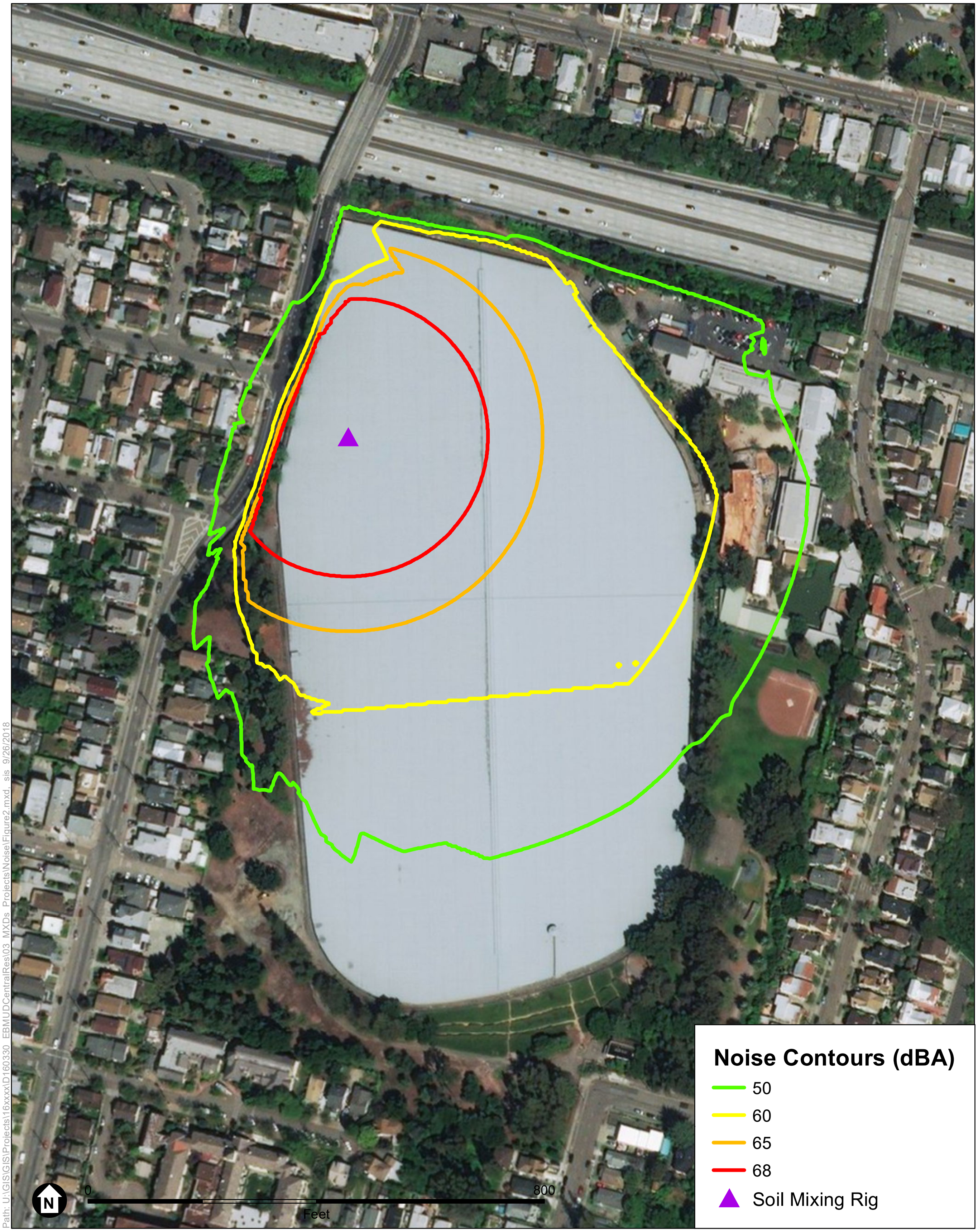


SOURCE: ESRI; ESA, 2018.

D160330 EBMUD Central Reservoir

Figure 1
Noise Contour Map
Center Rig Location

ESA

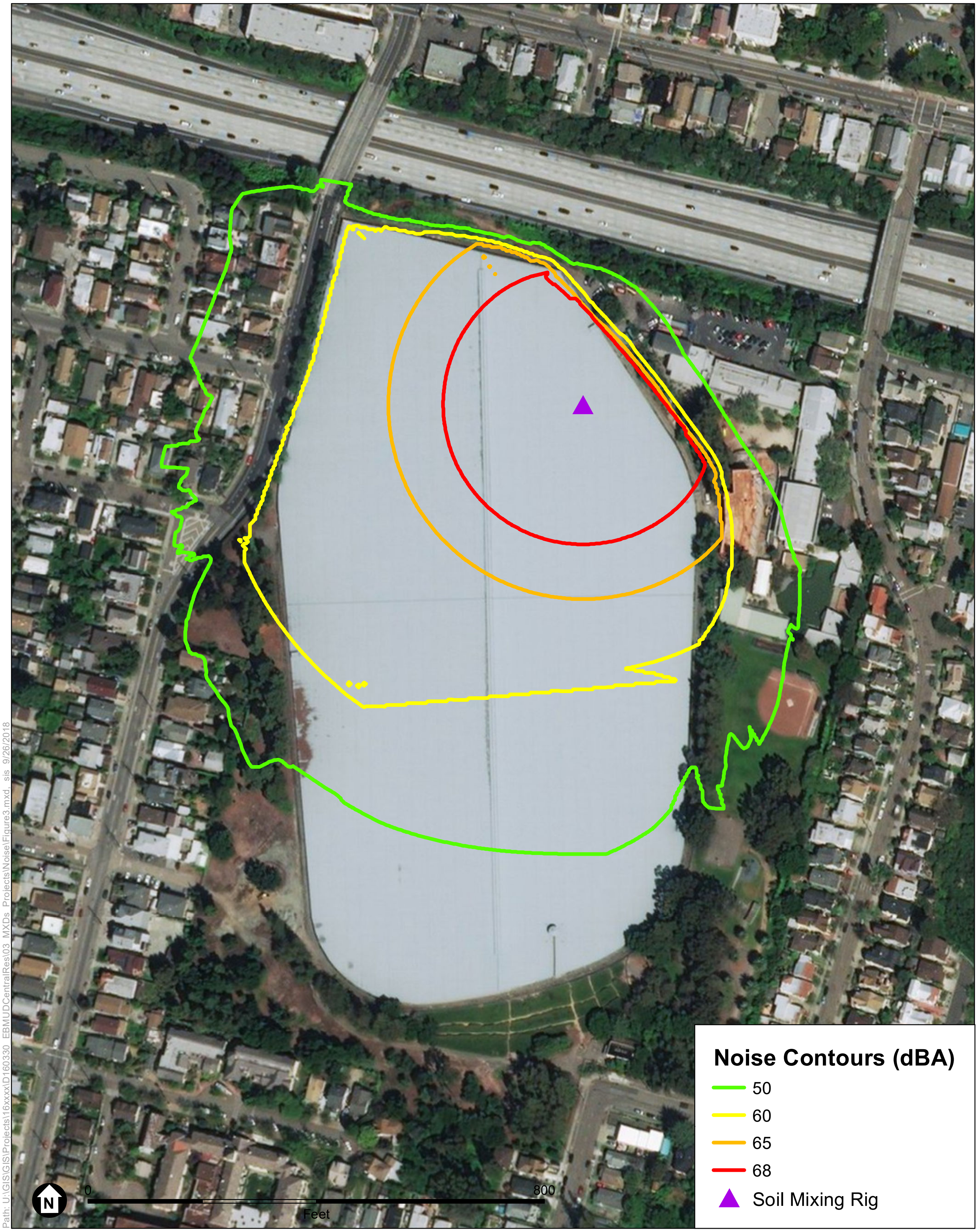


SOURCE: ESRI; ESA, 2018.

D160330 EBMUD Central Reservoir

Figure 2
Noise Contour Map
West Rig Location

ESA

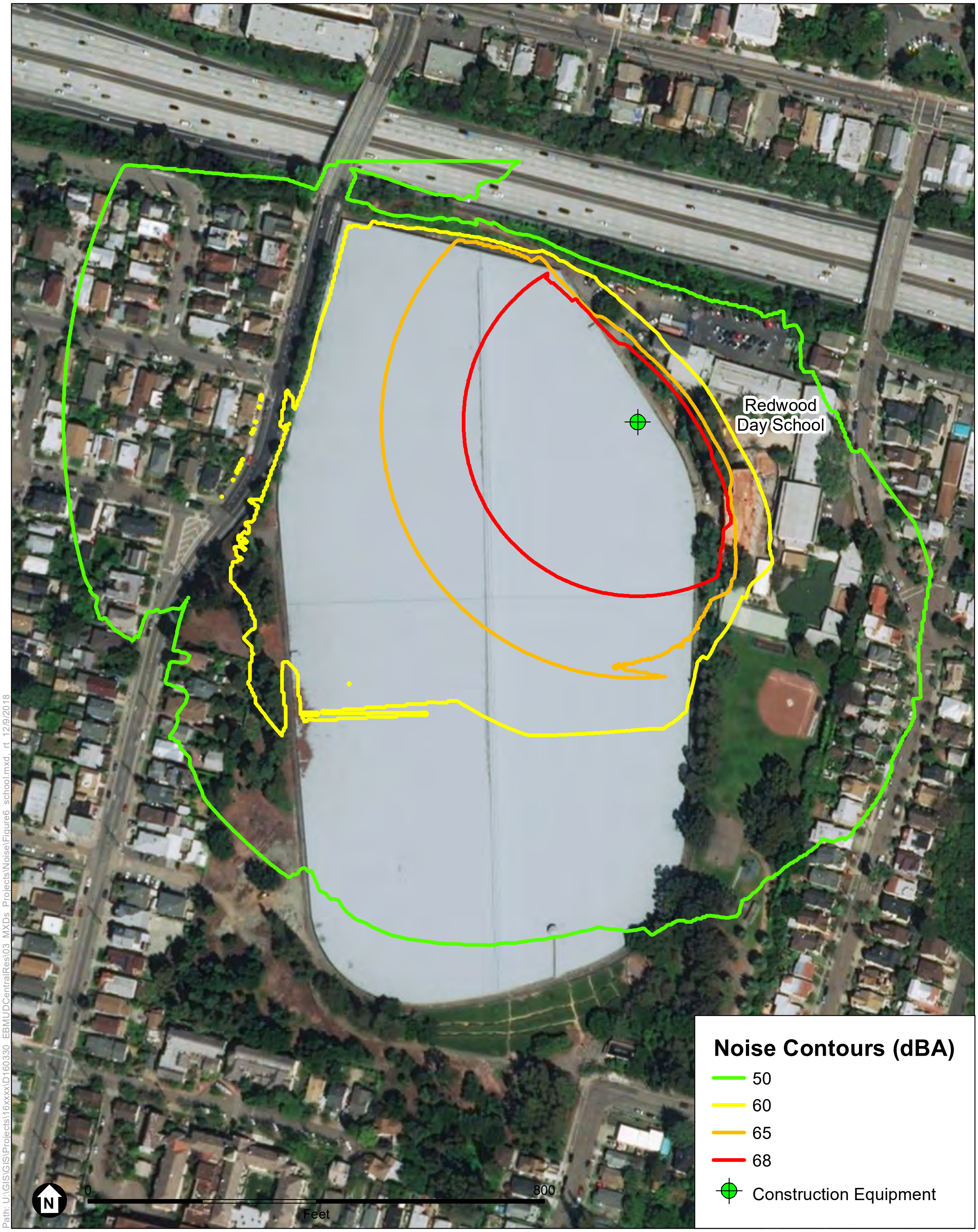


SOURCE: ESRI; ESA, 2018.

D160330 EBMUD Central Reservoir

Figure 3
Noise Contour Map
East Rig Location

ESA



SOURCE: ESRI; ESA, 2018.

D160330 EBMUD Central Reservoir

Figure 4
Noise Contours with Construction Equipment at Eastern Location

ESA

J4: Truck Noise modeling from the Traffic Noise Model

Truck Noise On site pipe and valve

* * * * CASE INFORMATION * * * *

* * * * Results calculated with TNM Version 2.5 * * * *

Trucks Pipe & Valve

* * * * TRAFFIC VOLUME/SPEED INFORMATION * * * *

Automobile volume (v/h):	0.0
Average automobile speed (mph):	0.0
Medium truck volume (v/h):	0.0
Average medium truck speed (mph):	0.0
Heavy truck volume (v/h):	1.0
Average heavy truck speed (mph):	15.0
Bus volume (v/h):	0.0
Average bus speed (mph):	0.0
Motorcycle volume (v/h):	0.0
Average Motorcycle speed (mph):	0.0

* * * * TERRAIN SURFACE INFORMATION * * * *

Terrain surface: hard

* * * * RECEIVER INFORMATION * * * *

DESCRIPTION OF RECEIVER # 1

Redwood Day School

Distance from center of 12-ft wide, single lane roadway (ft):	65.0
A-weighted Hourly Equivalent Sound Level without Barrier (dBA):	45.8

DESCRIPTION OF RECEIVER # 2

Eardley Residence

Distance from center of 12-ft wide, single lane roadway (ft):	140.0
A-weighted Hourly Equivalent Sound Level without Barrier (dBA):	42.7

DESCRIPTION OF RECEIVER # 3

23rd Residence

Distance from center of 12-ft wide, single lane roadway (ft):	225.0
A-weighted Hourly Equivalent Sound Level without Barrier (dBA):	40.6

Truck Noise On site pipe and valve

DESCRIPTION OF RECEIVER # 4

East 29th Residence

Distance from center of 12-ft wide, single lane roadway (ft):	675.0
A-weighted Hourly Equivalent Sound Level without Barrier (dBA):	35.2

Truck noise on site Restoration

* * * * CASE INFORMATION * * * *

* * * * Results calculated with TNM Version 2.5 * * * *

Site Restroration Trucks

* * * * TRAFFIC VOLUME/SPEED INFORMATION * * * *

Automobile volume (v/h):	0.0
Average automobile speed (mph):	0.0
Medium truck volume (v/h):	0.0
Average medium truck speed (mph):	0.0
Heavy truck volume (v/h):	1.0
Average heavy truck speed (mph):	15.0
Bus volume (v/h):	0.0
Average bus speed (mph):	0.0
Motorcycle volume (v/h):	0.0
Average Motorcycle speed (mph):	0.0

* * * * TERRAIN SURFACE INFORMATION * * * *

Terrain surface: hard

* * * * RECEIVER INFORMATION * * * *

DESCRIPTION OF RECEIVER # 1

Redwood Day School

Distance from center of 12-ft wide, single lane roadway (ft):	65.0
A-weighted Hourly Equivalent Sound Level without Barrier (dBA):	45.8

DESCRIPTION OF RECEIVER # 2

Eardley Residence

Distance from center of 12-ft wide, single lane roadway (ft):	75.0
A-weighted Hourly Equivalent Sound Level without Barrier (dBA):	45.3

DESCRIPTION OF RECEIVER # 3

23rd Residence

Distance from center of 12-ft wide, single lane roadway (ft):	100.0
A-weighted Hourly Equivalent Sound Level without Barrier (dBA):	44.0

Truck noise on site Restoration

DESCRIPTION OF RECEIVER # 4

East 29th Residence

Distance from center of 12-ft wide, single lane roadway (ft):	160.0
A-weighted Hourly Equivalent Sound Level without Barrier (dBA):	42.1

Truck Noise On site substructure

* * * * CASE INFORMATION * * * *

* * * * Results calculated with TNM Version 2.5 * * * *

Substructure

* * * * TRAFFIC VOLUME/SPEED INFORMATION * * * *

Automobile volume (v/h):	0.0
Average automobile speed (mph):	0.0
Medium truck volume (v/h):	0.0
Average medium truck speed (mph):	0.0
Heavy truck volume (v/h):	1.0
Average heavy truck speed (mph):	15.0
Bus volume (v/h):	0.0
Average bus speed (mph):	0.0
Motorcycle volume (v/h):	0.0
Average Motorcycle speed (mph):	0.0

* * * * TERRAIN SURFACE INFORMATION * * * *

Terrain surface: hard

* * * * RECEIVER INFORMATION * * * *

DESCRIPTION OF RECEIVER # 1

Redwood Day School

Distance from center of 12-ft wide, single lane roadway (ft):	140.0
A-weighted Hourly Equivalent Sound Level without Barrier (dBA):	42.7

DESCRIPTION OF RECEIVER # 2

Eardley Residence

Distance from center of 12-ft wide, single lane roadway (ft):	170.0
A-weighted Hourly Equivalent Sound Level without Barrier (dBA):	41.8

DESCRIPTION OF RECEIVER # 3

23rd Residence

Distance from center of 12-ft wide, single lane roadway (ft):	420.0
A-weighted Hourly Equivalent Sound Level without Barrier (dBA):	37.7

Truck Noise On site substructure

DESCRIPTION OF RECEIVER # 4

East 29th Residence

Distance from center of 12-ft wide, single lane roadway (ft):	980.0
A-weighted Hourly Equivalent Sound Level without Barrier (dBA):	33.1

Truck Noise

* * * * CASE INFORMATION * * * *

* * * * Results calculated with TNM Version 2.5 * * * *

Haul trucks and Worker Trips for Centrat Reservoir Demolition

* * * * TRAFFIC VOLUME/SPEED INFORMATION * * * *

Automobile volume (v/h):	9.0
Average automobile speed (mph):	25.0
Medium truck volume (v/h):	0.0
Average medium truck speed (mph):	0.0
Heavy truck volume (v/h):	9.0
Average heavy truck speed (mph):	25.0
Bus volume (v/h):	0.0
Average bus speed (mph):	0.0
Motorcycle volume (v/h):	0.0
Average Motorcycle speed (mph):	0.0

* * * * TERRAIN SURFACE INFORMATION * * * *

Terrain surface:	hard

* * * * RECEIVER INFORMATION * * * *

DESCRIPTION OF RECEIVER # 1

Roadside

Distance from center of 12-ft wide, single lane roadway (ft):	32.8
A-weighted Hourly Equivalent Sound Level without Barrier (dBA):	57.0

APPENDIX K

Transportation Impact Study

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EBMUD Central Reservoir Replacement Project

Transportation Impact Study - Draft 2 – September 2019

Prepared For: East Bay Municipal Utility District

Consulting Group

220 Montgomery Street, Suite 346 San Francisco, CA 94104

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1.0 INTRODUCTION

This Transportation Impact Study (TIS) has been prepared as a resource document for the Environmental Evaluation of the proposed Central Reservoir Replacement Project (herein referred to as the "Project"). The purpose of the TIS is to complete the technical analyses and documentation necessary to prepare an Environmental Impact Report (EIR) for the Project pursuant to the California Environmental Quality Act (CEQA). The TIS documents the existing transportation network and assesses potential transportation impacts associated with the construction-related and operational traffic for the Project.

1.1 Project Understanding

East Bay Municipal Utility District (EBMUD) owns and operates the Central Reservoir, which provides emergency and operational storage to about 52,000 metered services in the Cities of Oakland, Emeryville, and Alameda. The project site is located on a 26-acre site in the City of Oakland, and is generally bounded by 23rd Avenue to the west, Interstate 580 (I-580) to the north, Sheffield Avenue to the east, and East 29th Street to the south. Surrounding land uses include residential developments, Redwood Day School, and Central Reservoir Recreation Area. **Figure 1** presents the location of project site. The Project would include the replacement of the Central Reservoir and a design option that would lease a strip of property and authorize the Redwood Day School to construct a private driveway along the north end of the existing reservoir property at Ardley Avenue.

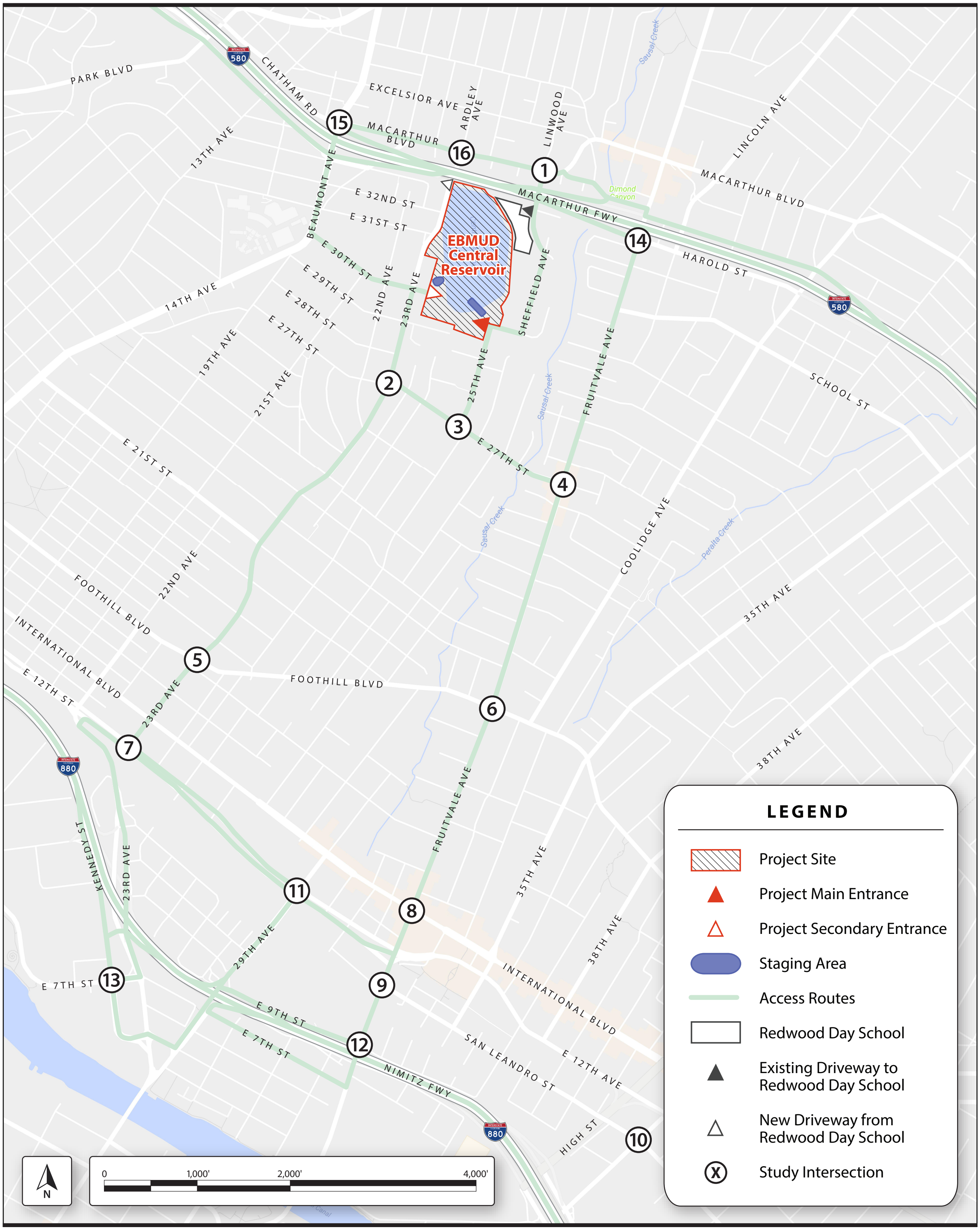
The Project would replace the existing 154-million-gallon (MG) reservoir with smaller tanks or a combination of tanks totaling 50 MG. The new tanks would be constructed on engineered fill to achieve an overflow elevation that is 20 feet higher than the existing reservoir. The Project would demolish the existing material storage building located on the project site, and expand the existing buried vault for the Central Rate Control Station (RCS), located on the sidewalk south of the project site, at the corner of 25th Avenue and East 29th Street, to make room for additional piping and valves.

The construction would last for approximately six years from January 2024 to December 2029. Demolition of the reservoir, embankment, a material storage building, and removal of some onsite trees would occur first, followed by earthwork and preparation of the subsurface soils. The subsurface would be improved using Cement Deep Soil Mixing (CDSM) columns, stone columns, or a combination of lightweight cellular concrete (LCC) and geopiers.

The Project would excavate approximately 199,000 cubic yards (CY) of soil on site. All of the excavated soil would be reused on site to backfill. The number of workers would vary from three to 13 workers a day depending on the phase of construction. Construction staging and worker parking would be provided on site. The primary access to the project site for both construction and operational traffic would be at the main entrance located at the northwest corner of the 25th Avenue and East 29th Street. A secondary access would be provided at the eastern terminus of East 30th Street during construction only. Construction would typically occur between 7:00 a.m. and 7:00 p.m., Monday through Friday, with afterhours or weekend construction activity limited to unplanned/unexpected occurrences or critical shutdowns and emergencies.

Following the replacement of the Central Reservoir, EBMUD would lease a strip of property and authorize the Redwood Day School to construct a private driveway along the north end of the existing reservoir property at Ardley Avenue. If this design option is approved by the City of Oakland, the Redwood Day School would be responsible for implementing a design that addresses all traffic control, security, safety, regulatory, and permitting requirements. [1]Redwood Day School has approximately 380 students from kindergarten through eighth grade. Redwood Day School is open from 7:45 a.m. to 6:00 p.m. including extended care before 8:30 a.m. and after 3:00 p.m. Student pick-up and drop-off activities currently occur along the existing white passenger loading zone on the west side of Sheffield Avenue adjacent to the school. The new driveway on Ardley Avenue would provide a new egress location for the existing Redwood Day School parking lot.

[1] It is anticipated that the construction of the new driveway would last for approximately 15 days in July 2029. The number of worker trips and truck trips during this period would consist of approximately seven daily workers and four truck trips per day.



EBMUD Central Reservoir Replacement Project

Consulting Group

Figure 1
Project Location

1.2 Study Scope and Approach

The analyses focus on short-term transportation impacts related to the Project construction and long-term impacts associated with operation of the Central Reservoir and the new driveway on Ardley Avenue after construction.

Scenario Development

The TIS scope of work includes analysis of transportation impacts under Existing and Existing plus Project conditions. Existing conditions are assumed to represent the existing conditions "on the ground" at the TIS commencement; Existing plus Project conditions represent Existing conditions with added construction or operational traffic.

Travel Demand Estimation

Short-Term Construction Traffic – Project travel demand during construction is estimated based on the number of construction related vehicle trips needed in each phase of the Project. For the purpose of conservative traffic analyses, all workers are assumed to drive alone to the project site. As an analytical assumption, about half of the construction workers are assumed to originate from north of the project site and the remaining half are assumed to originate from south of the project site. The truck access to and from the project site would be limited to I-880 due to California Vehicle Code Section 35655.5, which prohibits trucks over 4.5 tons from traveling on I-580 between Grand Avenue and the San Leandro border. It is anticipated that construction workers would use the most direct access routes to and from the project site via I-580.

Long-Term Operational Traffic – Project travel demand for the Central Reservoir after construction is estimated based on the number of operation and maintenance vehicle trips needed for the facility. In addition, the number of vehicle trips affected by the new driveway on Ardley Avenue is estimated based on the existing number of vehicle trips engaged in student pick-up and drop-off activities on Sheffield Avenue. As an analytical assumption, the existing vehicles that currently make U-turns on Sheffield Avenue to pick-up or drop-off students at the Redwood Day School would be diverted to the Redwood Day School parking lot following the construction of a new driveway on Ardley Avenue.

Data Collection and Impact Analysis

Existing traffic volumes were collected during the AM and PM peak hours at major intersections along the inbound and outbound truck routes as well as construction worker travel routes that would be directly affected by the Project. The intersection turning movement counts were collected on Wednesday May 23, 2018 during the AM (7 a.m. to 9 a.m.) and PM (4 p.m. to 6 p.m.) peak periods. The locations are:

1. MacArthur Boulevard / Sheffield Avenue
2. East 27th Street / 23rd Avenue
3. East 27th Street / 25th Avenue
4. East 27th Street / Fruitvale Avenue
5. Foothill Boulevard / 23rd Avenue
6. Foothill Boulevard / Fruitvale Avenue
7. East 12th Street / 23rd Avenue
8. International Boulevard / Fruitvale Avenue
9. San Leandro Street / Fruitvale Avenue
10. San Leandro Street / High Street
11. East 12th Street / 29th Avenue
12. East 9th Street / Fruitvale Avenue
13. East 7th Street / Kennedy Street
14. Harold Street / Fruitvale Avenue
15. MacArthur Boulevard / Beaumont Avenue
16. MacArthur Boulevard / Ardley Avenue

In addition, 24-hour traffic volumes were collected on Wednesday May 23, 2018 along residential streets and in the vicinity of Redwood Day School:

1. 23rd Avenue (between East 28th Street and East 29th Street)
2. East 27th Street (west of 25th Avenue)
3. 25th Avenue (between East 27th Street and East 28th Street)
4. Ardley Avenue south of I-580
5. Sheffield Avenue north of Sausal Street
6. Sheffield Avenue south of Morrison Avenue

Major public transit facilities are described in terms of routes and stops in the vicinity of the project site, and impacts are discussed. The number of bicyclists and pedestrians traveling through area intersections was collected on Wednesday May 23, 2018. The bicycle and pedestrian activity in the vicinity of the project site are described qualitatively in this TIS. On-street parking inventory and occupancy data are presented for the area generally bounded by 22nd Avenue to the west, East 28th Street to the south, Sheffield Avenue to the east, and I-580 to the north, based on the data collected during the morning period (6 a.m. and 8 a.m.) on Wednesday June 13, 2018.

2.0 ENVIRONMENTAL SETTING

The transportation and circulation study area extends beyond the project site and includes the roadways and transportation facilities that could be affected by the Project (see **Figure 1**). The existing setting includes descriptions of roadways and documentation of existing vehicular traffic, transit service, bicycle, pedestrian, and parking conditions.

2.1 Roadway Network

2.1.1 Regional Access

The project site is immediately south of Interstate 580 (I-580) and one and a half miles north of Interstate 880 (I-880). While the regional truck access to and from the project site would be limited to I-880 due to California Vehicle Code Section 35655.5, which prohibits trucks over 4.5 tons from traveling on I-580 between Grand Avenue and the San Leandro border, construction workers would use the most direct access routes to and from the project site via I-580. The interstate freeway facilities are described below.

Interstate 580 (I-580) is a regional freeway located north of the project site, extending from U.S. 101 in Marin County to Interstate 5 south of Tracy. In the vicinity of the project site, I-580 runs in an east-west direction and has four lanes in each direction. Access to the project site from I-580 is provided through off-ramps at Fruitvale Avenue, Park Boulevard, and Montana Street, and access from the project site to I-580 is provided through on-ramps at MacArthur Boulevard and Montana Street. The speed limit on I-580 is generally 65 miles per hour (mph). In the vicinity of the project site, the average daily traffic volume on I-580 is approximately 148,500 vehicles.[2] The AM and PM peak-hour traffic volumes are approximately 12,100 and 13,800 vehicles, respectively.[3]

Interstate 880 (I-880) is a north-south freeway that runs between Interstate 80 in Oakland and the Interstate 280/Highway 17 interchange in San Jose. In the vicinity of the project site, I-880 is an eight-lane freeway with four lanes in each direction. The project site can be directly accessed from off-ramps provided on High Street, 23rd Avenue, 29th Avenue and Kennedy Street off-ramps; the nearest on-ramps are located on 29th Avenue, East 9th Street, and 23rd Avenue.[4] The speed limit on I-880 is generally 65 mph for passenger vehicles, and 55 mph for trucks that have three or more axles. In the vicinity of the project site, the average daily traffic volume on I-880 is approximately 221,000 vehicles.[5] The AM and PM peak-hour traffic volumes are approximately 10,600 and 10,200 vehicles, respectively.[6]

[2] California Department of Transportation (Caltrans) *2016 Traffic Volumes on California State Highways*, 2016
[3] Freeway Performance Measurement System, http://pems.dot.ca.gov.
[4] I-880 on-ramp and off-ramp at 29th Avenue are under construction as of June 13th, 2018, and is scheduled to be completed by summer 2018.
[5] Caltrans *2016 Traffic Volumes on California State Highways*, 2016
[6] Freeway Performance Measurement System, http://pems.dot.ca.gov.

2.1.2 Local Access

The project site is located within a residential area, and neighboring land uses along 23rd Avenue, East 29th Street and Sheffield Avenue include residences, schools (Redwood Day School and Manzanita Community School), recreational facilities (Central Reservoir Recreation Area and Reservoir Baseball Diamond), and a healthcare facility (Oakland Heights Nursing and Rehabilitation). Description of the local roadways is presented below. The functional designation of local roadways was obtained from the City of Oakland General Plan. **Appendix A** shows the map of designated truck routes near the Project.

<u>Sheffield Avenue</u> is a two-way north-south street that runs between MacArthur Boulevard and East 29th Street, adjacent to the east boundary of the Project site. In the vicinity of the project site, Sheffield Avenue has one travel lane in each direction. There are on-street parking and sidewalks on both sides of the street. Sheffield Avenue has a posted speed limit of 15 mph with speed bumps. The City of Oakland General Plan identifies Sheffield Avenue as a local street.

<u>MacArthur Boulevard</u> is a two-way east-west street that runs between Camden Street and Fairmount Avenue. In the vicinity of the project site, MacArthur Boulevard has one travel lane and Class 2 bike lanes in each direction with on-street parking and sidewalks on both sides of the street. The posted speed limit on MacArthur Boulevard is 25 mph. The City of Oakland General Plan identifies MacArthur Boulevard as a regional transit street.

<u>Fruitvale Avenue</u> is a two-way north-south Street that runs between Hoover Avenue and Blanding Avenue. Fruitvale Avenue is part of designated truck routes in the City of Oakland. In the vicinity of the project site, Fruitvale Avenue has one travel lane in each direction and Class 2 bike lanes in the northbound direction between Foothill Boulevard and I-580. Between Foothill Boulevard and East 12th Street, Fruitvale Avenue has one travel lane in the southbound direction, two travel lanes in the northbound direction, and Class 3 bike routes in both directions. Sidewalks and on-street parking are generally provided on both sides of the street. The posted speed limit on Fruitvale Avenue is 25 mph. The City of Oakland General Plan identifies Fruitvale Avenue as an arterial street.

<u>San Leandro Street</u> is a two-way east-west street that runs between Fruitvale Avenue and West Broadmoor Boulevard. San Leandro Street is part of designated truck routes in the City of Oakland. In the vicinity of the project site, San Leandro Street has two travel lanes in each direction. On-street parking and sidewalks are provided on both sides of the street. The posted speed limit on San Leandro Street is 25 mph. The City of Oakland General Plan identifies San Leandro Street as an arterial street.

<u>East 30th Street</u> is a two-way east-west street that runs between 14th Avenue and 23rd Avenue and serves as the secondary entrance to the project site at its eastern terminus. In the vicinity of the project site, East 30th Street is approximately 30 feet wide and has one travel lane in each direction. There are

sidewalks and on-street parking on both sides of the street. The segment from 21st Street Avenue to 23rd Avenue is designated as a Class 3 Bike Boulevard. The speed limit on East 30th Street is 25 mph. The City of Oakland General Plan identifies East 30th Street as a local street.

East 29th Street is a two-way east-west street that runs intermittently between 14th Avenue and Sheffield Avenue. In the vicinity of the project site, East 29th Street has one travel lane in each direction. Sidewalks and on-street parking are generally provided on both sides of the street. The speed limit on East 29th Street is 25 mph. The City of Oakland General Plan identifies East 29th Street as a local street.

East 27th Street is a two-way east-west street that runs intermittently between 13th Avenue and Coolidge Avenue. In the vicinity of the project site, East 27th Street has one travel lane in each direction. Sidewalks and on-street parking are generally provided on both sides of the street. The speed limit on East 27th Street is 25 mph. The City of Oakland General Plan identifies East 27th Street as a local street.

East 12th Street is a two-way east-west street that runs between 1st Avenue and 54th Avenue. East 12th Street is part of designated truck routes in the City of Oakland. In the vicinity of the project site, East 12th Street has two travel lanes and Class 2 bike lanes in each direction with a center median. Sidewalks are generally provided on both sides of the street, and on-street parking is provided on the south side of the street. The speed limit on East 12th Street is 30 mph. The City of Oakland General Plan identifies East 12th Street as an arterial street.

East 7th Street is a two-way east-west street that runs between Kennedy Street and Fruitvale Avenue. In the vicinity of the project site, East 7th Street has one travel lane in each direction. Sidewalks and on-street parking are generally provided on both sides of the street. The segment from 23rd Avenue to Fruitvale Avenue is designated as a Class3 Bike Boulevard. East 7th Street has a posted speed limit of 15 mph with bumps. The City of Oakland General Plan identifies East 7th Street as a local street.

29th Avenue is a two-way north-south street that runs between Park Street Bridge and East 17th Street. In the vicinity of the project site, 29th Avenue has two travel lanes in each direction, and parking is prohibited. Sidewalks are provided on both sides of the street. The posted speed limit on 29th Avenue is 25 mph. The City of Oakland General Plan identifies 29th Avenue as an arterial street.

25th Avenue is a two-way north-south street that runs intermittently between East 10th Street and East 29th Street. In the vicinity of the project site, 25th Avenue has one travel lane in each direction. Sidewalks and on-street parking are generally provided on both sides of the street. The speed limit on 25th Avenue is 25 mph. The City of Oakland General Plan identifies 25th Avenue as a local street.

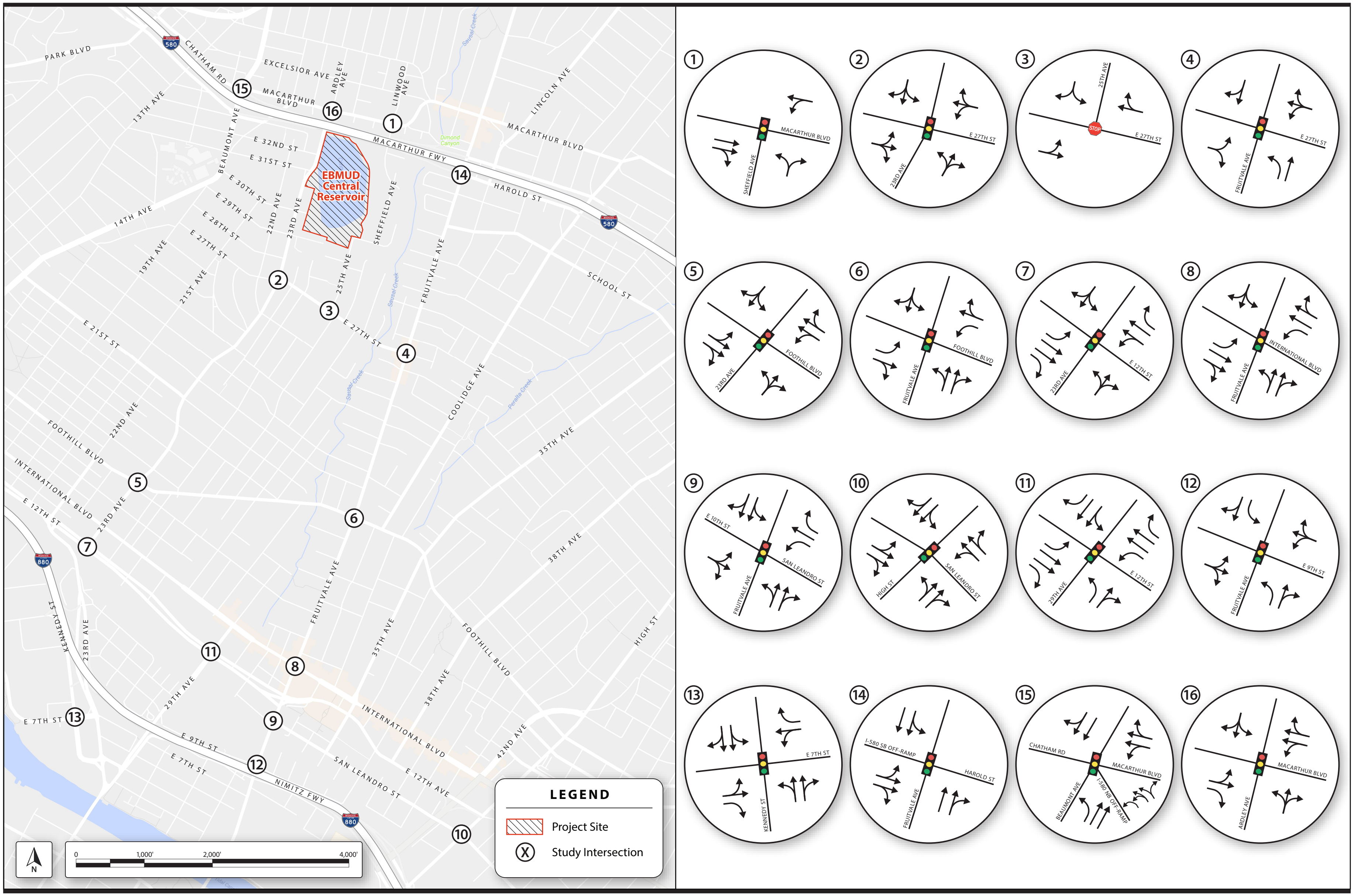
23rd Avenue is a two-way north-south street that runs intermittently between Park Street Bridge and East 31st Street(i.e., the street runs continuously between the Park Street Bridge and East 12th Street, then there is a break in the street along East 12th Street near International Boulevard, then the street picks up again and runs continuously to East 31st Street). 23rd Avenue is part of designated truck routes in the City of Oakland. In the vicinity of the project site, 23rd Avenue has one travel lane in each direction. Sidewalks and on-street parking are generally provided on both sides of the street. The segment from East 30th Street to East 31st Street is designated as a Class 3 Bike Route. The posted speed limit on 23rd Avenue is 30 mph. The City of Oakland General Plan identifies 23rd Avenue as a local transit street.

2.2 Existing Traffic Operations

2.2.1 Intersection Levels of Service

A total of 16 intersections, 15 signalized and 1 stop-controlled) were analyzed for the purposes of this TIS. Traffic operating characteristics of intersections are described by the concept of level of service (LOS). Signalized intersection LOS is stated in terms of average control delay per vehicle (in seconds) during a specified time period like AM and PM peak hours. Control delay is a measure based on many variables, including signal phasing and coordination, signal cycle length, and traffic volumes with respect to intersection capacity and resulting queues. All-way stop control intersection LOS is expressed in terms of the weighted average control delay of the overall intersection. Intersection LOS ranges from A, which indicates free flow or excellent conditions with short delays, to F, which indicates congested or overloaded conditions with extremely long delays.

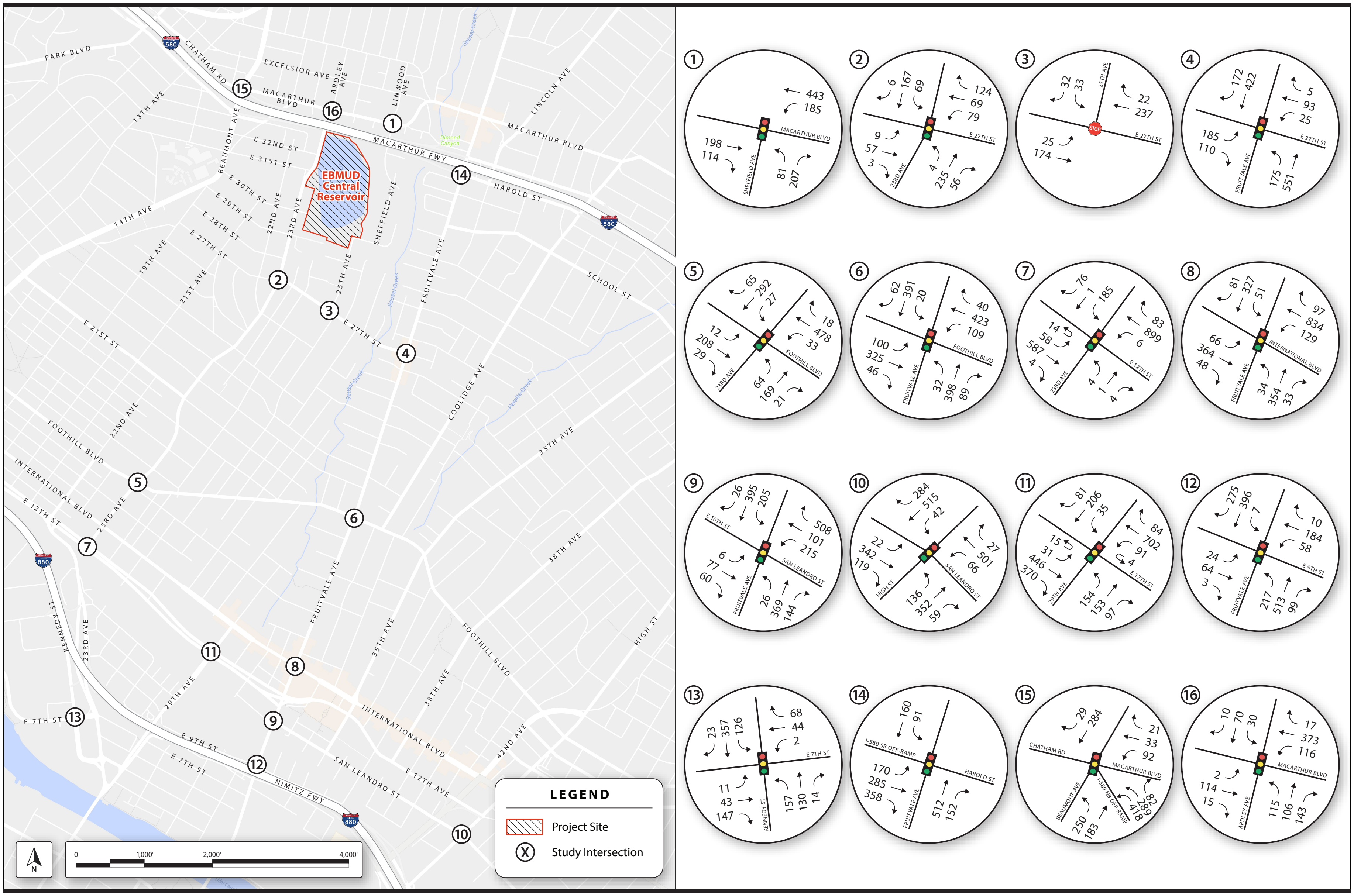
Intersection LOS for each intersection was analyzed for a 60-minute period when the highest traffic volume was recorded at each intersection during the peak period. Existing intersection turning movement counts were collected on Wednesday, May 23, 2018 during the AM (7 a.m. to 9 a.m.) and PM (4 p.m. to 6 p.m.) peak periods. **Figure 2** shows the lane configurations, and **Figures 3A** and **3B** show the existing vehicle turning movement volumes in AM and PM peak hours for the study intersections, respectively. Intersection turning movement count data is provided in **Appendix B**.



EBMUD Central Reservoir Replacement Project

Consulting Group

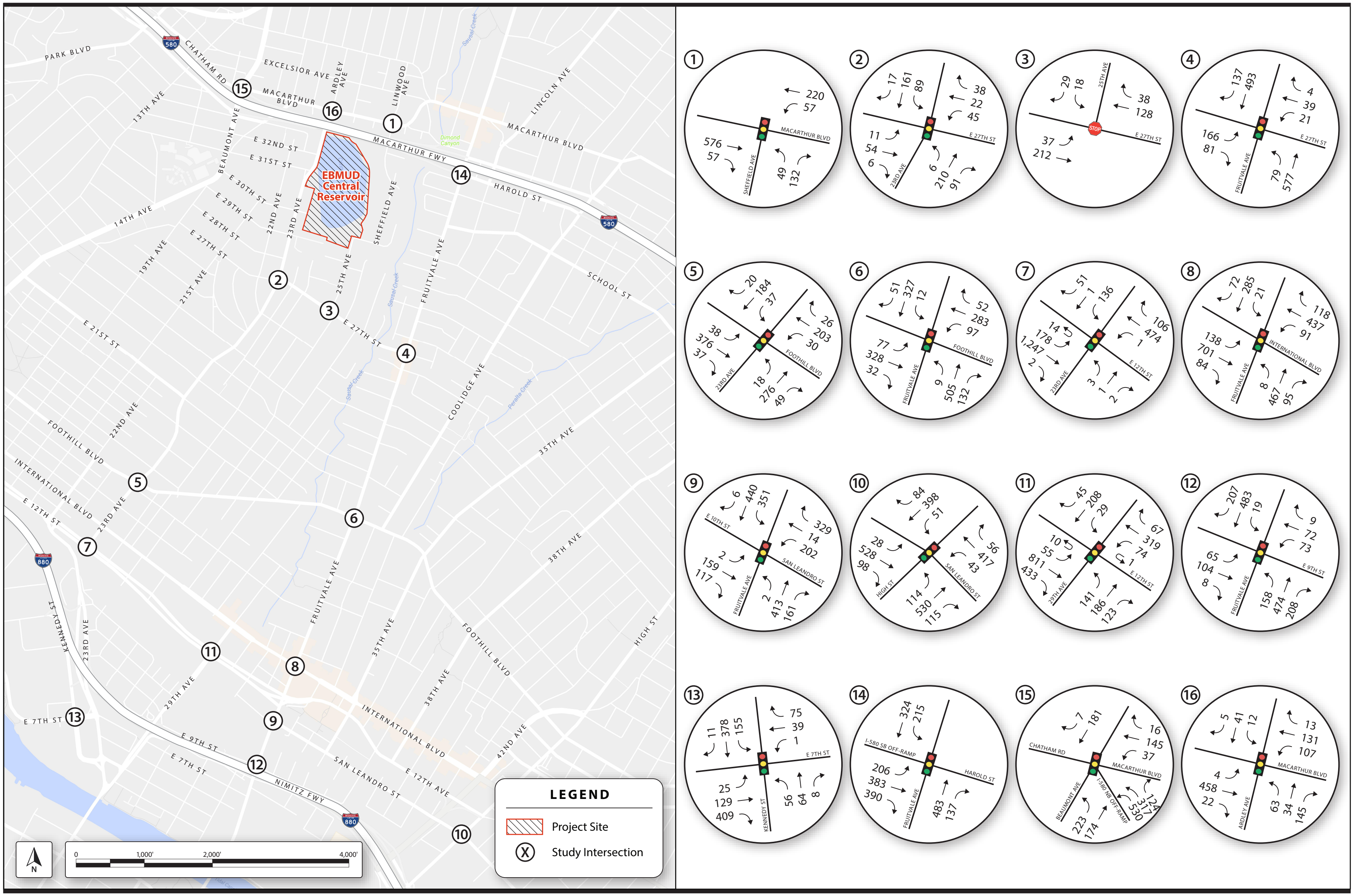
Figure 2
Intersection Lane Configurations



EBMUD Central Reservoir Replacement Project

Figure 3A
Existing Intersection Turning Movement Volumes (AM Peak Hour)

chs Consulting Group



EBMUD Central Reservoir Replacement Project

Consulting Group

Figure 3B
Existing Intersection Turning Movement Volumes (PM Peak Hour)

The intersections were evaluated using the *2000 Highway Capacity Manual* (HCM) operations methodology which determines the capacity for each lane group approaching the intersection. LOS is then based on the average stopped delay per vehicle (seconds per vehicle) for the various movements within the intersection. **Table 1** presents the LOS and delay data for the study intersections under the Existing conditions. It shows that all study intersections currently operate at LOS D or better during the AM and PM peak hours under existing conditions. Intersection LOS calculations are provided in **Appendix C**. It is noted that according to the City of Oakland's Transportation Impact Review Guidelines, the City does no longer has a standard for intersection LOS.

Table 1 – Intersection Level of Service: Existing Weekday AM and PM Peak Hours

Intersection	Control	AM Peak Hour		PM Peak Hour	
		Delay (s)	LOS	Delay (s)	LOS
1. MacArthur Boulevard / Sheffield Avenue	Signal	12	B	7.1	A
2. East 27th Street / 23rd Avenue	Signal	12.6	B	12.7	B
3. East 27th Street / 25th Avenue	AWSC[1]	9.5	A	8.7	A
4. East 27th Street / Fruitvale Avenue	Signal	29.6	C	17.9	B
5. Foothill Boulevard / 23rd Avenue	Signal	11	B	12.2	B
6. Foothill Boulevard / Fruitvale Avenue	Signal	42.2	D	28.4	C
7. East 12th Street / 23rd Avenue	Signal	24.6	C	16.4	B
8. International Boulevard / Fruitvale Avenue	Signal	18.7	B	17.7	B
9. San Leandro Street / Fruitvale Avenue	Signal	32.6	C	37	D
10. San Leandro Street / High Street	Signal	28.8	C	29.7	C
11. East 12th Street / 29th Avenue	Signal	35	C	35.4	D
12. East 9th Street / Fruitvale Avenue	Signal	15.8	B	14.2	B
13. East 7th Street / Kennedy Street	Signal	9.7	A	12	B
14. Harold Street / Fruitvale Avenue	Signal	20.5	C	21.4	C
15. MacArthur Boulevard / Beaumont Avenue	Signal	34.8	C	47.1	D
16. MacArthur Boulevard / Ardley Avenue	Signal	12.5	B	9.2	A

Source: CHS Consulting Group, 2018.
Notes:
1. AWSC = All-way stop-controlled.

2.2.2 Daily Traffic Conditions

The 24-hour traffic counts were collected on Wednesday, May 23, 2018 along 25th Avenue, 23rd Avenue and East 27th Street. 23rd Avenue carries the heaviest traffic volumes with approximately 6,100 daily vehicle trips. In the vicinity of Redwood Day School, Sheffield Avenue and Ardley Avenue carry approximately 2,870 and 5,390 daily vehicle trips, respectively. The peak hour of traffic on Sheffield Avenue occurs between 7:30 a.m. and 8:30 a.m. just before the school starts with approximately 580 vehicle trips. **Table 2** presents the summary of daily and peak hour traffic volumes along 25th Avenue, 23rd Avenue, East 27th Street, Sheffield Avenue, and Ardley Avenue. **Appendix B** includes detailed traffic volume data.

Table 2 – Weekday Daily, 12-Hour, and Peak Hour Traffic Volumes along Residential Streets

Street	Direction	# of Lanes	Daily Volume[1]	Peak Hour		
				Time	Volume	Percent of Daily
25th Avenue	Northbound	1	456	5 p.m. – 6 p.m.	61	13%
	Southbound	1	408		46	11%
	Total	2	864		107	12%
23rd Avenue	Northbound	1	3,317	7:45 a.m. – 8:45 a.m.	338	10%
	Southbound	1	2,809		233	8%
	Total	2	6,126		571	9%
East 27th Street	Eastbound	1	1,728	8 a.m. – 9 a.m.	179	10%
	Westbound	1	1,821		261	14%
	Total	2	3,549		440	12%
Sheffield Avenue South of RDS	Northbound	1	679	4:30 p.m. – 5:30 p.m.	56	8%
	Southbound	1	560		94	17%
	Total	2	1,239		150	12%
Sheffield Avenue North of RDS	Northbound	1	1,494	7:30 a.m. – 8:30 a.m.	282	19%
	Southbound	1	1,377		298	22%
	Total	2	2,871		580	20%
Ardley Avenue	Northbound	1	3,210	7:45 a.m. – 8:45 a.m.	368	11%
	Southbound	1	2,179		211	10%
	Total	2	5,389		579	11%

Source: CHS Consulting Group, May 23, 2018.
Notes:
1. Represents the average of 24-hour counts
RDS=Redwood Day School

2.3 Transit Network

The Alameda-Contra Costa Transit District (AC Transit) serves 13 cities and adjacent unincorporated areas in Alameda and Contra Costa counties and the Transbay Terminal in San Francisco.[7] AC Transit operates two local bus routes within a quarter-mile radius of the project site:

Route 62 operates between West Oakland Bay Area Rapid Transit (BART) Station and Fruitvale BART Station via 7th Street, 10th Street, 8th Avenue, 23rd Avenue, and East 12th Street. Service is provided from 5:30 a.m. to 12:30 a.m. at 15 to 20-min headways throughout the day. The nearest bus stop to the project site is located at the intersection of 23rd Avenue and East 30th Street, approximately 200 feet west of the secondary entrance to the project site.

Route 14 operates between West Oakland BART Station and Fruitvale BART Station via 14th Street, East 21st Street, 25th Avenue, East 27th Street, Fruitvale Avenue, Brookdale Avenue, Coolidge Avenue, 35th Avenue, MacArthur Boulevard, High Street and International Boulevard. Service is provided from 5 a.m. to 11 p.m. at 15-min headway during peak periods and 30-min headway during non-peak periods. The nearest bus stop to the project site is located at the intersection of 25th Avenue and East 27th Street, approximately 1,300 feet south of the Project secondary entrance. **Appendix D** shows the map of available transit services in the vicinity of the project site.

Regional transit service is primarily provided by BART at Fruitvale Station, located about one-and-a-half-miles south of the project site.

[7] Cities served by AC Transit include the Cities of Alameda, Albany, Berkeley, Emeryville, Fremont, Hayward, Newark, Oakland, Piedmont, San Leandro, Union City, El Cerrito and Richmond.

2.4 Bicycle Conditions

Bikeways are classified as bicycle paths (Class 1), bicycle lanes (Class 2), or bicycle routes (Class 3) according to City of Oakland Bicycle Master Plan. Class 1 bikeways (bicycle paths) provide for bicycle travel on a paved right-of-way that is completely separated from the street. Class 2 bikeways (bicycle lanes) are striped lanes on streets, designated with specific signage and stencils, for the use of bicyclists. Class 3 bikeways (bicycle routes) designate preferred streets for bicycle travel using lanes shared with motor vehicles. Arterial bicycle routes, bicycle boulevards, and neighborhood connectors are the three types of Class 3 bikeways in the City of Oakland. The following bicycle facilities are provided in the vicinity of the project site. **Appendix E** shows the map of bicycle facilities.

- Class 2 bikeways (bicycle lanes):
    - East 12th Street (both direction)
    - MacArthur Boulevard (both direction)
    - Ardley Avenue (both direction between East 31st Street and MacArthur Boulevard)
    - Fruitvale Avenue (northbound direction between Foothill Boulevard and I-580)
- Class 3 bikeways (bicycle routes):
    - 23rd Avenue (between East 30th Street and East 31st Street)
    - Fruitvale Avenue (between Foothill Boulevard and East 7th Street)
    - East 7th Street (between 23rd Avenue and Fruitvale Avenue)
    - East 30th Street (between 21st Avenue and 23rd Avenue)

According to the bicycle counts collected during the weekday AM (7 a.m. to 9 a.m.) and PM (4 p.m. to 6 p.m.) peak periods on Wednesday, May 23, 2018, there were up to 15 bicyclists on Fruitvale Avenue near East 27th Street during peak hours. **Appendix B** includes bicycle counts at all study intersections.

2.5 Pedestrian Conditions

In the vicinity of the project site, sidewalks are provided on both sides of all roadways including local roads, collectors and arterials. Sidewalks are approximately 5 to 6 feet wide along 23rd Avenue, East 27th Street and 25th Avenue.

Based on pedestrian counts during the weekday AM (7 a.m. to 9 a.m.) and PM (4 p.m. to 6 p.m.) peak periods on Wednesday, May 23, 2018, there are up to 130 pedestrians crossing at the 25th Avenue and East 27th Street intersection near the Manzanita Community School during the AM and PM peak hours. The pedestrian volumes are generally higher along Fruitvale Avenue with up to 540 pedestrian crossings at the intersection of Fruitvale Avenue and Foothill Boulevard during the peak hours. **Appendix B** includes pedestrian counts.

2.6 Parking Conditions

The project site is located in a residential area, and on-street parking is generally allowed on both sides of the street where curb space is provided. An on-street parking survey was conducted on Wednesday, June 13, 2018 during the morning period (6 a.m. to 8 a.m.). The survey area is generally bounded by 22nd Avenue to the west, East 28th Street to the south, Sheffield Avenue and McKillop Road to the east, and East 31st Street to the north. Parking supply and occupancy information is provided in **Table 3**. There are a total of 389 publicly available on-street parking spaces in the study area, and the average occupancy rate was around 55 percent during the morning period.

Table 3 – On-street Parking Supply and Occupancy during Weekday Morning Period

Street	From	To	Supply (spaces)	Occupancy (percent)
22nd Avenue	East 28th Street	East 29th Street	19	70%
	East 29th Street	East 30th Street	20	60%
	East 30th Street	East 31st Street	38	60%
23rd Avenue	East 28th Street	East 29th Street	21	60%
	East 29th Street	East 30th Street	19	50%
	East 30th Street	East 31st Street	36	60%
East 28th Street	22nd Avenue	23rd Avenue	14	60%
	Dead end	25th Avenue	25	55%
	25th Avenue	Garden Street	14	60%
East 29th Street	22nd Avenue	23rd Avenue	15	50%
	Project main entrance	Sheffield Avenue	21	30%
East 30th Street	22nd Avenue	23rd Avenue	18	75%
	23rd Avenue	Project secondary entrance	8	75%
East 31st Street	22nd Avenue	23rd Avenue	19	50%
25th Avenue	East 28th Street	Project main entrance	20	45%
Sheffield Avenue	East 29th Street	Morrison Avenue	50	50%
McKillop Road	Sheffield Avenue	Dead end	32	40%
Total			389	

Source: CHS Consulting Group, June 13, 2018.

Notes: Most on-street parking spaces in the parking survey area are unmarked open spaces. Total number of parking spaces represents a rough estimate of publicly available parking spaces, assuming about 20 feet per parallel parking space.

2.7 Local Regulatory Setting

There is no federal regulation that pertains to traffic and transportation in the Project area. The policies that apply to the Project are California Vehicle Code Section 35655.5, Alameda County Transportation Commission Congestion Management Plan, the City of Oakland plans and policies, and EBMUD's Standard Construction Specifications.

2.7.1 California Vehicle Code Section 35655.5

The project site is located next to I-580 and one and a half miles north of I-880. The regional truck access to and from the project site is limited to I-880 due to California Vehicle Code Section 35655.5, which prohibits trucks over 4.5 tons from traveling on I-580 between Grand Avenue and the San Leandro border. The California Vehicle Code Section 35655.5 is shown as below:

(a) Notwithstanding this article or any other provision of law, no vehicle, as described in Sections 410 and 655, with a gross weight of 9,000 pounds or more, shall be operated on the segment of Interstate Route 580 (I-580) that is located between Grand Avenue in the City of Oakland and the city limits of the City of San Leandro. This subdivision does not apply to passenger buses or paratransit vehicles.

(b) The Department of Transportation shall erect suitable signs at each end of the portion of highway described in subdivision (a) and at any other points that the department deems necessary to give adequate notice of the weight limit imposed under this section.

2.7.2 Alameda County Transportation Commission Congestion Management Program

The Alameda County Transportation Commission (Alameda CTC) plans, funds, and delivers transportation programs and projects that expand access and improve mobility for Alameda County. Alameda CTC combines the functions of two formerly separate agencies: the Alameda County Congestion Management Agency (ACCMA), and the Alameda County Transportation Improvement Authority (ACTIA). Alameda CTC delivers the Expenditure Plan for Measure BB, the one-cent Alameda County sales tax dedicated to funding transportation projects. The Expenditure Plan contains a number of capital projects (e.g., freeway widening, interchange improvements, high-occupancy vehicle [HOV] lanes, BART extensions, and transit station development) as well as programs for local street and road improvements (e.g., fixing potholes), special transportation services for seniors and disabled individuals, bicycle and pedestrian safety, and transit operations. As the congestion management agency, the Alameda CTC is also responsible for managing the *Congestion Management Program (CMP*). The LOS standard for the freeway segments along I-580 and I-880 in the vicinity of the project site is LOS E**.**

2.7.3 The City of Oakland Plans and Policies

The City of Oakland's adopted plans and policies shape the transportation analysis framework. The overall goals of these policies are to achieve an effective, sustainable, multi-modal transportation system for the City, including the City's Complete Streets Policy, General Plan Land Use and Transportation Element, Bicycle Master Plan, and Pedestrian Master Plan, which affirm that the City will provide transportation facilities that are safe and convenient for all users of the roadway, including pedestrians, bicyclists, motorists, persons with disabilities, users and operators of public transit, seniors, children, and movers of commercial goods.

The City of Oakland published the revised Transportation Impact Review Guidelines (TIRG) in April 2017, including the City' significance criteria, thresholds of significance and screening criteria related to VMT for analysis in CEQA document/transportation studies. Intersection operations analysis may be recommended if the development project would generate more than 800 peak hour vehicle trips or 400 peak hour transit trips. The Project would have a significant effect on the environment if it would:

- Conflict with a plan, ordinance, or policy addressing the safety or performance of the circulation system, including transit, roadways, bicycle lanes, and pedestrian paths (except for automobile level of service or other measures of vehicle delay); or
- Cause substantial additional VMT per capita, per service population, or other appropriate efficiency measure; or
    - The screening criteria and thresholds of significance relevant to the Project: Public services (e.g., police, fire stations, public utilities) do not generally generate VMT. Instead, these land uses are often built in response to development from other land uses (e.g., office and residential). Therefore, these land uses can be presumed to have less-than-significant impacts on VMT. However, this presumption would not apply if the project is sited in a location that would require employees or visitors to travel substantial distances and the project is not located within 0.5 mile of a major transit stop or does not meet the small project screening criterion.
- Substantially induce additional automobile travel by increasing physical roadway capacity in congested areas (i.e., by adding new mixed-flow lanes) or by adding new roadways to the network

2.7.4 EBMUD Standard Construction Specification 01 55 26

The proposed project would be required to comply with the EBMUD's *Standard Construction Specification 01 55 26* and the *California Manual on Uniform Traffic Control Devices* (CA MUTCD). The Specification requires preparation of a Traffic Control Plan (TCP), which may require implementation of different measures, depending on the project-specific construction impacts; the characteristics of the existing transportation network; and daily and peak-hour vehicle, pedestrian, and bicycle volumes. The TCP would include, but is not necessarily limited to, the following measures:

- *Circulation and detour plans to minimize impacts to local street circulation and use of haul routes to minimize truck traffic on local roadways to the extent possible. (Part 1.2 A.1)*

- *Description of emergency response vehicle access. If the road or area is completely blocked, preventing access by an emergency responder, a contingency plan must be included (Part 1.2 A.2)*

- *Construction area signs for street closure and detours shall be posted a minimum of forty-eight hours prior to the commencement of street closure. Contractor shall maintain safe access around the Project limit at all times. (Part 1.1 C).*

- *Flaggers shall perform their duties and shall be provided with the necessary equipment in accordance with the current "Flagging Instruction Handbook" of Caltrans (Part 3.3 A.1).*

- *Where alternating one-way traffic has been authorized, the following shall be posted at each end of the one-way traffic section at least one week prior to start of work (Part 3.2 A):*
  - *The approximate beginning and ending dates that traffic delays will be encountered.*
  - *The maximum time that traffic will be delayed.*

- *Convenient access to driveways in the vicinity of work shall be maintained as much as possible. Temporary approaches to, and crossing of, intersecting traffic lanes shall be provided and kept in good condition (Part 3.1 B).*

- *Traffic signs, flashing lights, barricades and other traffic safety devices used to control traffic shall conform to the requirements of the most recently adopted edition of* California Manual on Uniform Traffic Control Devices *and the agency having jurisdiction (Part 2.1 A).*

- *All equipment and materials shall be stored in designated contractor staging areas on or adjacent to the work site, in a manner intended to minimize obstruction of traffic (Part 1.2 A.4).*

3.0 IMPACT ANALYSIS

3.1 Trip Generation

This section estimates the travel demand generated by the Project.

3.1.1 Short-Term Construction Traffic

Project construction includes the replacement of the Central Reservoir and a design option for Redwood Day School to construct a private driveway on Ardley Avenue. Construction activities would include demolition of the existing reservoir, followed by preparation of the subsurface soils, the construction of superstructure, and site restoration. Construction traffic volumes generated by the Project were estimated based on the number of construction-related vehicle trips needed in each phase of the Project. Construction-related vehicle trips include trips made by construction workers traveling to and from the project site, material truck trips and equipment delivery trips. The number of Project-generated trips would vary on a daily basis, depending on the construction phase, planned activity, and material delivery needs. **Appendix F** includes detailed trip generation worksheets. Travel demand generated by construction-related vehicles was estimated using the following assumptions:

Construction Worker Trips

The number of daily worker trips was estimated based on the number of daily construction workers assigned for each construction phase (see **Appendix F**). The phases with 13 workers would be grading and excavation as well as tank walls and columns construction. The number of workers would vary from three to 13 workers a day depending on the phase of construction. Construction shifts would generally occur between 7 a.m. and 7 p.m. To provide a conservative assessment of potential traffic impacts, all construction workers were assumed to arrive and depart the project site during the weekday AM (7 a.m. to 9 a.m.) and PM (4 p.m. to 6 p.m.) peak periods, respectively. Therefore, half of the daily construction worker trips were assumed to be inbound trips during the AM peak hour, and the remaining half were assumed to be outbound trips during the PM peak hour.

For the purpose of conservative traffic analyses, all workers are assumed to drive alone to the project site and park their vehicles in the designated staging areas within the project site (see **Figure 1**). For the analysis, it is assumed that all workers would use the most direct access routes to the project site from freeways (e.g., I-580). As an analytical assumption, about half of the workers are assumed to originate from north of the project site (via I-580 southbound) and the remaining half of the workers are assumed to originate from south of the project site (via I-580 northbound). **Figures 4** and **5** present the inbound and outbound worker access routes, respectively.

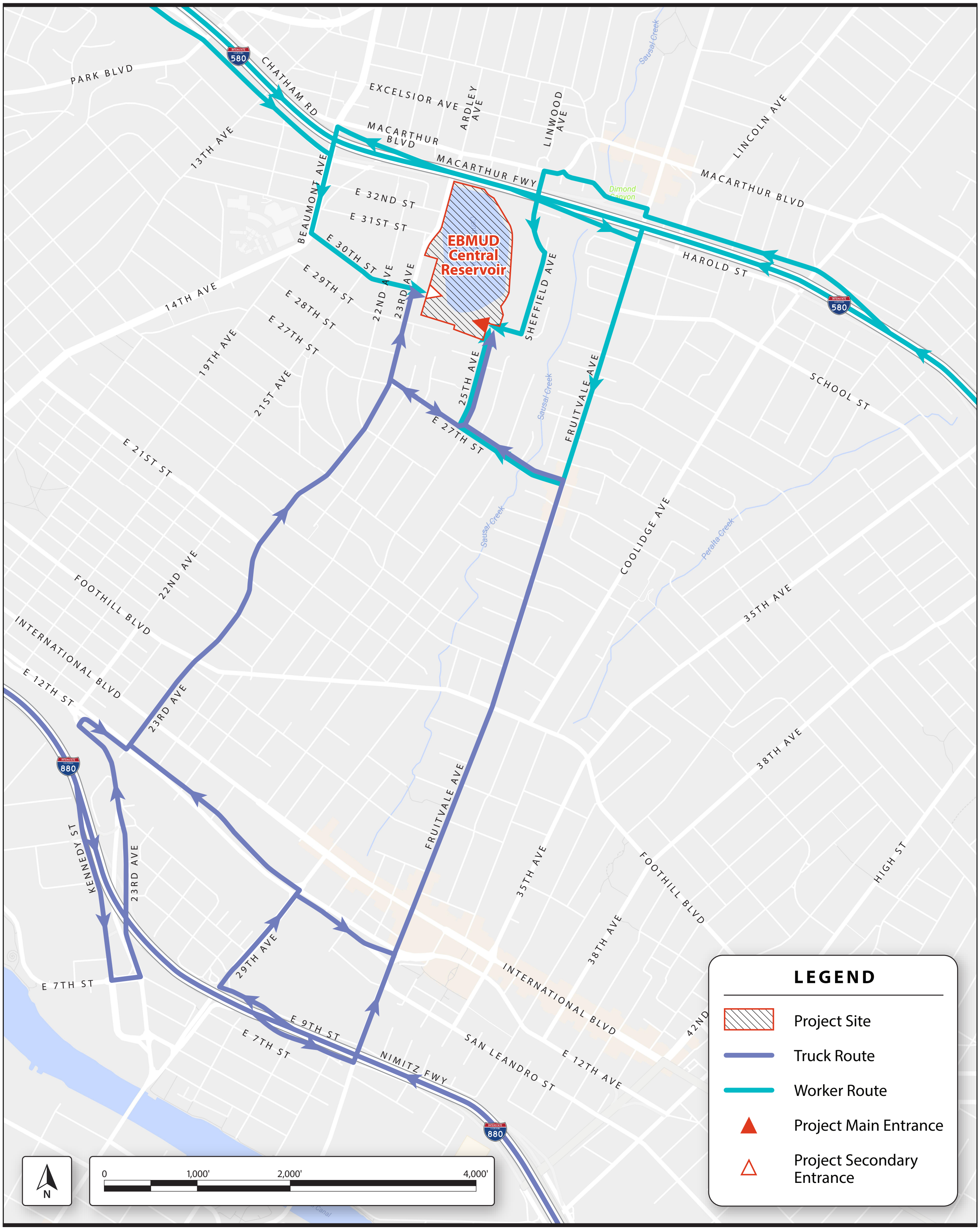


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Figure 4
Inbound Access Routes

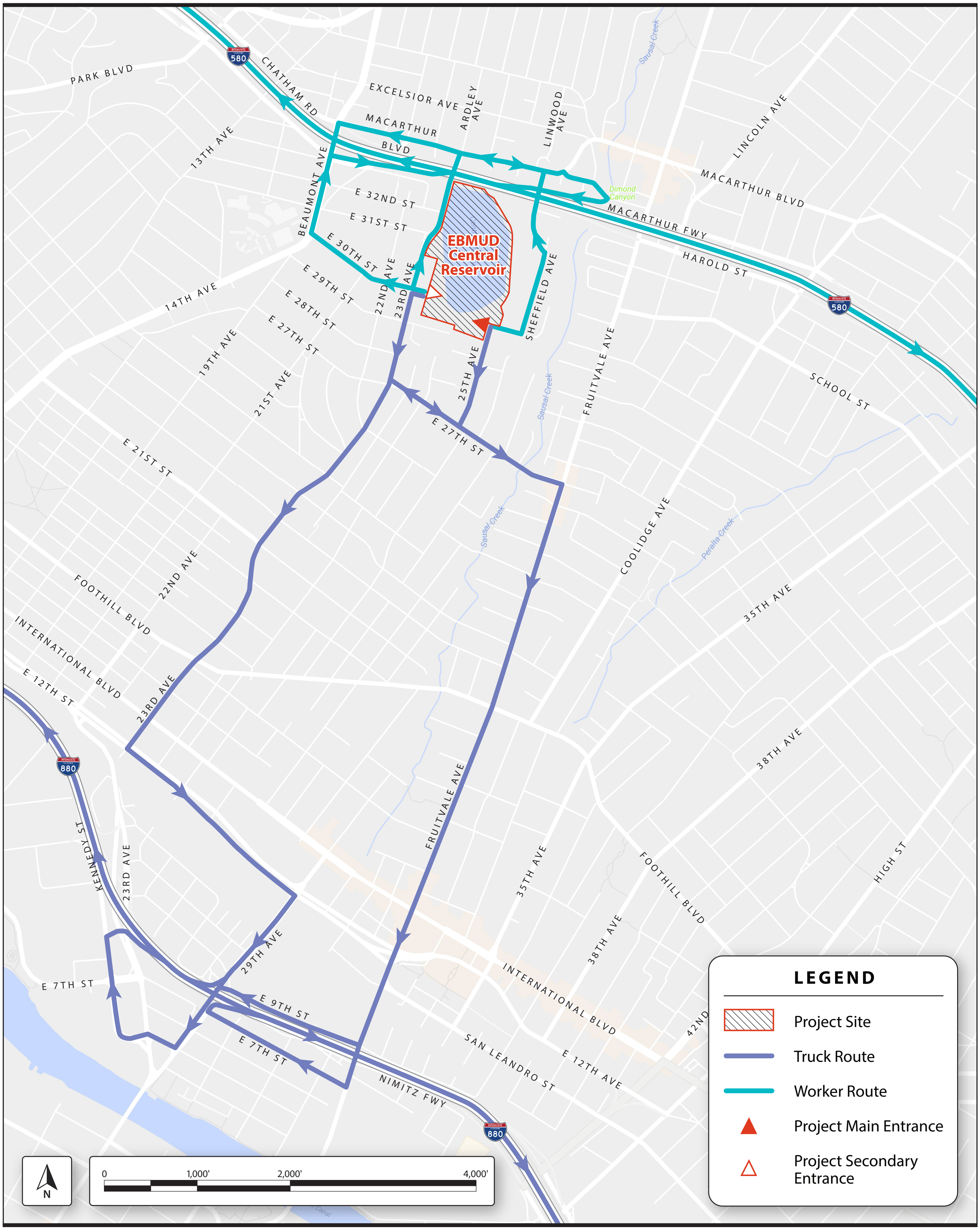

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Figure 5
Outbound Access Routes

Hauling and Material Delivery Truck Trips

Hauling truck trips would occur to dispose demolished building materials during the demolition phase between January 2024 and September 2025. Since all of the excavated soil would be reused on site to backfill, no soil debris would be hauled offsite. Material delivery trips would bring in new materials during the construction of substructure and superstructure and site restoration between February 2026 and July 2029. The number of daily hauling and material truck trips would vary substantially throughout the entire Project duration from 0 to 197 truck trips a day depending on the phase of construction. It is assumed that hauling and material truck trips would occur over a 7-hour period between 9 a.m. and 4 p.m. As an analytical assumption, half of the material truck trips are assumed to travel from north of the project site, and the remaining half of the hauling truck trips are assumed to travel from south of the Project. Due to truck restrictions on I-580, hauling and material trucks would use I-880 to access the project site. **Figures 4** and **5** present the inbound and outbound truck access routes, respectively.

Equipment Delivery Trips

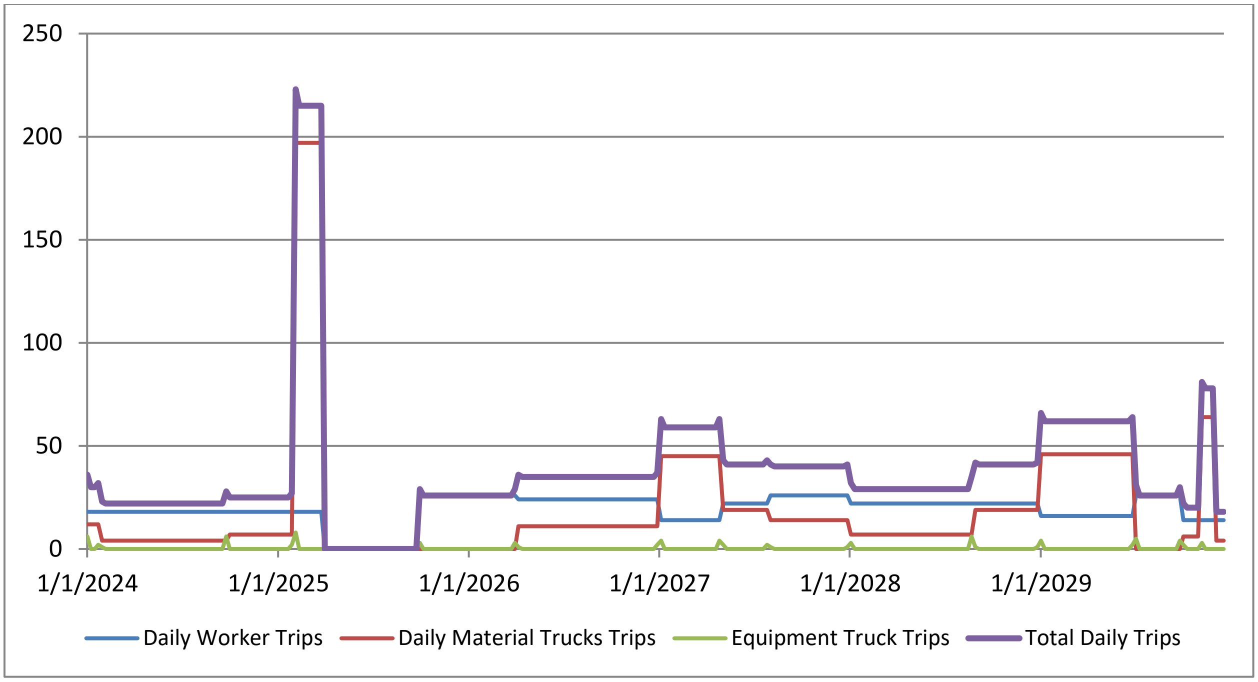
Inbound and outbound equipment delivery trips for reservoir construction would occur at the beginning and end of each phase ranging from 0 to 8 truck trips depending on the phase of construction. It is assumed that equipment delivery trips would occur between 9 a.m. and 4 p.m. As an analytical assumption, half of the delivery truck trips are assumed to travel from north of the project site, and the remaining half of the hauling truck trips are assumed to travel from south of the Project. Due to truck restriction on I-580, hauling and material trucks would use I-880 to access the project site. **Figures 4** and **5** present the inbound and outbound truck access routes, respectively.

Overall Construction Trips

The Project construction activities would occur at varying levels of intensity over the course of five years from January 2024 through December 2029. The highest volume period for worker trips, material truck trips, and equipment delivery trips would differ depending on the phase of construction. For example, the highest volume of worker trips would occur around winter 2025 for the construction of substructure and superstructure; whereas the highest volume of hauling and material truck trips would occur around spring 2025 during the removal of liner from the existing reservoir.

The total daily vehicle trips would range from 16 to 223 trips a day depending on the construction phase with an average of 38 vehicle trips a day. Overall, the highest combined construction traffic volume including worker trips, hauling and material truck trips, and equipment delivery trips would occur in spring 2025 and last for approximately eight weeks (three percent of the total construction period) during the construction of the removal of liner removal from existing reservoir. The level of construction traffic outside of the highest-volume period would be substantially lower for the majority of the time. **Exhibit 1** presents the magnitude of Project trips and their respective durations throughout the five-year construction period.

Exhibit 1 - Project Vehicle Trip Generation by Phase



Source: CHS Consulting Group, 2018

In order to develop a conservative estimate of construction traffic volumes for traffic analysis, the highest combined volume of worker trips, and hauling and material truck trips was used. The Project would generate a total of 215 daily vehicle trips during the highest-volume period, including 18 construction worker trips and 197 truck trips. As stated above, half of the daily worker trips are assumed to be inbound trips during the AM peak hour and the remaining half are assumed to be outbound trips during the PM peak hour. Daily truck trips would spread over a 7-hour period between 9 a.m. and 4 p.m. and generate an average of 28 truck trips per hour (=197/7) throughout the day. **Table 4** shows the daily and the peak hour Project trip generation during the highest volume period. **Figure 6** shows the increase in vehicle trips at key intersections located along project access routes.

Table 4 – Trip Generation during Construction

Vehicle Type	Daily			AM Peak Hour			MD Peak Hour			PM Peak Hour		
	IB	OB	Total	IB	OB	Total	IB	OB	Total	IB	OB	Total
Worker Vehicle Trips	9	9	18	9	0	9	0	0	0	0	9	9
Truck Trips	99	98	197	0	0	0	14	14	28	0	0	0
Total	108	107	215	9	0	9	14	14	28	0	9	9

Source: CHS Consulting Group, 2018.
IB = Inbound; OB = Outbound; MD = Mid-day

3.1.2 Long Term Operational Traffic

After construction, the Central Reservoir would continue to generate approximately four monthly vehicle trips for operation and maintenance.

Following the replacement of the Central Reservoir, EBMUD would lease a strip of property and authorize the Redwood Day School to construct a private driveway along the north end of the existing reservoir property at Ardley Avenue. If this design option is approved by the City of Oakland, it would not generate any additional trips; however, the existing vehicles that currently make U-turns on Sheffield Avenue to pick-up or drop-off students at the Redwood Day School would be diverted from Sheffield Avenue to Ardley Avenue. There are approximately 222 and 132 vehicle trips which currently make U-turns on southbound Sheffield Avenue at Morrison Avenue during the peak AM drop-off (7:30-8:30 a.m.) and PM pick-up (3-4 p.m.) hours, respectively. These vehicle trips would be diverted from Sheffield Avenue to Ardley Avenue through the new driveway. **Table 5** presents the projected vehicle volumes on Sheffield Avenue and Ardley Avenue after the construction of a new driveway on Ardley Avenue. **Appendix G** includes detailed traffic volume estimation on Sheffield Avenue.

Table 5 – School Trip Diversion after Construction

Location	Peak Drop Off Hour (7:30-8:30 a.m.)			Peak Pick-Up Hour (3-4 p.m.)		
	Existing	Diversion (Existing U-Turns)[1]	Existing Plus Project Design Option	Existing	Diversion (Existing U-Turns)[1]	Existing Plus Project Design Option
Southbound Sheffield Avenue south of Redwood Day School	256	-222	34	166	-132	34

Source: CHS Consulting Group, 2018.

Notes:

1. Estimated based on the existing traffic volumes in northbound and southbound directions north and south of Morrison Avenue.

3.2 Significance Criteria

The thresholds for determining the significance of impacts for this analysis are based on the environmental checklist contained in Appendix G of the State CEQA Guidelines. The proposed project would have a significant impact on transportation and circulation if it would:

1. 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.

2. 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.

3. 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.

4. Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).

5. Result in inadequate emergency access.

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

3.3 Criteria Requiring No Further Evaluation

Criteria listed above that are not applicable to actions associated with the project are identified below along with a supporting rationale as to why further consideration is unnecessary and a no-impact determination is appropriate.

Criterion 3. 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.

The Project involves the replacement of an existing reservoir with a combination of smaller tanks totaling 50 MG and the construction of a new driveway, which would not represent any air traffic safety hazards. Therefore, the Project would have no impact related to air traffic patterns.

3.4 Project Impacts

The impact analysis addresses short-term transportation impacts related to the Project construction and long-term impacts associated with operation of the Central Reservoir and the new driveway on Ardley Avenue after construction.

Impact TR-1 (Criterion 1): 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.

Short-Term Construction Impacts

The Project construction for the replacement of Central Reservoir and the design option that would allow the Redwood Day School construct a new private driveway on Ardley Avenue would generate approximately 215 daily vehicle trips including 18 worker vehicle trips and 197 truck trips. During the peak hours, the Project construction would generate up to nine worker vehicle trips during each AM or PM peak hours and up to 28 truck trips during the midday peak hour. These trips would spread onto multiple streets in the vicinity of the project site. **Figure 6** shows the estimated project volumes at major intersections in the area.[8]

The Project would also generate up to 26 construction worker vehicle trips during other construction phases, but these would have fewer truck trips, so the total construction trips would be less in these other construction phases. These Project-generated construction trips would spread onto multiple streets in the vicinity of the Project site and would be temporary in nature (i.e., not permanent operational trips); therefore, construction would not generate a substantial increase in VMT on a long-term basis. Project construction would also not increase the physical roadway capacity and would not induce additional auto mobile travel. Therefore, construction of the Project would not conflict with the *City of Oakland Transportation Impact Review Guidelines* criterion related to VMT and roadway capacity. Although the increases in volumes may be noticeable to local residents, the additional construction-related vehicles would not cause traffic volumes along local streets to exceed or approach the carrying capacity of the roadways or cause queuing issues.

The Project would provide approximately 22,000 square feet of staging areas within the project site. All construction equipment, trailers, and worker parking would be contained within the staging area. In the event construction workers (up to 13 daily workers during the peak construction phase) are not able to park on site, there would be a sufficient number of available on-street parking spaces (up to 175 available spaces) in the vicinity of the project site based on existing on-street parking conditions as described above in Section 2.6, Parking Conditions.

Because Project construction would not conflict with the City of Oakland Transportation Impact Review Guidelines criteria related to VMT and roadway capacity, and would not result in substantial differences in traffic operating conditions at study intersections from the existing condition, the Project construction impacts would be ***less than significant***.

[8] Project trip assignment assumes that the ongoing *23rd 29th Avenue Overcrossing Project,* which is scheduled to be completed by summer 2018, would be completed before the start of the Project construction, and the traffic from and to the northbound I-880 would be rerouted through the restored on- and off-ramps at 29th Avenue.

The City of Oakland does not require the analysis of intersection operations unless the Project would generate more than 800 peak hour vehicle trips on a long-term basis. However, intersection operational analysis is performed for key locations along the project access routes to provide information on projected intersection operating conditions with the addition Project traffic. **Table 6** presents the projected LOS and delay for the intersections with the increase in traffic under the Existing plus Project condition. It shows that all intersections would continue to operate at LOS D or better with the addition of Project trips during construction period. **Appendix C** includes detailed LOS calculations.

Table 6 – Intersection Level of Service: Existing Plus Project Construction

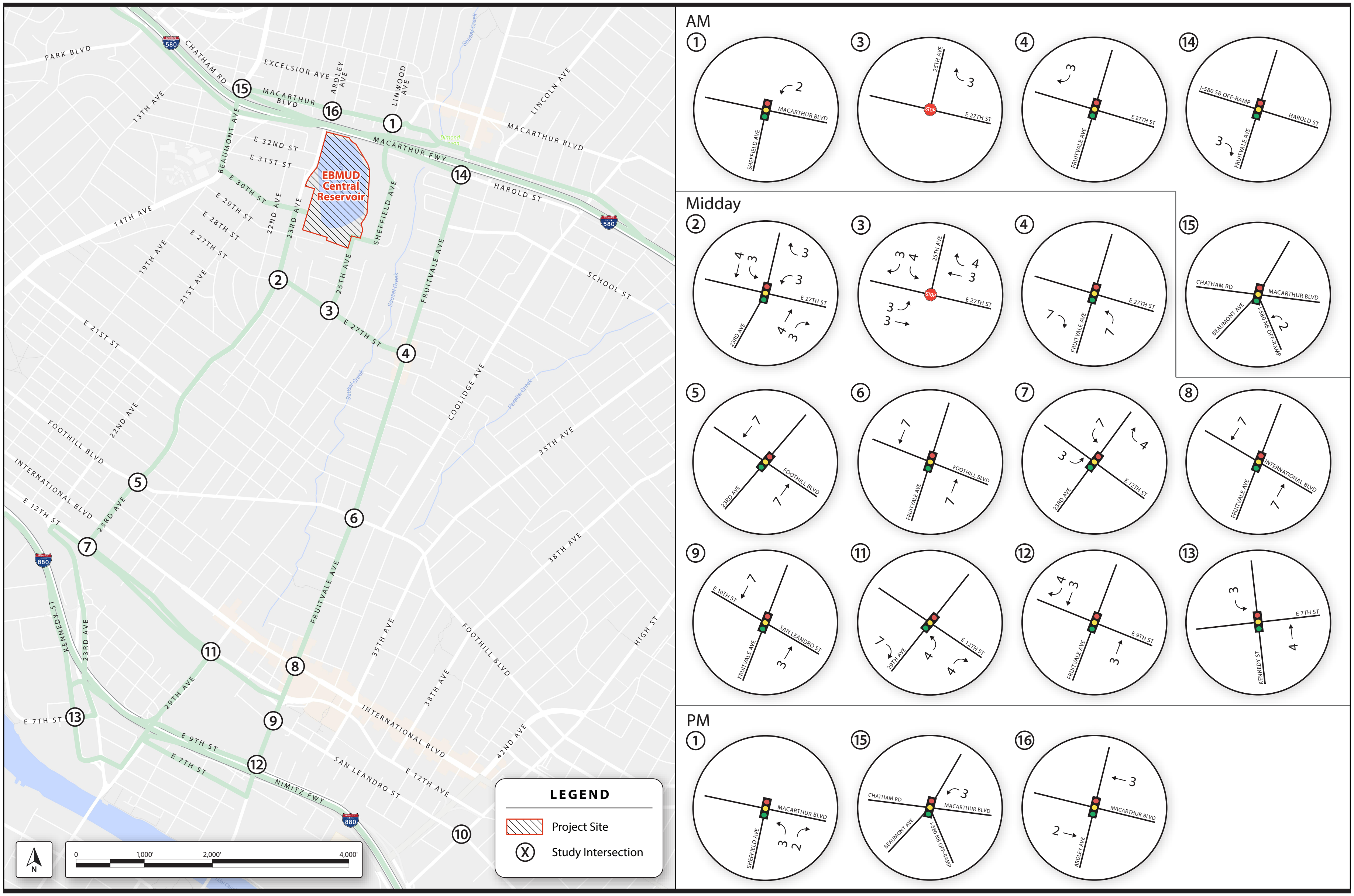
	AM Peak Hour				PM Peak Hour			
	Existing		EPP		Existing		EPP	
Intersection[1]	Delay[2]	LOS[2]	Delay[2]	LOS[2]	Delay[2]	LOS[2]	Delay[2]	LOS[2]
1. MacArthur Boulevard / Sheffield Avenue	12	B	12.1	B	7.1	A	7.2	A
2. East 27th Street / 23rd Avenue	12.6	B	12.6	B	12.7	B	12.7	B
3. East 27th Street / 25th Avenue	9.5	A	9.5	A	8.7	A	8.7	A
4. East 27th Street / Fruitvale Avenue	29.6	C	29.6	C	17.9	B	17.9	B
5. Foothill Boulevard / 23rd Avenue	11	B	11	B	12.2	B	12.2	B
6. Foothill Boulevard / Fruitvale Avenue	42.2	D	42.2	D	28.4	C	28.4	C
7. East 12th Street / 23rd Avenue	24.6	C	24.6	C	16.4	B	16.4	B
8. International Boulevard / Fruitvale Avenue	18.7	B	18.7	B	17.7	B	17.7	B
9. San Leandro Street / Fruitvale Avenue	32.6	C	32.6	C	37	D	37	D
10. San Leandro Street / High Street	28.8	C	28.8	C	29.7	C	29.7	C
11. East 12th Street / 29th Avenue	35	C	35	C	35.4	D	35.4	D
12. East 9th Street / Fruitvale Avenue	15.8	B	15.8	B	14.2	B	14.2	B
13. East 7th Street / Kennedy Street	9.7	A	9.7	A	12	B	12	B
14. Harold Street / Fruitvale Avenue	20.5	C	20.5	C	21.4	C	21.4	C
15. MacArthur Boulevard / Beaumont Avenue	34.8	C	34.8	C	47.1	D	47.0	D
16. MacArthur Boulevard / Ardley Avenue	12.5	B	12.5	B	9.2	A	9.2	A

Source: CHS Consulting Group, 2018.

Notes:

1. All intersections are signalized except for the intersection of East 27th Street and Fruitvale Avenue, which is all-way stop-controlled.
2. The LOS and delay (in seconds per vehicle) for signalized intersections and all-way stop-controlled intersection represent conditions for the overall intersection; **Bold** indicates the changed delays under EPP condition.

EPP = Existing Plus Project



EBMUD Central Reservoir Replacement Project

Figure 6
Project Volumes (AM/Midday/PM Peak Hour)

Consulting Group

Long-Term Operational Impacts

The operation of Central Reservoir would remain the same as the existing conditions and continue to generate approximately four monthly vehicle trips after the Project construction. Therefore, there would be no change in the VMT, safety or performance of transit, roadways, bicycle lanes, and pedestrian facilities.

If the design option were to be adopted and the Redwood Day School constructs a new private driveway connecting Ardley Avenue with the School, it is anticipated that the existing vehicles that currently make U-turns on Sheffield Avenue to pick-up or drop-off students at the Redwood Day School would no longer make these U-turns. Instead, vehicles would enter the school on Sheffield Avenue, and exit onto Ardley Avenue. As a result, approximately 222 and 132 U-turn trips during AM and PM peak hours would instead make right-turns into the parking lot from Sheffield Avenue and then exit to Ardley Avenue via the new driveway. As a result, the Project would cause a marginal decrease in VMT by 0.2 mile per trip. In addition, while most of the exiting vehicles would make right-turns onto Ardley Avenue to access I-580, some vehicles would make left-turns, which could cause vehicle delay and increase the potential for conflicts between pedestrians and bicyclists along Ardley Avenue; a potentially significant impact. With the implementation of the **Mitigation Measure TR-1**, which requires that Redwood Day School conduct an operational and safety analysis by a traffic engineer for the Ardley Avenue/new Redwood Day School driveway intersection, and implement measures to address safety issues, the Project operational impacts under the design option would be less than significant.

The new driveway on Ardley Avenue would potentially decrease traffic volumes on Sheffield Avenue south of Redwood Day School but increase traffic volumes on Ardley Avenue. Intersection operational analysis is performed for affected intersections, for informational purposes.[9] **Table 7** presents the projected LOS and delay for the intersections with the increase in traffic under the Existing plus Project condition. It shows that the intersections affected by the Project operation would continue to operate at LOS D or better with the addition of Project trips during construction period. **Appendix B** includes detailed LOS calculations, and **Appendix G** includes the illustration of the diverted traffic with the new driveway.

[9] For the purpose of conservative analysis, all the diverted traffic on the new driveway are assumed to turn right to northbound Ardley Avenue, and intersection operation analysis is conducted based on the peak hour of background traffic (7:45-8:45 a.m. and 5-6 p.m.) with the addition of school traffic during the peak student drop-off (7:30-8:30 a.m.) and pick-up (3-4 p.m.) periods.

Table 7 – Intersection Level of Service: Existing Plus Project Operation

Intersection[1]	AM Peak Hour				PM Peak Hour			
	Existing		Future		Existing		Future	
	Delay[2]	LOS[2]	Delay[2]	LOS[2]	Delay[2]	LOS[2]	Delay[2]	LOS[2]
1. MacArthur Boulevard / Sheffield Avenue	12	B	6.8	A	7.1	A	3.2	A
15. MacArthur Boulevard / Beaumont Avenue	34.8	C	34.8	C	47.1	D	46.2	D
16. MacArthur Boulevard / Ardley Avenue	12.5	B	43.2	D	9.2	A	11.1	B

Source: CHS Consulting Group, 2018.
Notes:
1. All intersections are signalized except for the intersection of East 27th Street and Fruitvale Avenue, which is all-way stop-controlled.
2. The LOS and delay (in seconds per vehicle) for signalized intersections and all-way stop-controlled intersection represent conditions for the overall intersection; **Bold** indicates the changed delays under the future condition.

Mitigation Measure TR-1: Conduct an operational and safety analysis by a traffic engineer for the Ardley Avenue/new Redwood Day School Driveway intersection for the Redwood Day School Access Driveway Design Option.

To minimize potential conflicts between the existing traffic on Ardley Avenue and the diverted traffic exiting onto Ardley Avenue from the new Redwood Day School Access Driveway Design Option, EBMUD shall as part of any agreement with Redwood Day School require that the school conduct an operational and safety analysis by a traffic engineer for the Ardley Avenue/new Redwood Day School access driveway intersection. The performance standard for the analysis is to minimize potential vehicular, pedestrian, and bicycle conflicts, based on the professional opinion of the traffic engineer and in accordance with City of Oakland Public Works Department standards. At a minimum, the analysis would evaluate the following:

- Traffic operational analysis consistent with City of Oakland Public Works Department standards to determine what type of stop-control (e.g., stop sign, traffic signal, etc.) is appropriate.
- An evaluation of sight distances for vehicles turning out of the Redwood Day School access driveway to ensure that any turns out of the driveway can be made safely.
- An evaluation of pedestrian and bicycle volumes along Ardley Avenue to determine whether signage and/or flashing beacons are warranted to alert driveway users to the presence of pedestrians and bicyclists on Ardley Avenue.
- An evaluation of whether signage is warranted along both travel directions of Ardley Avenue in advance of the driveway to alert roadway users of "Driveway Ahead."
- An evaluation of vehicular travel speeds on Ardley Avenue to determine whether traffic calming features such as school signage and/or speed bumps are warranted to slow traffic in the vicinity of the driveway.

If the operational and safety analysis concludes that turns out of the driveway can be safely accommodated, and this finding is endorsed by City of Oakland Public Works Department staff, then EBMUD could allow vehicular movements from the driveway onto Ardley Avenue.

Impact TR-2 (Criterion 2): 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.

Short-Term Construction Impacts

In the vicinity of the project site, the average daily traffic volumes are approximately 148,500 and 221,000 on I-580 and I-880, respectively. The Project construction would generate nine vehicle trips on I-580 during each AM or PM peak hour. Project construction would generate 28 trips on I-880 outside of the peak hours between hours of 9 a.m. and 4 p.m. only. These trips would not cause a substantial increase in traffic along I-580 and I-880 (less than 1%) and would only last for a temporary duration. Therefore, the Project construction would not conflict with the established Alameda County Transportation Commission (Alameda CTC)'s standards for their congestion management program. Therefore, the Project construction would have ***less than significant impacts***.

Long-Term Operational Impacts

If the design option were adopted and the Redwood Day School were to construct a new private driveway between Ardley Avenue and the School, no additional trips would be generated, but it would affect the circulation of local traffic by shifting approximately 222 and 132 vehicle trips from Sheffield Avenue to Ardley Avenue during the peak morning drop-off (7:30-8:30 a.m.) and the afternoon pick-up (3-4 p.m.) hours for Redwood Day School, respectively. The Project would not increase trips on I-880 or I-580. Therefore, the Project operation would have ***less than significant impacts***.

Impact TR-3 (Criterion 4): Substantially increase hazards due to a design feature or incompatible uses.

Short-Term Construction Impacts

The increased construction traffic on public roadways would potentially decrease the safety of vehicles, bicyclists, and pedestrians because larger vehicles may not easily see smaller vehicles, bicyclists, and pedestrians. Larger construction vehicles would also temporarily and intermittently reduce the capacity of local roadways due to their slower movements and larger turning radii.

Construction trucks would access the project site through both the primary entrance at the 25th Avenue and East 29th Street intersection and the secondary entrance at the eastern terminus of East 30th Street. East 30th Street is approximately 30 feet wide with perpendicular parking on both sides of the street, and East 29th Street and 25th Avenue are residential streets with on-street parking allowed on both sides of the street. Truck turning movements at the primary and secondary entrance to the project site would potentially conflict with the existing vehicles, pedestrians and bicyclists along East 30th Street, East 29th Street, and 25th Avenue.

Redwood Day School, located immediately northeast of the Central Reservoir, is generally open between the hours of 8:30 a.m. and 3 p.m., with peak drop-off and pick-up activities from 7:30 a.m. to 8:30 a.m. and from 3 p.m. to 4 p.m., respectively. The Project construction would generate up to 14 truck trips to and from the primary project site entrance at the intersection of 25th Avenue and East 29th Street outside of the peak hours.[10] Large truck traffic would not travel along Sheffield Avenue, in front of Redwood Day School, and so construction truck traffic would not substantially conflict with the majority of Redwood Day School traffic. Even so, construction traffic could potentially conflict with the existing school traffic (vehicular, pedestrian and bicyclists) along 25th Avenue and East 29th Street.

Manzanita Community School is located at 2409 East 27th Street, approximately 1300 feet south of the primary and secondary entrances to the project site. The school is generally open between the hours of 8:30 a.m. and 3 p.m., with peak drop-off and pick-up activities from 7:30 a.m. to 8:30 a.m. and from 3 p.m. to 4 p.m., respectively. The student pick-up and drop-off zones are located along East 27th Street, which is one of the access routes that may be used for Project construction. Project construction traffic could potentially increase hazards for school traffic.

Per EBMUD's Standard Construction Specification 01 55 26, the proposed project would be required to prepare of a Traffic Control Plan. The Traffic Control Plan would identify specific measures to control traffic and provide guidance to motorists as to when and how to safely move around the Project site during construction. Additionally, the contractors would be required to use traffic signs, flashing lights, barricades, and other traffic safety devices to control traffic to minimize impacts on circulation on the streets surrounding the Project site. Also, the implementation of Mitigation Measure TRA-2 would reduce the potential impact on traffic operations along East 27th Street near Manzanita Community School to less than significant by scheduling truck trips to avoid drop-off and pick-up hours for the schools. Adjustment of truck operating hours in this manner would allow for safer and more efficient movement of people picking up and dropping children off at school.

Overall, Project construction would not substantially affect traffic operations along nearby streets or permanently reduce roadway capacity because alternate routes of travel through locations in the vicinity of the Project site would be possible, and traffic operations would return to their current state after the end of construction activities.

A temporary change in traffic operations would create potential safety hazards for motorists due to truck traffic on East 27th Street, which is not normally a truck route. Travel on East 27th Street would be

[10] Assume a half of truck trips would occur through the primary entrance at the intersection of 25th Avenue and East 29th Street and the remaining half would occur through the secondary entrance at East 30th Street.

constrained in a manner that could present challenges to drivers unaccustomed to truck traffic. However, with the implementation of Standard Construction Specification 01 55 26 and **Mitigation Measure TR-2**, the Project's impacts related to traffic hazards on East 27th Street would be reduced to a level of ***less than significant***.

Mitigation Measure TR-2: As part of the Traffic Control Plan, include traffic control measures for trucks traveling along East 27th Street.

The following measures shall be implemented during the entire duration of the Project construction, to reduce the Project's temporary impacts on traffic circulation:

- *Hauling and material delivery trucks and equipment delivery trucks traveling to and from the Project site during construction shall be restricted in both travel directions along East 27th Street between Fruitvale Avenue and 23rd Avenue during the typical Manzanita Community School (2409 East 27th Street) drop-off and pick-up hours. Manzanita Community School is open between 8:30 a.m. and 3:00 p.m., and the peak drop-off and pick-up hours are from 7:30 a.m. to 8:30 a.m. and from 3:00 p.m. to 4:00 p.m., respectively. The construction contractor shall confirm the start and dismissal times prior to the beginning of each school year.*

- *If it is not feasible to avoid hauling and material delivery trucks and equipment delivery trucks during school drop-off and pick-up hours, the construction contractor shall provide flaggers at the crosswalks of the East 27th Street/25th Avenue intersections to manage traffic flow and maintain traffic safety. If construction trucks travel along East 27th Street, between 25th Avenue and 23rd Avenue, the construction contractor shall also provide flaggers near the existing white passenger loading zone on East 27th Street between the gate of Manzanita Community School and 25th Avenue.*

Long-Term Operational Impacts

If the design option were adopted and the Redwood Day School were to construct a new private driveway between Ardley Avenue and the School, parents would be allowed to make right-turns into the parking lot from Sheffield Avenue and exit to Ardley Avenue through the new driveway instead of making U-turns, which would decrease the conflicts between current U-turn vehicles and pedestrians as well as bicyclists. Therefore, the Project operational impacts would be ***less than significant***.

Impact TR-4 (Criterion 5): Result in inadequate emergency access

Short-Term Construction Impacts

The Project construction would not cause a complete or partial roadway closure, and thus there would be no disruptions to emergency vehicle access. As part of **Mitigation Measure TR-1**, the EBMUD would coordinate and notify administrators of the nearest fire station (Oakland Fire Station No. 16 at 3600 13th

Avenue [about a half mile northwest of the project site], hospitals (Highland Hospital at 1411 East 31st Street [about a 0.3 mile west of the project site]) in advance of the timing, location, duration of construction activities, and designated project access routes. Therefore, the Project impacts to emergency vehicle access would be ***less than significant***.

Long-Term Operational Impacts

The existing street network currently accommodates the movement of emergency vehicles that travel to the project site. In the event of an emergency, emergency vehicles would be able to access the project site in the same way as under the existing conditions, from 25th Avenue and East 29th Street or 23rd Avenue and East 30th Street immediately adjacent to the project site, following the completion of Project construction. Therefore, the Project impacts to emergency vehicle access would be ***less than significant***.

Impact TR-5 (Criterion 6): Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

Short-Term Construction Impacts

AC Transit operates two bus routes (Route 62 and 14) in the vicinity of the project site, and the nearest stop to the project site is located at the intersection of 23rd Avenue and East 30th Street. The Project construction would not generate a substantial amount of transit trips because the majority of construction workers are anticipated to drive to and from the project site. The project access routes for construction traffic (approximately 28 truck trips in the midday peak hour, and nine worker trips during each AM and PM peak hours) would partially overlap with the operation of AC Transit Routes 62 and 14 along 23rd Avenue, East 12th Street, East 27th Street, and Fruitvale Avenue. However, the conflicts between construction traffic and transit vehicles would be minor due to low volumes of construction traffic and low service frequencies for Routes 62 and 14 (i.e., up to four trips per hour).

In the vicinity of the project site, there are bike lanes along Fruitvale Avenue and portions of 23rd Avenue. Bicycle volumes are approximately 15 along Fruitvale Avenue and six along 23rd Avenue at East 27th Street in the busiest hour. The increased construction traffic on public roadways would potentially decrease the safety of bicyclists because local users may not be accustomed to the presence of large construction vehicles. Per EBMUD's Standard Construction Specification 01 55 26, the proposed project would be required to prepare of a Traffic Control Plan to minimize impacts on bicycle circulation on local streets. To maintain safe bicycle circulation, the Traffic Control Plan would identify specific measures around the Project site during periods of construction with heavy truck traffic (such as during concrete pours). The Traffic Control Plan may include measures such as signs, flashing lights, barricades, and other traffic safety devices to minimize impacts on circulation on the streets surrounding the Project site. Therefore, the Project would not result in changes in bicycle use or safety that would conflict with an applicable plan or policy related to bicycle use, and impacts would be less than significant.

The Project construction would provide worker parking and staging areas on site; therefore, the Project construction would not generate a substantial amount of pedestrian trips to and from the project site. The pedestrian volumes in the vicinity of the project site are generally moderate with approximately 130 pedestrian crossings at the intersection of East 27th Street and 25th Avenue in the PM peak hour, and the area is generally aligned with sidewalks. Therefore, potential conflicts between pedestrians and construction traffic would be generally low. Per EBMUD's Standard Construction Specification 01 55 26, the proposed project would be required to prepare of a Traffic Control Plan to minimize impacts on bicycle circulation on local streets. Sidewalks for pedestrians would remain open if safe for pedestrians, and alternate routes and signage provided if pedestrian routes are closed. Therefore, the Project would not result in changes in pedestrian use or safety that would conflict with an applicable plan or policy, and impacts would be ***less than significant***.

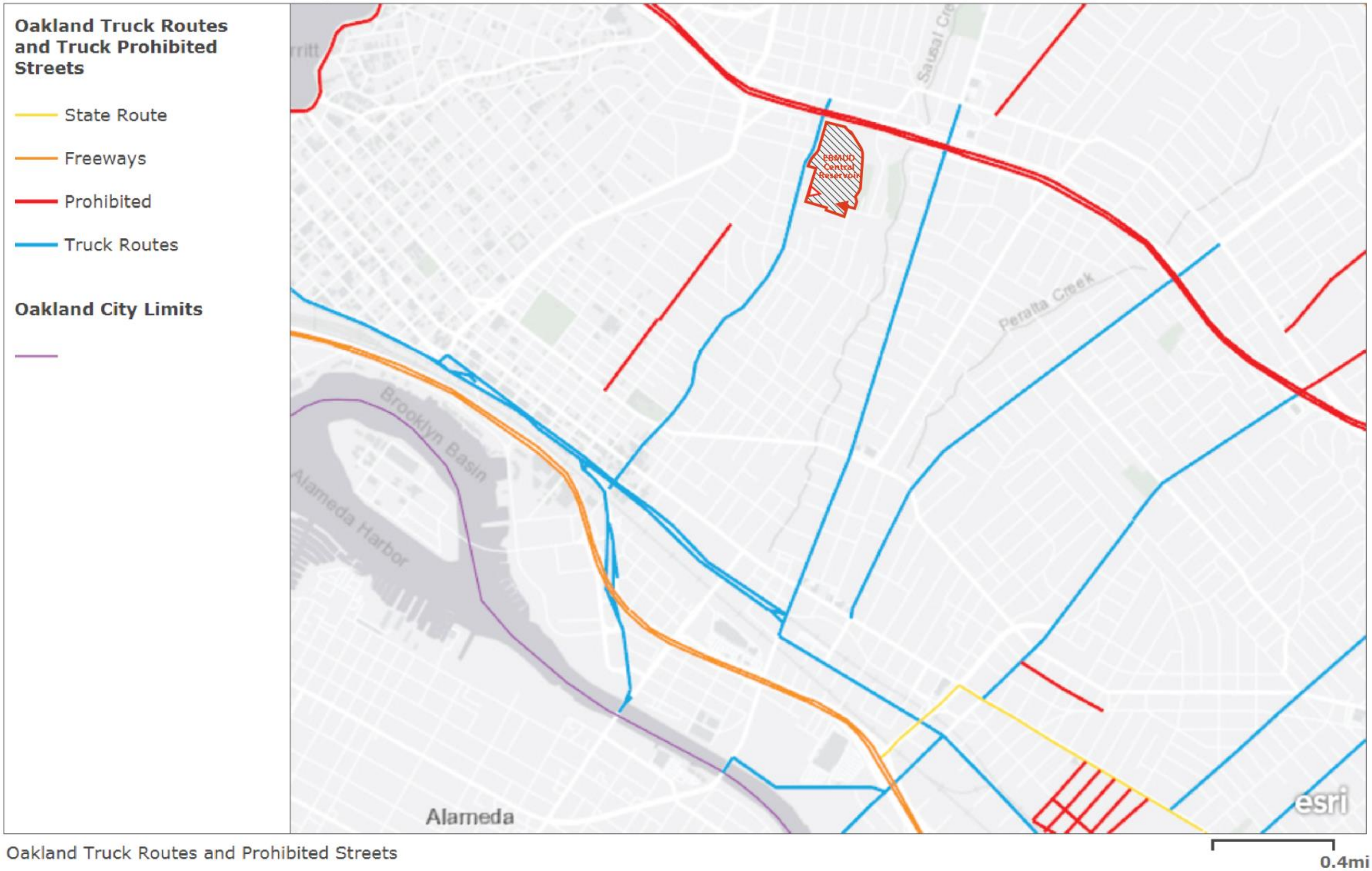
Long-Term Operational Impacts

If the design option were to be adopted and the Redwood Day School constructs a new private driveway connecting Ardley Avenue with the School, it is anticipated that the existing vehicles that currently make U-turns on Sheffield Avenue to pick-up or drop-off students at the Redwood Day School would be diverted from Sheffield Avenue to Ardley Avenue. As a result, approximately 222 and 132 vehicles in the AM and PM peak hours would instead make right turns into the parking lot from Sheffield Avenue and then exit to Ardley Avenue. The Project would potentially improve the safety of bicyclists and pedestrians on Sheffield Avenue by diverting vehicles which would otherwise make U-turns on Sheffield Avenue to the existing parking lot. Therefore, the Project impacts would be ***less than significant***.

Appendix A

Designated Truck Route Map

Oakland Truck Route Map



Oakland Truck Routes and Prohibited Streets

Appendix B

Intersection Turning Movement Counts

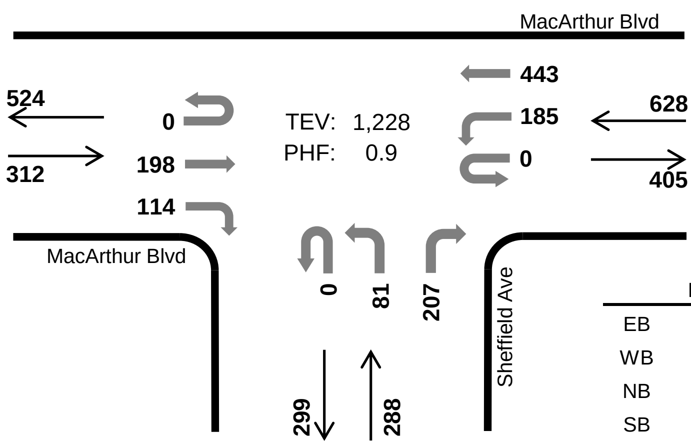
Daily Traffic Counts

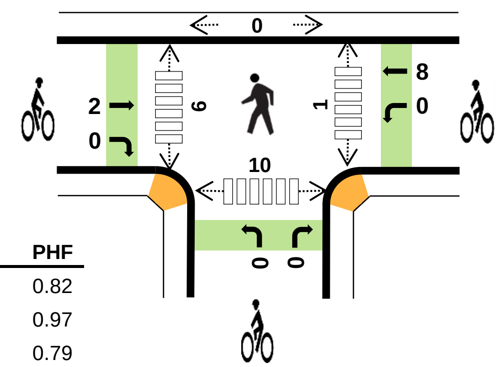
Sheffield Ave
MacArthur Blvd

N

Peak Hour

Date: 05-23-2018
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:45 AM to 8:45 AM





	HV %:	PHF
EB	4.8%	0.82
WB	4.5%	0.97
NB	0.0%	0.79
SB	-	-
TOTAL	3.5%	0.90

Two-Hour Count Summaries

Interval Start		MacArthur Blvd Eastbound UT	LT	TH	RT	MacArthur Blvd Westbound UT	LT	TH	RT	Sheffield Ave Northbound UT	LT	TH	RT	0 Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM		0	0	35	4	0	6	18	0	0	4	0	5	0	0	0	0	72	0
7:15 AM		0	0	29	5	0	9	35	0	0	6	0	11	0	0	0	0	95	0
7:30 AM		0	0	49	11	0	25	69	0	0	14	0	25	0	0	0	0	193	0
7:45 AM		**0**	**0**	**50**	**45**	**0**	**57**	**99**	**0**	**0**	**25**	**0**	**66**	**0**	**0**	**0**	**0**	**342**	702
8:00 AM		**0**	**0**	**47**	**31**	**0**	**62**	**92**	**0**	**0**	**17**	**0**	**56**	**0**	**0**	**0**	**0**	**305**	935
8:15 AM		**0**	**0**	**47**	**32**	**0**	**52**	**104**	**0**	**0**	**28**	**0**	**46**	**0**	**0**	**0**	**0**	**309**	1,149
8:30 AM		**0**	**0**	**54**	**6**	**0**	**14**	**148**	**0**	**0**	**11**	**0**	**39**	**0**	**0**	**0**	**0**	**272**	**1,228**
8:45 AM		0	0	33	3	0	15	152	0	0	8	0	24	0	0	0	0	235	1,121
Count Total		0	0	344	137	0	240	717	0	0	113	0	272	0	0	0	0	1,823	0
Peak Hour	**All**	**0**	**0**	**198**	**114**	**0**	**185**	**443**	**0**	**0**	**81**	**0**	**207**	**0**	**0**	**0**	**0**	**1,228**	**0**
	HV	**0**	**0**	**14**	**1**	**0**	**0**	**28**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**43**	**0**
	HV%	**-**	**-**	**7%**	**1%**	**-**	**0%**	**6%**	**-**	**-**	**0%**	**-**	**0%**	**-**	**-**	**-**	**-**	**4%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
7:00 AM	6	2	0	0	*8*	1	0	0	0	*1*	0	1	0	2	*3*
7:15 AM	1	7	0	0	*8*	0	0	0	0	*0*	1	1	0	1	*3*
7:30 AM	5	4	0	0	*9*	1	0	0	0	*1*	0	1	0	1	*2*
7:45 AM	**6**	**10**	**0**	**0**	***16***	**1**	**2**	**0**	**0**	***3***	**1**	**3**	**0**	**4**	*8*
8:00 AM	**3**	**4**	**0**	**0**	***7***	**0**	**3**	**0**	**0**	***3***	**0**	**2**	**0**	**1**	*3*
8:15 AM	**3**	**3**	**0**	**0**	***6***	**1**	**1**	**0**	**0**	***2***	**0**	**0**	**0**	**3**	*3*
8:30 AM	**3**	**11**	**0**	**0**	***14***	**0**	**2**	**0**	**0**	***2***	**0**	**1**	**0**	**2**	***3***
8:45 AM	2	7	1	0	*10*	0	2	0	0	*2*	0	0	0	5	*5*
Count Total	29	48	1	0	*78*	4	10	0	0	*14*	2	9	0	19	*30*
Peak Hr	**15**	**28**	**0**	**0**	***43***	**2**	**8**	**0**	**0**	***10***	**1**	**6**	**0**	**10**	***17***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	MacArthur Blvd				MacArthur Blvd				Sheffield Ave				0				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	6	0	0	0	2	0	0	0	0	0	0	0	0	0	8	0
7:15 AM	0	0	1	0	0	1	6	0	0	0	0	0	0	0	0	0	8	0
7:30 AM	0	0	5	0	0	0	4	0	0	0	0	0	0	0	0	0	9	0
7:45 AM	**0**	**0**	**6**	**0**	**0**	**0**	**10**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**16**	41
8:00 AM	**0**	**0**	**3**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**7**	40
8:15 AM	**0**	**0**	**2**	**1**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6**	38
8:30 AM	**0**	**0**	**3**	**0**	**0**	**0**	**11**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**14**	**43**
8:45 AM	0	0	2	0	0	1	6	0	0	1	0	0	0	0	0	0	10	37
Count Total	0	0	28	1	0	2	46	0	0	1	0	0	0	0	0	0	78	0
Peak Hour	**0**	**0**	**14**	**1**	**0**	**0**	**28**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**43**	**0**

Two-Hour Count Summaries - Bikes

Interval Start	MacArthur Blvd			MacArthur Blvd			Sheffield Ave			0			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	1	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	1	0
7:45 AM	**0**	**1**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	5
8:00 AM	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	7
8:15 AM	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	9
8:30 AM	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**10**
8:45 AM	0	0	0	0	2	0	0	0	0	0	0	0	2	9
Count Total	0	4	0	0	10	0	0	0	0	0	0	0	14	0
Peak Hour	**0**	**2**	**0**	**0**	**8**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**10**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

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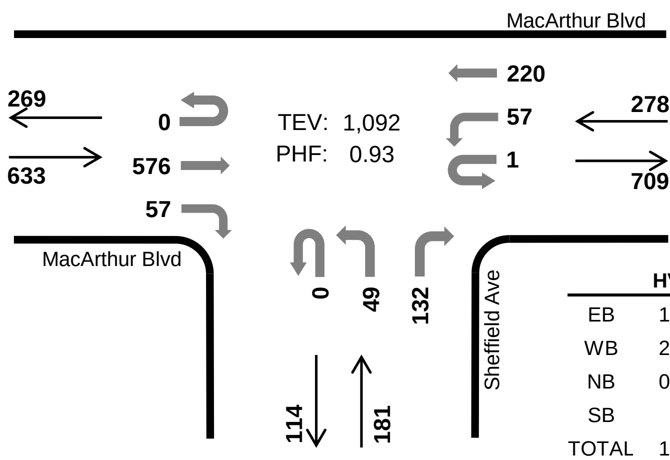
Sheffield Ave
MacArthur Blvd

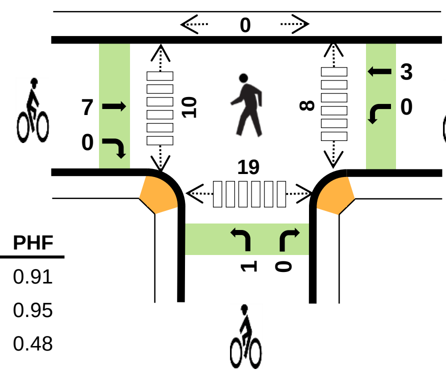
N

Peak Hour

Date: 05-23-2018
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 5:00 PM to 6:00 PM



	HV %:	PHF
EB	1.9%	0.91
WB	2.9%	0.95
NB	0.0%	0.48
SB	-	-
TOTAL	1.8%	0.93



Two-Hour Count Summaries

Interval Start	MacArthur Blvd Eastbound UT	LT	TH	RT	MacArthur Blvd Westbound UT	LT	TH	RT	Sheffield Ave Northbound UT	LT	TH	RT	0 Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
4:00 PM	0	0	86	15	0	28	53	0	0	6	0	25	0	0	0	0	213	0
4:15 PM	0	0	53	15	0	27	43	0	0	3	0	26	0	0	0	0	167	0
4:30 PM	0	0	82	22	0	45	69	0	0	4	0	21	0	0	0	0	243	0
4:45 PM	0	0	111	27	0	26	62	0	0	6	0	33	0	0	0	0	265	888
5:00 PM	**0**	**0**	**150**	**16**	**0**	**23**	**46**	**0**	**0**	**10**	**0**	**21**	**0**	**0**	**0**	**0**	**266**	941
5:15 PM	**0**	**0**	**154**	**13**	**1**	**10**	**53**	**0**	**0**	**5**	**0**	**20**	**0**	**0**	**0**	**0**	**256**	1,030
5:30 PM	**0**	**0**	**160**	**14**	**0**	**13**	**59**	**0**	**0**	**10**	**0**	**20**	**0**	**0**	**0**	**0**	**276**	1,063
5:45 PM	**0**	**0**	**112**	**14**	**0**	**11**	**62**	**0**	**0**	**24**	**0**	**71**	**0**	**0**	**0**	**0**	**294**	**1,092**
Count Total	0	0	908	136	1	183	447	0	0	68	0	237	0	0	0	0	1,980	0
Peak Hour All	**0**	**0**	**576**	**57**	**1**	**57**	**220**	**0**	**0**	**49**	**0**	**132**	**0**	**0**	**0**	**0**	**1,092**	**0**
Peak Hour HV	**0**	**0**	**12**	**0**	**0**	**0**	**8**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**20**	**0**
Peak Hour HV%	**-**	**-**	**2%**	**0%**	**0%**	**0%**	**4%**	**-**	**-**	**0%**	**-**	**0%**	**-**	**-**	**-**	**-**	**2%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
4:00 PM	3	1	0	0	*4*	0	0	0	0	*0*	0	1	0	2	*3*
4:15 PM	4	3	0	0	*7*	1	0	0	0	*1*	0	6	0	4	*10*
4:30 PM	2	4	0	0	*6*	0	3	0	0	*3*	0	4	0	2	*6*
4:45 PM	4	2	0	0	*6*	2	0	0	0	*2*	1	6	0	3	*10*
5:00 PM	**3**	**1**	**0**	**0**	***4***	**1**	**0**	**0**	**0**	***1***	**1**	**1**	**0**	**4**	*6*
5:15 PM	**4**	**4**	**0**	**0**	***8***	**0**	**3**	**0**	**0**	***3***	**0**	**0**	**0**	**6**	*6*
5:30 PM	**3**	**1**	**0**	**0**	***4***	**3**	**0**	**0**	**0**	***3***	**0**	**2**	**0**	**1**	*3*
5:45 PM	**2**	**2**	**0**	**0**	***4***	**3**	**0**	**1**	**0**	***4***	**7**	**7**	**0**	**8**	***22***
Count Total	25	18	0	0	*43*	10	6	1	0	*17*	9	27	0	30	*66*
Peak Hr	**12**	**8**	**0**	**0**	***20***	**7**	**3**	**1**	**0**	***11***	**8**	**10**	**0**	**19**	***37***

Project Manager: (415) 310-6469

project.manager.ca@idaxdata.com

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	MacArthur Blvd				MacArthur Blvd				Sheffield Ave				0				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0	4	0
4:15 PM	0	0	4	0	0	0	3	0	0	0	0	0	0	0	0	0	7	0
4:30 PM	0	0	2	0	0	0	4	0	0	0	0	0	0	0	0	0	6	0
4:45 PM	0	0	4	0	0	0	2	0	0	0	0	0	0	0	0	0	6	23
5:00 PM	**0**	**0**	**3**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	23
5:15 PM	**0**	**0**	**4**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**8**	24
5:30 PM	**0**	**0**	**3**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	22
5:45 PM	**0**	**0**	**2**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**20**
Count Total	0	0	25	0	0	0	18	0	0	0	0	0	0	0	0	0	43	0
Peak Hour	**0**	**0**	**12**	**0**	**0**	**0**	**8**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**20**	**0**

Two-Hour Count Summaries - Bikes

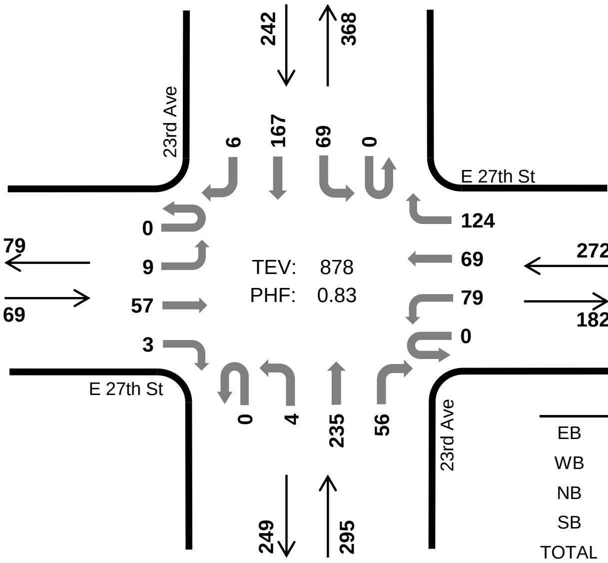
Interval Start	MacArthur Blvd			MacArthur Blvd			Sheffield Ave			0			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	1	0
4:30 PM	0	0	0	0	3	0	0	0	0	0	0	0	3	0
4:45 PM	0	2	0	0	0	0	0	0	0	0	0	0	2	6
5:00 PM	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	7
5:15 PM	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	9
5:30 PM	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	9
5:45 PM	**0**	**3**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**4**	**11**
Count Total	0	10	0	0	6	0	1	0	0	0	0	0	17	0
Peak Hour	**0**	**7**	**0**	**0**	**3**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**11**	**0**

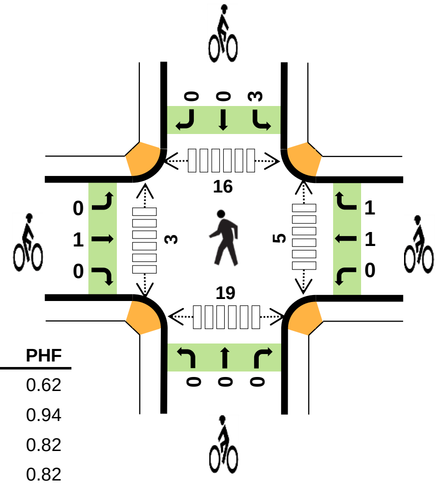
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

23rd Ave
E 27th St

Date: 05-23-2018
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:45 AM to 8:45 AM

Peak Hour





	HV %:	PHF
EB	1.4%	0.62
WB	1.1%	0.94
NB	4.1%	0.82
SB	4.1%	0.82
TOTAL	3.0%	0.83

Two-Hour Count Summaries

Interval Start		E 27th St Eastbound UT	LT	TH	RT	E 27th St Westbound UT	LT	TH	RT	23rd Ave Northbound UT	LT	TH	RT	23rd Ave Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM		0	1	1	0	0	10	1	13	0	1	24	2	0	2	8	0	63	0
7:15 AM		0	1	2	0	0	7	5	14	0	1	34	9	1	4	20	2	100	0
7:30 AM		0	2	5	3	0	15	8	19	0	2	52	3	0	15	24	1	149	0
7:45 AM		**0**	**4**	**10**	**2**	**0**	**15**	**16**	**34**	**0**	**1**	**58**	**11**	**0**	**10**	**41**	**0**	**202**	514
8:00 AM		**0**	**3**	**14**	**0**	**0**	**22**	**16**	**26**	**0**	**0**	**58**	**7**	**0**	**26**	**31**	**2**	**205**	656
8:15 AM		**0**	**2**	**25**	**1**	**0**	**25**	**14**	**33**	**0**	**2**	**69**	**19**	**0**	**24**	**49**	**1**	**264**	820
8:30 AM		**0**	**0**	**8**	**0**	**0**	**17**	**23**	**31**	**0**	**1**	**50**	**19**	**0**	**9**	**46**	**3**	**207**	**878**
8:45 AM		0	1	7	2	0	19	24	29	0	1	36	7	0	9	35	0	170	846
Count Total		0	14	72	8	0	130	107	199	0	9	381	77	1	99	254	9	1,360	0
Peak Hour	**All**	**0**	**9**	**57**	**3**	**0**	**79**	**69**	**124**	**0**	**4**	**235**	**56**	**0**	**69**	**167**	**6**	**878**	**0**
	HV	**0**	**0**	**1**	**0**	**0**	**2**	**1**	**0**	**0**	**0**	**10**	**2**	**0**	**3**	**7**	**0**	**26**	**0**
	HV%	**-**	**0%**	**2%**	**0%**	**-**	**3%**	**1%**	**0%**	**-**	**0%**	**4%**	**4%**	**-**	**4%**	**4%**	**0%**	**3%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
7:00 AM	0	0	3	1	*4*	0	0	0	0	*0*	0	0	0	3	*3*
7:15 AM	0	1	1	1	*3*	0	0	0	0	*0*	1	0	0	0	*1*
7:30 AM	1	0	2	2	*5*	0	1	0	1	*2*	0	1	0	0	*1*
7:45 AM	**0**	**1**	**5**	**3**	***9***	**0**	**1**	**0**	**0**	***1***	**0**	**1**	**0**	**11**	*12*
8:00 AM	**1**	**2**	**2**	**4**	***9***	**0**	**0**	**0**	**2**	***2***	**1**	**2**	**7**	**3**	*13*
8:15 AM	**0**	**0**	**3**	**1**	***4***	**1**	**0**	**0**	**1**	***2***	**4**	**0**	**9**	**2**	*15*
8:30 AM	**0**	**0**	**2**	**2**	***4***	**0**	**1**	**0**	**0**	***1***	**0**	**0**	**0**	**3**	***3***
8:45 AM	0	0	3	2	*5*	0	0	0	1	*1*	1	0	0	4	*5*
Count Total	2	4	21	16	*43*	1	3	0	5	*9*	7	4	16	26	*53*
Peak Hour	**1**	**3**	**12**	**10**	***26***	**1**	**2**	**0**	**3**	***6***	**5**	**3**	**16**	**19**	***43***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	E 27th St				E 27th St				23rd Ave				23rd Ave				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	1	0	4	0
7:15 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1	0	3	0
7:30 AM	0	0	1	0	0	0	0	0	0	0	2	0	0	1	1	0	5	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**4**	**1**	**0**	**0**	**3**	**0**	**9**	21
8:00 AM	**0**	**0**	**1**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**1**	**1**	**0**	**3**	**1**	**0**	**9**	26
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**1**	**0**	**4**	27
8:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**2**	**0**	**4**	**26**
8:45 AM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	2	0	5	22
Count Total	0	0	2	0	0	2	2	0	0	1	18	2	0	4	12	0	43	0
Peak Hour	**0**	**0**	**1**	**0**	**0**	**2**	**1**	**0**	**0**	**0**	**10**	**2**	**0**	**3**	**7**	**0**	**26**	**0**

Two-Hour Count Summaries - Bikes

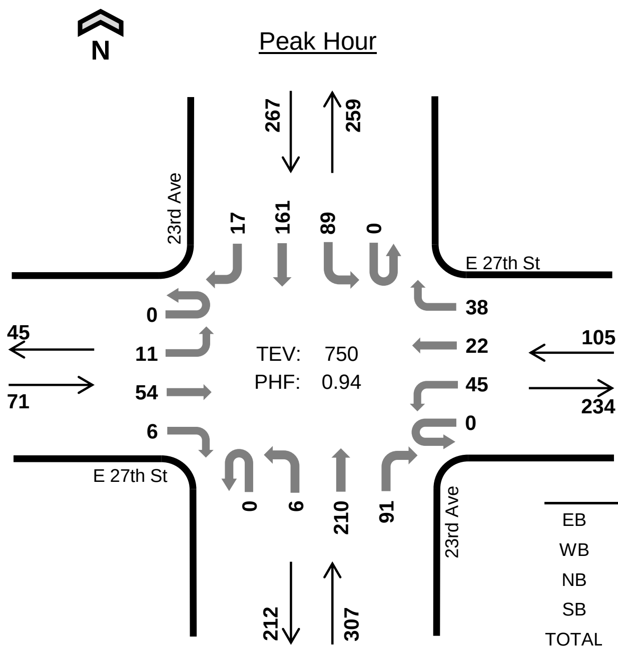
Interval Start	E 27th St			E 27th St			23rd Ave			23rd Ave			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	1	0	0	0	0	1	0	2	0
7:45 AM	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	3
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**2**	5
8:15 AM	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**2**	7
8:30 AM	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**6**
8:45 AM	0	0	0	0	0	0	0	0	0	0	1	0	1	6
Count Total	0	1	0	0	1	2	0	0	0	3	2	0	9	0
Peak Hour	**0**	**1**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**3**	**0**	**0**	**6**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

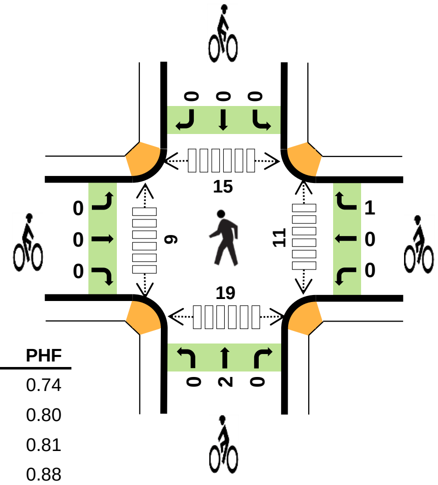
23rd Ave
E 27th St

Date: 05-23-2018
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:45 PM to 5:45 PM

Peak Hour



	HV %:	PHF
EB	0.0%	0.74
WB	1.0%	0.80
NB	2.0%	0.81
SB	2.2%	0.88
TOTAL	1.7%	0.94



Two-Hour Count Summaries

Interval Start	E 27th St Eastbound UT	LT	TH	RT	E 27th St Westbound UT	LT	TH	RT	23rd Ave Northbound UT	LT	TH	RT	23rd Ave Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
4:00 PM	0	0	8	1	0	9	7	9	0	1	42	13	0	9	49	1	149	0
4:15 PM	0	1	6	2	0	10	10	12	0	4	34	17	0	10	32	1	139	0
4:30 PM	0	2	12	0	0	14	10	10	0	3	42	21	0	13	39	1	167	0
4:45 PM	**0**	**5**	**15**	**2**	**0**	**11**	**5**	**7**	**0**	**1**	**48**	**11**	**0**	**19**	**48**	**9**	**181**	636
5:00 PM	**0**	**0**	**10**	**2**	**0**	**10**	**10**	**13**	**0**	**2**	**47**	**20**	**0**	**28**	**31**	**3**	**176**	663
5:15 PM	**0**	**3**	**19**	**2**	**0**	**13**	**1**	**9**	**0**	**1**	**50**	**32**	**0**	**30**	**33**	**1**	**194**	718
5:30 PM	**0**	**3**	**10**	**0**	**0**	**11**	**6**	**9**	**0**	**2**	**65**	**28**	**0**	**12**	**49**	**4**	**199**	**750**
5:45 PM	0	4	16	0	0	9	11	10	0	0	48	20	0	14	33	1	166	735
Count Total	0	18	96	9	0	87	60	79	0	14	376	162	0	135	314	21	1,371	0
Peak Hour All	**0**	**11**	**54**	**6**	**0**	**45**	**22**	**38**	**0**	**6**	**210**	**91**	**0**	**89**	**161**	**17**	**750**	**0**
Peak Hour HV	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**5**	**1**	**0**	**1**	**5**	**0**	**13**	**0**
Peak Hour HV%	**-**	**0%**	**0%**	**0%**	**-**	**0%**	**0%**	**3%**	**-**	**0%**	**2%**	**1%**	**-**	**1%**	**3%**	**0%**	**2%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
4:00 PM	0	0	2	2	*4*	0	0	0	0	*0*	0	1	6	0	*7*
4:15 PM	0	1	1	1	*3*	0	0	0	0	*0*	0	2	2	3	*7*
4:30 PM	0	0	1	3	*4*	0	0	0	0	*0*	0	1	0	6	*7*
4:45 PM	**0**	**0**	**1**	**2**	***3***	**0**	**0**	**1**	**0**	***1***	**3**	**2**	**6**	**1**	*12*
5:00 PM	**0**	**0**	**2**	**1**	***3***	**0**	**0**	**0**	**0**	***0***	**1**	**3**	**4**	**0**	*8*
5:15 PM	**0**	**0**	**2**	**1**	***3***	**0**	**0**	**1**	**0**	***1***	**2**	**1**	**2**	**7**	*12*
5:30 PM	**0**	**1**	**1**	**2**	***4***	**0**	**1**	**0**	**0**	***1***	**5**	**3**	**3**	**11**	***22***
5:45 PM	0	0	0	1	*1*	1	0	0	0	*1*	3	2	1	4	*10*
Count Total	0	2	10	13	*25*	1	1	2	0	*4*	14	15	24	32	*85*
Peak Hour	**0**	**1**	**6**	**6**	***13***	**0**	**1**	**2**	**0**	***3***	**11**	**9**	**15**	**19**	***54***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	E 27th St				E 27th St				23rd Ave				23rd Ave				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	4	0
4:15 PM	0	0	0	0	0	0	0	1	0	0	1	0	0	0	1	0	3	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	1	2	0	4	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**2**	**0**	**3**	14
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**1**	**0**	**3**	13
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**1**	**0**	**0**	**3**	13
5:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**2**	**0**	**4**	**13**
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	11
Count Total	0	0	0	0	0	0	0	2	0	0	9	1	0	2	11	0	25	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**5**	**1**	**0**	**1**	**5**	**0**	**13**	**0**

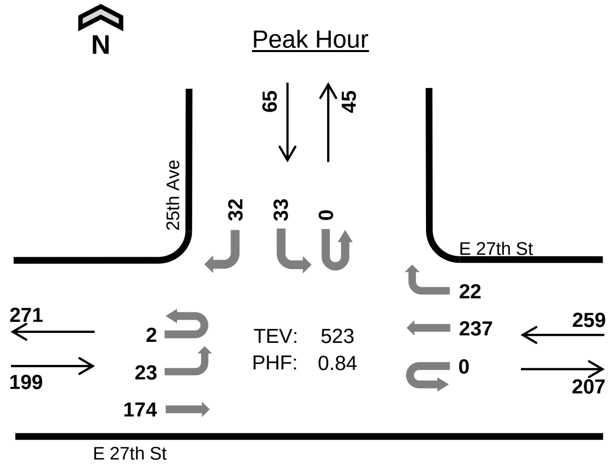
Two-Hour Count Summaries - Bikes

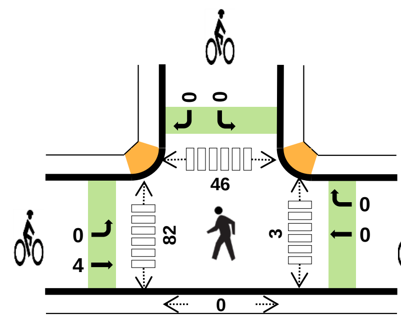
Interval Start	E 27th St			E 27th St			23rd Ave			23rd Ave			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	1
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	1
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	2
5:30 PM	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**3**
5:45 PM	0	1	0	0	0	0	0	0	0	0	0	0	1	3
Count Total	0	1	0	0	0	1	0	2	0	0	0	0	4	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**2**	**0**	**0**	**0**	**0**	**3**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

25th Ave
E 27th St

Date: 05-23-2018
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:45 AM to 8:45 AM





	HV %:	PHF
EB	3.5%	0.77
WB	1.5%	0.93
NB	-	-
SB	3.1%	0.68
TOTAL	2.5%	0.84

Two-Hour Count Summaries

Interval Start		E 27th St Eastbound UT	LT	TH	RT	E 27th St Westbound UT	LT	TH	RT	0 Northbound UT	LT	TH	RT	25th Ave Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM		0	0	6	0	0	0	16	2	0	0	0	0	0	3	0	2	29	0
7:15 AM		0	1	15	0	1	0	23	5	0	0	0	0	0	8	0	1	54	0
7:30 AM		0	2	23	0	0	0	30	5	0	0	0	0	1	2	0	4	67	0
7:45 AM		**0**	**1**	**34**	**0**	**0**	**0**	**51**	**6**	**0**	**0**	**0**	**0**	**0**	**5**	**0**	**7**	**104**	254
8:00 AM		**0**	**4**	**35**	**0**	**0**	**0**	**63**	**7**	**0**	**0**	**0**	**0**	**0**	**10**	**0**	**8**	**127**	352
8:15 AM		**2**	**8**	**55**	**0**	**0**	**0**	**61**	**6**	**0**	**0**	**0**	**0**	**0**	**9**	**0**	**15**	**156**	454
8:30 AM		**0**	**10**	**50**	**0**	**0**	**0**	**62**	**3**	**0**	**0**	**0**	**0**	**0**	**9**	**0**	**2**	**136**	**523**
8:45 AM		0	3	23	0	0	0	53	6	0	0	0	0	0	3	0	6	94	513
Count Total		2	29	241	0	1	0	359	40	0	0	0	0	1	49	0	45	767	0
Peak Hour	**All**	**2**	**23**	**174**	**0**	**0**	**0**	**237**	**22**	**0**	**0**	**0**	**0**	**0**	**33**	**0**	**32**	**523**	**0**
	HV	**0**	**0**	**7**	**0**	**0**	**0**	**3**	**1**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**13**	**0**
	HV%	**0%**	**0%**	**4%**	**-**	**-**	**-**	**1%**	**5%**	**-**	**-**	**-**	**-**	**-**	**6%**	**-**	**0%**	**2%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
7:00 AM	0	1	0	0	*1*	0	0	0	1	*1*	0	0	0	0	*0*
7:15 AM	0	3	0	2	*5*	0	0	0	0	*0*	0	0	1	0	*1*
7:30 AM	1	0	0	1	*2*	0	0	0	0	*0*	0	0	0	0	*0*
7:45 AM	**1**	**1**	**0**	**1**	***3***	**0**	**0**	**0**	**0**	***0***	**3**	**3**	**1**	**0**	*7*
8:00 AM	**2**	**2**	**0**	**1**	***5***	**2**	**0**	**0**	**0**	***2***	**0**	**13**	**10**	**0**	*23*
8:15 AM	**1**	**1**	**0**	**0**	***2***	**2**	**0**	**0**	**0**	***2***	**0**	**39**	**24**	**0**	*63*
8:30 AM	**3**	**0**	**0**	**0**	***3***	**0**	**0**	**0**	**0**	***0***	**0**	**27**	**11**	**0**	***38***
8:45 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	9	7	0	*16*
Count Total	8	8	0	5	*21*	4	0	0	1	*5*	3	91	54	0	*148*
Peak Hr	**7**	**4**	**0**	**2**	***13***	**4**	**0**	**0**	**0**	***4***	**3**	**82**	**46**	**0**	***131***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	E 27th St				E 27th St				0				25th Ave				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
7:15 AM	0	0	0	0	0	0	2	1	0	0	0	0	0	2	0	0	5	0
7:30 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	2	0
7:45 AM	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**3**	11
8:00 AM	**0**	**0**	**2**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**5**	15
8:15 AM	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	12
8:30 AM	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**13**
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
Count Total	0	0	8	0	0	0	5	3	0	0	0	0	0	5	0	0	21	0
Peak Hour	**0**	**0**	**7**	**0**	**0**	**0**	**3**	**1**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**13**	**0**

Two-Hour Count Summaries - Bikes

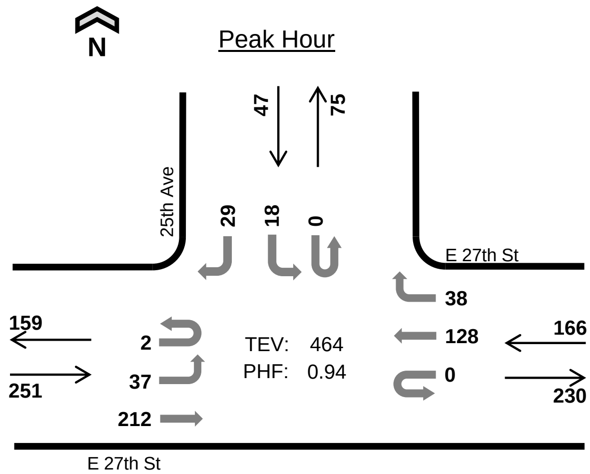
Interval Start	E 27th St			E 27th St			0			25th Ave			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	1	0	0	1	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	1
8:00 AM	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	2
8:15 AM	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	4
8:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Count Total	0	4	0	0	0	0	0	0	0	1	0	0	5	0
Peak Hour	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**0**

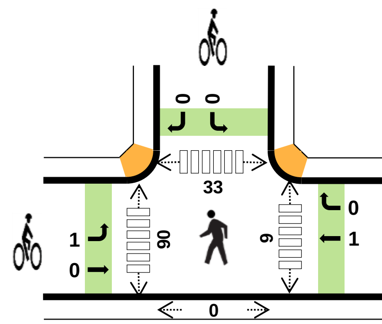
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

25th Ave
E 27th St

Date: 05-23-2018
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 5:00 PM to 6:00 PM

Peak Hour





	HV %:	PHF
EB	0.8%	0.87
WB	0.0%	0.94
NB	-	-
SB	0.0%	0.90
TOTAL	0.4%	0.94

Two-Hour Count Summaries

Interval Start		E 27th St Eastbound UT	LT	TH	RT	E 27th St Westbound UT	LT	TH	RT	0 Northbound UT	LT	TH	RT	25th Ave Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
4:00 PM		0	3	25	0	0	0	23	8	0	0	0	0	0	1	0	4	64	0
4:15 PM		0	4	36	0	0	0	31	5	0	0	0	0	0	3	0	1	80	0
4:30 PM		1	6	32	0	0	0	29	6	0	0	0	0	0	7	0	5	86	0
4:45 PM		1	2	37	0	0	0	23	6	0	0	0	0	0	4	0	4	77	307
5:00 PM		**0**	**3**	**49**	**0**	**0**	**0**	**32**	**6**	**0**	**0**	**0**	**0**	**0**	**6**	**0**	**6**	**102**	345
5:15 PM		**1**	**9**	**57**	**0**	**0**	**0**	**33**	**10**	**0**	**0**	**0**	**0**	**0**	**5**	**0**	**6**	**121**	386
5:30 PM		**1**	**18**	**53**	**0**	**0**	**0**	**29**	**12**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**7**	**124**	424
5:45 PM		**0**	**7**	**53**	**0**	**0**	**0**	**34**	**10**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**10**	**117**	**464**
Count Total		4	52	342	0	0	0	234	63	0	0	0	0	0	33	0	43	771	0
Peak Hour	**All**	**2**	**37**	**212**	**0**	**0**	**0**	**128**	**38**	**0**	**0**	**0**	**0**	**0**	**18**	**0**	**29**	**464**	**0**
	HV	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**
	HV%	**0%**	**0%**	**1%**	**-**	**-**	**-**	**0%**	**0%**	**-**	**-**	**-**	**-**	**-**	**0%**	**-**	**0%**	**0%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
4:00 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	1	2	0	*3*
4:15 PM	0	1	0	0	*1*	0	0	0	0	*0*	0	1	2	0	*3*
4:30 PM	1	0	0	0	*1*	0	1	0	1	*2*	1	2	0	0	*3*
4:45 PM	0	0	0	0	*0*	2	0	0	0	*2*	4	7	4	0	*15*
5:00 PM	**1**	**0**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	***0***	**0**	**13**	**0**	**0**	*13*
5:15 PM	**1**	**0**	**0**	**0**	***1***	**0**	**1**	**0**	**0**	***1***	**2**	**38**	**19**	**0**	*59*
5:30 PM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**4**	**21**	**9**	**0**	*34*
5:45 PM	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**0**	**0**	***1***	**3**	**18**	**5**	**0**	*26*
Count Total	3	1	0	0	*4*	3	2	0	1	*6*	14	101	41	0	*156*
Peak Hr	**2**	**0**	**0**	**0**	***2***	**1**	**1**	**0**	**0**	***2***	**9**	**90**	**33**	**0**	***132***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	E 27th St				E 27th St				0				25th Ave				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0
4:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5:00 PM	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	3
5:15 PM	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	3
5:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	2
5:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**
Count Total	0	1	2	0	0	0	1	0	0	0	0	0	0	0	0	0	4	0
Peak Hour	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**

Two-Hour Count Summaries - Bikes

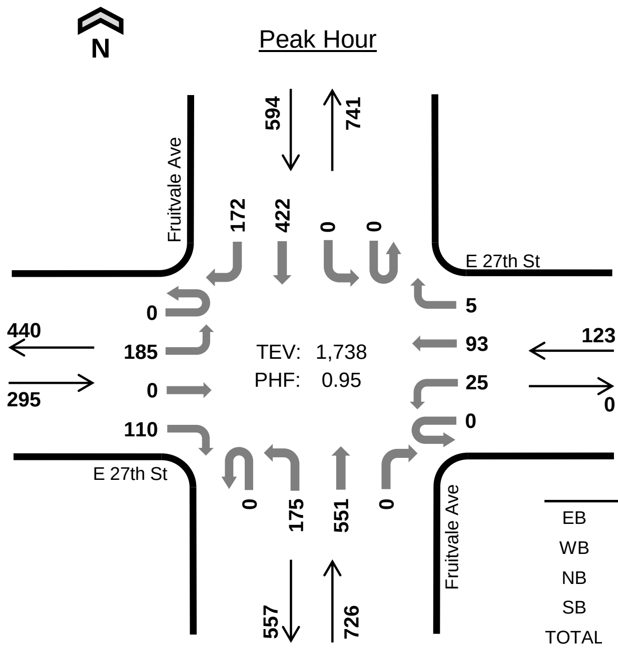
Interval Start	E 27th St			E 27th St			0			25th Ave			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	1	0	0	0	1	0	0	2	0
4:45 PM	0	2	0	0	0	0	0	0	0	0	0	0	2	4
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	4
5:15 PM	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	5
5:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	3
5:45 PM	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**2**
Count Total	1	2	0	0	1	1	0	0	0	1	0	0	6	0
Peak Hour	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

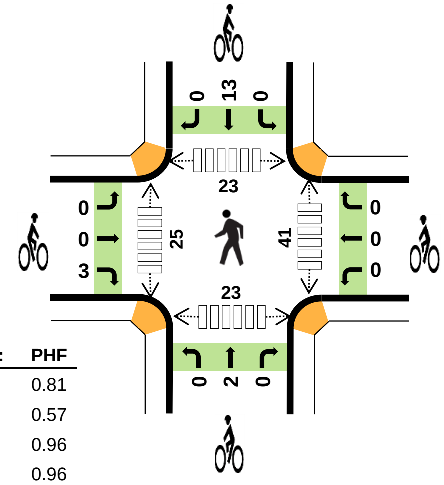
Fruitvale Ave
E 27th St

Date: 05-23-2018
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:45 AM to 8:45 AM

Peak Hour



	HV %:	PHF
EB	3.7%	0.81
WB	0.8%	0.57
NB	3.2%	0.96
SB	4.0%	0.96
TOTAL	3.4%	0.95



Two-Hour Count Summaries

Interval Start		E 27th St Eastbound UT	LT	TH	RT	E 27th St Westbound UT	LT	TH	RT	Fruitvale Ave Northbound UT	LT	TH	RT	Fruitvale Ave Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM		0	20	0	15	0	2	1	2	0	14	117	0	0	0	50	21	242	0
7:15 AM		0	35	0	15	0	1	2	3	0	11	148	0	0	0	79	25	319	0
7:30 AM		0	38	0	24	0	6	9	2	0	12	154	0	0	0	99	35	379	0
7:45 AM		**0**	**47**	**0**	**22**	**0**	**8**	**13**	**1**	**0**	**27**	**154**	**0**	**0**	**0**	**119**	**35**	**426**	1,366
8:00 AM		**0**	**41**	**0**	**27**	**0**	**5**	**13**	**2**	**0**	**56**	**134**	**0**	**0**	**0**	**98**	**50**	**426**	1,550
8:15 AM		**0**	**40**	**0**	**27**	**0**	**6**	**48**	**0**	**0**	**54**	**112**	**0**	**0**	**0**	**99**	**43**	**429**	1,660
8:30 AM		**0**	**57**	**0**	**34**	**0**	**6**	**19**	**2**	**0**	**38**	**151**	**0**	**0**	**0**	**106**	**44**	**457**	**1,738**
8:45 AM		0	45	0	15	0	1	8	1	0	38	126	0	0	0	107	51	392	1,704
Count Total		0	323	0	179	0	35	113	13	0	250	1,096	0	0	0	757	304	3,070	0
Peak Hour	**All**	**0**	**185**	**0**	**110**	**0**	**25**	**93**	**5**	**0**	**175**	**551**	**0**	**0**	**0**	**422**	**172**	**1,738**	**0**
	HV	**0**	**8**	**0**	**3**	**0**	**0**	**1**	**0**	**0**	**1**	**22**	**0**	**0**	**0**	**17**	**7**	**59**	**0**
	HV%	**-**	**4%**	**-**	**3%**	**-**	**0%**	**1%**	**0%**	**-**	**1%**	**4%**	**-**	**-**	**-**	**4%**	**4%**	**3%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
7:00 AM	1	0	3	4	*8*	1	0	0	3	*4*	4	2	0	0	*6*
7:15 AM	1	0	7	5	*13*	0	0	0	2	*2*	9	6	3	5	*23*
7:30 AM	4	0	6	5	*15*	0	0	0	2	*2*	7	2	6	7	*22*
7:45 AM	**1**	**1**	**6**	**8**	***16***	**1**	**0**	**0**	**3**	***4***	**8**	**2**	**2**	**2**	*14*
8:00 AM	**5**	**0**	**5**	**4**	***14***	**1**	**0**	**2**	**2**	***5***	**7**	**7**	**6**	**10**	*30*
8:15 AM	**1**	**0**	**4**	**6**	***11***	**1**	**0**	**0**	**4**	***5***	**12**	**12**	**8**	**2**	*34*
8:30 AM	**4**	**0**	**8**	**6**	***18***	**0**	**0**	**0**	**4**	***4***	**14**	**4**	**7**	**9**	***34***
8:45 AM	2	0	2	3	*7*	0	0	0	4	*4*	8	6	4	8	*26*
Count Total	19	1	41	41	*102*	4	0	2	24	*30*	69	41	36	43	*189*
Peak Hour	**11**	**1**	**23**	**24**	***59***	**3**	**0**	**2**	**13**	***18***	**41**	**25**	**23**	**23**	***112***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	E 27th St Eastbound UT	LT	TH	RT	E 27th St Westbound UT	LT	TH	RT	Fruitvale Ave Northbound UT	LT	TH	RT	Fruitvale Ave Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM	0	1	0	0	0	0	0	0	0	0	3	0	0	0	2	2	8	0
7:15 AM	0	1	0	0	0	0	0	0	0	0	7	0	0	0	3	2	13	0
7:30 AM	0	2	0	2	0	0	0	0	0	2	4	0	0	0	5	0	15	0
7:45 AM	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**6**	**0**	**0**	**0**	**6**	**2**	**16**	52
8:00 AM	**0**	**3**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**1**	**4**	**0**	**0**	**0**	**2**	**2**	**14**	58
8:15 AM	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**4**	**2**	**11**	56
8:30 AM	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**8**	**0**	**0**	**0**	**5**	**1**	**18**	**59**
8:45 AM	0	2	0	0	0	0	0	0	0	0	2	0	0	0	3	0	7	50
Count Total	0	14	0	5	0	0	1	0	0	3	38	0	0	0	30	11	102	0
Peak Hour	**0**	**8**	**0**	**3**	**0**	**0**	**1**	**0**	**0**	**1**	**22**	**0**	**0**	**0**	**17**	**7**	**59**	**0**

Two-Hour Count Summaries - Bikes

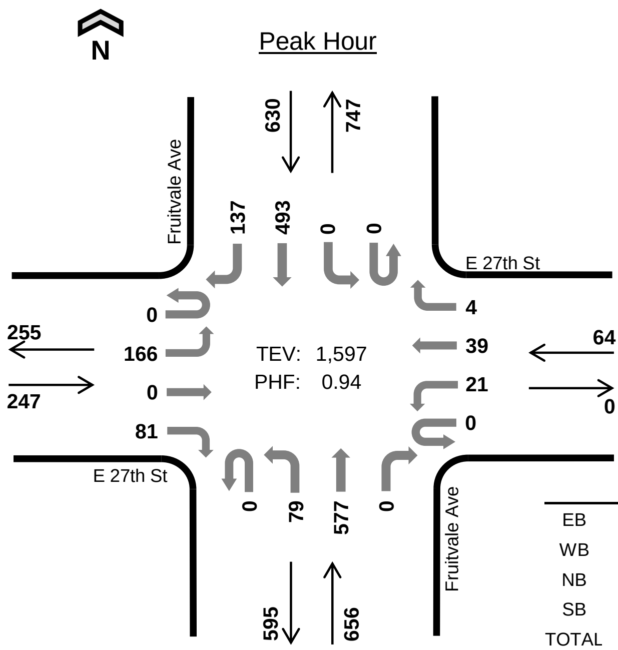
Interval Start	E 27th St Eastbound LT	TH	RT	E 27th St Westbound LT	TH	RT	Fruitvale Ave Northbound LT	TH	RT	Fruitvale Ave Southbound LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM	0	0	1	0	0	0	0	0	0	0	3	0	4	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	2	0	2	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	2	0	2	0
7:45 AM	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**4**	12
8:00 AM	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**2**	**0**	**5**	13
8:15 AM	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**5**	16
8:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**4**	**18**
8:45 AM	0	0	0	0	0	0	0	0	0	0	4	0	4	18
Count Total	0	0	4	0	0	0	0	2	0	0	24	0	30	0
Peak Hour	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**13**	**0**	**18**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

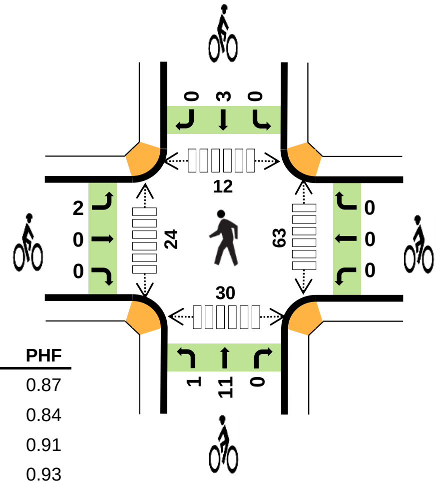
Fruitvale Ave
E 27th St

Date: 05-23-2018
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 5:00 PM to 6:00 PM

Peak Hour



	HV %:	PHF
EB	2.0%	0.87
WB	0.0%	0.84
NB	1.2%	0.91
SB	1.7%	0.93
TOTAL	1.5%	0.94



Two-Hour Count Summaries

Interval Start		E 27th St Eastbound				E 27th St Westbound				Fruitvale Ave Northbound				Fruitvale Ave Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM		0	44	0	13	0	1	7	2	0	11	119	0	0	0	129	37	363	0
4:15 PM		0	34	0	28	0	4	5	2	0	17	140	0	0	0	133	23	386	0
4:30 PM		0	36	0	23	0	2	10	3	0	16	153	0	0	0	107	36	386	0
4:45 PM		0	32	0	20	0	1	7	4	0	14	135	0	0	0	122	37	372	1,507
5:00 PM		**0**	**35**	**0**	**22**	**0**	**6**	**9**	**1**	**0**	**15**	**118**	**0**	**0**	**0**	**131**	**35**	**372**	1,516
5:15 PM		**0**	**47**	**0**	**19**	**0**	**4**	**15**	**0**	**0**	**15**	**160**	**0**	**0**	**0**	**104**	**33**	**397**	1,527
5:30 PM		**0**	**35**	**0**	**18**	**0**	**4**	**11**	**1**	**0**	**26**	**141**	**0**	**0**	**0**	**135**	**34**	**405**	1,546
5:45 PM		**0**	**49**	**0**	**22**	**0**	**7**	**4**	**2**	**0**	**23**	**158**	**0**	**0**	**0**	**123**	**35**	**423**	**1,597**
Count Total		0	312	0	165	0	29	68	15	0	137	1,124	0	0	0	984	270	3,104	0
Peak Hour	**All**	**0**	**166**	**0**	**81**	**0**	**21**	**39**	**4**	**0**	**79**	**577**	**0**	**0**	**0**	**493**	**137**	**1,597**	**0**
	HV	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**8**	**0**	**0**	**0**	**7**	**4**	**24**	**0**
	HV%	**-**	**3%**	**-**	**0%**	**-**	**0%**	**0%**	**0%**	**-**	**0%**	**1%**	**-**	**-**	**-**	**1%**	**3%**	**2%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	2	0	3	3	*8*	0	0	2	0	*2*	11	7	3	8	*29*
4:15 PM	0	0	2	3	*5*	0	0	2	0	*2*	23	11	4	4	*42*
4:30 PM	1	0	3	1	*5*	1	0	6	1	*8*	24	5	6	12	*47*
4:45 PM	1	0	0	2	*3*	2	0	1	0	*3*	19	11	4	19	*53*
5:00 PM	**2**	**0**	**3**	**3**	***8***	**1**	**0**	**4**	**1**	***6***	**13**	**10**	**1**	**10**	*34*
5:15 PM	**2**	**0**	**1**	**3**	***6***	**0**	**0**	**4**	**1**	***5***	**20**	**2**	**4**	**6**	*32*
5:30 PM	**1**	**0**	**2**	**3**	***6***	**1**	**0**	**3**	**1**	***5***	**12**	**1**	**3**	**7**	*23*
5:45 PM	**0**	**0**	**2**	**2**	***4***	**0**	**0**	**1**	**0**	***1***	**18**	**11**	**4**	**7**	***40***
Count Total	9	0	16	20	*45*	5	0	23	4	*32*	140	58	29	73	*300*
Peak Hour	**5**	**0**	**8**	**11**	***24***	**2**	**0**	**12**	**3**	***17***	**63**	**24**	**12**	**30**	***129***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	E 27th St Eastbound UT	LT	TH	RT	E 27th St Westbound UT	LT	TH	RT	Fruitvale Ave Northbound UT	LT	TH	RT	Fruitvale Ave Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
4:00 PM	0	2	0	0	0	0	0	0	0	0	3	0	0	0	2	1	8	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	1	5	0
4:30 PM	0	1	0	0	0	0	0	0	0	0	3	0	0	0	0	1	5	0
4:45 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3	21
5:00 PM	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**2**	**1**	**8**	21
5:15 PM	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**2**	**1**	**6**	22
5:30 PM	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**2**	**1**	**6**	23
5:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**1**	**1**	**4**	**24**
Count Total	0	9	0	0	0	0	0	0	0	0	16	0	0	0	12	8	45	0
Peak Hour	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**8**	**0**	**0**	**0**	**7**	**4**	**24**	**0**

Two-Hour Count Summaries - Bikes

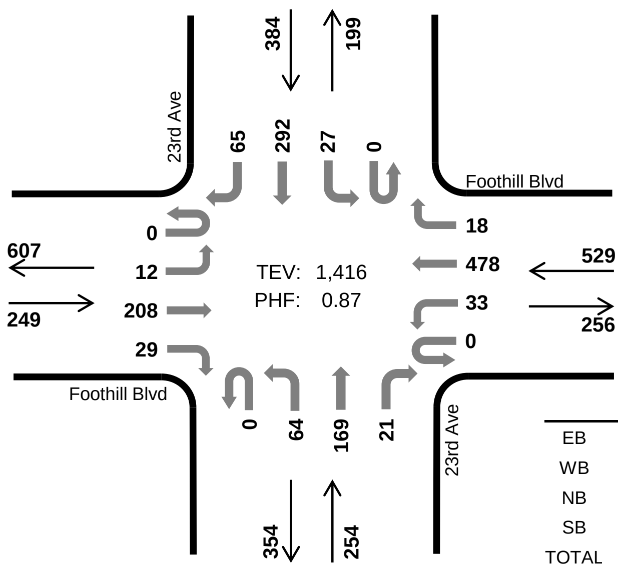
Interval Start	E 27th St Eastbound LT	TH	RT	E 27th St Westbound LT	TH	RT	Fruitvale Ave Northbound LT	TH	RT	Fruitvale Ave Southbound LT	TH	RT	15-min Total	Rolling One Hour
4:00 PM	0	0	0	0	0	0	0	2	0	0	0	0	2	0
4:15 PM	0	0	0	0	0	0	0	2	0	0	0	0	2	0
4:30 PM	1	0	0	0	0	0	3	3	0	0	1	0	8	0
4:45 PM	1	0	1	0	0	0	0	1	0	0	0	0	3	15
5:00 PM	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**1**	**0**	**6**	19
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**1**	**0**	**5**	22
5:30 PM	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**2**	**0**	**0**	**1**	**0**	**5**	19
5:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**17**
Count Total	4	0	1	0	0	0	4	19	0	0	4	0	32	0
Peak Hour	**2**	**0**	**0**	**0**	**0**	**0**	**1**	**11**	**0**	**0**	**3**	**0**	**17**	**0**

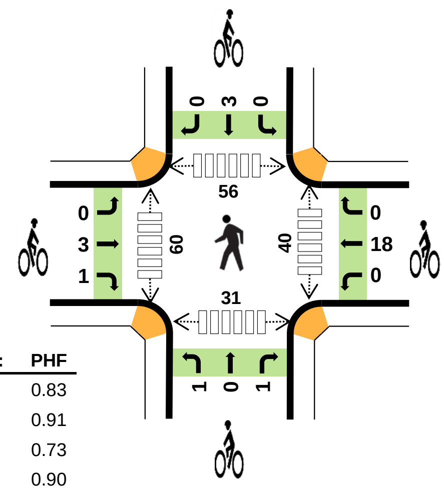
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

23rd Ave
Foothill Blvd

Date: 05-23-2018
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:45 AM to 8:45 AM

Peak Hour





	HV %:	PHF
EB	4.0%	0.83
WB	1.5%	0.91
NB	4.7%	0.73
SB	1.8%	0.90
TOTAL	2.6%	0.87

Two-Hour Count Summaries

Interval Start	Foothill Blvd Eastbound UT	LT	TH	RT	Foothill Blvd Westbound UT	LT	TH	RT	23rd Ave Northbound UT	LT	TH	RT	23rd Ave Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM	0	0	25	5	0	4	48	1	0	3	15	1	0	5	35	6	148	0
7:15 AM	0	0	23	3	0	3	69	2	0	5	22	4	0	2	36	4	173	0
7:30 AM	0	3	39	8	0	10	96	3	0	7	33	6	0	5	61	10	281	0
7:45 AM	**0**	**3**	**63**	**4**	**0**	**6**	**123**	**3**	**0**	**9**	**35**	**6**	**0**	**5**	**66**	**12**	**335**	937
8:00 AM	**0**	**4**	**41**	**7**	**0**	**11**	**127**	**7**	**0**	**8**	**33**	**2**	**0**	**7**	**75**	**13**	**335**	1,124
8:15 AM	**0**	**3**	**44**	**5**	**0**	**8**	**100**	**7**	**0**	**22**	**44**	**8**	**0**	**6**	**76**	**17**	**340**	1,291
8:30 AM	**0**	**2**	**60**	**13**	**0**	**8**	**128**	**1**	**0**	**25**	**57**	**5**	**0**	**9**	**75**	**23**	**406**	**1,416**
8:45 AM	0	3	66	7	0	6	107	5	0	11	31	4	0	6	59	21	326	1,407
Count Total	0	18	361	52	0	56	798	29	0	90	270	36	0	45	483	106	2,344	0
Peak Hour All	**0**	**12**	**208**	**29**	**0**	**33**	**478**	**18**	**0**	**64**	**169**	**21**	**0**	**27**	**292**	**65**	**1,416**	**0**
Peak Hour HV	**0**	**1**	**9**	**0**	**0**	**0**	**8**	**0**	**0**	**3**	**9**	**0**	**0**	**1**	**6**	**0**	**37**	**0**
Peak Hour HV%	**-**	**8%**	**4%**	**0%**	**-**	**0%**	**2%**	**0%**	**-**	**5%**	**5%**	**0%**	**-**	**4%**	**2%**	**0%**	**3%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
7:00 AM	2	4	2	5	*13*	0	1	0	0	*1*	0	1	1	2	*4*
7:15 AM	1	3	3	1	*8*	0	2	0	0	*2*	6	5	3	4	*18*
7:30 AM	2	1	4	2	*9*	2	0	0	2	*4*	4	4	7	4	*19*
7:45 AM	**5**	**2**	**2**	**1**	***10***	**1**	**5**	**1**	**1**	***8***	**3**	**5**	**8**	**2**	*18*
8:00 AM	**3**	**3**	**3**	**3**	***12***	**2**	**3**	**0**	**0**	***5***	**2**	**13**	**7**	**4**	*26*
8:15 AM	**1**	**2**	**4**	**1**	***8***	**1**	**4**	**1**	**1**	***7***	**11**	**12**	**12**	**8**	*43*
8:30 AM	**1**	**1**	**3**	**2**	***7***	**0**	**6**	**0**	**1**	***7***	**24**	**30**	**29**	**17**	***100***
8:45 AM	3	5	3	0	*11*	2	1	0	0	*3*	7	37	7	14	*65*
Count Total	18	21	24	15	*78*	8	22	2	5	*37*	57	107	74	55	*293*
Peak Hour	**10**	**8**	**12**	**7**	***37***	**4**	**18**	**2**	**3**	***27***	**40**	**60**	**56**	**31**	***187***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Foothill Blvd Eastbound				Foothill Blvd Westbound				23rd Ave Northbound				23rd Ave Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	1	1	0	0	4	0	0	0	2	0	0	2	2	1	13	0
7:15 AM	0	0	1	0	0	0	3	0	0	0	2	1	0	0	1	0	8	0
7:30 AM	0	0	1	1	0	0	1	0	0	0	3	1	0	0	1	1	9	0
7:45 AM	**0**	**0**	**5**	**0**	**0**	**0**	**2**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**1**	**0**	**10**	40
8:00 AM	**0**	**1**	**2**	**0**	**0**	**0**	**3**	**0**	**0**	**1**	**2**	**0**	**0**	**1**	**2**	**0**	**12**	39
8:15 AM	**0**	**0**	**1**	**0**	**0**	**0**	**2**	**0**	**0**	**1**	**3**	**0**	**0**	**0**	**1**	**0**	**8**	39
8:30 AM	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**2**	**0**	**7**	**37**
8:45 AM	0	0	3	0	0	0	5	0	0	0	3	0	0	0	0	0	11	38
Count Total	0	1	15	2	0	0	21	0	0	3	19	2	0	3	10	2	78	0
Peak Hour	**0**	**1**	**9**	**0**	**0**	**0**	**8**	**0**	**0**	**3**	**9**	**0**	**0**	**1**	**6**	**0**	**37**	**0**

Two-Hour Count Summaries - Bikes

Interval Start	Foothill Blvd Eastbound			Foothill Blvd Westbound			23rd Ave Northbound			23rd Ave Southbound			15-min Total	Rolling One Hour
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	1	0	0	0	0	0	0	0	1	0
7:15 AM	0	0	0	0	2	0	0	0	0	0	0	0	2	0
7:30 AM	0	2	0	0	0	0	0	0	0	0	2	0	4	0
7:45 AM	**0**	**1**	**0**	**0**	**5**	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**8**	15
8:00 AM	**0**	**2**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	19
8:15 AM	**0**	**0**	**1**	**0**	**4**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**7**	24
8:30 AM	**0**	**0**	**0**	**0**	**6**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**7**	**27**
8:45 AM	0	1	1	0	1	0	0	0	0	0	0	0	3	22
Count Total	0	6	2	0	22	0	1	0	1	0	5	0	37	0
Peak Hour	**0**	**3**	**1**	**0**	**18**	**0**	**1**	**0**	**1**	**0**	**3**	**0**	**27**	**0**

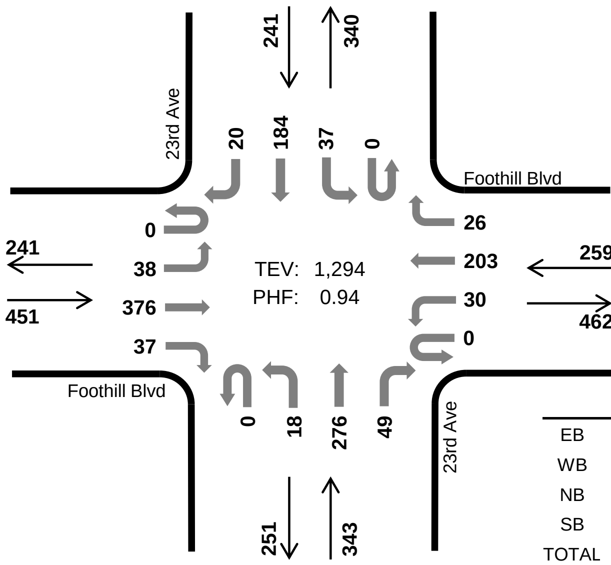
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

23rd Ave
Foothill Blvd

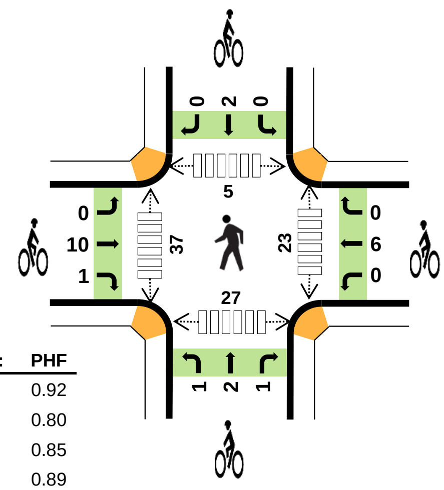
Date: 05-23-2018
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:45 PM to 5:45 PM

N

Peak Hour



	HV %:	PHF
EB	2.0%	0.92
WB	3.1%	0.80
NB	1.2%	0.85
SB	2.1%	0.89
TOTAL	2.0%	0.94



Two-Hour Count Summaries

Interval Start		Foothill Blvd Eastbound				Foothill Blvd Westbound				23rd Ave Northbound				23rd Ave Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM		0	2	76	6	0	10	60	4	0	7	41	10	0	3	52	6	277	0
4:15 PM		0	5	85	5	0	3	58	7	0	3	62	15	0	4	51	10	308	0
4:30 PM		0	4	80	3	0	10	49	5	0	4	69	13	0	7	37	8	289	0
4:45 PM		**0**	**4**	**95**	**10**	**0**	**6**	**43**	**4**	**0**	**6**	**61**	**14**	**0**	**11**	**52**	**5**	**311**	1,185
5:00 PM		**0**	**12**	**102**	**9**	**0**	**9**	**49**	**8**	**0**	**6**	**54**	**12**	**0**	**6**	**41**	**3**	**311**	1,219
5:15 PM		**0**	**13**	**80**	**8**	**0**	**10**	**64**	**7**	**0**	**4**	**70**	**15**	**0**	**9**	**44**	**4**	**328**	1,239
5:30 PM		**0**	**9**	**99**	**10**	**0**	**5**	**47**	**7**	**0**	**2**	**91**	**8**	**0**	**11**	**47**	**8**	**344**	**1,294**
5:45 PM		0	9	92	7	0	5	52	1	0	8	63	8	0	9	45	12	311	1,294
Count Total		0	58	709	58	0	58	422	43	0	40	511	95	0	60	369	56	2,479	0
Peak Hour	**All**	**0**	**38**	**376**	**37**	**0**	**30**	**203**	**26**	**0**	**18**	**276**	**49**	**0**	**37**	**184**	**20**	**1,294**	**0**
	HV	**0**	**1**	**8**	**0**	**0**	**2**	**6**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**5**	**0**	**26**	**0**
	HV%	**-**	**3%**	**2%**	**0%**	**-**	**7%**	**3%**	**0%**	**-**	**0%**	**1%**	**0%**	**-**	**0%**	**3%**	**0%**	**2%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	2	4	2	4	*12*	4	0	2	0	*6*	7	14	6	10	*37*
4:15 PM	1	1	1	3	*6*	2	2	1	0	*5*	2	6	5	2	*15*
4:30 PM	0	2	1	2	*5*	1	3	0	1	*5*	4	5	0	6	*15*
4:45 PM	**2**	**2**	**1**	**2**	***7***	**0**	**1**	**1**	**1**	***3***	**10**	**7**	**1**	**10**	*28*
5:00 PM	**4**	**2**	**1**	**1**	***8***	**4**	**2**	**0**	**1**	***7***	**3**	**14**	**4**	**10**	*31*
5:15 PM	**2**	**3**	**1**	**0**	***6***	**4**	**1**	**2**	**0**	***7***	**4**	**9**	**0**	**6**	*19*
5:30 PM	**1**	**1**	**1**	**2**	***5***	**3**	**2**	**1**	**0**	***6***	**6**	**7**	**0**	**1**	***14***
5:45 PM	1	1	0	1	*3*	1	2	0	0	*3*	6	10	5	4	*25*
Count Total	13	16	8	15	*52*	19	13	7	3	*42*	42	72	21	49	*184*
Peak Hour	**9**	**8**	**4**	**5**	***26***	**11**	**6**	**4**	**2**	***23***	**23**	**37**	**5**	**27**	***92***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Foothill Blvd Eastbound UT	LT	TH	RT	Foothill Blvd Westbound UT	LT	TH	RT	23rd Ave Northbound UT	LT	TH	RT	23rd Ave Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
4:00 PM	0	0	2	0	0	1	3	0	0	0	2	0	0	0	4	0	12	0
4:15 PM	0	0	1	0	0	0	1	0	0	0	1	0	0	0	2	1	6	0
4:30 PM	0	0	0	0	0	1	1	0	0	0	1	0	0	0	2	0	5	0
4:45 PM	**0**	**0**	**2**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**2**	**0**	**7**	30
5:00 PM	**0**	**1**	**3**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**8**	26
5:15 PM	**0**	**0**	**2**	**0**	**0**	**1**	**2**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**6**	26
5:30 PM	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**2**	**0**	**5**	**26**
5:45 PM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	3	22
Count Total	0	1	12	0	0	4	12	0	0	0	8	0	0	0	14	1	52	0
Peak Hour	**0**	**1**	**8**	**0**	**0**	**2**	**6**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**5**	**0**	**26**	**0**

Two-Hour Count Summaries - Bikes

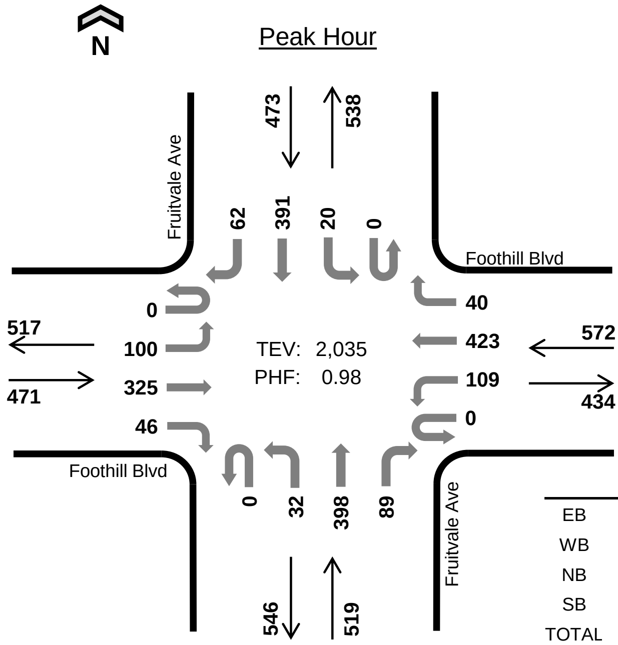
Interval Start	Foothill Blvd Eastbound LT	TH	RT	Foothill Blvd Westbound LT	TH	RT	23rd Ave Northbound LT	TH	RT	23rd Ave Southbound LT	TH	RT	15-min Total	Rolling One Hour
4:00 PM	0	3	1	0	0	0	1	1	0	0	0	0	6	0
4:15 PM	0	2	0	0	2	0	0	0	1	0	0	0	5	0
4:30 PM	0	1	0	0	3	0	0	0	0	0	1	0	5	0
4:45 PM	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**3**	19
5:00 PM	**0**	**4**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**7**	20
5:15 PM	**0**	**4**	**0**	**0**	**1**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**7**	22
5:30 PM	**0**	**2**	**1**	**0**	**2**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**6**	**23**
5:45 PM	0	1	0	0	2	0	0	0	0	0	0	0	3	23
Count Total	0	17	2	0	13	0	2	3	2	0	3	0	42	0
Peak Hour	**0**	**10**	**1**	**0**	**6**	**0**	**1**	**2**	**1**	**0**	**2**	**0**	**23**	**0**

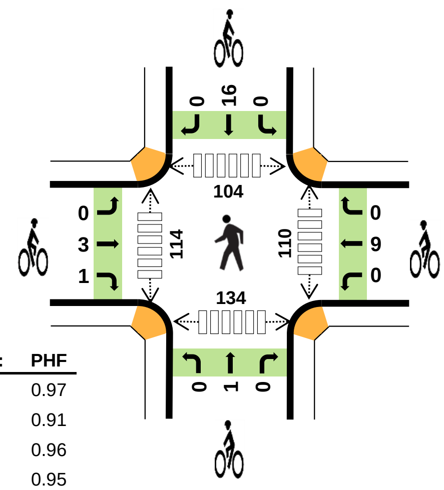
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Fruitvale Ave
Foothill Blvd

Date: 05-23-2018
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:45 AM to 8:45 AM

Peak Hour





	HV %:	PHF
EB	2.3%	0.97
WB	3.5%	0.91
NB	2.5%	0.96
SB	3.6%	0.95
TOTAL	3.0%	0.98

Two-Hour Count Summaries

Interval Start		Foothill Blvd Eastbound				Foothill Blvd Westbound				Fruitvale Ave Northbound				Fruitvale Ave Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		0	17	44	5	0	15	50	18	0	4	58	18	0	1	52	8	290	0
7:15 AM		0	17	45	7	0	19	55	12	0	6	86	26	0	3	98	3	377	0
7:30 AM		0	26	68	9	0	21	74	15	0	7	81	10	0	9	88	14	422	0
7:45 AM		**0**	**25**	**86**	**9**	**0**	**21**	**102**	**9**	**0**	**9**	**112**	**14**	**0**	**1**	**103**	**12**	**503**	1,592
8:00 AM		**0**	**17**	**84**	**11**	**0**	**31**	**114**	**13**	**0**	**5**	**101**	**20**	**0**	**6**	**95**	**22**	**519**	1,821
8:15 AM		**0**	**30**	**78**	**14**	**0**	**28**	**106**	**7**	**0**	**7**	**96**	**26**	**0**	**4**	**97**	**9**	**502**	1,946
8:30 AM		**0**	**28**	**77**	**12**	**0**	**29**	**101**	**11**	**0**	**11**	**89**	**29**	**0**	**9**	**96**	**19**	**511**	**2,035**
8:45 AM		0	29	77	10	0	31	103	16	0	4	88	18	0	5	89	18	488	2,020
Count Total		0	189	559	77	0	195	705	101	0	53	711	161	0	38	718	105	3,612	0
Peak Hour	**All**	**0**	**100**	**325**	**46**	**0**	**109**	**423**	**40**	**0**	**32**	**398**	**89**	**0**	**20**	**391**	**62**	**2,035**	**0**
	HV	**0**	**1**	**9**	**1**	**0**	**4**	**12**	**4**	**0**	**0**	**12**	**1**	**0**	**0**	**17**	**0**	**61**	**0**
	HV%	**-**	**1%**	**3%**	**2%**	**-**	**4%**	**3%**	**10%**	**-**	**0%**	**3%**	**1%**	**-**	**0%**	**4%**	**0%**	**3%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	5	3	5	3	*16*	1	0	0	7	*8*	10	14	22	19	*65*
7:15 AM	2	5	7	2	*16*	0	2	0	3	*5*	24	12	21	15	*72*
7:30 AM	2	2	5	6	*15*	1	0	0	6	*7*	37	10	18	23	*88*
7:45 AM	**5**	**5**	**3**	**6**	***19***	**2**	**1**	**1**	**4**	***8***	**28**	**23**	**27**	**38**	*116*
8:00 AM	**4**	**7**	**3**	**4**	***18***	**2**	**2**	**0**	**4**	***8***	**30**	**26**	**24**	**34**	*114*
8:15 AM	**1**	**4**	**4**	**4**	***13***	**0**	**3**	**0**	**4**	***7***	**32**	**42**	**35**	**30**	*139*
8:30 AM	**1**	**4**	**3**	**3**	***11***	**0**	**3**	**0**	**4**	***7***	**20**	**23**	**18**	**32**	*93*
8:45 AM	6	5	3	1	*15*	2	1	0	5	*8*	28	17	21	24	*90*
Count Total	26	35	33	29	*123*	8	12	1	37	*58*	209	167	186	215	*777*
Peak Hour	**11**	**20**	**13**	**17**	***61***	**4**	**9**	**1**	**16**	***30***	**110**	**114**	**104**	**134**	***462***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Foothill Blvd				Foothill Blvd				Fruitvale Ave				Fruitvale Ave				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	1	3	1	0	1	2	0	0	0	4	1	0	0	3	0	16	0
7:15 AM	0	1	1	0	0	0	5	0	0	0	7	0	0	1	1	0	16	0
7:30 AM	0	1	1	0	0	0	1	1	0	0	5	0	0	0	5	1	15	0
7:45 AM	**0**	**1**	**3**	**1**	**0**	**1**	**3**	**1**	**0**	**0**	**3**	**0**	**0**	**0**	**6**	**0**	**19**	66
8:00 AM	**0**	**0**	**4**	**0**	**0**	**2**	**4**	**1**	**0**	**0**	**3**	**0**	**0**	**0**	**4**	**0**	**18**	68
8:15 AM	**0**	**0**	**1**	**0**	**0**	**0**	**3**	**1**	**0**	**0**	**4**	**0**	**0**	**0**	**4**	**0**	**13**	65
8:30 AM	**0**	**0**	**1**	**0**	**0**	**1**	**2**	**1**	**0**	**0**	**2**	**1**	**0**	**0**	**3**	**0**	**11**	**61**
8:45 AM	0	1	5	0	0	0	5	0	0	0	2	1	0	0	1	0	15	57
Count Total	0	5	19	2	0	5	25	5	0	0	30	3	0	1	27	1	123	0
Peak Hour	**0**	**1**	**9**	**1**	**0**	**4**	**12**	**4**	**0**	**0**	**12**	**1**	**0**	**0**	**17**	**0**	**61**	**0**

Two-Hour Count Summaries - Bikes

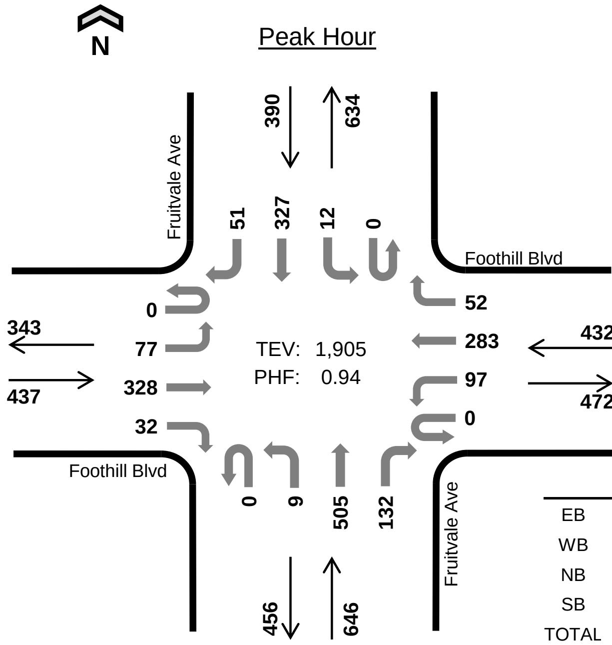
Interval Start	Foothill Blvd			Foothill Blvd			Fruitvale Ave			Fruitvale Ave			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	1	0	0	0	0	0	0	0	7	0	8	0
7:15 AM	0	0	0	0	2	0	0	0	0	0	3	0	5	0
7:30 AM	0	0	1	0	0	0	0	0	0	0	6	0	7	0
7:45 AM	**0**	**1**	**1**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**4**	**0**	**8**	28
8:00 AM	**0**	**2**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**8**	28
8:15 AM	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**7**	30
8:30 AM	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**7**	**30**
8:45 AM	0	1	1	0	1	0	0	0	0	0	4	1	8	30
Count Total	0	4	4	0	12	0	0	1	0	0	36	1	58	0
Peak Hour	**0**	**3**	**1**	**0**	**9**	**0**	**0**	**1**	**0**	**0**	**16**	**0**	**30**	**0**

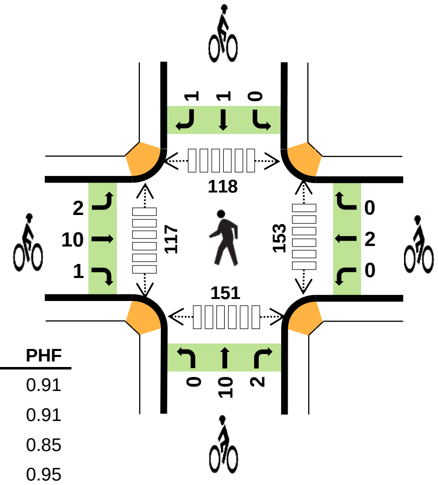
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Fruitvale Ave
Foothill Blvd

Peak Hour

Date: 05-23-2018
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 5:00 PM to 6:00 PM





	HV %:	PHF
EB	1.4%	0.91
WB	1.4%	0.91
NB	1.7%	0.85
SB	1.8%	0.95
TOTAL	1.6%	0.94

Two-Hour Count Summaries

Interval Start	Foothill Blvd Eastbound UT	LT	TH	RT	Foothill Blvd Westbound UT	LT	TH	RT	Fruitvale Ave Northbound UT	LT	TH	RT	Fruitvale Ave Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
4:00 PM	0	23	83	10	0	18	68	10	0	4	103	23	0	4	76	17	439	0
4:15 PM	0	24	76	9	0	17	61	9	0	4	139	36	0	2	99	16	492	0
4:30 PM	0	25	78	13	0	27	59	15	0	3	133	30	0	3	72	11	469	0
4:45 PM	0	20	80	9	0	27	66	13	0	4	114	30	0	5	78	9	455	1,855
5:00 PM	**0**	**24**	**83**	**9**	**0**	**22**	**71**	**15**	**0**	**3**	**90**	**33**	**0**	**5**	**77**	**15**	**447**	1,863
5:15 PM	**0**	**12**	**79**	**7**	**0**	**33**	**76**	**10**	**0**	**1**	**152**	**36**	**0**	**1**	**91**	**11**	**509**	1,880
5:30 PM	**0**	**22**	**88**	**10**	**0**	**14**	**77**	**9**	**0**	**1**	**129**	**29**	**0**	**5**	**82**	**11**	**477**	1,888
5:45 PM	**0**	**19**	**78**	**6**	**0**	**28**	**59**	**18**	**0**	**4**	**134**	**34**	**0**	**1**	**77**	**14**	**472**	**1,905**
Count Total	0	169	645	73	0	186	537	99	0	24	994	251	0	26	652	104	3,760	0
Peak Hour All	**0**	**77**	**328**	**32**	**0**	**97**	**283**	**52**	**0**	**9**	**505**	**132**	**0**	**12**	**327**	**51**	**1,905**	**0**
Peak Hour HV	**0**	**0**	**6**	**0**	**0**	**0**	**6**	**0**	**0**	**0**	**9**	**2**	**0**	**0**	**6**	**1**	**30**	**0**
Peak Hour HV%	**-**	**0%**	**2%**	**0%**	**-**	**0%**	**2%**	**0%**	**-**	**0%**	**2%**	**2%**	**-**	**0%**	**2%**	**2%**	**2%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
4:00 PM	4	6	2	5	*17*	4	0	4	0	*8*	32	16	24	33	*105*
4:15 PM	2	1	3	2	*8*	2	0	1	0	*3*	23	25	21	60	*129*
4:30 PM	0	2	2	1	*5*	1	2	5	1	*9*	24	26	27	45	*122*
4:45 PM	2	2	1	1	*6*	2	0	4	1	*7*	43	33	34	40	*150*
5:00 PM	**2**	**2**	**5**	**2**	***11***	**2**	**1**	**2**	**0**	***5***	**53**	**36**	**39**	**38**	***166***
5:15 PM	**2**	**1**	**3**	**1**	***7***	**5**	**0**	**4**	**1**	***10***	**29**	**22**	**29**	**33**	***113***
5:30 PM	**1**	**2**	**0**	**2**	***5***	**6**	**1**	**4**	**1**	***12***	**40**	**36**	**27**	**43**	***146***
5:45 PM	**1**	**1**	**3**	**2**	***7***	**0**	**0**	**2**	**0**	***2***	**31**	**23**	**23**	**37**	***114***
Count Total	14	17	19	16	*66*	22	4	26	4	*56*	275	217	224	329	*1,045*
Peak Hour	**6**	**6**	**11**	**7**	***30***	**13**	**2**	**12**	**2**	***29***	**153**	**117**	**118**	**151**	***539***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Foothill Blvd				Foothill Blvd				Fruitvale Ave				Fruitvale Ave				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	1	3	0	0	1	5	0	0	0	2	0	0	1	4	0	17	0
4:15 PM	0	0	2	0	0	0	1	0	0	0	2	1	0	0	2	0	8	0
4:30 PM	0	0	0	0	0	0	2	0	0	0	2	0	0	0	1	0	5	0
4:45 PM	0	0	2	0	0	1	1	0	0	0	1	0	0	0	1	0	6	36
5:00 PM	**0**	**0**	**2**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**1**	**1**	**11**	30
5:15 PM	**0**	**0**	**2**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**2**	**1**	**0**	**0**	**1**	**0**	**7**	29
5:30 PM	**0**	**0**	**1**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**5**	29
5:45 PM	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**2**	**1**	**0**	**0**	**2**	**0**	**7**	**30**
Count Total	0	1	13	0	0	2	15	0	0	0	16	3	0	1	14	1	66	0
Peak Hour	**0**	**0**	**6**	**0**	**0**	**0**	**6**	**0**	**0**	**0**	**9**	**2**	**0**	**0**	**6**	**1**	**30**	**0**

Two-Hour Count Summaries - Bikes

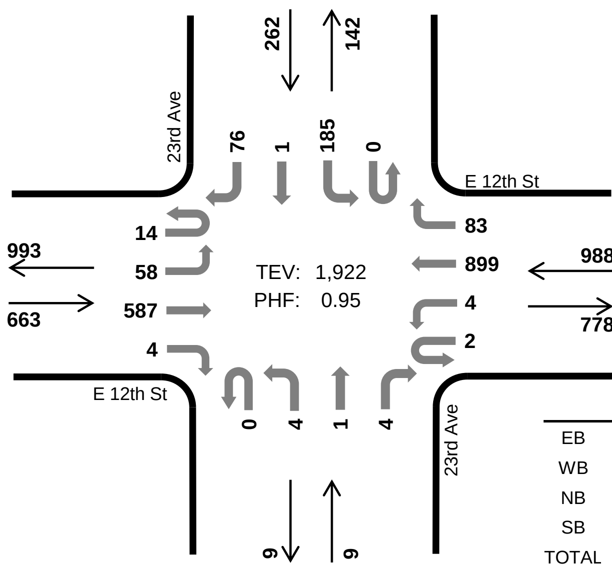
Interval Start	Foothill Blvd			Foothill Blvd			Fruitvale Ave			Fruitvale Ave			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	4	0	0	0	0	0	3	1	0	0	0	8	0
4:15 PM	1	1	0	0	0	0	0	1	0	0	0	0	3	0
4:30 PM	0	1	0	0	2	0	1	4	0	0	1	0	9	0
4:45 PM	0	1	1	0	0	0	0	3	1	0	1	0	7	27
5:00 PM	**1**	**1**	**0**	**0**	**1**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**5**	24
5:15 PM	**0**	**4**	**1**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**1**	**0**	**10**	31
5:30 PM	**1**	**5**	**0**	**0**	**1**	**0**	**0**	**2**	**2**	**0**	**0**	**1**	**12**	34
5:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**2**	**29**
Count Total	3	17	2	0	4	0	1	21	4	0	3	1	56	0
Peak Hour	**2**	**10**	**1**	**0**	**2**	**0**	**0**	**10**	**2**	**0**	**1**	**1**	**29**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

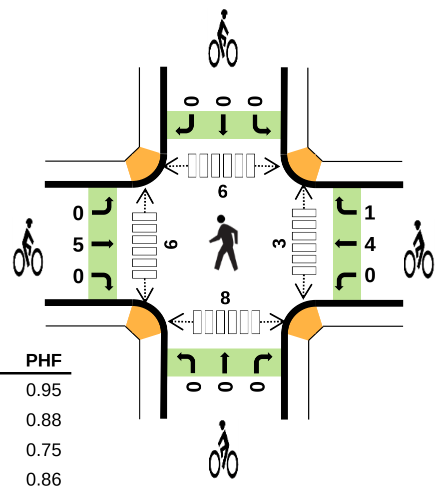
23rd Ave
E 12th St

Date: 05-23-2018
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 8:00 AM to 9:00 AM

Peak Hour



	HV %:	PHF
EB	1.1%	0.95
WB	2.2%	0.88
NB	0.0%	0.75
SB	1.9%	0.86
TOTAL	1.8%	0.95



Two-Hour Count Summaries

Interval Start	E 12th St Eastbound UT	LT	TH	RT	E 12th St Westbound UT	LT	TH	RT	23rd Ave Northbound UT	LT	TH	RT	23rd Ave Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM	3	5	78	0	0	0	74	6	0	0	0	0	0	21	0	7	194	0
7:15 AM	1	5	78	0	0	1	96	10	0	1	0	0	0	26	2	14	234	0
7:30 AM	1	13	99	0	1	0	147	21	0	0	0	1	0	31	0	18	332	0
7:45 AM	2	8	102	0	1	1	194	11	0	0	0	0	0	51	0	21	391	1,151
8:00 AM	**4**	**12**	**151**	**1**	**1**	**0**	**213**	**21**	**0**	**0**	**0**	**2**	**0**	**56**	**0**	**20**	**481**	1,438
8:15 AM	**5**	**17**	**144**	**2**	**0**	**0**	**222**	**21**	**0**	**1**	**1**	**0**	**0**	**39**	**1**	**21**	**474**	1,678
8:30 AM	**0**	**16**	**136**	**1**	**1**	**2**	**255**	**24**	**0**	**2**	**0**	**1**	**0**	**49**	**0**	**21**	**508**	1,854
8:45 AM	**5**	**13**	**156**	**0**	**0**	**2**	**209**	**17**	**0**	**1**	**0**	**1**	**0**	**41**	**0**	**14**	**459**	**1,922**
Count Total	21	89	944	4	4	6	1,410	131	0	5	1	5	0	314	3	136	3,073	0
Peak Hour All	**14**	**58**	**587**	**4**	**2**	**4**	**899**	**83**	**0**	**4**	**1**	**4**	**0**	**185**	**1**	**76**	**1,922**	**0**
Peak Hour HV	**1**	**3**	**3**	**0**	**0**	**0**	**15**	**7**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**2**	**34**	**0**
Peak Hour HV%	**7%**	**5%**	**1%**	**0%**	**0%**	**0%**	**2%**	**8%**	**-**	**0%**	**0%**	**0%**	**-**	**2%**	**0%**	**3%**	**2%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
7:00 AM	5	3	0	2	*10*	0	1	0	1	*2*	0	0	2	0	*2*
7:15 AM	5	3	0	2	*10*	1	1	0	0	*2*	1	1	1	1	*4*
7:30 AM	4	2	1	1	*8*	1	1	0	2	*4*	1	0	0	1	*2*
7:45 AM	3	3	0	1	*7*	2	3	0	1	*6*	1	1	0	3	*5*
8:00 AM	**1**	**7**	**0**	**3**	***11***	**1**	**2**	**0**	**0**	***3***	**0**	**3**	**2**	**1**	*6*
8:15 AM	**2**	**8**	**0**	**1**	***11***	**2**	**2**	**0**	**0**	***4***	**0**	**0**	**0**	**2**	*2*
8:30 AM	**0**	**4**	**0**	**1**	***5***	**1**	**1**	**0**	**0**	***2***	**3**	**0**	**4**	**5**	*12*
8:45 AM	**4**	**3**	**0**	**0**	***7***	**1**	**0**	**0**	**0**	***1***	**0**	**3**	**0**	**0**	***3***
Count Total	24	33	1	11	*69*	9	11	0	4	*24*	6	8	9	13	*36*
Peak Hour	**7**	**22**	**0**	**5**	***34***	**5**	**5**	**0**	**0**	***10***	**3**	**6**	**6**	**8**	***23***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	E 12th St				E 12th St				23rd Ave				23rd Ave				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	5	0	0	0	2	1	0	0	0	0	0	2	0	0	10	0
7:15 AM	0	0	5	0	0	0	2	1	0	0	0	0	0	1	1	0	10	0
7:30 AM	0	2	2	0	0	0	1	1	0	0	0	1	0	1	0	0	8	0
7:45 AM	0	0	3	0	0	0	3	0	0	0	0	0	0	1	0	0	7	35
8:00 AM	**0**	**1**	**0**	**0**	**0**	**0**	**5**	**2**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**2**	**11**	36
8:15 AM	**0**	**0**	**2**	**0**	**0**	**0**	**5**	**3**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**11**	37
8:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**5**	34
8:45 AM	**1**	**2**	**1**	**0**	**0**	**0**	**2**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**7**	**34**
Count Total	1	5	18	0	0	0	23	10	0	0	0	1	0	8	1	2	69	0
Peak Hour	**1**	**3**	**3**	**0**	**0**	**0**	**15**	**7**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**2**	**34**	**0**

Two-Hour Count Summaries - Bikes

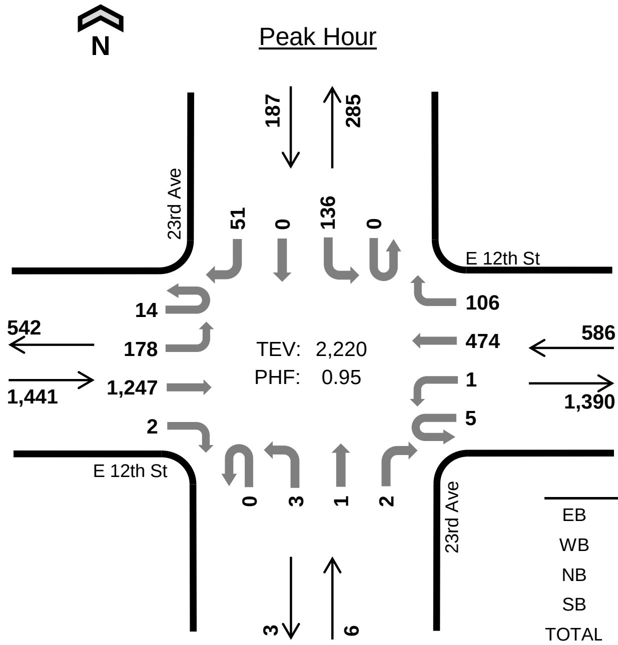
Interval Start	E 12th St			E 12th St			23rd Ave			23rd Ave			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	1	0	0	0	0	0	0	1	2	0
7:15 AM	0	1	0	0	1	0	0	0	0	0	0	0	2	0
7:30 AM	0	1	0	0	1	0	0	0	0	1	0	1	4	0
7:45 AM	0	2	0	0	2	1	0	0	0	1	0	0	6	14
8:00 AM	**0**	**1**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	15
8:15 AM	**0**	**2**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	17
8:30 AM	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	15
8:45 AM	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**10**
Count Total	0	9	0	0	9	2	0	0	0	2	0	2	24	0
Peak Hour	**0**	**5**	**0**	**0**	**4**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**10**	**0**

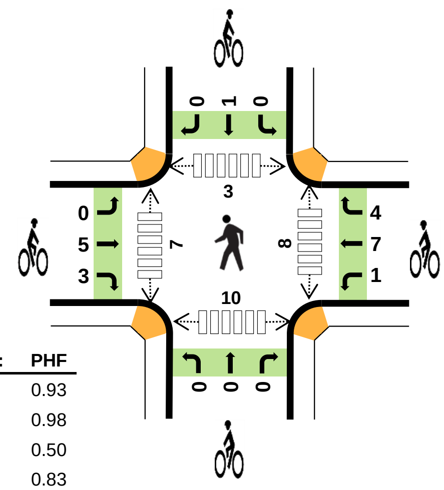
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

23rd Ave
E 12th St

Date: 05-23-2018
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 5:00 PM to 6:00 PM

Peak Hour





	HV %:	PHF
EB	1.4%	0.93
WB	1.0%	0.98
NB	0.0%	0.50
SB	3.2%	0.83
TOTAL	1.4%	0.95

Two-Hour Count Summaries

Interval Start		E 12th St Eastbound UT	LT	TH	RT	E 12th St Westbound UT	LT	TH	RT	23rd Ave Northbound UT	LT	TH	RT	23rd Ave Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
4:00 PM		5	34	242	1	1	0	109	21	0	1	1	1	0	29	1	16	462	0
4:15 PM		3	43	249	1	2	0	101	25	0	2	1	0	0	48	0	13	488	0
4:30 PM		6	46	258	0	2	1	111	30	0	1	1	0	1	20	1	13	491	0
4:45 PM		3	49	279	1	3	0	132	20	0	0	0	0	0	31	0	14	532	1,973
5:00 PM		**6**	**46**	**296**	**0**	**2**	**0**	**128**	**17**	**0**	**0**	**0**	**1**	**0**	**23**	**0**	**10**	**529**	2,040
5:15 PM		**5**	**46**	**293**	**2**	**0**	**1**	**114**	**34**	**0**	**2**	**0**	**1**	**0**	**38**	**0**	**18**	**554**	2,106
5:30 PM		**3**	**49**	**336**	**0**	**2**	**0**	**108**	**31**	**0**	**1**	**1**	**0**	**0**	**38**	**0**	**13**	**582**	2,197
5:45 PM		**0**	**37**	**322**	**0**	**1**	**0**	**124**	**24**	**0**	**0**	**0**	**0**	**0**	**37**	**0**	**10**	**555**	**2,220**
Count Total		31	350	2,275	5	13	2	927	202	0	7	4	3	1	264	2	107	4,193	0
Peak Hour	**All**	**14**	**178**	**1,247**	**2**	**5**	**1**	**474**	**106**	**0**	**3**	**1**	**2**	**0**	**136**	**0**	**51**	**2,220**	**0**
	HV	**0**	**0**	**20**	**0**	**0**	**0**	**3**	**3**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**2**	**32**	**0**
	HV%	**0%**	**0%**	**2%**	**0%**	**0%**	**0%**	**1%**	**3%**	**-**	**0%**	**0%**	**0%**	**-**	**3%**	**-**	**4%**	**1%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
4:00 PM	5	2	0	2	*9*	1	2	0	0	*3*	1	1	1	0	*3*
4:15 PM	4	2	0	4	*10*	1	1	0	0	*2*	4	0	1	4	*9*
4:30 PM	0	1	0	2	*3*	1	1	0	0	*2*	1	2	3	0	*6*
4:45 PM	2	1	0	1	*4*	2	1	0	1	*4*	2	2	5	2	*11*
5:00 PM	**8**	**2**	**0**	**3**	***13***	**3**	**3**	**0**	**0**	***6***	**1**	**1**	**0**	**1**	*3*
5:15 PM	**4**	**1**	**0**	**1**	***6***	**2**	**5**	**0**	**0**	***7***	**2**	**0**	**1**	**2**	*5*
5:30 PM	**3**	**2**	**0**	**2**	***7***	**2**	**0**	**0**	**0**	***2***	**3**	**2**	**1**	**5**	*11*
5:45 PM	**5**	**1**	**0**	**0**	***6***	**1**	**4**	**0**	**1**	***6***	**2**	**4**	**1**	**2**	***9***
Count Total	31	12	0	15	*58*	13	17	0	2	*32*	16	12	13	16	*57*
Peak Hour	**20**	**6**	**0**	**6**	***32***	**8**	**12**	**0**	**1**	***21***	**8**	**7**	**3**	**10**	***28***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	E 12th St				E 12th St				23rd Ave				23rd Ave				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	1	4	0	0	0	1	1	0	0	0	0	0	2	0	0	9	0
4:15 PM	0	0	4	0	0	0	1	1	0	0	0	0	0	3	0	1	10	0
4:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	3	0
4:45 PM	1	0	1	0	0	0	0	1	0	0	0	0	0	1	0	0	4	26
5:00 PM	**0**	**0**	**8**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**1**	**13**	30
5:15 PM	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**6**	26
5:30 PM	**0**	**0**	**3**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**7**	30
5:45 PM	**0**	**0**	**5**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6**	**32**
Count Total	1	1	29	0	0	0	5	7	0	0	0	0	0	10	0	5	58	0
Peak Hour	**0**	**0**	**20**	**0**	**0**	**0**	**3**	**3**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**2**	**32**	**0**

Two-Hour Count Summaries - Bikes

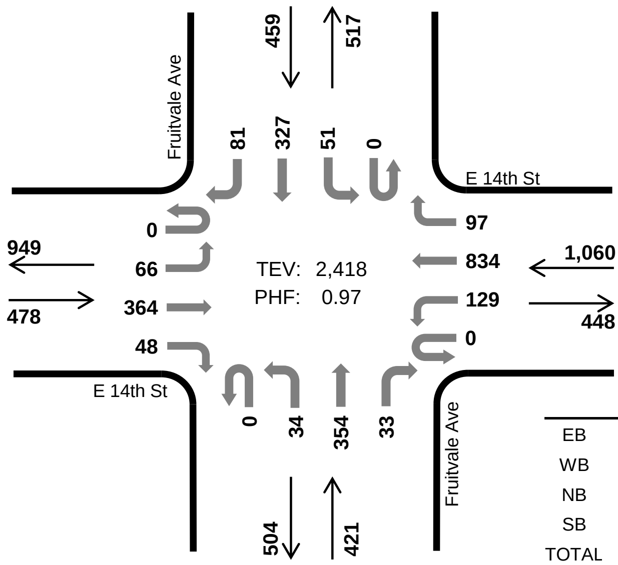
Interval Start	E 12th St			E 12th St			23rd Ave			23rd Ave			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	1	0	1	0	1	0	0	0	0	0	0	3	0
4:15 PM	0	0	1	0	1	0	0	0	0	0	0	0	2	0
4:30 PM	0	1	0	0	1	0	0	0	0	0	0	0	2	0
4:45 PM	1	1	0	0	0	1	0	0	0	0	1	0	4	11
5:00 PM	**0**	**3**	**0**	**1**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**6**	14
5:15 PM	**0**	**0**	**2**	**0**	**3**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**7**	19
5:30 PM	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	19
5:45 PM	**0**	**0**	**1**	**0**	**3**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**6**	**21**
Count Total	1	8	4	2	9	6	0	0	0	0	2	0	32	0
Peak Hour	**0**	**5**	**3**	**1**	**7**	**4**	**0**	**0**	**0**	**0**	**1**	**0**	**21**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

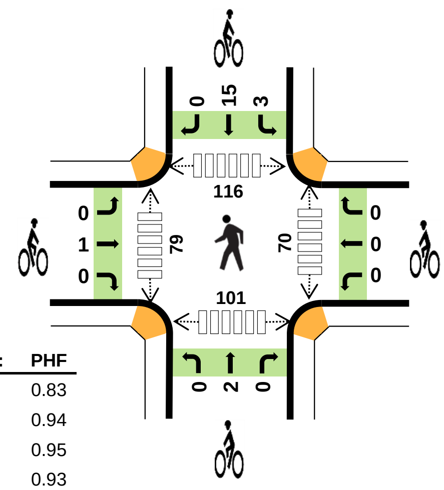
Fruitvale Ave
E 14th St

Date: 05-23-2018
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:45 AM to 8:45 AM

Peak Hour



	HV %:	PHF
EB	2.5%	0.83
WB	2.2%	0.94
NB	2.6%	0.95
SB	3.3%	0.93
TOTAL	2.5%	0.97



Two-Hour Count Summaries

Interval Start		E 14th St Eastbound UT	LT	TH	RT	E 14th St Westbound UT	LT	TH	RT	Fruitvale Ave Northbound UT	LT	TH	RT	Fruitvale Ave Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM		0	9	55	8	0	16	75	19	0	6	45	4	0	16	57	11	321	0
7:15 AM		0	11	62	8	0	30	98	19	0	9	69	10	0	9	101	12	438	0
7:30 AM		0	12	62	6	0	38	128	26	0	10	67	4	0	16	102	18	489	0
7:45 AM		**0**	**15**	**79**	**12**	**0**	**40**	**202**	**26**	**0**	**7**	**95**	**9**	**0**	**10**	**88**	**17**	**600**	1,848
8:00 AM		**0**	**13**	**80**	**8**	**0**	**32**	**207**	**27**	**0**	**11**	**91**	**8**	**0**	**12**	**72**	**24**	**585**	2,112
8:15 AM		**0**	**18**	**99**	**10**	**0**	**40**	**228**	**15**	**0**	**12**	**81**	**7**	**0**	**11**	**80**	**22**	**623**	2,297
8:30 AM		**0**	**20**	**106**	**18**	**0**	**17**	**197**	**29**	**0**	**4**	**87**	**9**	**0**	**18**	**87**	**18**	**610**	**2,418**
8:45 AM		0	15	96	12	0	27	169	16	0	7	66	8	0	11	92	22	541	2,359
Count Total		0	113	639	82	0	240	1,304	177	0	66	601	59	0	103	679	144	4,207	0
Peak Hour	**All**	**0**	**66**	**364**	**48**	**0**	**129**	**834**	**97**	**0**	**34**	**354**	**33**	**0**	**51**	**327**	**81**	**2,418**	**0**
	HV	**0**	**1**	**8**	**3**	**0**	**3**	**19**	**1**	**0**	**1**	**8**	**2**	**0**	**2**	**13**	**0**	**61**	**0**
	HV%	**-**	**2%**	**2%**	**6%**	**-**	**2%**	**2%**	**1%**	**-**	**3%**	**2%**	**6%**	**-**	**4%**	**4%**	**0%**	**3%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
7:00 AM	3	3	3	4	*13*	1	0	0	10	*11*	12	10	15	16	*53*
7:15 AM	3	6	6	1	*16*	0	0	0	2	*2*	20	10	22	14	*66*
7:30 AM	5	3	3	2	*13*	1	0	0	10	*11*	15	8	19	16	*58*
7:45 AM	**4**	**7**	**4**	**4**	***19***	**0**	**0**	**0**	**7**	***7***	**16**	**9**	**19**	**12**	*56*
8:00 AM	**2**	**6**	**1**	**6**	***15***	**0**	**0**	**1**	**2**	***3***	**25**	**29**	**30**	**29**	*113*
8:15 AM	**4**	**3**	**4**	**2**	***13***	**0**	**0**	**1**	**4**	***5***	**17**	**28**	**47**	**43**	*135*
8:30 AM	**2**	**7**	**2**	**3**	***14***	**1**	**0**	**0**	**5**	***6***	**12**	**13**	**20**	**17**	*62*
8:45 AM	8	9	3	2	*22*	0	0	0	4	*4*	25	14	26	21	*86*
Count Total	31	44	26	24	*125*	3	0	2	44	*49*	142	121	198	168	*629*
Peak Hour	**12**	**23**	**11**	**15**	***61***	**1**	**0**	**2**	**18**	***21***	**70**	**79**	**116**	**101**	*366*

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	E 14th St				E 14th St				Fruitvale Ave				Fruitvale Ave				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	1	2	0	0	0	2	1	0	0	3	0	0	2	2	0	13	0
7:15 AM	0	1	2	0	0	2	4	0	0	0	4	2	0	0	1	0	16	0
7:30 AM	0	0	5	0	0	0	1	2	0	0	3	0	0	1	1	0	13	0
7:45 AM	**0**	**1**	**2**	**1**	**0**	**1**	**5**	**1**	**0**	**1**	**1**	**2**	**0**	**0**	**4**	**0**	**19**	61
8:00 AM	**0**	**0**	**2**	**0**	**0**	**1**	**5**	**0**	**0**	**0**	**1**	**0**	**0**	**2**	**4**	**0**	**15**	63
8:15 AM	**0**	**0**	**2**	**2**	**0**	**1**	**2**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**2**	**0**	**13**	60
8:30 AM	**0**	**0**	**2**	**0**	**0**	**0**	**7**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**3**	**0**	**14**	**61**
8:45 AM	0	0	8	0	0	2	7	0	0	0	3	0	0	1	1	0	22	64
Count Total	0	3	25	3	0	7	33	4	0	1	21	4	0	6	18	0	125	0
Peak Hour	**0**	**1**	**8**	**3**	**0**	**3**	**19**	**1**	**0**	**1**	**8**	**2**	**0**	**2**	**13**	**0**	**61**	**0**

Two-Hour Count Summaries - Bikes

Interval Start	E 14th St			E 14th St			Fruitvale Ave			Fruitvale Ave			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	1	0	0	0	0	0	0	0	1	9	0	11	0
7:15 AM	0	0	0	0	0	0	0	0	0	2	0	0	2	0
7:30 AM	0	1	0	0	0	0	0	0	0	1	8	1	11	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**5**	**0**	**7**	31
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**2**	**0**	**3**	23
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**3**	**0**	**5**	26
8:30 AM	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**0**	**6**	**21**
8:45 AM	0	0	0	0	0	0	0	0	0	2	2	0	4	18
Count Total	0	3	0	0	0	0	0	2	0	9	34	1	49	0
Peak Hour	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**3**	**15**	**0**	**21**	**0**

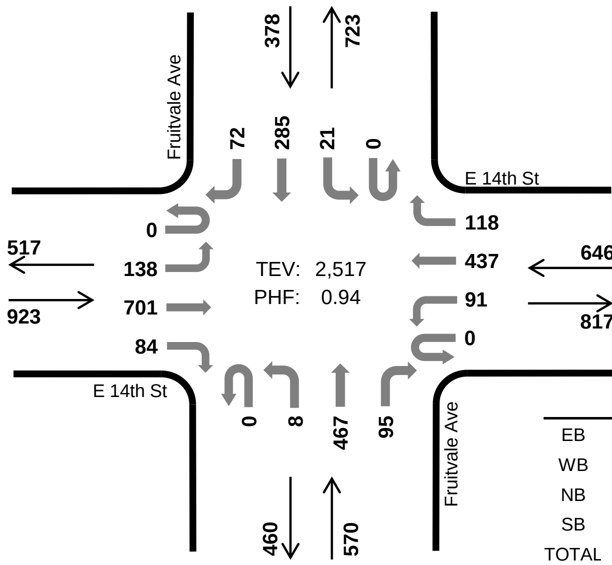
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Fruitvale Ave
E 14th St

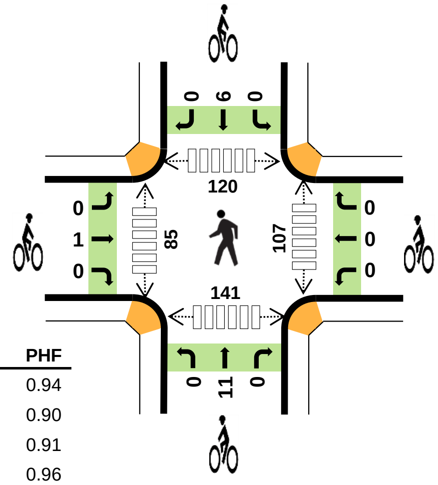
idax

Date: 05-23-2018
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 5:00 PM to 6:00 PM

Peak Hour



	HV %:	PHF
EB	1.3%	0.94
WB	1.4%	0.90
NB	1.4%	0.91
SB	1.6%	0.96
TOTAL	1.4%	0.94



Two-Hour Count Summaries

Interval Start	E 14th St Eastbound UT	LT	TH	RT	E 14th St Westbound UT	LT	TH	RT	Fruitvale Ave Northbound UT	LT	TH	RT	Fruitvale Ave Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
4:00 PM	0	34	166	15	0	20	96	28	0	1	86	22	0	8	66	17	559	0
4:15 PM	0	33	123	16	0	16	88	18	0	3	134	24	0	9	80	14	558	0
4:30 PM	0	29	146	25	0	23	121	34	0	2	95	27	0	1	79	16	598	0
4:45 PM	0	33	153	23	0	24	89	21	0	4	107	23	0	4	75	15	571	2,286
5:00 PM	**0**	**37**	**176**	**22**	**0**	**26**	**104**	**28**	**0**	**4**	**98**	**16**	**0**	**4**	**76**	**13**	**604**	2,331
5:15 PM	**0**	**27**	**153**	**18**	**0**	**22**	**96**	**30**	**0**	**1**	**131**	**25**	**0**	**5**	**65**	**26**	**599**	2,372
5:30 PM	**0**	**32**	**195**	**17**	**0**	**19**	**113**	**29**	**0**	**2**	**113**	**31**	**0**	**7**	**70**	**14**	**642**	2,416
5:45 PM	**0**	**42**	**177**	**27**	**0**	**24**	**124**	**31**	**0**	**1**	**125**	**23**	**0**	**5**	**74**	**19**	**672**	**2,517**
Count Total	0	267	1,289	163	0	174	831	219	0	18	889	191	0	43	585	134	4,803	0
Peak Hour All	**0**	**138**	**701**	**84**	**0**	**91**	**437**	**118**	**0**	**8**	**467**	**95**	**0**	**21**	**285**	**72**	**2,517**	**0**
Peak Hour HV	**0**	**1**	**11**	**0**	**0**	**0**	**8**	**1**	**0**	**0**	**8**	**0**	**0**	**0**	**6**	**0**	**35**	**0**
Peak Hour HV%	**-**	**1%**	**2%**	**0%**	**-**	**0%**	**2%**	**1%**	**-**	**0%**	**2%**	**0%**	**-**	**0%**	**2%**	**0%**	**1%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
4:00 PM	3	4	2	2	*11*	0	0	1	0	*1*	28	23	29	40	*120*
4:15 PM	5	2	2	3	*12*	0	1	1	1	*3*	25	23	28	39	*115*
4:30 PM	2	3	1	1	*7*	1	0	3	1	*5*	15	25	31	45	*116*
4:45 PM	4	3	2	2	*11*	0	0	2	4	*6*	31	31	35	45	*142*
5:00 PM	**4**	**3**	**2**	**1**	***10***	**0**	**0**	**2**	**0**	***2***	**30**	**26**	**25**	**53**	*134*
5:15 PM	**2**	**1**	**2**	**2**	***7***	**1**	**0**	**2**	**5**	***8***	**22**	**14**	**29**	**32**	*97*
5:30 PM	**5**	**4**	**1**	**1**	***11***	**0**	**0**	**4**	**0**	***4***	**32**	**16**	**32**	**27**	*107*
5:45 PM	**1**	**1**	**3**	**2**	***7***	**0**	**0**	**3**	**1**	***4***	**23**	**29**	**34**	**29**	***115***
Count Total	26	21	15	14	*76*	2	1	18	12	*33*	206	187	243	310	*946*
Peak Hour	**12**	**9**	**8**	**6**	***35***	**1**	**0**	**11**	**6**	***18***	**107**	**85**	**120**	**141**	***453***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	E 14th St				E 14th St				Fruitvale Ave				Fruitvale Ave				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	1	2	0	0	1	3	0	0	0	2	0	0	1	1	0	11	0
4:15 PM	0	1	4	0	0	0	2	0	0	0	2	0	0	0	3	0	12	0
4:30 PM	0	0	2	0	0	0	3	0	0	0	1	0	0	0	1	0	7	0
4:45 PM	0	0	4	0	0	0	3	0	0	0	2	0	0	0	1	1	11	41
5:00 PM	**0**	**1**	**3**	**0**	**0**	**0**	**2**	**1**	**0**	**0**	**2**	**0**	**0**	**0**	**1**	**0**	**10**	40
5:15 PM	**0**	**0**	**2**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**2**	**0**	**7**	35
5:30 PM	**0**	**0**	**5**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**11**	39
5:45 PM	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**2**	**0**	**7**	**35**
Count Total	0	3	23	0	0	1	19	1	0	0	15	0	0	1	12	1	76	0
Peak Hour	**0**	**1**	**11**	**0**	**0**	**0**	**8**	**1**	**0**	**0**	**8**	**0**	**0**	**0**	**6**	**0**	**35**	**0**

Two-Hour Count Summaries - Bikes

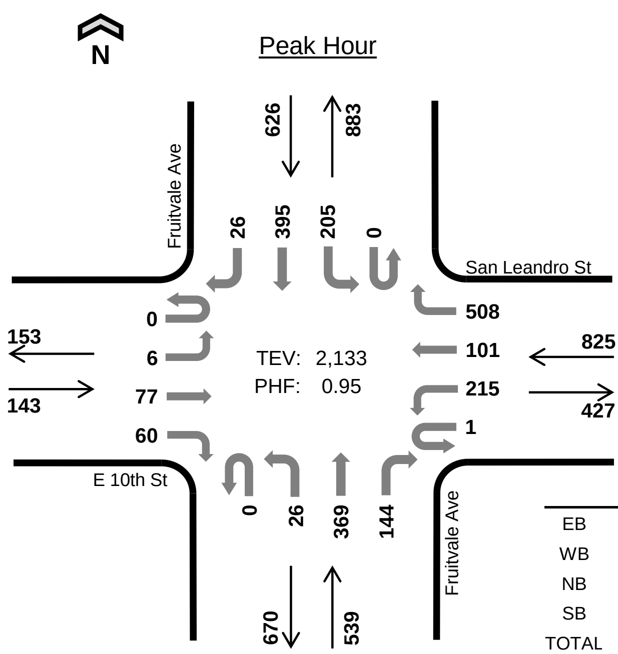
Interval Start	E 14th St			E 14th St			Fruitvale Ave			Fruitvale Ave			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	1	0
4:15 PM	0	0	0	0	1	0	0	0	1	0	1	0	3	0
4:30 PM	0	1	0	0	0	0	0	3	0	0	1	0	5	0
4:45 PM	0	0	0	0	0	0	0	2	0	0	4	0	6	15
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**2**	16
5:15 PM	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**5**	**0**	**8**	21
5:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**4**	20
5:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**1**	**0**	**4**	**18**
Count Total	0	2	0	0	1	0	0	17	1	0	12	0	33	0
Peak Hour	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**11**	**0**	**0**	**6**	**0**	**18**	**0**

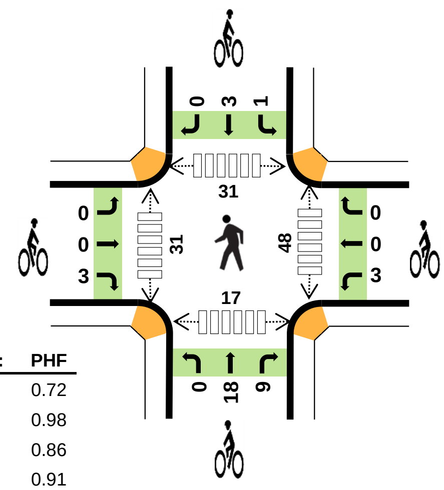
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Fruitvale Ave
San Leandro St

idax

Date: 05-23-2018
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:45 AM to 8:45 AM





	HV %:	PHF
EB	0.0%	0.72
WB	5.9%	0.98
NB	4.3%	0.86
SB	4.2%	0.91
TOTAL	4.6%	0.95

Two-Hour Count Summaries

Interval Start		E 10th St Eastbound UT	LT	TH	RT	San Leandro St Westbound UT	LT	TH	RT	Fruitvale Ave Northbound UT	LT	TH	RT	Fruitvale Ave Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM		0	0	1	5	0	40	6	67	0	1	36	14	0	21	59	0	250	0
7:15 AM		0	0	4	7	0	27	11	90	0	4	64	32	0	47	101	5	392	0
7:30 AM		0	0	8	13	0	42	5	100	0	14	67	36	0	39	108	5	437	0
7:45 AM		**0**	**0**	**12**	**13**	**0**	**57**	**26**	**117**	**0**	**13**	**105**	**39**	**0**	**40**	**123**	**9**	**554**	1,633
8:00 AM		**0**	**2**	**28**	**15**	**0**	**52**	**40**	**118**	**0**	**5**	**96**	**29**	**0**	**42**	**86**	**8**	**521**	1,904
8:15 AM		**0**	**4**	**25**	**21**	**1**	**53**	**19**	**135**	**0**	**4**	**88**	**40**	**0**	**66**	**96**	**7**	**559**	2,071
8:30 AM		**0**	**0**	**12**	**11**	**0**	**53**	**16**	**138**	**0**	**4**	**80**	**36**	**0**	**57**	**90**	**2**	**499**	**2,133**
8:45 AM		0	0	8	13	0	53	2	124	0	0	73	28	0	74	127	1	503	2,082
Count Total		0	6	98	98	1	377	125	889	0	45	609	254	0	386	790	37	3,715	0
Peak Hour	**All**	**0**	**6**	**77**	**60**	**1**	**215**	**101**	**508**	**0**	**26**	**369**	**144**	**0**	**205**	**395**	**26**	**2,133**	**0**
	HV	**0**	**0**	**0**	**0**	**0**	**18**	**2**	**29**	**0**	**0**	**7**	**16**	**0**	**16**	**10**	**0**	**98**	**0**
	HV%	**-**	**0%**	**0%**	**0%**	**0%**	**8%**	**2%**	**6%**	**-**	**0%**	**2%**	**11%**	**-**	**8%**	**3%**	**0%**	**5%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
7:00 AM	0	13	2	7	*22*	0	0	6	4	*10*	7	2	2	0	*11*
7:15 AM	0	8	6	7	*21*	0	1	1	1	*3*	9	3	1	1	*14*
7:30 AM	1	9	5	5	*20*	0	0	2	4	*6*	7	10	6	2	*25*
7:45 AM	**0**	**12**	**8**	**6**	***26***	**1**	**1**	**7**	**0**	***9***	**9**	**5**	**7**	**9**	*30*
8:00 AM	**0**	**11**	**2**	**7**	***20***	**0**	**0**	**10**	**3**	***13***	**19**	**12**	**8**	**0**	*39*
8:15 AM	**0**	**13**	**7**	**7**	***27***	**0**	**1**	**4**	**0**	***5***	**6**	**6**	**6**	**6**	*24*
8:30 AM	**0**	**13**	**6**	**6**	***25***	**2**	**1**	**6**	**1**	***10***	**14**	**8**	**10**	**2**	***34***
8:45 AM	0	11	5	5	*21*	0	1	5	2	*8*	7	13	8	6	*34*
Count Total	1	90	41	50	*182*	3	5	41	15	*64*	78	59	48	26	*211*
Peak Hour	**0**	**49**	**23**	**26**	***98***	**3**	**3**	**27**	**4**	***37***	**48**	**31**	**31**	**17**	***127***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	E 10th St Eastbound UT	LT	TH	RT	San Leandro St Westbound UT	LT	TH	RT	Fruitvale Ave Northbound UT	LT	TH	RT	Fruitvale Ave Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM	0	0	0	0	0	6	0	7	0	0	1	1	0	6	1	0	22	0
7:15 AM	0	0	0	0	0	4	0	4	0	0	2	4	0	5	2	0	21	0
7:30 AM	0	0	1	0	0	4	0	5	0	0	2	3	0	5	0	0	20	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**5**	**1**	**6**	**0**	**0**	**4**	**4**	**0**	**4**	**2**	**0**	**26**	89
8:00 AM	**0**	**0**	**0**	**0**	**0**	**5**	**0**	**6**	**0**	**0**	**0**	**2**	**0**	**5**	**2**	**0**	**20**	87
8:15 AM	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**9**	**0**	**0**	**3**	**4**	**0**	**4**	**3**	**0**	**27**	93
8:30 AM	**0**	**0**	**0**	**0**	**0**	**4**	**1**	**8**	**0**	**0**	**0**	**6**	**0**	**3**	**3**	**0**	**25**	**98**
8:45 AM	0	0	0	0	0	4	0	7	0	0	1	4	0	3	1	1	21	93
Count Total	0	0	1	0	0	36	2	52	0	0	13	28	0	35	14	1	182	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**18**	**2**	**29**	**0**	**0**	**7**	**16**	**0**	**16**	**10**	**0**	**98**	**0**

Two-Hour Count Summaries - Bikes

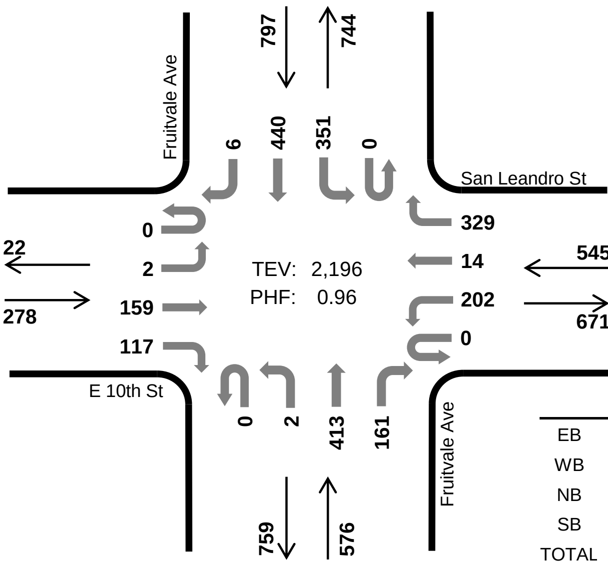
Interval Start	E 10th St Eastbound LT	TH	RT	San Leandro St Westbound LT	TH	RT	Fruitvale Ave Northbound LT	TH	RT	Fruitvale Ave Southbound LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM	0	0	0	0	0	0	0	0	6	1	3	0	10	0
7:15 AM	0	0	0	1	0	0	0	0	1	0	1	0	3	0
7:30 AM	0	0	0	0	0	0	0	0	2	0	4	0	6	0
7:45 AM	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**5**	**2**	**0**	**0**	**0**	**9**	28
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6**	**4**	**1**	**2**	**0**	**13**	31
8:15 AM	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**2**	**2**	**0**	**0**	**0**	**5**	33
8:30 AM	**0**	**0**	**2**	**1**	**0**	**0**	**0**	**5**	**1**	**0**	**1**	**0**	**10**	**37**
8:45 AM	0	0	0	1	0	0	0	3	2	0	2	0	8	36
Count Total	0	0	3	5	0	0	0	21	20	2	13	0	64	0
Peak Hour	**0**	**0**	**3**	**3**	**0**	**0**	**0**	**18**	**9**	**1**	**3**	**0**	**37**	**0**

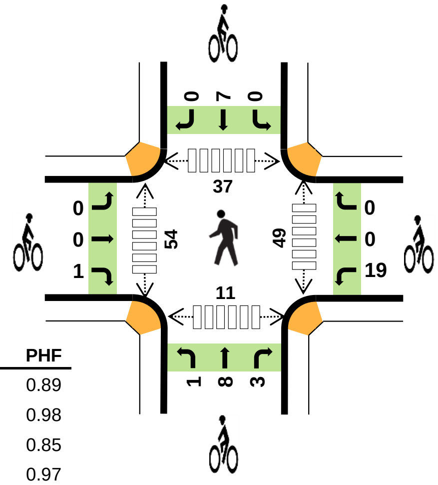
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Fruitvale Ave
San Leandro St

Date: 05-23-2018
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 5:00 PM to 6:00 PM

Peak Hour





	HV %:	PHF
EB	1.4%	0.89
WB	5.3%	0.98
NB	3.0%	0.85
SB	2.4%	0.97
TOTAL	3.1%	0.96

Two-Hour Count Summaries

Interval Start	E 10th St Eastbound UT	LT	TH	RT	San Leandro St Westbound UT	LT	TH	RT	Fruitvale Ave Northbound UT	LT	TH	RT	Fruitvale Ave Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
4:00 PM	0	0	18	23	0	40	7	73	0	0	92	41	0	73	98	7	472	0
4:15 PM	0	0	31	23	0	55	3	67	0	1	108	31	0	92	93	1	505	0
4:30 PM	0	0	31	21	0	43	4	62	0	1	96	40	0	104	111	5	518	0
4:45 PM	0	0	27	14	0	50	1	75	0	1	100	55	0	92	110	2	527	2,022
5:00 PM	**0**	**1**	**37**	**28**	**0**	**48**	**6**	**81**	**0**	**1**	**87**	**36**	**0**	**79**	**123**	**4**	**531**	2,081
5:15 PM	**0**	**0**	**44**	**26**	**0**	**50**	**2**	**87**	**0**	**0**	**105**	**41**	**0**	**91**	**98**	**1**	**545**	2,121
5:30 PM	**0**	**1**	**47**	**30**	**0**	**50**	**1**	**86**	**0**	**0**	**94**	**42**	**0**	**92**	**108**	**0**	**551**	2,154
5:45 PM	**0**	**0**	**31**	**33**	**0**	**54**	**5**	**75**	**0**	**1**	**127**	**42**	**0**	**89**	**111**	**1**	**569**	**2,196**
Count Total	0	2	266	198	0	390	29	606	0	5	809	328	0	712	852	21	4,218	0
Peak Hour All	**0**	**2**	**159**	**117**	**0**	**202**	**14**	**329**	**0**	**2**	**413**	**161**	**0**	**351**	**440**	**6**	**2,196**	**0**
Peak Hour HV	**0**	**0**	**4**	**0**	**0**	**12**	**0**	**17**	**0**	**0**	**4**	**13**	**0**	**17**	**2**	**0**	**69**	**0**
Peak Hour HV%	**-**	**0%**	**3%**	**0%**	**-**	**6%**	**0%**	**5%**	**-**	**0%**	**1%**	**8%**	**-**	**5%**	**0%**	**0%**	**3%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
4:00 PM	1	6	5	3	*15*	0	0	2	0	*2*	16	11	12	1	*40*
4:15 PM	0	7	2	6	*15*	0	3	2	0	*5*	12	10	9	3	*34*
4:30 PM	0	8	3	3	*14*	0	6	3	1	*10*	13	10	7	7	*37*
4:45 PM	0	3	7	5	*15*	0	6	3	3	*12*	3	4	1	2	*10*
5:00 PM	**1**	**8**	**4**	**4**	***17***	**1**	**2**	**2**	**0**	***5***	**12**	**10**	**8**	**0**	*30*
5:15 PM	**2**	**7**	**4**	**5**	***18***	**0**	**5**	**3**	**2**	***10***	**8**	**16**	**11**	**5**	*40*
5:30 PM	**0**	**10**	**1**	**5**	***16***	**0**	**3**	**1**	**2**	***6***	**10**	**15**	**11**	**3**	*39*
5:45 PM	**1**	**4**	**8**	**5**	***18***	**0**	**9**	**6**	**3**	***18***	**19**	**13**	**7**	**3**	***42***
Count Total	5	53	34	36	*128*	1	34	22	11	*68*	93	89	66	24	*272*
Peak Hour	**4**	**29**	**17**	**19**	***69***	**1**	**19**	**12**	**7**	***39***	**49**	**54**	**37**	**11**	***151***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	E 10th St				San Leandro St				Fruitvale Ave				Fruitvale Ave				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	1	0	0	4	0	2	0	0	1	4	0	2	1	0	15	0
4:15 PM	0	0	0	0	0	3	0	4	0	0	0	2	0	5	1	0	15	0
4:30 PM	0	0	0	0	0	3	0	5	0	0	0	3	0	3	0	0	14	0
4:45 PM	0	0	0	0	0	2	0	1	0	0	2	5	0	4	1	0	15	59
5:00 PM	**0**	**0**	**1**	**0**	**0**	**4**	**0**	**4**	**0**	**0**	**1**	**3**	**0**	**4**	**0**	**0**	**17**	61
5:15 PM	**0**	**0**	**2**	**0**	**0**	**2**	**0**	**5**	**0**	**0**	**0**	**4**	**0**	**5**	**0**	**0**	**18**	64
5:30 PM	**0**	**0**	**0**	**0**	**0**	**5**	**0**	**5**	**0**	**0**	**0**	**1**	**0**	**5**	**0**	**0**	**16**	66
5:45 PM	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**3**	**0**	**0**	**3**	**5**	**0**	**3**	**2**	**0**	**18**	**69**
Count Total	0	0	5	0	0	24	0	29	0	0	7	27	0	31	5	0	128	0
Peak Hour	**0**	**0**	**4**	**0**	**0**	**12**	**0**	**17**	**0**	**0**	**4**	**13**	**0**	**17**	**2**	**0**	**69**	**0**

Two-Hour Count Summaries - Bikes

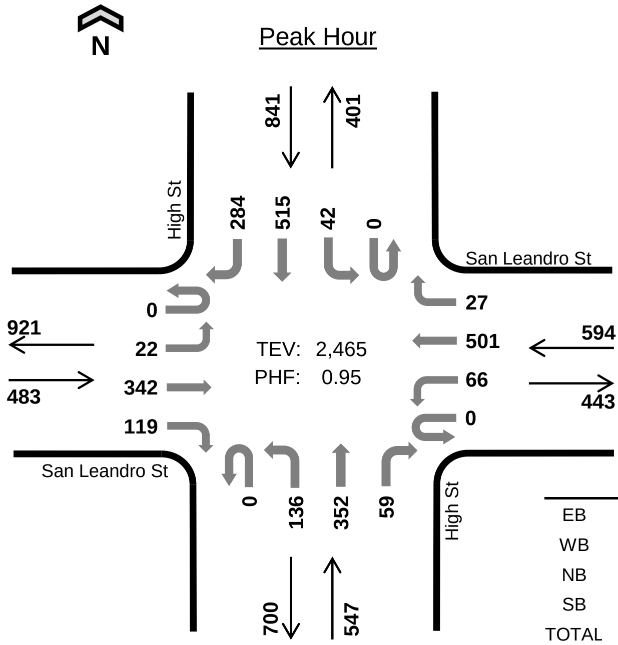
Interval Start	E 10th St			San Leandro St			Fruitvale Ave			Fruitvale Ave			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	1	1	0	0	0	2	0
4:15 PM	0	0	0	3	0	0	0	2	0	0	0	0	5	0
4:30 PM	0	0	0	6	0	0	0	2	1	0	1	0	10	0
4:45 PM	0	0	0	6	0	0	0	0	3	0	2	1	12	29
5:00 PM	**0**	**0**	**1**	**2**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**5**	32
5:15 PM	**0**	**0**	**0**	**5**	**0**	**0**	**1**	**2**	**0**	**0**	**2**	**0**	**10**	37
5:30 PM	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**1**	**0**	**0**	**2**	**0**	**6**	33
5:45 PM	**0**	**0**	**0**	**9**	**0**	**0**	**0**	**3**	**3**	**0**	**3**	**0**	**18**	**39**
Count Total	0	0	1	34	0	0	1	13	8	0	10	1	68	0
Peak Hour	**0**	**0**	**1**	**19**	**0**	**0**	**1**	**8**	**3**	**0**	**7**	**0**	**39**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

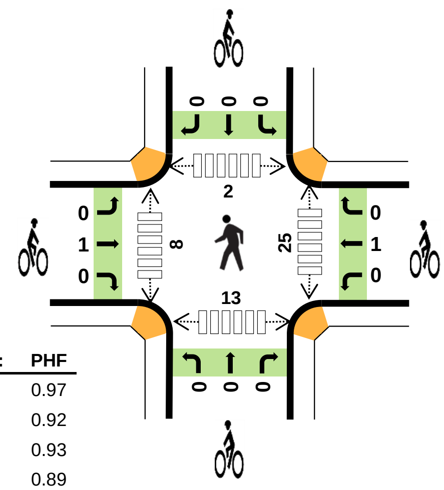
High St
San Leandro St

Date: 05-23-2018
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 8:00 AM to 9:00 AM

Peak Hour



	HV %:	PHF
EB	2.3%	0.97
WB	3.9%	0.92
NB	5.3%	0.93
SB	3.2%	0.89
TOTAL	3.7%	0.95



Two-Hour Count Summaries

Interval Start	San Leandro St				San Leandro St				High St				High St				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	3	41	34	0	21	87	9	0	19	57	8	0	12	98	27	416	0
7:15 AM	0	3	53	31	0	20	100	7	0	30	67	18	0	13	106	18	466	0
7:30 AM	0	5	61	25	0	21	119	5	0	31	60	11	0	10	135	32	515	0
7:45 AM	0	5	67	28	0	20	128	4	0	28	85	13	0	14	136	63	591	1,988
8:00 AM	**0**	**7**	**88**	**27**	**0**	**18**	**126**	**4**	**0**	**32**	**81**	**10**	**0**	**15**	**129**	**92**	**629**	2,201
8:15 AM	**0**	**9**	**81**	**32**	**0**	**21**	**133**	**7**	**0**	**35**	**91**	**14**	**0**	**6**	**130**	**92**	**651**	2,386
8:30 AM	**0**	**3**	**88**	**24**	**0**	**11**	**125**	**6**	**0**	**32**	**96**	**19**	**0**	**10**	**120**	**58**	**592**	2,463
8:45 AM	**0**	**3**	**85**	**36**	**0**	**16**	**117**	**10**	**0**	**37**	**84**	**16**	**0**	**11**	**136**	**42**	**593**	**2,465**
Count Total	0	38	564	237	0	148	935	52	0	244	621	109	0	91	990	424	4,453	0
Peak Hour All	**0**	**22**	**342**	**119**	**0**	**66**	**501**	**27**	**0**	**136**	**352**	**59**	**0**	**42**	**515**	**284**	**2,465**	**0**
Peak Hour HV	**0**	**1**	**8**	**2**	**0**	**3**	**17**	**3**	**0**	**4**	**21**	**4**	**0**	**2**	**22**	**3**	**90**	**0**
Peak Hour HV%	**-**	**5%**	**2%**	**2%**	**-**	**5%**	**3%**	**11%**	**-**	**3%**	**6%**	**7%**	**-**	**5%**	**4%**	**1%**	**4%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	5	9	10	4	*28*	1	0	0	0	*1*	9	5	0	3	*17*
7:15 AM	2	6	6	1	*15*	0	0	0	0	*0*	7	3	1	1	*12*
7:30 AM	4	5	4	6	*19*	0	0	1	0	*1*	5	2	0	4	*11*
7:45 AM	1	4	7	3	*15*	1	0	0	0	*1*	4	4	0	1	*9*
8:00 AM	**3**	**4**	**4**	**8**	***19***	**1**	**0**	**0**	**0**	***1***	**3**	**1**	**0**	**3**	*7*
8:15 AM	**3**	**5**	**5**	**6**	***19***	**0**	**0**	**0**	**0**	***0***	**8**	**2**	**1**	**3**	*14*
8:30 AM	**3**	**7**	**10**	**6**	***26***	**0**	**0**	**0**	**0**	***0***	**5**	**2**	**0**	**4**	*11*
8:45 AM	**2**	**7**	**10**	**7**	***26***	**0**	**1**	**0**	**0**	***1***	**9**	**3**	**1**	**3**	***16***
Count Total	23	47	56	41	*167*	3	1	1	0	5	50	22	3	22	*97*
Peak Hour	**11**	**23**	**29**	**27**	***90***	**1**	**1**	**0**	**0**	***2***	**25**	**8**	**2**	**13**	***48***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	San Leandro St				San Leandro St				High St				High St				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	3	2	0	1	8	0	0	3	7	0	0	0	4	0	28	0
7:15 AM	0	0	2	0	0	1	5	0	0	1	4	1	0	0	1	0	15	0
7:30 AM	0	0	2	2	0	2	2	1	0	1	3	0	0	1	5	0	19	0
7:45 AM	0	0	0	1	0	2	1	1	0	0	6	1	0	0	2	1	15	77
8:00 AM	**0**	**0**	**3**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**4**	**0**	**0**	**2**	**5**	**1**	**19**	68
8:15 AM	**0**	**1**	**2**	**0**	**0**	**1**	**4**	**0**	**0**	**1**	**3**	**1**	**0**	**0**	**5**	**1**	**19**	72
8:30 AM	**0**	**0**	**1**	**2**	**0**	**0**	**6**	**1**	**0**	**0**	**9**	**1**	**0**	**0**	**5**	**1**	**26**	79
8:45 AM	**0**	**0**	**2**	**0**	**0**	**2**	**3**	**2**	**0**	**3**	**5**	**2**	**0**	**0**	**7**	**0**	**26**	**90**
Count Total	0	1	15	7	0	9	33	5	0	9	41	6	0	3	34	4	167	0
Peak Hour	**0**	**1**	**8**	**2**	**0**	**3**	**17**	**3**	**0**	**4**	**21**	**4**	**0**	**2**	**22**	**3**	**90**	**0**

Two-Hour Count Summaries - Bikes

Interval Start	San Leandro St			San Leandro St			High St			High St			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	1	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	1	0
7:45 AM	0	0	1	0	0	0	0	0	0	0	0	0	1	3
8:00 AM	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	3
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	3
8:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	2
8:45 AM	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**2**
Count Total	0	2	1	0	1	0	0	1	0	0	0	0	5	0
Peak Hour	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**

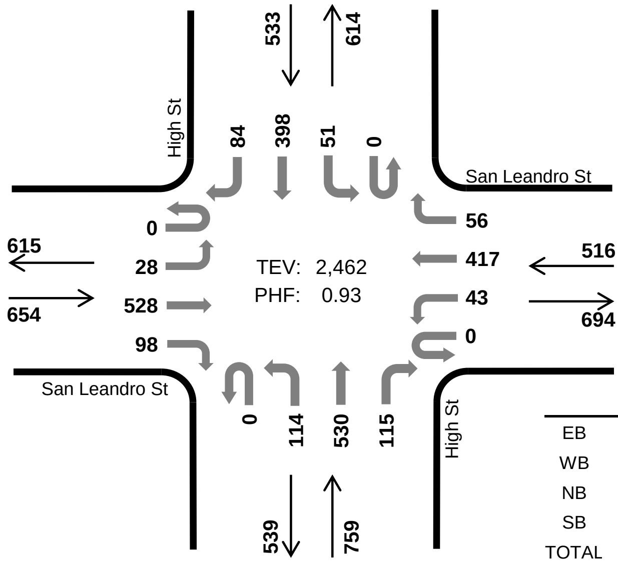
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

High St
San Leandro St

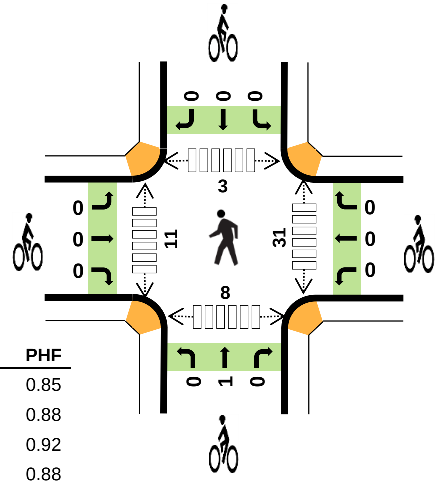
idax

Date: 05-23-2018
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:15 PM to 5:15 PM

Peak Hour



	HV %:	PHF
EB	1.5%	0.85
WB	3.1%	0.88
NB	0.8%	0.92
SB	1.7%	0.88
TOTAL	1.7%	0.93



Two-Hour Count Summaries

Interval Start	San Leandro St Eastbound UT	LT	TH	RT	San Leandro St Westbound UT	LT	TH	RT	High St Northbound UT	LT	TH	RT	High St Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
4:00 PM	0	7	117	34	0	14	100	16	0	32	124	26	0	17	108	20	615	0
4:15 PM	**0**	**7**	**120**	**34**	**0**	**12**	**98**	**9**	**0**	**22**	**123**	**22**	**0**	**13**	**87**	**26**	**573**	0
4:30 PM	**0**	**8**	**118**	**13**	**0**	**11**	**96**	**17**	**0**	**19**	**134**	**29**	**0**	**18**	**109**	**24**	**596**	0
4:45 PM	**0**	**4**	**159**	**29**	**0**	**12**	**97**	**18**	**0**	**32**	**135**	**39**	**0**	**10**	**117**	**13**	**665**	2,449
5:00 PM	**0**	**9**	**131**	**22**	**0**	**8**	**126**	**12**	**0**	**41**	**138**	**25**	**0**	**10**	**85**	**21**	**628**	**2,462**
5:15 PM	0	13	125	12	0	8	78	21	0	33	133	31	0	9	92	18	573	2,462
5:30 PM	0	11	136	22	0	9	89	23	0	34	126	13	0	10	77	32	582	2,448
5:45 PM	0	6	162	15	0	11	92	16	0	33	128	25	0	11	91	25	615	2,398
Count Total	0	65	1,068	181	0	85	776	132	0	246	1,041	210	0	98	766	179	4,847	0
Peak Hour All	**0**	**28**	**528**	**98**	**0**	**43**	**417**	**56**	**0**	**114**	**530**	**115**	**0**	**51**	**398**	**84**	**2,462**	**0**
Peak Hour HV	**0**	**0**	**7**	**3**	**0**	**4**	**12**	**0**	**0**	**2**	**2**	**2**	**0**	**1**	**8**	**0**	**41**	**0**
Peak Hour HV%	**-**	**0%**	**1%**	**3%**	**-**	**9%**	**3%**	**0%**	**-**	**2%**	**0%**	**2%**	**-**	**2%**	**2%**	**0%**	**2%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
4:00 PM	5	1	5	3	*14*	0	0	0	0	*0*	2	5	1	5	*13*
4:15 PM	**0**	**8**	**1**	**3**	***12***	**0**	**0**	**0**	**0**	***0***	**4**	**2**	**0**	**0**	*6*
4:30 PM	**4**	**2**	**1**	**3**	***10***	**0**	**0**	**0**	**0**	***0***	**8**	**3**	**0**	**2**	*13*
4:45 PM	**1**	**1**	**3**	**2**	***7***	**0**	**0**	**0**	**0**	***0***	**13**	**1**	**2**	**2**	*18*
5:00 PM	**5**	**5**	**1**	**1**	***12***	**0**	**0**	**1**	**0**	***1***	**6**	**5**	**1**	**4**	***16***
5:15 PM	0	0	5	3	*8*	0	0	0	0	*0*	6	2	1	5	*14*
5:30 PM	2	0	3	1	*6*	0	0	1	0	*1*	12	6	3	1	*22*
5:45 PM	3	0	1	4	*8*	0	0	1	0	*1*	8	1	0	5	*14*
Count Total	20	17	20	20	*77*	0	0	3	0	*3*	59	25	8	24	*116*
Peak Hour	**10**	**16**	**6**	**9**	***41***	**0**	**0**	**1**	**0**	***1***	**31**	**11**	**3**	**8**	***53***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	San Leandro St				San Leandro St				High St				High St				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	4	1	0	1	0	0	0	1	2	2	0	2	1	0	14	0
4:15 PM	**0**	**0**	**0**	**0**	**0**	**3**	**5**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**2**	**0**	**12**	0
4:30 PM	**0**	**0**	**3**	**1**	**0**	**1**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**3**	**0**	**10**	0
4:45 PM	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**1**	**1**	**0**	**0**	**2**	**0**	**7**	43
5:00 PM	**0**	**0**	**3**	**2**	**0**	**0**	**5**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**12**	**41**
5:15 PM	0	0	0	0	0	0	0	0	0	1	3	1	0	0	2	1	8	37
5:30 PM	0	0	1	1	0	0	0	0	0	0	3	0	0	0	1	0	6	33
5:45 PM	0	0	3	0	0	0	0	0	0	0	1	0	0	0	4	0	8	34
Count Total	0	0	15	5	0	5	12	0	0	4	11	5	0	3	16	1	77	0
Peak Hour	**0**	**0**	**7**	**3**	**0**	**4**	**12**	**0**	**0**	**2**	**2**	**2**	**0**	**1**	**8**	**0**	**41**	**0**

Two-Hour Count Summaries - Bikes

Interval Start	San Leandro St			San Leandro St			High St			High St			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
4:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**1**
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:30 PM	0	0	0	0	0	0	1	0	0	0	0	0	1	2
5:45 PM	0	0	0	0	0	0	0	0	1	0	0	0	1	3
Count Total	0	0	0	0	0	0	1	1	1	0	0	0	3	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**

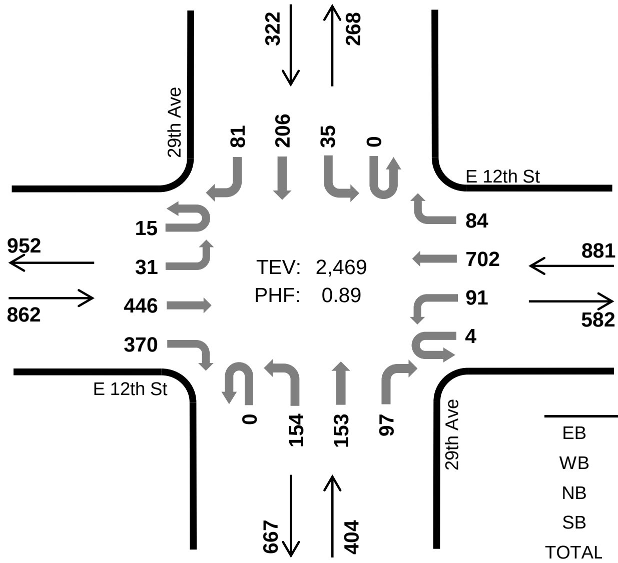
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

29th Ave
E 12th St

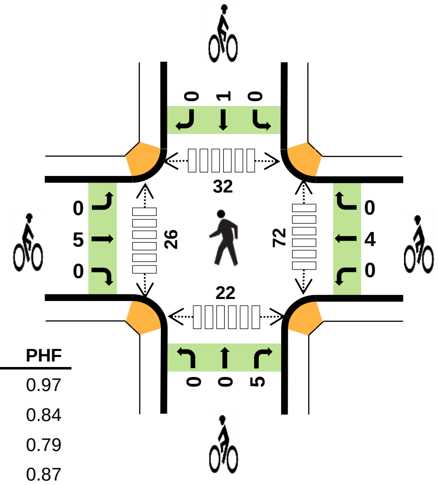
Date: 05-23-2018
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 8:00 AM to 9:00 AM

N

Peak Hour



	HV %:	PHF
EB	0.7%	0.97
WB	3.1%	0.84
NB	2.0%	0.79
SB	0.3%	0.87
TOTAL	1.7%	0.89



Two-Hour Count Summaries

Interval Start	E 12th St Eastbound UT	LT	TH	RT	E 12th St Westbound UT	LT	TH	RT	29th Ave Northbound UT	LT	TH	RT	29th Ave Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM	1	4	42	56	0	10	51	9	0	11	14	8	0	5	39	3	253	0
7:15 AM	2	4	51	49	1	10	78	6	0	12	15	12	0	8	47	6	301	0
7:30 AM	3	1	68	73	0	18	86	7	0	25	21	24	0	3	42	17	388	0
7:45 AM	0	4	78	79	0	23	150	17	0	29	33	23	0	7	56	29	528	1,470
8:00 AM	**5**	**9**	**108**	**100**	**1**	**26**	**147**	**28**	**0**	**35**	**41**	**25**	**0**	**12**	**63**	**18**	**618**	1,835
8:15 AM	**4**	**7**	**104**	**98**	**1**	**37**	**192**	**31**	**0**	**45**	**51**	**32**	**0**	**7**	**53**	**29**	**691**	2,225
8:30 AM	**4**	**6**	**115**	**94**	**1**	**12**	**195**	**16**	**0**	**43**	**28**	**25**	**0**	**9**	**45**	**19**	**612**	2,449
8:45 AM	**2**	**9**	**119**	**78**	**1**	**16**	**168**	**9**	**0**	**31**	**33**	**15**	**0**	**7**	**45**	**15**	**548**	**2,469**
Count Total	21	44	685	627	5	152	1,067	123	0	231	236	164	0	58	390	136	3,939	0
Peak Hour All	**15**	**31**	**446**	**370**	**4**	**91**	**702**	**84**	**0**	**154**	**153**	**97**	**0**	**35**	**206**	**81**	**2,469**	**0**
Peak Hour HV	**0**	**0**	**5**	**1**	**0**	**8**	**18**	**1**	**0**	**2**	**2**	**4**	**0**	**0**	**1**	**0**	**42**	**0**
Peak Hour HV%	**0%**	**0%**	**1%**	**0%**	**0%**	**9%**	**3%**	**1%**	**-**	**1%**	**1%**	**4%**	**-**	**0%**	**0%**	**0%**	**2%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
7:00 AM	7	4	0	0	*11*	1	1	2	0	*4*	1	0	1	2	*4*
7:15 AM	3	3	2	2	*10*	1	0	1	1	*3*	4	2	5	4	*15*
7:30 AM	5	4	2	0	*11*	2	0	1	1	*4*	7	4	2	8	*21*
7:45 AM	5	5	2	0	*12*	3	3	0	0	*6*	17	10	12	4	*43*
8:00 AM	**1**	**9**	**1**	**0**	***11***	**0**	**2**	**1**	**0**	***3***	**23**	**10**	**8**	**7**	*48*
8:15 AM	**2**	**8**	**3**	**0**	***13***	**2**	**2**	**0**	**0**	***4***	**23**	**12**	**7**	**6**	*48*
8:30 AM	**2**	**4**	**2**	**1**	***9***	**2**	**0**	**3**	**0**	***5***	**18**	**1**	**11**	**4**	*34*
8:45 AM	**1**	**6**	**2**	**0**	***9***	**1**	**0**	**1**	**1**	***3***	**8**	**3**	**6**	**5**	*22*
Count Total	26	43	14	3	*86*	12	8	9	3	*32*	101	42	52	40	*235*
Peak Hour	**6**	**27**	**8**	**1**	***42***	**5**	**4**	**5**	**1**	***15***	**72**	**26**	**32**	**22**	***152***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	E 12th St Eastbound UT	LT	TH	RT	E 12th St Westbound UT	LT	TH	RT	29th Ave Northbound UT	LT	TH	RT	29th Ave Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM	0	1	6	0	0	1	3	0	0	0	0	0	0	0	0	0	11	0
7:15 AM	0	0	2	1	0	1	2	0	0	0	0	2	0	1	1	0	10	0
7:30 AM	0	0	4	1	0	2	2	0	0	0	0	2	0	0	0	0	11	0
7:45 AM	0	0	4	1	0	1	4	0	0	0	0	2	0	0	0	0	12	44
8:00 AM	**0**	**0**	**1**	**0**	**0**	**2**	**6**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**11**	44
8:15 AM	**0**	**0**	**1**	**1**	**0**	**2**	**6**	**0**	**0**	**1**	**1**	**1**	**0**	**0**	**0**	**0**	**13**	47
8:30 AM	**0**	**0**	**2**	**0**	**0**	**2**	**2**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**1**	**0**	**9**	45
8:45 AM	**0**	**0**	**1**	**0**	**0**	**2**	**4**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**9**	**42**
Count Total	0	1	21	4	0	13	29	1	0	2	2	10	0	1	2	0	86	0
Peak Hour	**0**	**0**	**5**	**1**	**0**	**8**	**18**	**1**	**0**	**2**	**2**	**4**	**0**	**0**	**1**	**0**	**42**	**0**

Two-Hour Count Summaries - Bikes

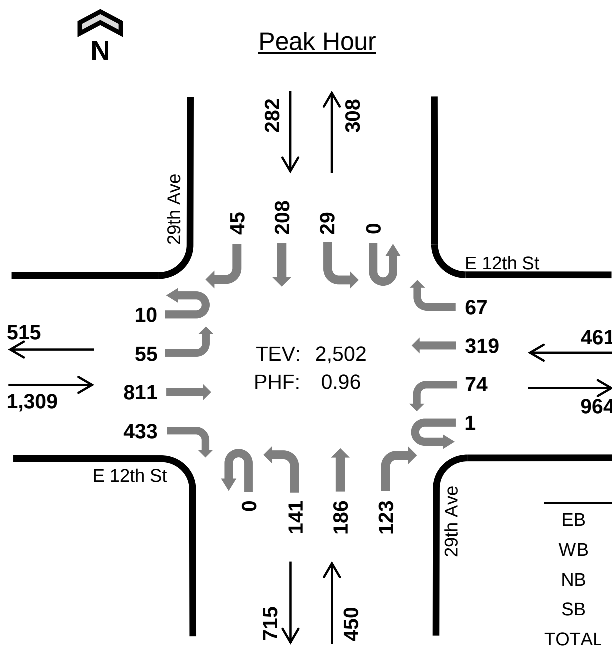
Interval Start	E 12th St Eastbound LT	TH	RT	E 12th St Westbound LT	TH	RT	29th Ave Northbound LT	TH	RT	29th Ave Southbound LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM	0	1	0	0	1	0	0	0	2	0	0	0	4	0
7:15 AM	0	1	0	0	0	0	0	0	1	0	1	0	3	0
7:30 AM	1	1	0	0	0	0	1	0	0	1	0	0	4	0
7:45 AM	0	3	0	0	3	0	0	0	0	0	0	0	6	17
8:00 AM	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**3**	16
8:15 AM	**0**	**2**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	17
8:30 AM	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**5**	18
8:45 AM	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**3**	**15**
Count Total	1	11	0	0	8	0	1	0	8	1	2	0	32	0
Peak Hour	**0**	**5**	**0**	**0**	**4**	**0**	**0**	**0**	**5**	**0**	**1**	**0**	**15**	**0**

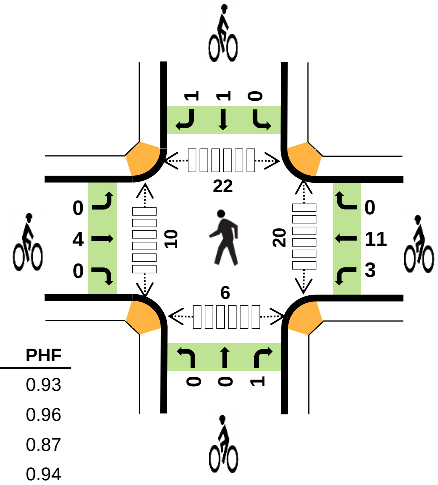
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

29th Ave
E 12th St

Date: 05-23-2018
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 5:00 PM to 6:00 PM

Peak Hour





	HV %:	PHF
EB	1.8%	0.93
WB	2.6%	0.96
NB	1.1%	0.87
SB	1.1%	0.94
TOTAL	1.7%	0.96

Two-Hour Count Summaries

Interval Start		E 12th St Eastbound UT	LT	TH	RT	E 12th St Westbound UT	LT	TH	RT	29th Ave Northbound UT	LT	TH	RT	29th Ave Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
4:00 PM		0	15	177	72	0	10	72	16	0	38	40	31	0	8	58	8	545	0
4:15 PM		2	8	163	93	0	20	61	9	0	33	62	32	0	4	40	3	530	0
4:30 PM		0	13	184	69	0	24	86	9	0	36	54	29	0	5	41	11	561	0
4:45 PM		2	18	183	86	2	15	73	16	0	40	49	27	0	4	54	20	589	2,225
5:00 PM		**4**	**12**	**172**	**107**	**0**	**24**	**74**	**21**	**0**	**36**	**40**	**29**	**0**	**5**	**55**	**15**	**594**	2,274
5:15 PM		**1**	**10**	**190**	**115**	**0**	**15**	**82**	**14**	**0**	**37**	**58**	**35**	**0**	**7**	**49**	**10**	**623**	2,367
5:30 PM		**2**	**14**	**228**	**109**	**1**	**16**	**78**	**16**	**0**	**31**	**43**	**30**	**0**	**10**	**49**	**9**	**636**	2,442
5:45 PM		**3**	**19**	**221**	**102**	**0**	**19**	**85**	**16**	**0**	**37**	**45**	**29**	**0**	**7**	**55**	**11**	**649**	**2,502**
Count Total		14	109	1,518	753	3	143	611	117	0	288	391	242	0	50	401	87	4,727	0
Peak Hour	**All**	**10**	**55**	**811**	**433**	**1**	**74**	**319**	**67**	**0**	**141**	**186**	**123**	**0**	**29**	**208**	**45**	**2,502**	**0**
	HV	**0**	**2**	**19**	**2**	**0**	**5**	**6**	**1**	**0**	**0**	**1**	**4**	**0**	**0**	**3**	**0**	**43**	**0**
	HV%	**0%**	**4%**	**2%**	**0%**	**0%**	**7%**	**2%**	**1%**	**-**	**0%**	**1%**	**3%**	**-**	**0%**	**1%**	**0%**	**2%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
4:00 PM	7	1	2	1	*11*	1	4	0	0	*5*	11	4	3	7	*25*
4:15 PM	7	3	3	0	*13*	1	1	0	0	*2*	6	0	2	1	*9*
4:30 PM	1	2	1	1	*5*	1	1	0	0	*2*	10	3	7	2	*22*
4:45 PM	3	2	2	0	*7*	2	1	0	0	*3*	5	4	1	2	*12*
5:00 PM	**7**	**3**	**1**	**1**	***12***	**2**	**1**	**0**	**1**	***4***	**5**	**5**	**3**	**3**	*16*
5:15 PM	**7**	**3**	**1**	**1**	***12***	**0**	**5**	**0**	**0**	***5***	**6**	**3**	**4**	**0**	*13*
5:30 PM	**4**	**4**	**1**	**1**	***10***	**2**	**5**	**1**	**1**	***9***	**5**	**2**	**12**	**1**	*20*
5:45 PM	**5**	**2**	**2**	**0**	***9***	**0**	**3**	**0**	**0**	***3***	**4**	**0**	**3**	**2**	***9***
Count Total	41	20	13	5	*79*	9	21	1	2	*33*	52	21	35	18	*126*
Peak Hour	**23**	**12**	**5**	**3**	***43***	**4**	**14**	**1**	**2**	***21***	**20**	**10**	**22**	**6**	***58***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	E 12th St				E 12th St				29th Ave				29th Ave				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	6	1	0	1	0	0	0	1	1	0	0	0	1	0	11	0
4:15 PM	0	0	4	3	0	2	1	0	0	0	0	3	0	0	0	0	13	0
4:30 PM	0	0	1	0	0	1	1	0	0	0	1	0	0	0	1	0	5	0
4:45 PM	0	1	2	0	0	1	1	0	0	0	0	2	0	0	0	0	7	36
5:00 PM	**0**	**1**	**5**	**1**	**0**	**1**	**2**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**12**	37
5:15 PM	**0**	**1**	**5**	**1**	**0**	**1**	**1**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**12**	36
5:30 PM	**0**	**0**	**4**	**0**	**0**	**2**	**2**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**10**	41
5:45 PM	**0**	**0**	**5**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**9**	**43**
Count Total	0	3	32	6	0	10	9	1	0	1	3	9	0	0	5	0	79	0
Peak Hour	**0**	**2**	**19**	**2**	**0**	**5**	**6**	**1**	**0**	**0**	**1**	**4**	**0**	**0**	**3**	**0**	**43**	**0**

Two-Hour Count Summaries - Bikes

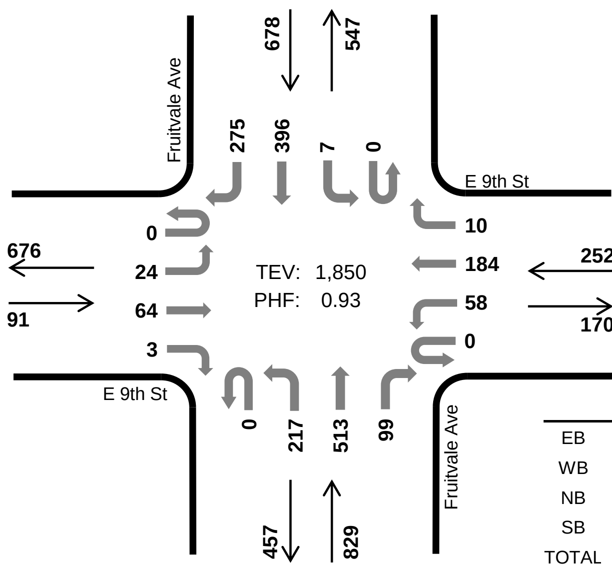
Interval Start	E 12th St			E 12th St			29th Ave			29th Ave			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	1	0	0	4	0	0	0	0	0	0	0	5	0
4:15 PM	0	1	0	0	1	0	0	0	0	0	0	0	2	0
4:30 PM	0	1	0	0	1	0	0	0	0	0	0	0	2	0
4:45 PM	0	1	1	0	1	0	0	0	0	0	0	0	3	12
5:00 PM	**0**	**2**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**4**	11
5:15 PM	**0**	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	14
5:30 PM	**0**	**2**	**0**	**1**	**4**	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**9**	21
5:45 PM	**0**	**0**	**0**	**2**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**21**
Count Total	0	8	1	3	18	0	0	0	1	0	1	1	33	0
Peak Hour	**0**	**4**	**0**	**3**	**11**	**0**	**0**	**0**	**1**	**0**	**1**	**1**	**21**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

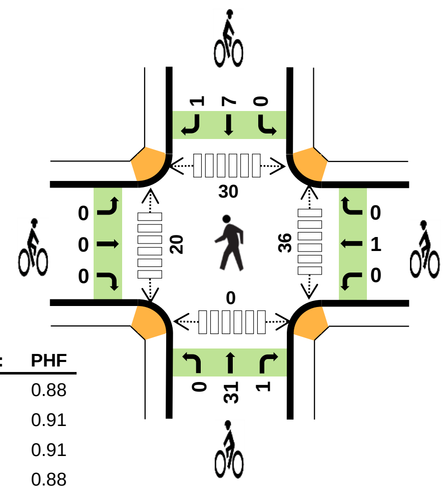
Fruitvale Ave
E 9th St

Date: 05-23-2018
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:45 AM to 8:45 AM

Peak Hour



	HV %:	PHF
EB	2.2%	0.88
WB	2.0%	0.91
NB	4.3%	0.91
SB	4.1%	0.88
TOTAL	3.8%	0.93



Two-Hour Count Summaries

Interval Start	E 9th St Eastbound UT	LT	TH	RT	E 9th St Westbound UT	LT	TH	RT	Fruitvale Ave Northbound UT	LT	TH	RT	Fruitvale Ave Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM	0	5	3	0	0	19	6	1	0	12	40	4	0	1	60	38	189	0
7:15 AM	0	8	4	1	0	11	18	3	0	65	117	16	0	1	68	49	361	0
7:30 AM	0	5	11	1	0	22	24	4	0	43	86	16	0	1	132	52	397	0
7:45 AM	**0**	**9**	**9**	**0**	**0**	**18**	**40**	**0**	**0**	**59**	**147**	**23**	**0**	**1**	**119**	**73**	**498**	1,445
8:00 AM	**0**	**6**	**14**	**1**	**0**	**14**	**45**	**3**	**0**	**40**	**127**	**34**	**0**	**2**	**87**	**61**	**434**	1,690
8:15 AM	**0**	**5**	**21**	**0**	**0**	**9**	**52**	**2**	**0**	**59**	**125**	**21**	**0**	**1**	**86**	**79**	**460**	1,789
8:30 AM	**0**	**4**	**20**	**2**	**0**	**17**	**47**	**5**	**0**	**59**	**114**	**21**	**0**	**3**	**104**	**62**	**458**	**1,850**
8:45 AM	0	6	16	1	0	17	45	2	0	56	89	16	0	3	119	59	429	1,781
Count Total	0	48	98	6	0	127	277	20	0	393	845	151	0	13	775	473	3,226	0
Peak Hour All	**0**	**24**	**64**	**3**	**0**	**58**	**184**	**10**	**0**	**217**	**513**	**99**	**0**	**7**	**396**	**275**	**1,850**	**0**
Peak Hour HV	**0**	**1**	**1**	**0**	**0**	**1**	**2**	**2**	**0**	**15**	**20**	**1**	**0**	**0**	**22**	**6**	**71**	**0**
Peak Hour HV%	**-**	**4%**	**2%**	**0%**	**-**	**2%**	**1%**	**20%**	**-**	**7%**	**4%**	**1%**	**-**	**0%**	**6%**	**2%**	**4%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
7:00 AM	0	3	4	6	*13*	0	0	4	2	*6*	8	3	8	1	*20*
7:15 AM	0	0	8	7	*15*	0	0	2	2	*4*	7	1	4	0	*12*
7:30 AM	0	1	12	5	*18*	0	0	6	5	*11*	10	4	2	1	*17*
7:45 AM	**2**	**0**	**9**	**7**	***18***	**0**	**0**	**9**	**2**	***11***	**8**	**6**	**4**	**0**	*18*
8:00 AM	**0**	**1**	**5**	**6**	***12***	**0**	**0**	**12**	**2**	***14***	**11**	**5**	**12**	**0**	*28*
8:15 AM	**0**	**2**	**14**	**8**	***24***	**0**	**1**	**5**	**1**	***7***	**5**	**5**	**5**	**0**	*15*
8:30 AM	**0**	**2**	**8**	**7**	***17***	**0**	**0**	**6**	**3**	***9***	**12**	**4**	**9**	**0**	*25*
8:45 AM	0	0	10	5	*15*	0	0	3	3	*6*	7	4	10	1	*22*
Count Total	2	9	70	51	*132*	0	1	47	20	*68*	68	32	54	3	*157*
Peak Hour	**2**	**5**	**36**	**28**	***71***	**0**	**1**	**32**	**8**	***41***	**36**	**20**	**30**	**0**	***86***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	E 9th St Eastbound UT	LT	TH	RT	E 9th St Westbound UT	LT	TH	RT	Fruitvale Ave Northbound UT	LT	TH	RT	Fruitvale Ave Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM	0	0	0	0	0	3	0	0	0	3	1	0	0	0	4	2	13	0
7:15 AM	0	0	0	0	0	0	0	0	0	1	7	0	0	0	6	1	15	0
7:30 AM	0	0	0	0	0	0	1	0	0	5	5	2	0	0	5	0	18	0
7:45 AM	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**5**	**1**	**0**	**0**	**5**	**2**	**18**	64
8:00 AM	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**3**	**2**	**0**	**0**	**0**	**6**	**0**	**12**	63
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**6**	**8**	**0**	**0**	**0**	**6**	**2**	**24**	72
8:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**3**	**5**	**0**	**0**	**0**	**5**	**2**	**17**	**71**
8:45 AM	0	0	0	0	0	0	0	0	0	6	4	0	0	0	3	2	15	68
Count Total	0	1	1	0	0	4	3	2	0	30	37	3	0	0	40	11	132	0
Peak Hour	**0**	**1**	**1**	**0**	**0**	**1**	**2**	**2**	**0**	**15**	**20**	**1**	**0**	**0**	**22**	**6**	**71**	**0**

Two-Hour Count Summaries - Bikes

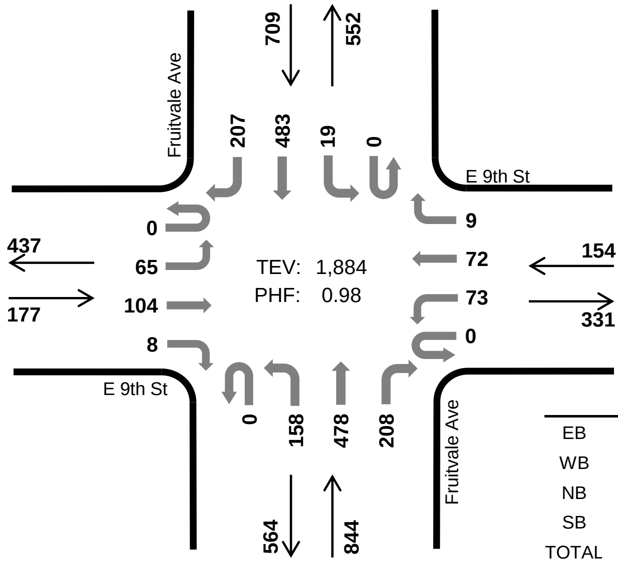
Interval Start	E 9th St Eastbound LT	TH	RT	E 9th St Westbound LT	TH	RT	Fruitvale Ave Northbound LT	TH	RT	Fruitvale Ave Southbound LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM	0	0	0	0	0	0	0	4	0	0	2	0	6	0
7:15 AM	0	0	0	0	0	0	0	1	1	0	2	0	4	0
7:30 AM	0	0	0	0	0	0	0	6	0	0	5	0	11	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**8**	**1**	**0**	**2**	**0**	**11**	32
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**12**	**0**	**0**	**1**	**1**	**14**	40
8:15 AM	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**5**	**0**	**0**	**1**	**0**	**7**	43
8:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6**	**0**	**0**	**3**	**0**	**9**	**41**
8:45 AM	0	0	0	0	0	0	0	3	0	0	3	0	6	36
Count Total	0	0	0	0	1	0	0	45	2	0	19	1	68	0
Peak Hour	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**31**	**1**	**0**	**7**	**1**	**41**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

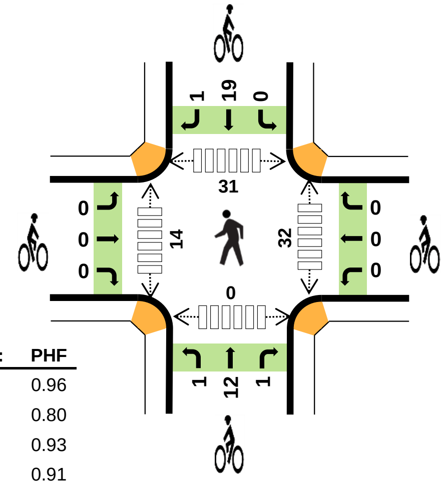
Fruitvale Ave
E 9th St

Date: 05-23-2018
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:15 PM to 5:15 PM

Peak Hour



	HV %:	PHF
EB	0.0%	0.96
WB	1.3%	0.80
NB	2.4%	0.93
SB	2.0%	0.91
TOTAL	1.9%	0.98



Two-Hour Count Summaries

Interval Start	E 9th St Eastbound UT	LT	TH	RT	E 9th St Westbound UT	LT	TH	RT	Fruitvale Ave Northbound UT	LT	TH	RT	Fruitvale Ave Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
4:00 PM	0	18	33	3	0	20	15	8	0	29	88	38	0	6	108	55	421	0
4:15 PM	**0**	**19**	**25**	**1**	**0**	**21**	**12**	**2**	**0**	**39**	**125**	**62**	**0**	**5**	**114**	**52**	**477**	0
4:30 PM	**0**	**19**	**24**	**3**	**0**	**23**	**23**	**2**	**0**	**41**	**123**	**45**	**0**	**5**	**113**	**60**	**481**	0
4:45 PM	**0**	**13**	**27**	**2**	**0**	**11**	**21**	**1**	**0**	**38**	**129**	**52**	**0**	**6**	**109**	**50**	**459**	1,838
5:00 PM	**0**	**14**	**28**	**2**	**0**	**18**	**16**	**4**	**0**	**40**	**101**	**49**	**0**	**3**	**147**	**45**	**467**	**1,884**
5:15 PM	0	22	21	3	0	15	19	2	0	31	134	34	0	6	131	46	464	1,871
5:30 PM	0	22	25	1	0	14	13	5	0	23	127	50	0	2	142	41	465	1,855
5:45 PM	0	11	27	1	0	14	18	2	0	37	140	36	1	3	146	41	477	1,873
Count Total	0	138	210	16	0	136	137	26	0	278	967	366	1	36	1,010	390	3,711	0
Peak Hour All	**0**	**65**	**104**	**8**	**0**	**73**	**72**	**9**	**0**	**158**	**478**	**208**	**0**	**19**	**483**	**207**	**1,884**	**0**
Peak Hour HV	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**4**	**15**	**1**	**0**	**1**	**12**	**1**	**36**	**0**
Peak Hour HV%	**-**	**0%**	**0%**	**0%**	**-**	**1%**	**0%**	**11%**	**-**	**3%**	**3%**	**0%**	**-**	**5%**	**2%**	**0%**	**2%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
4:00 PM	0	0	5	5	*10*	0	0	5	1	*6*	6	1	7	0	*14*
4:15 PM	**0**	**1**	**4**	**4**	***9***	**0**	**0**	**2**	**3**	***5***	**11**	**0**	**13**	**0**	*24*
4:30 PM	**0**	**0**	**4**	**4**	***8***	**0**	**0**	**4**	**6**	***10***	**6**	**3**	**4**	**0**	*13*
4:45 PM	**0**	**0**	**8**	**3**	***11***	**0**	**0**	**4**	**7**	***11***	**5**	**8**	**7**	**0**	*20*
5:00 PM	**0**	**1**	**4**	**3**	***8***	**0**	**0**	**4**	**4**	***8***	**10**	**3**	**7**	**0**	***20***
5:15 PM	0	2	4	3	*9*	0	1	3	7	*11*	7	10	6	0	*23*
5:30 PM	0	0	5	5	*10*	0	0	1	8	*9*	12	5	5	1	*23*
5:45 PM	0	0	8	2	*10*	0	0	3	13	*16*	4	6	5	0	*15*
Count Total	0	4	42	29	*75*	0	1	26	49	*76*	61	36	54	1	*152*
Peak Hour	**0**	**2**	**20**	**14**	***36***	**0**	**0**	**14**	**20**	***34***	**32**	**14**	**31**	**0**	***77***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	E 9th St				E 9th St				Fruitvale Ave				Fruitvale Ave				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	1	3	1	0	0	4	1	10	0
4:15 PM	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**2**	**2**	**0**	**0**	**0**	**4**	**0**	**9**	0
4:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**3**	**0**	**0**	**0**	**3**	**1**	**8**	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**7**	**1**	**0**	**1**	**2**	**0**	**11**	38
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**3**	**0**	**0**	**0**	**3**	**0**	**8**	**36**
5:15 PM	0	0	0	0	0	0	2	0	0	0	4	0	0	0	3	0	9	36
5:30 PM	0	0	0	0	0	0	0	0	0	3	2	0	0	0	4	1	10	38
5:45 PM	0	0	0	0	0	0	0	0	0	1	7	0	0	0	2	0	10	37
Count Total	0	0	0	0	0	1	2	1	0	9	31	2	0	1	25	3	75	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**4**	**15**	**1**	**0**	**1**	**12**	**1**	**36**	**0**

Two-Hour Count Summaries - Bikes

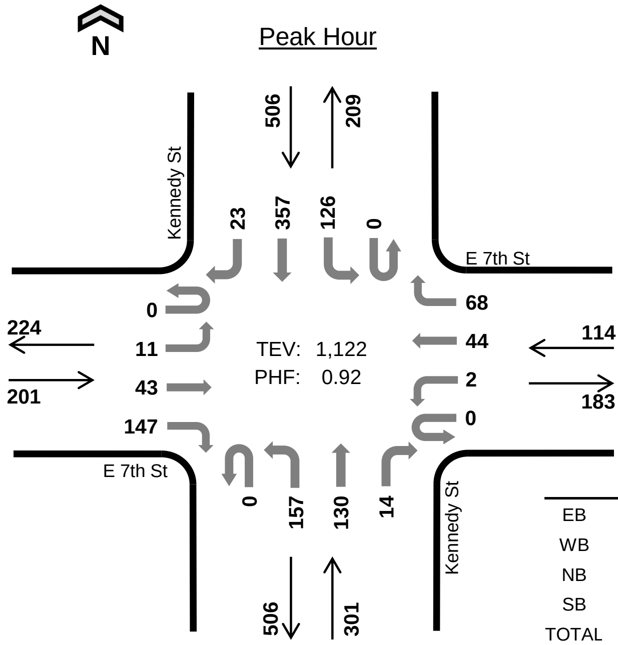
Interval Start	E 9th St			E 9th St			Fruitvale Ave			Fruitvale Ave			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	4	1	0	0	1	6	0
4:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**3**	**0**	**5**	0
4:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**6**	**0**	**10**	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**3**	**0**	**0**	**6**	**1**	**11**	32
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**1**	**0**	**4**	**0**	**8**	**34**
5:15 PM	0	0	0	1	0	0	0	3	0	0	7	0	11	40
5:30 PM	0	0	0	0	0	0	0	1	0	0	6	2	9	39
5:45 PM	0	0	0	0	0	0	0	3	0	0	13	0	16	44
Count Total	0	0	0	1	0	0	1	23	2	0	45	4	76	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**12**	**1**	**0**	**19**	**1**	**34**	**0**

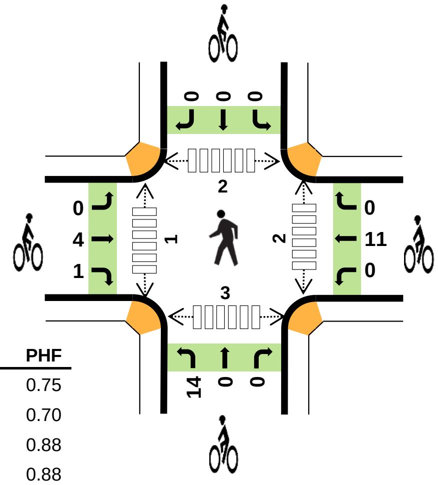
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Kennedy St
E 7th St

Date: 05-23-2018
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 8:00 AM to 9:00 AM

Peak Hour





	HV %:	PHF
EB	10.9%	0.75
WB	4.4%	0.70
NB	10.3%	0.88
SB	6.7%	0.88
TOTAL	8.2%	0.92

Two-Hour Count Summaries

Interval Start		E 7th St Eastbound				E 7th St Westbound				Kennedy St Northbound				Kennedy St Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		0	3	7	21	0	0	7	8	0	22	15	4	2	21	61	2	173	0
7:15 AM		0	3	12	30	1	0	18	16	0	34	14	1	0	15	97	1	242	0
7:30 AM		0	3	12	49	0	0	14	6	0	30	11	2	0	22	93	5	247	0
7:45 AM		0	3	9	40	0	0	11	11	0	29	28	4	0	23	97	5	260	922
8:00 AM		**0**	**1**	**10**	**35**	**0**	**1**	**5**	**18**	**0**	**40**	**35**	**6**	**0**	**35**	**98**	**10**	**294**	1,043
8:15 AM		**0**	**4**	**11**	**37**	**0**	**0**	**9**	**11**	**0**	**46**	**34**	**6**	**0**	**35**	**76**	**3**	**272**	1,073
8:30 AM		**0**	**3**	**8**	**25**	**0**	**0**	**15**	**14**	**0**	**36**	**29**	**1**	**0**	**20**	**95**	**4**	**250**	1,076
8:45 AM		**0**	**3**	**14**	**50**	**0**	**1**	**15**	**25**	**0**	**35**	**32**	**1**	**0**	**36**	**88**	**6**	**306**	**1,122**
Count Total		0	23	83	287	1	2	94	109	0	272	198	25	2	207	705	36	2,044	0
Peak Hour	**All**	**0**	**11**	**43**	**147**	**0**	**2**	**44**	**68**	**0**	**157**	**130**	**14**	**0**	**126**	**357**	**23**	**1,122**	**0**
	HV	**0**	**6**	**10**	**6**	**0**	**1**	**2**	**2**	**0**	**5**	**15**	**11**	**0**	**10**	**16**	**8**	**92**	**0**
	HV%	**-**	**55%**	**23%**	**4%**	**-**	**50%**	**5%**	**3%**	**-**	**3%**	**12%**	**79%**	**-**	**8%**	**4%**	**35%**	**8%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
7:00 AM	5	1	7	3	*16*	0	0	2	0	*2*	0	1	0	0	*1*
7:15 AM	1	2	3	4	*10*	0	1	3	0	*4*	0	2	0	3	*5*
7:30 AM	5	0	2	8	*15*	1	1	5	0	*7*	1	0	0	1	*2*
7:45 AM	4	1	4	3	*12*	0	0	4	0	*4*	1	0	0	2	*3*
8:00 AM	**4**	**0**	**6**	**10**	***20***	**2**	**1**	**3**	**0**	***6***	**2**	**1**	**1**	**0**	*4*
8:15 AM	**6**	**0**	**9**	**5**	***20***	**1**	**4**	**2**	**0**	***7***	**0**	**0**	**1**	**0**	*1*
8:30 AM	**5**	**3**	**8**	**11**	***27***	**0**	**3**	**8**	**0**	***11***	**0**	**0**	**0**	**0**	*0*
8:45 AM	**7**	**2**	**8**	**8**	***25***	**2**	**3**	**1**	**0**	***6***	**0**	**0**	**0**	**3**	***3***
Count Total	37	9	47	52	*145*	6	13	28	0	*47*	4	4	2	9	*19*
Peak Hour	**22**	**5**	**31**	**34**	***92***	**5**	**11**	**14**	**0**	***30***	**2**	**1**	**2**	**3**	***8***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	E 7th St				E 7th St				Kennedy St				Kennedy St				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	2	2	1	0	0	1	0	0	0	4	3	0	2	0	1	16	0
7:15 AM	0	0	1	0	0	0	1	1	0	0	2	1	0	3	0	1	10	0
7:30 AM	0	2	1	2	0	0	0	0	0	0	1	1	0	2	5	1	15	0
7:45 AM	0	2	1	1	0	0	0	1	0	0	1	3	0	2	0	1	12	53
8:00 AM	**0**	**0**	**2**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**5**	**0**	**2**	**5**	**3**	**20**	57
8:15 AM	**0**	**3**	**2**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**4**	**4**	**0**	**2**	**3**	**0**	**20**	67
8:30 AM	**0**	**1**	**3**	**1**	**0**	**0**	**1**	**2**	**0**	**2**	**5**	**1**	**0**	**3**	**6**	**2**	**27**	79
8:45 AM	**0**	**2**	**3**	**2**	**0**	**1**	**1**	**0**	**0**	**2**	**5**	**1**	**0**	**3**	**2**	**3**	**25**	**92**
Count Total	0	12	15	10	0	1	4	4	0	5	23	19	0	19	21	12	145	0
Peak Hour	**0**	**6**	**10**	**6**	**0**	**1**	**2**	**2**	**0**	**5**	**15**	**11**	**0**	**10**	**16**	**8**	**92**	**0**

Two-Hour Count Summaries - Bikes

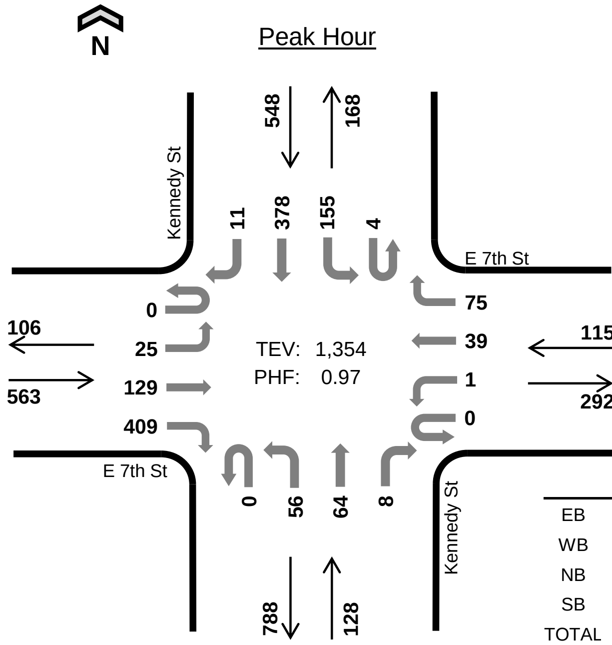
Interval Start	E 7th St			E 7th St			Kennedy St			Kennedy St			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	2	0	0	0	0	0	2	0
7:15 AM	0	0	0	0	0	1	3	0	0	0	0	0	4	0
7:30 AM	0	1	0	0	1	0	5	0	0	0	0	0	7	0
7:45 AM	0	0	0	0	0	0	4	0	0	0	0	0	4	17
8:00 AM	**0**	**2**	**0**	**0**	**1**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**6**	21
8:15 AM	**0**	**0**	**1**	**0**	**4**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**7**	24
8:30 AM	**0**	**0**	**0**	**0**	**3**	**0**	**8**	**0**	**0**	**0**	**0**	**0**	**11**	28
8:45 AM	**0**	**2**	**0**	**0**	**3**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**6**	**30**
Count Total	0	5	1	0	12	1	28	0	0	0	0	0	47	0
Peak Hour	**0**	**4**	**1**	**0**	**11**	**0**	**14**	**0**	**0**	**0**	**0**	**0**	**30**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

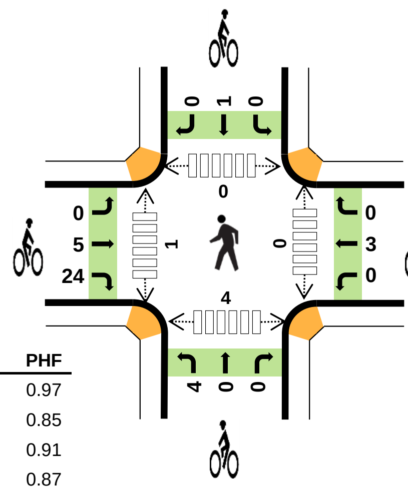
Kennedy St
E 7th St

Date: 05-23-2018
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:30 PM to 5:30 PM

Peak Hour



	HV %:	PHF
EB	1.8%	0.97
WB	0.9%	0.85
NB	4.7%	0.91
SB	4.0%	0.87
TOTAL	2.9%	0.97



Two-Hour Count Summaries

Interval Start	E 7th St Eastbound UT	LT	TH	RT	E 7th St Westbound UT	LT	TH	RT	Kennedy St Northbound UT	LT	TH	RT	Kennedy St Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
4:00 PM	0	12	43	92	0	1	6	16	0	15	9	3	1	38	92	6	334	0
4:15 PM	0	9	24	92	1	0	8	14	0	11	6	5	1	30	91	2	294	0
4:30 PM	**0**	**9**	**32**	**92**	**0**	**0**	**12**	**20**	**0**	**14**	**15**	**4**	**1**	**34**	**91**	**3**	**327**	0
4:45 PM	**0**	**4**	**34**	**105**	**0**	**0**	**9**	**16**	**0**	**18**	**16**	**1**	**1**	**45**	**95**	**3**	**347**	1,302
5:00 PM	**0**	**6**	**32**	**104**	**0**	**0**	**8**	**16**	**0**	**8**	**16**	**1**	**1**	**49**	**105**	**3**	**349**	1,317
5:15 PM	**0**	**6**	**31**	**108**	**0**	**1**	**10**	**23**	**0**	**16**	**17**	**2**	**1**	**27**	**87**	**2**	**331**	**1,354**
5:30 PM	0	4	15	123	0	0	13	12	0	14	16	5	0	33	83	1	319	1,346
5:45 PM	0	6	19	108	0	0	17	19	0	11	11	1	0	34	80	4	310	1,309
Count Total	0	56	230	824	1	2	83	136	0	107	106	22	6	290	724	24	2,611	0
Peak Hour All	**0**	**25**	**129**	**409**	**0**	**1**	**39**	**75**	**0**	**56**	**64**	**8**	**4**	**155**	**378**	**11**	**1,354**	**0**
Peak Hour HV	**0**	**0**	**6**	**4**	**0**	**0**	**1**	**0**	**0**	**1**	**4**	**1**	**0**	**5**	**15**	**2**	**39**	**0**
Peak Hour HV%	**-**	**0%**	**5%**	**1%**	**-**	**0%**	**3%**	**0%**	**-**	**2%**	**6%**	**13%**	**0%**	**3%**	**4%**	**18%**	**3%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
4:00 PM	4	0	4	8	*16*	4	2	0	1	*7*	0	0	0	0	*0*
4:15 PM	2	2	4	8	*16*	5	2	1	0	*8*	0	4	0	1	*5*
4:30 PM	**1**	**0**	**2**	**6**	***9***	**6**	**0**	**1**	**0**	***7***	**0**	**0**	**0**	**1**	*1*
4:45 PM	**5**	**0**	**1**	**5**	***11***	**6**	**3**	**1**	**0**	***10***	**0**	**0**	**0**	**1**	*1*
5:00 PM	**0**	**1**	**1**	**7**	***9***	**6**	**0**	**1**	**1**	***8***	**0**	**0**	**0**	**2**	*2*
5:15 PM	**4**	**0**	**2**	**4**	***10***	**11**	**0**	**1**	**0**	***12***	**0**	**1**	**0**	**0**	***1***
5:30 PM	3	1	2	2	*8*	7	1	1	1	*10*	0	1	0	0	*1*
5:45 PM	3	0	1	3	*7*	6	0	1	0	*7*	0	0	0	0	*0*
Count Total	22	4	17	43	*86*	51	8	7	3	*69*	0	6	0	5	*11*
Peak Hour	**10**	**1**	**6**	**22**	***39***	**29**	**3**	**4**	**1**	***37***	**0**	**1**	**0**	**4**	***5***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	E 7th St				E 7th St				Kennedy St				Kennedy St				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	3	1	0	0	0	0	0	1	1	2	0	2	4	2	16	0
4:15 PM	0	1	1	0	0	0	0	2	0	0	1	3	0	4	4	0	16	0
4:30 PM	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**1**	**3**	**2**	**9**	0
4:45 PM	**0**	**0**	**4**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**2**	**3**	**0**	**11**	52
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**2**	**5**	**0**	**9**	45
5:15 PM	**0**	**0**	**2**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**4**	**0**	**10**	**39**
5:30 PM	0	0	0	3	0	0	0	1	0	1	1	0	0	0	2	0	8	38
5:45 PM	0	1	0	2	0	0	0	0	0	1	0	0	0	0	3	0	7	34
Count Total	0	2	10	10	0	0	1	3	0	4	7	6	0	11	28	4	86	0
Peak Hour	**0**	**0**	**6**	**4**	**0**	**0**	**1**	**0**	**0**	**1**	**4**	**1**	**0**	**5**	**15**	**2**	**39**	**0**

Two-Hour Count Summaries - Bikes

Interval Start	E 7th St			E 7th St			Kennedy St			Kennedy St			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	4	0	1	1	0	0	0	1	0	0	7	0
4:15 PM	0	0	5	0	2	0	1	0	0	0	0	0	8	0
4:30 PM	**0**	**0**	**6**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**7**	0
4:45 PM	**0**	**0**	**6**	**0**	**3**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**10**	32
5:00 PM	**0**	**1**	**5**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**8**	33
5:15 PM	**0**	**4**	**7**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**12**	**37**
5:30 PM	0	0	7	0	1	0	1	0	0	1	0	0	10	40
5:45 PM	0	0	6	0	0	0	0	0	1	0	0	0	7	37
Count Total	0	5	46	0	7	1	6	0	1	2	1	0	69	0
Peak Hour	**0**	**5**	**24**	**0**	**3**	**0**	**4**	**0**	**0**	**0**	**1**	**0**	**37**	**0**

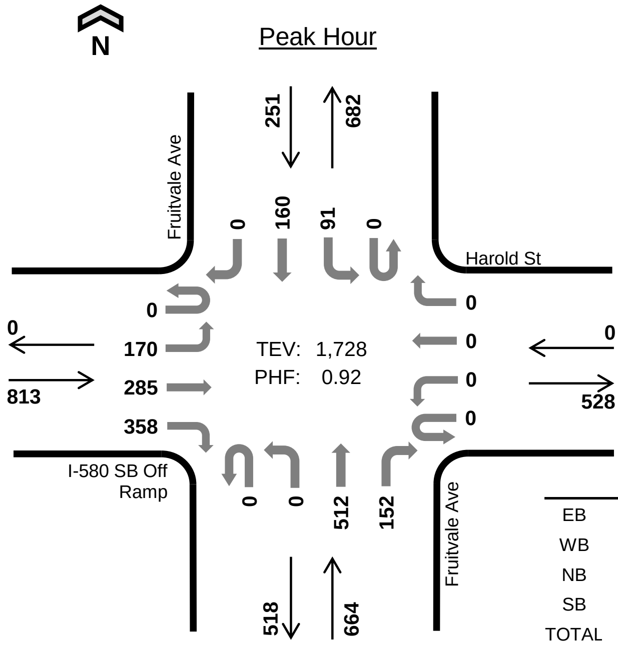
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

www.idaxdata.com

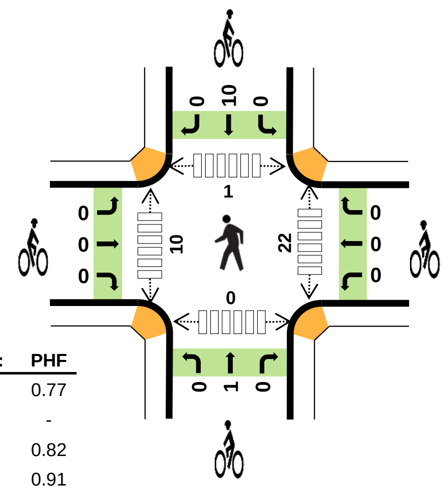
Fruitvale Ave
I-580 SB Off Ramp

Date: 05-23-2018
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:30 AM to 8:30 AM

Peak Hour



	HV %:	PHF
EB	1.1%	0.77
WB	-	-
NB	2.0%	0.82
SB	4.0%	0.91
TOTAL	1.9%	0.92



Two-Hour Count Summaries

Interval Start	I-580 SB Off Ramp Eastbound				Harold St Westbound				Fruitvale Ave Northbound				Fruitvale Ave Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	22	28	35	0	0	0	0	0	0	110	18	0	12	35	0	260	0
7:15 AM	0	32	35	36	0	0	0	0	0	0	137	26	0	12	51	0	329	0
7:30 AM	**0**	**40**	**45**	**68**	**0**	**0**	**0**	**0**	**0**	**0**	**160**	**42**	**0**	**20**	**49**	**0**	**424**	0
7:45 AM	**0**	**29**	**68**	**83**	**0**	**0**	**0**	**0**	**0**	**0**	**132**	**36**	**0**	**28**	**39**	**0**	**415**	1,428
8:00 AM	**0**	**46**	**80**	**90**	**0**	**0**	**0**	**0**	**0**	**0**	**114**	**33**	**0**	**18**	**37**	**0**	**418**	1,586
8:15 AM	**0**	**55**	**92**	**117**	**0**	**0**	**0**	**0**	**0**	**0**	**106**	**41**	**0**	**25**	**35**	**0**	**471**	**1,728**
8:30 AM	0	41	70	68	0	0	0	0	0	0	114	57	0	20	38	0	408	1,712
8:45 AM	0	55	54	83	0	0	0	0	0	0	104	31	0	25	41	0	393	1,690
Count Total	0	320	472	580	0	0	0	0	0	0	977	284	0	160	325	0	3,118	0
Peak Hour All	**0**	**170**	**285**	**358**	**0**	**0**	**0**	**0**	**0**	**0**	**512**	**152**	**0**	**91**	**160**	**0**	**1,728**	**0**
Peak Hour HV	**0**	**2**	**2**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**7**	**6**	**0**	**0**	**10**	**0**	**32**	**0**
Peak Hour HV%	**-**	**1%**	**1%**	**1%**	**-**	**-**	**-**	**-**	**-**	**-**	**1%**	**4%**	**-**	**0%**	**6%**	**-**	**2%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	3	0	2	2	*7*	0	0	0	4	*4*	6	3	0	0	*9*
7:15 AM	6	0	6	3	*15*	0	0	0	2	*2*	2	4	1	0	*7*
7:30 AM	**3**	**0**	**4**	**2**	***9***	**0**	**0**	**0**	**2**	***2***	**11**	**1**	**0**	**0**	*12*
7:45 AM	**4**	**0**	**3**	**4**	***11***	**0**	**0**	**0**	**3**	***3***	**2**	**1**	**1**	**0**	*4*
8:00 AM	**1**	**0**	**3**	**2**	***6***	**0**	**0**	**1**	**2**	***3***	**4**	**7**	**0**	**0**	*11*
8:15 AM	**1**	**0**	**3**	**2**	***6***	**0**	**0**	**0**	**3**	***3***	**5**	**1**	**0**	**0**	***6***
8:30 AM	1	0	8	4	*13*	0	0	0	0	*0*	7	0	0	0	*7*
8:45 AM	4	0	4	2	*10*	0	0	2	3	*5*	4	0	0	0	*4*
Count Total	23	0	33	21	*77*	0	0	3	19	*22*	41	17	2	0	*60*
Peak Hour	**9**	**0**	**13**	**10**	***32***	**0**	**0**	**1**	**10**	***11***	**22**	**10**	**1**	**0**	***33***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	I-580 SB Off Ramp Eastbound				Harold St Westbound				Fruitvale Ave Northbound				Fruitvale Ave Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	2	1	0	0	0	0	0	0	1	1	0	1	1	0	7	0
7:15 AM	0	1	2	3	0	0	0	0	0	0	6	0	0	0	3	0	15	0
7:30 AM	**0**	**1**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**2**	**0**	**0**	**2**	**0**	**9**	0
7:45 AM	**0**	**1**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**2**	**0**	**0**	**4**	**0**	**11**	42
8:00 AM	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**2**	**0**	**6**	41
8:15 AM	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**2**	**0**	**0**	**2**	**0**	**6**	**32**
8:30 AM	0	0	1	0	0	0	0	0	0	0	4	4	0	1	3	0	13	36
8:45 AM	0	3	1	0	0	0	0	0	0	0	2	2	0	0	2	0	10	35
Count Total	0	6	8	9	0	0	0	0	0	0	20	13	0	2	19	0	77	0
Peak Hour	**0**	**2**	**2**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**7**	**6**	**0**	**0**	**10**	**0**	**32**	**0**

Two-Hour Count Summaries - Bikes

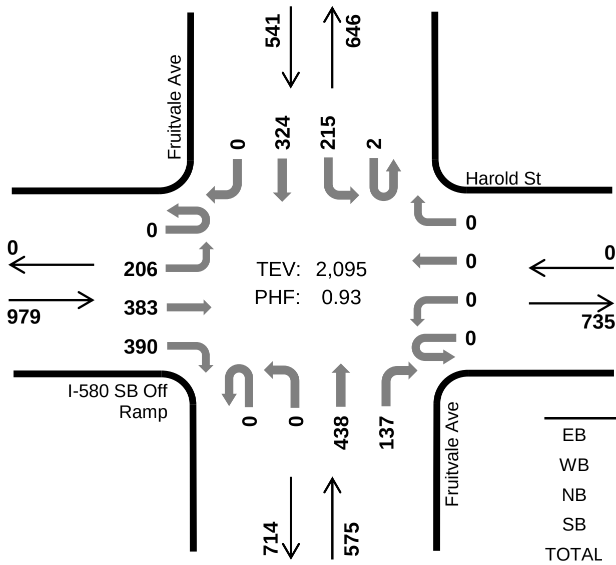
Interval Start	I-580 SB Off Ramp Eastbound			Harold St Westbound			Fruitvale Ave Northbound			Fruitvale Ave Southbound			15-min Total	Rolling One Hour
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	4	0	4	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	2	0	2	0
7:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**2**	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**3**	11
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**2**	**0**	**3**	10
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**3**	**11**
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	9
8:45 AM	0	0	0	0	0	0	0	2	0	0	3	0	5	11
Count Total	0	0	0	0	0	0	0	3	0	0	19	0	22	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**10**	**0**	**11**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

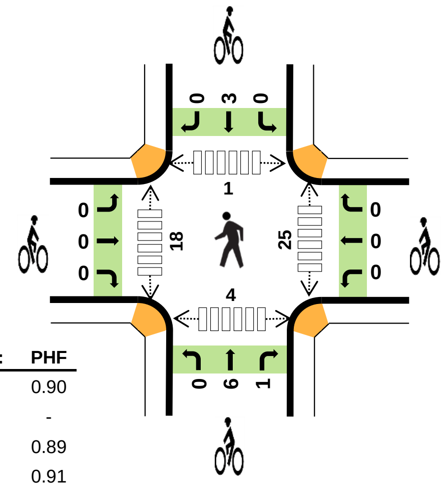
Fruitvale Ave
I-580 SB Off Ramp

Date: 05-23-2018
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 5:00 PM to 6:00 PM

Peak Hour



	HV %:	PHF
EB	0.9%	0.90
WB	-	-
NB	1.6%	0.89
SB	1.3%	0.91
TOTAL	1.2%	0.93



Two-Hour Count Summaries

Interval Start	I-580 SB Off Ramp Eastbound				Harold St Westbound				Fruitvale Ave Northbound				Fruitvale Ave Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	78	91	86	0	0	0	0	0	0	102	39	1	29	82	0	508	0
4:15 PM	0	74	89	100	0	0	0	0	0	0	111	32	0	31	71	0	508	0
4:30 PM	0	61	109	87	0	0	0	0	0	0	116	22	0	26	77	0	498	0
4:45 PM	0	42	98	77	0	0	0	0	0	0	115	31	3	43	107	0	516	2,030
5:00 PM	**0**	**51**	**87**	**94**	**0**	**0**	**0**	**0**	**0**	**0**	**96**	**32**	**1**	**44**	**71**	**0**	**476**	1,998
5:15 PM	**0**	**35**	**95**	**74**	**0**	**0**	**0**	**0**	**0**	**0**	**125**	**24**	**0**	**53**	**92**	**0**	**498**	1,988
5:30 PM	**0**	**59**	**90**	**123**	**0**	**0**	**0**	**0**	**0**	**0**	**93**	**43**	**0**	**69**	**79**	**0**	**556**	2,046
5:45 PM	**0**	**61**	**111**	**99**	**0**	**0**	**0**	**0**	**0**	**0**	**124**	**38**	**1**	**49**	**82**	**0**	**565**	**2,095**
Count Total	0	461	770	740	0	0	0	0	0	0	882	261	6	344	661	0	4,125	0
Peak Hour All	**0**	**206**	**383**	**390**	**0**	**0**	**0**	**0**	**0**	**0**	**438**	**137**	**2**	**215**	**324**	**0**	**2,095**	**0**
Peak Hour HV	**0**	**4**	**1**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**5**	**0**	**1**	**6**	**0**	**25**	**0**
Peak Hour HV%	**-**	**2%**	**0%**	**1%**	**-**	**-**	**-**	**-**	**-**	**-**	**1%**	**4%**	**0%**	**0%**	**2%**	**-**	**1%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	1	0	2	1	*4*	0	0	2	0	*2*	6	5	0	0	*11*
4:15 PM	0	0	1	2	*3*	0	0	1	0	*1*	9	0	0	0	*9*
4:30 PM	1	0	3	0	*4*	0	0	2	1	*3*	8	5	1	0	*14*
4:45 PM	0	0	1	2	*3*	0	0	1	0	*1*	12	2	0	0	*14*
5:00 PM	**3**	**0**	**3**	**0**	***6***	**0**	**0**	**1**	**0**	***1***	**3**	**5**	**0**	**2**	*10*
5:15 PM	**1**	**0**	**1**	**3**	***5***	**0**	**0**	**4**	**1**	***5***	**7**	**3**	**1**	**0**	*11*
5:30 PM	**2**	**0**	**3**	**3**	***8***	**0**	**0**	**2**	**1**	***3***	**8**	**8**	**0**	**2**	*18*
5:45 PM	**3**	**0**	**2**	**1**	***6***	**0**	**0**	**0**	**1**	***1***	**7**	**2**	**0**	**0**	***9***
Count Total	11	0	16	12	*39*	0	0	13	4	*17*	60	30	2	4	*96*
Peak Hour	**9**	**0**	**9**	**7**	***25***	**0**	**0**	**7**	**3**	***10***	**25**	**18**	**1**	**4**	***48***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	I-580 SB Off Ramp Eastbound				Harold St Westbound				Fruitvale Ave Northbound				Fruitvale Ave Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	1	0	0	0	0	0	0	0	0	0	2	0	0	1	0	4	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	3	0
4:30 PM	0	1	0	0	0	0	0	0	0	0	2	1	0	0	0	0	4	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	0	3	14
5:00 PM	**0**	**1**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**6**	16
5:15 PM	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**3**	**0**	**5**	18
5:30 PM	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**1**	**0**	**1**	**2**	**0**	**8**	22
5:45 PM	**0**	**2**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**1**	**0**	**6**	**25**
Count Total	0	6	1	4	0	0	0	0	0	0	7	9	0	1	11	0	39	0
Peak Hour	**0**	**4**	**1**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**5**	**0**	**1**	**6**	**0**	**25**	**0**

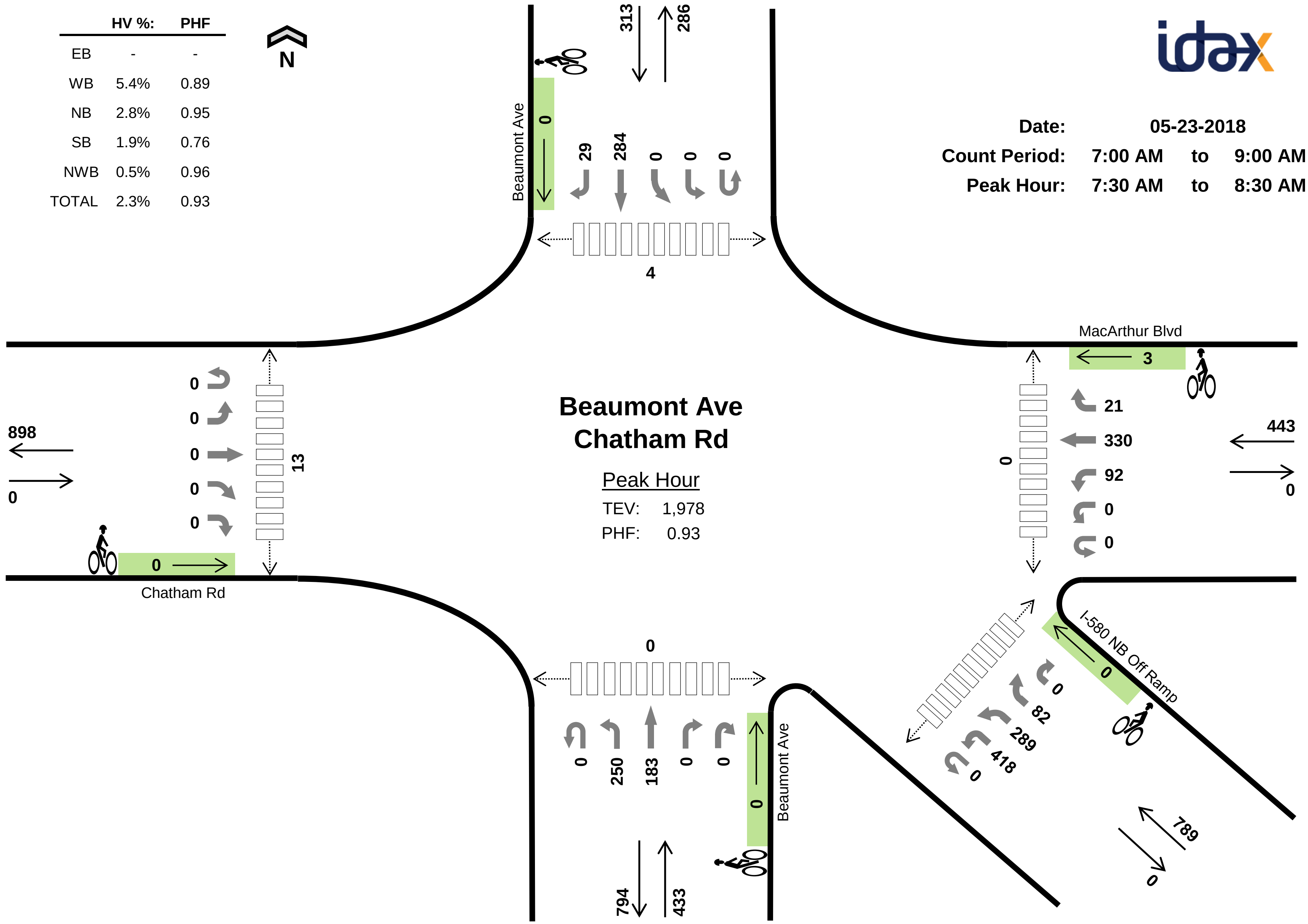
Two-Hour Count Summaries - Bikes

Interval Start	I-580 SB Off Ramp Eastbound			Harold St Westbound			Fruitvale Ave Northbound			Fruitvale Ave Southbound			15-min Total	Rolling One Hour
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	2	0	0	0	0	2	0
4:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	1	0
4:30 PM	0	0	0	0	0	0	0	1	1	0	1	0	3	0
4:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	1	7
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	6
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**1**	**0**	**1**	**0**	**5**	10
5:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**1**	**0**	**3**	10
5:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**10**
Count Total	0	0	0	0	0	0	0	11	2	0	4	0	17	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6**	**1**	**0**	**3**	**0**	**10**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

	HV %:	PHF
EB	-	-
WB	5.4%	0.89
NB	2.8%	0.95
SB	1.9%	0.76
NWB	0.5%	0.96
TOTAL	2.3%	0.93

Date:	05-23-2018		
Count Period:	7:00 AM	to	9:00 AM
Peak Hour:	7:30 AM	to	8:30 AM



Project Manager: (415) 310-6469

project.manager.ca@idaxdata.com

Two-Hour Count Summaries

Interval Start	Chatham Rd					MacArthur Blvd					Beaumont Ave					Beaumont Ave					I-580 NB Off Ramp					15-min Total	Rolling One Hour
	Eastbound					Westbound					Northbound					Southbound					Northwestbound						
	UT	LT	TH	BR	RT	UT	HL	LT	TH	RT	UT	LT	TH	RT	HR	UT	LT	BL	TH	RT	UT	HL	BL	BR	HR		
7:00 AM	0	0	0	0	0	0	0	8	27	1	0	56	19	0	0	0	0	0	20	1	0	103	34	17	0	286	0
7:15 AM	0	0	0	0	0	0	0	9	25	2	0	70	23	0	0	0	0	0	33	2	0	112	50	18	0	344	0
7:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**20**	**68**	**7**	**0**	**79**	**32**	**0**	**0**	**0**	**0**	**0**	**47**	**7**	**0**	**118**	**59**	**17**	**0**	**454**	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**29**	**92**	**3**	**0**	**63**	**41**	**0**	**0**	**0**	**0**	**0**	**54**	**7**	**0**	**109**	**69**	**18**	**0**	**485**	1,569
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**24**	**92**	**3**	**0**	**53**	**51**	**0**	**0**	**0**	**0**	**0**	**98**	**5**	**0**	**95**	**86**	**24**	**0**	**531**	1,814
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**19**	**78**	**8**	**0**	**55**	**59**	**0**	**0**	**0**	**0**	**0**	**85**	**10**	**0**	**96**	**75**	**23**	**0**	**508**	**1,978**
8:30 AM	0	0	0	0	0	0	0	27	87	6	0	53	27	0	0	0	0	0	58	1	0	89	79	17	0	444	1,968
8:45 AM	0	0	0	0	0	0	0	34	118	2	0	68	24	0	0	0	0	0	49	4	0	97	44	15	0	455	1,938
Count Total	0	0	0	0	0	0	0	170	587	32	0	497	276	0	0	0	0	0	444	37	0	819	496	149	0	3,507	0
Peak Hour All	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**92**	**330**	**21**	**0**	**250**	**183**	**0**	**0**	**0**	**0**	**0**	**284**	**29**	**0**	**418**	**289**	**82**	**0**	**1,978**	**0**
Peak Hour HV	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**9**	**14**	**1**	**0**	**8**	**4**	**0**	**0**	**0**	**0**	**0**	**1**	**5**	**0**	**1**	**3**	**0**	**0**	**46**	**0**
Peak Hour HV%	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**10%**	**4%**	**5%**	**-**	**3%**	**2%**	**-**	**-**	**-**	**-**	**-**	**0%**	**17%**	**-**	**0%**	**1%**	**0%**	**-**	**2%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals						Bicycles						Pedestrians (Crossing Leg)					
	EB	WB	NB	SB	NWB	Total	EB	WB	NB	SB	NWB	Total	East	West	North	South	Southeast	Total
7:00 AM	0	5	0	0	2	*7*	0	0	0	0	0	*0*	0	0	1	0	0	*1*
7:15 AM	0	5	0	1	1	*7*	0	0	0	0	0	*0*	0	6	2	0	0	*8*
7:30 AM	**0**	**4**	**3**	**2**	**3**	***12***	**0**	**0**	**0**	**0**	**0**	***0***	**0**	**2**	**1**	**0**	**0**	***3***
7:45 AM	**0**	**10**	**2**	**4**	**0**	***16***	**0**	**0**	**0**	**0**	**0**	***0***	**0**	**5**	**0**	**0**	**0**	***5***
8:00 AM	**0**	**6**	**2**	**0**	**1**	***9***	**0**	**2**	**0**	**0**	**0**	***2***	**0**	**4**	**2**	**0**	**0**	***6***
8:15 AM	**0**	**4**	**5**	**0**	**0**	***9***	**0**	**1**	**0**	**0**	**0**	***1***	**0**	**2**	**1**	**0**	**0**	***3***
8:30 AM	0	9	1	0	1	*11*	0	1	0	0	0	*1*	0	0	1	0	0	*1*
8:45 AM	0	9	2	1	3	*15*	0	0	0	0	0	*0*	0	1	0	0	0	*1*
Count Total	0	52	15	8	11	*86*	0	4	0	0	0	*4*	0	20	8	0	0	*28*
Peak Hr	**0**	**24**	**12**	**6**	**4**	*46*	**0**	**3**	**0**	**0**	**0**	*3*	**0**	**13**	**4**	**0**	**0**	*17*

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Chatham Rd Eastbound					MacArthur Blvd Westbound					Beaumont Ave Northbound					Beaumont Ave Southbound					I-580 NB Off Ramp Northwestbound					15-min Total	Rolling One Hour
	UT	LT	TH	BR	RT	UT	HL	LT	TH	RT	UT	LT	TH	RT	HR	UT	LT	BL	TH	RT	UT	HL	BL	BR	HR		
7:00 AM	0	0	0	0	0	0	0	2	2	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	7	0
7:15 AM	0	0	0	0	0	0	0	1	4	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	7	0
7:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**3**	**0**	**0**	**2**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**1**	**2**	**0**	**0**	**12**	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**5**	**1**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**3**	**0**	**0**	**0**	**0**	**0**	**16**	42
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**3**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**9**	44
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**3**	**0**	**0**	**3**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**9**	**46**
8:30 AM	0	0	0	0	0	0	0	3	6	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	11	45
8:45 AM	0	0	0	0	0	0	0	3	6	0	0	2	0	0	0	0	0	0	1	0	0	2	1	0	0	15	44
Count Total	0	0	0	0	0	0	0	18	32	2	0	10	5	0	0	0	0	0	3	5	0	4	5	2	0	86	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**9**	**14**	**1**	**0**	**8**	**4**	**0**	**0**	**0**	**0**	**0**	**1**	**5**	**0**	**1**	**3**	**0**	**0**	46	**0**

Two-Hour Count Summaries - Bikes

Interval Start	Chatham Rd Eastbound					MacArthur Blvd Westbound					Beaumont Ave Northbound					Beaumont Ave Southbound					I-580 NB Off Ramp Northwestbound					15-min Total	Rolling One Hour
	UT	LT	TH	BR	RT	UT	HL	LT	TH	RT	UT	LT	TH	RT	HR	UT	LT	BL	TH	RT	UT	HL	BL	BR	HR		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	2
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**3**
8:30 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Count Total	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	3	**0**

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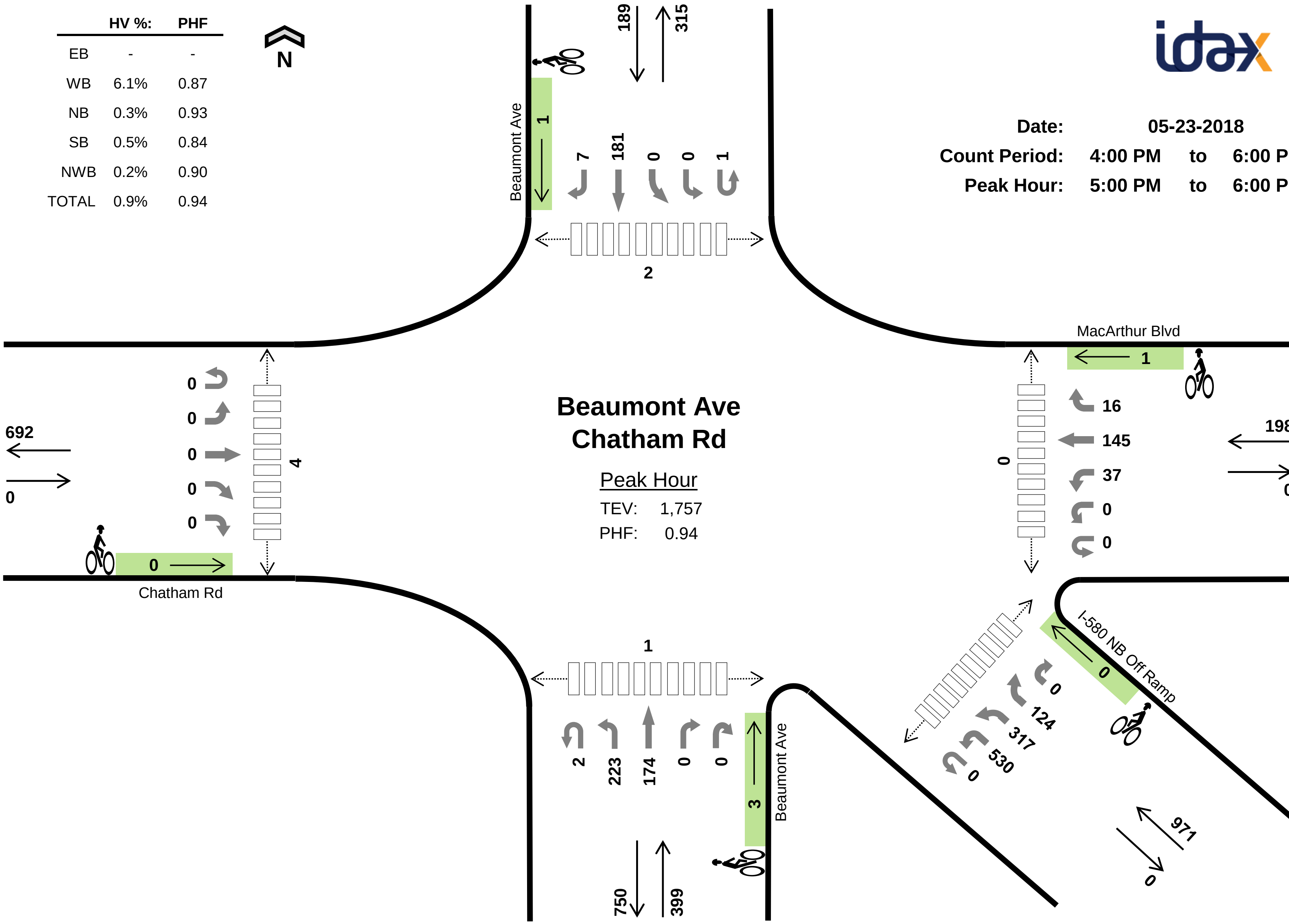
	HV %:	PHF
EB	-	-
WB	6.1%	0.87
NB	0.3%	0.93
SB	0.5%	0.84
NWB	0.2%	0.90
TOTAL	0.9%	0.94

Date: 05-23-2018
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 5:00 PM to 6:00 PM



Project Manager: (415) 310-6469

project.manager.ca@idaxdata.com

Two-Hour Count Summaries

Interval Start	Chatham Rd					MacArthur Blvd					Beaumont Ave					Beaumont Ave					I-580 NB Off Ramp					15-min Total	Rolling One Hour
	Eastbound					Westbound					Northbound					Southbound					Northwestbound						
	UT	LT	TH	BR	RT	UT	HL	LT	TH	RT	UT	LT	TH	RT	HR	UT	LT	BL	TH	RT	UT	HL	BL	BR	HR		
4:00 PM	0	0	0	0	0	0	0	7	31	2	0	71	44	0	0	0	0	0	37	4	0	109	61	25	0	391	0
4:15 PM	0	0	0	0	0	0	0	7	33	3	0	63	31	0	0	0	0	0	29	3	0	102	75	33	0	379	0
4:30 PM	0	0	0	0	0	0	0	8	28	3	0	76	38	0	0	0	0	0	39	5	0	127	55	18	0	397	0
4:45 PM	0	0	0	0	0	0	0	13	32	8	2	71	29	0	0	0	0	0	27	4	0	113	73	46	0	418	1,585
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**7**	**40**	**3**	**0**	**55**	**52**	**0**	**0**	**0**	**0**	**0**	**55**	**1**	**0**	**132**	**59**	**28**	**0**	**432**	1,626
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**11**	**31**	**2**	**2**	**50**	**44**	**0**	**0**	**0**	**0**	**0**	**38**	**0**	**0**	**125**	**79**	**31**	**0**	**413**	1,660
5:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**11**	**32**	**4**	**0**	**67**	**35**	**0**	**0**	**0**	**0**	**0**	**44**	**5**	**0**	**127**	**92**	**28**	**0**	**445**	1,708
5:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**8**	**42**	**7**	**0**	**51**	**43**	**0**	**0**	**1**	**0**	**0**	**44**	**1**	**0**	**146**	**87**	**37**	**0**	**467**	**1,757**
Count Total	0	0	0	0	0	0	0	72	269	32	4	504	316	0	0	1	0	0	313	23	0	981	581	246	0	3,342	0
Peak Hour All	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**37**	**145**	**16**	**2**	**223**	**174**	**0**	**0**	**1**	**0**	**0**	**181**	**7**	**0**	**530**	**317**	**124**	**0**	**1,757**	**0**
HV	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**7**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**1**	**0**	**0**	**16**	**0**
HV%	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**14%**	**5%**	**0%**	**0%**	**0%**	**0%**	**-**	**-**	**0%**	**-**	**-**	**1%**	**0%**	**-**	**0%**	**0%**	**0%**	**-**	**1%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals						Bicycles						Pedestrians (Crossing Leg)					
	EB	WB	NB	SB	NWB	Total	EB	WB	NB	SB	NWB	Total	East	West	North	South	Southeast	Total
4:00 PM	0	3	1	0	3	*7*	0	1	0	0	0	*1*	0	0	2	1	0	*3*
4:15 PM	0	4	1	1	2	*8*	0	0	0	0	0	*0*	0	2	0	0	0	*2*
4:30 PM	0	4	0	0	1	*5*	0	2	0	0	0	*2*	0	0	2	0	0	*2*
4:45 PM	0	3	0	0	1	*4*	0	0	0	0	0	*0*	0	0	0	0	0	*0*
5:00 PM	**0**	**2**	**1**	**0**	**2**	***5***	**0**	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**0**	**0**	**0**	***1***
5:15 PM	**0**	**5**	**0**	**1**	**0**	***6***	**0**	**1**	**1**	**0**	**0**	***2***	**0**	**0**	**1**	**1**	**0**	***2***
5:30 PM	**0**	**2**	**0**	**0**	**0**	***2***	**0**	**0**	**2**	**0**	**0**	***2***	**0**	**1**	**0**	**0**	**0**	***1***
5:45 PM	**0**	**3**	**0**	**0**	**0**	***3***	**0**	**0**	**0**	**1**	**0**	***1***	**0**	**2**	**1**	**0**	**0**	***3***
Count Total	0	26	3	2	9	*40*	0	4	3	1	0	*8*	0	6	6	2	0	*14*
Peak Hr	**0**	**12**	**1**	**1**	**2**	***16***	**0**	**1**	**3**	**1**	**0**	***5***	**0**	**4**	**2**	**1**	**0**	*7*

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Chatham Rd					MacArthur Blvd					Beaumont Ave					Beaumont Ave					I-580 NB Off Ramp					15-min Total	Rolling One Hour
	Eastbound					Westbound					Northbound					Southbound					Northwestbound						
	UT	LT	TH	BR	RT	UT	HL	LT	TH	RT	UT	LT	TH	RT	HR	UT	LT	BL	TH	RT	UT	HL	BL	BR	HR		
4:00 PM	0	0	0	0	0	0	0	1	2	0	0	1	0	0	0	0	0	0	0	0	0	0	1	2	0	7	0
4:15 PM	0	0	0	0	0	0	0	2	2	0	0	1	0	0	0	0	0	0	1	0	0	1	0	1	0	8	0
4:30 PM	0	0	0	0	0	0	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	5	0
4:45 PM	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	4	24
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**5**	22
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**6**	20
5:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	17
5:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**16**
Count Total	0	0	0	0	0	0	0	10	16	0	0	3	0	0	0	0	0	0	2	0	0	4	2	3	0	40	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**7**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**1**	**0**	**0**	16	**0**

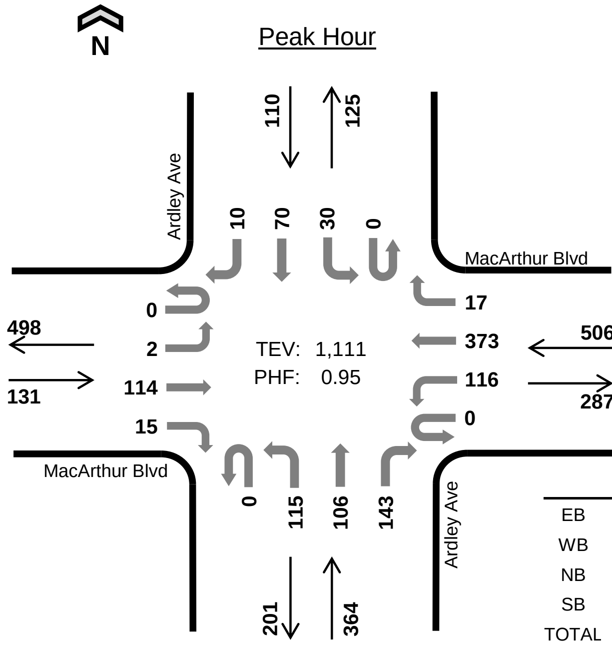
Two-Hour Count Summaries - Bikes

Interval Start	Chatham Rd					MacArthur Blvd					Beaumont Ave					Beaumont Ave					I-580 NB Off Ramp					15-min Total	Rolling One Hour
	Eastbound					Westbound					Northbound					Southbound					Northwestbound						
	UT	LT	TH	BR	RT	UT	HL	LT	TH	RT	UT	LT	TH	RT	HR	UT	LT	BL	TH	RT	UT	HL	BL	BR	HR		
4:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	2
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	4
5:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	4
5:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**5**
Count Total	0	0	0	0	0	0	0	1	2	1	0	1	2	0	0	0	0	0	1	0	0	0	0	0	0	8	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**2**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	5	**0**

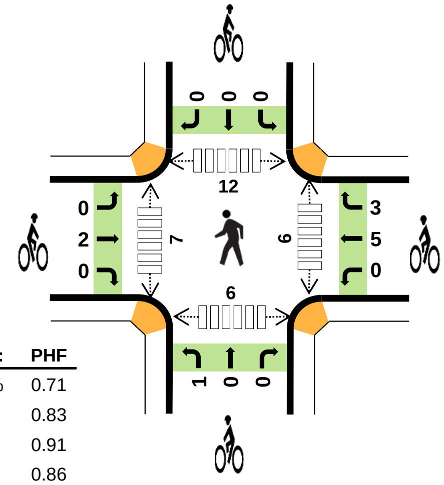
Ardley Ave
MacArthur Blvd

Date: 05-23-2018
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:45 AM to 8:45 AM

Peak Hour



	HV %:	PHF
EB	12.2%	0.71
WB	5.5%	0.83
NB	2.2%	0.91
SB	0.9%	0.86
TOTAL	4.8%	0.95



Two-Hour Count Summaries

Interval Start		MacArthur Blvd Eastbound				MacArthur Blvd Westbound				Ardley Ave Northbound				Ardley Ave Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		0	0	16	2	0	4	16	0	0	12	6	20	0	1	1	0	78	0
7:15 AM		0	0	7	5	0	12	28	1	0	11	10	21	0	2	1	2	100	0
7:30 AM		0	0	27	6	0	16	61	3	0	22	14	33	0	1	5	2	190	0
7:45 AM		**0**	**1**	**30**	**5**	**0**	**23**	**95**	**4**	**0**	**29**	**27**	**44**	**0**	**16**	**13**	**2**	**289**	657
8:00 AM		**0**	**0**	**28**	**3**	**0**	**17**	**85**	**5**	**0**	**28**	**35**	**30**	**0**	**9**	**22**	**1**	**263**	842
8:15 AM		**0**	**1**	**41**	**4**	**0**	**33**	**86**	**6**	**0**	**32**	**26**	**33**	**0**	**5**	**20**	**5**	**292**	1,034
8:30 AM		**0**	**0**	**15**	**3**	**0**	**43**	**107**	**2**	**0**	**26**	**18**	**36**	**0**	**0**	**15**	**2**	**267**	**1,111**
8:45 AM		0	2	12	6	0	34	119	0	0	21	12	23	0	0	10	2	241	1,063
Count Total		0	4	176	34	0	182	597	21	0	181	148	240	0	34	87	16	1,720	0
Peak Hour	**All**	**0**	**2**	**114**	**15**	**0**	**116**	**373**	**17**	**0**	**115**	**106**	**143**	**0**	**30**	**70**	**10**	**1,111**	**0**
	HV	**0**	**0**	**13**	**3**	**0**	**1**	**26**	**1**	**0**	**5**	**2**	**1**	**0**	**0**	**1**	**0**	**53**	**0**
	HV%	**-**	**0%**	**11%**	**20%**	**-**	**1%**	**7%**	**6%**	**-**	**4%**	**2%**	**1%**	**-**	**0%**	**1%**	**0%**	**5%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	6	2	4	0	*12*	1	0	0	0	*1*	0	3	1	2	*6*
7:15 AM	3	6	0	0	*9*	0	0	0	0	*0*	0	1	0	1	*2*
7:30 AM	6	4	2	0	*12*	0	0	1	0	*1*	0	1	1	1	*3*
7:45 AM	**6**	**10**	**4**	**0**	***20***	**1**	**2**	**1**	**0**	***4***	**1**	**0**	**2**	**4**	*7*
8:00 AM	**4**	**4**	**1**	**0**	***9***	**0**	**3**	**0**	**0**	***3***	**1**	**5**	**3**	**0**	*9*
8:15 AM	**3**	**4**	**1**	**0**	***8***	**1**	**1**	**0**	**0**	***2***	**2**	**1**	**3**	**0**	*6*
8:30 AM	**3**	**10**	**2**	**1**	***16***	**0**	**2**	**0**	**0**	***2***	**2**	**1**	**4**	**2**	***9***
8:45 AM	3	7	3	0	*13*	0	1	0	2	*3*	1	2	0	0	*3*
Count Total	34	47	17	1	*99*	3	9	2	2	*16*	7	14	14	10	*45*
Peak Hour	**16**	**28**	**8**	**1**	***53***	**2**	**8**	**1**	**0**	***11***	**6**	**7**	**12**	**6**	***31***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	MacArthur Blvd				MacArthur Blvd				Ardley Ave				Ardley Ave				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	5	1	0	0	2	0	0	3	0	1	0	0	0	0	12	0
7:15 AM	0	0	1	2	0	1	5	0	0	0	0	0	0	0	0	0	9	0
7:30 AM	0	0	4	2	0	1	3	0	0	1	0	1	0	0	0	0	12	0
7:45 AM	**0**	**0**	**5**	**1**	**0**	**1**	**9**	**0**	**0**	**2**	**1**	**1**	**0**	**0**	**0**	**0**	**20**	53
8:00 AM	**0**	**0**	**3**	**1**	**0**	**0**	**4**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**9**	50
8:15 AM	**0**	**0**	**2**	**1**	**0**	**0**	**3**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**8**	49
8:30 AM	**0**	**0**	**3**	**0**	**0**	**0**	**10**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**1**	**0**	**16**	**53**
8:45 AM	0	0	2	1	0	1	6	0	0	2	1	0	0	0	0	0	13	46
Count Total	0	0	25	9	0	4	42	1	0	11	3	3	0	0	1	0	99	0
Peak Hour	**0**	**0**	**13**	**3**	**0**	**1**	**26**	**1**	**0**	**5**	**2**	**1**	**0**	**0**	**1**	**0**	**53**	**0**

Two-Hour Count Summaries - Bikes

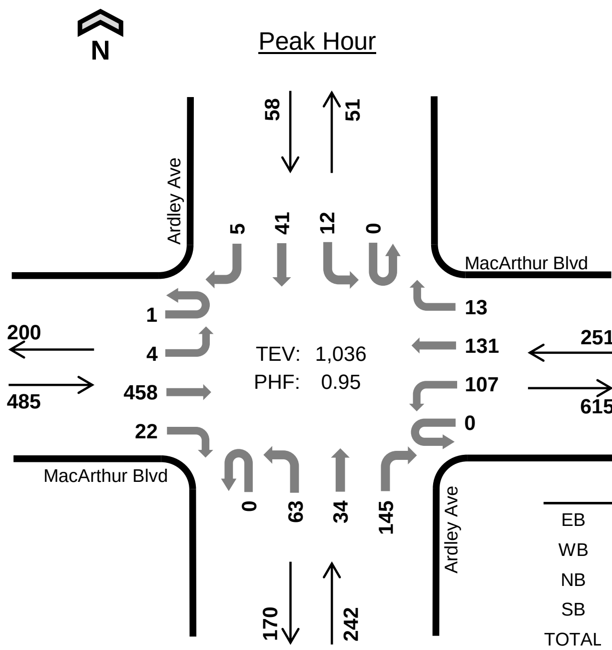
Interval Start	MacArthur Blvd			MacArthur Blvd			Ardley Ave			Ardley Ave			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	1	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	1	0
7:45 AM	**0**	**1**	**0**	**0**	**0**	**2**	**1**	**0**	**0**	**0**	**0**	**0**	**4**	6
8:00 AM	**0**	**0**	**0**	**0**	**2**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	8
8:15 AM	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	10
8:30 AM	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**11**
8:45 AM	0	0	0	0	1	0	0	0	0	0	2	0	3	10
Count Total	0	3	0	0	6	3	1	1	0	0	2	0	16	0
Peak Hour	**0**	**2**	**0**	**0**	**5**	**3**	**1**	**0**	**0**	**0**	**0**	**0**	**11**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

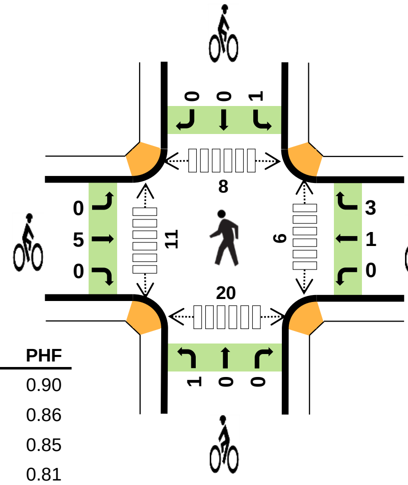
Ardley Ave
MacArthur Blvd

Date: 05-23-2018
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 5:00 PM to 6:00 PM

Peak Hour



	HV %:	PHF
EB	2.9%	0.90
WB	3.6%	0.86
NB	1.2%	0.85
SB	1.7%	0.81
TOTAL	2.6%	0.95



Two-Hour Count Summaries

Interval Start	MacArthur Blvd Eastbound UT	LT	TH	RT	MacArthur Blvd Westbound UT	LT	TH	RT	Ardley Ave Northbound UT	LT	TH	RT	Ardley Ave Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
4:00 PM	0	1	61	6	0	31	31	0	0	11	5	32	0	2	6	1	187	0
4:15 PM	0	0	41	5	0	18	25	1	0	16	4	24	0	2	6	0	142	0
4:30 PM	0	1	71	7	0	31	32	3	0	12	9	39	0	9	3	3	220	0
4:45 PM	0	1	93	8	0	32	29	1	0	15	5	28	0	2	12	3	229	778
5:00 PM	**0**	**0**	**126**	**6**	**0**	**24**	**32**	**6**	**0**	**17**	**6**	**37**	**0**	**2**	**11**	**1**	**268**	859
5:15 PM	**0**	**1**	**127**	**7**	**0**	**26**	**26**	**0**	**0**	**12**	**9**	**33**	**0**	**4**	**13**	**1**	**259**	976
5:30 PM	**1**	**2**	**118**	**5**	**0**	**32**	**31**	**1**	**0**	**20**	**8**	**43**	**0**	**3**	**7**	**3**	**274**	1,030
5:45 PM	**0**	**1**	**87**	**4**	**0**	**25**	**42**	**6**	**0**	**14**	**11**	**32**	**0**	**3**	**10**	**0**	**235**	**1,036**
Count Total	1	7	724	48	0	219	248	18	0	117	57	268	0	27	68	12	1,814	0
Peak Hour All	**1**	**4**	**458**	**22**	**0**	**107**	**131**	**13**	**0**	**63**	**34**	**145**	**0**	**12**	**41**	**5**	**1,036**	**0**
Peak Hour HV	**0**	**0**	**10**	**4**	**0**	**0**	**9**	**0**	**0**	**2**	**0**	**1**	**0**	**0**	**1**	**0**	**27**	**0**
Peak Hour HV%	**0%**	**0%**	**2%**	**18%**	**-**	**0%**	**7%**	**0%**	**-**	**3%**	**0%**	**1%**	**-**	**0%**	**2%**	**0%**	**3%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
4:00 PM	3	2	2	0	*7*	1	0	0	0	*1*	0	3	0	2	*5*
4:15 PM	5	3	1	0	*9*	1	0	0	0	*1*	4	2	8	7	*21*
4:30 PM	3	4	2	0	*9*	0	2	0	0	*2*	2	1	0	3	*6*
4:45 PM	5	1	1	0	*7*	1	0	0	1	*2*	2	4	3	1	*10*
5:00 PM	**3**	**2**	**0**	**0**	***5***	**1**	**0**	**0**	**0**	***1***	**3**	**1**	**1**	**3**	*8*
5:15 PM	**5**	**4**	**2**	**1**	***12***	**0**	**2**	**0**	**0**	***2***	**0**	**0**	**0**	**3**	*3*
5:30 PM	**3**	**1**	**0**	**0**	***4***	**3**	**2**	**1**	**0**	***6***	**3**	**5**	**5**	**10**	*23*
5:45 PM	**3**	**2**	**1**	**0**	***6***	**1**	**0**	**0**	**1**	***2***	**0**	**5**	**2**	**4**	***11***
Count Total	30	19	9	1	*59*	8	6	1	2	*17*	14	21	19	33	*87*
Peak Hour	**14**	**9**	**3**	**1**	***27***	**5**	**4**	**1**	**1**	***11***	**6**	**11**	**8**	**20**	***45***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	MacArthur Blvd Eastbound UT	LT	TH	RT	MacArthur Blvd Westbound UT	LT	TH	RT	Ardley Ave Northbound UT	LT	TH	RT	Ardley Ave Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
4:00 PM	0	0	2	1	0	1	1	0	0	1	0	1	0	0	0	0	7	0
4:15 PM	0	0	4	1	0	0	3	0	0	1	0	0	0	0	0	0	9	0
4:30 PM	0	0	2	1	0	1	3	0	0	2	0	0	0	0	0	0	9	0
4:45 PM	0	0	4	1	0	0	1	0	0	1	0	0	0	0	0	0	7	32
5:00 PM	**0**	**0**	**2**	**1**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	30
5:15 PM	**0**	**0**	**4**	**1**	**0**	**0**	**4**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**1**	**0**	**12**	33
5:30 PM	**0**	**0**	**2**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	28
5:45 PM	**0**	**0**	**2**	**1**	**0**	**0**	**2**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**6**	**27**
Count Total	0	0	22	8	0	2	17	0	0	7	0	2	0	0	1	0	59	0
Peak Hour	**0**	**0**	**10**	**4**	**0**	**0**	**9**	**0**	**0**	**2**	**0**	**1**	**0**	**0**	**1**	**0**	**27**	**0**

Two-Hour Count Summaries - Bikes

Interval Start	MacArthur Blvd Eastbound LT	TH	RT	MacArthur Blvd Westbound LT	TH	RT	Ardley Ave Northbound LT	TH	RT	Ardley Ave Southbound LT	TH	RT	15-min Total	Rolling One Hour
4:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	1	0
4:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	1	0
4:30 PM	0	0	0	0	2	0	0	0	0	0	0	0	2	0
4:45 PM	0	1	0	0	0	0	0	0	0	1	0	0	2	6
5:00 PM	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	6
5:15 PM	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	7
5:30 PM	**0**	**3**	**0**	**0**	**0**	**2**	**1**	**0**	**0**	**0**	**0**	**0**	**6**	11
5:45 PM	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**2**	**11**
Count Total	0	8	0	0	3	3	1	0	0	2	0	0	17	0
Peak Hour	**0**	**5**	**0**	**0**	**1**	**3**	**1**	**0**	**0**	**1**	**0**	**0**	**11**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Location: 23rd Ave between E 28th St / E 29th St
Count Date: 5/23/2018
Site Code: 01

Time	NB	SB	Total
12:00 AM	22	24	46
1:00 AM	15	24	39
2:00 AM	12	10	22
3:00 AM	9	11	20
4:00 AM	19	15	34
5:00 AM	46	22	68
6:00 AM	96	55	151
7:00 AM	258	123	381
8:00 AM	**338**	**233**	**571**
9:00 AM	167	145	312
10:00 AM	134	103	237
11:00 AM	150	104	254
12:00 PM	161	160	321
1:00 PM	229	185	414
2:00 PM	208	170	378
3:00 PM	209	189	398
4:00 PM	207	244	451
5:00 PM	**251**	**247**	**498**
6:00 PM	233	202	435
7:00 PM	161	172	333
8:00 PM	146	130	276
9:00 PM	108	104	212
10:00 PM	87	78	165
11:00 PM	51	59	110
Daily Total	**3,317**	**2,809**	**6,126**
Percent	**54%**	**46%**	
AM Peak Hour (8:00 AM - 9:00 AM)	**338**	**233**	**571**
Percent	**59%**	**41%**	
PM Peak Hour (5:00 PM - 6:00 PM)	**251**	**247**	**498**
Percent	**50%**	**50%**	

Note: Peak Hour Based on hourly time of day bins.

Location: E 27th St between Grande Vista Ave / 25th Ave
Count Date: 5/23/2018
Site Code: 02

Time	EB	WB	Total
12:00 AM	19	15	34
1:00 AM	5	3	8
2:00 AM	6	4	10
3:00 AM	4	7	11
4:00 AM	6	12	18
5:00 AM	19	14	33
6:00 AM	26	30	56
7:00 AM	85	128	213
8:00 AM	**179**	**261**	**440**
9:00 AM	68	102	170
10:00 AM	50	73	123
11:00 AM	59	76	135
12:00 PM	61	80	141
1:00 PM	141	124	265
2:00 PM	97	109	206
3:00 PM	104	126	230
4:00 PM	144	110	254
5:00 PM	**247**	**154**	**401**
6:00 PM	144	117	261
7:00 PM	88	95	183
8:00 PM	56	62	118
9:00 PM	59	48	107
10:00 PM	35	46	81
11:00 PM	26	25	51
Daily Total	**1,728**	**1,821**	**3,549**
Percent	**49%**	**51%**	
AM Peak Hour (8:00 AM - 9:00 AM)	**179**	**261**	**440**
Percent	**41%**	**59%**	
PM Peak Hour (5:00 PM - 6:00 PM)	**247**	**154**	**401**
Percent	**62%**	**38%**	

Note: Peak Hour Based on hourly time of day bins.

Location: 25th Ave between E 27th St / E 28th St
Count Date: 5/23/2018
Site Code: 03

Time	NB	SB	Total
12:00 AM	2	3	5
1:00 AM	1	1	2
2:00 AM	1	1	2
3:00 AM	1	1	2
4:00 AM	2	3	5
5:00 AM	6	1	7
6:00 AM	6	10	16
7:00 AM	24	32	56
8:00 AM	**36**	**49**	**85**
9:00 AM	13	17	30
10:00 AM	18	10	28
11:00 AM	14	22	36
12:00 PM	20	16	36
1:00 PM	47	30	77
2:00 PM	26	26	52
3:00 PM	31	17	48
4:00 PM	36	32	68
5:00 PM	**61**	**46**	**107**
6:00 PM	38	29	67
7:00 PM	28	17	45
8:00 PM	14	17	31
9:00 PM	15	13	28
10:00 PM	10	9	19
11:00 PM	6	6	12
Daily Total	**456**	**408**	**864**
Percent	**53%**	**47%**	
AM Peak Hour (8:00 AM - 9:00 AM)	**36**	**49**	**85**
Percent	**42%**	**58%**	
PM Peak Hour (5:00 PM - 6:00 PM)	**61**	**46**	**107**
Percent	**57%**	**43%**	

Note: Peak Hour Based on hourly time of day bins.

Location:	**Ardley Ave between E 32nd St / bridge over I-580**
Count Date:	**5/23/2018**
Site Code:	**04**

Time	NB	SB	Total
12:00 AM	21	18	39
1:00 AM	11	19	30
2:00 AM	8	5	13
3:00 AM	10	6	16
4:00 AM	19	6	25
5:00 AM	45	13	58
6:00 AM	86	39	125
7:00 AM	268	93	361
8:00 AM	**318**	**218**	**536**
9:00 AM	151	123	274
10:00 AM	131	86	217
11:00 AM	156	93	249
12:00 PM	167	138	305
1:00 PM	211	154	365
2:00 PM	207	127	334
3:00 PM	213	151	364
4:00 PM	211	178	389
5:00 PM	**254**	**180**	**434**
6:00 PM	234	163	397
7:00 PM	152	132	284
8:00 PM	119	98	217
9:00 PM	100	65	165
10:00 PM	71	51	122
11:00 PM	47	23	70
Daily Total	**3,210**	**2,179**	**5,389**
Percent	**60%**	**40%**	
AM Peak Hour (8:00 AM - 9:00 AM)	**318**	**218**	**536**
Percent	**59%**	**41%**	
PM Peak Hour (5:00 PM - 6:00 PM)	**254**	**180**	**434**
Percent	**59%**	**41%**	

Note: Peak Hour Based on hourly time of day bins.

Location: Sheffield Ave N/O Sausal St
Count Date: 5/23/2018
Site Code: 05

Time	NB	SB	Total
12:00 AM	6	4	10
1:00 AM	2	8	10
2:00 AM	2	1	3
3:00 AM	3	3	6
4:00 AM	14	2	16
5:00 AM	11	1	12
6:00 AM	29	12	41
7:00 AM	156	158	314
8:00 AM	**231**	**206**	**437**
9:00 AM	70	42	112
10:00 AM	48	28	76
11:00 AM	40	25	65
12:00 PM	30	29	59
1:00 PM	55	41	96
2:00 PM	63	86	149
3:00 PM	**188**	178	**366**
4:00 PM	126	**203**	329
5:00 PM	175	113	288
6:00 PM	86	80	166
7:00 PM	36	52	88
8:00 PM	77	38	115
9:00 PM	17	32	49
10:00 PM	16	20	36
11:00 PM	13	15	28
Daily Total	**1,494**	**1,377**	**2,871**
Percent	**52%**	**48%**	
AM Peak Hour (8:00 AM - 9:00 AM)	**231**	**206**	**437**
Percent	**53%**	**47%**	
PM Peak Hour (3:00 PM - 4:00 PM)	**188**	**178**	**366**
Percent	**51%**	**49%**	

Note: Peak Hour Based on hourly time of day bins.

Location: Sheffield Ave S/O Morrison Ave
Count Date: 5/23/2018
Site Code: 06

Time	NB	SB	Total
12:00 AM	3	3	6
1:00 AM	0	4	4
2:00 AM	2	1	3
3:00 AM	2	2	4
4:00 AM	13	2	15
5:00 AM	8	1	9
6:00 AM	22	8	30
7:00 AM	43	18	61
8:00 AM	**59**	**37**	**96**
9:00 AM	36	25	61
10:00 AM	29	11	40
11:00 AM	29	19	48
12:00 PM	18	15	33
1:00 PM	37	31	68
2:00 PM	35	32	67
3:00 PM	41	40	81
4:00 PM	56	**89**	**145**
5:00 PM	**67**	65	132
6:00 PM	53	53	106
7:00 PM	30	34	64
8:00 PM	63	25	88
9:00 PM	12	19	31
10:00 PM	14	16	30
11:00 PM	7	10	17
Daily Total	**679**	**560**	**1,239**
Percent	**55%**	**45%**	
AM Peak Hour (8:00 AM - 9:00 AM)	**59**	**37**	**96**
Percent	**61%**	**39%**	
PM Peak Hour (4:00 PM - 5:00 PM)	**56**	**89**	**145**
Percent	**39%**	**61%**	

Note: Peak Hour Based on hourly time of day bins.

Appendix C

Intersection LOS Calculation

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	198	114	185	443	81	207
Future Volume (vph)	198	114	185	443	81	207
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	3.0	
Lane Util. Factor	0.95			1.00	1.00	
Frpb, ped/bikes	0.98			1.00	0.99	
Flpb, ped/bikes	1.00			0.99	1.00	
Frt	0.95			1.00	0.90	
Flt Protected	1.00			0.99	0.99	
Satd. Flow (prot)	3222			1791	1611	
Flt Permitted	1.00			0.78	0.99	
Satd. Flow (perm)	3222			1413	1611	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	220	127	206	492	90	230
RTOR Reduction (vph)	36	0	0	0	179	0
Lane Group Flow (vph)	311	0	0	698	141	0
Confl. Peds. (#/hr)		10	10		6	1
Confl. Bikes (#/hr)		2				
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Turn Type	NA		Perm	NA	Prot	
Protected Phases	2			6	4	
Permitted Phases			6			
Actuated Green, G (s)	48.9			48.9	11.1	
Effective Green, g (s)	48.9			48.9	11.1	
Actuated g/C Ratio	0.72			0.72	0.16	
Clearance Time (s)	5.0			5.0	3.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	2316			1016	262	
v/s Ratio Prot	0.10				c0.09	
v/s Ratio Perm				c0.49		
v/c Ratio	0.13			0.69	0.54	
Uniform Delay, d1	3.0			5.3	26.1	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	0.1			3.8	2.1	
Delay (s)	3.1			9.1	28.2	
Level of Service	A			A	C	
Approach Delay (s)	3.1			9.1	28.2	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	12.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	68.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	75.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	57	3	79	69	124	4	235	56	69	167	6
Future Volume (vph)	9	57	3	79	69	124	4	235	56	69	167	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		1.00			0.98			0.99			1.00	
Flpb, ped/bikes		1.00			0.99			1.00			1.00	
Frt		0.99			0.94			0.97			1.00	
Flt Protected		0.99			0.99			1.00			0.99	
Satd. Flow (prot)		1812			1653			1786			1809	
Flt Permitted		0.96			0.90			1.00			0.85	
Satd. Flow (perm)		1754			1511			1781			1559	
Peak-hour factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Adj. Flow (vph)	11	69	4	95	83	149	5	283	67	83	201	7
RTOR Reduction (vph)	0	2	0	0	55	0	0	15	0	0	2	0
Lane Group Flow (vph)	0	82	0	0	272	0	0	340	0	0	289	0
Confl. Peds. (#/hr)	16		19	19		16	3		5	5		3
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Actuated Green, G (s)		27.0			27.0			22.0			22.0	
Effective Green, g (s)		27.0			27.0			22.0			22.0	
Actuated g/C Ratio		0.49			0.49			0.40			0.40	
Clearance Time (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		861			741			712			623	
v/s Ratio Prot												
v/s Ratio Perm		0.05			c0.18			c0.19			0.19	
v/c Ratio		0.10			0.37			0.48			0.46	
Uniform Delay, d1		7.5			8.7			12.2			12.2	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.2			1.4			2.3			2.5	
Delay (s)		7.7			10.1			14.5			14.6	
Level of Service		A			B			B			B	
Approach Delay (s)		7.7			10.1			14.5			14.6	
Approach LOS		A			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	12.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	62.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Traffic Volume (vph)	25	174	237	22	33	32
Future Volume (vph)	25	174	237	22	33	32
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	30	207	282	26	39	38

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total (vph)	237	308	77
Volume Left (vph)	30	0	39
Volume Right (vph)	0	26	38
Hadj (s)	0.06	-0.02	-0.16
Departure Headway (s)	4.5	4.3	4.9
Degree Utilization, x	0.30	0.37	0.11
Capacity (veh/h)	779	803	656
Control Delay (s)	9.4	9.9	8.5
Approach Delay (s)	9.4	9.9	8.5
Approach LOS	A	A	A

Intersection Summary			
Delay	9.5		
Level of Service	A		
Intersection Capacity Utilization	47.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	185	0	110	25	93	5	175	551	0	0	422	172
Future Volume (vph)	185	0	110	25	93	5	175	551	0	0	422	172
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.5	4.5			4.5	
Lane Util. Factor		1.00			1.00		1.00	1.00			1.00	
Frpb, ped/bikes		0.97			1.00		1.00	1.00			0.98	
Flpb, ped/bikes		0.98			1.00		1.00	1.00			1.00	
Frt		0.95			0.99		1.00	1.00			0.96	
Flt Protected		0.97			0.99		0.95	1.00			1.00	
Satd. Flow (prot)		1615			1804		1752	1845			1731	
Flt Permitted		0.71			0.92		0.95	1.00			1.00	
Satd. Flow (perm)		1180			1670		1752	1845			1731	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	195	0	116	26	98	5	184	580	0	0	444	181
RTOR Reduction (vph)	0	64	0	0	2	0	0	0	0	0	18	0
Lane Group Flow (vph)	0	247	0	0	127	0	184	580	0	0	607	0
Confl. Peds. (#/hr)	23		23	23		23	25		41	41		25
Confl. Bikes (#/hr)									2			13
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA		Perm	NA		Prot	NA			NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8								
Actuated Green, G (s)		18.0			18.0		9.5	53.5			39.5	
Effective Green, g (s)		18.0			18.0		9.5	53.5			39.5	
Actuated g/C Ratio		0.22			0.22		0.12	0.67			0.49	
Clearance Time (s)		4.0			4.0		4.5	4.5			4.5	
Vehicle Extension (s)		2.0			2.0		2.0	2.0			2.0	
Lane Grp Cap (vph)		265			375		208	1233			854	
v/s Ratio Prot							c0.10	0.31			c0.35	
v/s Ratio Perm		c0.21			0.08							
v/c Ratio		0.93			0.34		0.88	0.47			0.71	
Uniform Delay, d1		30.4			26.0		34.7	6.4			15.8	
Progression Factor		1.00			1.00		1.00	1.00			1.00	
Incremental Delay, d2		37.2			0.2		32.1	1.3			5.0	
Delay (s)		67.6			26.2		66.8	7.7			20.8	
Level of Service		E			C		E	A			C	
Approach Delay (s)		67.6			26.2			21.9			20.8	
Approach LOS		E			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	29.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	78.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	208	29	33	478	18	64	169	21	27	292	65
Future Volume (vph)	12	208	29	33	478	18	64	169	21	27	292	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5			4.5			4.5	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		0.99			1.00			0.99			0.99	
Flpb, ped/bikes		1.00			1.00			0.99			1.00	
Frt		0.98			0.99			0.99			0.98	
Flt Protected		1.00			1.00			0.99			1.00	
Satd. Flow (prot)		3440			3492			1795			1787	
Flt Permitted		0.92			0.92			0.84			0.96	
Satd. Flow (perm)		3180			3227			1520			1730	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	14	239	33	38	549	21	74	194	24	31	336	75
RTOR Reduction (vph)	0	19	0	0	5	0	0	6	0	0	15	0
Lane Group Flow (vph)	0	267	0	0	603	0	0	286	0	0	427	0
Confl. Peds. (#/hr)	56		31	31		56	60		40	40		60
Confl. Bikes (#/hr)			3			18						3
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		20.5			20.5			20.5			20.5	
Effective Green, g (s)		20.5			20.5			20.5			20.5	
Actuated g/C Ratio		0.41			0.41			0.41			0.41	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Vehicle Extension (s)		2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)		1303			1323			623			709	
v/s Ratio Prot												
v/s Ratio Perm		0.08			c0.19			0.19			c0.25	
v/c Ratio		0.20			0.46			0.46			0.60	
Uniform Delay, d1		9.5			10.7			10.7			11.6	
Progression Factor		1.00			0.64			0.95			1.00	
Incremental Delay, d2		0.4			0.8			2.4			3.8	
Delay (s)		9.9			7.7			12.6			15.3	
Level of Service		A			A			B			B	
Approach Delay (s)		9.9			7.7			12.6			15.3	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	11.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	76.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	325	46	109	423	40	32	398	89	20	391	62
Future Volume (vph)	100	325	46	109	423	40	32	398	89	20	391	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.5		4.5	5.5			5.5			5.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			1.00	
Frpb, ped/bikes	1.00	0.95		1.00	0.97			0.94			0.95	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			0.99	
Frt	1.00	0.98		1.00	0.99			0.97			0.98	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1752	1713		1752	1766			3172			1709	
Flt Permitted	0.95	1.00		0.95	1.00			0.90			0.97	
Satd. Flow (perm)	1752	1713		1752	1766			2868			1659	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	102	332	47	111	432	41	33	406	91	20	399	63
RTOR Reduction (vph)	0	5	0	0	4	0	0	17	0	0	5	0
Lane Group Flow (vph)	102	374	0	111	469	0	0	513	0	0	477	0
Confl. Peds. (#/hr)	104		134	134		104	114		110	110		114
Confl. Bikes (#/hr)			3			9			1			16
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	3	8		7	4			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	6.0	29.2		6.0	29.2			49.3			49.3	
Effective Green, g (s)	6.0	29.2		6.0	29.2			49.3			49.3	
Actuated g/C Ratio	0.06	0.29		0.06	0.29			0.49			0.49	
Clearance Time (s)	4.5	5.5		4.5	5.5			5.5			5.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	105	500		105	515			1413			817	
v/s Ratio Prot	0.06	0.22		c0.06	c0.27							
v/s Ratio Perm								0.18			c0.29	
v/c Ratio	0.97	0.75		1.06	0.91			0.36			0.58	
Uniform Delay, d1	46.9	32.1		47.0	34.2			15.7			18.0	
Progression Factor	1.02	0.91		1.00	1.00			1.00			1.00	
Incremental Delay, d2	78.0	6.0		104.1	20.4			0.7			3.0	
Delay (s)	125.8	35.3		151.1	54.5			16.4			21.1	
Level of Service	F	D		F	D			B			C	
Approach Delay (s)		54.5			72.9			16.4			21.1	
Approach LOS		D			E			B			C	

Intersection Summary			
HCM 2000 Control Delay	42.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	85.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	587	4	6	899	83	4	1	4	185	1	76
Future Volume (vph)	58	587	4	6	899	83	4	1	4	185	1	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5		4.5			4.5	
Lane Util. Factor	1.00	0.95	1.00		0.95	1.00		1.00			1.00	
Frpb, ped/bikes	1.00	1.00	0.97		1.00	0.96		0.99			0.99	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00		1.00			1.00	
Frt	1.00	1.00	0.85		1.00	0.85		0.94			0.96	
Flt Protected	0.95	1.00	1.00		1.00	1.00		0.98			0.97	
Satd. Flow (prot)	1770	3539	1539		3538	1512		1697			1711	
Flt Permitted	0.95	1.00	1.00		0.95	1.00		0.92			0.78	
Satd. Flow (perm)	1770	3539	1539		3369	1512		1589			1390	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	61	618	4	6	946	87	4	1	4	195	1	80
RTOR Reduction (vph)	0	0	1	0	0	23	0	3	0	0	15	0
Lane Group Flow (vph)	61	618	3	0	952	64	0	6	0	0	261	0
Confl. Peds. (#/hr)	6		8	8		6	6		3	3		6
Confl. Bikes (#/hr)			5			4						
Turn Type	Prot	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6			2			4			4	
Permitted Phases			6	2		2	4			4		
Actuated Green, G (s)	4.4	73.5	73.5		64.6	64.6		17.5			17.5	
Effective Green, g (s)	4.4	73.5	73.5		64.6	64.6		17.5			17.5	
Actuated g/C Ratio	0.04	0.74	0.74		0.65	0.65		0.18			0.18	
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5		4.5			4.5	
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	77	2601	1131		2176	976		278			243	
v/s Ratio Prot	c0.03	0.17										
v/s Ratio Perm			0.00		c0.28	0.04		0.00			c0.19	
v/c Ratio	0.79	0.24	0.00		0.44	0.07		0.02			1.07	
Uniform Delay, d1	47.3	4.3	3.5		8.7	6.5		34.2			41.2	
Progression Factor	1.00	1.00	1.00		1.00	1.00		1.00			0.98	
Incremental Delay, d2	39.0	0.2	0.0		0.6	0.1		0.0			73.9	
Delay (s)	86.3	4.5	3.5		9.4	6.7		34.2			114.2	
Level of Service	F	A	A		A	A		C			F	
Approach Delay (s)		11.8			9.1			34.2			114.2	
Approach LOS		B			A			C			F	

Intersection Summary			
HCM 2000 Control Delay	24.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	74.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	364	48	129	834	97	34	354	33	51	327	81
Future Volume (vph)	66	364	48	129	834	97	34	354	33	51	327	81
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			4.5			4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			1.00	
Frpb, ped/bikes	1.00	0.98		1.00	0.98			0.99			0.98	
Flpb, ped/bikes	0.97	1.00		0.91	1.00			1.00			1.00	
Frt	1.00	0.98		1.00	0.98			0.99			0.98	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1711	3410		1618	3411			3450			1765	
Flt Permitted	0.23	1.00		0.50	1.00			0.88			0.91	
Satd. Flow (perm)	413	3410		844	3411			3053			1610	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	68	375	49	133	860	100	35	365	34	53	337	84
RTOR Reduction (vph)	0	9	0	0	8	0	0	8	0	0	10	0
Lane Group Flow (vph)	68	415	0	133	952	0	0	426	0	0	464	0
Confl. Peds. (#/hr)	116		101	101		116	79		70	70		79
Confl. Bikes (#/hr)			1						2			15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			4	
Permitted Phases	2			6			4			4		
Actuated Green, G (s)	47.8	47.8		47.8	47.8			31.7			31.7	
Effective Green, g (s)	47.8	47.8		47.8	47.8			31.7			31.7	
Actuated g/C Ratio	0.54	0.54		0.54	0.54			0.36			0.36	
Clearance Time (s)	5.0	5.0		5.0	5.0			4.5			4.5	
Vehicle Extension (s)	2.0	2.0		2.0	2.0			2.0			2.0	
Lane Grp Cap (vph)	221	1831		453	1831			1087			573	
v/s Ratio Prot		0.12			c0.28							
v/s Ratio Perm	0.16			0.16				0.14			c0.29	
v/c Ratio	0.31	0.23		0.29	0.52			0.39			0.81	
Uniform Delay, d1	11.4	10.9		11.3	13.2			21.4			25.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	3.6	0.3		1.6	1.1			0.1			7.8	
Delay (s)	15.0	11.1		13.0	14.3			21.5			33.7	
Level of Service	B	B		B	B			C			C	
Approach Delay (s)		11.7			14.1			21.5			33.7	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	18.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	89.0	Sum of lost time (s)	9.5
Intersection Capacity Utilization	91.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	77	60	215	101	508	26	369	144	205	395	26
Future Volume (vph)	0	77	60	215	101	508	26	369	144	205	395	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5		4.5	4.5	4.5		4.0			4.0	
Lane Util. Factor		1.00		1.00	1.00	1.00		0.95			0.95	
Frpb, ped/bikes		0.97		1.00	1.00	1.00		0.98			0.99	
Flpb, ped/bikes		1.00		1.00	1.00	1.00		1.00			1.00	
Frt		0.94		1.00	1.00	0.85		0.96			0.99	
Flt Protected		1.00		0.95	1.00	1.00		1.00			0.98	
Satd. Flow (prot)		1651		1719	1810	1538		3216			3333	
Flt Permitted		1.00		0.95	1.00	1.00		0.90			0.53	
Satd. Flow (perm)		1651		1719	1810	1538		2888			1794	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	81	63	226	106	535	27	388	152	216	416	27
RTOR Reduction (vph)	0	24	0	0	0	22	0	32	0	0	2	0
Lane Group Flow (vph)	0	120	0	226	106	513	0	535	0	0	657	0
Confl. Peds. (#/hr)	31		17	17		31	31		48	48		31
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type		NA		Prot	NA	pt+ov	Perm	NA		Prot	NA	
Protected Phases		2		1	6	6 7		8		7	4	
Permitted Phases	2						8					
Actuated Green, G (s)		20.0		16.5	41.0	81.5		28.0			68.0	
Effective Green, g (s)		20.0		16.5	41.0	81.5		28.0			68.0	
Actuated g/C Ratio		0.17		0.14	0.35	0.69		0.24			0.58	
Clearance Time (s)		4.5		4.5	4.5			4.0			4.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		281		241	631	1066		688			1509	
v/s Ratio Prot		0.07		c0.13	0.06	c0.33					0.13	
v/s Ratio Perm								c0.19			0.12	
v/c Ratio		0.43		0.94	0.17	0.48		0.78			0.44	
Uniform Delay, d1		43.6		50.0	26.5	8.3		41.8			13.9	
Progression Factor		1.00		1.00	1.00	1.00		1.00			1.00	
Incremental Delay, d2		4.7		43.9	0.6	1.6		5.5			0.9	
Delay (s)		48.3		93.8	27.0	9.8		47.4			14.9	
Level of Service		D		F	C	A		D			B	
Approach Delay (s)		48.3			33.8			47.4			14.9	
Approach LOS		D			C			D			B	

Intersection Summary			
HCM 2000 Control Delay	32.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	117.5	Sum of lost time (s)	17.0
Intersection Capacity Utilization	87.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	342	119	66	501	27	136	352	59	42	515	284
Future Volume (vph)	22	342	119	66	501	27	136	352	59	42	515	284
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5			5.5			6.0			6.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frpb, ped/bikes		0.99			1.00			0.99			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.96			0.99			0.98			0.95	
Flt Protected		1.00			0.99			0.99			1.00	
Satd. Flow (prot)		3304			3423			3350			3256	
Flt Permitted		0.86			0.71			0.57			0.89	
Satd. Flow (perm)		2840			2451			1949			2902	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	23	360	125	69	527	28	143	371	62	44	542	299
RTOR Reduction (vph)	0	39	0	0	4	0	0	5	0	0	33	0
Lane Group Flow (vph)	0	469	0	0	620	0	0	571	0	0	852	0
Confl. Peds. (#/hr)	2		13	13		2	8		25	25		8
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		33.2			33.2			75.3			75.3	
Effective Green, g (s)		33.2			33.2			75.3			75.3	
Actuated g/C Ratio		0.28			0.28			0.63			0.63	
Clearance Time (s)		5.5			5.5			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)		785			678			1222			1821	
v/s Ratio Prot												
v/s Ratio Perm		0.17			c0.25			0.29			c0.29	
v/c Ratio		0.60			0.91			0.47			0.47	
Uniform Delay, d1		37.6			42.0			11.8			11.8	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.8			16.6			1.3			0.9	
Delay (s)		38.4			58.6			13.1			12.7	
Level of Service		D			E			B			B	
Approach Delay (s)		38.4			58.6			13.1			12.7	
Approach LOS		D			E			B			B	

Intersection Summary			
HCM 2000 Control Delay	28.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.5
Intersection Capacity Utilization	91.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	154	153	97	35	206	81	91	702	84	31	446	370
Future Volume (vph)	154	153	97	35	206	81	91	702	84	31	446	370
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.96			1.00	0.95	1.00	1.00	0.86	1.00	1.00	0.94
Flpb, ped/bikes	1.00	1.00			0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.94			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00			0.99	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1691			3485	1512	1770	3539	1361	1770	3539	1483
Flt Permitted	0.95	1.00			0.87	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1691			3044	1512	1770	3539	1361	1770	3539	1483
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	173	172	109	39	231	91	102	789	94	35	501	416
RTOR Reduction (vph)	0	19	0	0	0	66	0	0	50	0	0	275
Lane Group Flow (vph)	173	262	0	0	270	25	102	789	44	35	501	141
Confl. Peds. (#/hr)	26		72	72		26	22		32	32		22
Confl. Bikes (#/hr)						1			4			5
Turn Type	Prot	NA		Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	8			4		5	2		1	6	
Permitted Phases				4		4			2			6
Actuated Green, G (s)	23.2	57.2			30.0	30.0	13.9	49.0	49.0	7.8	42.9	42.9
Effective Green, g (s)	23.2	57.2			30.0	30.0	13.9	49.0	49.0	7.8	42.9	42.9
Actuated g/C Ratio	0.18	0.45			0.24	0.24	0.11	0.39	0.39	0.06	0.34	0.34
Clearance Time (s)	4.0	4.0			4.0	4.0	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	2.0	2.0			2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	323	761			719	357	193	1365	525	108	1195	500
v/s Ratio Prot	c0.10	0.16					c0.06	c0.22		0.02	0.14	
v/s Ratio Perm					c0.09	0.02			0.03			0.09
v/c Ratio	0.54	0.34			0.38	0.07	0.53	0.58	0.08	0.32	0.42	0.28
Uniform Delay, d1	47.0	22.7			40.6	37.7	53.5	30.8	24.7	57.1	32.4	30.8
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.2	1.2			0.1	0.0	1.2	1.8	0.3	0.6	1.1	1.4
Delay (s)	53.3	23.9			40.8	37.7	54.7	32.6	25.1	57.7	33.5	32.2
Level of Service	D	C			D	D	D	C	C	E	C	C
Approach Delay (s)		35.1			40.0			34.2			33.8	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	35.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	127.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	91.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	64	3	58	184	10	217	513	99	7	396	275
Future Volume (vph)	24	64	3	58	184	10	217	513	99	7	396	275
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00			1.00		1.00	0.98		1.00	0.98	
Flpb, ped/bikes		0.99			1.00		0.99	1.00		0.97	1.00	
Frt		1.00			0.99		1.00	0.98		1.00	0.94	
Flt Protected		0.99			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1786			1792		1722	1748		1692	1679	
Flt Permitted		0.81			0.91		0.31	1.00		0.35	1.00	
Satd. Flow (perm)		1458			1655		567	1748		619	1679	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	26	69	3	62	198	11	233	552	106	8	426	296
RTOR Reduction (vph)	0	2	0	0	2	0	0	7	0	0	25	0
Lane Group Flow (vph)	0	96	0	0	269	0	233	651	0	8	697	0
Confl. Peds. (#/hr)	30					30	20		36	36		20
Confl. Bikes (#/hr)						1			31			7
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			2			6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)		17.8			17.8		65.7	65.7		65.7	65.7	
Effective Green, g (s)		17.8			17.8		65.7	65.7		65.7	65.7	
Actuated g/C Ratio		0.19			0.19		0.71	0.71		0.71	0.71	
Clearance Time (s)		4.0			4.0		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		2.0			2.0		4.0	4.0		3.0	3.0	
Lane Grp Cap (vph)		282			320		404	1248		442	1199	
v/s Ratio Prot								0.37			c0.41	
v/s Ratio Perm		0.07			c0.16		0.41			0.01		
v/c Ratio		0.34			0.84		0.58	0.52		0.02	0.58	
Uniform Delay, d1		32.0			35.7		6.4	6.0		3.8	6.4	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.3			17.2		5.9	1.6		0.1	2.1	
Delay (s)		32.3			52.9		12.3	7.6		3.9	8.5	
Level of Service		C			D		B	A		A	A	
Approach Delay (s)		32.3			52.9			8.8			8.4	
Approach LOS		C			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	92.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	78.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	43	147	2	44	68	157	130	14	126	357	23
Future Volume (vph)	11	43	147	2	44	68	157	130	14	126	357	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0	3.0		4.5			4.5	
Lane Util. Factor		1.00	1.00		0.95	1.00		0.95			0.95	
Frpb, ped/bikes		1.00	0.98		1.00	0.98		1.00			1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00			1.00	
Frt		1.00	0.85		1.00	0.85		0.99			0.99	
Flt Protected		0.99	1.00		1.00	1.00		0.97			0.99	
Satd. Flow (prot)		1741	1468		3336	1462		3230			3276	
Flt Permitted		0.96	1.00		0.95	1.00		0.62			0.78	
Satd. Flow (perm)		1694	1468		3179	1462		2049			2588	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	47	160	2	48	74	171	141	15	137	388	25
RTOR Reduction (vph)	0	0	111	0	0	51	0	6	0	0	6	0
Lane Group Flow (vph)	0	59	49	0	50	23	0	321	0	0	544	0
Confl. Peds. (#/hr)	2		3	3		2	1		2	2		1
Confl. Bikes (#/hr)			4			11			14			
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)		18.5	18.5		18.5	18.5		34.0			34.0	
Effective Green, g (s)		18.5	18.5		18.5	18.5		34.0			34.0	
Actuated g/C Ratio		0.31	0.31		0.31	0.31		0.57			0.57	
Clearance Time (s)		3.0	3.0		3.0	3.0		4.5			4.5	
Lane Grp Cap (vph)		522	452		980	450		1161			1466	
v/s Ratio Prot												
v/s Ratio Perm		c0.03	0.03		0.02	0.02		0.16			c0.21	
v/c Ratio		0.11	0.11		0.05	0.05		0.28			0.37	
Uniform Delay, d1		14.9	14.9		14.6	14.6		6.7			7.1	
Progression Factor		1.00	1.00		1.00	1.00		1.00			1.00	
Incremental Delay, d2		0.4	0.5		0.1	0.2		0.6			0.7	
Delay (s)		15.3	15.3		14.7	14.8		7.3			7.9	
Level of Service		B	B		B	B		A			A	
Approach Delay (s)		15.3			14.7			7.3			7.9	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	9.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	77.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	170	285	358	0	0	0	0	512	152	91	160	0
Future Volume (vph)	170	285	358	0	0	0	0	512	152	91	160	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5						5.5			5.5	
Lane Util. Factor		0.95						0.95			0.95	
Frpb, ped/bikes		1.00						0.99			1.00	
Flpb, ped/bikes		1.00						1.00			1.00	
Frt		0.93						0.97			1.00	
Flt Protected		0.99						1.00			0.98	
Satd. Flow (prot)		3270						3381			3471	
Flt Permitted		0.99						1.00			0.59	
Satd. Flow (perm)		3270						3381			2074	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	185	310	389	0	0	0	0	557	165	99	174	0
RTOR Reduction (vph)	0	202	0	0	0	0	0	40	0	0	0	0
Lane Group Flow (vph)	0	682	0	0	0	0	0	682	0	0	273	0
Confl. Peds. (#/hr)	1					1	10		22	22		10
Confl. Bikes (#/hr)									1			10
Turn Type	Perm	NA						NA		Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4											
Actuated Green, G (s)		26.5						20.5			32.5	
Effective Green, g (s)		26.5						20.5			32.5	
Actuated g/C Ratio		0.38						0.29			0.46	
Clearance Time (s)		5.5						5.5			5.5	
Lane Grp Cap (vph)		1237						990			1132	
v/s Ratio Prot								c0.20			c0.03	
v/s Ratio Perm		0.21									0.08	
v/c Ratio		0.55						0.69			0.24	
Uniform Delay, d1		17.1						21.9			11.3	
Progression Factor		1.00						1.00			1.00	
Incremental Delay, d2		1.8						3.9			0.5	
Delay (s)		18.9						25.9			11.8	
Level of Service		B						C			B	
Approach Delay (s)		18.9			0.0			25.9			11.8	
Approach LOS		B			A			C			B	

Intersection Summary			
HCM 2000 Control Delay	20.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	80.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	NWL2	NWL	NWR
Lane Configurations										
Traffic Volume (vph)	92	330	21	250	183	284	29	418	289	82
Future Volume (vph)	92	330	21	250	183	284	29	418	289	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5		5.5	5.5	5.5		4.5	4.5	
Lane Util. Factor		0.95		1.00	0.95	0.95		0.97	1.00	
Frpb, ped/bikes		1.00		1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00		0.99	1.00	1.00		1.00	1.00	
Frt		0.99		1.00	1.00	0.99		1.00	0.97	
Flt Protected		0.99		0.95	1.00	1.00		0.95	0.96	
Satd. Flow (prot)		3474		1754	3539	3482		3433	1727	
Flt Permitted		0.99		0.55	1.00	1.00		0.95	0.96	
Satd. Flow (perm)		3474		1015	3539	3482		3433	1727	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	99	355	23	269	197	305	31	449	311	88
RTOR Reduction (vph)	0	5	0	0	0	11	0	0	0	0
Lane Group Flow (vph)	0	472	0	269	197	325	0	449	399	0
Confl. Peds. (#/hr)			4	13			13		13	4
Confl. Bikes (#/hr)			3							
Turn Type	Perm	NA		Perm	NA	NA		Perm	Prot	
Protected Phases		3			2	2			4	
Permitted Phases	3			2				4		
Actuated Green, G (s)		18.5		20.0	20.0	20.0		17.0	17.0	
Effective Green, g (s)		18.5		20.0	20.0	20.0		17.0	17.0	
Actuated g/C Ratio		0.26		0.29	0.29	0.29		0.24	0.24	
Clearance Time (s)		4.5		5.5	5.5	5.5		4.5	4.5	
Lane Grp Cap (vph)		918		290	1011	994		833	419	
v/s Ratio Prot					0.06	0.09			c0.23	
v/s Ratio Perm		0.14		c0.27				0.13		
v/c Ratio		0.51		0.93	0.19	0.33		0.54	0.95	
Uniform Delay, d1		21.9		24.3	18.9	19.7		23.1	26.1	
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.1		37.2	0.4	0.9		2.5	33.5	
Delay (s)		24.0		61.4	19.3	20.6		25.6	59.6	
Level of Service		C		E	B	C		C	E	
Approach Delay (s)		24.0			43.6	20.6			41.6	
Approach LOS		C			D	C			D	

Intersection Summary			
HCM 2000 Control Delay	34.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	83.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	114	15	116	373	17	115	106	143	30	70	10
Future Volume (vph)	2	114	15	116	373	17	115	106	143	30	70	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0	3.0		3.0			3.0	
Lane Util. Factor		1.00	1.00		1.00	1.00		1.00			1.00	
Frpb, ped/bikes		1.00	0.97		1.00	0.97		0.99			1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00			1.00	
Frt		1.00	0.85		1.00	0.85		0.95			0.99	
Flt Protected		1.00	1.00		0.99	1.00		0.98			0.99	
Satd. Flow (prot)		1808	1496		1786	1485		1663			1756	
Flt Permitted		1.00	1.00		0.90	1.00		0.87			0.88	
Satd. Flow (perm)		1802	1496		1634	1485		1472			1568	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	2	120	16	122	393	18	121	112	151	32	74	11
RTOR Reduction (vph)	0	0	8	0	0	9	0	47	0	0	7	0
Lane Group Flow (vph)	0	122	8	0	515	9	0	337	0	0	110	0
Confl. Peds. (#/hr)	12		6	6		12	7		6	6		7
Confl. Bikes (#/hr)			2			5			1			
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		1			1			2			2	
Permitted Phases	1		1	1		1	2			2		
Actuated Green, G (s)		26.0	26.0		26.0	26.0		18.0			18.0	
Effective Green, g (s)		26.0	26.0		26.0	26.0		18.0			18.0	
Actuated g/C Ratio		0.52	0.52		0.52	0.52		0.36			0.36	
Clearance Time (s)		3.0	3.0		3.0	3.0		3.0			3.0	
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)		937	777		849	772		529			564	
v/s Ratio Prot												
v/s Ratio Perm		0.07	0.01		c0.32	0.01		c0.23			0.07	
v/c Ratio		0.13	0.01		0.61	0.01		0.64			0.19	
Uniform Delay, d1		6.2	5.8		8.4	5.8		13.3			11.0	
Progression Factor		1.00	1.00		1.00	1.00		1.00			1.00	
Incremental Delay, d2		0.1	0.0		1.2	0.0		5.8			0.8	
Delay (s)		6.2	5.8		9.6	5.8		19.1			11.8	
Level of Service		A	A		A	A		B			B	
Approach Delay (s)		6.2			9.5			19.1			11.8	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	12.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	74.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	576	57	57	220	49	132
Future Volume (vph)	576	57	57	220	49	132
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	3.0	
Lane Util. Factor	0.95			1.00	1.00	
Frpb, ped/bikes	1.00			1.00	0.97	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	0.99			1.00	0.90	
Flt Protected	1.00			0.99	0.99	
Satd. Flow (prot)	3476			1841	1614	
Flt Permitted	1.00			0.81	0.99	
Satd. Flow (perm)	3476			1500	1614	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	619	61	61	237	53	142
RTOR Reduction (vph)	5	0	0	0	124	0
Lane Group Flow (vph)	675	0	0	298	71	0
Confl. Peds. (#/hr)		10	8		19	19
Confl. Bikes (#/hr)		7				
Turn Type	NA		Perm	NA	Prot	
Protected Phases	2			6	4	
Permitted Phases			6			
Actuated Green, G (s)	51.4			51.4	8.6	
Effective Green, g (s)	51.4			51.4	8.6	
Actuated g/C Ratio	0.76			0.76	0.13	
Clearance Time (s)	5.0			5.0	3.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	2627			1133	204	
v/s Ratio Prot	0.19				c0.04	
v/s Ratio Perm				c0.20		
v/c Ratio	0.26			0.26	0.35	
Uniform Delay, d1	2.5			2.5	27.1	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	0.2			0.6	1.0	
Delay (s)	2.8			3.1	28.2	
Level of Service	A			A	C	
Approach Delay (s)	2.8			3.1	28.2	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	7.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	68.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	57.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	54	6	45	22	38	6	210	91	89	161	17
Future Volume (vph)	11	54	6	45	22	38	6	210	91	89	161	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		1.00			0.98			0.99			1.00	
Flpb, ped/bikes		1.00			0.99			1.00			1.00	
Frt		0.99			0.95			0.96			0.99	
Flt Protected		0.99			0.98			1.00			0.98	
Satd. Flow (prot)		1813			1682			1762			1805	
Flt Permitted		0.97			0.89			1.00			0.83	
Satd. Flow (perm)		1774			1532			1755			1522	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	12	57	6	48	23	40	6	223	97	95	171	18
RTOR Reduction (vph)	0	3	0	0	20	0	0	28	0	0	4	0
Lane Group Flow (vph)	0	72	0	0	91	0	0	298	0	0	280	0
Confl. Peds. (#/hr)	15		19	19		15	9		11	11		9
Confl. Bikes (#/hr)			1			1						
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Actuated Green, G (s)		27.0			27.0			22.0			22.0	
Effective Green, g (s)		27.0			27.0			22.0			22.0	
Actuated g/C Ratio		0.49			0.49			0.40			0.40	
Clearance Time (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		870			752			702			608	
v/s Ratio Prot												
v/s Ratio Perm		0.04			c0.06			0.17			c0.18	
v/c Ratio		0.08			0.12			0.43			0.46	
Uniform Delay, d1		7.4			7.6			11.9			12.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.2			0.3			1.9			2.5	
Delay (s)		7.6			7.9			13.8			14.6	
Level of Service		A			A			B			B	
Approach Delay (s)		7.6			7.9			13.8			14.6	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	54.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Traffic Volume (vph)	37	212	128	38	18	29
Future Volume (vph)	37	212	128	38	18	29
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	39	226	136	40	19	31

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total (vph)	265	176	50
Volume Left (vph)	39	0	19
Volume Right (vph)	0	40	31
Hadj (s)	0.05	-0.12	-0.28
Departure Headway (s)	4.2	4.2	4.6
Degree Utilization, x	0.31	0.20	0.06
Capacity (veh/h)	832	834	717
Control Delay (s)	9.2	8.2	7.9
Approach Delay (s)	9.2	8.2	7.9
Approach LOS	A	A	A

Intersection Summary			
Delay	8.7		
Level of Service	A		
Intersection Capacity Utilization	48.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	166	0	81	21	39	4	79	577	0	0	493	137
Future Volume (vph)	166	0	81	21	39	4	79	577	0	0	493	137
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.5	4.5			4.5	
Lane Util. Factor		1.00			1.00		1.00	1.00			1.00	
Frpb, ped/bikes		0.97			1.00		1.00	1.00			0.98	
Flpb, ped/bikes		0.98			0.99		1.00	1.00			1.00	
Frt		0.96			0.99		1.00	1.00			0.97	
Flt Protected		0.97			0.98		0.95	1.00			1.00	
Satd. Flow (prot)		1648			1794		1770	1863			1780	
Flt Permitted		0.80			0.89		0.95	1.00			1.00	
Satd. Flow (perm)		1364			1625		1770	1863			1780	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	175	0	85	22	41	4	83	607	0	0	519	144
RTOR Reduction (vph)	0	67	0	0	3	0	0	0	0	0	10	0
Lane Group Flow (vph)	0	193	0	0	64	0	83	607	0	0	653	0
Confl. Peds. (#/hr)	12		30	30		12	24		63	63		24
Confl. Bikes (#/hr)									11			3
Turn Type	Perm	NA		Perm	NA		Prot	NA			NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8								
Actuated Green, G (s)		14.6			14.6		6.8	56.9			45.6	
Effective Green, g (s)		14.6			14.6		6.8	56.9			45.6	
Actuated g/C Ratio		0.18			0.18		0.08	0.71			0.57	
Clearance Time (s)		4.0			4.0		4.5	4.5			4.5	
Vehicle Extension (s)		2.0			2.0		2.0	2.0			2.0	
Lane Grp Cap (vph)		248			296		150	1325			1014	
v/s Ratio Prot							0.05	c0.33			c0.37	
v/s Ratio Perm		c0.14			0.04							
v/c Ratio		0.78			0.22		0.55	0.46			0.64	
Uniform Delay, d1		31.2			27.8		35.1	4.9			11.7	
Progression Factor		1.00			1.00		1.00	1.00			1.00	
Incremental Delay, d2		13.1			0.1		2.5	1.1			3.1	
Delay (s)		44.2			28.0		37.6	6.1			14.8	
Level of Service		D			C		D	A			B	
Approach Delay (s)		44.2			28.0			9.9			14.8	
Approach LOS		D			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	17.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	71.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	376	37	30	203	26	18	276	49	37	184	20
Future Volume (vph)	38	376	37	30	203	26	18	276	49	37	184	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5			4.5			4.5	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		0.99			1.00			0.99			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.99			0.98			0.98			0.99	
Flt Protected		1.00			0.99			1.00			0.99	
Satd. Flow (prot)		3463			3447			1805			1816	
Flt Permitted		0.91			0.88			0.98			0.91	
Satd. Flow (perm)		3169			3051			1771			1668	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	40	400	39	32	216	28	19	294	52	39	196	21
RTOR Reduction (vph)	0	13	0	0	17	0	0	12	0	0	6	0
Lane Group Flow (vph)	0	466	0	0	259	0	0	353	0	0	250	0
Confl. Peds. (#/hr)	5		27	27		5	37		23	23		37
Confl. Bikes (#/hr)			10			6			2			2
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		20.5			20.5			20.5			20.5	
Effective Green, g (s)		20.5			20.5			20.5			20.5	
Actuated g/C Ratio		0.41			0.41			0.41			0.41	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Vehicle Extension (s)		2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)		1299			1250			726			683	
v/s Ratio Prot												
v/s Ratio Perm		c0.15			0.09			c0.20			0.15	
v/c Ratio		0.36			0.21			0.49			0.37	
Uniform Delay, d1		10.2			9.5			10.9			10.2	
Progression Factor		1.00			1.00			1.26			1.00	
Incremental Delay, d2		0.8			0.4			2.0			1.5	
Delay (s)		11.0			9.9			15.7			11.7	
Level of Service		B			A			B			B	
Approach Delay (s)		11.0			9.9			15.7			11.7	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	12.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	69.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	77	328	32	97	283	52	9	505	132	12	327	51
Future Volume (vph)	77	328	32	97	283	52	9	505	132	12	327	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.5		4.5	5.5			5.5			5.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			1.00	
Frpb, ped/bikes	1.00	0.96		1.00	0.95			0.91			0.96	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.98			0.97			0.98	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1770	1765		1770	1722			3111			1738	
Flt Permitted	0.95	1.00		0.95	1.00			0.95			0.97	
Satd. Flow (perm)	1770	1765		1770	1722			2952			1696	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	82	349	34	103	301	55	10	537	140	13	348	54
RTOR Reduction (vph)	0	4	0	0	8	0	0	23	0	0	5	0
Lane Group Flow (vph)	82	379	0	103	348	0	0	664	0	0	410	0
Confl. Peds. (#/hr)	118		151	151		118	117		153	153		117
Confl. Bikes (#/hr)			10			2			10			1
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	3	8		7	4			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	5.6	24.6		7.0	26.0			42.9			42.9	
Effective Green, g (s)	5.6	24.6		7.0	26.0			42.9			42.9	
Actuated g/C Ratio	0.06	0.27		0.08	0.29			0.48			0.48	
Clearance Time (s)	4.5	5.5		4.5	5.5			5.5			5.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	110	482		137	497			1407			808	
v/s Ratio Prot	0.05	c0.21		c0.06	0.20							
v/s Ratio Perm								0.22			c0.24	
v/c Ratio	0.75	0.79		0.75	0.70			0.47			0.51	
Uniform Delay, d1	41.5	30.3		40.6	28.5			15.9			16.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	23.7	8.2		20.5	4.4			1.1			2.3	
Delay (s)	65.2	38.5		61.2	33.0			17.0			18.5	
Level of Service	E	D		E	C			B			B	
Approach Delay (s)		43.2			39.3			17.0			18.5	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	28.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	69.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	178	1247	2	1	474	106	3	1	2	136	0	51
Future Volume (vph)	178	1247	2	1	474	106	3	1	2	136	0	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5		4.5			4.5	
Lane Util. Factor	1.00	0.95	1.00		0.95	1.00		1.00			1.00	
Frpb, ped/bikes	1.00	1.00	0.97		1.00	0.96		0.99			0.99	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00		1.00			0.99	
Frt	1.00	1.00	0.85		1.00	0.85		0.95			0.96	
Flt Protected	0.95	1.00	1.00		1.00	1.00		0.98			0.96	
Satd. Flow (prot)	1770	3539	1538		3539	1527		1715			1701	
Flt Permitted	0.95	1.00	1.00		0.95	1.00		0.91			0.78	
Satd. Flow (perm)	1770	3539	1538		3376	1527		1605			1379	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	187	1313	2	1	499	112	3	1	2	143	0	54
RTOR Reduction (vph)	0	0	0	0	0	43	0	2	0	0	56	0
Lane Group Flow (vph)	187	1313	2	0	500	69	0	4	0	0	141	0
Confl. Peds. (#/hr)	3		10	10		3	7		8	8		7
Confl. Bikes (#/hr)			5			7						1
Turn Type	Prot	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6			2			4			4	
Permitted Phases			6	2		2	4			4		
Actuated Green, G (s)	11.5	77.5	77.5		61.5	61.5		13.5			13.5	
Effective Green, g (s)	11.5	77.5	77.5		61.5	61.5		13.5			13.5	
Actuated g/C Ratio	0.12	0.78	0.78		0.62	0.62		0.14			0.14	
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5		4.5			4.5	
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	203	2742	1191		2076	939		216			186	
v/s Ratio Prot	c0.11	c0.37										
v/s Ratio Perm			0.00		0.15	0.05		0.00			c0.10	
v/c Ratio	0.92	0.48	0.00		0.24	0.07		0.02			0.76	
Uniform Delay, d1	43.8	4.0	2.5		8.7	7.8		37.5			41.7	
Progression Factor	1.00	1.00	1.00		1.00	1.00		1.00			0.95	
Incremental Delay, d2	41.1	0.6	0.0		0.3	0.2		0.0			13.8	
Delay (s)	84.9	4.6	2.5		9.0	7.9		37.5			53.2	
Level of Service	F	A	A		A	A		D			D	
Approach Delay (s)		14.6			8.8			37.5			53.2	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	16.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	74.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	138	701	84	91	437	118	8	467	95	21	285	72
Future Volume (vph)	138	701	84	91	437	118	8	467	95	21	285	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			4.5			4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			1.00	
Frpb, ped/bikes	1.00	0.98		1.00	0.96			0.98			0.98	
Flpb, ped/bikes	0.92	1.00		0.94	1.00			1.00			1.00	
Frt	1.00	0.98		1.00	0.97			0.98			0.97	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1627	3398		1671	3274			3366			1766	
Flt Permitted	0.41	1.00		0.29	1.00			0.95			0.95	
Satd. Flow (perm)	697	3398		516	3274			3194			1683	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	147	746	89	97	465	126	9	497	101	22	303	77
RTOR Reduction (vph)	0	8	0	0	22	0	0	22	0	0	11	0
Lane Group Flow (vph)	147	827	0	97	569	0	0	585	0	0	391	0
Confl. Peds. (#/hr)	120		141	141		120	85		107	107		85
Confl. Bikes (#/hr)			1						11			6
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			4	
Permitted Phases	2			6			4			4		
Actuated Green, G (s)	52.3	52.3		52.3	52.3			27.2			27.2	
Effective Green, g (s)	52.3	52.3		52.3	52.3			27.2			27.2	
Actuated g/C Ratio	0.59	0.59		0.59	0.59			0.31			0.31	
Clearance Time (s)	5.0	5.0		5.0	5.0			4.5			4.5	
Vehicle Extension (s)	2.0	2.0		2.0	2.0			2.0			2.0	
Lane Grp Cap (vph)	409	1996		303	1923			976			514	
v/s Ratio Prot		c0.24			0.17							
v/s Ratio Perm	0.21			0.19				0.18			c0.23	
v/c Ratio	0.36	0.41		0.32	0.30			0.60			0.76	
Uniform Delay, d1	9.6	10.0		9.3	9.2			26.3			28.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	2.4	0.6		2.8	0.4			0.7			5.9	
Delay (s)	12.0	10.6		12.1	9.6			26.9			33.9	
Level of Service	B	B		B	A			C			C	
Approach Delay (s)		10.8			9.9			26.9			33.9	
Approach LOS		B			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	17.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	89.0	Sum of lost time (s)	9.5
Intersection Capacity Utilization	78.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	159	111	202	14	329	2	413	161	351	440	6
Future Volume (vph)	0	159	111	202	14	329	2	413	161	351	440	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5		4.5	4.5	4.5		4.0			4.0	
Lane Util. Factor		1.00		1.00	1.00	1.00		0.95			0.95	
Frpb, ped/bikes		0.98		1.00	1.00	1.00		0.98			1.00	
Flpb, ped/bikes		1.00		1.00	1.00	1.00		1.00			1.00	
Frt		0.94		1.00	1.00	0.85		0.96			1.00	
Flt Protected		1.00		0.95	1.00	1.00		1.00			0.98	
Satd. Flow (prot)		1705		1752	1845	1568		3276			3406	
Flt Permitted		1.00		0.95	1.00	1.00		0.95			0.55	
Satd. Flow (perm)		1705		1752	1845	1568		3123			1909	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	167	117	213	15	346	2	435	169	369	463	6
RTOR Reduction (vph)	0	22	0	0	0	17	0	34	0	0	0	0
Lane Group Flow (vph)	0	262	0	213	15	329	0	572	0	0	838	0
Confl. Peds. (#/hr)	37		11	11		37	54		49	49		54
Confl. Bikes (#/hr)						19			8			7
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type		NA		Prot	NA	pt+ov	Perm	NA		Prot	NA	
Protected Phases		2		1	6	6 7		8		7	4	
Permitted Phases	2						8					
Actuated Green, G (s)		20.0		16.5	41.0	81.5		28.0			68.0	
Effective Green, g (s)		20.0		16.5	41.0	81.5		28.0			68.0	
Actuated g/C Ratio		0.17		0.14	0.35	0.69		0.24			0.58	
Clearance Time (s)		4.5		4.5	4.5			4.0			4.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		290		246	643	1087		744			1563	
v/s Ratio Prot		c0.15		c0.12	0.01	0.21					c0.16	
v/s Ratio Perm								c0.18			0.15	
v/c Ratio		0.90		0.87	0.02	0.30		0.77			0.54	
Uniform Delay, d1		47.8		49.4	25.1	7.0		41.7			15.1	
Progression Factor		1.00		1.00	1.00	1.00		1.00			1.00	
Incremental Delay, d2		33.2		31.2	0.1	0.7		4.8			1.3	
Delay (s)		81.1		80.6	25.2	7.7		46.5			16.4	
Level of Service		F		F	C	A		D			B	
Approach Delay (s)		81.1			35.2			46.5			16.4	
Approach LOS		F			D			D			B	

Intersection Summary			
HCM 2000 Control Delay	37.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	117.5	Sum of lost time (s)	17.0
Intersection Capacity Utilization	91.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	528	98	43	417	56	114	530	115	51	398	84
Future Volume (vph)	28	528	98	43	417	56	114	530	115	51	398	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5			5.5			6.0			6.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frpb, ped/bikes		1.00			1.00			0.99			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.98			0.98			0.98			0.98	
Flt Protected		1.00			1.00			0.99			1.00	
Satd. Flow (prot)		3438			3459			3393			3418	
Flt Permitted		0.86			0.68			0.74			0.79	
Satd. Flow (perm)		2978			2376			2534			2730	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	556	103	45	439	59	120	558	121	54	419	88
RTOR Reduction (vph)	0	16	0	0	11	0	0	8	0	0	8	0
Lane Group Flow (vph)	0	672	0	0	532	0	0	791	0	0	553	0
Confl. Peds. (#/hr)	3		8	8		3	11		31	31		11
Confl. Bikes (#/hr)									1			
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		32.2			32.2			76.3			76.3	
Effective Green, g (s)		32.2			32.2			76.3			76.3	
Actuated g/C Ratio		0.27			0.27			0.64			0.64	
Clearance Time (s)		5.5			5.5			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)		799			637			1611			1735	
v/s Ratio Prot												
v/s Ratio Perm		c0.23			0.22			c0.31			0.20	
v/c Ratio		0.84			0.84			0.49			0.32	
Uniform Delay, d1		41.5			41.4			11.6			10.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		7.7			8.9			1.1			0.5	
Delay (s)		49.1			50.3			12.6			10.5	
Level of Service		D			D			B			B	
Approach Delay (s)		49.1			50.3			12.6			10.5	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	29.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.5
Intersection Capacity Utilization	93.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	141	186	123	29	208	45	74	319	67	55	811	433
Future Volume (vph)	141	186	123	29	208	45	74	319	67	55	811	433
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99			1.00	0.97	1.00	1.00	0.89	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.94			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00			0.99	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1728			3512	1543	1770	3539	1408	1770	3539	1540
Flt Permitted	0.95	1.00			0.88	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1728			3111	1543	1770	3539	1408	1770	3539	1540
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	147	194	128	30	217	47	77	332	70	57	845	451
RTOR Reduction (vph)	0	19	0	0	0	36	0	0	45	0	0	266
Lane Group Flow (vph)	147	303	0	0	247	11	77	332	25	57	845	185
Confl. Peds. (#/hr)	10		20	20		10	6		22	22		6
Confl. Bikes (#/hr)						1			11			4
Turn Type	Prot	NA		Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	8			4		5	2		1	6	
Permitted Phases				4		4			2			6
Actuated Green, G (s)	24.1	58.1			30.0	30.0	10.6	45.5	45.5	10.4	45.3	45.3
Effective Green, g (s)	24.1	58.1			30.0	30.0	10.6	45.5	45.5	10.4	45.3	45.3
Actuated g/C Ratio	0.19	0.46			0.24	0.24	0.08	0.36	0.36	0.08	0.36	0.36
Clearance Time (s)	4.0	4.0			4.0	4.0	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	2.0	2.0			2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	335	790			734	364	147	1267	504	144	1262	549
v/s Ratio Prot	c0.08	c0.18					c0.04	0.09		0.03	c0.24	
v/s Ratio Perm					0.08	0.01			0.02			0.12
v/c Ratio	0.44	0.38			0.34	0.03	0.52	0.26	0.05	0.40	0.67	0.34
Uniform Delay, d1	45.5	22.7			40.2	37.3	55.8	28.9	26.6	55.3	34.5	29.9
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.1	1.4			0.1	0.0	1.6	0.5	0.2	0.7	2.8	1.7
Delay (s)	49.6	24.1			40.3	37.3	57.3	29.4	26.8	56.0	37.4	31.5
Level of Service	D	C			D	D	E	C	C	E	D	C
Approach Delay (s)		32.1			39.9			33.5			36.2	
Approach LOS		C			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	35.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	127.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	91.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	104	8	73	72	9	158	478	208	19	483	207
Future Volume (vph)	65	104	8	73	72	9	158	478	208	19	483	207
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00			1.00		1.00	0.97		1.00	0.99	
Flpb, ped/bikes		0.99			1.00		0.99	1.00		0.98	1.00	
Frt		0.99			0.99		1.00	0.95		1.00	0.96	
Flt Protected		0.98			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1799			1799		1758	1724		1732	1756	
Flt Permitted		0.79			0.67		0.34	1.00		0.34	1.00	
Satd. Flow (perm)		1445			1228		624	1724		618	1756	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	66	106	8	74	73	9	161	488	212	19	493	211
RTOR Reduction (vph)	0	2	0	0	3	0	0	14	0	0	14	0
Lane Group Flow (vph)	0	178	0	0	153	0	161	686	0	19	690	0
Confl. Peds. (#/hr)	31					31	14		32	32		14
Confl. Bikes (#/hr)						1			12			19
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			2			6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)		14.8			14.8		68.7	68.7		68.7	68.7	
Effective Green, g (s)		14.8			14.8		68.7	68.7		68.7	68.7	
Actuated g/C Ratio		0.16			0.16		0.75	0.75		0.75	0.75	
Clearance Time (s)		4.0			4.0		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		2.0			2.0		4.0	4.0		3.0	3.0	
Lane Grp Cap (vph)		232			197		465	1287		461	1311	
v/s Ratio Prot								c0.40			0.39	
v/s Ratio Perm		0.12			c0.12		0.26			0.03		
v/c Ratio		0.77			0.78		0.35	0.53		0.04	0.53	
Uniform Delay, d1		37.0			37.0		4.0	4.9		3.0	4.9	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		12.8			16.1		2.0	1.6		0.2	1.5	
Delay (s)		49.8			53.1		6.0	6.5		3.2	6.4	
Level of Service		D			D		A	A		A	A	
Approach Delay (s)		49.8			53.1			6.4			6.3	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	14.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	92.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	72.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	129	409	1	39	75	56	64	8	155	378	11
Future Volume (vph)	25	129	409	1	39	75	56	64	8	155	378	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0	3.0		4.5			4.5	
Lane Util. Factor		1.00	1.00		0.95	1.00		0.95			0.95	
Frpb, ped/bikes		1.00	0.98		1.00	0.99		1.00			1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00			1.00	
Frt		1.00	0.85		1.00	0.85		0.99			1.00	
Flt Protected		0.99	1.00		1.00	1.00		0.98			0.99	
Satd. Flow (prot)		1830	1537		3500	1546		3398			3445	
Flt Permitted		0.96	1.00		0.95	1.00		0.74			0.82	
Satd. Flow (perm)		1775	1537		3337	1546		2555			2863	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	26	133	422	1	40	77	58	66	8	160	390	11
RTOR Reduction (vph)	0	0	292	0	0	53	0	3	0	0	2	0
Lane Group Flow (vph)	0	159	130	0	41	24	0	129	0	0	559	0
Confl. Peds. (#/hr)			4	4			1					1
Confl. Bikes (#/hr)			5			3						1
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)		18.5	18.5		18.5	18.5		34.0			34.0	
Effective Green, g (s)		18.5	18.5		18.5	18.5		34.0			34.0	
Actuated g/C Ratio		0.31	0.31		0.31	0.31		0.57			0.57	
Clearance Time (s)		3.0	3.0		3.0	3.0		4.5			4.5	
Lane Grp Cap (vph)		547	473		1028	476		1447			1622	
v/s Ratio Prot												
v/s Ratio Perm		c0.09	0.08		0.01	0.02		0.05			c0.20	
v/c Ratio		0.29	0.28		0.04	0.05		0.09			0.34	
Uniform Delay, d1		15.8	15.7		14.5	14.6		5.9			7.0	
Progression Factor		1.00	1.00		1.00	1.00		1.00			1.00	
Incremental Delay, d2		1.3	1.4		0.1	0.2		0.1			0.6	
Delay (s)		17.1	17.1		14.6	14.8		6.1			7.6	
Level of Service		B	B		B	B		A			A	
Approach Delay (s)		17.1			14.7			6.1			7.6	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	12.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	67.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	206	383	390	0	0	0	0	438	137	215	324	0
Future Volume (vph)	206	383	390	0	0	0	0	438	137	215	324	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5						5.5			5.5	
Lane Util. Factor		0.95						0.95			0.95	
Frpb, ped/bikes		0.99						0.99			1.00	
Flpb, ped/bikes		1.00						1.00			1.00	
Frt		0.94						0.96			1.00	
Flt Protected		0.99						1.00			0.98	
Satd. Flow (prot)		3254						3367			3462	
Flt Permitted		0.99						1.00			0.57	
Satd. Flow (perm)		3254						3367			2009	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	224	416	424	0	0	0	0	476	149	234	352	0
RTOR Reduction (vph)	0	160	0	0	0	0	0	43	0	0	0	0
Lane Group Flow (vph)	0	904	0	0	0	0	0	582	0	0	586	0
Confl. Peds. (#/hr)	1		4	4		1	18		25	25		18
Confl. Bikes (#/hr)									6			3
Turn Type	Perm	NA						NA		Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4											
Actuated Green, G (s)		28.5						17.5			30.5	
Effective Green, g (s)		28.5						17.5			30.5	
Actuated g/C Ratio		0.41						0.25			0.44	
Clearance Time (s)		5.5						5.5			5.5	
Lane Grp Cap (vph)		1324						841			1072	
v/s Ratio Prot								c0.17			c0.07	
v/s Ratio Perm		0.28									0.16	
v/c Ratio		0.68						0.69			0.55	
Uniform Delay, d1		17.0						23.8			14.6	
Progression Factor		1.00						1.00			1.00	
Incremental Delay, d2		2.9						4.7			2.0	
Delay (s)		19.9						28.5			16.6	
Level of Service		B						C			B	
Approach Delay (s)		19.9			0.0			28.5			16.6	
Approach LOS		B			A			C			B	

Intersection Summary			
HCM 2000 Control Delay	21.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	82.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	NWL2	NWL	NWR
Lane Configurations										
Traffic Volume (vph)	37	145	16	223	174	181	7	530	317	124
Future Volume (vph)	37	145	16	223	174	181	7	530	317	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5		5.5	5.5	5.5		4.5	4.5	
Lane Util. Factor		0.95		1.00	0.95	0.95		0.97	1.00	
Frpb, ped/bikes		1.00		1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00		1.00	1.00	1.00		1.00	1.00	
Frt		0.99		1.00	1.00	0.99		1.00	0.96	
Flt Protected		0.99		0.95	1.00	1.00		0.95	0.97	
Satd. Flow (prot)		3494		1781	3574	3551		3467	1732	
Flt Permitted		0.99		0.62	1.00	1.00		0.95	0.97	
Satd. Flow (perm)		3494		1171	3574	3551		3467	1732	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	40	156	17	240	187	195	8	570	341	133
RTOR Reduction (vph)	0	10	0	0	0	4	0	0	0	0
Lane Group Flow (vph)	0	203	0	240	187	199	0	570	474	0
Confl. Peds. (#/hr)			2	4			4		1	2
Confl. Bikes (#/hr)			3							
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA	NA		Perm	Prot	
Protected Phases		3			2	2			4	
Permitted Phases	3			2				4		
Actuated Green, G (s)		18.5		20.0	20.0	20.0		17.0	17.0	
Effective Green, g (s)		18.5		20.0	20.0	20.0		17.0	17.0	
Actuated g/C Ratio		0.26		0.29	0.29	0.29		0.24	0.24	
Clearance Time (s)		4.5		5.5	5.5	5.5		4.5	4.5	
Lane Grp Cap (vph)		923		334	1021	1014		841	420	
v/s Ratio Prot					0.05	0.06			c0.27	
v/s Ratio Perm		0.06		c0.20				0.16		
v/c Ratio		0.22		0.72	0.18	0.20		0.68	1.13	
Uniform Delay, d1		20.1		22.5	18.8	18.9		24.0	26.5	
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.6		12.5	0.4	0.4		4.4	83.8	
Delay (s)		20.7		35.0	19.2	19.3		28.4	110.3	
Level of Service		C		C	B	B		C	F	
Approach Delay (s)		20.7			28.1	19.3			65.6	
Approach LOS		C			C	B			E	

Intersection Summary			
HCM 2000 Control Delay	47.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	85.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	458	22	107	131	13	63	34	145	12	41	5
Future Volume (vph)	4	458	22	107	131	13	63	34	145	12	41	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0	3.0		3.0			3.0	
Lane Util. Factor		1.00	1.00		1.00	1.00		1.00			1.00	
Frpb, ped/bikes		1.00	0.96		1.00	0.97		0.98			1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00			1.00	
Frt		1.00	0.85		1.00	0.85		0.92			0.99	
Flt Protected		1.00	1.00		0.98	1.00		0.99			0.99	
Satd. Flow (prot)		1844	1502		1797	1524		1639			1798	
Flt Permitted		1.00	1.00		0.70	1.00		0.92			0.94	
Satd. Flow (perm)		1842	1502		1280	1524		1531			1706	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	4	482	23	113	138	14	66	36	153	13	43	5
RTOR Reduction (vph)	0	0	11	0	0	7	0	98	0	0	3	0
Lane Group Flow (vph)	0	486	12	0	251	7	0	157	0	0	58	0
Confl. Peds. (#/hr)	8		20	20		8	11		6	6		11
Confl. Bikes (#/hr)			5			1						
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		1			1			2			2	
Permitted Phases	1		1	1		1	2			2		
Actuated Green, G (s)		26.0	26.0		26.0	26.0		18.0			18.0	
Effective Green, g (s)		26.0	26.0		26.0	26.0		18.0			18.0	
Actuated g/C Ratio		0.52	0.52		0.52	0.52		0.36			0.36	
Clearance Time (s)		3.0	3.0		3.0	3.0		3.0			3.0	
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)		957	781		665	792		551			614	
v/s Ratio Prot												
v/s Ratio Perm		c0.26	0.01		0.20	0.00		c0.10			0.03	
v/c Ratio		0.51	0.02		0.38	0.01		0.29			0.09	
Uniform Delay, d1		7.8	5.8		7.2	5.8		11.4			10.6	
Progression Factor		1.00	1.00		1.00	1.00		1.00			1.00	
Incremental Delay, d2		0.4	0.0		0.4	0.0		1.3			0.3	
Delay (s)		8.3	5.8		7.5	5.8		12.7			10.9	
Level of Service		A	A		A	A		B			B	
Approach Delay (s)		8.1			7.4			12.7			10.9	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	9.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	77.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	198	114	187	443	81	207
Future Volume (vph)	198	114	187	443	81	207
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	3.0	
Lane Util. Factor	0.95			1.00	1.00	
Frpb, ped/bikes	0.98			1.00	0.99	
Flpb, ped/bikes	1.00			0.99	1.00	
Frt	0.95			1.00	0.90	
Flt Protected	1.00			0.99	0.99	
Satd. Flow (prot)	3222			1791	1611	
Flt Permitted	1.00			0.78	0.99	
Satd. Flow (perm)	3222			1410	1611	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	220	127	208	492	90	230
RTOR Reduction (vph)	36	0	0	0	179	0
Lane Group Flow (vph)	311	0	0	700	141	0
Confl. Peds. (#/hr)		10	10		6	1
Confl. Bikes (#/hr)		2				
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Turn Type	NA		Perm	NA	Prot	
Protected Phases	2			6	4	
Permitted Phases			6			
Actuated Green, G (s)	48.9			48.9	11.1	
Effective Green, g (s)	48.9			48.9	11.1	
Actuated g/C Ratio	0.72			0.72	0.16	
Clearance Time (s)	5.0			5.0	3.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	2316			1013	262	
v/s Ratio Prot	0.10				c0.09	
v/s Ratio Perm				c0.50		
v/c Ratio	0.13			0.69	0.54	
Uniform Delay, d1	3.0			5.3	26.1	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	0.1			3.9	2.1	
Delay (s)	3.1			9.2	28.2	
Level of Service	A			A	C	
Approach Delay (s)	3.1			9.2	28.2	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	12.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	68.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	75.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	57	3	79	69	124	4	235	56	69	167	6
Future Volume (vph)	9	57	3	79	69	124	4	235	56	69	167	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		1.00			0.98			0.99			1.00	
Flpb, ped/bikes		1.00			0.99			1.00			1.00	
Frt		0.99			0.94			0.97			1.00	
Flt Protected		0.99			0.99			1.00			0.99	
Satd. Flow (prot)		1812			1653			1786			1809	
Flt Permitted		0.96			0.90			1.00			0.85	
Satd. Flow (perm)		1754			1511			1781			1559	
Peak-hour factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Adj. Flow (vph)	11	69	4	95	83	149	5	283	67	83	201	7
RTOR Reduction (vph)	0	2	0	0	55	0	0	15	0	0	2	0
Lane Group Flow (vph)	0	82	0	0	272	0	0	340	0	0	289	0
Confl. Peds. (#/hr)	16		19	19		16	3		5	5		3
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Actuated Green, G (s)		27.0			27.0			22.0			22.0	
Effective Green, g (s)		27.0			27.0			22.0			22.0	
Actuated g/C Ratio		0.49			0.49			0.40			0.40	
Clearance Time (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		861			741			712			623	
v/s Ratio Prot												
v/s Ratio Perm		0.05			c0.18			c0.19			0.19	
v/c Ratio		0.10			0.37			0.48			0.46	
Uniform Delay, d1		7.5			8.7			12.2			12.2	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.2			1.4			2.3			2.5	
Delay (s)		7.7			10.1			14.5			14.6	
Level of Service		A			B			B			B	
Approach Delay (s)		7.7			10.1			14.5			14.6	
Approach LOS		A			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	12.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	62.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Traffic Volume (vph)	25	174	237	25	33	32
Future Volume (vph)	25	174	237	25	33	32
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	30	207	282	30	39	38

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total (vph)	237	312	77
Volume Left (vph)	30	0	39
Volume Right (vph)	0	30	38
Hadj (s)	0.06	-0.02	-0.16
Departure Headway (s)	4.5	4.3	5.0
Degree Utilization, x	0.30	0.38	0.11
Capacity (veh/h)	779	804	655
Control Delay (s)	9.4	9.9	8.5
Approach Delay (s)	9.4	9.9	8.5
Approach LOS	A	A	A

Intersection Summary			
Delay	9.5		
Level of Service	A		
Intersection Capacity Utilization	48.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	185	0	110	25	93	5	175	551	0	0	422	175
Future Volume (vph)	185	0	110	25	93	5	175	551	0	0	422	175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.5	4.5			4.5	
Lane Util. Factor		1.00			1.00		1.00	1.00			1.00	
Frpb, ped/bikes		0.97			1.00		1.00	1.00			0.98	
Flpb, ped/bikes		0.98			1.00		1.00	1.00			1.00	
Frt		0.95			0.99		1.00	1.00			0.96	
Flt Protected		0.97			0.99		0.95	1.00			1.00	
Satd. Flow (prot)		1615			1804		1752	1845			1730	
Flt Permitted		0.71			0.92		0.95	1.00			1.00	
Satd. Flow (perm)		1180			1670		1752	1845			1730	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	195	0	116	26	98	5	184	580	0	0	444	184
RTOR Reduction (vph)	0	64	0	0	2	0	0	0	0	0	18	0
Lane Group Flow (vph)	0	247	0	0	127	0	184	580	0	0	610	0
Confl. Peds. (#/hr)	23		23	23		23	25		41	41		25
Confl. Bikes (#/hr)									2			13
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA		Perm	NA		Prot	NA			NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8								
Actuated Green, G (s)		18.0			18.0		9.5	53.5			39.5	
Effective Green, g (s)		18.0			18.0		9.5	53.5			39.5	
Actuated g/C Ratio		0.22			0.22		0.12	0.67			0.49	
Clearance Time (s)		4.0			4.0		4.5	4.5			4.5	
Vehicle Extension (s)		2.0			2.0		2.0	2.0			2.0	
Lane Grp Cap (vph)		265			375		208	1233			854	
v/s Ratio Prot							c0.10	0.31			c0.35	
v/s Ratio Perm		c0.21			0.08							
v/c Ratio		0.93			0.34		0.88	0.47			0.71	
Uniform Delay, d1		30.4			26.0		34.7	6.4			15.8	
Progression Factor		1.00			1.00		1.00	1.00			1.00	
Incremental Delay, d2		37.2			0.2		32.1	1.3			5.1	
Delay (s)		67.6			26.2		66.8	7.7			20.9	
Level of Service		E			C		E	A			C	
Approach Delay (s)		67.6			26.2			21.9			20.9	
Approach LOS		E			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	29.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	78.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	208	29	33	478	18	64	169	21	27	292	65
Future Volume (vph)	12	208	29	33	478	18	64	169	21	27	292	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5			4.5			4.5	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		0.99			1.00			0.99			0.99	
Flpb, ped/bikes		1.00			1.00			0.99			1.00	
Frt		0.98			0.99			0.99			0.98	
Flt Protected		1.00			1.00			0.99			1.00	
Satd. Flow (prot)		3440			3492			1795			1787	
Flt Permitted		0.92			0.92			0.84			0.96	
Satd. Flow (perm)		3180			3227			1520			1730	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	14	239	33	38	549	21	74	194	24	31	336	75
RTOR Reduction (vph)	0	19	0	0	5	0	0	6	0	0	15	0
Lane Group Flow (vph)	0	267	0	0	603	0	0	286	0	0	427	0
Confl. Peds. (#/hr)	56		31	31		56	60		40	40		60
Confl. Bikes (#/hr)			3			18						3
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		20.5			20.5			20.5			20.5	
Effective Green, g (s)		20.5			20.5			20.5			20.5	
Actuated g/C Ratio		0.41			0.41			0.41			0.41	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Vehicle Extension (s)		2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)		1303			1323			623			709	
v/s Ratio Prot												
v/s Ratio Perm		0.08			c0.19			0.19			c0.25	
v/c Ratio		0.20			0.46			0.46			0.60	
Uniform Delay, d1		9.5			10.7			10.7			11.6	
Progression Factor		1.00			0.64			0.95			1.00	
Incremental Delay, d2		0.4			0.8			2.4			3.8	
Delay (s)		9.9			7.7			12.6			15.3	
Level of Service		A			A			B			B	
Approach Delay (s)		9.9			7.7			12.6			15.3	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	11.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	76.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	325	46	109	423	40	32	398	89	20	391	62
Future Volume (vph)	100	325	46	109	423	40	32	398	89	20	391	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.5		4.5	5.5			5.5			5.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			1.00	
Frpb, ped/bikes	1.00	0.95		1.00	0.97			0.94			0.95	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			0.99	
Frt	1.00	0.98		1.00	0.99			0.97			0.98	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1752	1713		1752	1766			3172			1709	
Flt Permitted	0.95	1.00		0.95	1.00			0.90			0.97	
Satd. Flow (perm)	1752	1713		1752	1766			2868			1659	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	102	332	47	111	432	41	33	406	91	20	399	63
RTOR Reduction (vph)	0	5	0	0	4	0	0	17	0	0	5	0
Lane Group Flow (vph)	102	374	0	111	469	0	0	513	0	0	477	0
Confl. Peds. (#/hr)	104		134	134		104	114		110	110		114
Confl. Bikes (#/hr)			3			9			1			16
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	3	8		7	4			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	6.0	29.2		6.0	29.2			49.3			49.3	
Effective Green, g (s)	6.0	29.2		6.0	29.2			49.3			49.3	
Actuated g/C Ratio	0.06	0.29		0.06	0.29			0.49			0.49	
Clearance Time (s)	4.5	5.5		4.5	5.5			5.5			5.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	105	500		105	515			1413			817	
v/s Ratio Prot	0.06	0.22		c0.06	c0.27							
v/s Ratio Perm								0.18			c0.29	
v/c Ratio	0.97	0.75		1.06	0.91			0.36			0.58	
Uniform Delay, d1	46.9	32.1		47.0	34.2			15.7			18.0	
Progression Factor	1.02	0.91		1.00	1.00			1.00			1.00	
Incremental Delay, d2	78.0	6.0		104.1	20.4			0.7			3.0	
Delay (s)	125.8	35.3		151.1	54.5			16.4			21.1	
Level of Service	F	D		F	D			B			C	
Approach Delay (s)		54.5			72.9			16.4			21.1	
Approach LOS		D			E			B			C	

Intersection Summary			
HCM 2000 Control Delay	42.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	85.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	587	4	6	899	83	4	1	4	185	1	76
Future Volume (vph)	58	587	4	6	899	83	4	1	4	185	1	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5		4.5			4.5	
Lane Util. Factor	1.00	0.95	1.00		0.95	1.00		1.00			1.00	
Frpb, ped/bikes	1.00	1.00	0.97		1.00	0.96		0.99			0.99	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00		1.00			1.00	
Frt	1.00	1.00	0.85		1.00	0.85		0.94			0.96	
Flt Protected	0.95	1.00	1.00		1.00	1.00		0.98			0.97	
Satd. Flow (prot)	1770	3539	1539		3538	1512		1697			1711	
Flt Permitted	0.95	1.00	1.00		0.95	1.00		0.92			0.78	
Satd. Flow (perm)	1770	3539	1539		3369	1512		1589			1390	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	61	618	4	6	946	87	4	1	4	195	1	80
RTOR Reduction (vph)	0	0	1	0	0	23	0	3	0	0	15	0
Lane Group Flow (vph)	61	618	3	0	952	64	0	6	0	0	261	0
Confl. Peds. (#/hr)	6		8	8		6	6		3	3		6
Confl. Bikes (#/hr)			5			4						
Turn Type	Prot	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6			2			4			4	
Permitted Phases			6	2		2	4			4		
Actuated Green, G (s)	4.4	73.5	73.5		64.6	64.6		17.5			17.5	
Effective Green, g (s)	4.4	73.5	73.5		64.6	64.6		17.5			17.5	
Actuated g/C Ratio	0.04	0.74	0.74		0.65	0.65		0.18			0.18	
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5		4.5			4.5	
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	77	2601	1131		2176	976		278			243	
v/s Ratio Prot	c0.03	0.17										
v/s Ratio Perm			0.00		c0.28	0.04		0.00			c0.19	
v/c Ratio	0.79	0.24	0.00		0.44	0.07		0.02			1.07	
Uniform Delay, d1	47.3	4.3	3.5		8.7	6.5		34.2			41.2	
Progression Factor	1.00	1.00	1.00		1.00	1.00		1.00			0.98	
Incremental Delay, d2	39.0	0.2	0.0		0.6	0.1		0.0			73.9	
Delay (s)	86.3	4.5	3.5		9.4	6.7		34.2			114.2	
Level of Service	F	A	A		A	A		C			F	
Approach Delay (s)		11.8			9.1			34.2			114.2	
Approach LOS		B			A			C			F	

Intersection Summary			
HCM 2000 Control Delay	24.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	74.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	364	48	129	834	97	34	354	33	51	327	81
Future Volume (vph)	66	364	48	129	834	97	34	354	33	51	327	81
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			4.5			4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			1.00	
Frpb, ped/bikes	1.00	0.98		1.00	0.98			0.99			0.98	
Flpb, ped/bikes	0.97	1.00		0.91	1.00			1.00			1.00	
Frt	1.00	0.98		1.00	0.98			0.99			0.98	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1711	3410		1618	3411			3450			1765	
Flt Permitted	0.23	1.00		0.50	1.00			0.88			0.91	
Satd. Flow (perm)	413	3410		844	3411			3053			1610	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	68	375	49	133	860	100	35	365	34	53	337	84
RTOR Reduction (vph)	0	9	0	0	8	0	0	8	0	0	10	0
Lane Group Flow (vph)	68	415	0	133	952	0	0	426	0	0	464	0
Confl. Peds. (#/hr)	116		101	101		116	79		70	70		79
Confl. Bikes (#/hr)			1						2			15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			4	
Permitted Phases	2			6			4			4		
Actuated Green, G (s)	47.8	47.8		47.8	47.8			31.7			31.7	
Effective Green, g (s)	47.8	47.8		47.8	47.8			31.7			31.7	
Actuated g/C Ratio	0.54	0.54		0.54	0.54			0.36			0.36	
Clearance Time (s)	5.0	5.0		5.0	5.0			4.5			4.5	
Vehicle Extension (s)	2.0	2.0		2.0	2.0			2.0			2.0	
Lane Grp Cap (vph)	221	1831		453	1831			1087			573	
v/s Ratio Prot		0.12			c0.28							
v/s Ratio Perm	0.16			0.16				0.14			c0.29	
v/c Ratio	0.31	0.23		0.29	0.52			0.39			0.81	
Uniform Delay, d1	11.4	10.9		11.3	13.2			21.4			25.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	3.6	0.3		1.6	1.1			0.1			7.8	
Delay (s)	15.0	11.1		13.0	14.3			21.5			33.7	
Level of Service	B	B		B	B			C			C	
Approach Delay (s)		11.7			14.1			21.5			33.7	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	18.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	89.0	Sum of lost time (s)	9.5
Intersection Capacity Utilization	91.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	77	60	215	101	508	26	369	144	205	395	26
Future Volume (vph)	0	77	60	215	101	508	26	369	144	205	395	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5		4.5	4.5	4.5		4.0			4.0	
Lane Util. Factor		1.00		1.00	1.00	1.00		0.95			0.95	
Frpb, ped/bikes		0.97		1.00	1.00	1.00		0.98			0.99	
Flpb, ped/bikes		1.00		1.00	1.00	1.00		1.00			1.00	
Frt		0.94		1.00	1.00	0.85		0.96			0.99	
Flt Protected		1.00		0.95	1.00	1.00		1.00			0.98	
Satd. Flow (prot)		1651		1719	1810	1538		3216			3333	
Flt Permitted		1.00		0.95	1.00	1.00		0.90			0.53	
Satd. Flow (perm)		1651		1719	1810	1538		2888			1794	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	81	63	226	106	535	27	388	152	216	416	27
RTOR Reduction (vph)	0	24	0	0	0	22	0	32	0	0	2	0
Lane Group Flow (vph)	0	120	0	226	106	513	0	535	0	0	657	0
Confl. Peds. (#/hr)	31		17	17		31	31		48	48		31
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type		NA		Prot	NA	pt+ov	Perm	NA		Prot	NA	
Protected Phases		2		1	6	6 7		8		7	4	
Permitted Phases	2						8					
Actuated Green, G (s)		20.0		16.5	41.0	81.5		28.0			68.0	
Effective Green, g (s)		20.0		16.5	41.0	81.5		28.0			68.0	
Actuated g/C Ratio		0.17		0.14	0.35	0.69		0.24			0.58	
Clearance Time (s)		4.5		4.5	4.5			4.0			4.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		281		241	631	1066		688			1509	
v/s Ratio Prot		0.07		c0.13	0.06	c0.33					0.13	
v/s Ratio Perm								c0.19			0.12	
v/c Ratio		0.43		0.94	0.17	0.48		0.78			0.44	
Uniform Delay, d1		43.6		50.0	26.5	8.3		41.8			13.9	
Progression Factor		1.00		1.00	1.00	1.00		1.00			1.00	
Incremental Delay, d2		4.7		43.9	0.6	1.6		5.5			0.9	
Delay (s)		48.3		93.8	27.0	9.8		47.4			14.9	
Level of Service		D		F	C	A		D			B	
Approach Delay (s)		48.3			33.8			47.4			14.9	
Approach LOS		D			C			D			B	

Intersection Summary			
HCM 2000 Control Delay	32.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	117.5	Sum of lost time (s)	17.0
Intersection Capacity Utilization	87.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	342	119	66	501	27	136	352	59	42	515	284
Future Volume (vph)	22	342	119	66	501	27	136	352	59	42	515	284
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5			5.5			6.0			6.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frpb, ped/bikes		0.99			1.00			0.99			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.96			0.99			0.98			0.95	
Flt Protected		1.00			0.99			0.99			1.00	
Satd. Flow (prot)		3304			3423			3350			3256	
Flt Permitted		0.86			0.71			0.57			0.89	
Satd. Flow (perm)		2840			2451			1949			2902	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	23	360	125	69	527	28	143	371	62	44	542	299
RTOR Reduction (vph)	0	39	0	0	4	0	0	5	0	0	33	0
Lane Group Flow (vph)	0	469	0	0	620	0	0	571	0	0	852	0
Confl. Peds. (#/hr)	2		13	13		2	8		25	25		8
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		33.2			33.2			75.3			75.3	
Effective Green, g (s)		33.2			33.2			75.3			75.3	
Actuated g/C Ratio		0.28			0.28			0.63			0.63	
Clearance Time (s)		5.5			5.5			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)		785			678			1222			1821	
v/s Ratio Prot												
v/s Ratio Perm		0.17			c0.25			0.29			c0.29	
v/c Ratio		0.60			0.91			0.47			0.47	
Uniform Delay, d1		37.6			42.0			11.8			11.8	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.8			16.6			1.3			0.9	
Delay (s)		38.4			58.6			13.1			12.7	
Level of Service		D			E			B			B	
Approach Delay (s)		38.4			58.6			13.1			12.7	
Approach LOS		D			E			B			B	

Intersection Summary			
HCM 2000 Control Delay	28.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.5
Intersection Capacity Utilization	91.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	154	153	97	35	206	81	91	702	84	31	446	370
Future Volume (vph)	154	153	97	35	206	81	91	702	84	31	446	370
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.96			1.00	0.95	1.00	1.00	0.86	1.00	1.00	0.94
Flpb, ped/bikes	1.00	1.00			0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.94			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00			0.99	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1691			3485	1512	1770	3539	1361	1770	3539	1483
Flt Permitted	0.95	1.00			0.87	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1691			3044	1512	1770	3539	1361	1770	3539	1483
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	173	172	109	39	231	91	102	789	94	35	501	416
RTOR Reduction (vph)	0	19	0	0	0	66	0	0	50	0	0	275
Lane Group Flow (vph)	173	262	0	0	270	25	102	789	44	35	501	141
Confl. Peds. (#/hr)	26		72	72		26	22		32	32		22
Confl. Bikes (#/hr)						1			4			5
Turn Type	Prot	NA		Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	8			4		5	2		1	6	
Permitted Phases				4		4			2			6
Actuated Green, G (s)	23.2	57.2			30.0	30.0	13.9	49.0	49.0	7.8	42.9	42.9
Effective Green, g (s)	23.2	57.2			30.0	30.0	13.9	49.0	49.0	7.8	42.9	42.9
Actuated g/C Ratio	0.18	0.45			0.24	0.24	0.11	0.39	0.39	0.06	0.34	0.34
Clearance Time (s)	4.0	4.0			4.0	4.0	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	2.0	2.0			2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	323	761			719	357	193	1365	525	108	1195	500
v/s Ratio Prot	c0.10	0.16					c0.06	c0.22		0.02	0.14	
v/s Ratio Perm					c0.09	0.02			0.03			0.09
v/c Ratio	0.54	0.34			0.38	0.07	0.53	0.58	0.08	0.32	0.42	0.28
Uniform Delay, d1	47.0	22.7			40.6	37.7	53.5	30.8	24.7	57.1	32.4	30.8
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.2	1.2			0.1	0.0	1.2	1.8	0.3	0.6	1.1	1.4
Delay (s)	53.3	23.9			40.8	37.7	54.7	32.6	25.1	57.7	33.5	32.2
Level of Service	D	C			D	D	D	C	C	E	C	C
Approach Delay (s)		35.1			40.0			34.2			33.8	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	35.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	127.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	91.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	64	3	58	184	10	217	513	99	7	396	275
Future Volume (vph)	24	64	3	58	184	10	217	513	99	7	396	275
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00			1.00		1.00	0.98		1.00	0.98	
Flpb, ped/bikes		0.99			1.00		0.99	1.00		0.97	1.00	
Frt		1.00			0.99		1.00	0.98		1.00	0.94	
Flt Protected		0.99			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1786			1792		1722	1748		1692	1679	
Flt Permitted		0.81			0.91		0.31	1.00		0.35	1.00	
Satd. Flow (perm)		1458			1655		567	1748		619	1679	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	26	69	3	62	198	11	233	552	106	8	426	296
RTOR Reduction (vph)	0	2	0	0	2	0	0	7	0	0	25	0
Lane Group Flow (vph)	0	96	0	0	269	0	233	651	0	8	697	0
Confl. Peds. (#/hr)	30					30	20		36	36		20
Confl. Bikes (#/hr)						1			31			7
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			2			6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)		17.8			17.8		65.7	65.7		65.7	65.7	
Effective Green, g (s)		17.8			17.8		65.7	65.7		65.7	65.7	
Actuated g/C Ratio		0.19			0.19		0.71	0.71		0.71	0.71	
Clearance Time (s)		4.0			4.0		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		2.0			2.0		4.0	4.0		3.0	3.0	
Lane Grp Cap (vph)		282			320		404	1248		442	1199	
v/s Ratio Prot								0.37			c0.41	
v/s Ratio Perm		0.07			c0.16		0.41			0.01		
v/c Ratio		0.34			0.84		0.58	0.52		0.02	0.58	
Uniform Delay, d1		32.0			35.7		6.4	6.0		3.8	6.4	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.3			17.2		5.9	1.6		0.1	2.1	
Delay (s)		32.3			52.9		12.3	7.6		3.9	8.5	
Level of Service		C			D		B	A		A	A	
Approach Delay (s)		32.3			52.9			8.8			8.4	
Approach LOS		C			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	92.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	78.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	43	147	2	44	68	157	130	14	126	357	23
Future Volume (vph)	11	43	147	2	44	68	157	130	14	126	357	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0	3.0		4.5			4.5	
Lane Util. Factor		1.00	1.00		0.95	1.00		0.95			0.95	
Frpb, ped/bikes		1.00	0.98		1.00	0.98		1.00			1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00			1.00	
Frt		1.00	0.85		1.00	0.85		0.99			0.99	
Flt Protected		0.99	1.00		1.00	1.00		0.97			0.99	
Satd. Flow (prot)		1741	1468		3336	1462		3230			3276	
Flt Permitted		0.96	1.00		0.95	1.00		0.62			0.78	
Satd. Flow (perm)		1694	1468		3179	1462		2049			2588	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	47	160	2	48	74	171	141	15	137	388	25
RTOR Reduction (vph)	0	0	111	0	0	51	0	6	0	0	6	0
Lane Group Flow (vph)	0	59	49	0	50	23	0	321	0	0	544	0
Confl. Peds. (#/hr)	2		3	3		2	1		2	2		1
Confl. Bikes (#/hr)			4			11			14			
Heavy Vehicles (%)	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)		18.5	18.5		18.5	18.5		34.0			34.0	
Effective Green, g (s)		18.5	18.5		18.5	18.5		34.0			34.0	
Actuated g/C Ratio		0.31	0.31		0.31	0.31		0.57			0.57	
Clearance Time (s)		3.0	3.0		3.0	3.0		4.5			4.5	
Lane Grp Cap (vph)		522	452		980	450		1161			1466	
v/s Ratio Prot												
v/s Ratio Perm		c0.03	0.03		0.02	0.02		0.16			c0.21	
v/c Ratio		0.11	0.11		0.05	0.05		0.28			0.37	
Uniform Delay, d1		14.9	14.9		14.6	14.6		6.7			7.1	
Progression Factor		1.00	1.00		1.00	1.00		1.00			1.00	
Incremental Delay, d2		0.4	0.5		0.1	0.2		0.6			0.7	
Delay (s)		15.3	15.3		14.7	14.8		7.3			7.9	
Level of Service		B	B		B	B		A			A	
Approach Delay (s)		15.3			14.7			7.3			7.9	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	9.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	77.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	170	285	361	0	0	0	0	512	152	91	160	0
Future Volume (vph)	170	285	361	0	0	0	0	512	152	91	160	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5						5.5			5.5	
Lane Util. Factor		0.95						0.95			0.95	
Frpb, ped/bikes		1.00						0.99			1.00	
Flpb, ped/bikes		1.00						1.00			1.00	
Frt		0.93						0.97			1.00	
Flt Protected		0.99						1.00			0.98	
Satd. Flow (prot)		3270						3381			3471	
Flt Permitted		0.99						1.00			0.59	
Satd. Flow (perm)		3270						3381			2074	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	185	310	392	0	0	0	0	557	165	99	174	0
RTOR Reduction (vph)	0	204	0	0	0	0	0	40	0	0	0	0
Lane Group Flow (vph)	0	683	0	0	0	0	0	682	0	0	273	0
Confl. Peds. (#/hr)	1					1	10		22	22		10
Confl. Bikes (#/hr)									1			10
Turn Type	Perm	NA						NA		Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4											
Actuated Green, G (s)		26.5						20.5			32.5	
Effective Green, g (s)		26.5						20.5			32.5	
Actuated g/C Ratio		0.38						0.29			0.46	
Clearance Time (s)		5.5						5.5			5.5	
Lane Grp Cap (vph)		1237						990			1132	
v/s Ratio Prot								c0.20			c0.03	
v/s Ratio Perm		0.21									0.08	
v/c Ratio		0.55						0.69			0.24	
Uniform Delay, d1		17.1						21.9			11.3	
Progression Factor		1.00						1.00			1.00	
Incremental Delay, d2		1.8						3.9			0.5	
Delay (s)		18.9						25.9			11.8	
Level of Service		B						C			B	
Approach Delay (s)		18.9			0.0			25.9			11.8	
Approach LOS		B			A			C			B	

Intersection Summary			
HCM 2000 Control Delay	20.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	80.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	NWL2	NWL	NWR
Lane Configurations										
Traffic Volume (vph)	92	330	21	250	183	284	29	420	289	82
Future Volume (vph)	92	330	21	250	183	284	29	420	289	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5		5.5	5.5	5.5		4.5	4.5	
Lane Util. Factor		0.95		1.00	0.95	0.95		0.97	1.00	
Frpb, ped/bikes		1.00		1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00		0.99	1.00	1.00		1.00	1.00	
Frt		0.99		1.00	1.00	0.99		1.00	0.97	
Flt Protected		0.99		0.95	1.00	1.00		0.95	0.96	
Satd. Flow (prot)		3474		1754	3539	3482		3433	1727	
Flt Permitted		0.99		0.55	1.00	1.00		0.95	0.96	
Satd. Flow (perm)		3474		1015	3539	3482		3433	1727	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	99	355	23	269	197	305	31	452	311	88
RTOR Reduction (vph)	0	5	0	0	0	11	0	0	0	0
Lane Group Flow (vph)	0	472	0	269	197	325	0	452	399	0
Confl. Peds. (#/hr)			4	13			13		13	4
Confl. Bikes (#/hr)			3							
Turn Type	Perm	NA		Perm	NA	NA		Perm	Prot	
Protected Phases		3			2	2			4	
Permitted Phases	3			2				4		
Actuated Green, G (s)		18.5		20.0	20.0	20.0		17.0	17.0	
Effective Green, g (s)		18.5		20.0	20.0	20.0		17.0	17.0	
Actuated g/C Ratio		0.26		0.29	0.29	0.29		0.24	0.24	
Clearance Time (s)		4.5		5.5	5.5	5.5		4.5	4.5	
Lane Grp Cap (vph)		918		290	1011	994		833	419	
v/s Ratio Prot					0.06	0.09			c0.23	
v/s Ratio Perm		0.14		c0.27				0.13		
v/c Ratio		0.51		0.93	0.19	0.33		0.54	0.95	
Uniform Delay, d1		21.9		24.3	18.9	19.7		23.1	26.1	
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.1		37.2	0.4	0.9		2.5	33.5	
Delay (s)		24.0		61.4	19.3	20.6		25.6	59.6	
Level of Service		C		E	B	C		C	E	
Approach Delay (s)		24.0			43.6	20.6			41.6	
Approach LOS		C			D	C			D	

Intersection Summary			
HCM 2000 Control Delay	34.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	83.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	114	15	116	373	17	115	106	143	30	70	10
Future Volume (vph)	2	114	15	116	373	17	115	106	143	30	70	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0	3.0		3.0			3.0	
Lane Util. Factor		1.00	1.00		1.00	1.00		1.00			1.00	
Frpb, ped/bikes		1.00	0.97		1.00	0.97		0.99			1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00			1.00	
Frt		1.00	0.85		1.00	0.85		0.95			0.99	
Flt Protected		1.00	1.00		0.99	1.00		0.98			0.99	
Satd. Flow (prot)		1808	1496		1786	1485		1663			1756	
Flt Permitted		1.00	1.00		0.90	1.00		0.87			0.88	
Satd. Flow (perm)		1802	1496		1634	1485		1472			1568	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	2	120	16	122	393	18	121	112	151	32	74	11
RTOR Reduction (vph)	0	0	8	0	0	9	0	47	0	0	7	0
Lane Group Flow (vph)	0	122	8	0	515	9	0	337	0	0	110	0
Confl. Peds. (#/hr)	12		6	6		12	7		6	6		7
Confl. Bikes (#/hr)			2			5			1			
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		1			1			2			2	
Permitted Phases	1		1	1		1	2			2		
Actuated Green, G (s)		26.0	26.0		26.0	26.0		18.0			18.0	
Effective Green, g (s)		26.0	26.0		26.0	26.0		18.0			18.0	
Actuated g/C Ratio		0.52	0.52		0.52	0.52		0.36			0.36	
Clearance Time (s)		3.0	3.0		3.0	3.0		3.0			3.0	
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)		937	777		849	772		529			564	
v/s Ratio Prot												
v/s Ratio Perm		0.07	0.01		c0.32	0.01		c0.23			0.07	
v/c Ratio		0.13	0.01		0.61	0.01		0.64			0.19	
Uniform Delay, d1		6.2	5.8		8.4	5.8		13.3			11.0	
Progression Factor		1.00	1.00		1.00	1.00		1.00			1.00	
Incremental Delay, d2		0.1	0.0		1.2	0.0		5.8			0.8	
Delay (s)		6.2	5.8		9.6	5.8		19.1			11.8	
Level of Service		A	A		A	A		B			B	
Approach Delay (s)		6.2			9.5			19.1			11.8	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	12.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	74.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	576	57	57	220	52	134
Future Volume (vph)	576	57	57	220	52	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	3.0	
Lane Util. Factor	0.95			1.00	1.00	
Frpb, ped/bikes	1.00			1.00	0.97	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	0.99			1.00	0.90	
Flt Protected	1.00			0.99	0.99	
Satd. Flow (prot)	3476			1841	1616	
Flt Permitted	1.00			0.81	0.99	
Satd. Flow (perm)	3476			1500	1616	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	619	61	61	237	56	144
RTOR Reduction (vph)	5	0	0	0	126	0
Lane Group Flow (vph)	675	0	0	298	74	0
Confl. Peds. (#/hr)		10	8		19	19
Confl. Bikes (#/hr)		7				
Turn Type	NA		Perm	NA	Prot	
Protected Phases	2			6	4	
Permitted Phases			6			
Actuated Green, G (s)	51.3			51.3	8.7	
Effective Green, g (s)	51.3			51.3	8.7	
Actuated g/C Ratio	0.75			0.75	0.13	
Clearance Time (s)	5.0			5.0	3.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	2622			1131	206	
v/s Ratio Prot	0.19				c0.05	
v/s Ratio Perm				c0.20		
v/c Ratio	0.26			0.26	0.36	
Uniform Delay, d1	2.5			2.6	27.1	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	0.2			0.6	1.1	
Delay (s)	2.8			3.1	28.2	
Level of Service	A			A	C	
Approach Delay (s)	2.8			3.1	28.2	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	7.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	68.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	57.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	54	6	45	22	38	6	210	91	89	161	17
Future Volume (vph)	11	54	6	45	22	38	6	210	91	89	161	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		1.00			0.98			0.99			1.00	
Flpb, ped/bikes		1.00			0.99			1.00			1.00	
Frt		0.99			0.95			0.96			0.99	
Flt Protected		0.99			0.98			1.00			0.98	
Satd. Flow (prot)		1813			1682			1762			1805	
Flt Permitted		0.97			0.89			1.00			0.83	
Satd. Flow (perm)		1774			1532			1755			1522	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	12	57	6	48	23	40	6	223	97	95	171	18
RTOR Reduction (vph)	0	3	0	0	20	0	0	28	0	0	4	0
Lane Group Flow (vph)	0	72	0	0	91	0	0	298	0	0	280	0
Confl. Peds. (#/hr)	15		19	19		15	9		11	11		9
Confl. Bikes (#/hr)			1			1						
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Actuated Green, G (s)		27.0			27.0			22.0			22.0	
Effective Green, g (s)		27.0			27.0			22.0			22.0	
Actuated g/C Ratio		0.49			0.49			0.40			0.40	
Clearance Time (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		870			752			702			608	
v/s Ratio Prot												
v/s Ratio Perm		0.04			c0.06			0.17			c0.18	
v/c Ratio		0.08			0.12			0.43			0.46	
Uniform Delay, d1		7.4			7.6			11.9			12.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.2			0.3			1.9			2.5	
Delay (s)		7.6			7.9			13.8			14.6	
Level of Service		A			A			B			B	
Approach Delay (s)		7.6			7.9			13.8			14.6	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	54.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Traffic Volume (vph)	37	212	128	38	18	29
Future Volume (vph)	37	212	128	38	18	29
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	39	226	136	40	19	31

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total (vph)	265	176	50
Volume Left (vph)	39	0	19
Volume Right (vph)	0	40	31
Hadj (s)	0.05	-0.12	-0.28
Departure Headway (s)	4.2	4.2	4.6
Degree Utilization, x	0.31	0.20	0.06
Capacity (veh/h)	832	834	717
Control Delay (s)	9.2	8.2	7.9
Approach Delay (s)	9.2	8.2	7.9
Approach LOS	A	A	A

Intersection Summary			
Delay	8.7		
Level of Service	A		
Intersection Capacity Utilization	48.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	166	0	81	21	39	4	79	577	0	0	493	137
Future Volume (vph)	166	0	81	21	39	4	79	577	0	0	493	137
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.5	4.5			4.5	
Lane Util. Factor		1.00			1.00		1.00	1.00			1.00	
Frpb, ped/bikes		0.97			1.00		1.00	1.00			0.98	
Flpb, ped/bikes		0.98			0.99		1.00	1.00			1.00	
Frt		0.96			0.99		1.00	1.00			0.97	
Flt Protected		0.97			0.98		0.95	1.00			1.00	
Satd. Flow (prot)		1648			1794		1770	1863			1780	
Flt Permitted		0.80			0.89		0.95	1.00			1.00	
Satd. Flow (perm)		1364			1625		1770	1863			1780	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	175	0	85	22	41	4	83	607	0	0	519	144
RTOR Reduction (vph)	0	67	0	0	3	0	0	0	0	0	10	0
Lane Group Flow (vph)	0	193	0	0	64	0	83	607	0	0	653	0
Confl. Peds. (#/hr)	12		30	30		12	24		63	63		24
Confl. Bikes (#/hr)									11			3
Turn Type	Perm	NA		Perm	NA		Prot	NA			NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8								
Actuated Green, G (s)		14.6			14.6		6.8	56.9			45.6	
Effective Green, g (s)		14.6			14.6		6.8	56.9			45.6	
Actuated g/C Ratio		0.18			0.18		0.08	0.71			0.57	
Clearance Time (s)		4.0			4.0		4.5	4.5			4.5	
Vehicle Extension (s)		2.0			2.0		2.0	2.0			2.0	
Lane Grp Cap (vph)		248			296		150	1325			1014	
v/s Ratio Prot							0.05	c0.33			c0.37	
v/s Ratio Perm		c0.14			0.04							
v/c Ratio		0.78			0.22		0.55	0.46			0.64	
Uniform Delay, d1		31.2			27.8		35.1	4.9			11.7	
Progression Factor		1.00			1.00		1.00	1.00			1.00	
Incremental Delay, d2		13.1			0.1		2.5	1.1			3.1	
Delay (s)		44.2			28.0		37.6	6.1			14.8	
Level of Service		D			C		D	A			B	
Approach Delay (s)		44.2			28.0			9.9			14.8	
Approach LOS		D			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	17.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	71.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	376	37	30	203	26	18	276	49	37	184	20
Future Volume (vph)	38	376	37	30	203	26	18	276	49	37	184	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5			4.5			4.5	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		0.99			1.00			0.99			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.99			0.98			0.98			0.99	
Flt Protected		1.00			0.99			1.00			0.99	
Satd. Flow (prot)		3463			3447			1805			1816	
Flt Permitted		0.91			0.88			0.98			0.91	
Satd. Flow (perm)		3169			3051			1771			1668	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	40	400	39	32	216	28	19	294	52	39	196	21
RTOR Reduction (vph)	0	13	0	0	17	0	0	12	0	0	6	0
Lane Group Flow (vph)	0	466	0	0	259	0	0	353	0	0	250	0
Confl. Peds. (#/hr)	5		27	27		5	37		23	23		37
Confl. Bikes (#/hr)			10			6			2			2
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		20.5			20.5			20.5			20.5	
Effective Green, g (s)		20.5			20.5			20.5			20.5	
Actuated g/C Ratio		0.41			0.41			0.41			0.41	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Vehicle Extension (s)		2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)		1299			1250			726			683	
v/s Ratio Prot												
v/s Ratio Perm		c0.15			0.09			c0.20			0.15	
v/c Ratio		0.36			0.21			0.49			0.37	
Uniform Delay, d1		10.2			9.5			10.9			10.2	
Progression Factor		1.00			1.00			1.26			1.00	
Incremental Delay, d2		0.8			0.4			2.0			1.5	
Delay (s)		11.0			9.9			15.7			11.7	
Level of Service		B			A			B			B	
Approach Delay (s)		11.0			9.9			15.7			11.7	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	12.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	69.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	77	328	32	97	283	52	9	505	132	12	327	51
Future Volume (vph)	77	328	32	97	283	52	9	505	132	12	327	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.5		4.5	5.5			5.5			5.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			1.00	
Frpb, ped/bikes	1.00	0.96		1.00	0.95			0.91			0.96	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.98			0.97			0.98	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1770	1765		1770	1722			3111			1738	
Flt Permitted	0.95	1.00		0.95	1.00			0.95			0.97	
Satd. Flow (perm)	1770	1765		1770	1722			2952			1696	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	82	349	34	103	301	55	10	537	140	13	348	54
RTOR Reduction (vph)	0	4	0	0	8	0	0	23	0	0	5	0
Lane Group Flow (vph)	82	379	0	103	348	0	0	664	0	0	410	0
Confl. Peds. (#/hr)	118		151	151		118	117		153	153		117
Confl. Bikes (#/hr)			10			2			10			1
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases	3	8		7	4			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	5.6	24.6		7.0	26.0			42.9			42.9	
Effective Green, g (s)	5.6	24.6		7.0	26.0			42.9			42.9	
Actuated g/C Ratio	0.06	0.27		0.08	0.29			0.48			0.48	
Clearance Time (s)	4.5	5.5		4.5	5.5			5.5			5.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	110	482		137	497			1407			808	
v/s Ratio Prot	0.05	c0.21		c0.06	0.20							
v/s Ratio Perm								0.22			c0.24	
v/c Ratio	0.75	0.79		0.75	0.70			0.47			0.51	
Uniform Delay, d1	41.5	30.3		40.6	28.5			15.9			16.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	23.7	8.2		20.5	4.4			1.1			2.3	
Delay (s)	65.2	38.5		61.2	33.0			17.0			18.5	
Level of Service	E	D		E	C			B			B	
Approach Delay (s)		43.2			39.3			17.0			18.5	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	28.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	69.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	178	1247	2	1	474	106	3	1	2	136	0	51
Future Volume (vph)	178	1247	2	1	474	106	3	1	2	136	0	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5		4.5			4.5	
Lane Util. Factor	1.00	0.95	1.00		0.95	1.00		1.00			1.00	
Frpb, ped/bikes	1.00	1.00	0.97		1.00	0.96		0.99			0.99	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00		1.00			0.99	
Frt	1.00	1.00	0.85		1.00	0.85		0.95			0.96	
Flt Protected	0.95	1.00	1.00		1.00	1.00		0.98			0.96	
Satd. Flow (prot)	1770	3539	1538		3539	1527		1715			1701	
Flt Permitted	0.95	1.00	1.00		0.95	1.00		0.91			0.78	
Satd. Flow (perm)	1770	3539	1538		3376	1527		1605			1379	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	187	1313	2	1	499	112	3	1	2	143	0	54
RTOR Reduction (vph)	0	0	0	0	0	43	0	2	0	0	56	0
Lane Group Flow (vph)	187	1313	2	0	500	69	0	4	0	0	141	0
Confl. Peds. (#/hr)	3		10	10		3	7		8	8		7
Confl. Bikes (#/hr)			5			7						1
Turn Type	Prot	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6			2			4			4	
Permitted Phases			6	2		2	4			4		
Actuated Green, G (s)	11.5	77.5	77.5		61.5	61.5		13.5			13.5	
Effective Green, g (s)	11.5	77.5	77.5		61.5	61.5		13.5			13.5	
Actuated g/C Ratio	0.12	0.78	0.78		0.62	0.62		0.14			0.14	
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5		4.5			4.5	
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0		2.0			2.0	
Lane Grp Cap (vph)	203	2742	1191		2076	939		216			186	
v/s Ratio Prot	c0.11	c0.37										
v/s Ratio Perm			0.00		0.15	0.05		0.00			c0.10	
v/c Ratio	0.92	0.48	0.00		0.24	0.07		0.02			0.76	
Uniform Delay, d1	43.8	4.0	2.5		8.7	7.8		37.5			41.7	
Progression Factor	1.00	1.00	1.00		1.00	1.00		1.00			0.95	
Incremental Delay, d2	41.1	0.6	0.0		0.3	0.2		0.0			13.8	
Delay (s)	84.9	4.6	2.5		9.0	7.9		37.5			53.2	
Level of Service	F	A	A		A	A		D			D	
Approach Delay (s)		14.6			8.8			37.5			53.2	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	16.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	74.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	138	701	84	91	437	118	8	467	95	21	285	72
Future Volume (vph)	138	701	84	91	437	118	8	467	95	21	285	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			4.5			4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			1.00	
Frpb, ped/bikes	1.00	0.98		1.00	0.96			0.98			0.98	
Flpb, ped/bikes	0.92	1.00		0.94	1.00			1.00			1.00	
Frt	1.00	0.98		1.00	0.97			0.98			0.97	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1627	3398		1671	3274			3366			1766	
Flt Permitted	0.41	1.00		0.29	1.00			0.95			0.95	
Satd. Flow (perm)	697	3398		516	3274			3194			1683	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	147	746	89	97	465	126	9	497	101	22	303	77
RTOR Reduction (vph)	0	8	0	0	22	0	0	22	0	0	11	0
Lane Group Flow (vph)	147	827	0	97	569	0	0	585	0	0	391	0
Confl. Peds. (#/hr)	120		141	141		120	85		107	107		85
Confl. Bikes (#/hr)			1						11			6
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			4	
Permitted Phases	2			6			4			4		
Actuated Green, G (s)	52.3	52.3		52.3	52.3			27.2			27.2	
Effective Green, g (s)	52.3	52.3		52.3	52.3			27.2			27.2	
Actuated g/C Ratio	0.59	0.59		0.59	0.59			0.31			0.31	
Clearance Time (s)	5.0	5.0		5.0	5.0			4.5			4.5	
Vehicle Extension (s)	2.0	2.0		2.0	2.0			2.0			2.0	
Lane Grp Cap (vph)	409	1996		303	1923			976			514	
v/s Ratio Prot		c0.24			0.17							
v/s Ratio Perm	0.21			0.19				0.18			c0.23	
v/c Ratio	0.36	0.41		0.32	0.30			0.60			0.76	
Uniform Delay, d1	9.6	10.0		9.3	9.2			26.3			28.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	2.4	0.6		2.8	0.4			0.7			5.9	
Delay (s)	12.0	10.6		12.1	9.6			26.9			33.9	
Level of Service	B	B		B	A			C			C	
Approach Delay (s)		10.8			9.9			26.9			33.9	
Approach LOS		B			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	17.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	89.0	Sum of lost time (s)	9.5
Intersection Capacity Utilization	78.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	159	111	202	14	329	2	413	161	351	440	6
Future Volume (vph)	0	159	111	202	14	329	2	413	161	351	440	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5		4.5	4.5	4.5		4.0			4.0	
Lane Util. Factor		1.00		1.00	1.00	1.00		0.95			0.95	
Frpb, ped/bikes		0.98		1.00	1.00	1.00		0.98			1.00	
Flpb, ped/bikes		1.00		1.00	1.00	1.00		1.00			1.00	
Frt		0.94		1.00	1.00	0.85		0.96			1.00	
Flt Protected		1.00		0.95	1.00	1.00		1.00			0.98	
Satd. Flow (prot)		1705		1752	1845	1568		3276			3406	
Flt Permitted		1.00		0.95	1.00	1.00		0.95			0.55	
Satd. Flow (perm)		1705		1752	1845	1568		3123			1909	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	167	117	213	15	346	2	435	169	369	463	6
RTOR Reduction (vph)	0	22	0	0	0	17	0	34	0	0	0	0
Lane Group Flow (vph)	0	262	0	213	15	329	0	572	0	0	838	0
Confl. Peds. (#/hr)	37		11	11		37	54		49	49		54
Confl. Bikes (#/hr)						19			8			7
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type		NA		Prot	NA	pt+ov	Perm	NA		Prot	NA	
Protected Phases		2		1	6	6 7		8		7	4	
Permitted Phases	2						8					
Actuated Green, G (s)		20.0		16.5	41.0	81.5		28.0			68.0	
Effective Green, g (s)		20.0		16.5	41.0	81.5		28.0			68.0	
Actuated g/C Ratio		0.17		0.14	0.35	0.69		0.24			0.58	
Clearance Time (s)		4.5		4.5	4.5			4.0			4.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		290		246	643	1087		744			1563	
v/s Ratio Prot		c0.15		c0.12	0.01	0.21					c0.16	
v/s Ratio Perm								c0.18			0.15	
v/c Ratio		0.90		0.87	0.02	0.30		0.77			0.54	
Uniform Delay, d1		47.8		49.4	25.1	7.0		41.7			15.1	
Progression Factor		1.00		1.00	1.00	1.00		1.00			1.00	
Incremental Delay, d2		33.2		31.2	0.1	0.7		4.8			1.3	
Delay (s)		81.1		80.6	25.2	7.7		46.5			16.4	
Level of Service		F		F	C	A		D			B	
Approach Delay (s)		81.1			35.2			46.5			16.4	
Approach LOS		F			D			D			B	

Intersection Summary			
HCM 2000 Control Delay	37.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	117.5	Sum of lost time (s)	17.0
Intersection Capacity Utilization	91.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	528	98	43	417	56	114	530	115	51	398	84
Future Volume (vph)	28	528	98	43	417	56	114	530	115	51	398	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5			5.5			6.0			6.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frpb, ped/bikes		1.00			1.00			0.99			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.98			0.98			0.98			0.98	
Flt Protected		1.00			1.00			0.99			1.00	
Satd. Flow (prot)		3438			3459			3393			3418	
Flt Permitted		0.86			0.68			0.74			0.79	
Satd. Flow (perm)		2978			2376			2534			2730	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	556	103	45	439	59	120	558	121	54	419	88
RTOR Reduction (vph)	0	16	0	0	11	0	0	8	0	0	8	0
Lane Group Flow (vph)	0	672	0	0	532	0	0	791	0	0	553	0
Confl. Peds. (#/hr)	3		8	8		3	11		31	31		11
Confl. Bikes (#/hr)									1			
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		32.2			32.2			76.3			76.3	
Effective Green, g (s)		32.2			32.2			76.3			76.3	
Actuated g/C Ratio		0.27			0.27			0.64			0.64	
Clearance Time (s)		5.5			5.5			6.0			6.0	
Vehicle Extension (s)		2.0			2.0			2.0			2.0	
Lane Grp Cap (vph)		799			637			1611			1735	
v/s Ratio Prot												
v/s Ratio Perm		c0.23			0.22			c0.31			0.20	
v/c Ratio		0.84			0.84			0.49			0.32	
Uniform Delay, d1		41.5			41.4			11.6			10.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		7.7			8.9			1.1			0.5	
Delay (s)		49.1			50.3			12.6			10.5	
Level of Service		D			D			B			B	
Approach Delay (s)		49.1			50.3			12.6			10.5	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	29.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.5
Intersection Capacity Utilization	93.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	141	186	123	29	208	45	74	319	67	55	811	433
Future Volume (vph)	141	186	123	29	208	45	74	319	67	55	811	433
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99			1.00	0.97	1.00	1.00	0.89	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.94			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00			0.99	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1727			3511	1543	1770	3539	1405	1770	3539	1539
Flt Permitted	0.95	1.00			0.88	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1727			3108	1543	1770	3539	1405	1770	3539	1539
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	147	194	128	30	217	47	77	332	70	57	845	451
RTOR Reduction (vph)	0	18	0	0	0	36	0	0	44	0	0	261
Lane Group Flow (vph)	147	304	0	0	247	11	77	332	26	57	845	190
Confl. Peds. (#/hr)	10		20	20		10	6		22	22		6
Confl. Bikes (#/hr)						1			11			4
Turn Type	Prot	NA		Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	8			4		5	2		1	6	
Permitted Phases				4		4			2			6
Actuated Green, G (s)	24.1	58.1			30.0	30.0	10.7	48.5	48.5	10.4	48.2	48.2
Effective Green, g (s)	24.1	58.1			30.0	30.0	10.7	48.5	48.5	10.4	48.2	48.2
Actuated g/C Ratio	0.19	0.45			0.23	0.23	0.08	0.37	0.37	0.08	0.37	0.37
Clearance Time (s)	4.0	4.0			4.0	4.0	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	2.0	2.0			2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	328	771			717	356	145	1320	524	141	1312	570
v/s Ratio Prot	c0.08	c0.18					c0.04	0.09		0.03	c0.24	
v/s Ratio Perm					0.08	0.01			0.02			0.12
v/c Ratio	0.45	0.39			0.34	0.03	0.53	0.25	0.05	0.40	0.64	0.33
Uniform Delay, d1	47.0	24.1			41.8	38.7	57.2	28.2	26.0	56.9	33.8	29.4
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.4	1.5			0.1	0.0	1.9	0.5	0.2	0.7	2.4	1.6
Delay (s)	51.4	25.6			41.9	38.7	59.1	28.7	26.2	57.5	36.3	31.0
Level of Service	D	C			D	D	E	C	C	E	D	C
Approach Delay (s)		33.7			41.4			33.2			35.4	
Approach LOS		C			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	35.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	91.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	104	8	73	72	9	158	478	208	19	483	207
Future Volume (vph)	65	104	8	73	72	9	158	478	208	19	483	207
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00			1.00		1.00	0.97		1.00	0.99	
Flpb, ped/bikes		0.99			1.00		0.99	1.00		0.98	1.00	
Frt		0.99			0.99		1.00	0.95		1.00	0.96	
Flt Protected		0.98			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1799			1799		1758	1724		1732	1756	
Flt Permitted		0.79			0.67		0.34	1.00		0.34	1.00	
Satd. Flow (perm)		1445			1228		624	1724		618	1756	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	66	106	8	74	73	9	161	488	212	19	493	211
RTOR Reduction (vph)	0	2	0	0	3	0	0	14	0	0	14	0
Lane Group Flow (vph)	0	178	0	0	153	0	161	686	0	19	690	0
Confl. Peds. (#/hr)	31					31	14		32	32		14
Confl. Bikes (#/hr)						1			12			19
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			2			6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)		14.8			14.8		68.7	68.7		68.7	68.7	
Effective Green, g (s)		14.8			14.8		68.7	68.7		68.7	68.7	
Actuated g/C Ratio		0.16			0.16		0.75	0.75		0.75	0.75	
Clearance Time (s)		4.0			4.0		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		2.0			2.0		4.0	4.0		3.0	3.0	
Lane Grp Cap (vph)		232			197		465	1287		461	1311	
v/s Ratio Prot								c0.40			0.39	
v/s Ratio Perm		0.12			c0.12		0.26			0.03		
v/c Ratio		0.77			0.78		0.35	0.53		0.04	0.53	
Uniform Delay, d1		37.0			37.0		4.0	4.9		3.0	4.9	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		12.8			16.1		2.0	1.6		0.2	1.5	
Delay (s)		49.8			53.1		6.0	6.5		3.2	6.4	
Level of Service		D			D		A	A		A	A	
Approach Delay (s)		49.8			53.1			6.4			6.3	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	14.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	92.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	72.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	129	409	1	39	75	56	64	8	155	378	11
Future Volume (vph)	25	129	409	1	39	75	56	64	8	155	378	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0	3.0		4.5			4.5	
Lane Util. Factor		1.00	1.00		0.95	1.00		0.95			0.95	
Frpb, ped/bikes		1.00	0.98		1.00	0.99		1.00			1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00			1.00	
Frt		1.00	0.85		1.00	0.85		0.99			1.00	
Flt Protected		0.99	1.00		1.00	1.00		0.98			0.99	
Satd. Flow (prot)		1830	1537		3500	1546		3398			3445	
Flt Permitted		0.96	1.00		0.95	1.00		0.74			0.82	
Satd. Flow (perm)		1775	1537		3337	1546		2555			2863	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	26	133	422	1	40	77	58	66	8	160	390	11
RTOR Reduction (vph)	0	0	292	0	0	53	0	3	0	0	2	0
Lane Group Flow (vph)	0	159	130	0	41	24	0	129	0	0	559	0
Confl. Peds. (#/hr)			4	4			1					1
Confl. Bikes (#/hr)			5			3						1
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)		18.5	18.5		18.5	18.5		34.0			34.0	
Effective Green, g (s)		18.5	18.5		18.5	18.5		34.0			34.0	
Actuated g/C Ratio		0.31	0.31		0.31	0.31		0.57			0.57	
Clearance Time (s)		3.0	3.0		3.0	3.0		4.5			4.5	
Lane Grp Cap (vph)		547	473		1028	476		1447			1622	
v/s Ratio Prot												
v/s Ratio Perm		c0.09	0.08		0.01	0.02		0.05			c0.20	
v/c Ratio		0.29	0.28		0.04	0.05		0.09			0.34	
Uniform Delay, d1		15.8	15.7		14.5	14.6		5.9			7.0	
Progression Factor		1.00	1.00		1.00	1.00		1.00			1.00	
Incremental Delay, d2		1.3	1.4		0.1	0.2		0.1			0.6	
Delay (s)		17.1	17.1		14.6	14.8		6.1			7.6	
Level of Service		B	B		B	B		A			A	
Approach Delay (s)		17.1			14.7			6.1			7.6	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	12.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	67.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	206	383	390	0	0	0	0	438	137	215	324	0
Future Volume (vph)	206	383	390	0	0	0	0	438	137	215	324	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5						5.5			5.5	
Lane Util. Factor		0.95						0.95			0.95	
Frpb, ped/bikes		0.99						0.99			1.00	
Flpb, ped/bikes		1.00						1.00			1.00	
Frt		0.94						0.96			1.00	
Flt Protected		0.99						1.00			0.98	
Satd. Flow (prot)		3254						3367			3462	
Flt Permitted		0.99						1.00			0.57	
Satd. Flow (perm)		3254						3367			2009	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	224	416	424	0	0	0	0	476	149	234	352	0
RTOR Reduction (vph)	0	160	0	0	0	0	0	43	0	0	0	0
Lane Group Flow (vph)	0	904	0	0	0	0	0	582	0	0	586	0
Confl. Peds. (#/hr)	1		4	4		1	18		25	25		18
Confl. Bikes (#/hr)									6			3
Turn Type	Perm	NA						NA		Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4											
Actuated Green, G (s)		28.5						17.5			30.5	
Effective Green, g (s)		28.5						17.5			30.5	
Actuated g/C Ratio		0.41						0.25			0.44	
Clearance Time (s)		5.5						5.5			5.5	
Lane Grp Cap (vph)		1324						841			1072	
v/s Ratio Prot								c0.17			c0.07	
v/s Ratio Perm		0.28									0.16	
v/c Ratio		0.68						0.69			0.55	
Uniform Delay, d1		17.0						23.8			14.6	
Progression Factor		1.00						1.00			1.00	
Incremental Delay, d2		2.9						4.7			2.0	
Delay (s)		19.9						28.5			16.6	
Level of Service		B						C			B	
Approach Delay (s)		19.9			0.0			28.5			16.6	
Approach LOS		B			A			C			B	

Intersection Summary			
HCM 2000 Control Delay	21.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	82.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	NWL2	NWL	NWR
Lane Configurations										
Traffic Volume (vph)	40	145	16	223	174	181	7	530	317	124
Future Volume (vph)	40	145	16	223	174	181	7	530	317	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5		5.5	5.5	5.5		4.5	4.5	
Lane Util. Factor		0.95		1.00	0.95	0.95		0.97	1.00	
Frpb, ped/bikes		1.00		1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00		1.00	1.00	1.00		1.00	1.00	
Frt		0.99		1.00	1.00	0.99		1.00	0.96	
Flt Protected		0.99		0.95	1.00	1.00		0.95	0.97	
Satd. Flow (prot)		3493		1781	3574	3551		3467	1732	
Flt Permitted		0.99		0.62	1.00	1.00		0.95	0.97	
Satd. Flow (perm)		3493		1171	3574	3551		3467	1732	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	43	156	17	240	187	195	8	570	341	133
RTOR Reduction (vph)	0	9	0	0	0	4	0	0	0	0
Lane Group Flow (vph)	0	207	0	240	187	199	0	570	474	0
Confl. Peds. (#/hr)			2	4			4		1	2
Confl. Bikes (#/hr)			3							
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA	NA		Perm	Prot	
Protected Phases		3			2	2			4	
Permitted Phases	3			2				4		
Actuated Green, G (s)		18.5		20.0	20.0	20.0		17.0	17.0	
Effective Green, g (s)		18.5		20.0	20.0	20.0		17.0	17.0	
Actuated g/C Ratio		0.26		0.29	0.29	0.29		0.24	0.24	
Clearance Time (s)		4.5		5.5	5.5	5.5		4.5	4.5	
Lane Grp Cap (vph)		923		334	1021	1014		841	420	
v/s Ratio Prot					0.05	0.06			c0.27	
v/s Ratio Perm		0.06		c0.20				0.16		
v/c Ratio		0.22		0.72	0.18	0.20		0.68	1.13	
Uniform Delay, d1		20.1		22.5	18.8	18.9		24.0	26.5	
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.6		12.5	0.4	0.4		4.4	83.8	
Delay (s)		20.7		35.0	19.2	19.3		28.4	110.3	
Level of Service		C		C	B	B		C	F	
Approach Delay (s)		20.7			28.1	19.3			65.6	
Approach LOS		C			C	B			E	

Intersection Summary			
HCM 2000 Control Delay	47.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	85.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	460	22	107	134	13	63	34	145	12	41	5
Future Volume (vph)	4	460	22	107	134	13	63	34	145	12	41	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0	3.0		3.0			3.0	
Lane Util. Factor		1.00	1.00		1.00	1.00		1.00			1.00	
Frpb, ped/bikes		1.00	0.96		1.00	0.97		0.98			1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00			1.00	
Frt		1.00	0.85		1.00	0.85		0.92			0.99	
Flt Protected		1.00	1.00		0.98	1.00		0.99			0.99	
Satd. Flow (prot)		1844	1502		1798	1524		1639			1798	
Flt Permitted		1.00	1.00		0.70	1.00		0.92			0.94	
Satd. Flow (perm)		1842	1502		1280	1524		1531			1706	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	4	484	23	113	141	14	66	36	153	13	43	5
RTOR Reduction (vph)	0	0	11	0	0	7	0	98	0	0	3	0
Lane Group Flow (vph)	0	488	12	0	254	7	0	157	0	0	58	0
Confl. Peds. (#/hr)	8		20	20		8	11		6	6		11
Confl. Bikes (#/hr)			5			1						
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		1			1			2			2	
Permitted Phases	1		1	1		1	2			2		
Actuated Green, G (s)		26.0	26.0		26.0	26.0		18.0			18.0	
Effective Green, g (s)		26.0	26.0		26.0	26.0		18.0			18.0	
Actuated g/C Ratio		0.52	0.52		0.52	0.52		0.36			0.36	
Clearance Time (s)		3.0	3.0		3.0	3.0		3.0			3.0	
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)		957	781		665	792		551			614	
v/s Ratio Prot												
v/s Ratio Perm		c0.26	0.01		0.20	0.00		c0.10			0.03	
v/c Ratio		0.51	0.02		0.38	0.01		0.29			0.09	
Uniform Delay, d1		7.8	5.8		7.2	5.8		11.4			10.6	
Progression Factor		1.00	1.00		1.00	1.00		1.00			1.00	
Incremental Delay, d2		0.4	0.0		0.4	0.0		1.3			0.3	
Delay (s)		8.3	5.8		7.6	5.8		12.7			10.9	
Level of Service		A	A		A	A		B			B	
Approach Delay (s)		8.2			7.5			12.7			10.9	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	9.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	77.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	198	114	185	443	19	87
Future Volume (vph)	198	114	185	443	19	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	3.0	
Lane Util. Factor	0.95			1.00	1.00	
Frpb, ped/bikes	0.98			1.00	0.99	
Flpb, ped/bikes	1.00			0.99	1.00	
Frt	0.95			1.00	0.89	
Flt Protected	1.00			0.99	0.99	
Satd. Flow (prot)	3222			1791	1592	
Flt Permitted	1.00			0.78	0.99	
Satd. Flow (perm)	3222			1417	1592	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	220	127	206	492	21	97
RTOR Reduction (vph)	27	0	0	0	88	0
Lane Group Flow (vph)	320	0	0	698	30	0
Confl. Peds. (#/hr)		10	10		6	1
Confl. Bikes (#/hr)		2				
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Turn Type	NA		Perm	NA	Prot	
Protected Phases	2			6	4	
Permitted Phases			6			
Actuated Green, G (s)	53.8			53.8	6.2	
Effective Green, g (s)	53.8			53.8	6.2	
Actuated g/C Ratio	0.79			0.79	0.09	
Clearance Time (s)	5.0			5.0	3.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	2549			1121	145	
v/s Ratio Prot	0.10				c0.02	
v/s Ratio Perm				c0.49		
v/c Ratio	0.13			0.62	0.21	
Uniform Delay, d1	1.6			2.9	28.6	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	0.1			2.6	0.7	
Delay (s)	1.7			5.5	29.3	
Level of Service	A			A	C	
Approach Delay (s)	1.7			5.5	29.3	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	6.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	68.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	64.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	NWL2	NWL	NWR
Lane Configurations										
Traffic Volume (vph)	92	441	21	250	183	284	29	418	289	82
Future Volume (vph)	92	441	21	250	183	284	29	418	289	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5		5.5	5.5	5.5		4.5	4.5	
Lane Util. Factor		0.95		1.00	0.95	0.95		0.97	1.00	
Frpb, ped/bikes		1.00		1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00		0.99	1.00	1.00		1.00	1.00	
Frt		0.99		1.00	1.00	0.99		1.00	0.97	
Flt Protected		0.99		0.95	1.00	1.00		0.95	0.96	
Satd. Flow (prot)		3487		1754	3539	3482		3433	1727	
Flt Permitted		0.99		0.55	1.00	1.00		0.95	0.96	
Satd. Flow (perm)		3487		1015	3539	3482		3433	1727	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	99	474	23	269	197	305	31	449	311	88
RTOR Reduction (vph)	0	4	0	0	0	11	0	0	0	0
Lane Group Flow (vph)	0	592	0	269	197	325	0	449	399	0
Confl. Peds. (#/hr)			4	13			13		13	4
Confl. Bikes (#/hr)			3							
Turn Type	Perm	NA		Perm	NA	NA		Perm	Prot	
Protected Phases		3			2	2			4	
Permitted Phases	3			2				4		
Actuated Green, G (s)		18.5		20.0	20.0	20.0		17.0	17.0	
Effective Green, g (s)		18.5		20.0	20.0	20.0		17.0	17.0	
Actuated g/C Ratio		0.26		0.29	0.29	0.29		0.24	0.24	
Clearance Time (s)		4.5		5.5	5.5	5.5		4.5	4.5	
Lane Grp Cap (vph)		921		290	1011	994		833	419	
v/s Ratio Prot					0.06	0.09			c0.23	
v/s Ratio Perm		0.17		c0.27				0.13		
v/c Ratio		0.64		0.93	0.19	0.33		0.54	0.95	
Uniform Delay, d1		22.8		24.3	18.9	19.7		23.1	26.1	
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		3.4		37.2	0.4	0.9		2.5	33.5	
Delay (s)		26.3		61.4	19.3	20.6		25.6	59.6	
Level of Service		C		E	B	C		C	E	
Approach Delay (s)		26.3			43.6	20.6			41.6	
Approach LOS		C			D	C			D	

Intersection Summary			
HCM 2000 Control Delay	34.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	83.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	114	15	116	373	17	226	106	254	30	70	10
Future Volume (vph)	2	114	15	116	373	17	226	106	254	30	70	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0	3.0		3.0			3.0	
Lane Util. Factor		1.00	1.00		1.00	1.00		1.00			1.00	
Frpb, ped/bikes		1.00	0.97		1.00	0.97		0.99			1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00			1.00	
Frt		1.00	0.85		1.00	0.85		0.94			0.99	
Flt Protected		1.00	1.00		0.99	1.00		0.98			0.99	
Satd. Flow (prot)		1808	1496		1786	1485		1645			1756	
Flt Permitted		1.00	1.00		0.90	1.00		0.85			0.86	
Satd. Flow (perm)		1802	1496		1634	1485		1418			1532	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	2	120	16	122	393	18	238	112	267	32	74	11
RTOR Reduction (vph)	0	0	8	0	0	9	0	55	0	0	7	0
Lane Group Flow (vph)	0	122	8	0	515	9	0	562	0	0	110	0
Confl. Peds. (#/hr)	12		6	6		12	7		6	6		7
Confl. Bikes (#/hr)			2			5			1			
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		1			1			2			2	
Permitted Phases	1		1	1		1	2			2		
Actuated Green, G (s)		26.0	26.0		26.0	26.0		18.0			18.0	
Effective Green, g (s)		26.0	26.0		26.0	26.0		18.0			18.0	
Actuated g/C Ratio		0.52	0.52		0.52	0.52		0.36			0.36	
Clearance Time (s)		3.0	3.0		3.0	3.0		3.0			3.0	
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)		937	777		849	772		510			551	
v/s Ratio Prot												
v/s Ratio Perm		0.07	0.01		c0.32	0.01		c0.40			0.07	
v/c Ratio		0.13	0.01		0.61	0.01		1.10			0.20	
Uniform Delay, d1		6.2	5.8		8.4	5.8		16.0			11.0	
Progression Factor		1.00	1.00		1.00	1.00		1.00			1.00	
Incremental Delay, d2		0.1	0.0		1.2	0.0		70.6			0.8	
Delay (s)		6.2	5.8		9.6	5.8		86.6			11.8	
Level of Service		A	A		A	A		F			B	
Approach Delay (s)		6.2			9.5			86.6			11.8	
Approach LOS		A			A			F			B	

Intersection Summary			
HCM 2000 Control Delay	43.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	87.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	576	57	57	220	13	36
Future Volume (vph)	576	57	57	220	13	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	3.0	
Lane Util. Factor	0.95			1.00	1.00	
Frpb, ped/bikes	1.00			1.00	0.97	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	0.99			1.00	0.90	
Flt Protected	1.00			0.99	0.99	
Satd. Flow (prot)	3476			1841	1612	
Flt Permitted	1.00			0.81	0.99	
Satd. Flow (perm)	3476			1504	1612	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	619	61	61	237	14	39
RTOR Reduction (vph)	4	0	0	0	36	0
Lane Group Flow (vph)	676	0	0	298	17	0
Confl. Peds. (#/hr)		10	8		19	19
Confl. Bikes (#/hr)		7				
Turn Type	NA		Perm	NA	Prot	
Protected Phases	2			6	4	
Permitted Phases			6			
Actuated Green, G (s)	55.6			55.6	4.4	
Effective Green, g (s)	55.6			55.6	4.4	
Actuated g/C Ratio	0.82			0.82	0.06	
Clearance Time (s)	5.0			5.0	3.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	2842			1229	104	
v/s Ratio Prot	0.19				c0.01	
v/s Ratio Perm				c0.20		
v/c Ratio	0.24			0.24	0.16	
Uniform Delay, d1	1.4			1.4	30.1	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	0.2			0.5	0.7	
Delay (s)	1.6			1.9	30.8	
Level of Service	A			A	C	
Approach Delay (s)	1.6			1.9	30.8	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	3.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.24		
Actuated Cycle Length (s)	68.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	52.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	NWL2	NWL	NWR
Lane Configurations										
Traffic Volume (vph)	37	211	16	223	174	181	7	530	317	124
Future Volume (vph)	37	211	16	223	174	181	7	530	317	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5		5.5	5.5	5.5		4.5	4.5	
Lane Util. Factor		0.95		1.00	0.95	0.95		0.97	1.00	
Frpb, ped/bikes		1.00		1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00		1.00	1.00	1.00		1.00	1.00	
Frt		0.99		1.00	1.00	0.99		1.00	0.96	
Flt Protected		0.99		0.95	1.00	1.00		0.95	0.97	
Satd. Flow (prot)		3514		1781	3574	3551		3467	1732	
Flt Permitted		0.99		0.62	1.00	1.00		0.95	0.97	
Satd. Flow (perm)		3514		1171	3574	3551		3467	1732	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	40	227	17	240	187	195	8	570	341	133
RTOR Reduction (vph)	0	7	0	0	0	4	0	0	0	0
Lane Group Flow (vph)	0	277	0	240	187	199	0	570	474	0
Confl. Peds. (#/hr)			2	4			4		1	2
Confl. Bikes (#/hr)			3							
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA	NA		Perm	Prot	
Protected Phases		3			2	2			4	
Permitted Phases	3			2				4		
Actuated Green, G (s)		18.5		20.0	20.0	20.0		17.0	17.0	
Effective Green, g (s)		18.5		20.0	20.0	20.0		17.0	17.0	
Actuated g/C Ratio		0.26		0.29	0.29	0.29		0.24	0.24	
Clearance Time (s)		4.5		5.5	5.5	5.5		4.5	4.5	
Lane Grp Cap (vph)		928		334	1021	1014		841	420	
v/s Ratio Prot					0.05	0.06			c0.27	
v/s Ratio Perm		0.08		c0.20				0.16		
v/c Ratio		0.30		0.72	0.18	0.20		0.68	1.13	
Uniform Delay, d1		20.6		22.5	18.8	18.9		24.0	26.5	
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.8		12.5	0.4	0.4		4.4	83.8	
Delay (s)		21.4		35.0	19.2	19.3		28.4	110.3	
Level of Service		C		C	B	B		C	F	
Approach Delay (s)		21.4			28.1	19.3			65.6	
Approach LOS		C			C	B			E	

Intersection Summary			
HCM 2000 Control Delay	46.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	85.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	458	22	107	131	13	129	34	211	12	41	5
Future Volume (vph)	4	458	22	107	131	13	129	34	211	12	41	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0		3.0	3.0		3.0			3.0	
Lane Util. Factor		1.00	1.00		1.00	1.00		1.00			1.00	
Frpb, ped/bikes		1.00	0.96		1.00	0.97		0.98			1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00			1.00	
Frt		1.00	0.85		1.00	0.85		0.92			0.99	
Flt Protected		1.00	1.00		0.98	1.00		0.98			0.99	
Satd. Flow (prot)		1844	1502		1797	1524		1641			1798	
Flt Permitted		1.00	1.00		0.70	1.00		0.88			0.92	
Satd. Flow (perm)		1842	1502		1280	1524		1463			1676	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	4	482	23	113	138	14	136	36	222	13	43	5
RTOR Reduction (vph)	0	0	11	0	0	7	0	93	0	0	3	0
Lane Group Flow (vph)	0	486	12	0	251	7	0	301	0	0	58	0
Confl. Peds. (#/hr)	8		20	20		8	11		6	6		11
Confl. Bikes (#/hr)			5			1						
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		1			1			2			2	
Permitted Phases	1		1	1		1	2			2		
Actuated Green, G (s)		26.0	26.0		26.0	26.0		18.0			18.0	
Effective Green, g (s)		26.0	26.0		26.0	26.0		18.0			18.0	
Actuated g/C Ratio		0.52	0.52		0.52	0.52		0.36			0.36	
Clearance Time (s)		3.0	3.0		3.0	3.0		3.0			3.0	
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)		957	781		665	792		526			603	
v/s Ratio Prot												
v/s Ratio Perm		c0.26	0.01		0.20	0.00		c0.21			0.03	
v/c Ratio		0.51	0.02		0.38	0.01		0.57			0.10	
Uniform Delay, d1		7.8	5.8		7.2	5.8		12.9			10.6	
Progression Factor		1.00	1.00		1.00	1.00		1.00			1.00	
Incremental Delay, d2		0.4	0.0		0.4	0.0		4.5			0.3	
Delay (s)		8.3	5.8		7.5	5.8		17.4			10.9	
Level of Service		A	A		A	A		B			B	
Approach Delay (s)		8.1			7.4			17.4			10.9	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	11.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	84.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Appendix D

Transit Facility Map

AC Transit Route Map

MAP LEGEND

All-day Service (see timetables for details)

Limited hours of service (see timetables for details)

Line terminal

Regular Stops

Express portion of line, with stops

Double lines and asterisks indicate a lower level of service than on the solid route (see timetables for details)

XX **Transbay service** shown by lines beginning with letters

Bus turnaround

BART or Light Rail line, with station

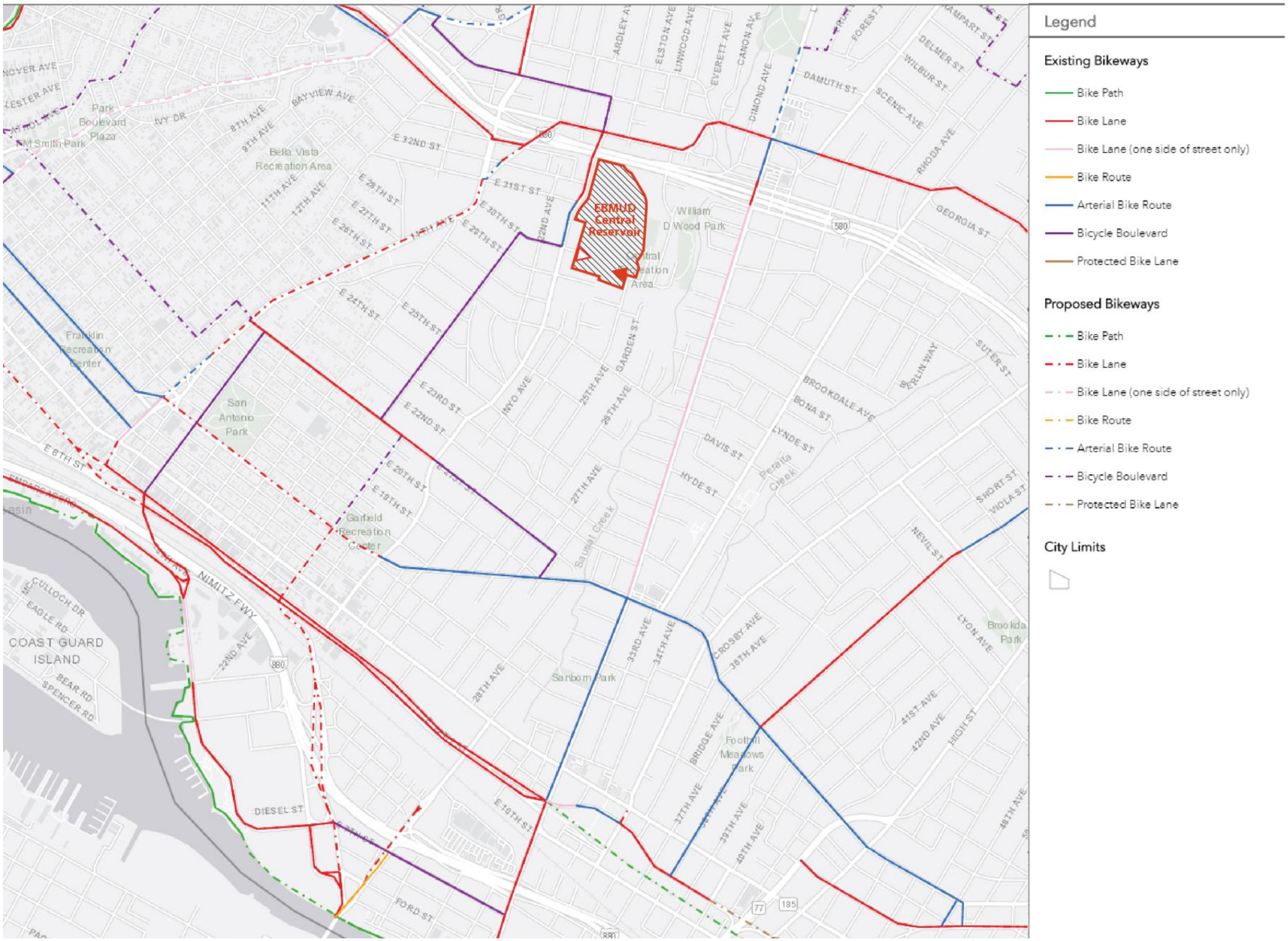
Other transit services

- Park & Ride lot
- Library
- Shopping center
- Hospital
- Point of interest
- Public school
- Private school

Appendix E

Bicycle Facility Map

City of Oakland, Existing & Proposed Bikeways



Appendix F

Trip Generation Worksheets

Table 1 Trip Generation by Phase

Phase	From	To	Duration (week)	Total Needs			Daily Trips			AM Peak Hour			PM Peak Hour		
				Number of Daily Workers	Hauling and Material Delivery Trips	Equipment Delivery Trips[1]	Worker Trips	Hauling and Material Delivery Trips	Total Trips	Worker Trips	Hauling and Material Delivery Trips [2]	Total Trips	Worker Trips	Hauling and Material Delivery Trips [2]	Total Trips
Demolition															
Site preparation, dewatering, well abandonment, demo materials bldg.	1/1/2024	1/31/2024	4	9	93	8	18	12	30	9	0	9	9	0	9
Roof Removal	2/1/2024	9/30/2024	35	9	327	7	18	4	22	9	0	9	9	0	9
Columns Removal	10/1/2024	1/31/2025	18	9	281	2	18	7	25	9	0	9	9	0	9
Liner Removal	**2/1/2025**	**3/31/2025**	**8**	**9**	**2,962**	**8**	**18**	**197**	**215**	**9**	**0**	**9**	**9**	**0**	**9**
Geotechnical investigation	4/1/2025	9/30/2025	26	0	0	0	0	0	0	0	0	0	0	0	0
Substructure Construction															
Access Road Improvements	10/1/2025	1/31/2026	18	13	0	3	26	0	26	13	0	13	13	0	13
CDSM foundation	2/1/2026	10/31/2026	39	12	1,046	3	24	11	35	12	0	12	12	0	12
Cement treated fill	11/1/2026	2/28/2027	17	7	1,760	8	14	45	59	7	0	7	7	0	7
Superstructure Construction															
Tank Foundation	3/1/2027	5/31/2027	13	11	682	4	22	19	41	11	0	11	11	0	11
Tank walls and columns	6/1/2027	10/31/2027	22	13	682	2	26	14	40	13	0	13	13	0	13
Tank roof slab	11/1/2027	6/30/2028	35	11	682	9	22	7	29	11	0	11	11	0	11
Prestressing & Shotcrete	7/1/2028	10/31/2028	17	11	682	2	22	19	41	11	0	11	11	0	11
Valve Structure	11/1/2028	4/30/2029	26	3	74	4	6	30	36	3	0	3	3	0	3
New Rate Control Station	11/1/2028	4/30/2029	26	5	16	2	10	16	26	5	0	5	5	0	5
Valve Structure & New Rate Control Station	11/1/2028	4/30/2029	26	8	90	6	16	46	62	8	0	8	8	0	8
Field Testing and startup	5/1/2029	7/31/2029	13	0	0	0	0	0	0	0	0	0	0	0	0
Site Restoration															
Landscaping, Irrigation System, Bio-retention area, Security Fence	5/1/2029	5/31/2029	4	7	47	2	14	6	20	7	0	7	7	0	7
Access Road Improvements	6/1/2029	6/30/2029	4	7	481	3	14	64	78	7	0	7	7	0	7
Redwood Day School Access Driveway	7/1/2029	7/31/2029	5	7	30	8	14	4	18	7	0	7	7	0	7

Source: ESA, 2018

Note: 1. Equipment delivery trips would occur only during the first week and last week of each phase.

2. Hauling and material delivery trips would occur only during non-peak hours (9 a.m. to 4 p.m.).

Bold = Phase with highest traffic volumes

Table 2 Trip Generation by Week

Week	From	To	Phase	Daily Trips: Worker Trips	Daily Trips: Hauling and Material Delivery Trips	Daily Trips: Equipment Truck Trips	Daily Trips: Total	AM plus PM Peak Hour Trips
1	1/1/2024	1/7/2024	Site preparation, dewatering, well abandonment, demo materials bldg.	18	12	6	36	18
2	1/8/2024	1/14/2024		18	12	0	30	18
3	1/15/2024	1/21/2024		18	12	0	30	18
4	1/22/2024	1/28/2024		18	12	2	32	18
5	1/29/2024	2/4/2024	Roof Removal	18	4	1	23	18
6	2/5/2024	2/11/2024		18	4	0	22	18
7	2/12/2024	2/18/2024		18	4	0	22	18
8	2/19/2024	2/25/2024		18	4	0	22	18
9	2/26/2024	3/3/2024		18	4	0	22	18
10	3/4/2024	3/10/2024		18	4	0	22	18
11	3/11/2024	3/17/2024		18	4	0	22	18
12	3/18/2024	3/24/2024		18	4	0	22	18
13	3/25/2024	3/31/2024		18	4	0	22	18
14	4/1/2024	4/7/2024		18	4	0	22	18
15	4/8/2024	4/14/2024		18	4	0	22	18
16	4/15/2024	4/21/2024		18	4	0	22	18
17	4/22/2024	4/28/2024		18	4	0	22	18
18	4/29/2024	5/5/2024		18	4	0	22	18
19	5/6/2024	5/12/2024		18	4	0	22	18
20	5/13/2024	5/19/2024		18	4	0	22	18
21	5/20/2024	5/26/2024		18	4	0	22	18
22	5/27/2024	6/2/2024		18	4	0	22	18
23	6/3/2024	6/9/2024		18	4	0	22	18
24	6/10/2024	6/16/2024		18	4	0	22	18
25	6/17/2024	6/23/2024		18	4	0	22	18
26	6/24/2024	6/30/2024		18	4	0	22	18
27	7/1/2024	7/7/2024		18	4	0	22	18
28	7/8/2024	7/14/2024		18	4	0	22	18
29	7/15/2024	7/21/2024		18	4	0	22	18
30	7/22/2024	7/28/2024		18	4	0	22	18
31	7/29/2024	8/4/2024		18	4	0	22	18
32	8/5/2024	8/11/2024		18	4	0	22	18
33	8/12/2024	8/18/2024		18	4	0	22	18
34	8/19/2024	8/25/2024		18	4	0	22	18
35	8/26/2024	9/1/2024		18	4	0	22	18
36	9/2/2024	9/8/2024		18	4	0	22	18
37	9/9/2024	9/15/2024		18	4	0	22	18
38	9/16/2024	9/22/2024		18	4	0	22	18
39	9/23/2024	9/29/2024		18	4	6	28	18
40	9/30/2024	10/6/2024	Columns Removal	18	7	0	25	18
41	10/7/2024	10/13/2024		18	7	0	25	18
42	10/14/2024	10/20/2024		18	7	0	25	18
43	10/21/2024	10/27/2024		18	7	0	25	18
44	10/28/2024	11/3/2024		18	7	0	25	18
45	11/4/2024	11/10/2024		18	7	0	25	18
46	11/11/2024	11/17/2024		18	7	0	25	18
47	11/18/2024	11/24/2024		18	7	0	25	18
48	11/25/2024	12/1/2024		18	7	0	25	18
49	12/2/2024	12/8/2024		18	7	0	25	18
50	12/9/2024	12/15/2024		18	7	0	25	18
51	12/16/2024	12/22/2024		18	7	0	25	18
52	12/23/2024	12/29/2024		18	7	0	25	18
53	12/30/2024	1/5/2025		18	7	0	25	18
54	1/6/2025	1/12/2025		18	7	0	25	18
55	1/13/2025	1/19/2025		18	7	0	25	18
56	1/20/2025	1/26/2025		18	7	0	25	18
57	1/27/2025	2/2/2025		18	7	2	27	18
58	**2/3/2025**	**2/9/2025**	**Liner Removal**	**18**	**197**	**8**	**223**	**18**
59	**2/10/2025**	**2/16/2025**		**18**	**197**	**0**	**215**	**18**
60	**2/17/2025**	**2/23/2025**		**18**	**197**	**0**	**215**	**18**
61	**2/24/2025**	**3/2/2025**		**18**	**197**	**0**	**215**	**18**
62	**3/3/2025**	**3/9/2025**		**18**	**197**	**0**	**215**	**18**
63	**3/10/2025**	**3/16/2025**		**18**	**197**	**0**	**215**	**18**
64	**3/17/2025**	**3/23/2025**		**18**	**197**	**0**	**215**	**18**
65	**3/24/2025**	**3/30/2025**		**18**	**197**	**0**	**215**	**18**
66	3/31/2025	4/6/2025	Geotechnical investigation	0	0	0	0	0
67	4/7/2025	4/13/2025		0	0	0	0	0
68	4/14/2025	4/20/2025		0	0	0	0	0
69	4/21/2025	4/27/2025		0	0	0	0	0
70	4/28/2025	5/4/2025		0	0	0	0	0

71	5/5/2025	5/11/2025		0	0	0	0	0
72	5/12/2025	5/18/2025		0	0	0	0	0
73	5/19/2025	5/25/2025		0	0	0	0	0
74	5/26/2025	6/1/2025		0	0	0	0	0
75	6/2/2025	6/8/2025		0	0	0	0	0
76	6/9/2025	6/15/2025		0	0	0	0	0
77	6/16/2025	6/22/2025		0	0	0	0	0
78	6/23/2025	6/29/2025		0	0	0	0	0
79	6/30/2025	7/6/2025		0	0	0	0	0
80	7/7/2025	7/13/2025		0	0	0	0	0
81	7/14/2025	7/20/2025		0	0	0	0	0
82	7/21/2025	7/27/2025		0	0	0	0	0
83	7/28/2025	8/3/2025		0	0	0	0	0
84	8/4/2025	8/10/2025		0	0	0	0	0
85	8/11/2025	8/17/2025		0	0	0	0	0
86	8/18/2025	8/24/2025		0	0	0	0	0
87	8/25/2025	8/31/2025		0	0	0	0	0
88	9/1/2025	9/7/2025		0	0	0	0	0
89	9/8/2025	9/14/2025		0	0	0	0	0
90	9/15/2025	9/21/2025		0	0	0	0	0
91	9/22/2025	9/28/2025		0	0	0	0	0
92	9/29/2025	10/5/2025		26	0	3	29	26
93	10/6/2025	10/12/2025		26	0	0	26	26
94	10/13/2025	10/19/2025		26	0	0	26	26
95	10/20/2025	10/26/2025		26	0	0	26	26
96	10/27/2025	11/2/2025		26	0	0	26	26
97	11/3/2025	11/9/2025		26	0	0	26	26
98	11/10/2025	11/16/2025		26	0	0	26	26
99	11/17/2025	11/23/2025		26	0	0	26	26
100	11/24/2025	11/30/2025		26	0	0	26	26
101	12/1/2025	12/7/2025	Grading and excavation	26	0	0	26	26
102	12/8/2025	12/14/2025		26	0	0	26	26
103	12/15/2025	12/21/2025		26	0	0	26	26
104	12/22/2025	12/28/2025		26	0	0	26	26
105	12/29/2025	1/4/2026		26	0	0	26	26
106	1/5/2026	1/11/2026		26	0	0	26	26
107	1/12/2026	1/18/2026		26	0	0	26	26
108	1/19/2026	1/25/2026		26	0	0	26	26
109	1/26/2026	2/1/2026		26	0	3	29	26
110	2/2/2026	2/8/2026		24	11	1	36	24
111	2/9/2026	2/15/2026		24	11	0	35	24
112	2/16/2026	2/22/2026		24	11	0	35	24
113	2/23/2026	3/1/2026		24	11	0	35	24
114	3/2/2026	3/8/2026		24	11	0	35	24
115	3/9/2026	3/15/2026		24	11	0	35	24
116	3/16/2026	3/22/2026	CDSM foundation	24	11	0	35	24
117	3/23/2026	3/29/2026		24	11	0	35	24
118	3/30/2026	4/5/2026		24	11	0	35	24
119	4/6/2026	4/12/2026		24	11	0	35	24
120	4/13/2026	4/19/2026		24	11	0	35	24
121	4/20/2026	4/26/2026		24	11	0	35	24
122	4/27/2026	5/3/2026		24	11	0	35	24
123	5/4/2026	5/10/2026		24	11	0	35	24
124	5/11/2026	5/17/2026		24	11	0	35	24
125	5/18/2026	5/24/2026		24	11	0	35	24
126	5/25/2026	5/31/2026		24	11	0	35	24
127	6/1/2026	6/7/2026		24	11	0	35	24
128	6/8/2026	6/14/2026		24	11	0	35	24
129	6/15/2026	6/21/2026		24	11	0	35	24
130	6/22/2026	6/28/2026		24	11	0	35	24
131	6/29/2026	7/5/2026		24	11	0	35	24
132	7/6/2026	7/12/2026		24	11	0	35	24
133	7/13/2026	7/19/2026		24	11	0	35	24
134	7/20/2026	7/26/2026	CDSM foundation	24	11	0	35	24
135	7/27/2026	8/2/2026		24	11	0	35	24
136	8/3/2026	8/9/2026		24	11	0	35	24
137	8/10/2026	8/16/2026		24	11	0	35	24
138	8/17/2026	8/23/2026		24	11	0	35	24
139	8/24/2026	8/30/2026		24	11	0	35	24
140	8/31/2026	9/6/2026		24	11	0	35	24
141	9/7/2026	9/13/2026		24	11	0	35	24
142	9/14/2026	9/20/2026		24	11	0	35	24
143	9/21/2026	9/27/2026		24	11	0	35	24
144	9/28/2026	10/4/2026		24	11	0	35	24
145	10/5/2026	10/11/2026		24	11	0	35	24
146	10/12/2026	10/18/2026		24	11	0	35	24

147	10/19/2026	10/25/2026		24	11	0	35	24
148	10/26/2026	11/1/2026		24	11	2	37	24
149	11/2/2026	11/8/2026		14	45	4	63	14
150	11/9/2026	11/15/2026		14	45	0	59	14
151	11/16/2026	11/22/2026		14	45	0	59	14
152	11/23/2026	11/29/2026		14	45	0	59	14
153	11/30/2026	12/6/2026		14	45	0	59	14
154	12/7/2026	12/13/2026		14	45	0	59	14
155	12/14/2026	12/20/2026		14	45	0	59	14
156	12/21/2026	12/27/2026		14	45	0	59	14
157	12/28/2026	1/3/2027	Cement treated fill	14	45	0	59	14
158	1/4/2027	1/10/2027		14	45	0	59	14
159	1/11/2027	1/17/2027		14	45	0	59	14
160	1/18/2027	1/24/2027		14	45	0	59	14
161	1/25/2027	1/31/2027		14	45	0	59	14
162	2/1/2027	2/7/2027		14	45	0	59	14
163	2/8/2027	2/14/2027		14	45	0	59	14
164	2/15/2027	2/21/2027		14	45	0	59	14
165	2/22/2027	2/28/2027		14	45	4	63	14
166	3/1/2027	3/7/2027		22	19	2	43	22
167	3/8/2027	3/14/2027		22	19	0	41	22
168	3/15/2027	3/21/2027		22	19	0	41	22
169	3/22/2027	3/28/2027		22	19	0	41	22
170	3/29/2027	4/4/2027		22	19	0	41	22
171	4/5/2027	4/11/2027		22	19	0	41	22
172	4/12/2027	4/18/2027	Tank Foundation	22	19	0	41	22
173	4/19/2027	4/25/2027		22	19	0	41	22
174	4/26/2027	5/2/2027		22	19	0	41	22
175	5/3/2027	5/9/2027		22	19	0	41	22
176	5/10/2027	5/16/2027		22	19	0	41	22
177	5/17/2027	5/23/2027		22	19	0	41	22
178	5/24/2027	5/30/2027		22	19	2	43	22
179	5/31/2027	6/6/2027		26	14	1	41	26
180	6/7/2027	6/13/2027		26	14	0	40	26
181	6/14/2027	6/20/2027		26	14	0	40	26
182	6/21/2027	6/27/2027		26	14	0	40	26
183	6/28/2027	7/4/2027		26	14	0	40	26
184	7/5/2027	7/11/2027		26	14	0	40	26
185	7/12/2027	7/18/2027		26	14	0	40	26
186	7/19/2027	7/25/2027		26	14	0	40	26
187	7/26/2027	8/1/2027		26	14	0	40	26
188	8/2/2027	8/8/2027		26	14	0	40	26
189	8/9/2027	8/15/2027		26	14	0	40	26
190	8/16/2027	8/22/2027	Tank walls and columns	26	14	0	40	26
191	8/23/2027	8/29/2027		26	14	0	40	26
192	8/30/2027	9/5/2027		26	14	0	40	26
193	9/6/2027	9/12/2027		26	14	0	40	26
194	9/13/2027	9/19/2027		26	14	0	40	26
195	9/20/2027	9/26/2027		26	14	0	40	26
196	9/27/2027	10/3/2027		26	14	0	40	26
197	10/4/2027	10/10/2027		26	14	0	40	26
198	10/11/2027	10/17/2027		26	14	0	40	26
199	10/18/2027	10/24/2027		26	14	0	40	26
200	10/25/2027	10/31/2027		26	14	1	41	26
201	11/1/2027	11/7/2027		22	7	3	32	22
202	11/8/2027	11/14/2027		22	7	0	29	22
203	11/15/2027	11/21/2027		22	7	0	29	22
204	11/22/2027	11/28/2027		22	7	0	29	22
205	11/29/2027	12/5/2027		22	7	0	29	22
206	12/6/2027	12/12/2027		22	7	0	29	22
207	12/13/2027	12/19/2027		22	7	0	29	22
208	12/20/2027	12/26/2027		22	7	0	29	22
209	12/27/2027	1/2/2028		22	7	0	29	22
210	1/3/2028	1/9/2028		22	7	0	29	22
211	1/10/2028	1/16/2028		22	7	0	29	22
212	1/17/2028	1/23/2028	Tank roof slab	22	7	0	29	22
213	1/24/2028	1/30/2028		22	7	0	29	22
214	1/31/2028	2/6/2028		22	7	0	29	22
215	2/7/2028	2/13/2028		22	7	0	29	22
216	2/14/2028	2/20/2028		22	7	0	29	22
217	2/21/2028	2/27/2028		22	7	0	29	22
218	2/28/2028	3/5/2028		22	7	0	29	22
219	3/6/2028	3/12/2028		22	7	0	29	22
220	3/13/2028	3/19/2028		22	7	0	29	22
221	3/20/2028	3/26/2028		22	7	0	29	22
222	3/27/2028	4/2/2028		22	7	0	29	22

223	4/3/2028	4/9/2028		22	7	0	29	22
224	4/10/2028	4/16/2028		22	7	0	29	22
225	4/17/2028	4/23/2028		22	7	0	29	22
226	4/24/2028	4/30/2028		22	7	0	29	22
227	5/1/2028	5/7/2028		22	7	0	29	22
228	5/8/2028	5/14/2028		22	7	0	29	22
229	5/15/2028	5/21/2028		22	7	0	29	22
230	5/22/2028	5/28/2028		22	7	0	29	22
231	5/29/2028	6/4/2028		22	7	0	29	22
232	6/5/2028	6/11/2028		22	7	0	29	22
233	6/12/2028	6/18/2028		22	7	0	29	22
234	6/19/2028	6/25/2028		22	7	0	29	22
235	6/26/2028	7/2/2028		22	7	6	35	22
236	7/3/2028	7/9/2028	Prestressing & Shotcrete	22	19	1	42	22
237	7/10/2028	7/16/2028		22	19	0	41	22
238	7/17/2028	7/23/2028		22	19	0	41	22
239	7/24/2028	7/30/2028		22	19	0	41	22
240	7/31/2028	8/6/2028		22	19	0	41	22
241	8/7/2028	8/13/2028		22	19	0	41	22
242	8/14/2028	8/20/2028		22	19	0	41	22
243	8/21/2028	8/27/2028		22	19	0	41	22
244	8/28/2028	9/3/2028		22	19	0	41	22
245	9/4/2028	9/10/2028		22	19	0	41	22
246	9/11/2028	9/17/2028		22	19	0	41	22
247	9/18/2028	9/24/2028		22	19	0	41	22
248	9/25/2028	10/1/2028		22	19	0	41	22
249	10/2/2028	10/8/2028		22	19	0	41	22
250	10/9/2028	10/15/2028		22	19	0	41	22
251	10/16/2028	10/22/2028		22	19	0	41	22
252	10/23/2028	10/29/2028		22	19	1	42	22
253	10/30/2028	11/5/2028	Valve Structure & New Rate Control Station	16	46	4	66	16
254	11/6/2028	11/12/2028		16	0	0	16	16
255	11/13/2028	11/19/2028		16	0	0	16	16
256	11/20/2028	11/26/2028		16	0	0	16	16
257	11/27/2028	12/3/2028		16	0	0	16	16
258	12/4/2028	12/10/2028		16	0	0	16	16
259	12/11/2028	12/17/2028		16	0	0	16	16
260	12/18/2028	12/24/2028		16	0	0	16	16
261	12/25/2028	12/31/2028		16	0	0	16	16
262	1/1/2029	1/7/2029		16	0	0	16	16
263	1/8/2029	1/14/2029		16	0	0	16	16
264	1/15/2029	1/21/2029		16	0	0	16	16
265	1/22/2029	1/28/2029		16	0	0	16	16
266	1/29/2029	2/4/2029		16	0	0	16	16
267	2/5/2029	2/11/2029		16	0	0	16	16
268	2/12/2029	2/18/2029		16	0	0	16	16
269	2/19/2029	2/25/2029		16	0	0	16	16
270	2/26/2029	3/4/2029		16	0	0	16	16
271	3/5/2029	3/11/2029		16	0	0	16	16
272	3/12/2029	3/18/2029		16	0	0	16	16
273	3/19/2029	3/25/2029		16	0	0	16	16
274	3/26/2029	4/1/2029		16	0	0	16	16
275	4/2/2029	4/8/2029		16	0	0	16	16
276	4/9/2029	4/15/2029		16	0	0	16	16
277	4/16/2029	4/22/2029		16	0	0	16	16
278	4/23/2029	4/29/2029		16	0	2	18	16
279	4/30/2029	5/6/2029	Landscaping, Irrigation System, Bio-retention area, Security Fence	14	6	2	22	14
280	5/7/2029	5/13/2029		14	6	0	20	14
281	5/14/2029	5/20/2029		14	6	0	20	14
282	5/21/2029	5/27/2029		14	6	0	20	14
283	5/28/2029	6/3/2029	Access Road Improvements	14	64	3	81	14
284	6/4/2029	6/10/2029		14	64	0	78	14
285	6/11/2029	6/17/2029		14	64	0	78	14
286	6/18/2029	6/24/2029		14	64	0	78	14
287	6/25/2029	7/1/2029	Redwood Day School Access Driveway	14	4	0	18	14
288	7/2/2029	7/8/2029		14	4	0	18	14
289	7/9/2029	7/15/2029		14	4	0	18	14
290	7/16/2029	7/22/2029		14	4	0	18	14
291	7/23/2029	7/29/2029		14	4	8	26	14

Source: ESA, 2018

Bold = Phase with highest traffic volumes

Appendix G

Redwood Day School Traffic

Redwood Day School is located in the northeast corner of the project site. The school has approximately 380 students from kindergarten through eighth grade. Redwood Day School is open from 7:45 a.m. to 6 p.m. including extended cares before 8:30 a.m. and after 3 p.m. Student pick-up and drop-off activities occur along the existing white passenger loading zone on the west side of Sheffield Avenue adjacent to the school. For the purpose of peak-hour traffic estimation, CHS assumes that the peak drop-off hour is one hour before the school starts at 8:30 a.m., and the peak pick-up hour is one hour after the school ends at 3 p.m., as shown in **Table 1**.

Table 1 – School Traffic Peak Hours

Bell Schedule	8:30 a.m. – 3 p.m.
Peak Drop-off	7:30 – 8:30 a.m.
Peak Pick-up	3 – 4 p.m.

It is reported that the majority of parents currently drop off or pick up students at the existing white passenger loading zone on Sheffield Avenue in the southbound direction, then make U-turns near Morrison Avenue to travel north to I-580. The number of vehicles making U-turns on Sheffield Avenue near Morrison Avenue was estimated based on the existing traffic volumes counted on Sheffield Avenue north of Redwood Day School and south of Morrison Avenue, on Wednesday, May 23, 2018. It is noted that a portion of the existing vehicle trips counted north of Redwood Day School is estimated to make trips to and from local residences or the existing Redwood Day School parking lot. Therefore, the traffic volumes on Sheffield Avenue were balanced by comparing volumes in the northbound and southbound directions.

Table 2 – Traffic Volumes on Sheffield Avenue

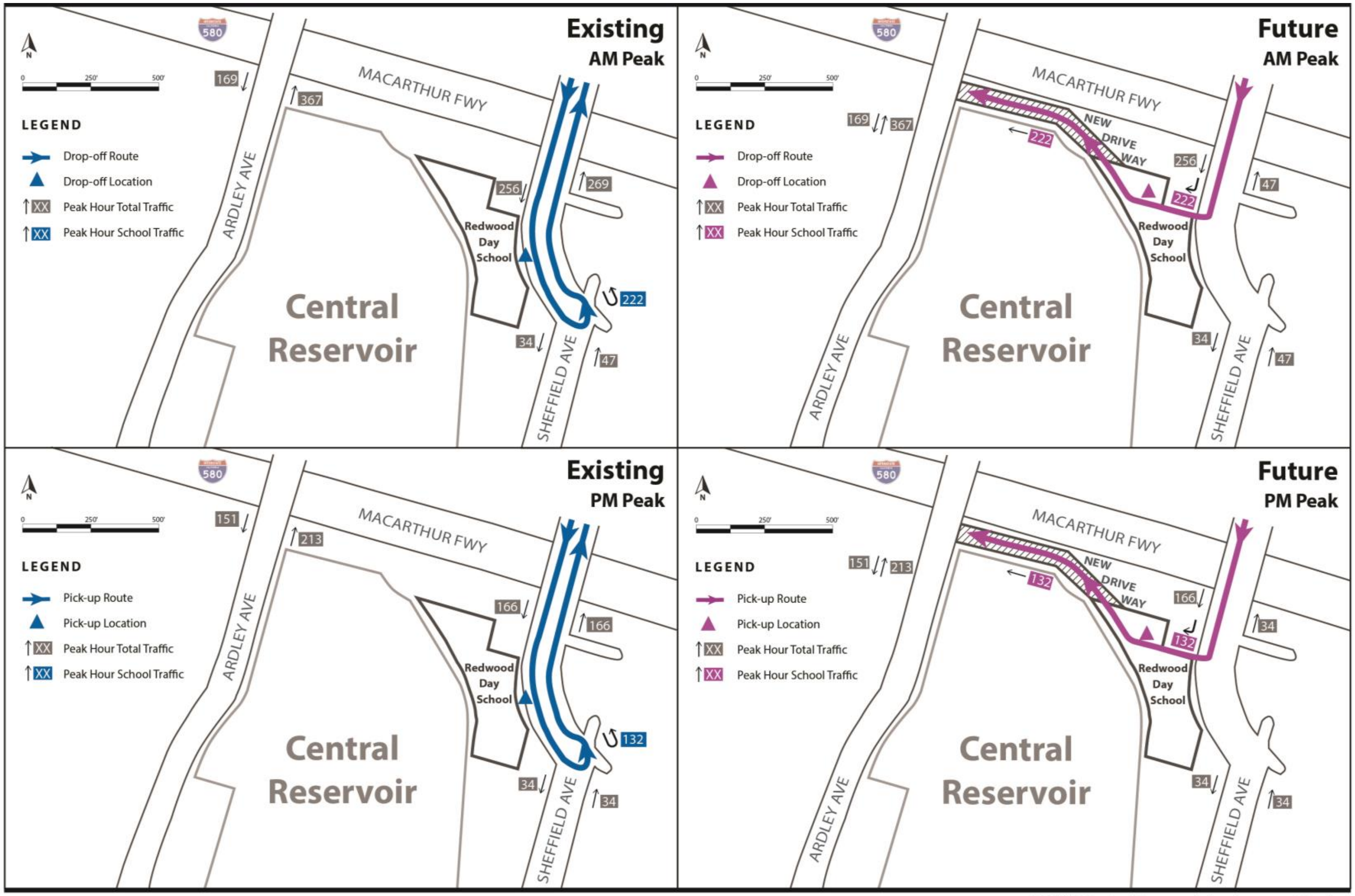
Peak Drop-off 7:30 – 8:30 a.m.		
	Southbound	Northbound
South of the Existing Driveway to RDS Parking Lot	256[1]	269
South of Morrison Street	34	47
Estimated Number of U-turns	222	
Peak Pick-up 3 – 4 p.m.		
	Southbound	Northbound
South of the Existing Driveway to RDS Parking Lot	166	166[2]
South of Morrison Street	34	34
Estimated Number of U-turns	**132**	

Note:

1. Of the total 288 vehicle trips collected north of the driveway, approximately 32 vehicle trips are estimated to enter the RDS parking lot or local residences.
2. Of the total 178 vehicle trips collected north of the driveway, approximately 12 vehicle trips are estimated to exit from the RDS parking lot or local residences.

RDS=Redwood Day School

Figure below illustrates the estimated number of vehicle trips diverted from Sheffield Avenue to Ardley Avenue.



EBMUD Central Reservoir Replacement Project

Exsiting and Future Peak Hour Redwood Day School Traffic

CHS Consulting Group