DRAFT

ENVIRONMENTAL ASSESSMENT FOR FORTIFICATION OF SECURITY GATES AT THE JET PROPULSION LABORATORY

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

SUBMITTED BY GSI

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Acronyms and Abbreviations

ACM	Asbestos Containing Materials
ANF	Angeles National Forest
APEFZ	Alquist Priolo Earthquake Fault Zones
ASTM	American Society for Testing and Materials
bgs	below ground surface
BMP	best management practice
CAAQS	California Ambient Air Quality Standards
CAA	Clean Air Act
CalDTSC	California Department of Toxic Substances Control
CalRecycle	California Department of Resources Recycling and Recovery
Caltech	California Institute of Technology
CCAA	California Clean Air Act
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CEPA ARB	California Environmental Protection Agency Air Resources Board
CESA	California Endangered Species Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CGS	California Geological Survey
CLARS	California Laboratory for Atmospheric Remote Sensing
CO	carbon monoxide
CO_2	carbon dioxide
CPUC	California Public Utilities Commission
CWA	Clean Water Act
dB	decibels
dBA	decibels-A-weighted Scale
DSN	Deep Space Network
EA	Environmental Assessment
EO	Executive Order
EPCRA	Emergency Planning and Community Right to Know Act
ERD	Environmental Resource Document
ESA	Endangered Species Act
ESA	Environmental Site Assessment
FEMA	Federal Emergency Management Agency
FFRDC	Federally Funded Research and Development Center
FONSI	Finding of No Significant Impact
FR	Federal Register

Acronyms and Abbreviations (continued)

GDSCC	Goldstone Deep Space Communication Complex
GHG	Greenhouse Gas
H_2S	Hydrogen Sulfide
HWP	Hahamongna Watershed Park
I	Interstate
JPL	Jet Propulsion Laboratory
LACFD	Los Angeles County Fire Department
LACSD	Los Angeles County Sanitation Department
MBTA	Migratory Bird Treaty Act
MWD	Metropolitan Water District
NAAQS	National Ambient Air Quality Standards
NASA	National Aeronautics and Space Administration
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NH_4	methane
NMFS	National Marine Fisheries Service
NO	nitrous oxide
NOx	nitrogen oxides
NO_2	nitrogen dioxide
NPD	NASA Policy Directives
NPDES	National Pollution Discharge Elimination System
NPG	NASA Policy Guidance
NPL	National Priority List
NPR	NASA Policy Requirement
NRHP	National Register of Historic Places
O_3	ozone
OHP	California State Office of Historic Preservation
PCB	Polychlorinated Biphenyl
PEA	Programmatic Environmental Assessment
Pb	lead
$PM_{2.5}$	less than or equal to 2.5 microns in diameter
PM_{10}	particulate matter less than or equal to ten microns in diameter
PVC	polyvinyl chloride
RCRA	Resource Conservation and Recovery Act
SARA	Superfund Amendments and Reauthorization Act
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SHMP	Seismic Hazard Mapping Program
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan

Acronyms and Abbreviations (continued)

SO_2	sulfur dioxide
SOCAB	South Coast Air Basin
SR	State Route
SRA	Source Receptor Areas
SWPPP	Storm Water Pollution Prevention Plan
TMF	Table Mountain Facility
TSCA	Toxic Substances Controls Act
TSP	total suspended particulates
U.S.	United States
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
USGS	U.S. Geological Survey
VOC	volatile organic compound
vpd	vehicles per day
VRP	Visibility Reducing Particle

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EXECUTIVE SUMMARY

ES-1 INTRODUCTION

This Environmental Assessment (EA) is prepared in accordance with the National Environmental Policy Act (NEPA) of 1969; 40 Code of Federal Regulations (CFR), Parts 1500-1508, the Council on Environmental Quality (CEQ) regulations implementing NEPA; and National Aeronautics and Space Administration (NASA) NEPA Guideline found in NASA Procedural Requirement (NPR) 8580.1A, *Implementing the National Environmental Policy Act and Executive Order 12114*.

The NASA Jet Propulsion Laboratory (JPL) is a Federally Funded Research and Development Center (FFRDC) operated by the California Institute of Technology (Caltech) under a contract (known as the Prime Contract) with the National Aeronautics and Space Administration (NASA). JPL is NASA's lead FFRDC for the robotic exploration of the solar system, and is responsible for operating NASA's Deep Space Network (DSN).

In 2010-2011, NASA conducted an analysis of existing facilities and infrastructure, while simultaneously forecasting future needs and objectives to enable NASA to meet its mission. NASA JPL developed a comprehensive facility planning strategy which would cover the next two decades through the concurrent implementation of the NASA JPL Master Plan Update 2011-2032 for the three NASA Caltech-managed facilities in California: the main JPL facility on Oak Grove Drive in Pasadena (hereafter referred to as "NASA JPL"), Goldstone Deep Space Communication Complex (GDSCC) near Barstow, and the Table Mountain Facility (TMF) in Wrightwood. NASA prepared a Programmatic Environmental Assessment (PEA), 2011 NASA JPL Facility Master Plan Updates Programmatic Environmental Assessment (NASA 2012a), to analyze the potential impacts from implementing the Master Plan Update for these three NASA Caltech-managed facilities. The Finding of No Significant Impact was signed on January 25, 2012. This EA has been tiered from and incorporates information from this decision document by reference.

This EA provides a NEPA-compliant analysis for the proposed alternatives to implement functional requirements for the FY 2015 Construction of Facilities project, Fortify Security Gates, at the Jet Propulsion Laboratory in conformance with NASA NPD 8820.2C Design and Construction of Facilities and NPR 1620.3 NASA Procedural Requirements, as implemented through the NASA JPL Prime Contract. This would include widening, reconfiguring, and enhancing access points at the West, South, and East Gates of the NASA JPL facility in order to improve the movement of vehicle traffic, especially during morning and afternoon peak hours. The scope of work would include vehicle guard structures, inspection lighting, electronic monitoring and controls/equipment, pop up bollards, barricades, parking areas, etc. to enhance vehicle safety into and out of the NASA JPL facility.

ES-2 PURPOSE AND NEED

The *purpose* of the Proposed Action is to remedy security inadequacies and improve vehicular circulation issues at each of the three security gates, through development of security infrastructure and reconfiguration of vehicular parking and circulation in discrete areas of the NASA JPL facility.

The *need* for the Proposed Action is to meet NASA Procedural Requirement 1620.3, Physical Security Requirements for NASA Facilities and Property, which specifically requires that designated vehicle inspection areas not interfere with the vehicular traffic or pedestrian flow on- and off-center to ensure the safety of the NASA JPL workforce and the General Public, and NASA assets. Further, NPR 1620.3 specifies:

"6.3.3.4. The immediate boundaries of a NASA Center and any specific designated security area shall be fenced … This defines the perimeter, provides a buffer zone, facilitates control, and makes accidental intrusion unlikely."

"6.3.3.6. The size of an individual internal security area shall depend on the degree of sensitivity required and the complexity of the area. As a rule, size should be kept to a minimum consistent with operational efficiency. Positive barriers at NASA Centers shall be established for:

a) Controlling vehicular and pedestrian traffic flow.

b) Checking identification of personnel entering or departing.

c) Conducting random vehicle checks.

d) Defining a buffer zone for more highly classified or sensitive areas."

In addition, the need is motivated by inadequacies in current security checkpoint configurations resulting in security vulnerabilities, safety hazards, and delays in traffic flow.

ES-3 ALTERNATIVES CONSIDERED

The following requirements were identified to fulfill the purpose and need of the Proposed Action at the NASA JPL. All alternatives were screened against the following criteria:

- Any alternative must adequately remedy security inadequacies at NASA JPL consistent with NASA policy and guidance, specifically NASA Procedural Requirement 1620.3, *Physical Security Requirements for NASA Facilities and Property*;
- Any alternative must maintain adequate or improved levels of service on the roadways and circulation within and around NASA JPL;
- Any alternative must support the City of Pasadena's Hahamongna Master Plan;
- The action must be consistent with the NASA JPL Master Plan updates;
- Any alternative must maintain or improve NASA JPL parking infrastructure;
- Any alternative must maintain or improve safety within and surrounding the facility;
- The action must maintain flexibility for future development of NASA JPL; and

- No alternative can adversely impact the NASA mission and operations.

Alternatives not meeting these criteria were not carried forward for further analysis within this EA.

ES-3.1 Alternatives Eliminated from Further Study

As part of the NEPA process, reasonable alternatives must be evaluated to determine the impact of each such alternative on the human environment. For alternatives to be considered reasonable, they must be technically and economically feasible, meet the purpose and need of the Proposed Action, and meet the criteria above. Eight alternatives were considered and five alternatives were eliminated as reasonable alternatives.

<u>On-Site Reconfiguration of the South Gate; North Side of Forestry Camp Road</u>

Under this alternative the West Gate and East Gate project elements would be implemented as described for Alternative A below; however, rather than involving the proposed acquisition via easement of approximately 10,000 square feet of property from the City of Pasadena currently used by the Los Angeles County Fire Department (LACFD), the proposed South Gate project elements would be reconfigured on-site on approximately 10,000 square feet of federally owned land on the north side of Forestry Camp Road.

Although construction of a parking lot in this area would be technically feasible, the area north of Forestry Camp Road would require substantial grading that would result in associated secondary impacts including the removal of specimen oak (*Quercus* spp.) trees. The site also includes overhead power lines, an aboveground cooling water main, and underground utilities which would need to be relocated. Further, this alternative location would eliminate workforce and service access to the south side of Building 179 and would require contractors to park off facility and then cross Forestry Camp Road to access NASA JPL property for identification and badging at the gatehouse. Consequently, this alternative would not meet the Purpose and Need of the Proposed Action since it would present pedestrian-vehicle conflicts at the South Gate, would not meet the requirements outlined in Section 2.2, *Process for Alternatives Development* since it would not maintain flexibility for future development at NASA JPL and thus was eliminated from further consideration within the EA.

<u>No Modifications to the West Gate</u>

Under this alternative the South Gate and East Gate project elements would be implemented as described for Alternative A below; however the proposed West Gate project elements would not be implemented. NASA JPL would not reconfigure the visitor and employee parking lots or provide hardscape improvements (e.g., proposed raised median) to facilitate improved circulation at the West Gate. Additionally, the existing guard booth would not be relocated and access to the Blue Lot north of the guard booth would remain. Further, the proposed guard booth, as well as the associated pop-up bollards, vehicle inspection systems, and the swing gates would not be constructed to separate the West Lot from the visitor parking lot. This alternative would not address existing parking and circulation issues at the West Gate, and more importantly, would not address security concerns at NASA JPL. As this alternative would not meet the criteria for screening alternatives, nor the requirements set forth in NPR 1620.3 as outlined in Section 2.2, *Process for Alternatives Development* it was eliminated from further consideration within the EA.

<u>No Modifications to the South Gate</u>

Under this alternative, the West Gate and East Gate project elements would be implemented as described for Alternative A below; however, the proposed South Gate project elements would not be implemented. Implementation of this alternative would not provide contractor parking outside of the South Gate and therefore would not facilitate positive control of the facility at this access point. Additionally, as the existing South Gate does not have pop-up bollards similar to those at the West and East Gates; implementation of this alternative would leave the South Gate vulnerable, particularly given that heavy-laden delivery trucks regularly access NASA JPL through this gate. This alternative would not meet the criteria for screening alternatives, nor the requirements set forth in NPR 1620.3 as outlined in Section 2.2, *Process for Alternatives Development*. For this reason this alternative was eliminated from further consideration within the EA.

No Modifications to the East Gate

Under this alternative, the West Gate and South Gate project elements would be implemented as described for Alternative A below; however, the proposed East Gate project elements would not be implemented. The City of Pasadena would fulfill its proposal to construct a traffic roundabout as well as the proposed fencing as currently envisioned, but NASA JPL would not construct the security fencing along the NASA JPL Bridge necessary to eliminate pedestrian and vehicle conflicts as well as associated security risks. Additionally, the sewer and utility lines would not be extended across the bridge, which would limit the use of the City's proposed traffic roundabout as a setting for a modular guard booth to be operated by NASA JPL. Therefore, as this alternative would meet the criteria for screening alternatives, nor, the requirements set forth in NPR 1620.3 as outlined in Section 2.2, *Process for Alternatives Development* and was eliminated from further consideration within this EA.

No Extension of Utilities Across the NASA JPL Bridge

Under this alternative, the West Gate and South Gate project elements would be implemented as described for Alternative A below. Additionally, some of the proposed East Gate project elements would be implemented (e.g., security fencing); however, sewer and utilities lines would not be extended across the NASA JPL Bridge. Similar to the discussion above for the No Modifications to the East Gate Alternative, this would limit the use of the City's proposed traffic roundabout as a setting for a modular guard booth to be operated by NASA JPL. Therefore, as this alternative would not meet the criteria for screening alternatives, nor the requirements set forth in NPR 1620.3 as outlined in Section 2.2, *Process for Alternatives Development* , it was eliminated from further consideration within this EA.

ES-3.2 Alternatives Carried Forward for Further Analysis

Alternative A

Alternative A would implement improvements to the West, South, and East Gates at NASA JPL. These improvements would be designed to enhance security at NASA JPL to levels compliant with NASA Procedural Requirement 1620.3, *Physical Security Requirements for NASA Facilities and Property,* improve traffic circulation and parking infrastructure within and surrounding the facility, and improve safety. Security-related project elements are being considered that would improve upon and expand the current deployment and use of various systems including access control, communication systems, security command centers, barrier protection, fence protection, vehicle inspection, and video surveillance. In order to improve the movement of vehicle traffic, especially during morning and afternoon peak hours, project elements would be designed to widen, reconfigure, and enhance access points into and out of the facility. Alternative A would include upgraded security checkpoints with associated infrastructure, automatic gates, automatic vehicle barriers and pop-up bollard equipment, security communications, video surveillance equipment, fence protection, roadway enhancements, and pre-access parking areas. NASA JPL and the City of Pasadena work collaboratively to promote and achieve mindful development and environmental stewardship at NASA JPL and in the surrounding area. As part of these cooperative agreements, the City would make available to NASA JPL to access and develop parking approximately 10,000 sf of the property currently leased to the Los Angeles County Fire Department (LACFD). The City would also offer NASA JPL use of the proposed roundabout that the City of Pasadena would build east of the JPL Bridge for installation of a modular guard booth. The exact mechanism for acquisition is still being developed but would likely be acquisition via easement. These parcels would be acquired prior to the development of proposed additional parking at the South Gate and installation of a modular security guard booth atop the City's proposed future roundabout outside of the East Gate.

<u>Alternative B</u>

The proposed on-site reconfiguration of the South Gate east along Surveyor Road would consist of the reconfiguration of the South Gate within the current NASA JPL property boundaries. The acquisition of approximately 10,000 square feet from the City of Pasadena currently occupied by LACFD's Fire Camp Facility would not occur. Under this alternative the existing guard booth would be relocated along Forestry Camp Road east of Road A. Additionally, the area to the southeast along Road A, which is currently paved and used for contractor parking, would be reconfigured for limited contractor parking located on NASA

JPL land. The existing fencing in this area would be removed and relocated eastward such that the proposed traffic roundabout and limited contractor parking would be contained to direct access to the facility through the South Gate. This configuration would enable parking outside of the fenced NASA JPL facility for the purpose of providing positive control of the South Gate. Similar to Alternative A, Forestry Camp Road would be configured with two inbound lanes and one outboard lane.

Security related elements under consideration would include relocating the guard booth, pop-up bollards and swing gates would be installed adjacent to the relocated guard booth. Additionally, a vehicle inspection system that would include an automatic license plate recognition camera and undercarriage vehicle inspection system would be installed at the relocated guard booth. Contractor vehicles would enter the on-site traffic roundabout and park. Contractors would then undergo inspection and badging at the gatehouse located outside of the NASA JPL fence. Then contractors would continue onto the facility through either the relocated South Gate or through a one-way remote operated gate that would be installed at the southern end of the on-site contractor parking lot.

The proposed improvements at the South Gate would include vehicle and pedestrian directional signage and striping, including reconfiguration of the existing parking to accommodate the proposed on-site traffic roundabout. This alternative would reduce the existing on-site parking in this area from approximately 21 spaces to just 13 spaces. Additionally, this alternative would require the relocation of existing Southern California Edison power poles. However, the existing nature trail as well as the mature specimen oak trees located in the vicinity of the South Gate would be protected in place. Further, many of the existing improvements along Viking Road (within NASA JPL) would be retained.

<u>No Action Alternative</u>

Under the No Action Alternative, the proposed improvements to the West, South, and East Gates would not be implemented and the existing parking and circulation issues at the West Gate, and existing security risks at the West, South, and East Gates would persist (refer to Section 1.5, *Existing Facility Access, Parking,* *and Circulation*). The Council on Environmental Quality (CEQ) regulations stipulate that the No Action Alternative be analyzed to assess any environmental consequences that may occur if the proposed alternatives are not implemented. Consequently, this alternative will be carried forward for analysis within the EA.

ES-4 Environmental Consequences

Table ES-1 summarizes projected impacts from the alternatives analyzed in this EA.

Table ES-1: Projected Environmental Impacts

Resource Area	Projected Impact Alternative A	Projected Impact Alternative B	Projected Impact No Action	Control Measures
Traffic and Transportation	Temporary less than significant impacts to traffic flow patterns during construction, as well as long-term beneficial impacts to traffic patterns within the affected environment.	Temporary impacts to traffic flow patterns during construction, as well as less long-term beneficial impacts to traffic patterns compared to Alternative A.	No short-term impacts. Long-term adverse impacts from unaddressed traffic issues and parking demand.	Construction Traffic Control Plan.
Utilities And Services	Temporary insignificant impacts from interruptions during utility relocation/installation. There would be improved utility placement/functionality. No adverse impact since improvements would require negligible increase in utility use.	Temporary insignificant impacts from interruptions during utility relocation/installation. There would be improved utility placement/functionality. No adverse impact since improvements would require negligible increase in utility use.	No impact.	None.
Air Quality	Short-term emissions from construction equipment/vehicles. Reduced vehicle queuing/idling may lead to less emissions.	Similar to Alternative A, except there may be increased long-term queuing at South gate compared to Alternative A, but would be an improvement to existing conditions.	No impact.	BMPs including watering stockpiled soil.

Table ES-1: Projected Environmental Impacts

Resource Area	Projected Impact Alternative A	Projected Impact Alternative B	Projected Impact No Action	Control Measures
Hazardous Materials and Waste	Potential short-term impact from petroleum products and other potential hazardous materials used during construction.	Potential short-term impact from petroleum products and other potential hazardous materials used during construction.	No Impact.	Adherence to applicable Federal and state hazardous material and waste regulations.
Geological Resources	Short-term less than significant impacts to soils during construction/grading work.	Short-term less than significant disturbance to soils during construction/grading work.	No Impact.	BMPs including covering soil stockpiles and use of silt fences / barriers.
Water Resources	Potential short-term impacts from surface water runoff during construction.	Potential short-term impacts from surface water runoff during construction.	No Impact	BMPs including covering soil stockpiles and use of silt fences / barriers.
Cultural Resources	No Impact	No Impact	No Impact.	None.
Socioeconomics and Environmental Justice	Beneficial impact from temporary construction jobs and increased security for workers.	Beneficial impact from temporary construction jobs and increased security for workers.	No Impact.	None.
Noise	Short-term impacts from construction noise.	Short-term impacts from construction noise.	No Impact.	Standard daytime work hours, noise barriers/permits, if necessary.

Table ES-1: Projected Environmental Impacts

Resource Area	Projected Impact Alternative A	Projected Impact Alternative B	Projected Impact No Action	Control Measures
Land Use	Temporary change in land use during construction (temporary entrances/parking areas). Administrative change in land use in obtaining easement from the City of Pasadena for land at the South Gate and East Gate. No other impacts.	Temporary change in land use during construction (temporary entrances/parking areas).	No impact.	None.
Biological Resources	No impact	No impact	No impact.	None.
Visual Resources	Short-term visual impacts from construction activities/equipment/staging areas. Long-term beneficial impact of reducing visual clutter (e.g., redundant and inconsistent fencing types at the West Gate).	Short-term visual impacts from construction activities/equipment/staging areas. Long-term beneficial impact of reducing visual clutter (e.g., redundant and inconsistent fencing types at the West Gate).	No impact.	Construction fencing/barriers to reduce visual impacts.

ES-5 Conclusions

The proposed alternatives would not result in significant impacts to the affected environment. The control measures included in Table ES-1 and Section 3 of the EA would reduce any potential impact to a level of that is less than significant. Based on the analysis conducted under NEPA, there would be no significant impacts to the affected human or natural environment.

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1.0 PURPOSED AND NEED FOR ACTION

1.1 INTRODUCTION

The National Aeronautics and Space Administration (NASA) is proposing development of a comprehensive facility security planning strategy at the NASA Jet Propulsion Laboratory (NASA JPL). This Environmental Assessment (EA) has been prepared to evaluate the potential environmental impacts associated with the proposed fortification of security gates and associated on-site parking and circulation improvements at NASA JPL. The preparation of this EA is consistent with regulations issued by the Council on Environmental Quality (CEQ), 14 Code of Federal Regulations (CFR) Part 1216.3, *Procedures for Implementing the National Environmental Policy Act (NEPA),* and NPR 8580.1A, *Implementing the National Environmental Policy Act*. In accordance with CEQ Regulations for Implementing the Procedural Provisions of NEPA (40 CFR Parts 1500-1508, Section 1502.13), this section specifies the purpose and need for the Proposed Action at the NASA JPL facility.

1.2 BACKGROUND

NASA JPL is a Federally Funded Research and Development Center (FFRDC) managed and operated by the California Institute of Technology (Caltech) under a contract with NASA (known as the Prime Contract). JPL is NASA's lead FFRDC for the robotic exploration of the solar system and is responsible for operating NASA's Deep Space Network (DSN). NASA JPL also conducts research and development work for other Federal agencies, creating international expertise in key fields such as space science instrumentation and telecommunications, spacecraft component design and systems integration, micro-devices, electronics, and software automation.

The NASA JPL facility (described in greater detail below in Section 1.4, *Facility Description*) is located on approximately 169 acres between the cities of Pasadena and La Cañada Flintridge unincorporated community of Altadena. Approximately 5,000 employees and contractors work at NASA JPL daily – accessing the facility via one of three entry gates. Detailed evaluations of the configurations, infrastructure, and security systems at each gate have identified conditions that do not meet the criteria for screening alternatives.

1.3 MISSION

NASA's primary mission is "to pioneer the future in space exploration, scientific discovery, and aeronautics research." NASA JPL is a world class space exploration facility, with a mission that calls for:

- Robotic Mission Formulation, Implementation, Operation, and Science;
- Multiple Unique NASA Research and Technology Capabilities and Strategic Assets; and
- JPL DSN Supporting Multiple Deep Space and Near Earth Mission Operations for NASA and International Agencies.

NASA JPL's mission is the planning, advocacy, and execution of unmanned exploratory scientific flight through the solar system. This includes activities in the areas of planetary exploration, earth science, astrobiology, telecommunications, and astrophysics.

1.4 FACILITY DESCRIPTION

The main NASA JPL facility is located in the northern metropolitan Los Angeles area, between the cities of Pasadena and La Cañada Flintridge, and the unincorporated community of Altadena (see Figure 1-1).[1] NASA JPL encompasses approximately 169 acres, and contains 2.7 million square feet of

[1] NASA JPL also includes two off-site complexes, the California Laboratory for Atmospheric Remote Sensing (CLARS) and the Woodbury Complex in Altadena. Recurring lease costs for the Woodbury Complex have led to a proposed long-term plan to relocate the Woodbury employees to NASA JPL.

facility space (see Figure 1-2).[2] The on-site workforce at NASA JPL consists of approximately 5,000 full-time equivalent employees.

NASA JPL viewed from the overlook point off of N. Windsor Avenue.

NASA JPL is surrounded by natural settings on the northern, eastern, and southern boundaries. The facility is separated from residential neighborhoods by the foothills of the San Gabriel Mountains to the north and the Arroyo Seco Canyon to the east. The northern foothills of the Angeles National Forest (ANF) are covered with native chaparral. The Arroyo Seco to the east is typically a dry river bed and only contains water during periods of rainfall. The residential area of La Cañada Flintridge borders NASA JPL on the west. An equestrian club (Flintridge Riding Club) and a LACFD facility are located to the southwest. La Cañada High School, Hahamongna Watershed Park (HWP), and Devil's Gate Dam are located farther south.

1.5 EXISTING FACILITY ACCESS AND GATE CONFIGURATIONS / SECURITY STATUS

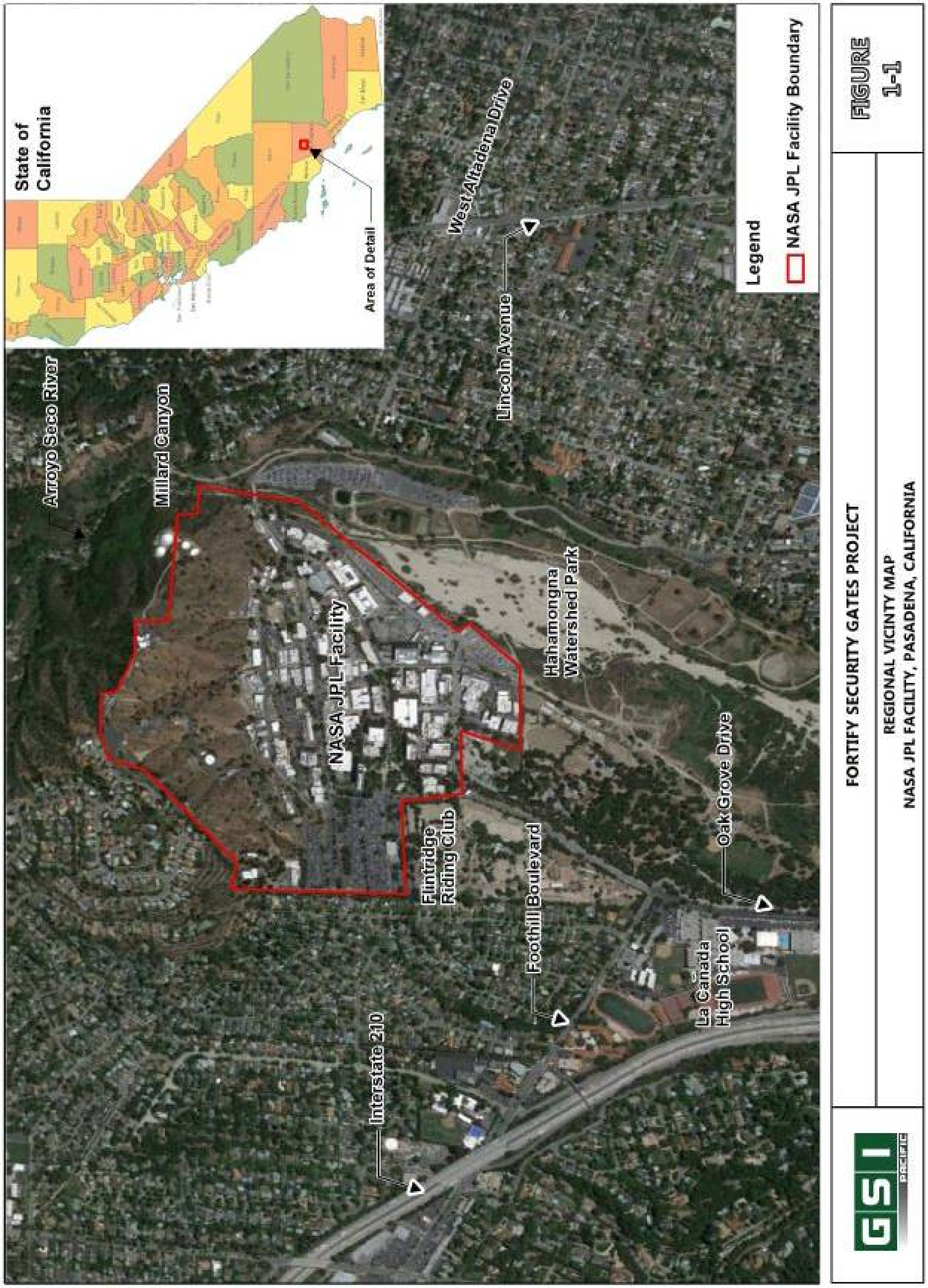
1.5.1 NASA JPL Facility Access

NASA JPL is fenced and gated with limited points of entry. There are three manned security checkpoints. Security personnel at the traffic roundabout on Oak Grove Drive pre-screen all arriving vehicles, drivers, and pedestrians, perform vehicle inspections, and direct persons and vehicles to one of the three security checkpoints. The primary checkpoint is manned 24-hours a day and is located at the west end of NASA JPL (i.e., West Gate), adjacent to the Visitor Center, where most arriving visitors are screened, badged, and admitted by prior arrangement. A security checkpoint is located off-facility on the traffic

[2] 156.9 acres are federally owned, the remainder is leased from the Flintridge Riding Club and the City of Pasadena.

roundabout, on the public street (Oak Grove Drive) under agreement with the City of La Cañada Flintridge. Employees entering at the West Gate are admitted upon presentation of staff identification badges. The second checkpoint is opened on work days from 5:30 am to 6 pm and is located at the south end of NASA JPL (i.e., South Gate), and is used primarily for deliveries and by contract service providers. Such visitors are admitted at the South Gate where they temporarily park their vehicles on-site and are signed-in and admitted at an outdoor security booth. The third checkpoint is located at the east end of the facility, at the NASA JPL Bridge entrance to NASA JPL (i.e., East Gate). The East Gate is open on work days from 5:30am to 8pm and is used almost exclusively by NASA JPL staff entering through the former East Arroyo Parking Lot via Windsor Road. The JPL security guard force opens the East Arroyo Parking Lot gate (located at the south end of the former East Parking Lot) between the hours of 4:30 am to midnight. Moreover, City of Pasadena personnel open the "Pasadena gate" (located at Windsor and Arroyo Roads) at 5:30 am and close it at midnight on the same days as the East Gate.

There are several personnel turnstile-type gates located along the NASA JPL perimeter used by NASA JPL staff mainly to access the surrounding park and National Forest areas during work hours for recreation purposes. Access to most buildings is open to those who have been admitted to NASA JPL through the primary security checkpoints. Access to buildings with special or sensitive uses, or to areas with higher security needs, is limited to those with appropriate access codes on their magnetic card keys. Vehicular access to the NASA JPL facility and the East Gate is through a residential neighborhood. Prior to October 2014, the City of Pasadena had leased the 3.84-hectare (9.58-acre) East Arroyo Parking Lot to NASA JPL for motor vehicle parking by its on-site workforce. Most of the on-site work force that parked in the leased East Arroyo Parking Lot used the NASA JPL Shuttle service to get to their work stations. Following completion of the 1,250-space Arroyo Parking Structure, those NASA JPL employees now enter the facility through the East Gate to access that on-site structure.


State of California
Area of Detail
Legend
NASA JPL Facility Boundary
Arroyo Seco River
Millard Canyon
West Altadena Drive
Lincoln Avenue
NASA JPL Facility
Hahamongna Watershed Park
Flintridge Riding Club
Foothill Boulevard
Oak Grove Drive
La Cañada High School
Interstate 210
FORTIFY SECURITY GATES PROJECT
REGIONAL VICINITY MAP
NASA JPL FACILITY, PASADENA, CALIFORNIA
FIGURE 1-1
GSI PACIFIC

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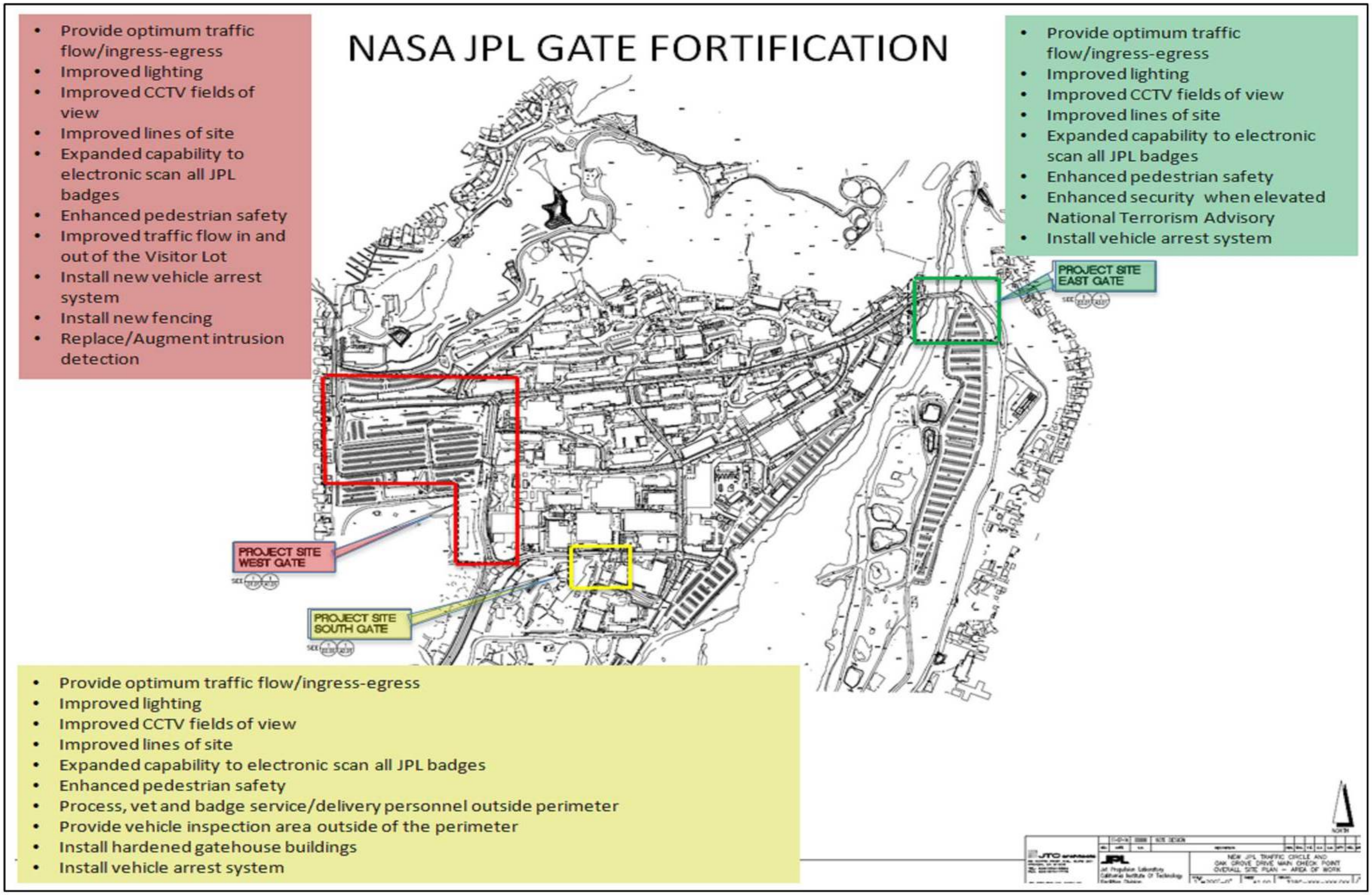

GSI PACIFIC	FORTIFY SECURITY GATES PROJECT	FIGURE 1-2
	FACILITY MAP NASA JPL FACILITY, PASADENA, CALIFORNIA	

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High-density development, easements, topography, and boundary constraints at NASA JPL have influenced a system of relatively narrow streets with some steep grade, although there is adequate space along the roadways for on-street parking and sidewalks. Most of the major thoroughfares located in the facility have functioning sidewalks that enable effective pedestrian circulation. However, narrow discontinuous sidewalks and non-existent sidewalks in some areas impact pedestrian circulation and create safety conflict points between pedestrians and vehicles.

The new Arroyo Parking Structure was constructed to replace off-site parking provided by the East Arroyo Parking Lot.

1.5.2 Gate Configurations and Security Status

1.5.2.1 West Gate

<u>Configuration</u>

The West Gate is located north of Oak Grove Drive, which terminates at the traffic roundabout where Oak Grove Drive becomes Ranger Road. The existing West Gate configuration includes a large paved area subdivided into fenced parking areas with restricted circulation into and between them. The West Lot, which provides 1,041 parking spaces for employees and visitors, and includes the Blue Lot (parking by assignment only) is located mostly on land leased from the Flintridge Riding Club.

The configuration of the West Gate, access to the parking areas, and internal design/separation of the parking area results in inefficient circulation at the visitor parking lots, employee parking lots, and the fenced Blue Lot. Currently, traffic headed north on Oak Grove Drive toward the West Gate is directed to a specific parking area by security staff manning the main security checkpoint at the traffic roundabout at the terminus of Oak Grove Drive; drivers are assigned a parking lot based on their visitor, employee, or assignment status. Drivers head north on Ranger Road toward the West Gate following a painted line on the pavement which leads to the assigned parking area. No posted signage either outside of or within the parking areas guides traffic. Thus, the absence of direction within the parking areas can create confusion and ineffective traffic circulation. Additionally, poor lane configuration (e.g., one lane serving incoming and outbound vehicles at the parking entrance), complicates circulation, causes delays, and can create traffic hazards.

Security Status

The configuration of the existing West Gate does not currently meet the requirements specified in NPR 1620.3, specifically 6.3.3.6, as there are no positive barriers separating the visitor and employee (including the Blue Lot) parking areas for the purpose of controlling vehicular traffic. The West Lot lacks vehicular access control with vehicle inspection abilities and security infrastructure (e.g., swing-arm gates, pop-up bollards), to maintain positive control of employee parking at the West Gate.

1.5.2.2 South Gate

Configuration

The South Gate processes more than 1,000 vehicle trips per day; all heavy truck deliveries and contractor entry into NASA JPL (to the shipping and receiving docks and construction sites) are directed exclusively through the South Gate.

The South Gate is located at the eastern terminus of Forestry Camp Road (whose western end is the traffic roundabout at Oak Grove Drive). Forestry Camp Road is located outside NASA JPL property; however, the north side of the road is NASA JPL property with facilities located as near as 20 feet from the road. On the south side of the road is land owned by the City of Pasadena that is leased to the LACFD for managing its air operations (helicopter only) and as a storage facility, training camp, and emergency staging site activated only during wildland fire events.

Forestry Camp Road is configured with one inbound and one outbound lane leading to a manned guard booth at the South Gate. Access through the South Gate is controlled by swing-arm gates on either side of the guard booth. At the south side of the Forestry Camp Road at the gate is a gatehouse where identification is checked and passes are issued. Adjacent to the gatehouse is a pedestrian turnstile with security keycode access that enables entry into the facility. No parking for contractors is available outside the facility; contractors must pass through the South Gate, park inside the facility, and return to the gatehouse for identification check and pass issuance.

<u>Security Status</u>

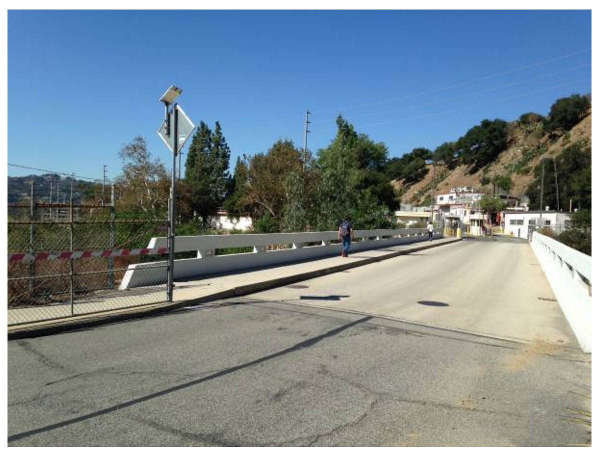
Unlike NASA JPL's other two security checkpoints (i.e., West and East Gates), presently, there is no vehicle arrest system or hydraulic security bollards which would prevent an unauthorized vehicle from penetrating the facility. In addition, the current configuration of the South Gate lacks any off-site parking or staging areas for the processing of service and construction contractor personnel. This situation creates a security vulnerability by allowing unbadged individuals to drive inside the facility perimeter to park walking back to the South Gate for badging, then continue on to their on-site work destination. This arrangement prevents Security Officers from having positive control of this entry point.

The South Gate includes a guard booth and a security booth where identification is checked and passes area. The adjacent turnstile with security keycode access provides entrance to the facility.

1.5.2.3 East Gate

<u>Configuration</u>

The East Gate is located at the west end of the NASA JPL Bridge and the eastern terminus of Explorer Road, which traverses the NASA JPL facility (east-west). The NASA JPL Bridge – which is Federal property owned by NASA – links the East Gate with the terminus of Windsor Road and provides access from the eastern side of the facility. Currently, the East Gate comprises one inbound and one outbound lane with a manned guard booth. Swing-arm gates control inbound and outbound traffic; pop-up bollards are in place and can be activated to prohibit access of unauthorized vehicles. Pedestrian access to the East Gate is via an unrestricted sidewalk on the south side of the bridge. At the western terminus of the sidewalk, a pedestrian turnstile with security keycode access enables workforce entry into the facility. Outside the East Gate, between the west end of the bridge and the turnstile, a pedestrian and horse trail leads from the sidewalk southward/downhill into Hahamongna Watershed Park. Both the sidewalk and the pedestrian and horse trail are frequently used by both the public and the NASA JPL workforce.



The NASA JPL Bridge provides vehicular and pedestrian access to the East Gate at NASA JPL.

Between 1952 and 2014, the City of Pasadena had leased 9.58 acres on the east side of the NASA JPL Bridge to NASA JPL for use as workforce vehicular parking (East Arroyo Parking Lot with approximately 1,093 spaces). The lease for this parking area expired in 2014; in anticipation of that lease expiration, NASA JPL constructed a new on-site parking structure. This new on-site parking structure, analyzed in the *Final Environmental Assessment for NASA Jet Propulsion Laboratory On-Site Parking Structure* (NASA 2012b), opened in September 2014 and contains approximately 1,250 parking spaces. The City of Pasadena intends to improve the former East Arroyo Parking Lot for recreational access and related uses and for groundwater recharge consistent with the Hahamongna Master Plan.

Security Status

Due to the lack of a security checkpoint and fencing along the sidewalk on the southern side of the NASA JPL Bridge, the East Gate does not currently meet the requirements specified in NPR 1620.3, specifically the requirement that the immediate boundaries of the facility and any specific designated security area shall be fenced to provide a buffer zone, facilitate control, and reduce the potential for accidental intrusion. Additionally, the lack of a security fence along the sidewalk on the Arroyo Seco Bridge does not provide adequate safety separation of pedestrians and vehicles, resulting in potential for pedestrian/vehicles conflicts. Also, the East Gates lacks vehicular access control with vehicle inspection abilities to maintain positive control of employee entering at the East Gate and a buffer zone that makes accidental intrusion unlikely.

1.6 PURPOSE AND NEED FOR ACTION

1.6.1 Statement of Purpose

The purpose of the Proposed Action is to remedy security inadequacies and improve vehicular circulation issues at each of the three security gates, through development of security infrastructure and reconfiguration of vehicular parking and circulation in discrete areas of the NASA JPL facility.

1.6.2 Statement of Need

The *need* for the Proposed Action is driven by NASA Procedural Requirement 1620.3, *Physical Security Requirements for NASA Facilities and Property*, which specifically requires that designated vehicle inspection areas not interfere with the vehicular traffic or pedestrian flow on- and off-center to ensure the safety of the NASA JPL workforce and the General Public, and NASA assets. Further, NPR 1620.3 specifies:

> “**6.3.3.4.** The immediate boundaries of a NASA Center and any specific designated security area shall be fenced … This defines the perimeter, provides a buffer zone, facilitates control, and makes accidental intrusion unlikely.”
>
> “**6.3.3.6.** The size of an individual internal security area shall depend on the degree of sensitivity required and the complexity of the area. As a rule, size should be kept to a minimum consistent with operational efficiency. Positive barriers at NASA Centers shall be established for:
>
> a) Controlling vehicular and pedestrian traffic flow.
> b) Checking identification of personnel entering or departing.
> c) Conducting random vehicle checks.
> d) Defining a buffer zone for more highly classified or sensitive areas.”

In addition, the need is motivated by inadequacies in current security checkpoint configurations resulting in security vulnerabilities, safety hazards, and delays in traffic flow.

1.7 REGULATORY FRAMEWORK

Table 1-1 lists statutes, regulations, executive orders, as well as NPRs, NASA Policy Directives (NPDs), and NASA Policy Guidance (NPG) that govern and/or influence the scope of this EA. A number of statutes were considered but found to have no influence on this project. Although this list is not all-inclusive, the proposed alternatives comply with applicable regulatory requirements.

Table 1-1: Summary of Applicable Regulatory Requirements

Regulatory Requirements
Statutes
National Environmental Policy Act (NEPA) of 1969 (42 U.S. Code [USC] §4321-4347)
National Historic Preservation Act (NHPA) of 1966 (16 USC § 470 et seq.) (89 Public Law [PL] 966)
Clean Air Act (CAA) of 1970 as amended (42 USC § 7401 et seq.)
Clean Water Act (CWA) of 1977 as amended (33 USC § 1251 et seq.)
Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 (42 USC § 9601et seq.)
Archaeological Resources Protection Act of 1979 (16 USC §470aa-mm)
Endangered Species Act of 1973 (16 USC §1531-1544)
Resource Conservation and Recovery Act (42 USC § 6901 et seq.)
Regulations
Council on Environmental Quality (CEQ) Regulations (40 Code of Federal Regulations [CFR]

Table 1-1: Summary of Applicable Regulatory Requirements

Regulatory Requirements
Parts 1500-1508)
36 CFR Part 800 – Protection of Historic Properties
32 CFR Part 229 – Protection of Archaeological Resources: Uniform Regulations
40 CFR 6, 51, and 93 – Conformity of General Federal Actions to State or Federal Implementation Plans
29 CFR Part 1910 – Occupational Safety and Health Standards
CFR Title 40 – Protection of the Environment
33 CFR 320-330 – U.S. Army Corps of Engineers (USACE) Regulations
40 CFR Parts 300-399 – Hazardous Substance Regulations
40 CFR Part 61 Subpart M – National Emission Standard for Asbestos Secretary of the Interior Standards and Guidelines for Archeology and Historic Preservation (Federal Register [FR] Vol. 48, No. 190, 44716-44742)
Executive Orders
Executive Order (EO) 11593 – Protection and Enhancement of the Cultural Environment
EO 11988 – Floodplain Management
EO 11990 – Protection of Wetlands
EO 12898 – Environmental Justice
EO 13287 – Preserve America
EO 13327 – Federal Real Property Management
EO 13423 – Strengthening Federal Environmental, Energy, and Transportation Management
EO 13514 – Federal Leadership in Environmental , Energy, and Economic Performance
NASA Procedural Requirements, Policy Directives, and Policy Guidance
NASA Procedural Requirement (NPR) 8553.1B, "NASA Environmental Management System", September 22, 2009
NPR 8580.1A, "Implementing the National Environmental Policy Act and EO 12114", November 26, 2001
NPR 8810.1, Master Planning Procedural Requirements
NPR 8810.2A, Master Planning For Real Property
NASA Policy Directive (NPD) 1600.2A, "NASA Security Policy"
NPD 8831.1C and 2D, "Maintenance and Operations of Institutional and Program Facilities and Related Equipment"
NASA Policy Guidance (NPG) 1620.1B, "Security Procedures and Guidelines"

1.8 ENVIRONMENTAL ISSUES

The potential impacts of the proposed alternatives that are described in this EA are assessed in accordance with NPR 8580.1A, which requires that impacts to resources be analyzed in terms of their context, duration, and intensity. In order to facilitate public and decision-maker understanding, impacts to resources are described as short-term, long-term, or cumulative impacts, based on an understanding and interpretation by resource professionals and specialists.

Much of the information described for these resource areas has been tiered from and incorporated by reference from the *Final Programmatic Environmental Assessment for NASA Jet Propulsion Laboratory Facility Master Plan Updates (*NASA 2012a*).*[3]

This EA evaluates potential environmental impacts to the following resources that would likely be affected by implementation of the proposed alternatives:

- Traffic and Transportation;
- Utilities and Services;
- Air Quality;
- Hazardous Materials and Waste;
- Geological Resources;
- Water Resources;
- Cultural Resources;
- Socioeconomics and Environmental Justice;
- Noise;
- Land Use;
- Biological Resources; and
- Visual Resources.

[3] A Finding of No Significant Impact (FONSI) associated with this EA was signed on 25 January 2012.

2.0 ALTERNATIVES CONSIDERED

2.1 INTRODUCTION

This section describes details related to the proposed alternatives, including the No Action Alternative, to be evaluated in this Environmental Assessment (EA). Guidance for complying with the National Environmental Policy Act (NEPA) and National Aeronautics and Space Administration (NASA) Procedural Requirement (NPR) 8580.1A, *Implementing the National Environmental Policy Act* requires an assessment of potentially effective and reasonably feasible alternatives. Details related to the proposed alternatives, as well as a description of alternatives that were considered but eliminated from further analysis are provided below.

2.2 PROCESS FOR ALTERNATIVES DEVELOPMENT

Several requirements were identified to fulfill the purpose and need for the proposed action at the NASA's Jet Propulsion Laboratory (JPL). The proposed alternatives, described below, were screened against the following criteria:

- Any alternative must adequately remedy security inadequacies at NASA JPL consistent with NASA policy and guidance, specifically NASA Procedural Requirement 1620.3, *Physical Security Requirements for NASA Facilities and Property*, which includes:
    - **6.3.3.4.** The immediate boundaries of a NASA Center and any specific designated security area shall be fenced … This defines the perimeter, provides a buffer zone, facilitates control, and makes accidental intrusion unlikely.
    - **6.3.3.6.** The size of an individual internal security area shall depend on the degree of sensitivity required and the complexity of the area. As a rule, size should be kept to a minimum consistent with operational efficiency. Positive barriers at NASA Centers shall be established for:
        - Controlling vehicular and pedestrian traffic flow.

- Checking identification of personnel entering or departing.
- Conducting random vehicle checks.
- Defining a buffer zone for more highly classified or sensitive areas.

- Any alternative must maintain adequate or improve levels of service on the roadways and circulation within and around NASA JPL;

- Any alternative, specifically at the East Gate, must support the City of Pasadena's Hahamongna Master Plan;

- The action must be consistent with the NASA JPL Master Plan updates;

- The action must maintain flexibility for future development of NASA JPL; and

- No alternative can adversely impact the NASA mission and operations.

Alternatives not meeting these criteria were not carried forward for further analysis within this EA (see Section 2.3, *Alternatives Eliminated from Consideration*).

2.3 ALTERNATIVES ELIMINATED FROM CONSIDERATION

The alternatives described below were considered, but ultimately eliminated from detailed analysis in the EA as they did not meet the requirements outlined in Section 2.2, *Process for Alternatives Development*.

2.3.1 On-Site Reconfiguration of the South Gate; North Side of Forestry Camp Road

Under this alternative the West Gate and East Gate project elements would be implemented as described for Alternative A below; however, rather than involving the proposed acquisition via easement of approximately 10,000 square feet of property from the City of Pasadena currently used by the Los Angeles County Fire Department (LACFD), the proposed South Gate project elements would be reconfigured on-site on approximately 10,000 square feet of federally owned land on the north side of Forestry Camp Road.

Alternative South Gate location considered north of Forestry Camp Road.

Although construction of a parking lot in this area would be technically feasible, the area north of Forestry Camp Road would require substantial grading that would result in associated secondary impacts including the removal of specimen oak (*Quercus* spp.) trees. The site also includes overhead power lines, an aboveground cooling water main, and underground utilities which would need to be relocated. Further, this alternative location would eliminate workforce and service access to the south side of Building 179 and would require contractors to park off facility and then cross Forestry Camp Road to access NASA JPL property for identification and badging at the gatehouse. Consequently, this alternative would not be reasonable and would not meet the Purpose and Need of the Proposed Action since it would present pedestrian-vehicle conflicts at the South Gate, would not meet the requirements outlined in Section 2.2, *Process for Alternatives Development* since it would not maintain flexibility for future development at NASA JPL it was thus was eliminated from further consideration within the EA.

2.3.2 Partial Improvements to Facility Access Points

2.3.2.1 No Modifications to the West Gate

Under this alternative the South Gate and East Gate project elements would be implemented as described for Alternative A below; however the proposed West Gate project elements would not be implemented. NASA JPL would not reconfigure the visitor and employee parking lots or provide hardscape improvements (e.g., proposed raised median) to facilitate improved circulation at the West Gate. Additionally, the existing guard booth would not be relocated and access to the Blue Lot north of the guard booth would remain. Further, the proposed guard booth, as well as the associated pop-up bollards, vehicle inspection systems, and the swing gates would not be constructed to separate the West Lot from the visitor parking lot. This alternative would not address existing parking and circulation issues at the West Gate, and more importantly, would not address security concerns at NASA JPL. As this alternative would not meet the criteria for screening alternatives, nor the requirements set forth in NPR 1620.3 as outlined in Section 2.2, *Process for Alternatives Development* it was eliminated from further consideration within the EA.

2.3.2.2 No Modifications to the South Gate

Under this alternative, the West Gate and East Gate project elements would be implemented as described for Alternative A below; however, the proposed South Gate project elements would not be implemented. Implementation of this alternative would not provide contractor parking outside of the South Gate and therefore would not facilitate positive control of the facility at this access point. Additionally, as the existing South Gate does not have pop-up bollards similar to those at the West and East Gates; implementation of this alternative would leave the South Gate vulnerable, particularly given that heavy-laden delivery trucks regularly access NASA JPL through this gate. This alternative would not meet the criteria for screening alternatives, nor the requirements set forth in NPR 1620.3 as outlined in Section 2.2, *Process for Alternatives Development*. For this reason this alternative was eliminated from further consideration within the EA.

2.3.2.3 No Modifications to the East Gate

Under this alternative, the West Gate and South Gate project elements would be implemented as described for Alternative A below; however, the proposed East Gate project elements would not be implemented. The City of Pasadena would fulfill its proposal to construct a traffic roundabout as well as the proposed fencing as currently envisioned, but NASA JPL would not construct the security fencing along the NASA JPL Bridge necessary to eliminate pedestrian and vehicle conflicts as well as associated security risks. Additionally, the sewer and utility lines would not be extended across the bridge, which would limit the use of the City's proposed traffic roundabout as a setting for a modular guard booth to be operated by NASA JPL. Therefore, as this alternative would meet the criteria for screening alternatives, nor, the requirements set forth in NPR 1620.3 as outlined in Section 2.2, *Process for Alternatives Development* and was eliminated from further consideration within this EA.

No Extension of Utilities Across the NASA JPL Bridge

Under this alternative, the West Gate and South Gate project elements would be implemented as described for Alternative A below. Additionally, some of the proposed East Gate project elements would be implemented (e.g., security fencing); however, sewer and utilities lines would not be extended across the NASA JPL Bridge. Similar to the discussion above for the No Modifications to the East Gate Alternative, this would limit the use of the City's proposed traffic roundabout as a setting for a modular guard booth to be operated by NASA JPL. Therefore, as this alternative would not meet the criteria for screening alternatives, nor the requirements set forth in NPR 1620.3 as outlined in Section 2.2, *Process for Alternatives Development*, it was eliminated from further consideration within this EA.

2.4 ALTERNATIVES CARRIED FORWARD FOR FURTHER ANALYSIS

Two alternatives were identified that would meet the *purpose* and *need* of the Proposed Action. In addition, the Council on Environmental Quality (CEQ) regulation Section 1502.14(d) stipulates that the No Action Alternative be analyzed to assess any environmental consequences that may occur if the proposed alternatives are not implemented. Therefore, this alternative is also carried forward for analysis in the EA.

2.4.1 Improvements to the West, South, and East Gates at NASA JPL (Alternative A)

Alternative A would implement improvements to the West, South, and East Gates at NASA JPL. These improvements would be designed to enhance security at NASA JPL, improve traffic circulation and parking infrastructure within and surrounding the facility, and improve safety. Security-related project elements have been designed to improve upon and expand the current deployment and use of various systems including access control, communication systems, security command centers, barrier protection, fence protection, vehicle inspection, and video surveillance. In order to improve the movement of vehicle traffic, especially during morning and afternoon peak hours, project elements have been designed to widen, reconfigure, and enhance access points into and out of the facility. Alternative A would include new guard booths, automatic gates, automatic vehicle barriers and pop-up bollard equipment, security communications, video surveillance equipment, fence protection, roadway enhancements, and parking areas. NASA JPL and the City of Pasadena work collaboratively to promote and achieve mindful development and environmental stewardship at NASA JPL and in the surrounding area. As part of these cooperative agreements, the City would make available to NASA JPL specific parcels of land to at the South and East Gates to access and develop. The exact mechanism for acquisition of these parcels is still being developed but would likely be acquisition via easement.

Table 2-1: Summary of Elements by Access Point Area under Alternative A

Alternative A Elements
West (or Main) Gate
• Relocation of the West Gate Guard Booth on Ranger Road • Abandonment of Bus Turnaround (Not Currently in Use) • Reconfiguration of Parking Entrance • Addition of Raised Concrete Median (i.e., Curb) to Direct Traffic to the West Lot • Replacement of Perimeter Fencing • Removal of Internal Fencing • Addition of New Guard Booth, Pop-Up Bollards, Vehicle Inspection Equipment, Swing Arm Gates, and Pedestrian Turnstile
South Gate
• Reconfiguration of Existing On-Site Parking • Easement from the City of Pasadena for 10,000 square feet of the Northeast Corner of Los Angeles County Fire Department Fire Camp Facility Minor Re-grading and New Parking Area • Addition of Pop-Up Bollards and Vehicle Inspection Equipment to the Existing Guard Booth
East Gate
• Fencing along Pedestrian Access across NASA JPL Bridge

Table 2-1: Summary of Elements by Access Point Area under Alternative A

Alternative A Elements
• Installation of Utilities and Sewer Lines across NASA JPL Bridge to Support the Modular Guard Booth and Proposed City Public Restroom • Pedestrian Easement on the Bridge • Easement from City of Pasadena for Placement of the Modular Guard Booth on the City's Proposed Roundabout.

2.4.1.1 Description of Elements Proposed Under Alternative A

The following section provides a detailed description of the project elements included in Alternative A organized by access point area: West, South, and East Gates. Each of the elements described below will be evaluated in this EA. For approximate locations and configurations for the elements included in Alternative A, please refer to Figure 2-1 (West Gate), Figure 2-2 (South Gate), and Figure 2-3 (East Gate).

<u>West Gate Improvements</u>

Existing guard booth proposed for relocation north along Ranger Road.

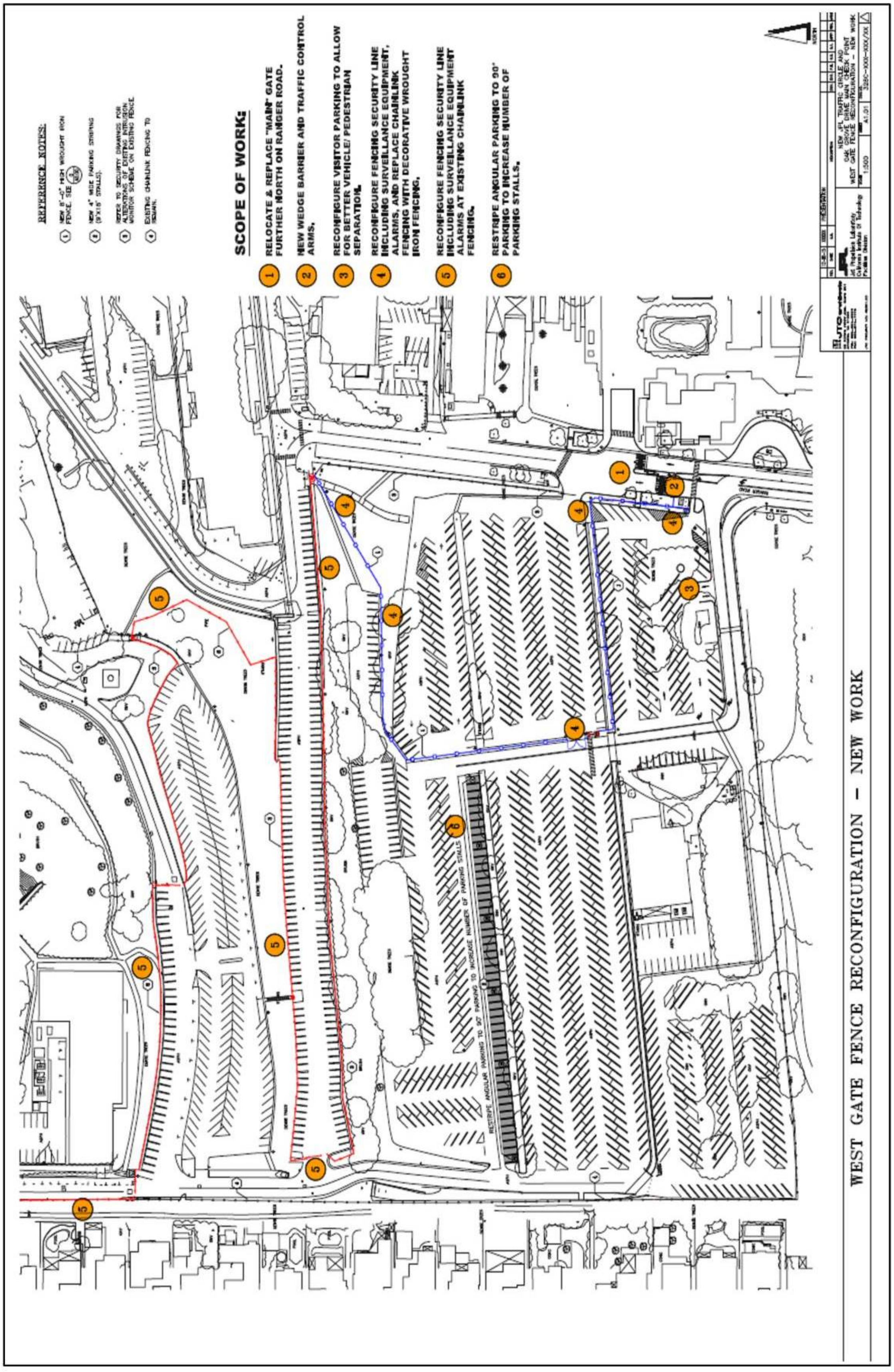
Implementation of the proposed West Gate improvements would include relocation of an existing guard booth and construction of a raised median and a new guard booth within the West Lot to direct traffic and maintain positive control of employee parking. Construction of the new guard booth would also include the construction of security infrastructure, including pop-up bollards, swing-arm gates, and a vehicle inspection system. Additional improvements would include restriping, fencing, and other circulation improvements within the employee, visitor, and

Blue Lot parking lots. These improvements would include vehicle and pedestrian directional signage and striping, including parking spaces.

Under Alternative A, the West Gate guard booth would be relocated further north on Ranger Road to a location that aligns with the existing gatehouse that is north of the Visitor Control. This improvement is necessary for the guards at the guard booth to establish visual contact with the guards at the gatehouse, increase vehicle queuing north of the existing pedestrian crosswalk and remove unsightly bollards. The existing guard booth structure including its structural elements, gates, control and surveillance equipment, utilities, lighting, and pop-up bollards would be relocated or restored as required to accommodate new construction. Improvements to the Blue Lot would include opening it to vehicular traffic on the west side of the lot as opposed to the current east entrance off Ranger Road; access to that entrance would follow that for other employees and visitors.

Ingress to and egress from the West Gate is provided by Ranger Road, one lane in each direction. To alleviate congestion during morning peak hours, NASA JPL proposes to add an additional northbound lane; adequate road width is available to enable restriping of three 12-foot wide lanes (two northbound and one southbound) without impacting any currently unpaved surfaces. To access any of the parking associated with the West Gate, a new raised median would direct northbound visitor and employee traffic to the west, turning left off Ranger Road before (or south of) the proposed location of the guard booth further north on Ranger Road.

Within the parking lot, perimeter fencing would be reconfigured to isolate visitor parking traffic from NASA JPL's West Lot employee parking area. The visitor parking entrance would be reconfigured to allow for up to two inbound entrance and one outbound lane exit as opposed to the current configuration of one lane serving both inbound and outbound vehicles. Workforce access into the West Lot would include additional security measures from those in the visitor parking area by the installation of a new, manned guard booth that would include pop-up bollards, vehicle inspection equipment, and swing-arm gates at the West Lot entrance. Manning of the guard booth would be performed by staff currently stationed at the existing gatehouse northwest of the Visitor Center.



FORTIFY SECURITY GATES PROJECT

PROPOSED WEST GATE IMPROVEMENTS
NASA JPL FACILITY, PASADENA, CALIFORNIA

FIGURE 2-1

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Entry into NASA JPL would be accomplished in one of two manners: 1) visitors would continue to be processed through the Visitor Center as is currently operating; 2) employees would continue to enter via the manned keycode-access located just northwest of the Visitor Center (adjacent to the current location of the security checkpoint). All proposed improvements at the West Gate would comply with January 2011 NASA JPL Facilities Design Standard and NPR 1620.3.

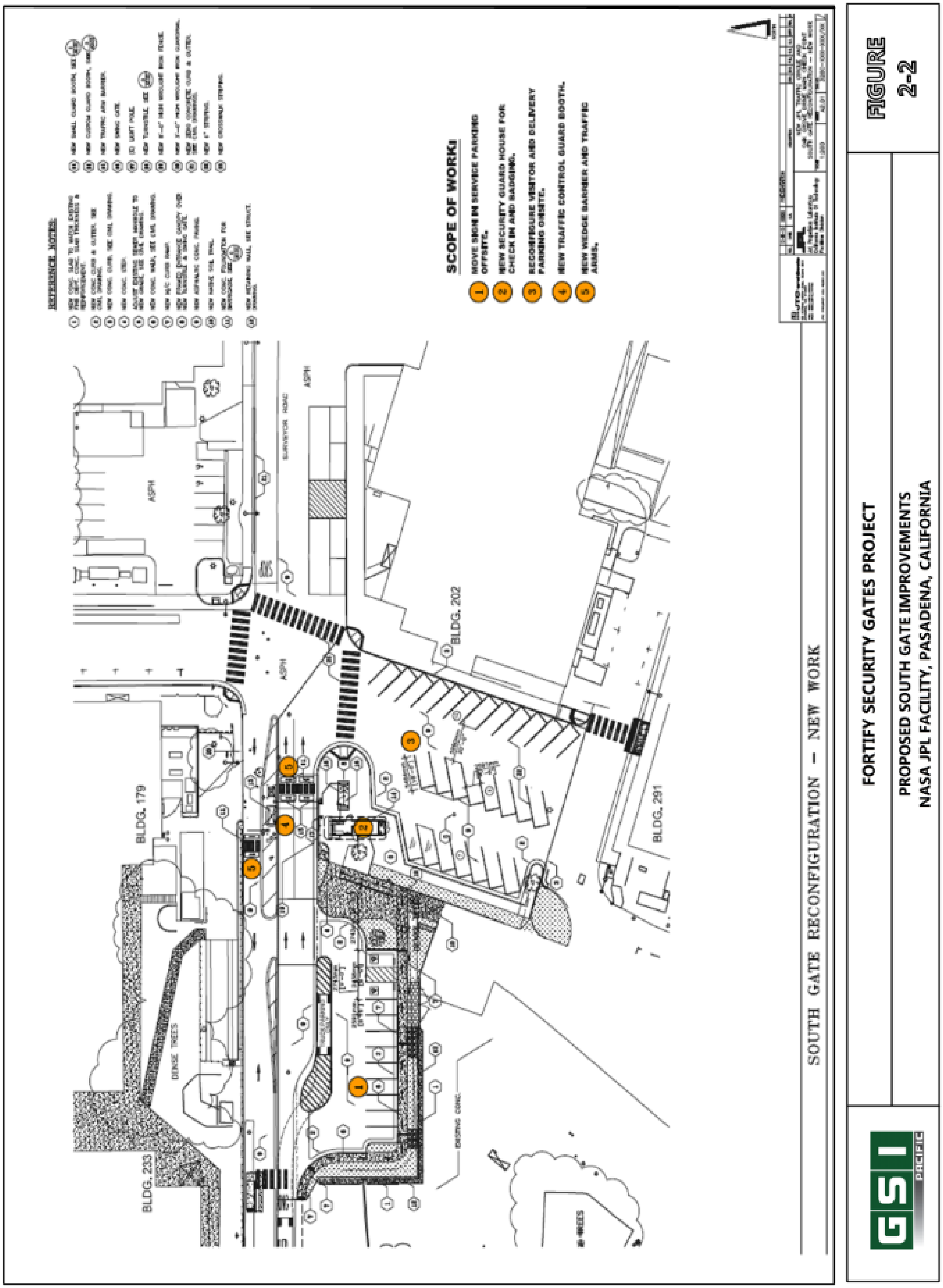
<u>South Gate Improvements</u>

Proposed South Gate improvements would include the acquisition of approximately 10,000 square feet from the City of Pasadena currently occupied by Los Angeles County Fire Department's (LACFD's) Fire Camp Facility. The exact mechanism for acquisition is still being developed but would likely be acquisition via easement.

This 10,000 square foot area is currently paved and used for vehicular parking. NASA JPL's planned used for this area shall be consistent with its current use (vehicular parking) and with the Permanent Open Space Easement executed by the Metropolitan Water District (MWD) of Southern California and filed with the Los Angeles County Registrar Recorder, Document No. 05 2526971. This area would be regraded and striped with approximately 11 parking spaces and would be used as a new off-site parking area for NASA JPL contractors to enable contractor badging *prior* to entering the facility through the South Gate. This proposed new parking area would also be available for use by the public, consistent with the MWD Open Space Easement. Forestry Camp Road would be restriped to facilitate an additional inbound lane toward the South Gate. Additionally, approximately 15,000 square feet of existing on-site NASA JPL workforce parking located south-southeast of the South Gate and North from the Credit Union would be reconfigured. The proposed improvements at the South Gate would include vehicle and pedestrian directional signage and striping.

Within each lane of traffic adjacent to the existing guard booth, pop-up bollards and swing gates would be installed. Additionally, a vehicle inspection system would be installed at the guard booth including an automatic license plate recognition camera and undercarriage vehicle inspection system. A new turnstile entry system with entry/egress would also be installed, just south of the guard booth. Further, a new security guard house for contractor check in and badging would be constructed south of the guard booth.

Any mechanism used for the acquisition of the approximately 10,000 square feet from the City of Pasadena would include a public use requirement. Parking would not be restricted to NASA JPL contractors, but would be available for use by the public. This alternative would increase the existing available parking to 31 spaces. The existing nature trail as well as the mature specimen oak (*Quercus* spp.) trees located in the vicinity of the South Gate would be protected in place. Many of the existing improvements along Viking Road (within NASA JPL) would be retained, including the existing curb, existing chain link fence, existing power pole and overhead electrical lines; however, the existing storm drain pipe and catch basin would be removed and additional hardscape improvements, including a concrete drainage feature and a sidewalk would be added within the proposed acquisition parcel.


SCOPE OF WORK:
1 MOVE SIGN IN SERVICE PARKING OFFSITE.
2 NEW SECURITY GUARD HOUSE FOR CHECK IN AND BADGING.
3 RECONFIGURE VISITOR AND DELIVERY PARKING ONSITE.
4 NEW TRAFFIC CONTROL GUARD BOOTH.
5 NEW WEDGE BARRIER AND TRAFFIC ARMS.
BLDG. 179
BLDG. 202
BLDG. 233
BLDG. 291
SOUTH GATE RECONFIGURATION — NEW WORK
FORTIFY SECURITY GATES PROJECT
PROPOSED SOUTH GATE IMPROVEMENTS
NASA JPL FACILITY, PASADENA, CALIFORNIA
FIGURE 2-2

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East Gate Improvements

The former East Arroyo Parking Lot, located east of the East Gate (at the eastern end of the NASA JPL Bridge), had been leased since 1952 from the City of Pasadena. This 3.88-hectare (9.58-acre) parcel was return to the City of Pasadena on October 31, 2014 and is set to undergo substantial changes initiated by the City and consistent with their vision to redevelop that site for recreational access and uses and groundwater recharge infrastructure.

The proposed East Gate project elements would include pedestrian improvements as well as sewer and utilities extension across the bridge, which would support future siting of a security checkpoint on the City property to be operated by NASA JPL.

The City of Pasadena is currently planning a number of improvements in this area including a traffic roundabout on Windsor Road located immediately adjacent to the NASA JPL Bridge eastern entrance. The traffic roundabout would be designed by the City of Pasadena and would be used as a setting for the future installation and operation of a modular guard booth to be operated by NASA JPL. NASA JPL would complete a lease modification and then an easement (the easement would phase in as the lease phases out) from the City of Pasadena to enable continued workforce vehicular access to this traffic roundabout. The design of the security checkpoint would be similar to the security checkpoint that is on Oak Grove Drive in the City of La Cañada. Future operation of the guard booth would result in a relocation of security personnel from another location within the facility. To address security and safety issues, under the proposed project NASA JPL would install security fencing on the south side of the NASA JPL Bridge along the existing sidewalk to allow public use by foot. The fencing would separate pedestrian and vehicle uses and resolve security conflicts in this area by eliminating the ability of pedestrians or bicyclists to enter the roadway (and potentially approach the East Gate) on the bridge span. New fencing would also be installed on the north side of the bridge. The existing, restricted access turnstile would remain in place.

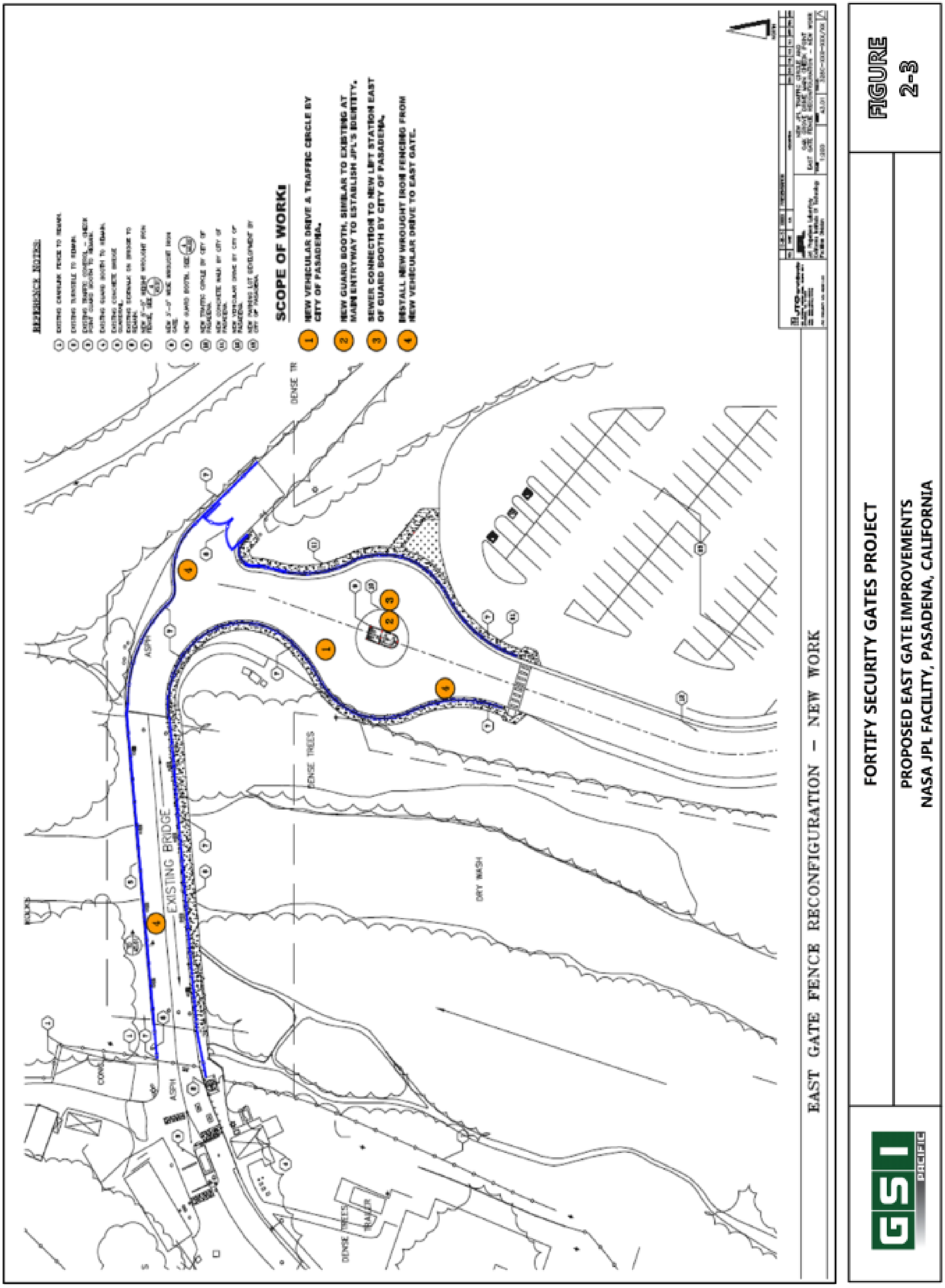
NASA JPL would route new electrical and communication conduit and a sewer line under the bridge to serve both the proposed modular guard booth that would be placed on the City of Pasadena's proposed traffic roundabout and City's proposed future public restroom.

Review and approval by the City of Pasadena and Water and Power Company would be required. All improvements would also comply with January 2011 NASA JPL Facilities Design Standard and NPR 1620.3.

2.4.1.2 Design and Construction

For development projects included in Alternative A, it is anticipated that all construction equipment would be brought onsite and would remain onsite for the duration of their use. Best management practices (BMPs) to minimize environmental impacts (e.g., soil stockpiling, use of silt berms/fences, watering of exposed soils), preparation of management plans (e.g., Traffic Management Plan, Stormwater Pollution Prevention Plan [SWPPP], Erosion Control Plan, and Soils Management Plan), and worker training programs would be required and implemented during construction. Upon completion, all disturbed areas not supporting new facilities or pavements would be revegetated.

Design and construction of the new facilities and proposed additions would incorporate sustainable principles (per Executive Order [EO] 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*). Additionally, all construction would comply with applicable codes and laws, NASA Policy Directives (NPDs) (e.g., NPD 1600.2A, *NASA Security Policy*) and NASA Facilities Design Guidelines (2012), including all applicable building setback requirements.


SCOPE OF WORK:
1 NEW VEHICULAR DRIVE & A TRAFFIC CIRCLE BY CITY OF PASADENA.
2 NEW GUARD BOOTH, SIMILAR TO EXISTING AT MAIN ENTRYWAY TO ESTABLISH JPL'S IDENTITY.
3 SEWER CONNECTION TO NEW LIFT STATION EAST OF GUARD BOOTH BY CITY OF PASADENA.
4 INSTALL NEW WROUGHT IRON FENCING FROM NEW VEHICULAR DRIVE TO EAST GATE.
EXISTING BRIDGE
DRY WASH
DENSE TREES
EAST GATE FENCE RECONFIGURATION – NEW WORK
GSI PACIFIC
FORTIFY SECURITY GATES PROJECT
PROPOSED EAST GATE IMPROVEMENTS
NASA JPL FACILITY, PASADENA, CALIFORNIA
FIGURE 2-3

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2.4.2 Reconfiguration of the South Gate On-site on Federally-Owned Land (Alternative B)

Under this alternative the acquisition of approximately 10,000 square feet from the City of Pasadena currently occupied by LACFD's Fire Camp Facility would not occur. Instead the South Gate would be reconfigured within the current NASA JPL property boundaries. Under this alternative the existing guard booth would be relocated along Forestry Camp Road east of Viking Road. Additionally, the area to the southeast along Viking Road, which is currently paved and used for contractor parking, would be reconfigured for limited contractor parking located on NASA JPL land. The existing fencing in this area would be removed and relocated eastward such that the proposed traffic roundabout and limited contractor parking would be contained to direct access to the facility through the South Gate. This configuration would enable parking outside of the fenced NASA JPL facility for the purpose of providing positive control of the South Gate. Similar to Alternative A, Forestry Camp Road would be configured with two inbound lanes and one outboard lane.

Within each lane of traffic pop-up bollards and swing gates would be installed adjacent to the relocated guard booth. Additionally, a vehicle inspection system would be installed at the relocated guard booth including an automatic license plate recognition camera and undercarriage vehicle inspection system. Contractor vehicles would enter the on-site traffic roundabout and park. Contractors would then undergo inspection and badging at the gatehouse located outside of the NASA JPL fence. Then contractors would continue onto the facility through either the South Gate or a one-way remote operated gate installed at the southern end of the contractor parking lot.

The proposed improvements at the South Gate would include vehicle and pedestrian directional signage and striping, including reconfiguration of the existing parking to accommodate the traffic roundabout. This alternative would reduce the existing on-site parking from approximately 21 spaces to just 13 spaces. Additionally, this alternative would require the relocation of existing Southern California Edison power poles. However, the existing nature trail as well as the mature specimen oak trees located in the vicinity of the South Gate would be protected in place. Further, many of the existing improvements along Viking Road (within NASA JPL) would be retained.

2.4.3 No Action Alternative

Under the No Action Alternative, the proposed improvements to the West, South, and East Gates identified for Alternative A would not be implemented and the existing security risks and deficiencies in parking and circulation at the West, South, and East Gates would persist (refer to Section 1.5, *Existing Facility Access, Parking, and Circulation*). The Council on Environmental Quality (CEQ) regulations stipulate that the No Action Alternative be analyzed to assess any environmental consequences that may occur if the proposed alternatives are not implemented. Therefore, this alternative will be carried forward for analysis within the EA.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL IMPACTS

3.1 INTRODUCTION

This section describes the existing physical environment and socioeconomic setting within the affected project area including and surrounding the National Aeronautics and Space Administration (NASA) Jet Propulsion Laboratory (JPL) facility. The section includes an analysis of potential environmental impacts from Alternative A, Alternative B, and the No Action Alternative. Potential short-term construction-related impacts associated have been described as well as potential long-term operational impacts associated with implementation of the alternatives under consideration. This section also describes potential incremental cumulative impacts from the alternatives under consideration.

Information used to develop this section has been obtained from research of existing datasets, as well as from the NASA JPL Oak Grove Master Plan Update *Final Programmatic Environmental Assessment, NASA Jet Propulsion Laboratory Facility Master Plan Updates* (NASA 2012a), the *Final Environmental Assessment, NASA Jet Propulsion Laboratory On-Site Parking Structure* (NASA 2012b), *NASA JPL Environmental Resource Document (ERD)* (NASA 2015), as well as other studies completed for the NASA JPL facility that have been incorporated by reference.

Potential impacts have been evaluated to determine whether they would constitute a "significant effect" on a particular environmental resource area. Impacts identified in this Environmental Assessment (EA) are described as having No Impact, Significant Adverse Impact, or Beneficial Impact, to the environment. The terms "impact" and "effect" are used synonymously in this EA. Impacts may apply to the full range of natural, aesthetic, historic, cultural, and socioeconomic resources.

3.1.1 Regulatory Setting

Environmental impacts have been assessed according to the Federal guidelines included in Council on Environmental Quality (CEQ), 14 Code of Federal Regulations (CFR) Part 1216.3, *Procedures for Implementing the National Environmental Policy Act (NEPA),* and NASA Procedural Requirement (NPR)

8580.1A, *Implementing the National Environmental Policy Act*. In accordance with CEQ Regulations for Implementing the Procedural Provisions of NEPA (40 CFR Parts 1500-1508, Section 1502.13), this section describes the affected environment, as well as anticipated foreseeable impacts to the affected environment from the implementation of the proposed alternatives at NASA JPL.

3.1.2 Impact Analysis

Direct Impacts: Caused by the action and occur at the same time and place.

Indirect Impacts: Caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect impacts may include growth inducing impacts and other impacts related to induced changes in the pattern of land use, population density or growth rate, and related effects on air, water and other natural systems, including ecosystems.

Impacts include ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historical, cultural, economic, social, or health, whether direct, indirect, or cumulative. Impacts may also include those resulting from actions which may have both beneficial and detrimental effects, even if on balance the agency believes that the effect will be beneficial (40 CFR 1508.8).

3.1.2.1 Significance of Environmental Impacts

According to CEQ regulations 40 CFR 1500-1508, the determination of a significant impact is a function of both context and intensity, as summarized below.

Context: This means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of a proposed action. For instance, in the case of a site-specific action, significance would usually depend upon the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant.

Intensity: This refers to the severity of impact. Responsible officials must bear in mind that more than one agency may make decisions about partial aspects of a major action.

To determine significance, the severity of the impact must be examined in terms of the type, quality and sensitivity of the resource involved; the location of the proposed project; the duration of the effect (short or long-term) and other consideration of context. Significance of the impact will vary with the setting of a proposed action and the surrounding area (including residential, industrial, commercial, and natural sites).

3.2 TRAFFIC AND TRANSPORTATION

3.2.1 Definition of Resource

Traffic and transportation refers to the movement of vehicles throughout a road or highway network. Primary roads include principal arterials, such as major interstates, designed to move traffic and not necessarily to provide access to all adjacent areas. Secondary roads include arterials, such as rural routes and major surface streets, which provide access to residential and commercial areas, hospitals, and schools.

3.2.2 Existing Conditions

3.2.2.1 Existing Roadway Network

Regional Access

United States (U.S.) Interstate (I-) 210 (Foothill Freeway) is a limited-access east-west freeway, which provides regional access to NASA JPL from the San Fernando Valley to the northwest and the San Gabriel Valley and Inland Empire to the east. In the vicinity of NASA JPL, I-210 has four mixed-flow travel lanes in each direction. The Berkshire Avenue/Oak Grove Drive exit provides the most direct access to NASA JPL from the eastbound and westbound traffic routes (NASA 2012c). State Route (SR) 134 (Ventura Freeway) is an east-west freeway that connects Pasadena with the southern San Fernando Valley to the west. The Ventura Freeway is located to the south of NASA JPL. Additional regional access is provided via SR 2 (Glendale Freeway) located west of NASA JPL. In the project vicinity, four mixed-flow travel lanes and one high occupancy vehicle lane are provided in each direction on the Ventura Freeway. An interchange with the Foothill Freeway is located southeast of the facility.

Local Access

The principal arterial road providing access to the main entrance of NASA JPL is Oak Grove Drive along the western limits of the facility. Oak Grove Drive has a total average weekday traffic count of approximately 9,308 vehicles per day (vpd) near the West Gate (Main Gate). It is a four-lane road with no parking and limited pedestrian improvements (e.g., sidewalks). The primary arterial feeders to Oak Grove Drive are Foothill Boulevard, the Foothill Freeway eastbound and westbound ramps, and Berkshire Place. Foothill Boulevard is designated as a primary arterial west of Crown Avenue, and a major arterial east of Crown Avenue (NASA 2012c). There is one westbound lane and two eastbound lanes on Foothill Boulevard near the West Gate. Berkshire Place is a major arterial with two travel lanes in each direction (NASA 2012c). There are no parking facilities along Berkshire Place.

Oak Grove Drive terminates at the traffic roundabout housing the NASA JPL primary security checkpoint; at that location, two roads – Ranger Road and Forestry Camp Road – provide access to NASA JPL. Ranger Road provides access to the West Gate, including associated parking facilities used by on-site employees and visitors.

The South Gate is located at the eastern terminus of Forestry Camp Road (whose western end is the traffic roundabout at Oak Grove Drive). The South Gate processes more than 1,000 vehicle trips per day; all heavy truck deliveries and contractor entry into NASA JPL (to the shipping and receiving docks and construction sites) are directed exclusively through the South Gate.

Access to the East Gate is provided via Windsor Avenue, which is primarily residential in nature in the vicinity of NASA JPL (NASA 2012b), and Explorer Road. Windsor Avenue provides one travel lane in each direction as well as a separate left turning lane at intersections and provides direct access to NASA JPL's East Gate (via the NASA JPL Bridge). In 2008, the total average weekday traffic count south of the former Arroyo Parking Lot was 5,963 vpd. The total average weekday traffic count north of the former Arroyo Parking Lot at the East Gate was approximately 2,583 vpd. Pedestrian access is available to the East Gate via a sidewalk on the south side of the NASA JPL Bridge.

Bicycle Facilities

A bikeway runs from South Pasadena to Hahamongna Watershed Park and connects to bicycle lanes on Oak Grove Drive. On-street bicycle lanes are provided north of Foothill Boulevard and south of Berkshire Place (NASA 2012b, 2012c).

3.2.2.2 Traffic Generation and Circulation at NASA JPL

As previously described in Section 1.5.1, *NASA JPL Facility Access*, there are three manned security checkpoints at the NASA JPL facility. The primary gate is located at the west side of NASA JPL (i.e., West Gate), adjacent to the Visitor Center, where most arriving visitors are screened, badged, and admitted by prior arrangement. The second gate is located at the south end of NASA JPL (i.e., South Gate), and is used primarily for deliveries and by contract service providers. Such visitors are admitted at the South Gate where they temporarily park their vehicles on-site and are signed in and admitted at a security booth. The third gate is located at the east side of the facility, at the NASA JPL Bridge entrance to NASA JPL (i.e., East Gate). The East Gate is used almost exclusively by NASA JPL staff entering through the former East Arroyo Parking Lot via Windsor Road.

Morning traffic and afternoon congestion is common on Foothill Boulevard between Crown Avenue and Oak Grove Drive approaching the NASA JPL facility. Much of the congestion is a result of two high schools, a middle school, an elementary school, and NASA JPL being in the same vicinity. Traffic congestion occurs at the gates, particularly when visitors and deliveries mix with entering personnel, during high security, and during high profile media events. On-site vehicle circulation is provided by two-lane roads through the central core areas of NASA JPL, with Forestry Camp Road/Arroyo Road, Mariner Road, and

Explorer Road providing the primary east-west thoroughfares. On-site traffic volumes are depicted in Table 3-1.

Table 3-1: NASA JPL Existing Traffic Volumes

Segment	Peak Traffic Volume		
	Weekday	AM Peak Hour (6-8 AM)	PM Peak Hour (6-8 AM)
Explorer Road (near East Gate)	2,941	445	338
Oak Grove Drive (near West Gate)	9,967	1,094	1,083
Forestry Camp Road	3,227	421	353
Ranger Road (south of West Lot)	8,063	932	941
Ranger Road (adjacent to West Lot)	3,455	312	340

Source: NASA 2012b, 2012c.

On-site vehicles are limited at NASA JPL due to limited parking and the constricted configuration of the roads. Roads serving the northern portion of the facility are steep and winding, making transportation of large or sensitive equipment challenging. A variety of delivery and haul trucks serve NASA JPL daily, and circulation is managed to avoid peak traffic and full parking associated with daily facility operations. For example, liquid nitrogen is delivered daily by a truck and trailer. There are multiple liquid nitrogen tanks at NASA JPL that require the truck to navigate through the facility, making between one and seven stops. Delivery is scheduled between 6:00 and 10:00 PM to minimize disruption to on-site traffic circulation (NASA 2012b, 2012c).

3.2.2.3 Parking

In total there are approximately 4,439 on- and off-site parking spaces at the NASA JPL facility. Parking for the facility is limited due to steep terrain and the high density of buildings in the main development area. The ability to meet parking needs is one of the most serious infrastructure challenges facing NASA JPL (NASA 2012b).

Table 3-2: Current Parking at NASA JPL

Type	Location	Number of Spaces
Owned	Onsite	2,739
Leased from City of Pasadena	Adjacent, Lower Arroyo	208
Leased from Flintridge Riding Club	Adjacent	1,041
Leased Offsite	3 miles from facility – Woodbury (parking for leased building)	135
Total Parking Spaces		**4,123**

Source: NASA 2010, 2012b.

On-Site Parking

Approximately 2,739 parking spaces are currently provided within the NASA JPL facility in surface lots, lots adjacent to buildings, underground parking below buildings, the newly completed on-site parking structure that recently replaced the former East Arroyo Lot parking area, and parking on streets inside facility boundaries. Parking facilities are interspersed throughout NASA JPL and are served by the NASA JPL shuttles. Additionally, on-site priority parking is provided for car- and vanpools. Carpools with three or more persons may park in "green" hang tag locations and two person carpools may park in cross-hatched "unassigned parking" areas; vanpools have individually reserved parking spaces. Approximately 875 on-site parking spaces are priority reserved spaces. Preferential parking is also provided for electric, compressed natural gas, and hybrid vehicles (NASA 2012b).

Leased Parking

The following two surface parking lots are leased for NASA JPL use, totaling 1,249 leased spaces:

- **West Lot**: This lot – accessed from Ranger Road and located west of the West Gate – is currently leased from the Flintridge Riding Club and contains 1,041 surface parking spaces for employees and visitors. Because this parking facility is leased, parking supply may not always be available, which would jeopardize NASA JPL's ability to provide sufficient parking in the future.

- **Lower Arroyo Lot**: The Lower Arroyo lot, accessed from Forestry Camp Road, leased from the City of Pasadena, contains 208 surface parking spaces (NASA 2012b).

3.2.3 Approach to Analysis

The proposed alternatives each would result in a significant transportation impact if it resulted in a substantial increase in traffic generation, a substantial increase in the use of connecting street systems or mass transit, or if on-site parking demand would not be met by projected parking space supply.

3.2.4 Environmental Impacts

3.2.4.1 Alternative A

Alternative A would result in short-term, less than significant impacts to traffic flow patterns during construction and long-term beneficial impacts to traffic circulation at NASA JPL.

<u>Construction Impacts</u>

Minor construction-related activities associated with implementation of Alternative A would be anticipated to produce short-term, less than significant impacts on traffic generation, traffic volume, street use, and parking availability both on-site and in the immediate surrounding vicinity. A slight increase in traffic volumes and limited interruption to traffic flow on-site would be likely due to temporary road closures, detours, and additional construction-related traffic entering, leaving, and cycling through NASA JPL. Such activity may result in a short-term delay for the on-site workforce, other contractors, and visitors entering the NASA JPL facility.

During the construction period, temporary alternative entrance points, detour routes, and traffic controls would be established at each of the three entrance gates as a part of a construction traffic control plan. These temporary measures may create short-term increased traffic queuing relative to the existing conditions. Construction-related activities would be limited to the maximum extent feasible during peak traffic hours. Additionally, these impacts would be further reduced as construction at the gates would be completed in phases, minimizing potential short-term construction-related impacts.

Operational Impacts

Following the completion of the proposed circulation and security upgrades under Alternative A, there would be long-term beneficial impacts to traffic patterns within and in the immediate vicinity of NASA JPL. At the West Gate, the additional northbound lane on Ranger Road would reduce traffic congestion during the morning peak hour commute, and the new guard booth and circulation improvements would help to reduce traffic congestion within the West Lot. At the South Gate, the proposed construction of an additional inbound lane, as well as the addition of approximately 11 parking spaces at the Los Angeles County Fire Department's (LACFD's) Fire Camp Facility would reduce traffic congestion and improve contractor parking at this entrance. Additionally, improvements at the East Gate would eliminate existing pedestrian-vehicle conflicts on the NASA JPL Bridge and further reduce traffic congestion in this area. There would be no significant adverse operational impacts to traffic or circulation under Alternative A.

3.2.4.2 Alternative B

Implementation of Alternative B would result in similar short-term, less than significant impacts to traffic flow patterns described for Alternative A. However, as Alternative B would not include the proposed property acquisition and associated off-site grading, the construction period would be slightly reduced relative to Alternative A.

Construction Impacts

Alternative B would result in similar less than significant, short-term construction-related impacts to existing traffic patterns and parking at the West Gate and East Gate as Alternative A. Construction-related activities associated with implementation of Alternative B would be anticipated to produce short-term and minor adverse impacts on traffic generation, traffic volume, street use, and parking availability both on-site and in surrounding areas. This would result in a short-term delay for the on-site workforce, other contractors, and visitors entering the NASA JPL facility.

At the South Gate, construction activities associated with circulation and parking reconfiguration within NASA JPL would have greater adverse impact than Alternative A since the project footprint would – in its entirety – overlie existing transportation infrastructure. More delays, traffic disruption, loss of parking, and circulation interference would occur since construction activities would require displacement of existing transportation infrastructure. Under Alternative A, a significant portion of construction activities associated with the South Gate reconfiguration would occur outside of NASA JPL.

Similar to Alternative A, construction-related activities would be limited to the maximum extent feasible during peak traffic hours under Alternative B. Additionally, these impacts would be further reduced as construction at the gates would be completed in phases, minimizing potential short-term construction-related impacts.

<u>Operational Impacts</u>

Alternative B would result in the same long-term beneficial impacts to traffic patterns at the West Gate and East Gate as Alternative A since these proposed components would be the same under either alternative. Implementation of Alternative B, however, would result in less beneficial impacts to traffic flow and parking at the South Gate, compared to Alternative A.

Under this alternative the acquisition of approximately 10,000 square feet from the City of Pasadena currently occupied by LACFD's Fire Camp Facility would not occur. Instead, the South Gate would be reconfigured on-site within the NASA JPL property boundaries displacing current transportation infrastructure. The area to the southeast along Viking Road, which is currently paved and used for parking, would be reconfigured to include a traffic roundabout and contractor parking. The perimeter fence would be reconfigured to isolate this area for the purpose of providing positive control of the South Gate. This reconfiguration – while providing control at the South Gate – would constrict circulation within the facility in the vicinity of the gate.

This alternative would reduce the existing parking from approximately 21 spaces to just 13 spaces; these 13 spaces would be dedicated to contractor parking resulting in a net removal of 21 spaces from the internal parking inventory at the facility. Implementation of Alternative B would improve circulation and security at the South Gate but would result in a net loss of overall available on-site parking, which would be an adverse impact to on-site parking.

3.2.4.3 No Action Alternative

Under the No Action Alternative there would be no change to existing circulation or traffic flow patterns within the affected environment. The proposed improvements to roadways, security checkpoints, and parking areas, would not be implemented and conditions would remain as described above.

3.3 UTILITIES AND SERVICES

3.3.1 Definition of Resources

Utilities and services consist of systems and physical structures that enable a population in a specified area to function. Utilities include infrastructure that supports facility operations, including electricity, natural gas, or telecommunications. Utilities also include on-site utility production, such as power generation or wastewater treatment. Services comprise functions provided to a facility by public agencies or by a facility to the community. Such services may include police and fire protection, water and solid waste service, sanitary sewer and wastewater treatment, and recreational facilities.

3.3.2 Regulatory Setting

The California Public Utilities Commission (CPUC) regulates privately owned electric, natural gas, telecommunications, water, railroad, rail transit, and passenger transportation companies. The CPUC serves the public interest by protecting consumers and ensuring the provision of safe, reliable utility service and infrastructure at reasonable rates, with a commitment to environmental enhancement and a healthy economy (CPUC 2007).

NASA JPL has evaluated Federal energy reduction goals set for in Executive Order (EO) 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*, and EO 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*. NASA JPL has programs in place to address these goals; any proposed action would be carried out in accordance with these goals and programs.

3.3.3 Existing Conditions

The current utility infrastructure at NASA JPL includes electrical power, natural gas, fuel oil, water, sanitary sewer, nitrogen and compressed air, telecommunications, and storm sewers. The utility systems at NASA JPL have been installed incrementally throughout the development of the facility. The current utility infrastructure includes elements spanning its entire history. Some original pipes and equipment date back to the World War II era. The majority of the newer utility systems are buried below grade in a relatively protected environment and their condition is not expected to have changed since construction (NASA 2012b). Utilities and services at and surrounding NASA JPL were described in Section 3.1.5 and 4.1.5 of the Master Plan Updates Programmatic EA (PEA) and are incorporated herein by reference. However, a brief description of the existing wastewater collection and treatment is provided below as it relates to the proposed alternatives, specifically at the East Gate.

3.3.3.1 Wastewater Collection and Treatment

The City of Pasadena wastewater collection system, which is a part of the Los Angeles County Sanitation District (LACSD), receives effluent generated at the laboratory. The average monthly wastewater discharge for NASA JPL in 2009 was approximately 60,000 gallons per day (gpd) (Chirino 2010); that volume is estimated to have remained consistent through 2014.

The majority of the wastewater flows by gravity to a wastewater retention basin (i.e., large wet well) located at Building 289. The wet well has 100,000 gallon of capacity, which is sufficient for approximately 18 hours of detention (NASA 2008). Additional wastewater flows by gravity to two wastewater lift stations at Building 224 and Building 308. The effluent from these lift stations is conveyed to the retention tank and is discharged to Building 270, the sewage metering station, before leaving the laboratory. All wastewater lift stations are equipped with emergency backup power generators, audio/visual alarms, and gas monitoring equipment (NASA 2008).

Wastewater discharge to sewers in the Los Angeles basin is regulated by the wastewater ordinance of the LACSD. This ordinance regulates sewer construction, sewer use, and both direct and indirect industrial wastewater discharges. The U.S. Environmental Protection Agency (USEPA) has enacted specific requirements for implementing the intentions of the Clean Water Act (CWA). LACSD regulates industrial wastewater discharges at NASA JPL through an Industrial Waste Discharge Permit (Permit No. 7024).

3.3.4 Approach to Analysis

Significance of utilities systems or public service impacts are assessed in terms of their direct effects on the utility or public service providers. The magnitude of potential impacts varies depending on the location of a proposed action; for example, an action that alters existing utility systems infrastructure may be unnoticed in an urban area but may have significant impacts in a more rural region. If potential public service and utility systems impacts would result in substantial shifts in the amount of services provided, or substantial changes to the utility systems infrastructure, the action would be significant.

3.3.5 Environmental Impacts

3.3.5.1 Alternative A

Construction Impacts

Less than significant short-term construction-related impacts on utilities and services would be expected under Alternative A. Alternative A would include minor utility and infrastructure relocation or installation at each of the gates, as well as new utilities lines associated with the East Gate improvements across the NASA JPL Bridge. Existing electrical and communications conduits as well as an existing sewer line in this location would be extended across the NASA JPL Bridge to its eastern terminus. These utility improvements would serve the modular guard booth to be placed on the City's proposed traffic roundabout located on City of Pasadena property.

Utility relocation and installation work could result in short-term interruptions of service provided by the existing utility infrastructure. However, service interruptions would not take place through the duration of construction activities but rather at limited, temporary intervals during connection and relocation activities. As a result, short-term impacts on utility systems and public services due to construction activities would be considered less than significant.

Operational Impacts

No long-term impacts to utilities and services would be expected under Alternative A. Following the completion of construction activities, the operation and maintenance of the proposed improvements at NASA JPL would require a negligible increase in utility and infrastructure services. Further, relocation and installation of utilities and infrastructure would result in improved utility placement and functionality. Future use of the security checkpoint at the East Gate would not increase sewer loads at NASA JPL as the personnel that would operate the guard booth at the security checkpoint would be relocated from a different location on the facility. The proposed restroom that the City would construct would be available for use by the public. It is NASA JPL's interest to maintain the integrity of the facility sewer lines and to ensure facility wastewater discharge parameters continue to be met. To this end, the City and NASA JPL in their ongoing collaboration have been discussing ways to include effluent control measures into the design and operation of the City's public restroom. NASA JPL and the City have yet to finalize these mitigation measures. On a preliminary basis, these mitigation measures would include design and administrative elements such as security lighting, locking the restroom during off-hours, visual monitoring by the JPL Security force, etc. Because of the limited public parking, operating hours (HWP park is open from dawn to dusk, the "Pasadena gate" and East Arroyo Parking Lot gate are locked from midnight to 5:30 am and 4:30 am, respectively) and draft mitigation measures, there is not expected to be a substantial change in facility wastewater discharge parameters or increase in sewer loads and Alternative A would not exceed existing sewer capacity. As result, no long-term adverse impacts on utilities and services would be expected under Alternative A.

3.3.5.2 Alternative B

Construction Impacts

Short-term impacts to utilities and services anticipated under Alternative B would be similar to those described for Alternative A. Utility relocation and installation at the West and East Gates would be identical to those proposed for Alternative A. However, there would be slightly less utility work at the South Gate compared to Alternative A as many of the existing improvements, including the existing power pole and overhead electrical lines would be retained. As described for Alternative A, service interruption during construction activities would take place at temporary intervals. As a result, impacts on utilities and services would be considered less than significant.

Operational Impacts

Long-term impacts to utilities and services anticipated under Alternative B would be similar to those described for Alternative A. Operation and maintenance of improvements to the West Gate, South Gate, and East Gate at NASA JPL would require a negligible increase in utility use. No long-term impacts on utilities and services would be anticipated under Alternative B.

3.3.5.3 No Action Alternative

Under the No Action Alternative, implementation of improvements to the West Gate, South Gate, and East Gate at NASA JPL would not take place. There would be no change to infrastructure and the existing demand on utilities and services at NASA JPL. Therefore, there would be no impact to public infrastructure and utilities.

3.4 AIR QUALITY

3.4.1 Definition of Resource

3.4.1.1 Climate

Climate is defined as long-term atmospheric patterns that characterize a region or location, and includes measures of temperature, humidity, atmospheric pressure, wind, precipitation, atmospheric particle count, and other meteorological variables. Knowing the climate of an area enables the predictability of short-term weather phenomena; however, only the weather can specify actual short-term atmospheric conditions. Some geographic regions with great topographic variations over relatively short distances (e.g., slope steepness, aspect, etc.) have micro-climates that are distinct to small areas (e.g., canyons, leeward vs. windward, hilltops, basins, etc.).

3.4.1.2 Air Quality

Air quality at a given location is a function of several factors including the quantity and type of pollutants emitted locally and regionally, as well as the dispersion rates of these pollutants. Primary factors affecting pollutant dispersion are wind speed and direction, atmospheric stability, temperature, the presence or absence of inversions, and topography. Air quality is affected by both stationary sources (e.g., industrial development) and mobile sources (e.g., motor vehicles).

Air quality at a given location is determined by the concentration of various pollutants in the atmosphere. National Ambient Air Quality Standards (NAAQS) are established by the USEPA for criteria pollutants, including: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter less than or equal to (≤) ten microns in diameter (PM_{10}) and ≤2.5 microns in diameter ($PM_{2.5}$), and lead (Pb). The State of California adopted the NAAQS and promulgates additional California Ambient Air Quality Standards (CAAQS) under the California Clean Air Act (CCAA). The CCAA identifies ten criteria pollutants and the standards are generally more stringent than the Federal standards.

Ozone (O_3). The majority of ground-level (or terrestrial) O_3 is formed as a result of complex photochemical reactions in the atmosphere involving volatile organic compounds (VOC), nitrogen oxides (NO_x), and oxygen. O_3 is a highly reactive gas that damages lung tissue, reduces pulmonary function, and sensitizes the lung to other irritants. Although stratospheric O_3 shields the earth from damaging ultraviolet radiation, terrestrial O_3 is a highly damaging air pollutant and is the primary source of smog.

Carbon Monoxide (CO). CO is a colorless, odorless, and poisonous gas produced by incomplete burning of carbon in fuel. The health threat from CO is most serious for those who suffer from cardiovascular disease, particularly those with angina and peripheral vascular disease.

Nitrogen Dioxide (NO_2). NO_2 is a highly reactive gas that can irritate the lungs, cause bronchitis and pneumonia, and lower resistance to respiratory infections. Repeated exposure to high concentrations of NO_2 may cause acute respiratory disease in children. Because NO_2 is a key precursor in the formation of O_3 or smog, control of NO_2 emissions is an important component of overall pollution reduction strategies. The two primary sources of NO_2 in the United States are fuel combustion and transportation.

Sulfur Dioxide (SO_2). SO_2 is emitted from volcanoes, stationary source coal and oil combustion, steel mills, refineries, pulp and paper mills, and from nonferrous smelters. High concentrations of SO_2 may aggravate existing respiratory and cardiovascular disease; asthmatics and those with emphysema or bronchitis are the most sensitive to SO_2 exposure. SO_2 also contributes to acid rain, which can lead to the acidification of lakes and streams and damage trees.

Particulate Matter (PM_{10} and $PM_{2.5}$). Particulate matter (PM) is a mixture of tiny particles that vary greatly in shape, size, and chemical composition, and can be comprised of metals, soot, soil, and dust. PM_{10} includes larger, coarse particles, whereas $PM_{2.5}$ includes smaller, fine particles. Sources of coarse particles include crushing or grinding operations, and dust from paved or unpaved roads. Sources of fine particles include all types of combustion activities (e.g., motor vehicles, power plants, wood burning) and certain industrial processes.

Exposure to PM_{10} and $PM_{2.5}$ levels exceeding current standards can result in increased respiratory- and cardiac-related respiratory illness. Short-term effects from PM may include headaches, breathing difficulties, eye irritation, and sore throat. The USEPA has concluded that $PM_{2.5}$ are more likely to contribute to health problems than PM_{10}.

Airborne Lead (Pb). Airborne Pb can be inhaled directly or ingested indirectly by consuming Pb-contaminated food, water, or non-food materials such as dust or soil. Fetuses, infants, and children are most sensitive to Pb exposure. Pb has been identified as a factor in high blood pressure and heart disease. Exposure to Pb has declined dramatically in the last 10 years as a result of the reduction of Pb in gasoline and paint, and the elimination of Pb from soldered cans.

Visibility Reducing Particles (VRPs). VRPs consist of suspended particulate matter, which is a complex mixture of tiny particles that consist of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. These particles vary greatly in shape, size and chemical composition, and can be made up of many different materials such as metals, soot, soil, dust, and salt (California Environmental Protection Agency Air Resources Board [CEPA ARB], 2014a).

Sulfates are the fully oxidized ionic form of sulfur. Sulfates occur in combination with metal and / or hydrogen ions. In California, emissions of sulfur compounds occur primarily from the combustion of petroleum-derived fuels (e.g., gasoline and diesel fuel) that contain sulfur. This sulfur is oxidized to SO_2 during the combustion process and subsequently converted to sulfate compounds in the atmosphere. The conversion of SO_2 to sulfates takes place comparatively rapidly and completely in urban areas of California due to regional meteorological features (CEPA ARB 2014b).

Hydrogen Sulfide (H_2S). H_2S is a colorless gas with the odor of rotten eggs. It is formed during bacterial decomposition of sulfur-containing organic substances. Also, it can be present in sewer gas and some natural gas, and can be emitted as the result of geothermal energy exploitation (CEPA ARB 2014c).

Vinyl Chloride. Vinyl chloride is a colorless gas with a mild, sweet odor. Most vinyl chloride is used to make polyvinyl chloride (PVC) plastic and vinyl products. Vinyl chloride has been detected near landfills, sewage plants, and hazardous waste sites, due to microbial breakdown of chlorinated solvents (CEPA ARB 2014d).

3.4.1.3 Greenhouse Gases (GHGs)

GHGs trap heat in the earth's atmosphere, affecting climate change and contributing to global warming. Both naturally occurring and anthropogenic (man-made) GHGs include: water vapor, carbon dioxide (CO_2), methane (NH_4), nitrous oxide (NO), and O_3. According to guidance from the CEQ, during an analysis of direct effects it is appropriate to: (1) quantify cumulative emissions over the life of the project, (2) discuss measures to reduce GHG emissions, including consideration of reasonable alternatives, and (3) qualitatively discuss the link between such GHG emissions and climate change. However, it is not currently useful for NEPA analysis to attempt to link specific climatological changes, or the environmental impacts thereof, to the particular project or emissions, as such direct linkage is difficult to isolate and to understand. The estimated level of GHG emissions can serve as a reasonable proxy for assessing potential climate change impacts, and provide decision makers and the public with useful information for a reasoned choice among alternatives (CEQ 2010).

3.4.2 Regulatory Setting

The U.S. Clean Air Act (CAA) Amendments of 1990 place most of the responsibility to achieve compliance with NAAQS on individual states. The CEPA ARB is responsible for the promotion and protection of public health, welfare, and ecological resources through the effective and efficient reduction of air pollutants while recognizing and considering the effects on the economy. The major goals of the board are to: provide safe, clean air to all Californians; protect the public from exposure to toxic air contaminants; reduce California's emission of GHGs; provide leadership in implementing and enforcing air pollution control rules and regulations; provide innovative approaches for complying with air pollution rules and regulations; base decisions on best possible scientific and economic information; and provide quality consumer service to all air resource board clients (CEPA ARB 2014e).

The USEPA requires each state to prepare a State Implementation Plan (SIP). A SIP is a compilation of goals, strategies, schedules, and enforcement actions that will lead the state into compliance with all NAAQS for CO, PM_{10}, $PM_{2.5}$, SO_2, NO_2, and O_3 to thus reach attainment status. Areas not in compliance with a standard can be declared nonattainment areas by USEPA or the appropriate state or local agency. There can be lenience for Exceptional Events, which are defined as "unusual or naturally occurring events that can affect air quality but are not reasonably controllable using techniques that tribal, state, or local air agencies may implement in order to attain and maintain the NAAQS" (USEPA 2013). An example of an Exceptional Event is a volcanic eruption, which affects air quality by causing exceedances of NAAQS and cannot be controlled by human intervention.

3.4.3 Existing Conditions

Air quality at and surrounding NASA JPL was described in Sections 3.1.6 and 4.1.6 of the Master Plan Updates PEA and is incorporated herein by reference. The following describes the local climate air quality standards, air quality conditions, and the NASA JPL air pollution sources, controls, and reporting requirements.

CEPA ARB has delegated the responsibility for implementation of the CAA and CCAA to local air pollution control agencies. NASA JPL and the surrounding communities of Pasadena, Altadena, and La Cañada Flintridge, are located in the eastern portion of the Los Angeles metropolitan area, within the South Coast Air Basin (SOCAB). SOCAB consists of Orange County, all of Los Angeles County except for the Antelope Valley, the non-desert portion of western San Bernardino County, and the western and Coachella Valley portions of Riverside County (NASA 2012b).

3.4.3.1 Climate

SOCAB has a distinctive climate determined by its geographical location. Regional meteorology is dominated by a persistent high-pressure area, which resides over the eastern Pacific Ocean. SOCAB has a Mediterranean climate characterized by warm, dry summers and mild winters, infrequent rainfall and moderate humidity, with moderate daytime onshore breezes. This mild climatic condition is occasionally interrupted by periods of hot easterly winds associated with Santa Ana winds, winter storms, and infrequent summer thunderstorms. Santa Ana winds can be strong near the mouths of canyons oriented along the direction of airflow, such as the Arroyo Seco (NASA 2012b).

3.4.3.2 Air Quality Standards

Pollutant transport in SOCAB generally follows the on-shore and offshore air flow characteristic of coastal areas. The South Coast Air Quality Management District (SCAQMD) has divided the air basin into 38 Source Receptor Areas (SRA), each containing one or more monitoring stations. These SRAs are designated to provide a general representation of the local meteorological conditions within the particular area. NASA JPL is located within SRA 88, and the nearest monitoring station is the West San Gabriel Valley station, located 5 miles to the southeast of NASA JPL. Pollutants monitored at the station include O_3, CO, total suspended particulates (TSP), SO_4, and NO_2. The station is not equipped to monitor ambient PM_{10} or $PM_{2.5}$ levels or Pb.

In the SOCAB, emissions of NO_x are heavily distributed in the western portion of the basin. Daytime wind flow, mountain barriers, a persistent temperature inversion, and intense sunlight all contribute to high O_3 concentrations in the downwind, inland valleys and coastal areas. Maximum O_3 concentrations usually are recorded during the summer. Ozone is associated with eye irritation, reduced visibility, and adverse health effects at high concentrations. CO concentrations are highest near heavily congested roadways.

According to the most recent conformity designation, the SOCAB is in *attainment* or *maintenance* for SO_2, CO, and NO_2. In 2014, Los Angeles County was designated as a *nonattainment* area for O_3, PM_{10}, $PM_{2.5}$, and Pb (Table 3-3).

Table 3-3: Attainment Status and *de minimis* Emission Thresholds for NASA JPL

Pollutant	SOCAB Attainment Designation	*de minimis* Threshold (tpy)
O_3	Nonattainment / Extreme	10
PM_{10}	Nonattainment / Serious	70
$PM_{2.5}$	Nonattainment	100
Pb	Nonattainment	25
NO_2	Attainment/Maintenance	100
CO	Attainment/Maintenance	100

Source: USEPA 2014.

3.4.3.3 Air Pollution Sources, Controls, and Reporting Requirements

NASA JPL submits annual emissions inventory reports to SCAQMD, which include emissions analyses from permitted and unpermitted sources. All sources of air pollutants and permit status are evaluated under a comprehensive air pollutant source identification and evaluation program, which includes an extensive equipment listing maintained by NASA JPL's Environmental Affairs Program Office as part of their emissions and waste management database. Table 3-4 lists the volumes of criteria pollutants reported to the SCAQMD in 2010.

Table 3-4: Criteria Pollutants Reported by NASA JPL to SCAQMD

Pollutant	Annual Emissions (tpy)
CO	6.06
NO_x	10.21
ROG	2.20
SO_x	0.07
TSP	0.94

Source: NASA 2012b.

NASA JPL is currently permitted by the SCAQMD as a Regional Clean Air Incentives Market facility, and as a Title V facility under the Federal Operating Permit Program because the volumes of criteria pollutants and toxic (non criteria) pollutants exceed regulatory thresholds, respectively. NASA JPL received its initial Title V Facility Permit in September 2001 due primarily to annual emissions of NO_x exceeding the threshold amount shown in Table 1 of SCAQMD Rule 3001.

The type of air emission sources that usually require SCAQMD permits to operate (Rule 201 and Rule 203) include boilers, internal combustion engines, emergency generators, painting operations, degreasers, fuel storage tanks, dispensers, and various research and development processes. Various types of these individual emissions units currently operate under SCAQMD permits at NASA JPL. Although NASA JPL has a substantial amount of research and development activities, only one facility requires that air pollution control equipment be installed: the Microdevices Laboratory (Building 302) requires a wet scrubber to control emissions for clean room laboratory operations. NASA JPL is currently in compliance with air quality permitting regulations.

3.4.1.4 Toxic Release Inventory

NASA JPL complies with other reporting requirements, such as the Section 313 Reporting Requirements under the Emergency Planning and Community Right to Know Act (EPCRA) and toxic emission inventory reporting under Air Toxics "Hot Spots" Information and Assessment Act AB 2588. NASA JPL has submitted required inventory data; however, due to the low facility priority ranking, which is based on both toxicity and quantity of emissions, NASA JPL has not been required to submit a follow-up risk assessment of reported emissions.

3.4.4 Approach to Analysis

The 1990 Amendments to the CAA require that Federal agency activities conform to the SIP with respect to achieving and maintaining attainment of NAAQS and to addressing air quality impacts. The USEPA General Conformity Rule requires that a conformity analysis be performed, which demonstrates that a proposed action does not: 1) cause or contribute to any violation of any NAAQS in the area; 2) interfere with provisions in the SIP for maintenance or attainment of any NAAQS; 3) increase the frequency or severity of any existing violation of any NAAQS; or 4) delay timely attainment of any NAAQS, any interim emission reduction goals, or other milestones included in the SIP. Provisions in the General Conformity Rule allow for exemptions from performing a conformity determination only if total emissions of individual nonattainment area pollutants resulting from a proposed action fall below the *de minimis* threshold values.

3.4.5 Environmental Impacts

3.4.5.1 Alternative A

<u>Construction Impacts</u>

Fugitive Dust Emissions

Under Alternative A, fugitive dust would likely be generated during any ground clearing and grading activities and combustion emissions would be generated from construction-related vehicles and equipment. Dust emissions generated by such activity can vary substantially depending on levels of activity, specific operations, and prevailing meteorological conditions. The standard dust emission factor for general non-residential construction activity is conservatively estimated at 0.19 tons of PM_{10} generated per acre per month of activity (USEPA 2006). The standard emission factor for new road construction, which is assumed to involve extensive earthmoving and heavy construction vehicle travel, is 0.42 tons of PM_{10} generated per acre per month of activity (USEPA 2006). Per procedures documented in the National Emissions Inventory (USEPA 2006), $PM_{2.5}$ emissions are estimated by applying a particle size multiplier of 0.10 to PM_{10} emissions.

Table 3-5 shows the anticipated disturbed areas and potential dust generation for FY 2015 should the entirety of the project footprint be exposed and subject to generation of fugitive dust – note that this is a conservative estimate since much of the area will undergo repaving and not full ground disturbance. Approximately 2.42 tons of dust may potentially be emitted during FY 2015, under the most conservative estimates.

Table 3-5: Anticipated Construction-Related Dust Emissions per Fiscal Year

Fiscal Year	Total Estimated Disturbed Area (acres)	Potential Uncontrolled Dust Generated per Year (tpy)	Potential Dust Generated per Year with BMPs (tpy)
2015	0.53	2.42	1.21

Note: Total disturbed area per year is calculated by multiplying the total surface area of proposed new construction projects by 1.5, to account for site preparation, grading, and staging activities.
Source: USEPA 2006.

Increased fugitive dust resulting from activities under Alternative A would involve short-term adverse impacts that could be reduced through standard dust minimization practices (e.g., regularly watering exposed soils, soil stockpiling, and soil stabilization). These standard Best Management Practices (BMPs) for dust minimization can reduce dust generation by 50 percent, thereby reducing dust emissions for site preparation and construction activities during FY 2015 to approximately 1.21 tons per year (tpy) under Alternative A (USEPA 2006).

Although any substantial increase in dust generation is inherently adverse, implementation of these dust minimization measures would limit the total quantity generated during project implementation. Increased fugitive dust emissions associated with Alternative A would be short-term and temporary, and would be minimized using dust suppression techniques; therefore, air quality impacts associated with fugitive dust would be considered minor and would not result in significant impacts.

Combustion Emissions

Combustion emissions associated with construction-related vehicles and equipment under Alternative A would be minimal because most vehicles would be driven to and kept at work sites throughout the duration of construction activities. Further, as is the case with fugitive dust emissions associated with site preparation activities, emissions generated by construction equipment would be temporary and short-term; therefore, only minor, less than significant impacts to air quality would occur as a result of use and maintenance of construction-related vehicles or equipment.

Projected combustion emissions under implementation of Alternative A are listed in Table 3-6; they are based on the scenario of ten-hour workdays, five days per week, for simultaneous construction activity over the course of six months (i.e., 24 weeks). Since a specific equipment list and horsepower rating for the equipment is not yet determined, emission factors were representative of a fleet-wide average, and a standard equipment list for construction was used.

General Conformity

Since the anticipated emissions associated with construction of Alternative A fall well below these levels, implementation of Alternative A would result in negligible impacts regarding General Conformity that would be less than significant.

Table 3-6: Potential Annual Emissions from Construction Related Combustion

Equipment	CO (tpy)	NO_x (tpy)	PM (tpy)	SO_x (tpy)	ROG (tpy)
Off-Highway Truck	0.305	0.890	0.031	0.001	0.103
Grader	0.91	0.560	0.028	0.001	0.069
Trencher	0.224	0.321	0.026	0.000	0.069
Loader	0.229	0.449	0.024	0.001	0.057
Roller	0.195	0.314	0.022	0.000	0.047
Paving Equipment	0.207	0.370	0.026	0.000	0.055
Construction Worker Commute	0.17	0.02	0.02	0.00	0.00
Total	**3.072**	**5.824**	**0.010**	**0.799**	**0.333**
de minimis thresholds	100	10	70	100	10
Significant?	**No**	**No**	**No**	**No**	**No**

Notes: NO_x is a precursor for O_3 and $PM_{2.5}$, ROG and SO_x is a precursor for O_3
tpy – tons per year
Source: USEPA 2006.

Operational Impacts

No long-term impacts to air quality are expected due to implementation of Alternative A. No impacts to air quality are expected due to the proposed reconfigured entrances at NASA JPL. Improvements at the entrances and security checkpoints include additional lanes, lane and parking restriping, and construction of traffic roundabouts that would contribute to alleviating traffic congestion during peak transportation hours. These improvements would result in less queuing or idling at the entrances and parking areas, which may lead to a small reduction of vehicle-related emissions at NASA JPL. As a result, no long-term adverse impacts are anticipated due to implementation of Alternative A.

3.4.5.2 Alternative B

Construction Impacts

Short-term impacts to air quality expected due to implementation of Alternative B would be similar to Alternative A. However, these impacts would be slightly reduced as the 10,000 square foot acquisition property would not be graded under this alternative. Under this alternative ground disturbance, fugitive dust, and vehicular and equipment emissions are expected to lead to temporary increases in airborne pollutant concentrations. However, these impacts would be temporary and applicable BMPs would be implemented to reduce impacts. As a result, short-term impacts to air quality are considered to be less than significant.

Operational Impacts

No long-term impacts to air quality are expected due to implementation of Alternative B. No impacts to air quality are expected due to the proposed reconfigured entrances at NASA JPL. Improvements at the entrances and security checkpoints include additional lanes, lane and parking restriping, and construction of traffic roundabouts that would contribute to alleviating traffic congestion during peak transportation hours. These improvements would result in less queuing or idling at the entrances and parking areas, which may lead to a small reduction of vehicle-related emissions at NASA JPL. As a result, no long-term adverse impacts are anticipated due to implementation of Alternative A.

3.4.5.3 No Action Alternative

Under the No Action Alternative, the implementation of improvements to the West, South, and East Gates at NASA JPL would not take place. The entrance points and parking areas would remain unchanged from current conditions. No construction activity would occur, and no fugitive dust or vehicular emissions would be generated. No impacts to air quality would occur under implementation of the No Action Alternative.

3.5 HAZARDOUS MATERIALS AND WASTES

3.5.1 Definition of Resource

Solid Materials are defined as substances that do not have strong physical properties of ignitability, corrosivity, reactivity, or toxicity. Solid Wastes are defined as solid waste that does not pose a substantial present or potential hazard to human health or to the environment.

Hazardous materials are defined as substances with strong physical properties of ignitability, corrosivity, reactivity, or toxicity, which may cause an increase in mortality, serious irreversible illness, incapacitating reversible illness, or pose a substantial threat to human health or to the environment. *Hazardous wastes* are defined as any solid, liquid, contained gaseous, or semisolid waste, or any combination of wastes that pose a substantial present or potential hazard to human health or to the environment.

Issues associated with hazardous materials and wastes typically center on underground storage tanks, aboveground storage tanks, and the storage, transport, and use of pesticides and fuel. When such resources are improperly used, they can threaten the health and well-being of wildlife species, botanical habitats, soil systems, water resources, and people.

3.5.2 Regulatory Setting

Federal laws and regulations pertaining to hazardous materials and waste include the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the Superfund Amendments and Reauthorization Act (SARA), the Toxic Substances Controls Act (TSCA), and the Resource and Conservation Recovery Act (RCRA).

Solid and hazardous waste streams in the State of California are regulated at the state and local level. Since January 2010, the California Department of Resources Recycling and Recovery (CalRecycle) has been the regulatory agency responsible for regulating solid waste in the State of California. CalRecycle exists as an entity within the California Natural Resources Agency and has enforcement authority over waste disposal programs under California Code of Regulations (CCR) Title 27, and nonhazardous waste management under CCR Title 14.

Hazardous and universal waste streams are regulated by the California Department of Toxic Substances Control (CalDTSC). The Hazardous Waste Control Law (1972) pertains to the management of hazardous waste streams and represents a State of California regulation similar to RCRA. Finally, the Southern California Association of Governments (SCAG) is responsible for preparing the Southern California Hazardous Waste Management Plan pursuant to the California Health and Safety Code. SCAG's decision makers adopt regional policies for both solid waste and hazardous wastes that will enable the region to support state waste goals while growing in accordance with SCAG's adopted plans, such as the Regional Transportation Plan, Compass Growth Vision, and Regional Comprehensive Plan and Guide (NASA 2012a).

3.5.3 Existing Conditions

Management of hazardous materials and wastes at NASA JPL focuses on evaluation of the storage, handling, and transportation capabilities for a site. Evaluation extends to the generation and disposal of hazardous wastes, and includes fuels, solvents, acids and bases, and petroleum oil and lubricants. In addition to being a threat to humans, the improper release of hazardous materials and wastes can threatened the health and well-being of wildlife species and habitats, soil systems, and water resources. A description of hazardous materials and wastes at NASA JPL is provided below. Hazardous materials and wastes at and surrounding NASA JPL were described in more detail in Sections 3.1.13 and 4.1.13 of the Master Plan Updates PEA and are incorporated herein by reference. Additionally, a description of the proposed acquisition parcel is also described below as it relates to the proposed alternatives.

3.5.3.1 NASA JPL Hazardous Waste Generation and Handling

NASA JPL generates 1,000 kilograms or more hazardous wastes per year and it therefore classified as a large quantity generator. Research and development activities generate different types of laboratory chemical wastes that include common chemicals that have either exceeded their shelf life, are excess after project completion, or are spent after being used in a given project. Hazardous wastes are moved from the point of generation to an on-site hazardous waste storage facility for consolidation prior to transport for recycling/disposal off-site (NASA 2012a).

3.5.3.2 Pollution Prevention and Waste Minimization

NASA JPL has an established strategy to provide a systematic approach to pollution prevention as presented in its Pollution Prevention Plan. Plan objectives are to develop a program for preventing, reducing, reusing, and recycling waste and emissions. The plan builds on existing programs and activities that currently meet compliance requirements, as well as identifying additional activities, while trying to reduce costs associated with pollution prevention programs. The plan also encourages pollution prevention concepts to be implemented in daily business processes to aid the on-site workforce in understanding pollution prevention and environmentally related activities.

3.5.3.3 Non-Hazardous wastes

Non-hazardous waste (i.e., garbage and recycling) generated at NASA JPL is collected in containers/barrels and disposed of daily by a contractor. A large construction materials container is also provided and removed as needed. Non-hazardous waste materials such as scrap metal, metal drums, scrap paper, pallets, and toner cartridges are periodically recovered and recycled. NASA JPL has an aggressive recycling program with recycling bins distributed throughout the facility for white paper, toner cartridges, and cardboard. Additionally, newspaper recycling bins are located in all cafeterias.

3.5.3.4 Toxic Substances

Excluding laboratory chemicals, other toxic or hazardous substances that are or were historically present at NASA JPL include polychlorinated biphenyls (PCBs), asbestos, pesticides, and radiation sources. The status of these, as well as information regarding chemical safety and reporting requirements, is discussed below.

<u>PCBs</u>

Through the 1980s up to 1993, NASA JPL conducted a lab-wide program to identify and remove all PCB transformers and capacitors from the facility. As part of the program, PCB transformers were either removed from the facility and disposed of or had the PCB's removed and then reclassified as non-PCB transformers.

Asbestos

Asbestos at NASA JPL is found in spray-applied fireproofing and piping insulation. Non-friable asbestos may be contained in flooring tile and adhesive. Asbestos removal or abatement at NASA JPL is dictated by the renovation or remodeling needs of the facility. Asbestos is removed by a licensed contractor in accordance with the asbestos standard of Occupational Safety and Health Administration, 29 CFR, 1926-58. Asbestos-containing materials (ACM) are handled and disposed of off-site consistent with TSCA.

Pesticides

A range of pesticides are used at NASA JPL for rodent control and grounds maintenance, and are applied by licensed contractors, who are overseen by certified advisors and applicators. NASA JPL reduces potential environmental impacts of pesticides in use by controlled applications, inventory inspection, and monitoring. All insecticides, fungicides, herbicides, and rodenticides are handled, applied, and disposed of consistent with applicable Federal and state requirements.

Radiation

NASA JPL radiation sources include ionizing (e.g., x-rays, gamma rays, alpha and beta particles, neutrons, protons, high-speed electrons) and non-ionizing emitters (e.g., lasers and radio frequency radiation). Large ionizing radiation sources are few and fixed in location, but small sources are used in varying locations throughout the site. Non-ionizing radiation sources include visible and near-visible infrared lasers, electromagnetic radiation (microwave and radio frequency transmitters) and ultraviolet radiation from ultraviolet lamps. Source controls include occupational safety evaluations of new sources and checks for correct operation and adherence to safety procedures. Storage and disposal is consistent with NASA JPL's radioactive material license conditions.

3.5.3.5 Chemical Safety and Reporting Requirements

NASA JPL complies with EPCRA and the more strict State of California community right-to-know requirements. NASA JPL is in compliance with Title 19 of the CCR and California Business Plan requirements, and provides a California Business Plan annually to the LACFD.

As part of the plan, NASA JPL submits a facility inventory of hazardous materials that contains reportable quantities of materials. All acutely hazardous materials stored at NASA JPL are below threshold quantities for Accidental Release Prevention (November 2007). Accidental releases are unanticipated emissions of a regulated substance or other extremely hazardous substance into the ambient air from a stationary source.

3.5.3.6 NASA CERCLA Cleanup

During historical operations at the NASA JPL site, various chemicals and other materials were used. In the 1940s and 1950s, liquid wastes from materials used at NASA JPL, such as solvents, solid and liquid rocket propellants, cooling tower chemicals, and analytical laboratory chemicals, were disposed of into seepage pits, a disposal practice common at that time. By 1958, a sanitary sewage system was installed to handle sewage and wastewater, and the use of seepage pits for sanitary and chemical wastes was discontinued. Some of these chemicals, including perchlorate and chlorinated solvents, eventually reached the groundwater hundreds of feet beneath NASA JPL and were subsequently carried by groundwater flow to areas adjacent to the facility. In 1992, NASA JPL was placed on the National Priority List (NPL) by the USEPA. As the responsible agency, NASA has conducted number of detailed investigations and studies on the facility and adjacent areas since the early 1990s. Please refer to Section 3.1.13 the Master Plan Updates PEA for further discussion.

3.5.3.7 LACFD Fire Camp Site

As described in Section 2.4.1.1, *Description of Elements Proposed Under Alternative A*, NASA JPL would acquire an approximately 10,000 square foot parcel of land currently occupied by the LACFD from the City of Pasadena via easement. Under the Proposed Action it would be regraded and striped with approximately 11 parking spaces and would be used as a new off-site parking area for NASA JPL contractors. This proposed new parking area would also be available for use by the public, consistent with the MWD Open Space Easement.

NASA JPL prepared a Phase I Environmental Site Assessment (ESA) consistent with American Society for Testing and Materials (ASTM) Standard Practice E 1527-13, for the future parking area adjacent to the South Gate. This included a visual reconnaissance of the location, visual inspection of the surrounding properties, review of historical ownership and use, review of regulatory listings, and interviews with persons knowledgeable of the site (NASA JPL 2014). The primary purpose of the Phase I ESA was to identify any Recognized Environmental Concerns (RECs), including the presence or likely presence of hazardous substances or petroleum products that indicate an existing release, past release, or material threat of release into structures on the property or into the ground, groundwater, or surface water of the property (NASA JPL 2014).

The Phase I ESA found that groundwater beneath the site, due to perchlorate contamination by NASA JPL, is considered to be a REC. Additionally, the Phase I ESA found a 1993 document that referenced drums in a drum storage area at the LACFD Fire Camp 2 facility that were leaking petroleum product; this is considered to be a REC. However, the exact location of that drum storage area was not disclosed. Moreover, the existing petroleum handling area in LACFD Fire Camp 2 is not on the site that NASA JPL is interested in acquiring. Based on the information gathered during the performance of the assessment, shallow soil sampling of exposed soil along the fence lines bordering the site is recommended to determine if any impacted soil remains from the oil spill documented in 1993. No further investigation was recommended (NASA JPL 2014).

3.5.4 Approach to Analysis

Federal, state, and local laws regulate the storage, handling, disposal, and transportation of hazardous materials and wastes; the primary purpose of these laws is to protect human health and the environment. The significance of potential impacts associated with hazardous substances is based on their toxicity, reactivity, ignitability, and corrosivity. Impacts associated with hazardous materials and wastes would be significant if the storage, use, transportation, or disposal of hazardous substances substantially increased the human health risk or environmental exposure.

3.5.5 Environmental Impacts

3.5.5.1 Alternative A

<u>Construction Impacts</u>

Solid Waste

Solid waste consisting of demolition debris and solid waste from construction personnel would be generated during the construction period. However, the total amount of solid waste generated during construction activities would be negligible, and the contractor would be responsible for solid waste disposal in accordance with all applicable rules and regulations. As a result, short-term construction-related impacts on solid waste are considered less than significant.

Hazardous Waste

During construction activities there would be use of petroleum products and potentially hazardous materials for equipment use and utility work. Therefore, the potential of petroleum or hazardous material release would be possible. To minimize this hazard, all applicable Federal and state regulations relating to hazardous materials handling, use and transportation would be followed to ensure that hazardous material release to the affected environment would be minimized and contained. For example, vehicles and equipment would be regularly inspected for leaks and performance and maintained accordingly, and any old suspect utility components encountered (e.g., transformers or asbestos-containing conduits) would be handled appropriately. As a result, construction-related impacts associated with hazardous materials and waste would be short-term and less than significant.

The Phase I ESA conducted for the 10,000 square foot parcel of land at the LACFD Fire Camp site identified a small petroleum release in 1993 at an unknown location in LACFD Fire Camp 2 and recommended shallow soil sampling of exposed soil along the fence lines to determine if any impacted soil remains. To date, that sampling has not been performed. The Proposed Action in this location includes only minor grading and the replacement of existing pavement. There would be no extensive digging or trenching at the site. Nevertheless to reduce worker exposure potential, standard NASA JPL protocol and BMPs would be implemented during all construction activities. This would include construction monitoring for any suspect petroleum and/or any additional constituent contamination at the site. Should evidence of any contaminants be found, construction would be suspended immediately until soil testing can be completed. NASA JPL would coordinate with all appropriate state and Federal agencies and address any contamination prior to resuming construction activities. Based on the minimal level of disturbance under implementation of the Proposed Action, impacts related to hazardous waste are not anticipated to be significant.

Operational Impacts

Solid Waste

No significant long-term sources of solid waste are anticipated as a result of implementation of Alternative A. Any operation or maintenance activities would not be expected to result in any additional long-term demand for solid waste disposal.

Hazardous Waste

Hazardous materials and wastes would not be utilized during operation of the security checkpoints. However, if hazardous materials are utilized or encountered, applicable Federal and state regulations would be followed. As a result, no long-term impacts from hazardous materials and wastes would be expected due to operation and maintenance activities.

3.5.5.2 Alternative B

Construction Impacts

Solid Waste

Short-term construction-related impacts to solid wastes that would be expected as a result of Alternative B would be similar to those described for Alternative A. The total amount of solid waste generated by construction activities would be negligible and would be disposed in accordance with applicable rules and regulations. As a result, short-term construction-related impacts on solid waste are considered less than significant.

Hazardous Waste

Potential short-term construction-related impacts from hazardous materials and wastes from Alternative B would be similar to those described for Alternative A. As a result, less than significant short-term impacts would be expected.

3.5.5.3 Operational Impacts

Solid Waste

Long-term impacts to solid wastes expected due to implementation of Alternative B would be similar to those described for Alternative A. Operation and maintenance activities would take place at regularly scheduled intervals; however, no solid waste is expected to be generated due to those activities. As a result, no long-term impacts to solid wastes would be expected.

Hazardous Waste

Long-term impacts from hazardous materials and wastes expected due to implementation of Alternative B would be similar to those described for Alternative A. As a result, no long-term impacts from hazardous materials and waste would be expected.

3.5.5.4 No Action Alternative

Under the No Action Alternative, the implementation of improvements to the entrance areas at NASA JPL would not take place. Existing conditions would remain unchanged, and there would be no additional hazardous materials used and no additional solid or hazardous wastes generated in the area. As a result, there would be no impacts to hazardous materials and wastes.

3.6 GEOLOGICAL RESOURCES

3.6.1 Definition of Resources

Geological resources typically consist of surface and subsurface materials and their inherent properties. Principal geologic factors affecting the ability to support structural development are soil stability, topography, and seismic properties (i.e., potential for subsurface shifting, faulting, or crustal disturbance).

The term soil, in general, refers to unconsolidated materials overlying bedrock or other parent material. Soils play a critical role in both the natural and human environment. Soil structure, elasticity, strength, shrink-swell potential, and erodibility all determine the ability for the ground to support man-made structures and facilities. Soils typically are described in terms of their complex type, slope, physical characteristics, and relative compatibility or constraining properties with regard to particular construction activities and types of land use.

Topography is the change in elevation over the surface of a land area. An area's topography is influenced by many factors, including human activity, underlying geologic material, seismic activity, climatic conditions, and erosion. A discussion of topography typically encompasses a description of surface elevations, slope, and distinct physiographic features (e.g., mountains), and their influence on human activities.

Natural hazards prone to the area include earthquakes and tsunamis. Earthquakes typically result from release of energy from the earth's crust and manifest themselves by shaking and sometimes displacement of the ground which can result in property damage. When the epicenter of a large earthquake is located offshore, the seabed may be displaced sufficiently to cause a tsunami. A tsunami is a series of water waves caused by the displacement of a large volume of a body of water. Great wave heights can be generated by large events; although the impact of tsunamis is limited to coastal areas, their destructive power can be enormous.

3.6.2 Regulatory Setting

The California Geological Survey (CGS) has delineated special study zones along known active and potentially active faults in California pursuant to the Alquist Priolo Earthquake Fault Zones (APEFZ) Act of 1972. The state designates the authority to local government to regulate development within APEFZ. Construction of habitable structures is not permitted over potential rupture zones.

The CGS has also identified Seismic Hazard Zones that are delineated in accordance with the Seismic Hazard Mapping Program (SHMP) of the Seismic Hazards Act of 1990. The Act is "to provide for a statewide seismic hazard mapping and technical advisory program to assist cities and counties in fulfilling their responsibilities for protecting the public health and safety from the effects of strong ground shaking, liquefaction, landslides, or other ground failure and other seismic hazards caused by earthquakes."

The CGS identifies several earth resource issues that should be taken into consideration in evaluating whether proposed projects are likely to be subject to geologic hazards, particularly related to earthquake damage. These considerations include the potential for existing conditions to pose a risk to the project, and the potential for the project to result in an impact on the existing conditions for geology or soils. The State of California (Uniform) Building Code sets standards for investigation and mitigation of facility conditions related to fault movement, liquefaction, landslides, differential compactions/seismic settlement, ground rupture, ground shaking, tsunami, seiche, and seismically induced flooding. Mitigation of geological (including earthquake) and soil (geotechnical) issues must be undertaken in compliance with the California Building Code.

3.6.3 Existing Conditions

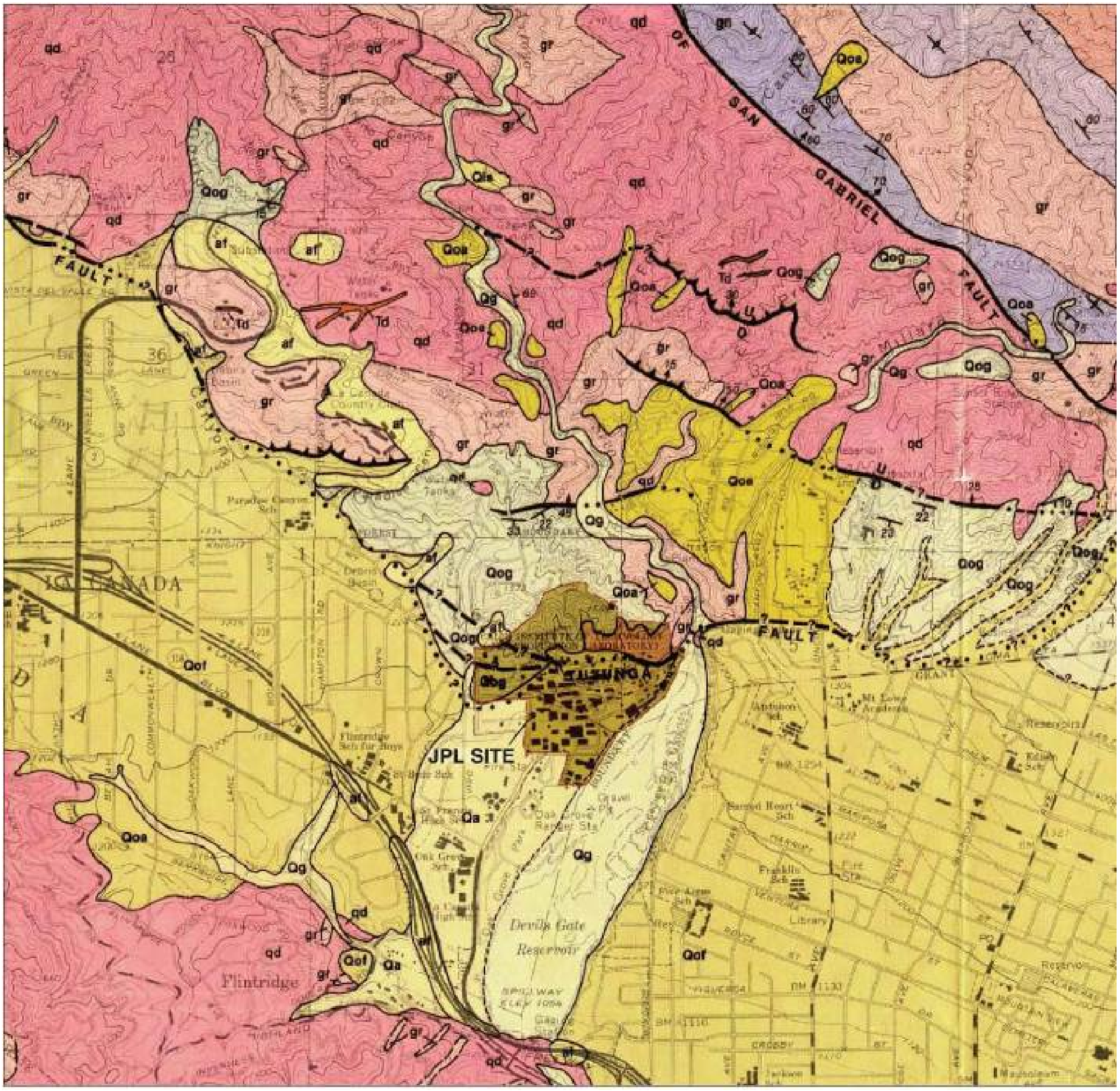
3.6.3.1 Geology

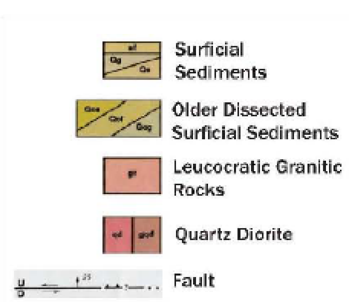
NASA JPL is situated on an alluvial plain south of the San Gabriel Mountains. These mountains are of the Quaternary Pacoima Formation, composed of conglomeratic arkosic sandstones of stream channel and fanglomeratic origin (Figure 3-1; NASA 2012a).

3.6.3.2 Soils

Soils at NASA JPL consist primarily of 20 to 30 inches of a fine sandy loam layer (Hanford Series). Soils are mapped as Balder family-Xerorthents complex, 5 to 60 percent slopes. The Balder family soils are well drained gravelly sandy loam derived from residuum weathered from granodiorite. Xerorthents soils are somewhat excessively drained gravelly sandy loam derived from residuum weathered from granodiorite and/or residuum weathered from metamorphic rock. These soils are underlain by a granitic rock basement. This crystalline basement is composed of rocks ranging from Precambrian to Tertiary, and includes various types of diorites, granites, monzonites, and granodorites with a history of intrusion and metamorphism (NASA 2012a).

Figure 3-1: Regional Geology Map





3.6.3.3 Topography

Periodic tectonic uplift of the mountains has occurred during the past 1 to 2 million years producing the present area topography. Most of this uplift occurred along north to northeast dipping reverse and thrust faults located along the southwestern edges of the mountains (NASA 2012a). NASA JPL is located near the southwestern base of the San Gabriel Mountains. The northern portion of the facility is mountainous and steep and topped by a narrow ridge. The remainder of the facility slopes moderately and has been graded extensively throughout its development. The site terrain varies in elevation from 458 feet to 1,075 feet above mean sea level. The Arroyo Seco, a drainage course emanating from the San Gabriel Mountains, has incised through the alluvium on the southeast side of NASA JPL.

3.6.3.4 Seismicity

NASA JPL is located in a seismically active area as is most of Southern California. Active faults in the vicinity of NASA JPL include the San Andreas fault located 24 miles to the northeast, the Newport-Inglewood fault zone located 17.5 miles to the southwest, the Whittier-Elsinore fault located 17 miles to the south/southeast, and the Raymond fault located 3.5 miles to the south. The active Sierra Madre fault zone trends east-west along the base of the San Gabriel Mountains, crossing through NASA JPL. The Sierra Madre fault zone includes multiple segments of reverse thrust faults that dip steeply to the north. It is considered to be more active along the western end of the fault zone with decreasing activity in the central and eastern portions. NASA JPL is located within the central portion of the Sierra Madre fault zone. The fault zone is considered active and capable of producing moderate to large earthquakes and ground rupture. Historic earthquakes along related fault zones include the 1971 San Fernando Earthquake and the 1991 Sierra Madre Earthquake. Current U.S. Geological Survey (USGS) data indicate that the Sierra Madre fault zone is capable of producing a magnitude 7.0 earthquake. Although recent geologic studies of the Sierra Madre fault system near NASA JPL indicate Holocene fault movement, the Sierra Madre fault zone on site is not currently zoned as an APEFZ by the CGS.

The appropriate setback from on-site faults and potential rupture zones are based on evaluation of risk and performance objectives. A minimum setback of 100 feet and 50 feet, is maintained from the nearest fault trace or fault rupture zone for essential (e.g., first aid station, fire and security stations, disaster operation and communication areas, etc.) and nonessential structures, respectively. Planning considerations at NASA JPL include routing of lifelines around potential rupture zones or other mitigation measures to reduce the potential for damage due to fault rupture.

3.6.4 Approach to Analysis

Determination of the significance of potential impacts to geological and soil resources is based on 1) the importance of the resource (i.e., commercial, ecological, and/or scientific); 2) the proportion of the resource that would be affected relative to its occurrence in the region; and 3) the susceptibility for deleterious effects on the resource due to a proposed action. Impacts to geological and soil resources are significant if the physical structure, chemical composition, or visual aesthetic character are adversely affected over a relatively large area.

3.6.5 Environmental Impacts

3.6.5.1 Alternative A

Construction Impacts

Alternative A would have less than significant short-term construction-related impacts on affected soils within the project area. Soil would be temporarily excavated and stockpiled during trenching and minor grading activities at the gates and during more extensive grading activities at the proposed LACFD Fire Camp acquired property. Excavated soils at the LACFD Fire Camp acquired property would be reused as fill/backfill. Any remaining soils would be recycled or disposed of according to county and state regulations. Construction BMPs, such as covering/tarping soil stockpiles and use of silt fences/barriers would reduce or eliminate potential silt runoff if heavy rainfall or flooding occurs during construction activities. Additionally, construction of fencing across the NASA JPL Bridge would not result in substantial grading activities that would have the potential to impact the Arroyo Seco below. Consequently, there would be no significant construction-related impacts to geological resources and minor topographical alterations during grading would not significantly alter site topography.

Operational Impacts

There would be no long-term impacts to geological resources, soils, or topography. Additionally, project elements under Alternative A would be located within the Sierra Madre Bridge Fault Hazard Zone. Any long-term topographical alterations at the LACFD acquisition property would be minimal.

3.6.5.2 Alternative B

Construction Impacts

Short-term impacts to geology, soils, and topography under Alternative B would be similar to those described for Alternative A. Soil would be temporarily excavated and stockpiled onsite within designated areas. Stockpiled soil would be protected in accordance with applicable construction BMPs. However, Alternative B would include a slightly smaller amount of potential soil disturbance compared to Alternative A since it would not include grading/excavation at the Los Angeles County Fire Department's Fire Camp Facility.

Operational Impacts

There would be no long-term impacts to geology, soils, or topography. Additionally, project elements under Alternative A would be located within the Sierra Madre Bridge Fault Hazard Zone. Any long-term topographical alterations at NASA JPL would be minimal.

3.6.5.3 No Action Alternative

Under the No Action Alternative there would be no disturbance to geology, soils, or topography as no construction or ground disturbing activities would occur.

Consequently, there would be no impacts to geological resources under this alternative.

3.7 WATER RESOURCES

3.7.1 Definition of Resources

Water resources analyzed in this study encompass surface water, groundwater, floodplains, and wetlands. Surface water resources include lakes, rivers, and streams and are important for a variety of reasons including ecological, economic, recreational, aesthetic, and human health. Groundwater comprises subsurface water resources and is an essential resource in many areas as it is used for potable water, agricultural irrigation, and industrial applications. Floodplains are belts of low, level ground present on one or both sides of a stream channel and are subject to either periodic or infrequent inundation by floodwater.

The CWA defines wetlands as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas" (40 CFR 230.3[t]).

3.7.2 Existing Conditions

3.7.2.1 Surface Water and Drainage

Surface water from the hillsides above the NASA JPL facility is transmitted via an underground storm drain system located throughout the developed regions of the site. The storm drain outlets flow into the Arroyo Seco River, which is the closest surface water body to the NASA JPL facility, located directly east of the facility border, within the Hahamongna Watershed Park. The Arroyo Seco is an intermittent stream that drains a portion of the northeastern section of the Los Angeles River Basin. Natural flow in the Arroyo Seco is dependent on rainfall and is dry during periods of little or no rainfall. The average monthly discharge for the Arroyo Seco upstream of NASA JPL is approximately 10 cubic feet per second (USGS 2010), with storm drains from local municipalities comprising the majority of direct drainage to the Arroyo Seco. Discharges to the Arroyo Seco from the NASA JPL facility are permitted by a U.S. National Pollution Discharge Elimination System (NPDES) Storm Water General Permit. The permit requires NASA JPL to develop and maintain a SWPPP to prevent storm water pollution. The site SWPPP identifies BMPs for industrial activities that are exposed to precipitation. NASA JPL also holds a Stormwater Discharge Permit for the discharge of groundwater from an artesian well behind Building 150. Construction Stormwater Permits are required for onsite construction activities (NASA 2012a). On-site drainage from NASA JPL is north to south. Runoff in the steep northern areas of the site is intercepted with debris basins to control the velocity of runoff and to capture debris from the mountains. Surface runoff from the northern areas is transmitted by an underground storm drain system, located throughout the developed lower portion of NASA JPL to one of nine outlet points in the Arroyo Seco.

The City of Pasadena Department of Parks and Recreation initiated a multi-use project in the Arroyo Seco, known as the *Hahamongna Watershed Park Master Plan* in September 2003 (City of Pasadena 2003). The project was designed to enhance water resources, improve flood control, restore native habitat, and improve recreation and infrastructure for use by the local community. It included the development of hiking trails into the Arroyo, construction of an interpretive nature center, restoration of native vegetation, and the revitalization of HWP. The City of Pasadena Water and Power Department plans to increase spreading basis operations for the Hahamongna watershed Park Master Plan project. Some of the land proposed to be used as spreading basins was previously used as the East Arroyo Parking Lot.

3.7.2.2 Groundwater

The NASA JPL facility is situated over part of the Monk Hill Basin, which is an unconfined groundwater aquifer. The Pasadena Subarea, the Santa Anita Subarea, and the Monk Hill Basin make up the unconfined aquifer called the Raymond Basin. The Raymond Basin is bounded to the north by the San Gabriel Mountains, to the south and east by the San Gabriel Valley, and the west by the San Rafael Hills. The Basin provides part of the potable water supply for

Pasadena, La Cañada-Flintridge, San Marino, Sierra Madre, Altadena, Alhambra, and Arcadia.

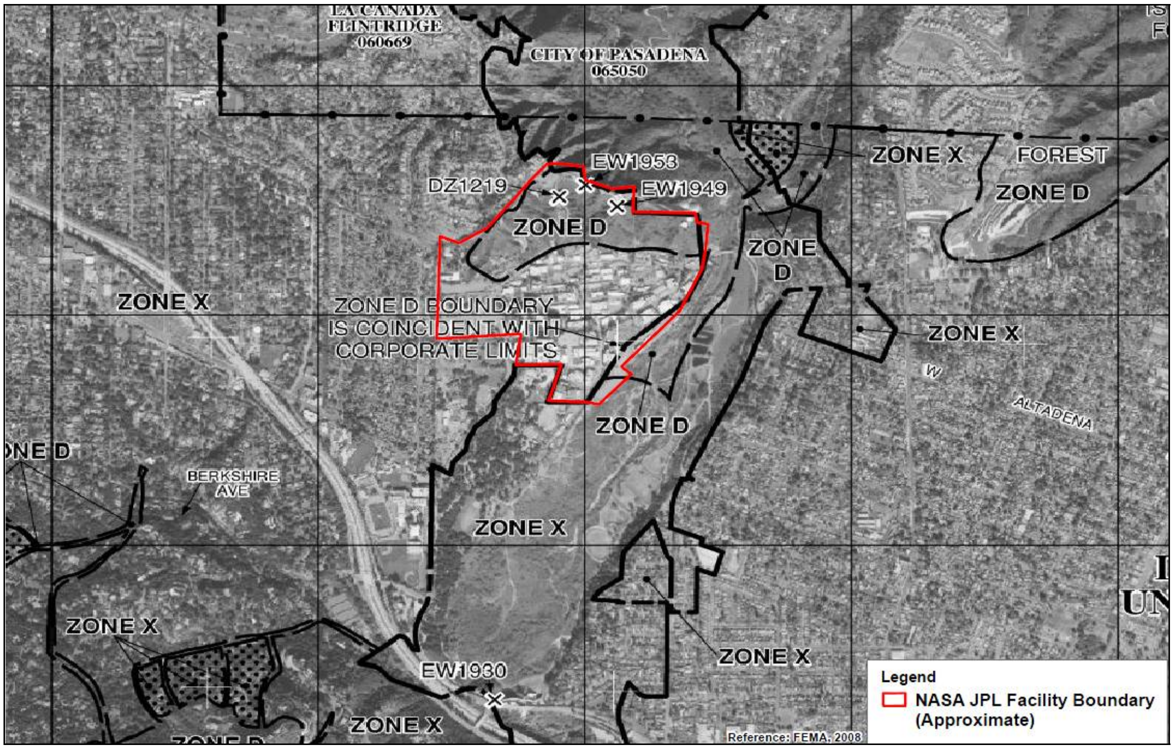
The greater Raymond Basin is replenished by both natural rainfall and artificial recharge from several spreading basins on the eastern side of the Arroyo Seco, near NASA JPL. These spreading basins are operated by the City of Pasadena. The alluvial aquifer below the Arroyo Seco is predominantly characterized by relatively coarse sediment, which makes the Arroyo extremely permeable.

Surface water percolates into the groundwater fairly quickly, and groundwater flow rates are relatively high. The City of Pasadena obtains approximately 40 to 50 percent of its municipal water supply from groundwater wells. The groundwater table below the facility is located at approximately 200 feet below ground surface (bgs). The groundwater table and groundwater flow patterns are significantly influenced by Pasadena production wells located to the southeast of the facility. Groundwater moves from the northwest to the southeast towards NASA JPL, then towards these water supply wells. The groundwater contains various chemicals, including some historically used at NASA JPL. In 1992, NASA JPL was placed on the NPL of sites subject to regulation under CERCLA. The local water purveyors constantly monitor the water served to the public and take the necessary actions, including blending and treatment, to assure this water meets all applicable drinking water quality standards (NASA 2012a).

3.7.2.3 Floodplains

The NASA JPL facility is included in the U.S. Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Number 06037C1375F dated September 26, 2008. According to the map, the majority of the NASA JPL facility is located within Flood Zone X; defined as "areas determined to be outside the 0.2 percent annual chance floodplain" (FEMA 2008). A portion of the steep northern section of the facility is located within Flood Zone D; "areas in which flood hazards are undetermined, but possible" (FEMA 2008). The areas directly east and south of the NASA JPL facility, within the Hahamongna Watershed Park are also located within Zone D. The residential areas to the west and southwest are within Zone X (Figure 3-2).

Figure 3-2: FEMA Flood Map



3.7.2.4 Wetlands

The Arroyo Seco river, located directly east of the NASA JPL facility, includes an intermittent riverine streambed and seasonally flooded wetlands dominated by shrubs and emergents that have been modified by a man-made barrier or dam that influences water flow. No other classified wetlands are located within the vicinity of the NASA JPL facility (United States Fish and Wildlife Service [USFWS] 2014).

3.7.3 Approach to Analysis

Significant impacts to water resources would occur if Federal or state water quality regulations or standards for surface water or groundwater are violated, if existing water resources are directly or indirectly impacted from water extraction activities due to increased demand, if activities were located in a regulatory floodplain without an appropriate flood study, if activities fail to adequately address upstream drainage as it is conveyed through the project area, or if activities change historic drainage flows and/or patterns, potentially impacting downstream areas (NASA 2012a).

3.7.4 Environmental Impacts

3.7.4.1 Alternative A

Construction Impacts

Under the Alternative A, there would be less than significant potential impacts to surface water hydrology during the construction period from sediment and stormwater runoff to the Arroyo Seco watershed and the surrounding environment. BMPs would be implemented that adhere to Federal and state regulations to minimize sediment/stormwater discharges associated with construction activities.

There would be no anticipated impacts to groundwater. Given the estimated depth to groundwater of approximately 200 feet bgs, and the shallow depth of planned surface grading, it would be unlikely that groundwater would be encountered (NASA 2012a).

Although certain areas within and surrounding the NASA JPL facility have not been mapped/studied by FEMA, the majority of the facility is located in FEMA Flood Zone X ("areas determined to be outside the 0.2 percent annual chance floodplain" [FEMA 2008]). Any potential adverse impacts to the Arroyo Seco floodplain, as well as other floodplains in the area would be reduced by adherence to BMPs (e.g., soil tarping, silt fencing, etc.) that would minimize/eliminate short term construction impacts from runoff into floodplains.

Operational Impacts

There would be no anticipated long-term impacts to surface water or groundwater since Alternative A would follow all applicable stormwater management regulations in creating adequate storm drains and other surface water collection features needed to ensure that the existing surface water flow patterns would not be substantially altered. Further, there would be no anticipated disturbance to the underlying groundwater resources. Since no existing floodplains are planned to be altered, there would be no long-term impacts to floodplains within the affected environment.

3.7.4.2 Alternative B

Construction Impacts

Under Alternative B there would be potential less than significant short-term construction-related impacts to water resources similar to those described for Alternative A. Potential surface water impacts during the construction period would be minimized or eliminated by adhering to construction BMPs and applicable regulations. There would be no anticipated impacts to groundwater resources or floodplain function.

Operational Impacts

Long-term impacts to surface water, groundwater and floodplains would be similar to those described for Alternative A. All applicable surface water collection features would be incorporated into construction design in order to assure that the proposed alternative components would not significantly alter surface water or ground water resources. There would be no anticipated impact to flood plain function.

3.7.4.3 No Action Alternative

Under the No Action Alternative there would be no change to existing surface water, groundwater or floodplain function. Consequently, there would be no impacts to water resources under this alternative.

3.8 CULTURAL RESOURCES

3.8.1 Definition of Resources

Cultural resources represent and document activities, accomplishments, and traditions of previous civilizations and link current and former inhabitants of an area. Depending on their conditions and historic uses, these resources may provide insight to living conditions in previous civilizations and may retain cultural and religious significance to modern groups.

Archaeological resources comprise areas where prehistoric or historic activity measurably altered the earth or deposits of physical remains (e.g., arrowheads, bottles). Architectural resources include standing buildings, districts, bridges, dams, and other structures of historic or aesthetic significance. Architectural resources generally must be more than 50 years old to be considered for inclusion in the National Register of Historic Places (NRHP), an inventory of culturally significant resources identified in the U.S.; however, more recent structures, such as Cold War-era resources, may warrant protection if they have the potential to gain significance in the future. Traditional cultural resources can include archaeological resources, structures, neighborhoods, prominent topographic features, habitats, plants, animals, and minerals that Native Americans or other groups consider essential for the persistence of traditional culture.

3.8.2 Regulatory Setting

Several Federal laws and regulations have been established to manage cultural resources, including the National Historic Preservation Act (NHPA) (1966), the Archaeological and Historic Preservation Act (1974), and the Archaeological Resource Protection Act (1979). In order for a cultural resource to be considered significant, it must meet one or more of the following criteria for inclusion on the NRHP:

"The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design setting, materials, workmanship, feeling, and association and: (a) that are associated with events that have made a significant contribution to the broad patterns of our history; or (b) that are associated with the lives or persons significant in our past; or (c) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or (d) that have yielded, or may be likely to yield, information important in prehistory or history" (CFR, Title 36, Part 60:4; 2004).

The California State Office of Historic Preservation (OHP) is responsible for administering federally and state-mandated historic preservation programs to further the identification, evaluation, registration, and protection of California's irreplaceable archaeological and historical resources under the direction of the State Historic Preservation Officer (SHPO), a gubernatorial appointee, and the State Historical Resources Commission. OHP reviews and comments on federally sponsored projects pursuant to Section 106 of the NHPA and state projects pursuant to Sections 5025 and 5024.5 of the Public Resources Code and the California Environmental Quality Act (CEQA) (OHP 2014).

3.8.3 Existing Conditions

3.8.3.1 Archaeology

No known or recorded archaeological resources are located within the boundaries of the NASA JPL facility; however, several sites are located in the vicinity. NASA JPL is well developed with few undisturbed areas available for archaeological inspection. The only undisturbed area, the hillside to the north, is considered too steep to be inhabitable or archaeologically sensitive. The area adjacent to the Arroyo Seco; however, can be considered potentially sensitive because of the occurrence of archaeological sites to the north and south of NASA JPL (NASA 2012b).

3.8.3.2 Historic Resources

NASA JPL prepared a *Historic Resources Study Gate to Gate, NASA Jet Propulsion Laboratory, Pasadena, CA* in 2010 (Page & Turnbull 2010). The study was completed to assist NASA JPL in meeting its obligations under Sections 106 and 110 of the NHPA and concluded that 7 buildings are eligible for listing on the NRHP. These buildings, with their date of construction, include:

- Building 11, Space Sciences Laboratory, 1942;
- Building 18, Structural Test Laboratory, 1945;
- Building 82, High Vacuum Laboratory, 1948;

- Building 90, Pyrotechnics Laboratory, 1948;
- Building 103, Electronic Fabrication Shop, 1947;
- Building 125, Combined Engineering Support, 1954; and
- Building 179, Spacecraft Assembly Facility, 1961.

Additionally, two structures, Building 230 (Space Flight Operations) and Building 150 (25-foot Space Simulator), are currently listed on the NRHP as a result of the *Man in Space Theme Study* performed by the National Park Service in 1984. These properties were formally designated by the Secretary of the Interior on October 3, 1985 (NASA 2012a).

3.8.4 Approach to Analysis

Cultural resources are subject to review under both Federal and state laws and regulations. Section 106 of the NHPA empowers the Advisory Council on Historic Preservation to comment on federally initiated, licensed, or permitted projects affecting cultural sites listed or eligible for inclusion on the NRHP.

Once cultural resources have been identified, significance evaluation is the process by which resources are assessed relative to significance criteria for scientific or historic research, for the general public, and for traditional cultural groups. Only cultural resources determined to be significant (i.e., eligible for the NRHP) are protected under the NHPA.

Analysis of potential impacts to cultural resources considers both direct and indirect impacts. Direct impacts may occur by 1) physically altering, damaging, or destroying all or part of a resource; 2) altering the characteristics of the surrounding environment that contribute to resource significance; 3) introducing visual, audible, or atmospheric elements that are out of character with the property or alter its setting; or 4) neglecting the resource to the extent that it is deteriorated or destroyed.

Identifying the locations of proposed actions and determining the exact locations of cultural resources that could be affected can assess direct impacts. Indirect impacts primarily result from the effects of project-induced population increases and the resultant need to develop new housing areas, utilities services, and other support functions necessary to accommodate population growth. These activities and the subsequent use of the facilities can disturb or destroy cultural resources.

3.8.5 Environmental Impacts

3.8.5.1 Alternative A

Construction Impacts

Archaeological and cultural resources have not been encountered within the boundaries of the NASA JPL during past archaeological surveys; however, several sites are located in the area and there is potential for buried deposits indicative of either prehistoric or historic activities within NASA JPL (McKenna et al. 1993). Potential sites may include habitation sites of the Hahamongna peoples occupying the upper reaches of Arroyo Seco, Verdugo Wash, and the San Rafael Hills. Hahamongna Park located on the southeast edge of NASA JPL has been determined as a site with the potential to contain buried deposits; however, construction activities associated with Alternative A would not be located at or within Hahamongna Park. Further, all construction activities would take place at areas within the NASA JPL facility that were previously disturbed. Should an inadvertent discovery of a cultural artifact occur during implementation of Alternative A NASA JPL would follow the Protocol for the Inadvertent Discovery of Cultural Artifacts (NASA JPL Rule Doc ID 72132) (NASA 2012b).

Two structures located at NASA JPL, Building 230 (Space Flight Operations) and Building 150 (25-foot Space Simulator) are currently listed on the NRHP. However, neither of these buildings are located within or adjacent to planned construction areas at NASA JPL. Construction activities are not expected to impact the seven buildings eligible for listing on the NRHP. As a result, no short-term impacts on cultural resources would be anticipated as a result of the implementation of Alternative A.

Operational Impacts

Operation and maintenance of the proposed improvements would not result in any irrevocable loss of historic or cultural resources since any inadvertent discovery of a cultural artifact during implementation of Alternative A would be identified and preserved following the Protocol for the Inadvertent Discovery of Cultural Artifacts (NASA JPL Rule Doc ID 72132). As a result, no long-term impacts on historic or cultural resources would be expected.

3.8.5.2 Alternative B

<u>Construction Impacts</u>

Short-term impacts to cultural resources expected due to implementation of Alternative B would be similar to Alternative A. Construction activities would take place on previously disturbed areas and would not take place in areas with a potential to contain buried deposits. In the event of an inadvertent discovery of a cultural artifact NASA JPL would follow the Protocol for the Inadvertent Discovery of Cultural Artifacts (NASA JPL Rule Doc ID 72132). Construction activities would not take place within or adjacent to structures currently listed on the NRHP or the structures eligible for listing on the NRHP. As a result, no short-term impacts to cultural resources are considered due to implementation of Alternative B.

<u>Operational Impacts</u>

Operation and maintenance of the proposed improvements under Alternative B would not result in any irrevocable loss of historic or cultural resources since any inadvertent discovery of a cultural artifact during implementation would be identified and preserved following the Protocol for the Inadvertent Discovery of Cultural Artifacts (NASA JPL Rule Doc ID 72132). No long-term impacts on historic or cultural resources would be expected as a result of the implementation of Alternative B.

3.8.5.3 No Action Alternative

Under the No Action Alternative, there would be no proposed improvements or ground disturbing activities at NASA JPL. The West, South, and East gates would remain unchanged from current conditions and there would be no impacts to any potential archaeological, historic, or cultural resources at the NASA JPL facility.

3.9 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

3.9.1 Definition of Resource

Socioeconomics are defined as the basic attributes and resources associated with the human environment, particularly population and economic activity. Human population is affected by regional birth and death rates as well as net in- or outmigration. Economic activity typically comprises employment, personal income, and industrial growth. Impacts on these fundamental socioeconomic indicators can also influence other components such as housing availability and public services provision.

3.9.2 Regulatory Setting

In 1994, Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations, was issued to focus attention of Federal agencies on human health and environmental conditions in minority and low income communities. EO 12898 requires that all Federal agencies address the effects of policies on minority and low-income populations and communities as well as ensure that disproportionately high and adverse human health or environmental effects on these communities are identified and addressed. The CEQ has oversight of the Federal agencies' compliance with EO 12898 and NEPA. CEQ, in consultation with USEPA and other affected agencies, developed Environmental Justice Guidance Under the National Environmental Policy Act (CEQ 1997) to further assist Federal agencies with their NEPA procedures so that environmental justice concerns are effectively identified and addressed.

3.9.3 Existing Conditions

The NASA JPL facility is located in both the city of Pasadena, and the City of La Cañada Flintridge. Both cities are located within Los Angeles County. Socioeconomic data was gathered from the U.S. Census Bureau 2010 American Fact Finder dataset. As of 2010 the county of Los Angeles included a total population of 9,818,605, while the cities of Pasadena and La Cañada Flintridge included total populations of 137,122 and 20,246, respectively. Table 3-7 below shows the general demographic characteristics for Pasadena and La Cañada

Flintridge. La Cañada Flintridge includes a relatively small population with a high median income level and low poverty rate, compared to Pasadena.

Table 3-7: Socioeconomic Data

Demographic Statistics	Pasadena	La Cañada Flintridge
Age		
Median Age	37.2	45.9
Race (percent of total population)		
One race	95.1	96.6
Two or more races	4.9	3.4
Black of African American	10.7	0.5
White	55.8	68.9
American Indian and Alaska Native	0.6	0.1
Asian	14.3	25.8
Native Hawaiian or Pacific Islander	0.1	0.0
Hispanic or Latino	33.7	6.3
Housing		
Total Housing Units	59,551	7,089
Total Households	55,270	6,849
Economic Data		
Labor Force Population	77,114	9,389
Unemployment Rate	9.8%	5.8%
Median Household Income	$68,310	$154,947
Percent of Population Below the Poverty Rate	12.9%	2.1%

Source: U.S Census Bureau, 2010.

3.9.4 Approach to Analysis

Significance of population and economic activity are assessed in terms of their direct effects on the local economy and related effects on other socioeconomic resources (e.g., housing). The magnitude of potential impacts varies depending on the location of a proposed action; for example, an action that creates 20 employment positions may be unnoticed in an urban area, but may have significant impacts in a more rural region. If potential socioeconomic impacts would result in substantial shifts in population trends, or adversely affect regional spending and earning patterns, they would be significant.

In order to comply with EO 12898, and ethnicity and poverty status in the vicinity of the Proposed Action have been examined and compared to county, state, and national data to determine if any minority or low-income communities could potentially be disproportionately affected by implementation of the Proposed Action or alternatives. Data have been collected from previously published documents issued by Federal, state, and local agencies and from state and national databases (e.g., U.S. Bureau of Economic Analysis Regional Economic Information System).

The CEQ guidance states that "minority populations should be identified" where either: a) the minority population of the affected area exceeds 50 percent; or b) the population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographical analysis." (CEQ 1997). Only census tracts in Altadena and Pasadena meet the definition of a minority population; none are located in the community of La Cañada Flintridge (NASA 2012a). Further, CEQ (1997) guidelines do not specifically state the percentage considered meaningful in the case of low-income populations; however, while low income individuals do reside within the surrounding community, the percentages in the potentially affected census tracts are well below the 50 percent required to be considered a "low-income population" as defined by Housing and Urban Development guidelines (NASA 2012a).

3.9.5 Environmental Impacts

3.9.5.1 Alternative A

<u>Construction Impacts</u>

Alternative A would result in beneficial impacts by creating temporary construction jobs to implement the proposed security gates fortification projects. However, this beneficial impact would be short-term and temporary in nature. There would be no short-term adverse impacts anticipated under Alternative A.

<u>Operational Impacts</u>

Alternative A would include security improvements, which would result in a higher level of safety for workers at the facility. However, there would be no increase in long-term employment or staffing at NASA JPL associated with this alternative. Consequently, there would be no anticipated long-term impacts to socioeconomic resources, low-income or minority populations under Alternative A.

3.9.5.2 Alternative B

Alternative B would result in similar short-term beneficial impacts through the creation of construction jobs, and increased safety for facility occupants. There would be no anticipated adverse short or long-term impacts to socioeconomic resources, low-income or minority populations under Alternative A.

3.9.5.3 No Action Alternative

Under the No Action Alternative there would be no improvements to the security gates at the NASA JPL facility. There would be no additional short-term construction-related jobs created, and there would be no impact to the affected socioeconomic environment. Further, there would be no effect on housing or community facilities in the vicinity of NASA JPL.

3.10 NOISE

3.10.1 Definition of Resource

Noise is generally defined as unwanted sound. Noise can be any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise annoying. Human responses to noise vary depending on the type and characteristics of the noise, distance between the noise source and receptor, receptor sensitivity, and time of day.

Determination of noise levels are based on: 1) sound pressure level generated (decibels [dB] scale); 2) distance of listener from source of noise; 3) attenuating and propagating effects of the medium between the source and the listener; and 4) period of exposure.

An A-weighted dB sound level (dBA) is one measurement of noise. The human ear can perceive sound over a range of frequencies, which varies for individuals. In using the A-weighted scale for measurement, only the frequencies heard by most listeners are considered. This gives a more accurate representation of the perception of noise. The noise measure in a residential area, similar to conditions within the project area, is estimated at approximately 70 dBA. Normal conversational speech at a distance of five to ten feet is approximately 70 dBA. The decibel scale is logarithmic, so, for example, sound at 90 dBA would be perceived to be twice as loud as sound at 80 dBA.

Passenger vehicles, motorcycles, and trucks use the roads in the vicinity of the project area. Noise levels generated by vehicles vary based on a number of factors including vehicle type, speed, and level of maintenance. Intensity of noise is attenuated with distance. Some estimates of noise levels from vehicles are listed in Table 3-8.

Table 3-8: Typical Noise Sources

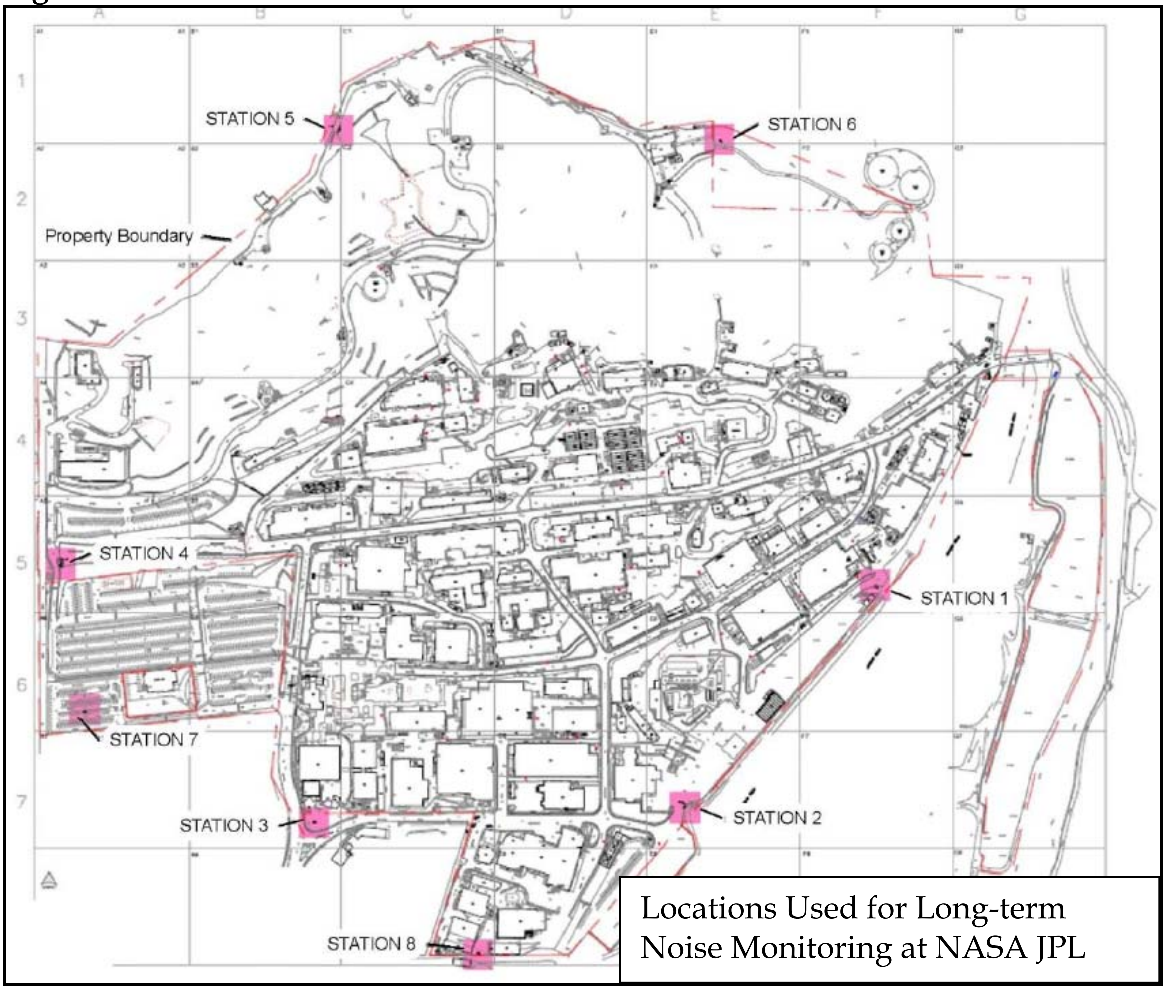
Source	Distance (feet)	Noise Level (dBA)
Automobile, 40 mph	50	72
Automobile Horn	10	95
Light Automobile Traffic	100	50
Truck, 40 mph	50	84
Heavy Truck or Motorcycle	25	90

Note: mph – miles per hour.

3.10.2 Existing Conditions

A survey of ambient noise conditions at NASA JPL was conducted in 2007. Noise sources at NASA JPL include vehicle traffic, cooling towers, pumping stations, compressors, backup generators, building ventilation systems, maintenance and construction equipment. Sound level meters were set up around the perimeter of the NASA JPL facility in order to estimate NASA JPL's contribution to noise within the surrounding affected acoustic environment. Figure 3-3 shows the locations where the sound level meters were placed onsite (NASA 2012a).

Figure 3-3: Noise Measurement Locations



Generally, the highest noise levels measured around the perimeter of the NASA JPL facility were on the east side of the property, while the lowest noise levels occurred at the northern portion of the property. According to the results of the noise level measurements, it was determined that while the NASA JPL facility generates noise from the sources identified above, it is not creating significant noise emissions to the surrounding residential and recreational areas at or above normal land use compatibility standards for office-type and residential land uses, as identified in the noise elements of the La Cañada Flintridge and Pasadena General Plans (NASA 2012a).

3.10.3 Approach to Analysis

Noise impact analyses typically evaluate potential changes to existing noise environments that would result from the implementation of a proposed action. These potential changes may be beneficial if they reduce the number of sensitive receptors exposed to unacceptable noise levels. Conversely, impacts may be significant if they result in an introduction to unacceptable noise levels or increased exposure to unacceptable noise levels. Noise associated with an action is compared with existing noise conditions to determine the magnitude of potential impacts.

3.10.4 Environmental Impacts

3.10.4.1 Alternative A

Under Alternative A there would be negligible short-term construction related impacts to noise receptors at NASA JPL, particularly in the immediate vicinity of the West, South, and East gates.

Construction Impacts

Under Alternative A there would be noise generated from heavy equipment used for demolition and construction activities; including jack hammering, saw cutting asphalt and concrete, and general construction-related noise. Sensitive receptors include the NASA JPL facility, the Flintridge Riding Club, the Hahamongna Watershed Park, as well as residential areas within the vicinity of the NASA JPL borders. However, these short-term impacts would not affect the surrounding residential and recreational areas at or above normal land use compatibility standards for office-type and residential land uses, as identified in the noise elements of the La Cañada Flintridge and Pasadena General Plans (NASA 2012a). Construction noise impacts would be further reduced by limiting idling of construction vehicles and adhering to standard weekday working hours.

Operational Impacts

Once completed, Alternative A would include reconfigured roadways, parking areas, and entrance security check points. There would be no anticipated significant long-term noise impacts from the proposed alternative components once in operation.

3.10.4.2 Alternative B

Construction Impacts

Under Alternative B there would be similar noise generated during the construction period as discussed for Alternative A. There would be no significant short-term construction-related impacts.

Operational Impacts

Alternative B components would be similar to those included in Alternative A, and would not be anticipated to result any in significant long-term noise impacts to the existing noise environment.

3.10.4.3 No Action Alternative

The No Action Alternative would not include any activities leading to the generation of any noise to sensitive receptors. There would be no noise impacts under the No Action Alternative.

3.11 LAND USE

3.11.1 Definition of Resource

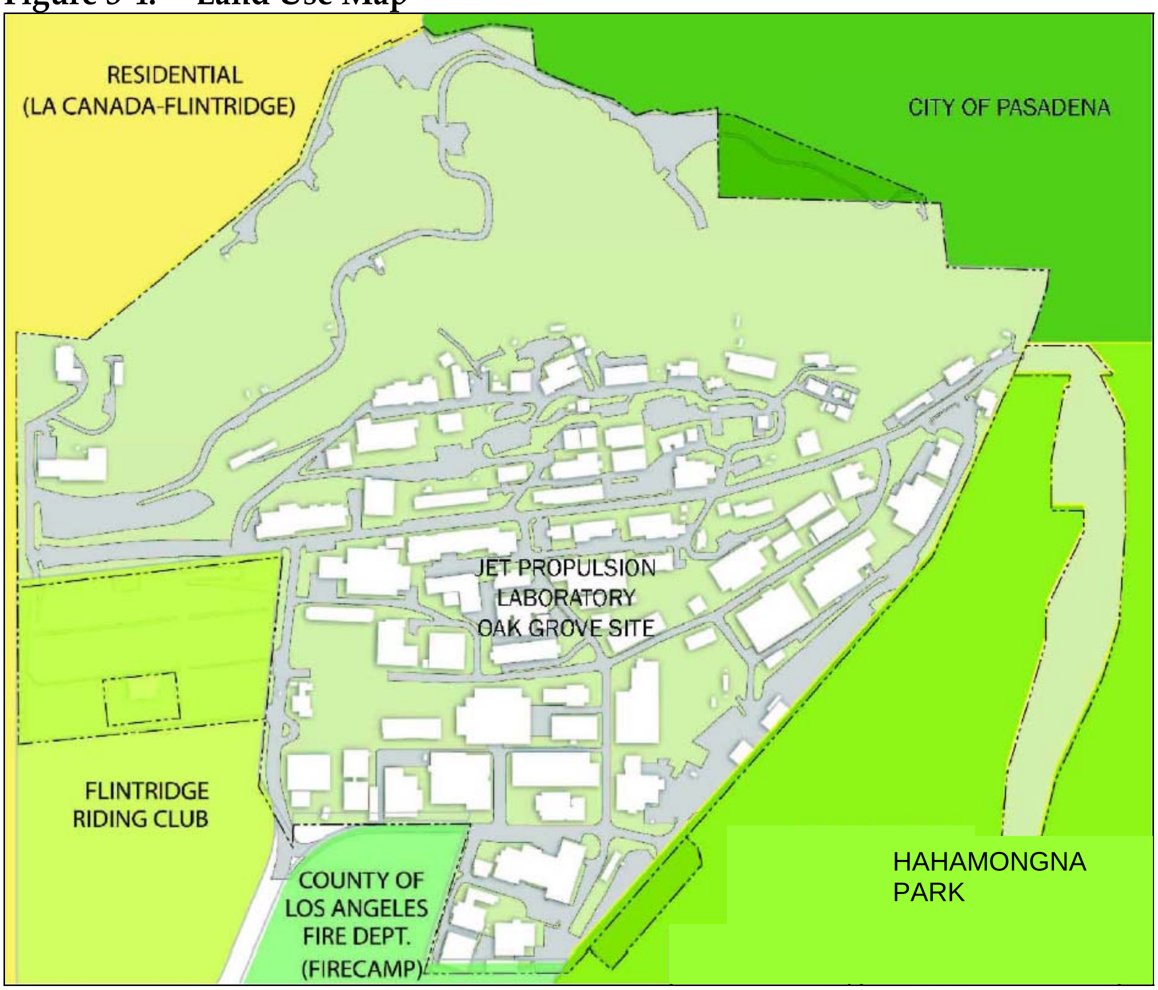
Land use is comprised of natural conditions or human-modified activities occurring at a particular location. Human-modified land use categories include residential, commercial, industrial, transportation, communications and utilities, agricultural, institutional, recreational, and other developed use areas.

Management plans and zoning regulations determine the type and extent of land use allowable in specific areas and are often intended to protect specially designated or environmentally sensitive areas.

3.11.2 Existing Conditions

Land use within the NASA JPL facility primarily includes office and laboratory use. The facility includes 138 buildings totaling over 2.7 million gross square feet in area. The areas surrounding the facility include residential and recreational use, as well as the natural floodplain included in the Hahamongna Watershed Park to the east. The LACFD training camp is located along the southwest boundary of the NASA JPL facility. Figure 3-4 shows land use at the facility, as well as within the surrounding area (NASA 2012a).

Figure 3-4: Land Use Map



3.11.3 Approach to Analysis

Significance of potential land use impacts is based on the level of land use sensitivity in areas affected by a proposed action. In general, land use impacts would be significant if they would: 1) be inconsistent or noncompliant with applicable land use plans or policies; 2) preclude the viability of existing land use; 3) preclude continued use or occupation of an area; or 4) be incompatible with adjacent or vicinity land use to the extent that public health or safety is threatened.

3.11.4 Environmental Impacts

3.11.4.1 Alternative A

Construction Impacts

Short-term construction associated with gate improvements would not affect or be affected by any existing land use designations or plans. The areas under consideration have been previously developed and continue to undergo development and redevelopment. As these project elements are consistent with long-term planning objectives and compatible with existing and surrounding land use, construction activities associated with implementation of Alternative A would not be considered adverse.

Operational Impacts

Implementation of Alternative A would be compatible and consistent with the NASA JPL Master Plan (NASA 2012a). Additionally, it would be compatible and consistent with NASA Procedural Requirement 1620.3, *Physical Security Requirements for NASA Facilities and Property*, which specifically requires that designated vehicle inspection areas do not interfere with the vehicular traffic or pedestrian flow on- and off-center to ensure the safety of the NASA JPL workforce and the General Public, and NASA assets.

Long-term land use changes under Alternative A would include an easement obtained from the City of Pasadena granting NASA JPL the authority to develop a new inbound lane at the South Gate as well as contractor parking. Use of this 10,000 square foot property is not anticipated to be adversely impacted by the additional 11 parking spaces planned under Alternative A since the site is currently paved in its entirety. The remainder of the planned project components would be consistent with current use, as well as regional plans and zoning for the affected environment.

3.11.4.2 Alternative B

Construction Impacts

Short-term construction associated with gate improvements would not affect or be affected by any existing land use designations or plans. The areas under consideration have been previously developed and continue to undergo development and redevelopment. As these project elements are consistent with long-term planning objectives and compatible with existing and surrounding land use, construction activities associated with implementation of Alternative B would not be considered adverse.

Operational Impacts

Land use under Alternative B would be the same as Alternative A, except there would be no easement obtained from the City of Pasadena for the additional inbound lane and contractor parking. Therefore, land use would be consistent with current use, as well as regional plans and zoning for the affected environment.

3.11.4.3 No Action Alternative

Under the No Action Alternative there would be no additional improvements to the security gates at the NASA JPL facility, and there would be no changes to land use within the affected environment.

3.12 BIOLOGICAL RESOURCES

3.12.1 Definition of Resource

Biological resources include native or naturalized plants and animals and the habitats in which they occur. Sensitive biological resources are defined as those plants and animal species listed as threatened or endangered, or proposed as such, by USFWS, the National Marine Fisheries Service (NMFS), and the California Department of Fish and Wildlife (CDFW).

3.12.2 Regulatory Setting

The Endangered Species Act (ESA) was created in order to protect and recover imperiled species and the ecosystems upon which they depend. The ESA grants USFWS primary responsibility for terrestrial and freshwater organisms and NMFS primary responsibility for marine wildlife.

The California Endangered Species Act (CESA) was created to parallel the ESA and allows the CDFW to designate species, including plants as threatened or endangered. Further, the CESA makes it illegal to import, export, take, possess, purchase, sell, or attempt to do any of those actions to species that are designated as threatened, endangered, or candidates for listing, unless permitted by CDFW (CDFW 2014).

The Migratory Bird Treaty Act (MBTA) makes it unlawful to pursue, hunt, kill, capture, possess, buy, sell, purchase, or barter any migratory bird, including the feathers or other parts, nests, eggs, or migratory bird products. In addition, this act serves to protect environmental conditions for migratory birds from pollution or other ecosystem degradations.

3.12.3 Existing Conditions

Previous biological surveys of NASA JPL did not find evidence of species listed as threatened or endangered by either the State of California or Federal government. No special-status plants were detected during surveys of the facility. No critical habitat has been identified on the site. Historically, portions of the site were designated as critical habitat for the Southwestern Arroyo Toad; that designation was repealed by the USFWS in late 2002 (NASA 2012b).

Some migratory birds may be potential transients of the general area, but the immediate project area contains little to no suitable habitat for migratory birds. There are no known nesting sites in this area, and these lands are not vital for foraging or roosting (NASA 2012b).

3.12.4 Approach to Analysis

Determination of the significance of potential impacts to biological resources is based on 1) the importance (i.e., legal, commercial, recreation, ecological, or scientific) of the resource; 2) the proportion of the resource that would be affected relative to its occurrence in the region; 3) the sensitivity of the resource to proposed activities; and 4) the duration of ecological ramifications.

Impacts to biological resources are significant if species or habitats of concern are adversely affected over relatively large areas, or if disturbances cause reductions in population size or distribution. Potential physical impacts such as habitat loss, noise, and impacts to water quality were evaluated to assess potential impacts to biological resources resulting from the proposed alternatives.

3.12.5 Environmental Impacts

3.12.5.1 Alternative A

Construction Impacts

Construction areas planned under Alternative A would be located in areas that have been previously developed by roadways, sidewalks, and other impervious surfaces. Construction of fencing along the NASA JPL Bridge would not impact the Arroyo Seco streambed below. Therefore, construction activities would not result in a loss of vegetation or biological habitat. In addition, no threatened or endangered species, or critical habitat for any threatened or endangered species, occur within NASA JPL. As a result, no short-term impacts on biological resources would be anticipated as a result of the implementation of Alternative A.

Operational Impacts

No irrevocable loss of habitat, ongoing takes, or direct mortality of threatened or endangered species would occur due to operation of the proposed security gate fortification project. As a result, no long-term impacts to biological resources would be anticipated.

3.12.5.2 Alternative B

Construction Impacts

Short-term impacts to biological resources expected under Alternative B would be similar to those described for Alternative A. Construction activities would not result in a temporary loss of vegetation and habitat for terrestrial species and no threatened or endangered species, or critical habitat for any threatened or endangered species, occur within NASA JPL. As a result, no short-term impacts to biological resources are considered due to implementation of Alternative B.

Operational Impacts

Long-term impacts to biological resources expected under Alternative B would be similar to Alternative A. No irrevocable loss of habitat, ongoing takes, or direct mortality of threatened or endangered species would occur. As a result, no long-term impacts to biological resources are expected due to implementation of Alternative B.

3.12.5.3 No Action Alternative

Under the No Action Alternative, there would be no disturbance to the existing environment; as a result there would be no impacts to biological resources at the proposed project sites.

3.13 VISUAL RESOURCES

3.13.1 Definition of Resource

Visual resources are defined as the natural and manufactured features that comprise the aesthetic qualities of an area. These features form the overall impressions that an observer receives of an area or its landscape character. Landforms, water surfaces, vegetation, and manufactured features are considered characteristic of an area if they are inherent to the structure and function of a landscape.

3.13.2 Existing Conditions

The visual environment within the NASA JPL facility is representative of a developed commercial area. The main natural visual resources within the NASA JPL property include the foothills within the northern portion of the property. NASA JPL consists of 138 buildings and other minor ancillary structures, totaling over 2.7 million gross square feet in the area. The primary land use near NASA JPL is residential, along with undeveloped areas of the ANF to the north. The ANF is largely undeveloped and improved with hiking/equestrian trails and service roads. No state forests or parks exist in the surrounding area (NASA 2012b).

3.13.3 Approach to Analysis

Determination of the significance of impacts to visual resources is based on the level of visual sensitivity in the area. Visual sensitivity is defined as the degree of public interest in a visual resource and concern over adverse changes in the quality of that resource. In general, an impact to a visual resource is significant if implementation of a proposed action would result in substantial alterations to an existing sensitive visual setting.

3.13.4 Environmental Impacts

3.13.4.1 Alternative A

Construction Impacts

Under Alternative A, short-term impacts to visual and aesthetic resources within NASA JPL would be expected to occur during construction activities. These impacts would be due to the presence of construction equipment within and around NASA JPL. The visual resources adjacent to the construction areas are representative of a developed area. Further, presence of construction equipment would be temporary and limited to the construction and staging areas; and dust fencing or barriers would be used in order to reduce impacts. Therefore, construction activities would be consistent with the surrounding environment. Finally, Alternative A would not include staging construction equipment in a special use area such as a park, beach, or scenic vista. As a result, short-term impacts to visual and aesthetic resources within NASA JPL would be less than significant.

Operational Impacts

Alternative A would not be expected to have long-term impacts to visual and aesthetic resources. Once construction is completed, improvements would represent a small permanent visual change in the area. However, the improvements would include low-lying fencing consistent with newer fencing installed at the facility, roadways and guard booths that would be compatible with existing facility use and would not be visible from a distance. The proposed features would blend in to the existing environment and would not adversely contrast with the urban aesthetic of the existing environment. As a result, no long-term impacts to visual and aesthetic resources are anticipated.

3.13.4.2 Alternative B

Construction Impacts

Short-term impacts to visual and aesthetic resources expected under Alternative B would be similar to Alternative A. Construction activities would be consistent with the surrounding environment, temporary, and BMPs would be utilized to reduce any impacts. In addition, equipment would be limited to construction and staging areas which would not be located in not special use areas. As a result, short-term impacts to visual and aesthetic resources would be less than significant.

<u>Operational Impacts</u>

Long-term impacts to visual and aesthetic resources expected under Alternative B would be similar to Alternative A. Security gate improvements would include low-lying fencing and guard booths that would be compatible with existing facility use and would not be visible from a distance. As a result, no long-term impacts to visual and aesthetic resources would be anticipated as a result of implementation of Alternative B.

3.13.4.3 No Action Alternative

Under the No Action Alternative there would be no change to visual and aesthetic resources within the affected environment. Therefore, there would be no impact to visual and aesthetic resources.

3.14 CUMULATIVE IMPACTS

Cumulative impacts on environmental resources result from incremental impacts of a proposed action that, when combined with other past, present, and reasonably foreseeable future projects in an affected area, may collectively cause more substantial adverse impacts. Cumulative impacts can result from minor, but collectively substantial, actions undertaken over a period of time by various agencies (Federal, state, or local) or persons. In accordance with NEPA and the CEQ memorandum of "Guidance on the Consideration of Past Actions in Cumulative Effects Analysis," a discussion of cumulative impacts resulting from projects which are proposed, under construction, recently completed, or anticipated to be implemented in the near future is required.

3.14.1 Past Actions

NASA JPL was developed beginning in the late 1930s and continues to be updated and developed based on needed technologies and use. NASA JPL was previously undeveloped open fields. NASA JPL first used these fields for experimentation in propulsion, which lead to the construction of a few small shacks and some buried bunkers used to test propellants and other fuels. In 1940, the facility was acquired by the U.S. Army and construction of permanent/semi-permanent buildings began. The first permanent structure, described as an engineering building was added to the facility in 1942 with the start of activities supporting World War II efforts. At least 97 additional buildings/structures were constructed during the remainder of the 1940s. Some of the earlier, temporary buildings or inadequate facilities were replaced at this time with more permanent structures (NASA 2012b).

During the 1950s, another 60 buildings/structures were completed as either new construction or to replace outdated facilities. During the 1960s, 78 buildings/structures were constructed. Some of these replaced older, outdated structures. During the period from 1970 to 1980, 51 additional buildings/structures were constructed at the facility as either new construction or to replace outdated facilities. In the 1980s, ten buildings were added to the facility (NASA 2012b).

From 1990 to 2010, an additional 49 buildings/structures were constructed. A significant number of these structures were temporary trailer offices. Over the life of NASA JPL, more than 325 facilities have been constructed on site. Of these, 222 buildings/structures are still standing (NASA 2012b).

In 2014, a new on-site parking structure was completed in order to provide parking for facility workers who used the former East Arroyo Lot, which was returned to the City of Pasadena in order to implement natural groundwater recharge basins in the area (NASA 2012b).

From a cumulative perspective, past development of NASA JPL from its initial appearance as open fields to the urban setting that exists at the current time has been a major impact. However, the existing footprint of the facility has been in place for approximately 50 years. The construction of new security entrances and parking areas at NASA JPL does not create a major impact in relation to the overall impact of the Laboratory (NASA 2012b).

3.14.2 Planned or Reasonably Foreseeable Projects

3.14.2.1 Onsite Projects

The *NASA JPL Master Plan Update* proposes and describes several Recapitalization Buildings/Projects over a 20-year horizon. One reasonably foreseeable project is the Flight Electronics Facility. This 85,000 square foot facility would be located west of the intersection of Mariner Road and Explorer Road in an existing built up industrial area, and would require the demolition of existing Trailers 1722 and 1723. It would be a four-story facility with clean rooms for the fabrication, assembly, and functional testing of flight hardware. The fabrication and assembly areas would be a mix of low and high bays. A small portion of the building would be allocated to general offices for fabrication (NASA 2012b).

There would also be a small, box level, Thermal Vacuum and Dynamics test area on site to eliminate the current practice of the transporting of components back and forth from test facilities. A key feature of this facility would be direct vehicular service access to Explorer road. This would reduce the need for service vehicles to use Mariner Road. The Flight Electronics Facility would consolidate many of the laboratories working with flight science which currently are spread throughout NASA JPL. This would allow a better discourse between affiliated programs currently located in Buildings 300 and 302. Furthermore, the Flight Electronics Facility should allow pedestrians who require assistance to use the circulation systems to ascend from Mariner Road to Explorer Road (NASA 2012b).

While NASA JPL expects minor construction impacts on existing air quality and noise, it does not anticipate any significant traffic-related or visual resources impacts, or any other long-term impacts on the human or natural environment. The proposed project is not expected to result in any cumulative impacts associated with either Alternative A or Alternative B. Any cumulative impacts were determined to be less than significant (NASA 2012b).

3.14.2.2 Offsite Projects

The following major public infrastructure projects are planned by the City of Pasadena and the City of La Cañada Flintridge:

- Flintridge Sacred Heart Academy Specific Plan
- La Cañada Flintridge Citywide Catch Basin Maintenance Plan
- Hahamongna Watershed Park Master Plan
- Devil's Gate Sediment Removal Project

- Arroyo Seco Canyon Water Resources, Habitat Restoration and Recreation Project
- Street Lighting and Electric System Undergrounding
- La Loma Bridge Project
- Master Sewer Plan
- Preventive Maintenance
- Interstate 210 Sound wall
- Street lighting Improvements

None of the proposed projects would result in a significant cumulative impact in conjunction with Alternative A or Alternative B since the proposed projects would include short-term construction-related impacts, and long-term socioeconomic benefits through improved public safety and health, improved natural environmental and habitat function, floodplain management, increased recreational opportunities and community aesthetics (City of Pasadena, 2014; City of La Cañada Flintridge 2014).

4.0 CONSULTATION AND COORDINATION

4.1 FEDERAL AGENCIES

Advisory Council on Historic Preservation
National Aeronautics and Space Administration
U.S. Army Corps of Engineers
U.S. Environmental Protection Agency
U.S. Geological Survey

4.2 STATE AGENCIES

California Air Resources Board
California Department of Resources Recycling and Recovery
California Department of Toxic Substances Control
California Department of Transportation
California Environmental Protection Agency
California Office of Historic Preservation
California Public Utilities Commission
California State Water Resources Control Board
Los Angeles Regional Water Quality Control Board
South Coast Air Quality Management District

4.3 CITY AND COUNTY AGENCIES

City of Pasadena Department of Public Works
City of Pasadena Department of Water and Power
Los Angeles County Department of Public Works
Los Angeles County Health Department
Los Angeles County Metropolitan Transit Authority
Los Angeles County Sanitation District

4.4 OTHER ORGANIZATIONS

Southern California Edison
Southern California Gas Company

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