DRAFT

ENVIRONMENTAL ASSESSMENT

For

ENCROACHMENTS ALONG MIRAMAR PIPELINE

at

NAVAL BASE POINT LOMA

April 2022

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Abstract

Designation:	Environmental Assessment
Title of Proposed Action:	Encroachments Along Miramar Pipeline
Project Location:	Naval Base Point Loma
Lead Agency for the EA:	Department of the Navy
Cooperating Agency:	Defense Logistics Agency
Affected Region:	San Diego, CA
Action Proponent:	Naval Base Point Loma and the Defense Logistics Agency
Point of Contact:	Naval Facilities Engineering Systems Command Southwest Attention: Code EV26.SVR 750 Pacific Highway, 12th Floor (Environmental) San Diego, CA 92132 NAVFAC SW MiramarPipeline@navy.mil
Date:	April 2022

Naval Base Point Loma, a Command of the United States Navy, along with the Defense Logistics Agency as a cooperating agency, has prepared this Environmental Assessment in accordance with the National Environmental Policy Act, as implemented by the Council on Environmental Quality Regulations and Navy regulations for implementing National Environmental Policy Act. The Proposed Action would relocate sections of an existing 8-inch pipeline to address two areas of the pipeline easement that have been encroached upon and have maintenance and repair access issues that can affect operations. The action would take place in the community of Clairemont Mesa within the City of San Diego, California. This Environmental Assessment evaluates the potential environmental impacts associated with the four action alternatives, Alternatives 1, 2, 3, and 4, and the No Action Alternative to the following resource areas: air quality, land use, noise, transportation, public health and safety, and hazardous materials and wastes.

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EXECUTIVE SUMMARY

ES.1 Proposed Action

The United States (U.S.) Navy proposes to relocate sections of the existing 8-inch Miramar Pipeline to provide enhanced access for regular inspection, routine maintenance, and emergency response. The Proposed Action is needed because non-Navy development has encroached upon Navy easements thereby diminishing the Navy's ability to access and therefore maintain the pipeline. The Proposed Action would include relocating existing pipeline segments that fall within encroachments at High Tech High, formerly Horizon Christian Academy, and the Cannington Drive area. Both encroachment areas are in the community of Clairemont Mesa within the City of San Diego. The existing pipeline would need to remain in service while the new pipeline is being constructed. Once the new pipe segments are tied into the existing pipeline and the pipeline is operational, the existing segments that are no longer needed would be closed in place.

ES.2 Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to maintain the pipeline between Naval Base Point Loma (NBPL) and Marine Corps Air Station (MCAS) Miramar in safe operational condition. The pipeline is a strategic Department of Defense logistic asset that sustains an uninterrupted supply of petroleum products necessary to meet the overall mission as well as the Navy's U.S. Pacific Fleet and Department of Homeland Security defense mission requirements.

The need for the Proposed Action is to have unencumbered access to the pipeline for regular inspection, routine maintenance, and emergency response. The Navy proposes to address the current pipeline easement encroachments to meet the purpose of the Proposed Action and operational and mission requirements.

ES.3 Alternatives Considered

Alternatives were developed for analysis based upon the following reasonable alternative screening factors:

- Fuel product transfer between NBPL to MCAS Miramar and from MCAS Miramar to NBPL must be retained.
- Minimize the length of the new realigned pipeline to the extent possible and avoid private property and other existing infrastructure.
- Any new pipeline constructed must be fully compliant with all applicable 49 Code of Federal Regulations (CFR) 195 pipeline construction codes during removal and pipeline construction phases.
- NBPL and MCAS Miramar must be able to continue normal operations and not be severely impacted during pipeline relocation activities. Short-term disruptions in use of the pipeline would be acceptable, provided that military operations are not disrupted.
- Pipeline should be relocated to an existing utility corridor within City of San Diego right-of-way (ROW) for ease of access for routine maintenance, inspection, and emergency repairs.

The Navy is considering four action alternatives that meet the purpose of and need for the Proposed Action and a No Action Alternative. The alternatives considered include:

- Alternative 1 – Encroachment at High Tech High (Option 1) and Encroachment at Cannington Drive (Option 1)
- Alternative 2 – Encroachment at High Tech High (Option 2) and Encroachment at Cannington Drive (Option 1)
- Alternative 3 – Encroachment at High Tech High (Option 1) and Encroachment at Cannington Drive (Option 2)
- Alternative 4 – Encroachment at High Tech High (Option 2) and Encroachment at Cannington Drive (Option 2)

ES.4 Summary of Environmental Resources Evaluated in the EA

Council on Environmental Quality (CEQ) regulations, National Environmental Policy Act (NEPA), and Navy instructions for implementing the National Environmental Policy Act, specify that an Environmental Assessment (EA) should address those resource areas potentially subject to impacts. In addition, the level of analysis should be commensurate with the anticipated level of environmental impact.

The following resource areas have been addressed in this EA: air quality, land use, noise, transportation, public health and safety, and hazardous materials and wastes. Because potential impacts were negligible or nonexistent, the following resources were not evaluated in this EA: water resources, geological resources, cultural resources, biological resources, airspace, infrastructure, socioeconomics, and environmental justice. The introduction to Chapter 3 contains a brief discussion of each of these resource areas and an explanation of why impacts were considered negligible or nonexistent.

ES.5 Summary of Potential Environmental Consequences of the Action Alternatives and Major Mitigating Actions

Table ES-1 provides a tabular summary of the potential impacts to the resources associated with the action alternatives analyzed. Due to the similarity between the action alternatives and associated similarity of impacts, Table ES-1 presents the summary of potential impacts from each of the four alternatives together as “Proposed Action Alternatives.”

Public Involvement

The Navy solicited public and agency comments during a scoping period from March 1, 2019 through April 1, 2019. An open house information session was held on March 18, 2019 at Lafayette Elementary School in San Diego. Comments received during the scoping period were considered in preparing the Draft EA. Following scoping, the Navy considered public comments that led to expanding the range of alternatives to be analyzed in the Draft EA, specifically with respect to the encroachment at Cannington Drive. As a result, two additional alternatives (Alternatives 3 and 4) have been included in the Draft EA. The Navy circulated the Draft EA for public review for a 30-day public review from April 11, 2022, to May 11, 2022.

Table ES-1: Summary of Potential Impacts to Resource Areas

Resource Area	*No Action Alternative*	*Proposed Action Alternatives*
Air Quality	The No Action Alternative would not generate air pollutant emissions and there would be no change to the baseline air quality. Therefore, the No Action Alternative would not result in an adverse effect related to air quality.	The Proposed Action Alternatives would result in emissions of air pollutants during construction. Emissions would be below *de minimis* levels. Therefore, implementation of the Proposed Action Alternatives would not result in significant impacts related to air quality.
Land Use	The No Action Alternative would not result in a change to existing land use conditions. Therefore, the No Action Alternative would not result in an adverse effect related to land use.	The Proposed Action Alternatives would not result in changes to existing land uses and does not propose new land uses. No permanent conflict with land uses would occur. Therefore, implementation of the Proposed Action Alternatives would not result in significant impacts related to air quality.
Noise	The No Action Alternative would not generate noise and no change to the baseline noise levels would occur. Therefore, the No Action Alternative would not result in an adverse effect related to land use.	The Proposed Action Alternatives would generate noise during construction from the operation of equipment and vehicles. However, construction would be temporary and noise exposure to a given receptor would be short-term as construction progresses along the linear alignment. Therefore, implementation of the Proposed Action Alternatives would not result in significant impacts related to noise.
Transportation	The No Action Alternative would not affect roadways and no change to existing transportation would occur. Therefore, the No Action Alternative would not result in an adverse effect related to transportation.	The Proposed Action Alternatives would involve construction within roadway rights-of-way and would have the potential to affect driveway access, roadway access and capacity, parking facilities, and pedestrian facilities. Construction effects would be temporary and a traffic control plan would be implemented that would include measures to minimize construction effects. Therefore, implementation of the Proposed Action Alternatives would not result in significant impacts related to transportation.
Public Health and Safety	The No Action Alternative would not result in relocation of the existing pipeline, and the encroachment areas would remain encumbered. Although the pipeline does not currently pose a risk to public health and safety, under the No Action Alternative the benefits of increased access for maintenance and repairs would not be realized. However, the Navy would continue to inspect and monitor the pipeline to ensure its safety and reliability; therefore, implementation of the	The Proposed Action Alternatives would comply with all applicable federal, state, and county regulations, as well as Navy policies and procedures, as related to public health and safety during construction and operation of the proposed pipeline segments. Implementation of all applicable safety procedures would prevent and minimize potential risk to human health and the environment associated with construction and operation of the new pipeline sections; therefore, no significant impacts would

Table ES-1: Summary of Potential Impacts to Resource Areas

Resource Area	*No Action Alternative*	*Proposed Action Alternatives*
	No Action Alternative would have a less than significant public health and safety impact.	occur. The Proposed Action Alternatives would enhance the overall safety, reliability, and integrity, and increase public and environmental safety by minimizing the potential for future pipe leaks or breaks; thus, long-term impacts are considered beneficial. No disproportionate risk of injury or hazardous substances exposure to children per EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, would occur.
Hazardous Materials and Wastes	The No Action Alternative would not involve construction and therefore would not involve the use of hazardous materials or have the potential to encounter hazardous materials. The existing pipeline would continue to operate under existing conditions with routine inspections and monitoring to ensure its safety and reliability; therefore, implementation of the No Action Alternative would have a less than significant public hazardous materials and wastes impact.	The Proposed Action Alternatives would use hazardous materials and have the potential to encounter hazardous materials during construction. Hazardous materials would be handled in accordance with applicable regulations, and a Soil and Groundwater Management Plan would be implemented to avoid impacts. Abandonment of the existing pipeline segments and construction, and operation of the new pipeline segments, would comply with applicable procedures, policies, and regulations. For this reason, the Proposed Action Alternatives would not result in significant impacts associated with hazardous materials and waste. In the long term, implementation of the Proposed Action Alternatives would enhance the pipeline's overall safety by providing improved access for regular inspection, routine maintenance, and emergency response for unplanned fuel releases. Improved access for regular inspection, routine maintenance, and emergency response would increase public environmental safety by minimizing the potential for future pipe leaks or breaks; thus, long-term impacts are considered beneficial.

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Abbreviations and Acronyms

Acronym	Definition
ACM	Asbestos-containing material
AICUZ	Air Installation Compatible Use Zone
APZ	Accident Potential Zone
BMP	best management practice
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CNEL	Community Noise Equivalent Level
CO	carbon monoxide
CO_2	carbon dioxide
CO_2	carbon dioxide equivalent
CSDAPCD	County of San Diego Air Pollution Control District
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
dB	decibel
dBA	A-weighted sound level
DLA	Defense Logistics Agency
DNL	day-night average sound level
DoD	United States Department of Defense
EA	Environmental Assessment
EO	Executive Order
FONSI	Finding of No Significant Impact
FY	Fiscal Year
GHG	greenhouse gas
HAP	hazardous air pollutant
Hz	hertz
I-805	Interstate 805
JP-5	Jet propellent fuel no. 5
LBP	Lead-based paint
Leq	Equivalent Sound Level
Lmax	Maximum A-weighted sound level
LOS	level of service
MCAS	Marine Corps Air Station
MSAT	Mobile Source Air Toxics
NAAQS	National Ambient Air Quality Standards
NAVFAC	Naval Facilities Engineering Systems Command
NAVSUP FLC SD	Naval Supply Systems Command Fleet Logistics Center San Diego
NBPL	Naval Base Point Loma
NEPA	National Environmental Policy Act
NIOSH	National Institute for Occupational Safety and Health
NIPTS	Noise Induced Permanent Threshold Shift
NO_2	nitrogen dioxide
NO_X	nitrogen oxide
OPS	Office of Pipeline Safety
OPNAVINST	Office of the Chief of Naval Operations Instruction
OSFM	Office of the State Fire Marshal
OSHA	Occupational Safety and Health Administration
Pb	lead
PCB	polychlorinated biphenyl
PHMSA	Pipeline and Hazardous Materials Safety Administration
PIMA	Pipeline Installment and Maintenance Agreement
PM_{10}	particulate matter less than or equal to 10 microns in

Acronym	Definition
	diameter
$PM_{2.5}$	particulate matter less than or equal to 2.5 microns in diameter
RAICUZ	Range Air Installation Compatible Use Zone
RCRA	Resource Conservation and Recovery Act
REC	Recognized Environmental Condition
ROI	region of influence
ROW	Right-of-way
SCM	Special Conservation Measure
SDAB	San Diego Air Basin
SEL	sound exposure level
SIP	State Implementation Plan
SO_2	sulfur dioxide
tpy	tons per year
TSCA	Toxic Substances Control Act
U.S.	United States
U.S.C.	United States Code
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
VOC	volatile organic compound

1 Purpose of and Need for the Proposed Action

1.1 Introduction

Naval Base Point Loma (NBPL), a command of the United States (U.S.) Navy and the Defense Logistics Agency (DLA) propose to relocate sections of an 8-inch existing pipeline to address two areas of the pipeline easement that have been encroached upon and have maintenance and repair access issues that can affect operations. The action would take place in the community of Clairemont Mesa within the City of San Diego, California.

The existing Miramar Pipeline is an approximately 17-mile-long, American National Standard Institute Class 300, 8-inch carbon steel, liquid fuel pipeline owned by the Navy that runs underground between NBPL and Marine Corps Air Station (MCAS) Miramar, San Diego. Much of the pipeline passes through developed areas (residential, commercial, and high traffic). Some areas of the pipeline traverse natural and semi-natural habitats. The fuel pipeline crosses the City of San Diego communities of Point Loma, Clairemont Mesa, Bay Park, Kearny Mesa and Miramar.

The pipeline was constructed in 1954 within City of San Diego easements to the Navy and carries both jet propellant fuel no. 5 (JP-5) and diesel fuel marine to NBPL and JP-5 to MCAS Miramar (Navy 2015). Miramar Station is a commercially operated breakout facility that receives and stores government-owned product via a commercial pipeline and is connected to NBPL and MCAS Miramar via the 8-inch Navy owned pipeline. It is located approximately 13 miles from NBPL and 4 miles from MCAS Miramar, and consists of four 80,0000-barrel tanks, a commercial pipeline, and a pumphouse. Current operations include the following:

- Shipments of both JP-5 and diesel fuel marine from Miramar Station to NBPL
- Shipments of JP-5 from Miramar Station to MCAS Miramar
- Transfer of JP-5 between NBPL and MCAS Miramar in both directions

The Proposed Action would continue use of the existing 8-inch pipeline and new segments of pipeline in a manner that addresses encroachments and pipeline anomalies consistent with the Pipeline Installation and Maintenance Agreement that the Navy is negotiating with the City of San Diego. Encroachments are identified as areas where non-Navy development has encroached into the Navy pipeline easement, creating operational and maintenance encumbrances. Pipeline anomalies are pipe deformations such as dents, corrosion, or metal loss with potential to compromise pipeline integrity.

The Navy has prepared this Environmental Assessment (EA) in accordance with the National Environmental Policy Act (NEPA), as implemented by the Council on Environmental Quality (CEQ) Regulations and Navy regulations for implementing NEPA.

1.2 Background

1.2.1 Regulatory Context

The U.S. Department of Transportation, through its Pipeline and Hazardous Materials Safety Administration (PHMSA), regulates pipelines per the requirements in 49 Code of Federal Regulations (CFR) 195 for hazardous liquids only. These regulations provide minimum safety standards, and they apply to national pipeline systems owned and operated by pipeline operators. Federally owned pipeline

systems are exempt from PHMSA regulations; as such, PHMSA has no jurisdiction over the Miramar pipeline.

Although the 8-inch pipeline does not fall under the jurisdiction of PHMSA and the requirements of 49 CFR 195, the Navy uses this regulation as a Best Management Practice (BMP) guideline for realignment and/or repair of pipeline anomalies identified during inspections (Navy 2015). Accordingly, the government has elected to consider the entire pipeline route as a High Consequence Area as defined in 49 CFR 195.452, *Pipeline Integrity in High Consequence Areas*. Therefore, all work to relocate or repair the pipeline shall meet the requirements of 49 CFR 195 and related guidelines of the PHMSA for design, material procurement, construction, and construction documentation.

1.2.2 Recent Pipeline Inspections, Studies, and Repairs

The Miramar Pipeline is inspected internally approximately every five years consistent with American Petroleum Institute 570, *Piping Inspection Code: In-service Inspection, Repair, and Alteration of Piping Systems*. The most recent in-line inspection commenced in November 2018, and preliminary data results were reported in February 2019. Based on these preliminary data results, several anomalies were identified along the pipeline in the vicinity of the encroachments at High Tech High School (formerly Horizon Christian Academy) and Cannington Drive; however, each anomaly was considered non-actionable, which is defined as an anomaly that does not exceed acceptable limits, based on the operator's anomaly and pipeline data analysis.

The pipeline system is rated to operate at a maximum flow rate of 1,571 barrels per hour. This is the safe operating flow rate that will keep surge pressures below 814 pounds per square inch, the surge limit of a fully qualified Class 300 pipeline system. To meet the overall Navy mission as discussed below in Section 1.4 (Purpose of and Need for the Proposed Action) at this reduced flow rate (i.e., reduced from full surge limit), Naval Supply Systems Command Fleet Logistics Center San Diego (NAVSUP FLC SD) operates the pipeline 10 to 12 hours per day, six days per week (Navy 2015).

Naval Facilities Engineering Systems Command (NAVFAC) Southwest conducted the Miramar Pipeline Optimization Study (Navy 2011), requested by NAVSUP FLC SD and funded by DLA, to determine the best operational and most economical solution for resupply of liquid fuel between NBPL and MCAS Miramar. Several factors were considered during the study, including cost and benefit, schedule, and risk assessment. The Optimization Study recommended realigning portions of the pipeline, addressing geohazards associated with seismic issues (liquefaction and lateral spread), and other miscellaneous repair needs (Navy 2011). Projects were identified based on the lowest cost alternatives, accommodating all operational requirements and constraints, allowing completion in a timely manner, and ensuring the government's ability to maintain ownership of the asset. A majority of the study recommendations for pipeline projects have been implemented. However, the major encroachments in the Clairemont Mesa area have yet to be resolved and are the focus of this EA.

One previous project, the Miramar Pipeline Repair and Relocation, replaced the existing pipeline between NBPL and Lytton Street (approximately 3.5 miles). This project addressed the sections of the pipeline where the highest number of anomalies had been identified and eliminated the majority of metal loss features found during inspections. The project also alleviated the problems associated with the following geohazards: (1) pipeline along the southern bank of the San Diego River, and (2) active fault crossing of the Rose Canyon Fault Zone. In addition, the relocation project addressed an encroachment into the pipeline easement that was identified in the Optimization Study (Encroachment 1) located along the La Playa waterfront in Point Loma. The potential environmental

effects were analyzed in the *Environmental Assessment for the Miramar Pipeline Repair and Relocation Naval Base Point Loma* (Navy 2015) and a Finding of No Significant Impact was signed on April 24, 2015. These improvements were completed in May 2018.

A Categorical Exclusion was prepared in 2016 that included multiple pipeline repairs as a result of an in-line inspection of the Miramar Pipeline from Point Loma, NAVSUP FLC SD, to MCAS Miramar. Thirty-one (31) anomalies located at MCAS Miramar and at multiple locations in the City of San Diego were identified. They were evaluated in the Categorical Exclusion in 2016, and repairs were completed in November 2018.

The remaining recommendations from the Optimization Study, which constitute the Proposed Action addressed in this EA, would address the two major encroachments into the Navy easement which create operational and maintenance encumbrances: encroachment at High Tech High School and encroachment at Cannington Drive, including a residential neighborhood and church property.

1.3 Location

The project area is located between NBPL Defense Fuel Support Point in the NBPL complex and MCAS Miramar within the City of San Diego. The sections of the pipeline addressed in this EA are located within the community of Clairemont Mesa (Figure 1-1).

NBPL is composed of three main campuses (Peninsula, Old Town, and Harbor Drive) and several special areas that total approximately 1,918 acres. A portion of the 17-mile Miramar Pipeline is included within these special areas and all NBPL facilities are within San Diego County, California. NBPL is on the west side of San Diego Bay, near the mouth of the Bay directly opposite Naval Air Station North Island, and is bordered to the north by the communities of La Playa and Sunset Cliffs, to the south and west by the Pacific Ocean, and to the east by the Bay.

1.4 Purpose of and Need for the Proposed Action

The mission of NBPL is to sustain the fleet, enable the warfighter, protect natural resources, and support Navy sailors and family by providing the highest quality services and support across a dispersed footprint. The government-owned pipeline between NBPL and MCAS Miramar (Miramar Pipeline) is a strategic Department of Defense logistic asset that sustains an uninterrupted supply of petroleum products necessary to meet the overall mission as well as the Navy's U.S. Pacific Fleet and Department of Homeland Security defense mission requirements. The U.S. Pacific Fleet mission is to build and persistently employ dynamic naval combat power supported by the Joint Force in the maritime domain in order to defend U.S. interest throughout the Indo-Pacific region and the homeland, demonstrate advantage in maritime domain, enhance U.S. alliances and partnerships, deter aggression, and promote peace. Further, Base Realignment and Closure and other base consolidations have brought additional Navy assets into the Metro San Diego area, which has increased the demand for petroleum requirements within the area. A continuous uninterrupted flow of fuel product is required to meet the increased military demand.

NAVSUP FLC SD provides logistics, business, and support services to fleet, shore, and industrial commands of the Navy, U.S. Coast Guard, Military Sealift Command, and other joint and allied forces. NAVSUP FLC SD is responsible for the safe transfer of fuel between the fuel facility and military ships or vessels as well as overall operation of the pipeline.

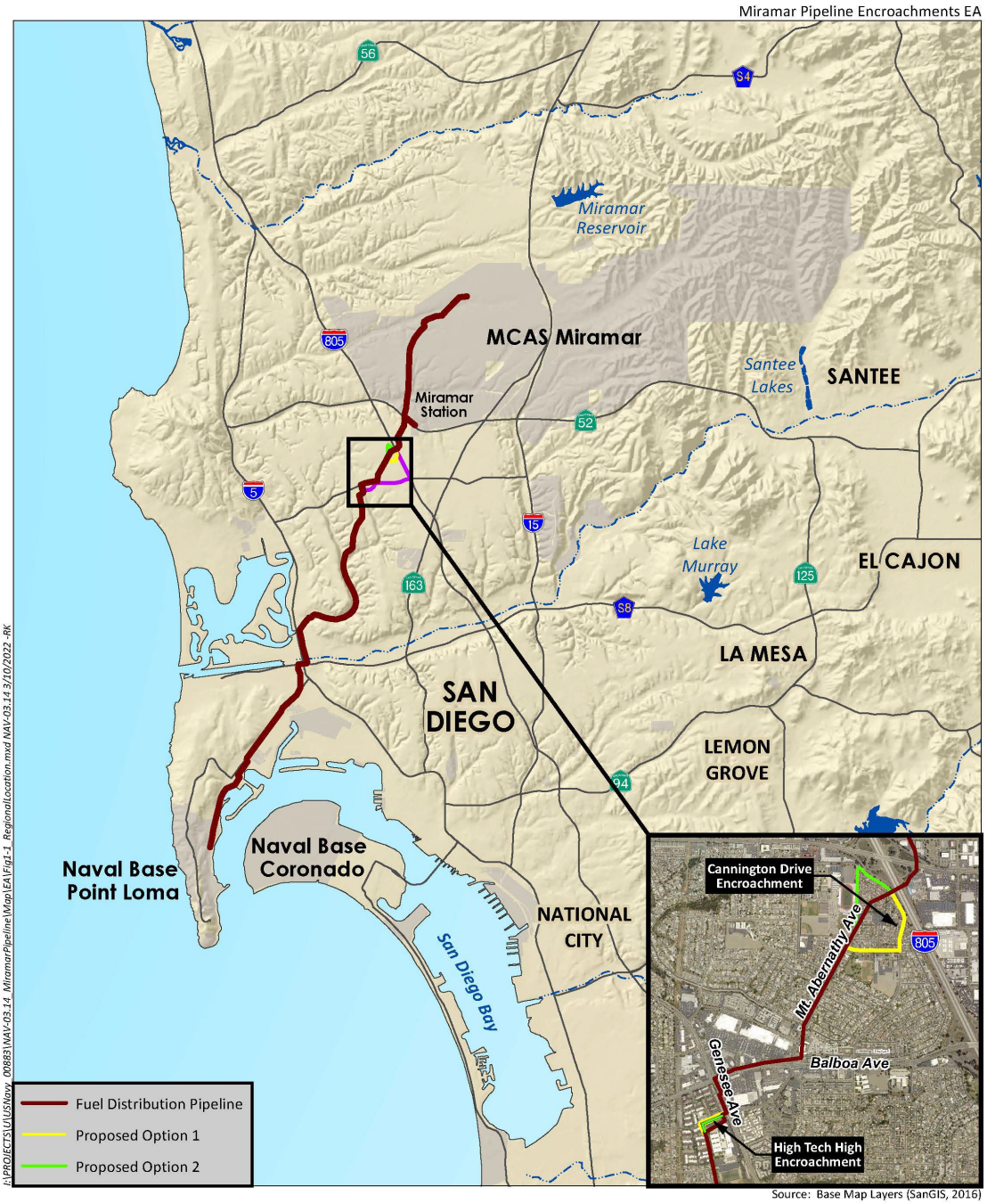

Figure 1-1: Regional Location of the Miramar Pipeline Between NBPL and MCAS Miramar

The purpose of the Proposed Action is to maintain the pipeline between NBPL and MCAS Miramar in safe operational condition. The pipeline is a strategic Department of Defense logistic asset that sustains an uninterrupted supply of petroleum products necessary to meet the overall mission as well as the Navy's U.S. Pacific Fleet and Department of Homeland Security defense mission requirements.

The need for the Proposed Action is to have unencumbered access to the pipeline for regular inspection, routine maintenance, and emergency response. The Navy proposes to address the current pipeline easement encroachments to meet the purpose of the Proposed Action and operational and mission requirements.

The two major encroachments within the Navy easement that are driving the need for the realignment of the existing pipeline to maintain access include the section of pipeline within the parking lot at High Tech High (approximately ten feet from a building); sections of pipeline beneath residential structures including driveways, fences, and a swimming pool; and a section of pipeline within a church parking lot.

1.5 Scope of Environmental Analysis

This EA includes an analysis of potential environmental impacts associated with the action alternatives and the No Action Alternative. The environmental resource areas analyzed in this EA include air quality/ climate change, land use, noise, transportation, and public health and safety.

Nine additional resource areas were considered but were not carried forward for detailed analysis in this EA because there would be no impacts (or only negligible impacts) on these resources from implementation of the alternatives. The introduction to Chapter 3 contains a brief description of these resource areas, their relationship to the action alternatives, and the basis for eliminating them from detailed analysis.

1.6 Key Documents

Key documents are sources of information incorporated into this EA. Documents are key because of similar actions, analyses, or impacts that may apply to this Proposed Action. CEQ guidance encourages incorporating documents by reference. Documents incorporated by reference in part or in whole include:

Miramar Pipeline Optimization Study (May 2011). NAVFAC conducted the Miramar Pipeline Optimization Study requested by NAVSUP FLC SD and funded by DLA to determine the best operational and most economical solution for resupply of liquid fuel between NBPL and MCAS Miramar. The Optimization Study recommended realigning portions of the pipeline, addressing geohazards associated with seismic issues (liquefaction and lateral spread), and other miscellaneous repairs such as encroachments that created operational and maintenance encumbrances. Projects were identified based on the lowest cost alternatives, accommodating all operational requirements and constraints, allowing completion in a timely manner, and ensuring the government's ability to maintain ownership of the asset.

Miramar Pipeline High Tech High Encroachment Study (May 2018). The encroachment study evaluated alternatives for relocating a portion of the existing 8-inch Miramar pipeline near and beneath a portion of High Tech High School property in the community of Clairemont Mesa. It recommends that the existing pipeline, located in a Navy-owned easement, would be relocated to a City of San Diego right-of-way (ROW), thereby providing unencumbered access for pipeline maintenance and operation.

Final Environmental Assessment for Miramar Pipeline Repair and Relocation (April 2015). This EA analyzed potential environmental impacts associated with replacing the existing pipeline between NBPL and Lytton Street (approximately 3.5 miles) to address the sections of the pipeline where the highest number of anomalies had been identified and eliminate the majority of metal loss features found during inspections. The project alleviated the problems associated with the following geohazards: (1) pipeline along the southern bank of the San Diego River, and (2) active fault crossing of the Rose Canyon Fault Zone. In addition, the relocation project addressed an encroachment into the pipeline easement that was identified in the Optimization Study (Encroachment 1) located along the La Playa waterfront in Point Loma.

Miramar Pipeline Encroachment 3 Mount Abernathy Alternative Business Case Analysis (January 2021). A Business Case Analysis for Miramar Pipeline Encroachment 3, Mount (Mt.) Abernathy Alternative was prepared for NAVFAC Southwest to address community concerns raised during the public scoping meeting for the subject EA. A potential new alignment along Mt. Abernathy Avenue was suggested as an alternative to address the encroachment at Cannington Drive and limit potential impacts to the Lafayette Elementary School and Olive Grove Community Park. The Business Case Analysis compares the two separate pipeline alignments along Printwood Way/Cannington Drive and Mt. Abernathy Avenue/Cannington Drive. As a resuilt of this analysis, two new alternatives have been added to the EA (Alternatives 3 and 4).

1.7 Relevant Laws and Regulations

The Navy has prepared this EA based upon federal and state laws, statutes, regulations, and policies pertinent to the implementation of the Proposed Action, including the following:

- NEPA (42 United States Code [U.S.C.] sections 4321–4370h), which requires an environmental analysis for major federal actions that have the potential to significantly impact the quality of the human environment
- CEQ Regulations for Implementing the Procedural Provisions of NEPA (40 CFR parts 1500–1508)
- Navy regulations for implementing NEPA (32 CFR part 775), which provides Navy policy for implementing CEQ regulations and NEPA
- Clean Air Act (42 U.S.C. section 7401 et seq.)
- Clean Water Act (33 U.S.C. section 1251 et seq.)
- Rivers and Harbors Act (33 U.S.C. section 407)
- National Historic Preservation Act (54 U.S.C. section 306108 et seq.)
- Migratory Bird Treaty Act (16 U.S.C. section 703–712)
- Comprehensive Environmental Response and Liability Act (42 U.S.C. section 9601 et seq.)
- Emergency Planning and Community Right-to-Know Act (42 U.S.C. sections 11001–11050)
- Resource Conservation and Recovery Act (42 U.S.C. section 6901 et seq.)
- Toxic Substances Control Act (15 U.S.C. sections 2601–2629)
- Executive Order (EO) 11988, Floodplain Management

- EO 12088, Federal Compliance with Pollution Control Standards
- EO 12114, Environmental Effects Abroad of Major Federal Actions, including the implementing regulation 32 CFR part 187, Environmental Effects Abroad of Major Department of Defense Actions
- EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations
- EO 13045, Protection of Children from Environmental Health Risks and Safety Risks
- EO 13423, Strengthening Federal Environmental, Energy, and Transportation Management
- EO 13693, Planning for Federal Sustainability in the Next Decade

A description of the Proposed Action's consistency with these laws, policies, and regulations, as well as the names of regulatory agencies responsible for their implementation, is presented in Chapter 5 (Table 5-1).

1.8 Public and Agency Participation and Intergovernmental Coordination

Regulations from the CEQ direct agencies to involve the public in preparing and implementing their NEPA procedures.

Outreach and public involvement efforts were conducted in accordance with NEPA and Navy guidance. A 30-day public scoping period was initiated on March 1, 2019 and ran through April 1, 2019. One public scoping meeting was held March 18, 2019, from 5 p.m. to 8 p.m. at the Lafayette Elementary School in the Clairemont Mesa community. The purpose of the public scoping meeting was to offer the public an opportunity to learn about the project, speak one-on-one with Navy representatives and subject matter experts, and to submit comments on the proposal. The public had an opportunity to submit written comments during the public scoping period. Additionally, the public could email comments to the Navy project manager at NAVFAC_SW_MiramarPipeline@navy.mil. Comments on the proposal were also accepted via postal mail. The Navy provided a project website (www.cnic.navy.mil/NBPLMiramarPipeline) where the public could access project information. Following scoping, the Navy considered public comments that led to expanding the range of alternatives to be analyzed in the Draft EA, specifically with respect to the encroachment at Cannington Drive. As a result, two additional alternatives (Alternatives 3 and 4) have been included in the Draft EA.

The Navy published a Notice of Availability of the Draft EA for three consecutive days in the *San Diego Union Tribune* on April 11–13, 2022; two consecutive publication days in the *San Diego Union-Tribune en Español* on April 16 and 23, 2022; and two consecutive publication days in the *San Diego Reader* on April 14 and 21, 2022. The notice described the Proposed Action; provided details on the virtual public meeting; solicited public comments on the Draft EA; provided dates of the 30-day public comment and review period; and announced that a printed copy of the Draft EA is available for review at Balboa Branch, Clairemont Branch, and North Clairemont Branch public libraries and an electronic copy is posted on the project website (www.cnic.navy.mil/NBPLMiramarPipeline). The Draft EA is available for a 30-day public review and comment period from April 11, 2022, to May 11, 2022. The Navy mailed Notice of Availability letters and postcards to elected officials, federal, state, and local agencies, and interested parties within the surrounding community. A news release was distributed to media outlets.

The Navy is consulting with the Defense Logistics Agency regarding this Proposed Action.

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2 Proposed Action and Alternatives

2.1 Proposed Action

The Navy proposes to relocate sections of the existing 8-inch Miramar Pipeline to provide enhanced access for regular inspection, routine maintenance, and emergency response. The Proposed Action is needed because non-Navy development has encroached upon Navy easements thereby diminishing the Navy's ability to access and therefore maintain the pipeline. The Proposed Action would include relocating existing pipeline segments that fall within encroachments at High Tech High, formerly Horizon Christian Academy, and the Cannington Drive area. Both encroachment areas are in the community of Clairemont Mesa within the City of San Diego. The existing pipeline would need to remain in service while the new pipeline is being constructed. Once the new pipe segments are tied into the existing pipeline and the pipeline is operational, the existing segments that are no longer needed would be cleaned and closed in place.

2.2 Screening Factors

NEPA's implementing regulations provide guidance on the consideration of alternatives to a federally proposed action and require rigorous exploration and objective evaluation of reasonable alternatives. Only those alternatives determined to be reasonable and to meet the purpose and need require detailed analysis.

Potential alternatives that meet the purpose and need were evaluated against the following screening factors:

- Fuel product transfer between NBPL to MCAS Miramar and from MCAS Miramar to NBPL must be retained.
- Minimize the length of the new realigned pipeline to the extent possible and avoid private property and other existing infrastructure.
- Any new pipeline constructed must be fully compliant with all applicable 49 CFR 195 pipeline construction codes during removal and pipeline construction phases.
- NBPL and MCAS Miramar must be able to continue normal operations and not be severely impacted during pipeline relocation activities. Short-term disruptions in use of the pipeline would be acceptable, provided that military operations are not disrupted.
- Pipeline should be relocated to an existing utility corridor within City of San Diego ROW for ease of access for routine maintenance, inspection, and emergency repairs.

Various alternatives were evaluated against the screening factors. The alternatives considered include:

- Alternative 1 – Encroachment at High Tech High (Option 1) and Encroachment at Cannington Drive (Option 1)
- Alternative 2 – Encroachment at High Tech High (Option 2) and Encroachment at Cannington Drive (Option 1)
- Alternative 3 – Encroachment at High Tech High (Option 1) and Encroachment at Cannington Drive (Option 2)

- Alternative 4 – Encroachment at High Tech High (Option 2) and Encroachment at Cannington Drive (Option 2)
- No Action Alternative

2.3 Alternatives Carried Forward for Analysis

Based on the reasonable alternative screening factors and meeting the purpose and need for the Proposed Action, four action alternatives were identified and will be analyzed within this EA.

2.3.1 No Action Alternative

Under the No Action Alternative, the NAVSUP FLC SUP would not implement the pipeline realignments necessary to maintain safe operations of the existing pipeline by providing enhanced access for maintenance. The pipeline would continue to remain in operation within ten feet of the High Tech High school building, below a residence on Cannington Drive, and multiple other properties. If maintenance or repair is needed, it may be very challenging to reach the pipeline and could require removal of existing infrastructure at encroaching properties. The No Action Alternative would not meet the purpose and need for the Proposed Action; however, as required by NEPA, the No Action Alternative is carried forward for analysis in this EA. The No Action Alternative will be used to analyze the consequences of not undertaking the Proposed Action, not simply conclude no impact, and will serve to establish a comparative baseline for analysis.

2.3.2 Alternative 1 – Encroachment at High Tech High (Option 1) and Encroachment at Cannington Drive (Option 1)

Alternative 1 would relocate segments of the Miramar Pipeline to maintain safe operations of the existing pipeline by providing enhanced access for inspection, maintenance, and repair. Alternative 1 would construct up to 3,400 feet of buried 8-inch petroleum pipeline outside of existing encroachments located at High Tech High and the Cannington Drive area. Approximately 2,250 feet of the existing pipeline would be closed in place. Pipeline closure would include emptying the pipe of fuel, disposing of waste, cleaning the pipe interior, and filling the pipe with concrete slurry. The existing pipeline would need to remain in service while the new pipeline is being constructed.

For the encroachment at High Tech High, this alternative includes the relocation of the pipeline on the north side of Mt. Alifan Drive and west side Mt. Acadia Boulevard (Option 1, Figure 2-1). Approximately 605 feet of pipeline is currently located under the High Tech High parking lot within ten feet of a building. The location of the pipeline across school property and its proximity to the building make future repairs difficult. The proposed realignment would address the encroachments by constructing new underground pipeline segments within the City of San Diego ROW. The new pipeline would be approximately 750 feet long and constructed entirely under the street surface. Approximately 690 feet of the existing pipeline, most of which is located under the High Tech High parking lot, would be closed in place.

As shown in Figure 2-2 for the encroachment at Cannington Drive, a predominately residential development and church property, south of Clairemont Mesa Boulevard and west of Interstate 805 (I-805), has been built over the existing pipeline ROW. One house, located at 4896 Cannington Drive, has been constructed directly above the pipeline. If repair work is required on the pipeline at this location, the resident and home may be impacted and encumbered access to the pipeline may make repairs logistically challenging, costly, and time consuming. The new pipeline alignment would construct a new

segment of pipeline in the City of San Diego street ROW. The existing pipeline under the church property and residential properties would be closed in place, thus providing a long-term solution.

As shown in Figure 2-2 for Option 1, the new pipeline would tie-in to the existing pipeline near the intersection of Printwood Way and Mt. Abernathy Avenue and would run approximately 2,650 feet through segments of Printwood Way and Cannington Drive and connect to the existing pipeline at the tie-in north of Liebel Court. Approximately 1,675 feet of the existing pipeline would be closed in place.

In Cannington Drive, there is an existing 42-inch reinforced concrete water transmission line on the north side of the roadway, and an existing 8-inch vitrified clay sewer along the road centerline. The new fuel pipeline alignment along Cannington Drive would be located between the existing 42-inch water line and the existing 8-inch sewer line, which are spaced approximately 15 feet apart. This alignment would avoid impacting existing residential utility services since there are no utility lines located on the north side of this section of Cannington Drive.

A waiver of separation distance for the proposed fuel line along Cannington Drive and the existing 42-inch water line would need to be requested from the State Water Resources Control Board. If a waiver of the minimum of ten feet of separation cannot be obtained, the fuel line would need to be shifted to the north side of Cannington Drive. This alignment change would require coordination with the California Department of Transportation due to the proximity to I-805 ROW and the existing sound berm structure.

The new pipe would consist of 8-inch diameter carbon steel and would be delivered to the site in 40-foot sections that would be pre-coated onsite, above, or in the pipeline trenches. A factory-applied fusion-bonded epoxy coating would be applied on all buried pipe as well as field-applied fusion-bonded spray coating for the field joints and bend fittings. Some below-ground welding in the trenches would be needed to join the existing and new sections of pipe together. These joints would also be coated with field-applied fusion-bonded epoxy coating.

Pipeline sections would be constructed via open cut trenching for the entire pipeline segment. Open cut trenching generally consists of saw-cutting and removing pavement, excavating, installing pipeline, and then backfilling with suitable trench backfill material. Bedding material would be placed above and below the new pipe segments to protect the pipe coating from dings and abrasions during backfilling and compaction efforts. Excess trench excavation and demolition debris would be removed and disposed of at approved waste disposal facilities. Pavement surfaces would be restored by placing new base course and pavement, or full depth bituminous pavement. Since the trenching would be within City of San Diego roadway ROW, the construction would need to meet the City standards for public works construction. A Pipeline Installment and Maintenance Agreement (PIMA) would need to be acquired with the City. The PIMA gives the Navy the right to lay pipeline within the City's ROW and conduct maintenance.

The City of San Diego Standard Specifications for Public Works Construction (Greenbook) Section 306 limits the length of open trench construction to a maximum of "500 feet or the distance necessary to accommodate the amount of pipeline installed in a single day, whichever is greater." Before starting any trench excavation, the contractor would need to obtain a public ROW permit, which includes preparing a traffic control plan, and providing proper notice to the underground service alert.

Figure 2-1: Encroachment at High Tech High

Figure 2-2: Encroachment at Cannington Drive

A Traffic Analysis for the encroachment at High Tech High has been prepared, analyzed, and circulated through the City of San Diego review process. The Traffic Analysis for the encroachment at Cannington Drive is currently being prepared. The traffic analyses utilize existing traffic count data to determine preferred times of construction that would have the least impact to traffic flow in the encroachment areas and establish ways to segment construction activities to minimize traffic flow disruption. A Traffic Control Plan would also be prepared for each of the encroachment areas. The goal of the Traffic Analyses/Traffic Control Plans effort is to reduce impacts to the local community, businesses, schools, and churches in the area while maintaining standard traffic control geometries and operations during construction.

The duration of construction is estimated to be about six months and includes site surveys, mobilization of equipment and supplies, trenching, new pipeline installation and testing, backfilling, and resurfacing of old pipeline segments, and commissioning new pipeline. It is estimated that 10 to 15 workers would be onsite during construction. Heavy equipment and vehicles would be used onsite for excavation and trenching activities. Typical equipment may include excavators, loaders, compactors, multiple heavy-duty trucks, paving equipment, concrete trucks, water trucks, dump trucks, welding trucks, excavation shoring equipment, air compressors, and other typical construction tools. To alleviate traffic impacts, at most a few hundred feet of pipe is expected to be constructed each day between the hours of 7:00 a.m. and 7:00 p.m. Construction activities, including hours, would adhere to the provisions of the traffic control permit issued by the City of San Diego. At the end of each construction day, trench areas would be trench-plated, or backfilled and paved, so that excavated areas can be crossed by vehicle traffic.

Regarding fueling operations, there is currently sufficient NAVSUP FLC SD staff qualified to carryout fueling operations throughout the pipeline repair and relocation periods, and to operate the pipeline when all repairs and pipe installations are complete. No additional personnel would be assigned to operate and maintain the pipeline.

2.3.3 Alternative 2 – Encroachment at High Tech High (Option 2) and Encroachment at Cannington Drive (Option 1)

Alternative 2 would relocate segments of the Miramar Pipeline to maintain safe operations of the existing pipeline by providing enhanced access for inspection, maintenance, and repair. Alternative 2 would construct up to 3,365 feet of buried 8-inch petroleum pipeline outside of existing encroachments located at High Tech High and the Cannington Drive area. Approximately 2,210 feet of the existing pipeline would be closed in place. Alternative 2 would consist of the same project components as described under Alternative 1, except that the new segment of pipeline for the encroachment at High Tech High would be located on the south side of Mt. Alifan Drive (versus the north side under Alternative 1) and east side of Mt. Acadia Boulevard (versus the west side under Alternative 1) (Option 2, Figure 2-1).

Approximately 605 feet of pipeline is currently located under the High Tech High parking lot within ten feet of a building. The proposed realignment would address the encroachments by constructing new underground pipeline segments within the City of San Diego ROW. The new pipeline would be approximately 715 feet long constructed entirely under the street surface. Approximately 650 feet of the existing pipeline, most of which is located under the High Tech High parking lot, would be closed in place. The method and duration of construction would be similar to Alternative 1. Similar to

Alternative 1, a PIMA would need to be acquired with the City. The PIMA gives the Navy the right to lay pipeline within the City's ROW and conduct maintenance.

2.3.4 Alternative 3 – Encroachment at High Tech High (Option 1) and Encroachment at Cannington Drive (Option 2)

Alternative 3 would relocate segments of the Miramar Pipeline to maintain safe operations of the existing pipeline by providing enhanced access for inspection, maintenance, and repair. Alternative 3 would construct up to 3,170 feet of buried 8-inch petroleum pipeline outside of existing encroachments located at High Tech High and the Cannington Drive area. Approximately 1,965 feet of the existing pipeline would be closed in place. Alternative 3 would consist of the same project components as described under Alternative 1, except that the new pipeline for the encroachment at Cannington Drive would be run through Mt. Abernathy Avenue (versus Printwood Way) and Cannington Drive. It would connect to the existing pipeline at the tie-in located south of the intersection of Mt. Abernathy Avenue and Cannington Drive (Figure 2-2, Option 2).

Option 2 for the encroachment at Cannington Drive would construct approximately 2,420 feet of new buried pipeline within City of San Diego street ROW. Approximately 1,965 feet of the existing pipeline would be closed in place. Existing utility services, including water, sewer, gas, electric, cable, and telephone, are located on the east side of Mt. Abernathy Avenue. Since there are no utility services on the west side of the roadway, the new pipeline would be constructed on the west side of Mt. Abernathy between the two existing sewer mains. In Cannington Drive, there is an existing 42-inch reinforced concrete water transmission line on the north side of the roadway, and an existing 8-inch vitrified clay sewer along the road centerline. The new fuel pipeline alignment would be located between the existing 42-inch water line and the existing 8-inch sewer line, which are spaced approximately 15 feet apart. This alignment would avoid impacting existing residential utility services since there are no utility lines located on the north side of this section of Cannington Drive. Similar to Option 1 for the Cannington Drive encroachment, a waiver of separation distance to the 42-inch diameter water line in Cannington Drive would be required. A PIMA would also be required to give the Navy the right to lay pipeline within the City's ROW and conduct maintenance.

2.3.5 Alternative 4 – Encroachment at High Tech High (Option 2) and Encroachment at Cannington Drive (Option 2)

Alternative 4 would relocate segments of the Miramar Pipeline to maintain safe operations of the existing pipeline by providing enhanced access for inspection, maintenance, and repair. Alternative 4 would construct up to 3,135 feet of buried 8-inch petroleum pipeline outside of existing encroachments located at High Tech High and the Cannington Drive area. Approximately 1,925 feet of the existing pipeline would be closed in place.

Alternative 4 would consist of the same project components as described under Alternative 2 for High Tech High (Figure 2-1, Option 2) except that the new pipeline for the encroachment at Cannington Drive would be located mostly along Mt. Abernathy Avenue (versus Printwood Way) as described for Alternative 3 for the encroachment at Cannington Drive (Figure 2-2, Option 2). A PIMA would also be required to give the Navy the right to lay pipeline within the City's ROW and conduct maintenance.

2.4 Alternatives Considered but not Carried Forward for Detailed Analysis

The following alternatives were considered, but not carried forward for detailed analysis in this EA as they did not meet the purpose and need for the project and satisfy the screening factors presented in Section 2.2 (Screening Factors).

2.4.1 Encroachment at High Tech High (Option 3)

This alternative would consist of the same project components as described under Alternative 1, except that the pipeline alignment for the encroachment at High Tech High would be located in Mt. Acadia Boulevard, Mt. Alifan Drive, Mt. Everest Boulevard, and Balboa Avenue within the City of San Diego ROW (Option 3, Figure 2-1). The relocated pipeline alignment would be approximately 2,965 feet long constructed under the street surface, and approximately 50 feet constructed beneath sidewalk. Approximately 1,735 feet of the existing pipeline would be closed in place. The duration of construction would be six months.

The proposed pipeline alignment would cross a high-pressure gas line and overhead electrical transmission poles at two locations, one at Mt. Alifan Drive and the second at Balboa Avenue. Furthermore, the alignment would cross through two busy intersections (Mt. Everest Boulevard/Balboa Avenue and Balboa Avenue/Genesee Avenue). This alternative was considered but is not being carried forward for detailed analysis in the EA because the realigned pipeline would not meet the purpose and need of the Proposed Action due to the excessive length of the realigned pipe within City of San Diego ROW and it would impact existing infrastructure as well as busy intersections.

2.4.2 Encroachment at High Tech High (Private Property)

This alternative would consist of the same project components as described under Alternative 1, except that the pipeline alignment for High Tech High would be located within the school parking lot (Figure 2-3). The proposed pipeline route would relocate approximately 603 feet of pipeline that is currently located under the high school parking lot within ten feet of a building. The new pipeline alignment would remain on the same property and would shift the pipeline away from the building to the north end of the parking lot. Approximately 542 feet of the existing pipeline would be closed in place. This alternative was considered but is not being carried forward for detailed analysis in the EA because the realigned pipeline would not meet the purpose and need of the Proposed Action since it would remain within private property and continue to create operational and maintenance encumbrances.

2.4.3 Encroachment at Cannington Drive (Northern Alignment)

This alternative would consist of the same project components as described under Alternatives 1 and 2, except that the pipeline alignment for the encroachment at Cannington Drive would be relocated to the north of the existing pipeline (Figure 2-4). The realigned pipeline would run along Mt. Abernathy Avenue for approximately 1,400 feet and then turn east and cross under Cannington Drive, Clairemont Mesa Boulevard, and I-805 and tie into the existing pipeline just northeast of the intersection of Convoy Court and Hickman Field Drive in the parking lot of California College San Diego. Page: 8
This alternative would also have segments of pipe that would likely be inaccessible for inspection, maintenance, and repair such as under the I-805.

This alternative was considered but is not being carried forward for detailed analysis in the EA because the realigned pipeline would not meet the purpose and need of the Proposed Action since it would

impact more existing infrastructure than the Proposed Action alternatives and would be more costly since the pipeline would have to be drilled down and encased where it crosses beneath the I-805.

2.4.4 Interstate 805 Right-of-Way

This alternative would consist of the same project components for the encroachment at High Tech High (Options 1 or 2); however, the realigned pipeline would continue north on Mt. Alifan Drive, run east along Balboa Avenue, and then run along the I-805 ROW and tie-in with the existing pipeline adjacent to the I-805 (Figure 2-5). This alternative was considered but is not being carried forward for detailed analysis in the EA because the realigned pipeline would not meet the purpose of and need for the Proposed Action due to the excessive length of the realigned pipe and because the pipeline would not be within City of San Diego ROW. This alternative would impact more infrastructure than the Proposed Action alternatives discussed in Section 2.3, as well as two busy intersections (Mt. Alifan Drive/Genesee Avenue and Mt. Alifan Drive/Balboa Avenue. In addition, relocating the pipeline to run adjacent to the I-805 would require a California Department of Transportation permit and would be very costly.

2.4.5 Enforcement of Easement Rights Against Encroaching Properties

Under this alternative, the Navy would clear encroaching properties through enforcement of Navy easement rights by judicial action against encroaching landowners, or by agreement with landowners who agree to remove their encroachments rather than litigate. In some cases, the judicial proceedings could rise to the level of condemnation of parcels, or Navy purchase of the land in lieu of condemnation. The Navy would need to engage with about a dozen properties to fully unencumber the pipeline easement in the community of Clairemont Mesa. This alternative would avoid disruption of traffic, noise and air emissions associated with realigning the pipeline; however, there would be some demolition activities associated with clearing the encroaching properties such as removal of landscape and hardscape and demolition of structures and parking lots.

While this alternative would remove the present encroachments, it is not a permanent guarantee of unobstructed access to the pipeline, as it would require daily inspections to prevent future encroachments from occurring. In addition, if easement enforcement is by condemnation, then it would be considered an exorbitant cost at taxpayer expense and public/City-imposed burden on the Navy and therefore not reasonable.

Figure 2-3: Encroachment at High Tech High: Private Property

Encroachment at Cannington Drive: Northern Alignment

Figure 2-4

Figure 2-4: Encroachment at Cannington Drive: Northern Alignment

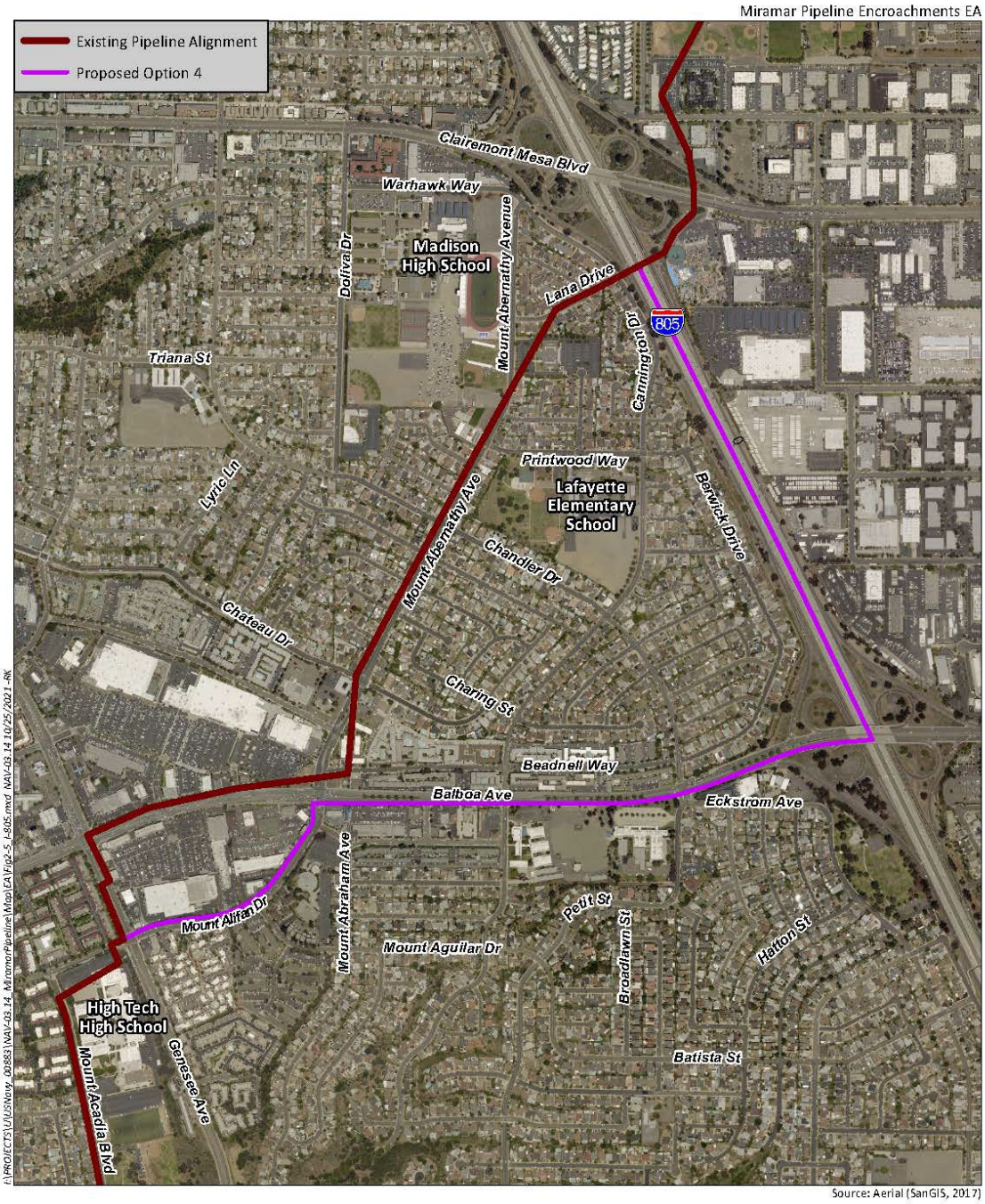

Figure 2-5: Interstate 805 Right-of-Way

2.5 Best Management Practices Included in Proposed Action

This section presents an overview of the BMPs that are incorporated into the Proposed Action in this document. BMPs are existing policies, practices, and measures that the Navy would adopt to reduce the environmental impacts of designated activities, functions, or processes. Although BMPs mitigate potential impacts by avoiding, minimizing, or reducing/eliminating impacts, BMPs are distinguished from potential mitigation measures because BMPs are (1) existing requirements for the Proposed Action; (2) ongoing, regularly occurring practices; or (3) not unique to this Proposed Action. In other words, the BMPs identified in this document are inherently part of the Proposed Action and are not potential mitigation measures proposed as a function of the NEPA environmental review process for the Proposed Action. Table 2-1 includes a list of BMPs. Mitigation measures are discussed separately in Chapter 3.

Table 2-1: Best Management Practices

BMP	*Description*	*Impacts Reduced/Avoided*
Storm Water Pollution Prevention Plans	The Proposed Action would conform with applicable National Pollutant Discharge Elimination System requirements including implementation of one or more Storm Water Pollution Prevention Plans and associated BMPs. BMPs may include erosion control blankets, soil stabilizers, temporary seeding, silt fencing, hay bales, sandbags, and storm drain inlet protection devices.	Soils (erosion and off-site sediment transport); Water Resources (water quality)
Health and Safety Program	The construction contractor would implement a Health and Safety Program to ensure appropriate safety measures are implemented during construction.	Public Health and Safety (Safety)
Hazardous Materials Business Plan	The construction contractor would prepare and submit a Hazardous Materials Business Plan to the County of San Diego Environmental Health Hazardous Materials Division that would include the types and volumes of hazardous materials and waste to be used and plans and procedures to prevent and minimize accidental release.	Hazardous Materials and Wastes
Public Right-of-Way Permit	The construction contractor would obtain a public right-of-way permit that would include provision of proper notice to the underground service alert and City of San Diego Engineering Department.	Hazardous Materials and Wastes
Soil and Groundwater Management Plan	The construction contractor would comply with the Soil and Groundwater Management Plan prepared for the Proposed Action to address the potential to encounter contaminated soil and groundwater associated with unknown releases in localized areas along the project alignment.	Hazardous Materials and Wastes

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3 Affected Environment and Environmental Consequences

This chapter presents a description of the environmental resources and baseline conditions that could be affected from implementing any of the alternatives and an analysis of the potential direct and indirect effects of each alternative.

All potentially relevant environmental resource areas were initially considered for analysis in this Environmental Assessment (EA). In compliance with the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ), and Department of Navy guidelines; the discussion of the affected environment (i.e., existing conditions) focuses only on those resource areas potentially subject to impacts. Additionally, the level of detail used in describing a resource is commensurate with the anticipated level of potential environmental impact.

"Significantly," as used in NEPA, requires considerations of both context and intensity. Context means that the significance of an action must be analyzed in several contexts such as society as a whole (e.g., 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 on the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant. Intensity refers to the severity or extent of the potential environmental impact, which can be thought of in terms of the potential amount of the likely change. In general, the more sensitive the context, the less intense a potential impact needs to be to be considered significant. Likewise, the less sensitive the context, the more intense a potential impact would be expected to be significant.

This section includes air quality, land use, noise, transportation, public health and safety, and hazardous materials and wastes.

The potential impacts to the following resource areas are considered to be negligible or non-existent so they were not analyzed in detail in this EA:

Water Resources: The Proposed Action would occur within roadways within highly developed areas where no natural water resources are present. Project construction could have the potential to result in effects to downstream water resource quality from releases of pollutants from construction work areas, including fuels and other fluids used for equipment and vehicles and sediments from earth disturbed during trenching and excavation activities. However, the potential for the release of such pollutants would be minimal based on the limited scope of construction activities (e.g., number of pieces of construction equipment) and size of disturbed areas. In addition, a Storm Water Pollution Prevention Plan would be prepared to minimize off-site surface water runoff that may carry pollutants to downstream water courses. Following completion of construction, affected roadways would be resurfaced and the Proposed Action would not result in the potential for long-term effects associated with water resources.

Geological Resources: The Proposed Action would occur within roadways that are underlain by previously compacted material. Potential effects to geological resources would be limited to erosion during the construction period, which would involve earth disturbance from trenching and excavation activities. The potential for erosion would be minimal due to the limited size of the trench (two feet wide). In addition, best management practices (BMPs) outlined in Section 2.5, including erosion control blankets, silt fencing, and minimizing points of access to the construction site, would be implemented to minimize soil erosion potential. The Navy would adhere to applicable state laws for erosion and

sediment control and would monitor the effectiveness of temporary erosion control measures. Following completion of construction, affected roadways would be resurfaced and the Proposed Action would not result the potential for long-term effects associated with erosion or other geological resources.

Cultural Resources: The Proposed Action would occur within roadways that have been previously disturbed, within highly developed areas; therefore, the likelihood of encountering belowground archaeological resources is minimal. Similarly, no built environment resources that could considered historic properties per the National Historic Preservation Act within the project footprint within the roadways. Therefore, the Proposed Action has low to no probability of impacting sensitive cultural resources.

Biological Resources: The Proposed Action would occur within roadways within highly developed areas where no native vegetation communities or habitats are present. In addition, no wetlands or other Clean Water Act regulated waters occur within the Proposed Action area. As such, the Proposed Action is not anticipated to impact biological resources.

Visual Resources: The Proposed Action would not result in permanent visual impacts as both the closed portions of the existing pipeline and the new pipeline alignments would be located belowground. Roadways disturbed during construction would be restored to preexisting conditions. No changes to the visual environment would occur.

Airspace: The Proposed Action would involve the realignment of portions of a belowground pipeline. Because the facilities would be below ground, they would not affect airspace. No impacts would occur.

Infrastructure: The Proposed Action would construct infrastructure in the form of a belowground pipeline but would not relocate or permanently affect existing infrastructure, including utility lines (e.g., potable water, sewer, electricity, natural gas, telecommunications) and facilities (e.g., buildings, roads, bridges, wharves, airfields). Construction would temporarily impact roadways for the installation of the new pipeline realignments. Affected roadways would be resurfaced following pipeline installation. As such, no permanent infrastructure impacts would occur.

Socioeconomics: The Proposed Action would not result in a permanent increase in civilian population or in personnel. Operations associated with the new pipeline would continue to be carried out by existing Navy operators. Contractors associated with the proposed construction activities would be provided by civilian contracting firms, drawing employees from a labor pool from the surrounding region. For construction projects of this duration and magnitude, the workforce is generally composed of workers that would commute to job sites rather than relocate their households. As such, construction activities are not anticipated to result in either an in-migration or relocation of employees to satisfy the need for temporary construction-related employment. Therefore, no increase in population would be expected from temporary workers relocating to the immediate area. Construction activities would create a temporary regional increase in employment, which would result in beneficial effects on the construction industry due to increases in payroll, taxes, and the indirect purchase of goods and services. The overall effects on the local and regional economy and socioeconomic environment would be negligible and no impacts would occur.

Environmental Justice: Executive Order (EO) 12898—Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations—directs federal agencies to identify and address disproportionately high and adverse human health or environmental effects of their actions on minority and low-income populations, to the greatest extent practicable and permitted by law. The EO is also

intended to promote nondiscrimination in federal programs that affect humans and the environment, as well as provide minority and low-income communities access to public information and public participation.

The Proposed Action involves realignment of portions of an existing pipeline within existing roadways. Impacts would be limited to the temporary construction period. In addition, because construction would continuously occur along the linear alignment, any one individual would not be affected for an extended period. As discussed in other sections of this EA (such as 3.1, *Air Quality*, 3.3, *Noise*, and 3.5, *Public Health and Safety*), the Proposed Action would not result in substantial adverse effects to the surrounding community. Implementation of the Proposed Action would not cause disproportionately high and adverse human health or environmental effects on any minority or low-income populations. Accordingly, no adverse environmental justice impacts would occur as a result of implementation of the Proposed Action.

3.1 Air Quality

This discussion of air quality includes criteria pollutants, standards, sources, and greenhouse gases. Air quality in a given location is defined by the concentration of various pollutants in the atmosphere. A region's air quality is influenced by many factors, including the type and amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions.

Most air pollutants originate from human-made sources, including mobile sources (e.g., cars, trucks, buses) and stationary sources (e.g., factories, refineries, power plants), as well as indoor sources (e.g., some building materials and cleaning solvents). Air pollutants are also released from natural sources such as volcanic eruptions and forest fires.

3.1.1 Regulatory Setting

3.1.1.1 Criteria Pollutants and National Ambient Air Quality Standards

The principal pollutants defining the air quality, called "criteria pollutants," include carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), ozone, suspended particulate matter less than or equal to 10 microns in diameter (PM_{10}), fine particulate matter less than or equal to 2.5 microns in diameter ($PM_{2.5}$), and lead (Pb). CO, SO_2, Pb, and some particulates are emitted directly into the atmosphere from emissions sources. Ozone, NO_2, and some particulates are formed through atmospheric chemical reactions that are influenced by weather, ultraviolet light, and other atmospheric processes.

Under the Clean Air Act (CAA), the U.S. Environmental Protection Agency (USEPA) has established National Ambient Air Quality Standards (NAAQS) (40 CFR part 50) for these pollutants. NAAQS are classified as primary or secondary. Primary standards protect against adverse health effects; secondary standards protect against welfare effects, such as damage to farm crops and vegetation and damage to buildings. Some pollutants have long-term and short-term standards. Short-term standards are designed to protect against acute, or short-term, health effects, while long-term standards were established to protect against chronic health effects.

Areas that are and have historically been in compliance with the NAAQS are designated as attainment areas. Areas that violate a federal air quality standard are designated as nonattainment areas. Areas

that have transitioned from nonattainment to attainment are designated as maintenance areas and are required to adhere to maintenance plans to ensure continued attainment.

The CAA requires states to develop a general plan to attain and maintain the NAAQS in all areas of the country and a specific plan to attain the standards for each area designated nonattainment for a NAAQS. These plans, known as State Implementation Plans (SIPs), are developed by state and local air quality management agencies, and submitted to USEPA for approval.

3.1.1.2 Mobile Sources

Hazardous air pollutants (HAPs) emitted from mobile sources are called Mobile Source Air Toxics (MSATs). MSATs are compounds emitted from highway vehicles and non-road equipment that are known or suspected to cause cancer or other serious health and environmental effects. In 2001, USEPA issued its first MSAT Rule, which identified 201 compounds as being HAPs that require regulation. A subset of six of the MSAT compounds was identified as having the greatest influence on health and included benzene, butadiene, formaldehyde, acrolein, acetaldehyde, and diesel particulate matter. More recently, USEPA issued a second MSAT Rule in February 2007, which generally supported the findings in the first rule and provided additional recommendations of compounds having the greatest impact to health. The rule also identified several engine emission certification standards that must be implemented (40 CFR parts 59, 80, 85, and 86; Federal Register Volume 72, No. 37, pp. 8427–8570, 2007). Unlike the criteria pollutants, there are no NAAQS for benzene and other HAPs. The primary control methodologies for these pollutants for mobile sources involves reducing their content in fuel and altering the engine operating characteristics to reduce the volume of pollutant generated during combustion.

3.1.1.3 General Conformity

The USEPA General Conformity Rule applies to federal actions occurring in nonattainment or maintenance areas when the total direct and indirect emissions of nonattainment pollutants (or their precursors) exceed specified thresholds. The emissions thresholds that trigger requirements for a conformity analysis are called *de minimis* levels. *De minimis* levels (in tons per year [tpy]) vary by pollutant and also depend on the severity of the nonattainment status for the air quality management area in question.

A conformity applicability analysis is the first step of a conformity evaluation and assesses if a federal action must be supported by a conformity determination. This is typically done by quantifying applicable direct and indirect emissions that are projected to result due to implementation of the federal action. Indirect emissions are those emissions caused by the federal action and originating in the region of interest, but which can occur later or in a different location from the action itself and are reasonably foreseeable. The federal agency can control and will maintain control over the indirect action due to a continuing program responsibility of the federal agency. Reasonably foreseeable emissions are projected future direct and indirect emissions that are identified at the time the conformity evaluation is performed. The location of such emissions is known and the emissions are quantifiable, as described and documented by the federal agency based on its own information and after reviewing any information presented to the federal agency. If the results of the applicability analysis indicate that the total emissions would not exceed the *de minimis* emissions thresholds, then the conformity evaluation process is completed. *De minimis* threshold emissions are presented in Table 3-1.

Table 3-1: General Conformity *de minimis* levels

Pollutant	*Area Type*	*tpy*
Ozone (VOC or NOx)	Serious nonattainment	50
	Severe nonattainment	25
	Extreme nonattainment	10
	Other areas outside an ozone transport region	100
Ozone (NOx)	Marginal and moderate nonattainment inside an ozone transport region	100
	Maintenance	100
Ozone (VOC)	Marginal and moderate nonattainment inside an ozone transport region	50
	Maintenance within an ozone transport region	50
	Maintenance outside an ozone transport region	100
Carbon monoxide, SO_2 and NO_2	All nonattainment & maintenance	100
PM_{10}	Serious nonattainment	70
	Moderate nonattainment and maintenance	100
$PM_{2.5}$ Direct emissions, SO_2, NOx (unless determined not to be a significant precursor), VOC or ammonia (if determined to be significant precursors)	All nonattainment & maintenance	100
Lead (Pb)	All nonattainment & maintenance	25

3.1.1.4 Greenhouse Gases

Greenhouse gases (GHGs) are gas emissions that trap heat in the atmosphere. These emissions occur from natural processes and human activities. Scientific evidence indicates a trend of increasing global temperature over the past century due to an increase in GHG emissions from human activities. The climate change associated with this global warming is predicted to produce negative economic and social consequences across the globe.

Revised draft guidance from CEQ, dated December 18, 2014, recommends that agencies consider both the potential effects of a proposed action on climate change, as indicated by its estimated greenhouse gas emissions, and the implications of climate change for the environmental effects of a proposed action. The guidance also emphasizes that agency analyses should be commensurate with projected greenhouse gas emissions and climate impacts, and should employ appropriate quantitative or qualitative analytical methods to ensure useful information is available to inform the public and the decision-making process in distinguishing between alternatives and mitigations. It recommends that agencies consider 25,000 metric tons of carbon dioxide equivalent (CO_2e) emissions on an annual basis as a reference point below which a quantitative analysis of greenhouse gas is not recommended unless it is easily accomplished based on available tools and data.

USEPA issued the Final *Mandatory Reporting of Greenhouse Gases Rule* on September 22, 2009. GHGs covered under the Final *Mandatory Reporting of Greenhouse Gases Rule* are carbon dioxide (CO_2), methane, nitrogen oxide (NO_x), hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and other fluorinated gases including nitrogen trifluoride and hydrofluorinated ethers. Each GHG is assigned a

global warming potential. The global warming potential is the ability of a gas or aerosol to trap heat in the atmosphere. The global warming potential rating system is standardized to CO_2, which has a value of one. The equivalent CO_2 rate is calculated by multiplying the emissions of each GHG by its global warming potential and adding the results together to produce a single, combined emissions rate representing all GHGs. Under the rule, suppliers of fossil fuels or industrial GHGs, manufacturers of mobile sources and engines, and facilities that emit 25,000 metric tons or more per year of GHG emissions as CO_2e are required to submit annual reports to USEPA.

In an effort to reduce energy consumption, reduce GHGs, reduce dependence on petroleum, and increase the use of renewable energy resources, the Navy has implemented a number of renewable energy projects. The Navy has established Fiscal Year (FY) 2020 GHG emissions reduction targets of 34 percent from a FY 2008 baseline for direct GHG emissions and 13.5 percent for indirect emissions. Examples of Navy-wide GHG reduction projects include energy efficient construction, thermal and photovoltaic solar systems, geothermal power plants, and the generation of electricity with wind energy. The Navy continues to promote and install new renewable energy projects.

3.1.2 Affected Environment

The Proposed Action is in San Diego County, which encompasses the San Diego Air Basin (SDAB). The County of San Diego Air Pollution Control District (CSDAPCD) is responsible for implementing and enforcing state and federal air quality regulations in San Diego County. The SDAB has been determined by the USEPA to be a nonattainment area for 8-hour ozone, with a classification of Severe under the 2008 and 2015 standards. The County is classified by the USEPA as unclassified/attainment for all other criteria pollutants. Because San Diego County is in nonattainment for ozone, a General Conformity evaluation is required.

The most recent emissions inventory for the San Diego County is shown in Table 3-2. Volatile organic compound (VOC) and NO_X emissions are used to represent ozone generation because they are precursors of ozone.

Table 3-2: San Diego County Air Emissions Inventory (2011)

Location	*NO_X (tpy)*	*VOC (tpy)*	*CO (tpy)*	*SO_2 (tpy)*	*PM_{10} (tpy)*	*$PM_{2.5}$ (tpy)*
San Diego County	42,845	156,407	270,195	1,100	31,251	10,918

Source: EPA 2013
Key: tpy = tons per year

3.1.3 Environmental Consequences

Effects on air quality are based on estimated direct and indirect emissions associated with the action alternatives. The region of influence (ROI) for assessing air quality impacts is the air basin in which the project is located, the SDAB.

Estimated emissions from a proposed federal action are typically compared with the relevant national and state standards to assess the potential for increases in pollutant concentrations.

3.1.3.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur, no emissions would be generated, and there would be no change to baseline air quality. Therefore, no significant impacts to air quality or air resources would occur with implementation of the No Action Alternative.

3.1.3.2 Alternative 1 – Encroachment at High Tech High (Option 1) and Encroachment at Cannington Drive (Option 1) Potential Impacts

Alternative 1 would result in emissions of air pollutants during construction.

General Conformity

Criteria pollutant emissions would occur during project construction, primarily from trenching/excavation, new pipeline installation, and backfilling/repaving. Construction emissions would include emissions associated with the operation of off-road equipment and on-road vehicles. Construction is assumed to begin in 2023 and last approximately six months. Table 3-3 shows the estimated annual construction emissions of criteria pollutants generated under Alternative 1 for the years 2023, with the maximum yearly emissions compared to the *de minimis* thresholds. Emissions calculation spreadsheets are included in Appendix A.

Table 3-3: Estimated Construction Emissions (tons per year)

Year	*NOx (tpy)*	*VOC (tpy)*	*CO (tpy)*	*SO_2 (tpy)*	*PM_{10} (tpy)*	*$PM_{2.5}$ (tpy)*
2023	1.45	0.18	1.82	0.00	0.20	0.09
Maximum Emissions	1.45	0.18	1.82	0.00	0.20	0.09
General Conformity *de minimis* Threshold	25*	25*	N/A**	N/A	N/A**	N/A**
Exceed *de minimis*?	No	No	No	No	No	No

*Threshold for area in serious non-attainment

**As shown in Table 3-1, General Conformity *de minimis* levels for CO, PM_{10}, and $PM_{2.5}$ are only provided for nonattainment and maintenance areas.

Key: tpy = tons per year

As shown in Table 3-3, construction emissions generated by Alternative 1 would be well below the General Conformity *de minimis* thresholds, including for ozone precursors (NO_X and VOCs) for which San Diego has been classified by the USEPA as a severe nonattainment area. Therefore, a Record of Non-Applicability has been prepared and is included in Appendix B.

Implementation of Alternative 1 would not result in significant impacts to air quality.

Greenhouse Gases

Implementation of Alternative 1 would contribute directly to emissions of GHGs from the combustion of fossil fuels during construction activities. Construction activities would generate approximately 421 tons (382 metric tons) of CO_2e if the proposed activities occurred during 2023, as detailed in Appendix A. These estimated annual GHG emissions fall below the CEQ threshold of 25,000 metric tons. This limited amount of emissions would not likely contribute to global warming to any discernible extent. Therefore, impacts from GHGs from construction activities for Alternative 1 would not result in significant imapcts.

3.1.3.3 Alternative 2 – Encroachment at High Tech High (Option 2) and Encroachment at Cannington Drive (Option 1) Potential Impacts

Alternative 2 would be similar to Alternative 1, except that the new segment of pipeline for the encroachment at High Tech High would be located on the south side of Mt. Alifan Drive (versus the north side under Alternative 1) and east side of Mt. Acadia Boulevard (versus the west side under Alternative 1). The amount of construction and related emissions for Alternative 2 would be similar to Alternative 1. Construction emissions of Alternative 2 would be well below the General Conformity *de minimis* thresholds. GHG emissions under Alternative 2 would also be similar to Alternative 1 and would not exceed the CEQ threshold of 25,000 metric tons. Therefore, implementation of the Alternative 2 would not result in significant impacts to air quality or GHGs.

3.1.3.4 Alternative 3 – Encroachment at High Tech High (Option 1) and Encroachment at Cannington Drive (Option 2) Potential Impacts

Alternative 3 would be similar to Alternative 1, except that the new pipeline for the encroachment at Cannington Drive would run through Mt. Abernathy Avenue (versus Printwood Way) and Cannington Drive to connect to the existing pipeline located south of the intersection of Mt. Abernathy Avenue and Cannington Drive. The amount of construction and related emissions for Alternative 3 would be similar to Alternative 1. Construction emissions of Alternative 3 would be well below the General Conformity *de minimis* thresholds. GHG emissions under Alternative 3 would also be similar to Alternative 1 and would not exceed the CEQ threshold of 25,000 metric tons. Therefore, implementation of the Alternative 3 would not result in significant impacts to air quality or GHGs.

3.1.3.5 Alternative 4 – Encroachment at High Tech High (Option 2) and Encroachment at Cannington Drive (Option 2) Potential Impacts

Alternative 4 would be similar to Alternative 1, except that the new segment of pipeline for the encroachment at High Tech High would be located on the south side of Mt. Alifan Drive (versus the north side under Alternative 1) and east side of Mt. Acadia Boulevard (versus the west side under Alternative 1) and the new pipeline for the encroachment at Cannington Drive would run through Mt. Abernathy Avenue (versus Printwood Way) and Cannington Drive to connect to the existing pipeline located south of the intersection of Mt. Abernathy Avenue and Cannington Drive. The amount of construction and related emissions for Alternative 4 would be similar to Alternative 1. Construction emissions of Alternative 4 would be well below the General Conformity *de minimis* thresholds. GHG emissions under Alternative 4 would also be similar to Alternative 1 and would not exceed the CEQ threshold of 25,000 metric tons. Therefore, implementation of the Alternative 4 would not result in significant impacts to air quality or GHGs.

3.2 Land Use

This discussion of land use includes current and planned uses and the regulations, policies, or zoning that may control the proposed land use. The term land use refers to real property classifications that indicate either natural conditions or the types of human activity occurring on a parcel. Two main objectives of land use planning are to ensure orderly growth and compatible uses among adjacent property parcels or areas. However, there is no nationally recognized convention or uniform terminology for describing land use categories. As a result, the meanings of various land use descriptions, labels, and definitions vary among jurisdictions. Natural conditions of property can be described or categorized as unimproved, undeveloped, conservation or preservation area, and natural

or scenic area. There is a wide variety of land use categories resulting from human activity. Descriptive terms often used include residential, commercial, industrial, agricultural, institutional, and recreational.

3.2.1 Regulatory Setting

In many cases, land use descriptions are codified in installation master planning and local zoning laws. Office of the Chief of Naval Operations Instruction (OPNAVINST) 11010.40 establishes an encroachment management program to ensure operational sustainment that has direct bearing on land use planning on installations. Additionally, the joint instruction OPNAVINST 11010.36C and Marine Corps Order 11010.16 provides guidance administering the Air Installation Compatible Use Zone (AICUZ) program, which recommends land uses that are compatible with noise levels, accident potential, and obstruction clearance criteria for military airfield operations. OPNAVINST 3550.1A and Marine Corps Order 3550.11 provide guidance for a similar program, Range AICUZ (RAICUZ). This program includes range safety and noise analyses, and provides land use recommendations which will be compatible with Range Compatibility Zones and noise levels associated with military range operations.

Through the Coastal Zone Management Act of 1972 (CZMA), Congress established national policy to preserve, protect, develop, restore, or enhance resources in the coastal zone. This Act encourages coastal states to properly manage use of their coasts and coastal resources, prepare and implement coastal management programs, and provide for public and governmental participation in decisions affecting the coastal zone. To this end, CZMA imparts an obligation upon federal agencies whose actions or activities affect any land or water use or natural resource of the coastal zone to be carried out in a manner consistent to the maximum extent practicable with the enforceable policies of federally approved state coastal management programs. However, Federal lands, which are "lands the use of which is by law subject solely to the discretion of the Federal Government, its officers, or agents," are statutorily excluded from the State's "coastal uses or resources." If, however, the proposed federal activity affects coastal uses or resources beyond the boundaries of the federal property (i.e., has spillover effects), the CZMA Section 307 federal consistency requirement applies. As a federal agency, the Navy is required to determine whether its proposed activities would affect the coastal zone. This takes the form of a consistency determination, a negative determination, or a determination that no further action is necessary.

3.2.2 Affected Environment

The following discussions provide a description of the existing conditions for each of the categories under land use resources along the proposed and existing pipeline alignments in the High Tech High and Cannington Drive encroachment areas.

3.2.2.1 Land Use Compatibility

The Proposed Action is located in the Clairemont Mesa community of San Diego. The Clairemont Mesa community is characterized by single-family homes built in the 1950s and 1960s. It is an urbanized community with shopping centers, parks and recreational facilities, churches, and schools. Multi-family uses are located along major transportation corridors in the community, including Clairemont Mesa Boulevard, Clairemont Drive, Genesee Avenue, Balboa Avenue, and around shopping centers. The Clairemont Mesa Community Plan identifies the number of parks and recreational facilities and education opportunities in the community as an attractive feature.

Land uses in High Tech High encroachment area consist of multi-family residential, school, and commercial uses. Along Mt. Acadia Boulevard, uses directly adjacent to the proposed pipeline alignment include multi-family residential to the west, and High Tech High to the east. Along Mt. Alifan Drive, uses directly adjacent to the proposed pipeline alignment include multi-family residential to the north, and a parking lot associated with High Tech High to the south.

Land uses in the Cannington Drive encroachment area consist primarily of single-family residential uses that are located along the east side of Mt. Abernathy Avenue, the north side of Printwood Way, the west and east sides of Cannington Drive in its southern portion, and the west side of Cannington Drive in its northern portion. Other uses include Madison High School on the west side of Mt. Abernathy Avenue, the Church of Jesus Christ of Latter-day Saints on the east side of Mt. Abernathy Avenue, the Reformation Lutheran Church and School on the west side of the Mt. Abernathy Avenue and Printwood Way intersection, and Olive Grove Community Park and LaFayette Elementary School on the south side of Printwood Way.

The proposed pipeline alignment is not located within the coastal zone or within Accident Potential Zones associated with MCAS Miramar AICUZ (Navy 2005). There is no prime farmland, unique farmland, and land of statewide or local importance in the Proposed Action vicinity. All land within the Proposed Action vicinity is designated as Urban and Built-Up Land (California Department of Conservation 2018). These issues are not discussed further.

3.2.3 Environmental Consequences

The location and extent of a proposed action needs to be evaluated for its potential effects on a project site and adjacent land uses. Factors affecting a proposed action in terms of land use include its compatibility with on-site and adjacent land uses, restrictions on public access to land, or change in an existing land use that is valued by the community. Other considerations are given to proximity to a proposed action, the duration of a proposed activity, and its permanence.

3.2.3.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur and there would be no change to the existing condition. Regular inspection, routine maintenance, and emergency response access would remain encumbered. The pipeline would continue to operate within ten feet of a building at High Tech High and below a residence on Cannington Drive and multiple other properties. These are less than significant impacts, and no significant impacts would occur with implementation of the No Action Alternative.

3.2.3.2 Alternative 1 – Encroachment at High Tech High (Option 1) and Encroachment at Cannington Drive (Option 1)

The ROI for land use impacts includes the proposed pipeline alignment and the land uses adjacent to the pipeline construction areas. For Alternative 1, this includes 750 feet along Mt. Acadia Boulevard and Mt. Alifan Drive in the High Tech High encroachment area and 2,650 feet along Printwood Way, Cannington Drive, and Mt. Abernathy Avenue in the Cannington Drive encroachment area. Adjacent land uses include multi-family residential and a school in the High Tech High encroachment area and single-family residences, a church, a park, and a school in the Cannington Drive encroachment area.

The Proposed Action consists of a short-term construction project and continued operation of the Miramar Pipeline. No change to existing land uses is proposed and no new land uses are proposed.

Construction activities would be contained within roadway rights-of-way. Temporary inconveniences to adjacent land uses may occur during construction activities, primarily related to transportation impacts, including precluded driveway access and restricted roadway capacity on area roads. Transportation impacts are discussed in Section 3.4, *Transportation*. Due to the temporary nature of the construction activities, compliance with existing federal, state, and local regulatory requirements for construction and operation of the pipeline, and the incorporation of BMPs and/or Special Conservation Measures (SCMs) identified in other sections of this EA, the Proposed Action would not result in significant land use impacts associated with land use consistency and temporary inconveniences to adjacent land uses.

3.2.3.3 Alternative 2 – Encroachment at High Tech High (Option 2) and Encroachment at Cannington Drive (Option 1)

The ROI for land use impacts includes the proposed pipeline alignment and the land uses adjacent to the pipeline construction areas. For Alternative 2, this includes 715 feet along Mt. Acadia Boulevard and Mt. Alifan Drive in the High Tech High encroachment area and 2,650 feet along Printwood Way, Cannington Drive, and Mt. Abernathy Avenue in the Cannington Drive encroachment area. Although under Alternative 2 the pipeline alignment in the High Tech High encroachment area would be located on east side of Mt. Acadia Boulevard and the south side of Mt. Alifan Drive, adjacent land uses would be the same as those identified for Alternative 1. Therefore, land use impacts associated with Alternative 2 would be the same as those identified for Alternative 1 and would not be significant.

3.2.3.4 Alternative 3 – Encroachment at High Tech High (Option 1) and Encroachment at Cannington Drive (Option 2)

The ROI for land use impacts includes the proposed pipeline alignment and the land uses adjacent to the pipeline construction areas. For Alternative 3, this includes 750 feet along Mt. Acadia Boulevard and Mt. Alifan Drive in the High Tech High encroachment area and 2,420 feet along Mt. Abernathy Avenue and Cannington Drive in the Cannington Drive encroachment area.

Land use impacts associated with Alternative 3 would be similar to those identified for Alternatives 1 and 2. Under Alternative 3, the pipeline alignment and adjacent land uses in the High Tech High encroachment area would be the same as Alternative 1. At the Cannington Drive encroachment area, the pipeline alignment would run along Mt. Abernathy and the northern portion of Cannington Drive instead of along Printwood Way and the southern portion of Cannington Drive. Adjacent land uses in the Cannington Drive encroachment area would be similar to Alternative 1 and consist of a school, churches, and single-family residences. This alternative would involve temporary construction within roadway rights-of-way and would not change existing land uses or add new land uses. As identified for Alternatives 1 and 2, Alternative 3 may result in temporary inconveniences to adjacent land uses, which are addressed in other sections in Chapter 3 of this EA. With the incorporation of BMPs and/or SCMs identified in other sections of this EA to ensure remain less than significant, the Proposed Action would not result in significant land use impacts associated with land use consistency and temporary inconveniences to adjacent land uses.

3.2.3.5 Alternative 4 – Encroachment at High Tech High (Option 2) and Encroachment at Cannington Drive (Option 2)

The ROI for land use impacts includes the proposed pipeline alignment and the land uses adjacent to the pipeline construction areas. For Alternative 4, this includes 715 feet along Mt. Acadia Boulevard and

Mt. Alifan Drive in the High Tech High encroachment area and 2,420 feet along Mt. Abernathy Avenue and Cannington Drive in the Cannington Drive encroachment area.

Land use impacts associated with Alternative 4 would be similar to those identified for Alternatives 1, 2, and 3. Under Alternative 4, the pipeline alignment and adjacent land uses in the High Tech High encroachment area would be the same as Alternative 2 and the pipeline alignment and adjacent land uses in the Cannington Drive encroachment area would be the same as Alternative 3. Therefore, the analysis for the previous alternatives applies to Alternative 4. No significant impacts related to land use would occur.

3.3 Noise

This discussion of noise includes the types or sources of noise and the associated sensitive receptors in the human environment. Noise in relation to biological resources and wildlife species is discussed in the Biological Resources section.

Sound is a physical phenomenon consisting of minute vibrations that travel through a medium, such as air or water, and are sensed by the human ear. Sound is all around us. The perception and evaluation of sound involves three basic physical characteristics:

- Intensity – the acoustic energy, which is expressed in terms of sound pressure, in decibels (dB)
- Frequency – the number of cycles per second the air vibrates, in Hertz (Hz)
- Duration – the length of time the sound can be detected

Noise is defined as unwanted or annoying sound that interferes with or disrupts normal human activities. Although continuous and extended exposure to high noise levels (e.g., through occupational exposure) can cause hearing loss, the principal human response to noise is annoyance. The response of different individuals to similar noise events is diverse and is influenced by the type of noise, perceived importance of the noise, its appropriateness in the setting, time of day, type of activity during which the noise occurs, and sensitivity of the individual. While aircraft are not the only sources of noise in an urban or suburban environment, they are readily identified by their noise output and are given special attention in this EA.

3.3.1 Basics of Sound and A-Weighted Sound Level

The loudest sounds that can be detected comfortably by the human ear have intensities that are a trillion times higher than those of sounds that can barely be detected. This vast range means that using a linear scale to represent sound intensity is not feasible. The dB is a logarithmic unit used to represent the intensity of a sound, also referred to as the sound level. All sounds have a spectral content, which means their magnitude or level changes with frequency, where frequency is measured in cycles per second or Hz. To mimic the human ear's non-linear sensitivity and perception of different frequencies of sound, the spectral content is weighted. For example, environmental noise measurements are usually on an "A-weighted" scale that filters out very low and very high frequencies to replicate human sensitivity. It is common to add the "A" to the measurement unit to identify that the measurement has been made with this filtering process (dBA). In this document, the dB unit refers to A-weighted sound levels. Table 3-4 provides a comparison of how the human ear perceives changes in loudness on the logarithmic scale.

Table 3-4: Subjective Responses to Changes in A-Weighted Decibels

Change	*Change in Perceived Loudness*
3 dB	Barely perceptible
5 dB	Quite noticeable
10 dB	Dramatic – twice or half as loud
20 dB	Striking – fourfold change

Figure 3-1 (Cowan, 1994) provides a chart of A-weighted sound levels from typical noise sources. Some noise sources (e.g., air conditioner, vacuum cleaner) are continuous sounds that maintain a constant sound level for some period of time. Other sources (e.g., automobile, heavy truck) are the maximum sound produced during an event like a vehicle pass-by. Other sounds (e.g., urban daytime, urban nighttime) are averages taken over extended periods of time. A variety of noise metrics have been developed to describe noise over different time periods, as discussed below.

Noise levels from aircraft operations that exceed background noise levels at an airfield typically occur beneath main approach and departure corridors, in local air traffic patterns around the airfield, and in areas immediately adjacent to parking ramps and aircraft staging areas. As aircraft in flight gain altitude, their noise contributions drop to lower levels, often becoming indistinguishable from the background noise.

3.3.2 Noise Metrics

A metric is a system for measuring or quantifying a particular characteristic of a subject. Since noise is a complex physical phenomenon, different noise metrics help to quantify the noise environment. The noise metrics used in this EA are described in summary format below. While the Day-Night Average Sound Level (DNL) and Community Noise Equivalent Level (CNEL) noise metrics are the most used tools for analyzing noise generated at an airfield, the U.S. Department of Defense (DoD) has been developing additional metrics (and analysis techniques). These supplemental metrics and analysis tools provide more detailed noise exposure information for the decision process and improve the discussion regarding noise exposure. The DoD Noise Working Group product, *Improving Aviation Noise Planning, Analysis and Public Communication with Supplemental Metrics* (DoD Noise Working Group, 2009) was used to determine the appropriate metrics and analysis tools for this EA.

3.3.2.1 Day-Night Average Sound Level

The DNL metric is the energy-averaged sound level measured over a 24-hour period, with a 10-dB penalty assigned to noise events occurring between 10 p.m. and 7 a.m. (acoustic night). DNL values are average quantities, mathematically representing the continuous sound level that would be present if all the variations in sound level that occur over a 24-hour period were averaged to have the same total sound energy. The DNL metric quantifies the total sound energy received and is therefore a cumulative measure, but it does not provide specific information on the number of noise events or the individual sound levels that occur during the 24-hour day. DNL is the standard noise metric used by the U.S. Department of Housing and Urban Development, Federal Aviation Administration, USEPA, and DoD.

Studies of community annoyance in response to numerous types of environmental noise show that DNL correlates well with impact assessments; there is a consistent relationship between DNL and the level of annoyance. Most people are exposed to sound levels of 50 to 55 DNL or higher on a daily basis.

Research has indicated that about 87 percent of the population is not highly annoyed by outdoor sound levels below 65 dB DNL (Federal Interagency Committee on Urban Noise, 1980). Therefore, the 65 dB DNL noise contour is used to help determine compatibility of military aircraft operations with local land use, particularly for land use associated with airfields.

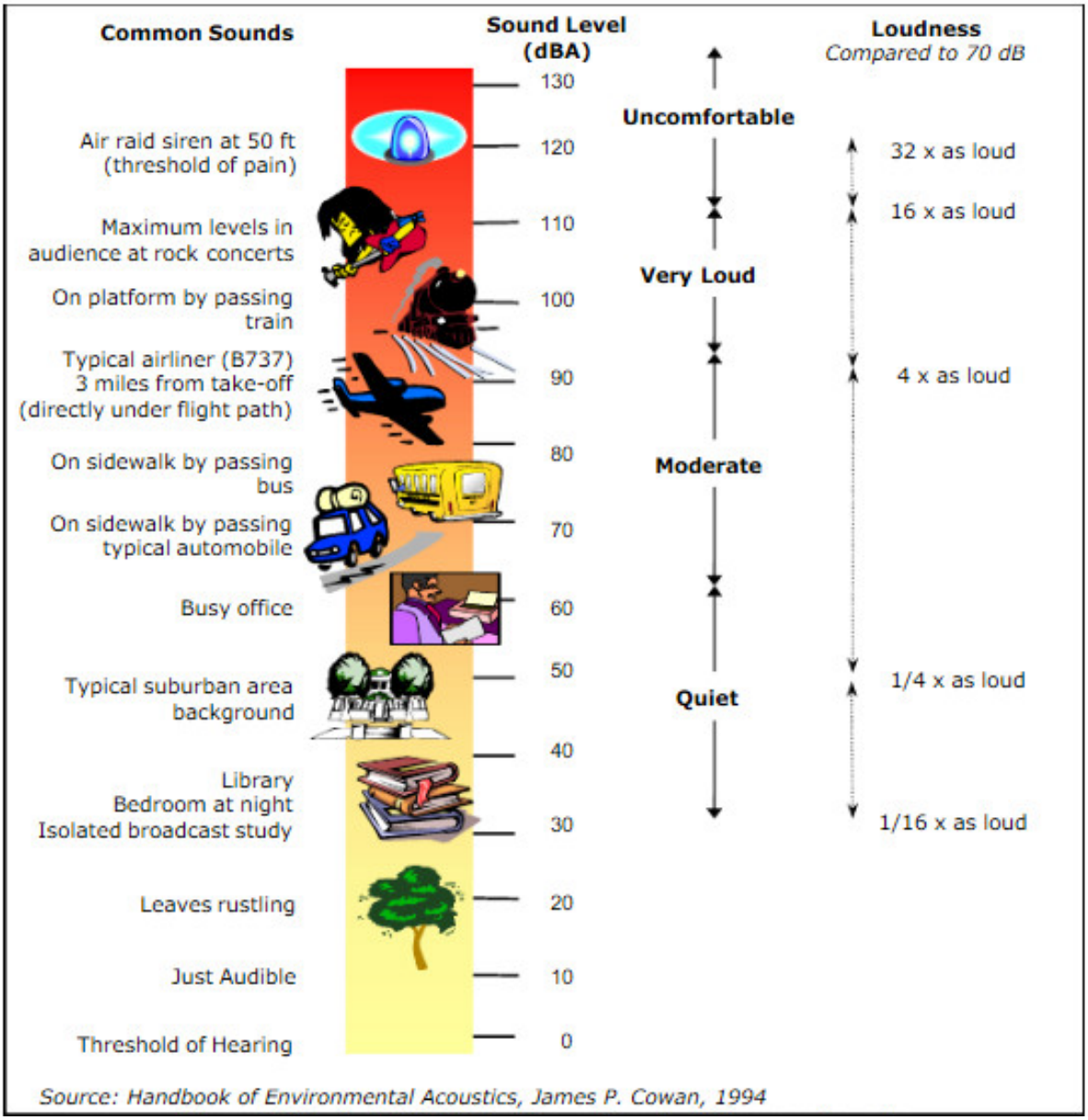

Figure 3-1: A-Weighted Sound Levels from Typical Sources

3.3.2.2 Community Noise Equivalent Level

CNEL is a noise metric adopted as a standard by the state of California. The CNEL metric is similar to the DNL metric and is also an energy-averaged sound level measurement. DNL and CNEL provide average noise levels taking into consideration and applying penalties for annoyance from intrusive events that occur during evening and nighttime hours. Both DNL and CNEL are measures of cumulative noise exposure over a 24-hour period, with adjustments to reflect the added intrusiveness of noise during certain times of the day. However, while DNL considers one adjustment period, CNEL reflects two adjustment periods. DNL includes a single adjustment period for night, in which each aircraft noise event at night (defined as 10 p.m. to 7 a.m.) is counted 10 times. CNEL adds a second adjustment period where each aircraft noise event in the evening (defined as 7 p.m. to 10 p.m.) is counted three times. The nighttime adjustment is equivalent to increasing the noise levels during that time interval by 10 dB. Similarly, the evening adjustment increases the noise levels by approximately 5 dB.

3.3.2.3 Equivalent Sound Level

A cumulative noise metric useful in describing noise is the Equivalent Sound Level (Leq). Leq is the continuous sound level that would be present if all the variations in sound level occurring over a specified time period were smoothed out as to contain the same total sound energy. The same calculation for a daily average time period such as DNL or CNEL but without the penalties is a 24-hour equivalent sound level, abbreviated Leq(24). Other typical time periods for Leq are 1 hour and 8 hours.

3.3.2.4 Sound Exposure Level

The Sound Exposure Level (SEL) metric is a composite metric that represents both the intensity of a sound and its duration. Individual time-varying noise events (e.g., aircraft overflights) have two main characteristics: a sound level that changes throughout the event and a period of time during which the event is heard. SEL provides a measure of total sound energy of the entire acoustic event, but it does not directly represent the sound level heard at any given time. During an aircraft flyover, SEL captures the total sound energy from the beginning of the acoustic event to the point when the receiver no longer hears the sound. It then condenses that energy into a 1-second period of time and the metric represents the total sound exposure received. The SEL has proven to be a good metric to compare the relative exposure of transient sounds, such as aircraft overflights, and is the recommended metric for sleep disturbance analysis (DoD Noise Working Group, 2009). In this EA, SEL is used in aircraft comparison and sleep disturbance analyses.

3.3.2.5 Maximum Sound Level

The highest A-weighted sound level measured during a single event where the sound level changes value with time (e.g., an aircraft overflight) is called the maximum A-weighted sound level or Lmax. During an aircraft overflight, the noise level starts at the ambient or background noise level, rises to the maximum level as the aircraft flies closest to the observer, and returns to the background level as the aircraft recedes into the distance. Lmax defines the maximum sound level occurring for a fraction of a second. For aircraft noise, the “fraction of a second” over which the maximum level is defined is generally 1/8 second (American National Standards Institute, 1988). For sound from aircraft overflights, the SEL is usually greater than the Lmax because an individual overflight takes seconds and the Lmax occurs instantaneously. In this EA, Lmax is used in the analysis of aircraft comparison and speech interference.

3.3.2.6 Number of Events Above a Threshold Level

The "Number of Events Above a Threshold Level" metric provides the total number of noise events that exceed a selected noise level threshold during a specified period of time (DoD Noise Working Group, 2009). Combined with the selected noise metric, Lmax or SEL, the Number of Events Above metric is symbolized as NAXXmetric (NA = number of events above, XX = dB level, metric = Lmax or SEL). For example, the Lmax and SEL Number of Events Above metrics are symbolized as NA75Lmax and NA75SEL, respectively, with 75 dB as the example dB level. In this EA, an Lmax threshold is selected to analyze speech interference and an SEL threshold is selected for analysis of sleep disturbance.

3.3.3 Noise Effects

An extensive amount of research has been conducted regarding noise effects including annoyance, speech interference, sleep disturbance, noise-induced hearing impairment, nonauditory health effects, performance effects, noise effects on children, effects on domestic animals and wildlife, property values, structures, terrain, and archaeological sites. These effects are summarized below.

3.3.3.1 Annoyance

As previously noted, the primary effect of aircraft noise on exposed communities is long-term annoyance, defined by USEPA as any negative subjective reaction on the part of an individual or group. The scientific community has adopted the use of long-term annoyance as a primary indicator of community response and there is a consistent relationship between DNL/CNEL and the level of community annoyance (Federal Interagency Committee on Noise, 1992).

3.3.3.2 Potential Hearing Loss

People living in high noise environments for an extended period of time (40 years) can be at risk for hearing loss called Noise Induced Permanent Threshold Shift (NIPTS). The NIPTS defines a permanent change in hearing level, or threshold, caused by exposure to noise (United States Environmental Protection Agency, 1982). According to USEPA (1974), changes in hearing level of less than 5 dB are generally not considered noticeable. There is no known evidence that an NIPTS of less than 5 dB is perceptible or has any practical significance for the individual affected. Furthermore, the variability in audiometric testing is generally assumed to be plus or minus 5 dB. The preponderance of available information on hearing loss risk is from the workplace with continuous exposure throughout the day for many years.

Based on a report by Ludlow and Sixsmith (1999), there were no major differences in audiometric test results between military personnel, who as children, had lived in or near installations where fast jet operations were based, and a similar group who had no such exposure as children. Hence, for the purposes of this EA, the limited data are considered applicable to the general population, including children, and are used to provide a conservative estimate of the risk of potential hearing loss.

DoD policy directive requires that hearing loss risk be estimated for the at-risk population, defined as the population exposed to DNL greater than or equal to 80 dB (Department of Defense, 2009). To assess the potential for NIPTS, the Navy generally uses the 80 dB DNL noise contour (or in California 80 dB CNEL) as a threshold to identify the exposed population who may be at the most risk of possible hearing loss from aircraft noise (USEPA, 1982; DoD Noise Working Group, 2009). However, it should be recognized that characterizing noise exposure in terms of DNL and CNEL overestimates hearing loss risk but suffices when nighttime operations are 5 percent or less than the total operations. When nighttime

operations are greater than 5 percent, Leq(24) is recommended for calculating potential hearing loss since hearing loss is a physical phenomenon due to the sound level and independent of annoyance. Thus, the additional penalties applied by CNEL for evening and nighttime operations do not accurately portray the NIPTS. This EA calculates potential hearing loss using Leq(24) to get the accuracy necessary for the larger amount of nighttime and evening operations.

3.3.3.3 Speech Interference

Speech interference associated with aircraft noise is a primary cause of annoyance for communities. Speech interference can cause disruption of routine activities, such as enjoyment of radio or television programs, telephone use, or family conversation, giving rise to frustration or irritation. In extreme cases, speech interference may cause fatigue and vocal strain to individuals who try to communicate over the noise. In this EA, speech interference is measured by the number of daily indoor events (from 7 a.m. to 10 p.m.) that exceed 50 dB Lmax at selected locations. This metric also accounts for noise level reduction provided by buildings with windows open or closed.

3.3.3.4 Classroom Criteria and Noise Effects on Children

Research suggests that environments with sustained high background noise can have variable effects, including effects on learning and cognitive abilities and various noise-related physiological changes. Research on the impacts of aircraft noise, and noise in general, on the cognitive abilities of school-aged children has received more attention in recent years. Several studies suggest that aircraft noise can affect the academic performance of school children. Physiological effects in children exposed to aircraft noise and the potential for health effects have been the focus of limited investigation (DoD Noise Working Group, 2009).

Analyses for school-aged children are similar to speech interference by using the indoor number of events exceeding 50 dB Lmax, but also has the added restriction of using an outdoor equivalent noise level of 60 dB Leq(9hr). This represents a level that a person with normal hearing can clearly hear a speaker (teacher) speaking at a level of 50 dB indoors in a classroom setting.

3.3.3.5 Sleep Disturbance

The disturbance of sleep is a major concern for communities exposed to nighttime aircraft noise. In this EA, sleep disturbance uses the SEL noise metric and calculates the probability of awakening from single aircraft overflights. These are based upon the particular type of aircraft, flight profile, power setting, speed, and altitude relative to the receptor. The results are then presented as a percent probability of people awakening (United States Environmental Protection Agency, 1974).

3.3.3.6 Workplace Noise

In 1972, the National Institute for Occupational Safety and Health (NIOSH) published a criteria document with a recommended exposure limit of 85 dBA as an 8-hour time-weighted average. This exposure limit was reevaluated in 1998 when NIOSH made recommendations that went beyond conserving hearing by focusing on the prevention of occupational hearing loss. Following the reevaluation using a new risk assessment technique, NIOSH published another criteria document in 1998, which reaffirmed the 85 dB recommended exposure limit (National Institute for Occupational Health and Safety, 1998).

3.3.4 Nonauditory Health Effects

Studies have been conducted to examine the nonauditory health effects of aircraft noise exposure, focusing primarily on stress response, blood pressure, birth weight, mortality rates, and cardiovascular health. Exposure to noise levels higher than those normally produced by aircraft in the community can elevate blood pressure and stress hormone levels. However, the response to such loud noise is typically short in duration: after the noise goes away, the physiological effects reverse and levels return to normal. In the case of repeated exposure to aircraft noise, the connection is not as clear. The results of most cited studies are inconclusive, and it cannot be conclusively stated that a causal link exists between aircraft noise exposure and the various type of nonauditory health effects that were studied (DoD Noise Working Group, 2009).

3.3.4.1 Noise Effects on Children

A review of the scientific literature indicated that there has not been a tremendous amount of research in the area of aircraft noise effects on children. The research reviewed does suggest that environments with sustained high background noise can have variable effects, including effects on learning and cognitive abilities and various noise-related physiological changes. Research on the impacts of aircraft noise, and noise in general, on the cognitive abilities of school-aged children has received more attention in recent years. Several studies suggest that aircraft noise can affect the academic performance of schoolchildren. Physiological effects in children exposed to aircraft noise and the potential for health effects have been the focus of limited investigation (DoD Noise Working Group, 2009).

3.3.4.2 Noise Effects on the Elderly

Based upon a study by the Harvard School of Public Health, older people exposed to aircraft noise, especially at higher levels, may experience an increased risk of hospitalization for cardiovascular disease (BMJ, 2013). This study concluded a statistically significant association between exposure to aircraft noise and risk of hospitalization for cardiovascular diseases among older people living near airports.

3.3.5 Regulatory Setting

Under the Noise Control Act of 1972, the Occupational Safety and Health Administration (OSHA) established workplace standards for noise. The minimum requirement states that constant noise exposure must not exceed 90 dBA over an 8-hour period. The highest allowable sound level to which workers can be constantly exposed is 115 dBA and exposure to this level must not exceed 15 minutes within an 8-hour period. The standards limit instantaneous exposure, such as impact noise, to 140 dBA. If noise levels exceed these standards, employers are required to provide hearing protection equipment that will reduce sound levels to acceptable limits.

The joint instruction, Chief of Naval Operations Instruction (OPNAVINST) 11010.36C and Marine Corps Order 11010.16, *Air Installations Compatible Use Zones (AICUZ) Program,* provides guidance administering the AICUZ program which recommends land uses that are compatible with aircraft noise levels. OPNAVINST 3550.1A and Marine Corps Order 3550.11 provide guidance for a similar program, RAICUZ. This program includes range safety and noise analyses and provides land use recommendations which will be compatible with Range Compatibility Zones and noise levels associated with military range operations. Per OPNAVINST 11010.36C, NOISEMAP is to be used for developing noise contours and is

the best noise modeling science available today for fixed-wing aircraft until the new Advanced Acoustic Model is approved for use.

The City of San Diego has a noise ordinance that limits construction noise, such as the effect of any construction noise that reaches residentially zoned property. This limit is an average sound level (Leq) of 75 dBA or less during the 12-hour period from 7 a.m. to 7 p.m. The ordinance also limits construction activity outside of these hours and during certain days (i.e., Sundays and major holidays) where it may create an excessive impact to neighboring sites.

3.3.6 Affected Environment

The Proposed Action is in an urbanized area within the Clairemont Mesa community of San Diego. Land uses in the immediate vicinity of the encroachment areas consist mainly of single-family residences, multi-family residences, and schools, with commercial uses also nearby. The primary noise source is roadway traffic, including along Interstate 805 (I-805), Balboa Avenue, Genesee Avenue, and other smaller roadways. Additional sources of noise include aircraft utilizing MCAS Miramar and Montgomery-Gibbs Executive Airport (discussed further below) and construction activities.

The federal government supports conditions free from noise that threaten human health and welfare and the environment. Response to noise varies, depending on the type and characteristics of the noise, distance between the noise source and whoever hears it (the receptor), receptor sensitivity, and time of day. A noise sensitive receptor is defined as a land use where people involved in indoor or outdoor activities may be subject to stress or considerable interference from noise. Such locations or facilities often include residential dwellings, hospitals, nursing homes, educational facilities, and libraries. Sensitive receptors may also include noise-sensitive cultural practices, some domestic animals, or certain wildlife species. The nearest sensitive receptors are residential and school properties, which are located along the project alignment at approximately 20 feet.

3.3.6.1 Aircraft Noise

As mentioned above, the Proposed Action is in an area subject to noise from aircraft utilizing MCAS Miramar and Montgomery-Gibbs Executive Airport. No portion of the High Tech High encroachment area is within a mapped noise contour (60 CNEL or greater) of either airport. The northern portion of the Cannington Drive encroachment area is within the 60-CNEL contour of MCAS Miramar and the southern portion is within the 60-CNEL contour of Montgomery-Gibbs Executive Airport.

3.3.7 Environmental Consequences

Analysis of potential noise impacts includes estimating likely noise levels from the Proposed Action and determining potential effects to sensitive receptor sites. Noise impacts associated with the Proposed Action would be limited to the construction period as the belowground pipeline would not generate noise during operations.

3.3.7.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur and there would be no change to baseline noise levels. Therefore, no significant impacts due to the noise environment would occur with implementation of the No Action Alternative.

3.3.7.2 Alternative 1 – Encroachment at High Tech High (Option 1) and Encroachment at Cannington Drive (Option 1) Potential Impacts

Alternative 1 would generate noise during construction. Construction activities can cause an increase in noise that is well above ambient levels. Noise is often emitted during construction from heavy off-road equipment and on-road vehicles. Under Alternative 1, construction activities for construction of the new pipeline segments would occur approximately 20 feet from residential and school properties located along the alignment. The primary noise-generating activities associated with construction would include trenching/excavation, new pipeline installation, and backfilling/repaving. Table 3-5 lists noise levels at 20 feet associated with pieces of construction equipment that are typically used during these types of construction activities and may be used for the Proposed Action.

Table 3-5: Estimated Construction Equipment Noise Levels

Equipment	*Estimated Noise Level (dBA L_{EQ}) at 20 Feet (6 Meters)*
Air compressor	81.6
Backhoe	81.5
Compactor	84.2
Concrete Saw	90.5
Concrete Truck	82.8
Excavator	84.7
Generator	85.6
Jack Hammer	89.9
Loader	83.1
Paver	82.2
Truck (heavy)	80.4
Welding Torch	78.0

Source: U.S. Department of Transportation 2008

Construction equipment is mobile and it is unlikely that multiple pieces would operate at the same time and location. Construction noise would be localized, short-term, and intermittent as construction activities move along the linear pipeline alignment. In addition, construction activities would comply with the City of San Diego's noise ordinance that would further limit the impacts to sensitive receptors in the surrounding area. Noise levels inside the nearby residences and schools would be attenuated by the structures themselves, by approximately 15 dBA depending on the structure construction (USEPA 1974).

Occupational noise exposure prevention procedures (i.e., hearing protection and monitoring) for contractors performing construction activities would be required in compliance with applicable Navy occupational noise exposure regulations. As such, noise generated by construction activities under Alternative 1 would not be significant.

3.3.7.3 Alternative 2 – Encroachment at High Tech High (Option 2) and Encroachment at Cannington Drive (Option 1) Potential Impacts

Construction for Alternative 2 would be similar to Alternative 1, except that the new segment of pipeline for the encroachment at High Tech High would be located on the south side of Mt. Alifan Drive (versus the north side under Alternative 1) and east side of Mt. Acadia Boulevard (versus the west side under Alternative 1). Adjacent sensitive receptors (residential and school properties) would remain the same

as Alternative 1. Construction activities would also be the same, would be localized, short-term, and intermittent, and would not result in significant impacts to the noise environment.

3.3.7.4 Alternative 3 – Encroachment at High Tech High (Option 1) and Encroachment at Cannington Drive (Option 2) Potential Impacts

Construction of Alternative 3 would be similar to Alternative 1, except that the new pipeline for the encroachment at Cannington Drive would run through Mt. Abernathy Avenue (versus Printwood Way) and Cannington Drive to connect to the existing pipeline located south of the intersection of Mt. Abernathy Avenue and Cannington Drive. Distances to residential and school receptors along these portions of Mt. Abernathy Avenue and Cannington Drive would be the same as those along the Alternative 1 alignment. Construction activities would be the same, would be localized, short-term, and intermittent, and would not result in significant impacts to the noise environment.

3.3.7.5 Alternative 4 – Encroachment at High Tech High (Option 2) and Encroachment at Cannington Drive (Option 2) Potential Impacts

Construction of Alternative 4 would involve the same construction activities in the same locations as Alternative 2 in the High Tech High encroachment area (option on south side of Mt. Alifan/east side of Mt. Acadia) and as Alternative 3 in the Cannington Drive encroachment area (Mt.Abernathy option). Construction activities would be the same, would be localized, short-term, and intermittent, and would not result in significant impacts to the noise environment.

3.4 Transportation

This discussion of transportation includes all the air, land, and sea routes with the means of moving passengers and goods. A transportation system can consist of any or all the following: roadways, bus routes, railways, subways, bikeways, trails, waterways, airports, and taxis, and can be looked at on a local or regional scale.

Traffic is commonly measured through average daily traffic and design capacity. These two measures are used to assign a roadway with a corresponding level of service (LOS). The LOS designation is a professional industry standard used to describe the operating conditions of a roadway segment or intersection. The LOS is defined on a scale of A to F that describes the range of operating conditions on a particular type of roadway facility. LOS A through LOS B indicates free flow travel. LOS C indicates stable traffic flow. LOS D indicates the beginning of traffic congestion. LOS E indicates the nearing of traffic breakdown conditions. LOS F indicates stop-and-go traffic conditions and represents unacceptable congestion and delay.

3.4.1 Regulatory Setting

EO 13693 encourages government entities to improve building efficiency, performance, and management by including in the planning for new buildings or leases, cost-effective strategies to optimize sustainable space usage and consideration of existing community transportation planning and infrastructure, including access to public transit. This EO encourages the coordination of federal real property discussions with local communities to encourage planned transportation investments that aim to support public transit access.

The Proposed Action is located within the City of San Diego ROW and would adhere to City of San Diego standards for public works construction. Standards and regulations governing the implementation of the

Proposed Action include the City of San Diego Municipal Code, Land Development Code, Standard Specifications and Drawings for Public Works Construction, and the California Manual on Uniform Traffic Control Devices. Various permits would be required from the City for construction within their ROW, including a Traffic Control Permit. The Traffic Control Permit requires preparation and submittal of a Traffic Control Plan to the City. The Traffic Control Plan is required to conform to the latest edition of the City of San Diego Standard Drawings, Appendix "A," the California Manual on Uniform Traffic Control Devices, and Standard Specifications for Public Works Construction (including Regional Supplemental Amendments and the City of San Diego Supplemental Amendments. The project would adhere to City standards that restrict the linear extent of open trench to no more than 500 feet in length.

3.4.2 Affected Environment

The ROI for transportation and circulation includes the roadway segments, intersections, bicycle facilities, sidewalks, transit facilities, and driveways and other access points that may be affected by the construction of the proposed replacement pipeline. This includes facilities along the replacement pipeline alignment that may experience direct impacts and facilities near the alignment that may experience indirect effects, such as traffic detours.

Major roadways near the High Tech High encroachment area include Genesee Avenue to the east and Balboa Avenue to the north. Major roadways near the Cannington Drive encroachment area include Balboa Avenue to the south and Clairemont Mesa Boulevard to the north. Roadways proposed for construction activities as a part of the Proposed Action include Mt. Alifan Drive, Mt. Acadia Boulevard, Printwood Way, Cannington Drive, and Mt. Abernathy Avenue. Most of the land in the encroachment areas has been fully developed. The primary mode of travel is by passenger car.

The following information is based on the three traffic analyses prepared for the Proposed Action (Kimley-Horn 2018 [Appendix C-1], Kimley-Horn 2019 [Appendix C-2], and Kimley-Horn 2022 [Appendix C-3]) that describe the existing characteristics of roadway segments that coincide with the replacement of the existing pipeline alignment.

Mt. Alifan Drive and Mt. Acadia Boulevard (High Tech High Encroachment Area)

Mt. Alifan Drive is a four-lane collector east of Mt. Acadia Boulevard and a two-lane collector west of Mt. Acadia Boulevard. It carries approximately 11,500 vehicles per day and has a posted speed limit of 25 miles per hour. The segment of Mt. Alifan Drive between Mt. Acadia Boulevard and Genesee Avenue does not have parking or bike lanes. Sidewalks are provided on both sides of the roadway. The roadway is fronted by the Pacific Bluffs residential community on the north and High Tech High on the south. Where Mt. Alifan Drive reduces to two lanes west of Mt. Acadia Boulevard, parking is provided along both sides of the roadway, but is restricted for approximately 80 feet approaching the intersection.

High Tech High has a northern parking lot with the primary access point from Mt. Alifan Drive within the limits of the pipeline construction area. A secondary access point with pick-up/drop-off circulation is located on Mt. Acadia Boulevard south of the construction area. This secondary access is far from the north parking lot and requires vehicles to circulate around the school buildings to get between the north parking area and the secondary access.

The residential complex of the north side of Mt. Alifan Drive has a driveway to the units as well as two driveways accessing the main office parking lot. The residents have alternative access points further west on Mt. Alifan Drive and on Balboa Avenue.

Mt. Acadia Boulevard is a two-lane collector, carries approximately 9,500 vehicles per day, and has a posted speed limit of 30 miles per hour. Sidewalks and parking are provided along both sides of the roadway. No bicycle facilities are present. High Tech High is located on the east side of the roadway and a residential complex is located on the west side. No driveways are located along the portion of Mt. Acadia Boulevard proposed for pipeline construction.

Printwood Way, Cannington Drive, and Mt. Abernathy Avenue (Cannington Drive Encroachment Area)

Printwood Way, Cannington Drive, and Mt. Abernathy Avenue north of Chandler Drive are all two-lane residential streets, with a speed limit of 25 miles per hour. Mt. Abernathy Avenue north of Printwood Way carries approximately 2,200 vehicles per day, Printwood Way east of Mt. Abernathy Avenue carries approximately 850 vehicles per day, and Cannington Drive north of Printwood Way carries approximately 1,100 vehicles per day. Parking and sidewalks are provided along both sides of the roadways.

The Reformation Lutheran Church and School is located on the west side of the Mt. Abernathy Avenue and Printwood Way intersection, and the driveway for the property is located just south of the intersection. Lafayette Elementary School is located along the south side of Printwood Way, while the north side of Printwood Way is fronted by driveways for residential homes. Cannington Drive within the study area is also fronted with residential driveways. Madison High School is located west of Mt. Abernathy Avenue. A majority of the parking lot and circulation driveways for Madison High School are located on the west and north sides of the school campus (outside of the proposed construction area) rather than on Mt. Abernathy Avenue. There are a few driveways located along Mt. Abernathy that provide access to the football field and associated atheletic facilities.

Transit Service

There are no transit services along the roadways that may be affected by construction of the Proposed Action.

3.4.3 Environmental Consequences

Impacts to ground traffic and transportation are analyzed by considering the possible changes to existing traffic conditions and the capacity of area roadways from proposed increases in commuter and construction traffic.

Construction of the Proposed Action may result in the following temporary impacts related to transportation:

- Reduction of access to properties by precluding driveway access;
- Reduction of access to and along roadways, reducing capacity and requiring directional detours;
- Reduction in on-street parking; and
- Reduction in pedestrian facilities.

No bicycle or transit facilities are located along the roadways considered in this analysis; therefore, impacts to such facilities are not further addressed.

Operation of the Proposed Action would not add new traffic to the existing street network on a recurring basis, and affected roadways would be restored to their existing condition following project construction. Because several roadways would be fully or partially resurfaced as a result of the Proposed

Action, the action alternatives would have beneficial long-term impacts related to transportation and circulation. Therefore, because the Proposed Action would have no adverse effect on transportation and circulation during operations, the impact described in this section discusses only temporary impacts resulting from construction.

3.4.3.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur and there would be no change to transportation. Therefore, no significant impacts would occur with implementation of the No Action Alternative.

3.4.3.2 Alternative 1 – Encroachment at High Tech High (Option 1) and Encroachment at Cannington Drive (Option 1)

Under Alternative 1, construction would occur within Mt. Alifan Drive, Mt. Acadia Boulevard, Mt. Abernathy, Printwood Way, and Cannington Drive. The existing road surface in each location would be demolished and a trench dug to place the realigned pipeline. Following placement of the new pipeline segments, the trench would be backfilled and the roadway would be resurfaced. The excavation of the trench and pavement reconstruction could result in the temporary preclusion of access to adjacent driveways and closure of travel lanes, as discussed in further detail below.

Construction of the pipeline is proposed to occur in phases, with each phase involving modifications to existing roadway geometrics to best maintain vehicular access and provide capacity during the construction period within the available roadway ROW. Refer to each of the traffic analyses prepared for the Proposed Action, included as Appendices C-1, C-2, and C-3, for the detailed recommended construction phasing and modifications to roadway geometry.

Reductions in Access to Driveways

During construction of the pipeline, driveway access along project roadways would be temporarily impacted. The use of driveways in areas with an open trench would not be feasible until the trench can be temporarily covered (with plates) or until resurfacing is complete. For the High Tech High encroachment area, High Tech High and the Pacific Bluffs residential complex on the north side of Mt. Alifan Drive would have reduced driveway access during construction activities. Both properties have alternative access driveways that are outside of the proposed construction area. For the Cannington Drive encroachment area, vehicle access to residential driveways on the northern side of Printwood Way and the western side of Cannington Drive would be blocked during construction activities. The properties in this encroachment that would have restricted driveway access are single family dwelling units that do not have an alternate means of access. Driveway access to Lafayette Elementary School and the Reformation Lutheran Church and School would be maintained during construction hours but would have turn restrictions in and out of the driveways.

Open trenches would be covered with metal plates, or backfilled and paved, at the end of each workday (construction activities would be completed between 7:00 a.m. and 7:00 p.m.) so that excavated areas can be crossed by vehicle traffic and driveways can be accessed. Additionally, in accordance with City of San Diego standards, the linear extent of open trench would be no more than 500 feet in length; therefore, it is estimated that a maximum of 8 to 10 single-family residential units along Printwood Way and Cannington Drive would have precluded access at any given time. Alternative 1 would include the preparation of a Traffic Control Plan (described in more detail below), as required by the City of San

Diego, which would include a measure to notify in advance all businesses, residences, and schools of the upcoming roadwork and the preclusion of access to their driveways during construction activities.

Restricted driveway access would be temporary and would be localized to the immediate area of construction and would progress along the alignment as pipeline replacement progresses. Given the temporary nature of the driveway access impacts at a given location, the incorporation of measures from the Traffic Control Plan to minimize impacts, and that access would be restored at the end of each construction day, temporary driveway access impacts would not be significant.

Reduced Roadway Access and Capacity

The construction work areas would include the trench area and the influence area needed for staging, resurfacing, and traffic control. Based on the required work areas, one or more travel lanes may be affected at construction areas. The closure of a lane or lanes of vehicular travel would have the potential to reduce the capacity of the roadway. To minimize the extent of effects on travel, the roadway would be modified using temporary traffic control measures such as cones and construction signs. Lanes would be maintained open but shifted where feasible to limit the amount of roadway capacity reduced and eliminate the need for detours.

In the High Tech High encroachment area, the four-lane Mt. Alifan Drive between Mt. Acadia Boulevard and Genesee Avenue would be reduced to two lanes (one lane in each direction) to construct the new pipeline segment on the north side of Mt. Alifan Drive. According to the traffic analysis, one travel lane in each direction is sufficient to handle the traffic volumes experienced on this segment. Substantial congestion would not result from the lane closures along Mt. Alifan Drive and the traffic volumes do not necessitate limitations on the hours of construction in this encroachment area. In addition, the access driveway for High Tech High can remain open during construction, but westbound left turns into and out of the school would be restricted to avoid queues backing up to Genesee Avenue.

In the Cannington Drive encroachment area, two lanes of travel cannot be accommodated within the existing roadway along Printwood Way and along a majority of Cannington Drive (on the north end of the Cannington Drive alignment the pipeline would be constructed close enough to the western curbline that two lanes of travel can be accommodated within the remaining roadway width). Traffic detours and flagging would be implemented as appropriate to accommodate affected traffic. Traffic volumes in this encroachment area are low and are primarily associated with residential and school traffic. Potential impacts to traffic volumes in this area would be avoided through implementation of a measure in the Traffic Control Plan to restrict construction hours on Mt. Abernathy Avenue and Printwood Way from occurring between 7:00 a.m. and 9:00 a.m. and between 2:00 p.m. and 3:00 p.m., or to perform construction activities when school is not in session. Traffic volumes on Cannington Drive are low and do not necessitate limitations on the hours of construction. As such, temporary impacts to roadways would be less than significant in the Cannington Drive encroachment area with implementation of a Traffic Control Plan.

Modifications to Parking Facilities

In the High Tech High encroachment area, on-street parking is provided along both sides of Mt. Acadia Boulevard and along both sides of Mt. Alifan Drive west of Mt. Acadia Boulevard. Parking is restricted on Mt. Alifan Drive between Mt. Acadia Boulevard and Genesee Avenue and within a certain distance on all approaches of the intersection. The on-street parking in both encroachment areas generally serve the adjacent school and residential uses. A majority of the work in the High Tech High encroachment area would occur where parking is already prohibited (i.e., on Mt. Alifan Drive between Mt. Acadia Boulevard

and Genesee Avenue) and parking would not be substantially affected by construction. In addition, surrounding residential land uses have parking spaces or lots and other roadways in the area also allow on-street parking.

In the Cannington Drive encroachment area, on-street parking is provided along both sides of Mt. Abernathy Avenue, Printwood Way, and Cannington Drive. The on-street parking in both encroachment areas generally serve the adjacent school and residential uses. Parking would be restricted on all roadways where pipeline construction would occur; however, surrounding residential land uses in the encroachment areas have parking spaces or lots and other roadways in the area also allow on-street parking.

Based on much of the construction occurring where parking is already prohibited and based on the existing off-street parking in the area and on-street parking on other roadways, parking impacts during construction would be temporary and limited and would not be significant.

Modifications to Pedestrian Facilities

Sidewalks are not anticipated to be affected during construction as construction would be limited to the roadways. Sidewalks in both encroachment areas would therefore remain open and accessible. In the Cannington Drive encroachment area, there are school crossings along Printwood Way at Printwood Court and at Cannington Drive that are within the pipeline alignment. Impacts to these school crossings would be avoided through implementation of a measure in the Traffic Control Plan to restrict construction hours on Mt. Abernathy Avenue and Printwood Way from occurring between 7:00 a.m. and 9:00 a.m. and between 2:00 p.m. and 3:00 p.m., or to perform construction activities when school is not in session. Impacts to pedestrian facilities would therefore be less than significant.

Special Conservation Measures/Traffic Control Plan

The City of San Diego requires that a project-specific Traffic Control Plan be submitted to the City's Traffic Division for review and approval prior to the issuance of any permit for construction. The following avoidance and minimization measures/SCMs have been developed as part of the traffic analysis for the Proposed Action and would be incorporated into the Traffic Control Plan to further reduce temporary transportation impacts associated with Alternative 1:

SCM 1 – Through the use of traffic control, modify existing roadway geometrics to best maintain vehicular access and provide capacity during the construction period within the available roadway ROW.

SCM 2 – A flagger should be provided to control traffic at the intersection of Mt. Alifan Drive and Mt. Acadia Boulevard during construction phases where turn lanes are closed to assist traffic flow through the intersection. The flagger would be able to control traffic flow instead of relying on the existing stop-control intersection and help mitigate delays for the westbound direction of travel.

SCM 3 – Notify in advance residents, schools, and businesses of the upcoming road work and preclusion of access to their driveways.

SCM 4 – Minimize the duration during which access is precluded by adhering to the City-standard maximum open trench length of 500 feet.

SCM 5 – A flagger should be provided to control traffic at the intersection of Mt. Abernathy Avenue and Printwood Way during peak hours of construction at the intersection and up to 200 feet east of the intersection. The flagger would be able to control traffic flow instead of relying on the existing stop-control interaction and help mitigate vehicle delays.

SCM 6 – At least one flagger should be provided to control traffic at the intersection of Printwood Way and Cannington Drive during construction of the segment from the west side of the Printwood Court/ Printwood Way intersection to Cannington Drive. The flagger would be able to control traffic flow, enforce the limit line setback, and help mitigate vehicle delays.

SCM 7 – Restrict construction hours on Mt. Abernathy Avenue and Printwood Way from occurring between 7:00 a.m. and 9:00 a.m. and between 2:00 p.m. and 3:00 p.m. or perform construction activities when school is not in session.

SCM 8 – Notify in advance residents and surrounding land uses of upcoming loss of on-street parking prior to beginning construction.

3.4.3.3 Alternative 2 – Encroachment at High Tech High (Option 2) and Encroachment at Cannington Drive (Option 1)

Under Alternative 2, the pipeline alignment in the High Tech High encroachment area would occur along the same roadways as identified for Alternative 1 with the alignment occurring on the south side of Mt. Alifan Drive (versus the north side under Alternative 1) and the east side of Mt. Acadia Boulevard (versus the west side under Alternative 1). The change in alignment in the High Tech High encroachment area would reduce the length of new pipeline that would be constructed within roadways at the High Tech High encroachment area by 35 feet. The alignment at the Cannington Drive encroachment would be the same as that identified for Alternative 1.

Although Alternative 2 would have a slightly shorter pipeline segment than Alternative 1, transportation impacts would be the same. Alternative 2 would result in temporary impacts associated with reduced access to properties due to restricted driveway access, reduced roadway access and capacity, and reduced on-street parking. As described above for Alternative 1, impacts would be temporary and SCMs 1 through 8 included as part of a Traffic Control Plan would be implemented to reduce the severity of the identified short-term impacts. Alternative 2 would not result in significant impacts to transportation.

3.4.3.4 Alternative 3 – Encroachment at High Tech High (Option 1) and Encroachment at Cannington Drive (Option 2)

Under Alternative 3, the pipeline alignment in the High Tech High encroachment area and associated transportation-related impacts would be the same as under Alternative 1. Temporary impacts related to reduced access to properties due to restricted driveway access, reduced roadway access and capacity, and reduced on-street parking would be addressed through implementation of SCMs included as part of a Traffic Control Plan.

In the Cannington Drive encroachment area, the pipeline alignment for Alternative 3 would run north along Mt. Abernathy Avenue and then southeast along Cannington Drive to connect to the existing pipeline located south of the intersection of Mt. Abernathy Avenue and Cannington Drive. The pipeline would be located on the western side of Mt. Abernathy Avenue and on the eastern side of Cannington Drive, on the opposite side of the single-family residences along these portions of the roadways and of the Church of Jesus Christ of Latter-day Saints located on the east side of Mt. Abernathy Avenue. Driveway access to these residences would therefore not be restricted. The location of the pipeline alignment towards one side of each roadway would also allow for two lanes of travel within the remaining roadway width. Traffic volumes in this encroachment area are low and are primarily

associated with residential and school traffic. To minimize potential school traffic congestion, a SCM would be implemented as part of the Traffic Control Plan to restrict construction hours on Mt. Abernathy Avenue from occurring between 7:00 a.m. and 9:00 a.m. and between 3:00 p.m. and 4:00 p.m., or to perform construction activities when school is not in session. Traffic volumes on Cannington Drive are low and do not necessitate limitations on the hours of construction.

On-street parking is provided along both sides of Mt. Abernathy Avenue and Cannington Drive and generally serves the residential uses. This on-street parking would be restricted during construction; however, surrounding residential land uses have parking spaces and other roadways in the area also allow on-street parking.

Similar to Alternatives 1 and 2, sidewalks are not anticipated to be affected during construction as construction would be limited to the roadways. Sidewalks would therefore remain open and accessible. With the construction hours restrictions noted above, school crossings along Mt. Abernathy Avenue and Cannington Drive would not be affected. Bicycle facilities are not provided on Mt. Abernathy Avenue or Cannington Drive within the vicinity of the project and therefore do not need to be modified. Lane widths during construction should be maintained at 14 feet when feasible to allow for bicyclists to share a lane with a vehicle if needed. Alternative 3 would not result in significant impacts to transportation.

Special Conservation Measures/Traffic Control Plan

As noted above for Alternative 1, the City of San Diego requires that a project-specific Traffic Control Plan be submitted to the City's Traffic Division for review and approval prior to the issuance of any permit for construction. The Traffic Control Plan for Alternative 3 would include SCMs 1 through 4 and 8, listed above, as well as the following two SCMs:

SCM 9 – A flagger should be provided to control traffic at the intersection of Mt. Abernathy Avenue and Cannington Drive during peak hours when construction is occurring at this intersection. The flagger would be able to control traffic flow instead of relying on the existing stop-control interaction and help mitigation vehicle delays. The flagger would be able to control traffic flow, enforce the limit setback, and help mitigate vehicle delays.

SCM 10 – Restrict construction hours on Mt. Abernathy Avenue from occurring between 7:00 a.m. and 9:00 a.m. and between 3:00 p.m. and 4:00 p.m. or perform construction activities while school is not in session.

3.4.3.5 Alternative 4 – Encroachment at High Tech High (Option 2) and Encroachment at Cannington Drive (Option 2)

Under Alternative 4, the pipeline alignment in the High Tech High encroachment area and associated transportation-related impacts would be the same as under Alternative 2. The pipeline alignment in the Cannington Drive encroachment area and associated transportation-related impacts would be the same as under Alternative 3. As discussed for Alternatives 2 and 3, Alternative 4 would result in temporary impacts associated with reduced access to properties due to restricted driveway access, reduced roadway access and capacity, and reduced on-street parking. SCMs 1 through 5 and 9 through 11 included as part of a Traffic Control Plan would be implemented to reduce the severity of the identified short-term impacts. Alternative 4 would not result in significant impacts to transportation.

3.5 Public Health and Safety

This discussion of public health and safety includes consideration for any activities, occurrences, or operations that have the potential to affect the safety, well-being, or health of members of the public. A safe environment is one in which there is no, or optimally reduced, potential for death, serious bodily injury or illness, or property damage. The primary goal is to identify and prevent potential accidents or impacts on the public. Public health and safety within this EA discusses information pertaining to community emergency services, construction activities, operations, and environmental health and safety risks to children.

Community emergency services are organizations which ensure public safety and health by addressing different emergencies. The three main emergency service functions include police, fire and rescue service, and emergency medical service. Public health and safety during construction, demolition, and renovation activities is generally associated with construction traffic, as well as the safety of personnel within or adjacent to the construction zones. Operational safety may refer to the actual use of the facility or built-out proposed project, or training or testing activities and potential risks to inhabitants or users of adjacent or nearby land and water parcels. Safety measures are often implemented through designated safety zones, warning areas, or other types of designations.

The AICUZ Program, which is discussed in the Land Use section, delineates accident potential zones (APZs), which are areas around an airfield where an aircraft mishap is most likely to happen. APZs are not predictors of accidents nor do they reflect accident probability. The DoD defines an APZ as a planning tool for local planning agencies. The APZs follow departure, arrival, and flight pattern tracks from an airfield and are based upon historical accident data. Range Air Installation Compatible Use Zone, which is also discussed in the Land Use section, addresses range safety.

Environmental health and safety risks to children are defined as those that are attributable to products or substances a child is likely to come into contact with or ingest, such as air, food, water, soil, and products that children use or to which they are exposed.

3.5.1 Regulatory Setting

Construction safety and health regulations promulgated by OSHA are contained in 29 CFR 1926. Under the Occupational Safety and Health Act, employers are responsible for providing a safe and healthful workplace and must comply with all applicable OSHA standards.

Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, requires federal agencies to "make it a high priority to identify and assess environmental health and safety risks that may disproportionately affect children and shall ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks."

3.5.2 Affected Environment

The ROI for the Proposed Action as related to public health and safety is along and adjacent to the proposed pipeline alignments. In the High Tech High encroachment area, this includes the proposed pipeline alignments along Mt. Acadia Boulevard and Mt. Alifan Drive. For the Cannington Drive encroachment area, this includes the proposed pipeline alignments along Mt. Abernathy Avenue, Printwood Way, and Cannington Drive.

The Proposed Action is located within the jurisdiction of the City of San Diego. The City of San Diego Police Department provides law enforcement services within the Proposed Action vicinity. Fire protection services are provided by the City of San Diego Fire-Rescue Department. Fire Station 36, located at 5855 Chateau Drive, is approximately mid-way between the two encroachment areas and is the closest station to both encroachment areas. Emergency medical services in the Proposed Action vicinity are provided by the City of San Diego Fire-Rescue Department and the City's emergency medical services contractor, American Medical Response.

In 1997, Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks, was issued. This order requires each federal agency to "…make it a high priority to identify and assess environmental health and safety risks that may disproportionately affect children and shall…ensure that its policies, programs, activities and standards address disproportionate risks to children…" Within the High Tech High encroachment area, the existing pipeline is located within ten feet of a building at High Tech High and adjacent to numerous residences where children may be present. Within the Cannington Drive encroachment area, the existing pipeline runs in proximity to the Reformation Lutheran Church and School, Lafayette Elementary School, and Madison High School, as well as adjacent to and/or under numerous residences.

Refer to Section 3.1, *Air Quality*, and Section 3.3, *Noise*, for discussions and analysis on public health and safety as related to air quality and noise.

3.5.3 Environmental Consequences

The safety and environmental health analysis contained in the respective sections addresses issues related to the health and well-being of military personnel and civilians living in the vicinity of the proposed pipeline alignments. Specifically, this section provides information on hazards associated with with the pipeline realignment. Additionally, this section addresses the environmental health and safety risks to children.

3.5.3.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur. The portions of the pipeline within the encroachment areas would continue to remain in operation within ten feet of the High Tech High school building and below a residence on Cannington Drive and multiple other properties. There would be no change in the existing conditions and access in the encroachment areas would remain encumbered. The benefits of increased access for inspection, maintenance and repairs would not be realized under the No Action Alternative. However, the Navy would continue to inspect and monitor the pipeline to ensure its safety and reliability; therefore, implementation of the No Action Alternative would have a less than significant public health and safety impact.

3.5.3.2 Alternative 1 – Encroachment at High Tech High (Option 1) and Encroachment at Cannington Drive (Option 1)

The existing pipeline does not currently pose a risk to public safety or the environment; however, constructing new underground pipeline segments within the City of San Diego ROW within the two encroachment areas would enhance its overall safety, reliability, and integrity, and increase public and environmental safety by providing unencumbered access to the pipeline for inspection, maintenance, and repairs. The ability to quickly and efficiently respond in the event of an emergency would be significantly enhanced within the two major encroachment areas as a result of the Proposed Action.

Safety regulations and procedures would be followed to minimize the chance of a leak or spill during construction activities. The Navy would work closely with local agencies, including emergency responders, to ensure applicable requirements are adhered and to ensure safety procedures are followed and contingency plans are in place in the event of a fuel spill or leak detected during construction activities. The Navy would adhere to existing inspection protocols to ensure pipeline safety before, during, and after project implementation.

Safety procedures and protocols for construction workers would be conducted consistent with OSHA guideline to ensure a safe work environment. During construction activities, a health and safety program would be implemented by the construction contractors, based on industry standards for accident prevention. At a minimum, the construction health and safety program would comply with federal and local health and safety regulations.

Because a health and safety program would be implemented for construction activities and the public would be excluded from entering construction areas, potential health and safety impacts during construction would not be significant.

Existing regulations and procedures that are already adhered to and implemented in the normal operations of the pipeline would prevent and minimize potential risk associated with public health and safety during construction and operation of the pipeline. For this reason, Alternative 1 would not result in significant impacts associated with public health and safety. Alternative 1 would enhance the overall safety, reliability, and integrity of the pipeline by minimizing the potential for future pipe leaks or breaks through regular inspections and maintenance, and would increase the ability to implement contingency plans in the event of a fuel spill or leak.

Per the requirements of EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, potential impacts to children as a result of implementation of Alternative 1 have been evaluated. While the existing and proposed alignment are located adjacent to schools and residences where children are or may be present, construction materials and activities would be confined to the construction areas within the roadway. Although the existing pipeline is located within ten feet of a building at High Tech High for the High Tech High Encroachment (Option 1), realignment and existing pipeline abandonment construction activities, including the tie-in locations, would occur in the roadway, over 170 feet north of the nearest building at High Tech High. The proposed pipeline realignment for Cannington Drive (Option 1) would be located within Printwood Way approximately 200 feet of the nearest school building. Estimated air quality emissions associated with construction activities would be in compliance with federal air quality standards (see Section 3.1, *Air Quality*), and any hazardous waste generated or encountered during construction activities would be disposed of offsite in accordance with all applicable federal and state regulations. The implementation of these measures and conformance to applicable regulatory requirements during all construction activities would ensure that Alternative 1 would not result in the creation of hazardous substances or contamination that would potentially affect children.

Once the realigned new pipeline segments are installed, operation of the pipeline would not result in or cause disproportionate risk of exposure of hazardous substances to children because the pipeline would continue to be operated in accordance with all applicable federal, state, county, and Navy regulations and procedures for the safe storage and transfer of bulk fuels. In addition, inspection, testing, and monitoring procedures would be implemented as required. The Navy has determined that there are no

environmental health and safety risks associated with the Alternative 1 that would disproportionately affect children and no significant impact would occur.

3.5.3.3 Alternative 2 – Encroachment at High Tech High (Option 2) and Encroachment at Cannington Drive (Option 1)

Alternative 2 would include the same project components and construction activities as Alternative 1, and construction would occur within the same roadways, except under Alternative 2 the High Tech High encroachment area alignment would be located on the south side of Mt. Alifan Drive and the east side of Mt. Acadia Boulevard. As such, the ROI would be the same under Alternative 2 as that identified for Alternative 1. The analysis provided above for Alternative 1 would apply equally to Alternative 2 because proposed construction and operations would be the same and would occur in the same locations. Therefore, implementation of Alternative 2 would not result in significant impacts related to health and safety.

3.5.3.4 Alternative 3 – Encroachment at High Tech High (Option 1) and Encroachment at Cannington Drive (Option 2)

Alternative 3 would include the same project components and construction activities as Alternative 1 and construction would occur within the same roadways in the High Tech High encroachment area as Alternative 1. However,in the Cannington Drive encroachment area, the pipeline alignment for Alternative 3 would run north along Mt. Abernathy Avenue and then southeast along Cannington Drive to connect to the existing pipeline located south of the intersection of Mt. Abernathy Avenue and Cannington Drive. Public health and safety impacts associated with Alternative 3 would be the same as those identified for Alternative 1 as construction and operation activities would be the same. Under this alternative, the pipeline alignment would run closer to Madison High School than Alternative 1. However, because Alternative 1 analyzed an alignment adjacent to other schools, including High Tech High and Lafayette Elementary School, the analysis for Alternative 1 is applicable to Alternative 3. As assessed for Alternative 1, implementation of Alternative 3 would not result in significant impacts related to health and safety.

3.5.3.5 Alternative 4 – Encroachment at High Tech High (Option 2) and Encroachment at Cannington Drive (Option 2)

Alternative 4 would include the same project components and construction activities as Alternative 1. Construction would occur within the same roadways in the High Tech High encroachment area as Alternative 2 and within the same roadways in the Cannington Drive encroachment area as Alternative 3. The analysis provided above for the other alternatives would apply equally to Alternative 4 because proposed construction and operations would be the same and would occur in the same locations. Therefore, implementation of Alternative 4 would not result in significant impacts related to health and safety.

3.6 Hazardous Materials and Wastes

This section discusses hazardous materials, hazardous waste, toxic substances, and contaminated sites.

3.6.1 Regulatory Setting

Hazardous materials are defined by 49 CFR section 171.8 as “hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous

Materials Table, and materials that meet the defining criteria for hazard classes and divisions in 49 CFR Part 173." Transportation of hazardous materials is regulated by the U.S. Department of Transportation regulations.

Hazardous wastes are defined by the Resource Conservation and Recovery Act (RCRA), as amended by the Hazardous and Solid Waste Amendments, as: "a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may (A) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (B) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed." Certain types of hazardous wastes are subject to special management provisions intended to ease the management burden and facilitate the recycling of such materials. These are called universal wastes and their associated regulatory requirements are specified in 40 CFR part 273. Four types of waste are currently covered under the universal wastes regulations: hazardous waste batteries, hazardous waste pesticides that are either recalled or collected in waste pesticide collection programs, hazardous waste thermostats, and hazardous waste lamps, such as fluorescent light bulbs.

Special hazards are those substances that might pose a risk to human health and are addressed separately from other hazardous substances. Special hazards include asbestos-containing material (ACM), polychlorinated biphenyls (PCBs), and lead-based paint (LBP). USEPA is given authority to regulate special hazard substances by the Toxic Substances Control Act (TSCA). Asbestos is also regulated by USEPA under the Clean Air Act, and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

The federal government establishes minimum pipeline safety standards. The Office of Pipeline Safety (OPS) within the USDOT, PHMSA has overall regulatory responsibility for hazardous liquid and gas pipelines under its jurisdiction in the United States. The USDOT regulates pipelines through the CFR Title 49 Parts 191-193 for natural and other gas and hazardous liquids, respectively. These regulations provide minimum safety standards that apply to the national pipeline systems owned and operated by the pipeline operators. Federally owned pipeline systems are, however, exempt from USDOT regulations. As such, PHMSA has no jurisdiction over the proposed pipeline.

California Government Code Section 51010-51019.1, the California Office of the State Fire Marshal (OSFM), Pipeline Safety Division has "exclusive safety regulatory and enforcement authority over intrastate hazardous liquid pipelines". The OSFM has adopted 19 CFR 195, Subparts A and F, and enforces those regulations on pipelines under its jurisdiction. Through certification by OPS, the OSFM regulations, inspects, and enforces intrastate gas and liquid pipeline safety requirements in the State of California.

The pipeline is owned and operated by the Navy; therefore, pipeline design and construction would meet the Department of Defense UFC 3-460-01 "Unified Facilities Criteria, Petroleum Fuel Facilities" requirements. As a BMP, the Navy has elected to consider the entire pipeline route from NBPL to MCAS Miramar as a High Consequence Area, as defined in 49 CFR 195.452. Therefore, all work to replace, or repair the pipeline shall meet the requirements of 49 CFR 195 and related guidelines of PHMSA for design, material procurement, construction, and construction documentation.

3.6.2 Affected Environment

The ROI for the Proposed Action as related to hazardous materials and wastes is along and adjacent to the proposed pipeline alignments. In the High Tech High encroachment area, this includes the proposed pipeline alignments along Mt. Acadia Boulevard and Mt. Alifan Drive. For the Cannington Drive encroachment area, this includes the proposed pipeline alignments along Mt. Abernathy Avenue, Printwood Way, and Cannington Drive.

3.6.2.1 Pipeline Conditions and Operations

The existing pipeline was constructed and is maintained in compliance with applicable federal and state regulations, which specify measures for preventing and containing leaks and spills. The pipeline is an 8-inch diameter, standard-weight carbon steel pipeline that has wrapping (coal tar enamel, asphalt-saturated felt, or polyvinyl) to protect against corrosion. The pipeline has also been protected from corrosion with annual cathodic protection performance surveys and corrective actions as needed, and is inspected internally approximately every five years. The most recent in-line inspection commenced in November 2018 and preliminary data results were reported in February 2019. Based on these preliminary data results, several anomalies were identified along the pipeline in the vicinity of the encroachments at High Tech High and Cannington Drive; however, each anomaly was considered non-actionable, which is defined as an anomaly that does not exceed acceptable limits, based on the operator's anomaly and pipeline data analysis.

The pipeline continually contains fuel and is operated for 10-12 hours per day, on average, six days per week (Navy 2015). Flow is continuous while fuel is being pumped unless there is a need to shut down for an emergency or unforeseen maintenance (Navy 2014a). Five motor-operated valve stations along the entire 17-mile length of the pipeline allow segments to be isolated so flow can be stopped for various reasons, including inspection and maintenance. The pipeline is monitored by a Vista statis leak detection system at MCAS Miramar and is protected with thermal pressure-relief valves and pressure gauges at various locations (Navy 2014b). Through the leak detection system, daily inventory control procedures, required maintenance actions, and routine facility inspections, discharges are prevented and/or minimized.

During fuel transfer operations, three personnel perform tasks to ensure a safe transfer. While any transfer operation is being made, routine checks of pumps, valves, manifolds, and pipes are carried out to ensure the systems are in proper working order. A pipeline rider also patrols the entire length of the line, five days a week and monitors the activities or contractors and residents that might encroach on the pipeline ROW (Navy 2014a).

NAVSUP FLC SD also subscribes to a national Dig Alert program that provides NAVSUP FLC SD with a list of contractors planning excavation or other work in the area of the pipeline. NAVSUP FLC SD marks the location of the pipeline before the contractors' work begins and monitors then as they work to ensure the pipeline is not damaged (Navy 2014b).

Because NAVSUP FLC SD is a bulk fuel storage and transfer facility, Defense Energy Support Center, Navy policy, and government regulations require that a contingency plan is in place to respond to oil and hazardous substance spills. The Integrated Contingency Plan for Oil and Hazardous Substances Spill Prevention and Response serves as the single operational document used for responding to any spill occurring at NBPL (Navy 2014c). In the event of a spill or release of fuel from the pipeline, the procedures discussed in the Emergency Response Action Plan, and particularly the Red Plan sections of

the Integrated Contingency Plan are followed to contain the release and properly dispose of any spill materials in compliance with Title 14 California Code of Regulations, *Oil Spill Contingency Plans*, as enforced by the State of California, Office of Spill Prevention and Response. The Emergency Response Action Plan and the Red Plan include specific measures such as securing pumps and closing valves, blocking drains, and deploying booms. Additional booms are deployed as quickly as possible to prevent the spill from moving or affecting sensitive areas. Additional military and civilian contractor personnel and equipment are mobilized as need to expedite cleanup operations, and procedures are reviewed to address the cause of the spill and prevent its recurrence (Navy 2009).

Historical Leaks

Although the Miramar Pipeline has had several historical pipeline leaks (1994, 1995, 1996), these leaks were located outside of the Proposed Action area and have been addressed through a previous project, the Miramar Pipeline Repair and Relocation. As discussed in Section 1.2.2, an Environmental Assessment for the Miramar Pipeline Repair and Relocation was completed in 2015, with a Finding of No Significant Impact (FONSI) signed on April 24, 2015, and improvements completed in May 2018. Additionally, multiple pipeline repairs were evaluated in a 2016 Categorical Exclusion and repairs were completed in November 2018. In the High Tech High and Cannington Drive encroachment areas, recent in-line inspections and several years of quarterly leak detection test results indicates there are no identified pipeline integrity deficiencies within the Proposed Action pipeline alignments (Navy 2016). In the High Tech High encroachment area, there is no evidence of previous repairs for corrosion. In the Cannington Drive encroachment area, there is one repair of a dent, and an observed maximum metal loss of less than 20 percent due to corrosion.

3.6.2.2 Hazardous Materials and Wastes

Several studies have been performed along the existing and proposed alignments (with the exception of Cannington Drive, Option 2, since this alignment was added after public scoping) to determine the presence or absence of potential hazardous materials. Hazardous materials studies prepared for the Proposed Action include Environmental Soil Analytical Testing (Ninyo & Moore 2013a), a Hazardous Materials Technical Study (Ninyo & Moore 2014), a Phase I Environmental Site Assessment for the High Tech High encroachment area (Ninyo & Moore 2016a), and a Phase I Environmental Site Assessment for the Cannington Drive encroachment area (Ninyo & Moore 2016b). Additionally, a Soil and Groundwater Management Plan was prepared for the Proposed Action (Ninyo & Moore 2013b). Key findings and recommendations from each of these studies are summarized below.

Environmental Soil Analytical Testing

Analytical soil samples were collected within both encroachment areas and then tested. None of the collected samples contained petroleum hydrocarbons or VOCs above laboratory detection limits; however, it is recommended that a Soil and Groundwater Management Plan be implemented to address the possibility of encountering localized areas of concern.

Hazardous Materials Technical Study

The Hazardous Materials Technical Study (Ninyo & Moore 2014) was prepared to evaluate the potential for the existing and proposed alignments to have been impacted by releases of hazardous materials or wastes from current or historical activities. Findings and recommendations of the report for the High Tech High encroachment area include the following: (1) there is one property (6426 Mt. Ada Road) located 0.5 mile east of the alignment (listed as a case-closed status in regulatory databases) that may

be a source of unauthorized releases; (2) a San Diego Gas and Electric-operated natural gas transmission pipeline is present approximately 500 feet west of the pipeline alignment; and (3) subsurface disturbance activities should include implementation of a Soil and Groundwater Management Plan to address the possibility of encountering localized areas of potential environmental concern. Findings and recommendations of the report for the Cannington Drive encroachment area include: (1) the alignment is located in close proximity to the 160-acre Rosedale Field and Bombing Target site, which is located adjacent to the south of the Printwood Way and Carrington Drive pipeline segment; (2) there were no open or closed cases of unauthorized releases of hazardous materials; and (3) subsurface disturbance activities should include implementation of the Soil and Groundwater Management Plan to address the possibility of encountering localized areas of potential environmental concern.

Phase I Environmental Site Assessments

Two Phase I Environmental Site Assessments (Ninyo & Moore 2016a and 2016b) were prepared for the Proposed Action, one for the High Tech High encroachment area and one for the Cannington Drive encroachment area. No evidence of Recognized Environmental Conditions (RECs) was identified in the existing or planned pipeline corridors. The Phase I Environmental Site Assessments indicate that there is a low potential to encounter unknown contamination near the existing pipeline. Based on recent inspections, there is no evidence of previous repairs indicative of a pipeline leak. In the Cannington Drive encroachment area, there is one repair of a dent in the pipeline, which is not indicative of a pipeline leak. The paragraphs below summarize the findings of the Phase I Environmental Site Assessments regarding specific hazardous materials and waste concerns.

Soil and Groundwater Management Plan

A Soil and Groundwater Management Plan (Ninyo & Moore 2013b) has been prepared for the Proposed Action. The Soil and Groundwater Management Plan was prepared to address the potential to encounter contaminated soil and groundwater associated with unknown releases in localized areas along the pipeline alignment. The Soil and Groundwater Management Plan summarizes the protocol for excavation, trenching, temporary stockpiling/storage, handling, and reuse and/or offsite disposal of soil and/or groundwater generated by the Proposed Action. The Soil and Groundwater Management Plan has been incorporated into the project specifications and will be implemented as part of construction activities.

3.6.3 Environmental Consequences

The hazardous materials and wastes analysis contained in the respective sections addresses issues related to the use and management of hazardous materials and wastes as well as the presence and management of specific cleanup sites at the existing and proposed pipeline alignments.

3.6.3.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur. The use of hazardous materials and potential to encounter hazardous materials during construction would not occur. The existing pipeline would continue to operate under existing conditions with routine inspections and monitoring to ensure its safety and reliability; therefore, implementation of the No Action Alternative would have a less than significant public hazardous materials and wastes impact.

3.6.3.2 Alternative 1 – Encroachment at High Tech High (Option 1) and Encroachment at Cannington Drive (Option 1)

Construction

Hazardous materials associated with proposed construction activities may include coal-tar coating on the new piping, epoxy coating for the new piping, oily wastewater from pipeline cleaning, fuel and hydraulic fluid used for heavy equipment and construction vehicles, and paints to be used in re-marking the replaced pavement. Construction contractors would be required to adhere to applicable federal, state, and County of San Diego requirements for hazardous materials and hazardous waste management, including submitting a Hazardous Materials Business Plan to the County of San Diego Environmental Health Hazardous Materials Division. The Hazardous Materials Business Plan would include the types and volumes of hazardous materials and waste to be used by the construction contractor and plans and procedures to prevent and minimize accidental release. The contractor would also be required to comply with the Waste Management Plan for the San Diego Metro Area, which establishes policy, procedures, control, and responsibility for the proper management of hazardous waste on Naval facilities and projects in the San Diego Metro Area (Navy 2007). Hazardous waste generated during construction would be subject to California Health and Safety Code Chapter 6.5 Hazardous Waste Control Law and corresponding regulations under Title 22 California Code of Regulations, Division 4.5. Compliance with federal, state, and county regulations, and adherence to the Hazardous Materials Business Plan and the NRSW Waste Management Plan would minimize potential risk to human health and the environment from hazardous materials and wastes associated with the construction contractors' equipment and activities.

Before starting excavation, the contractor would be required to obtain a Public Right-of-Way permit, which would include provision of proper notice to the underground service alert and the City of San Diego Engineering Department. Coordination with these agencies would ensure that underground utilities in the project area are identified and marked, which would prevent accidental damage to potential underground oil, natural gas, and wastewater pipelines in the project area and an associated inadvertent release of hazardous materials and/or wastes.

The proposed pipeline would be buried at depths as required by 49 CFR 195.248, *Cover Over Buried Pipeline,* and City of San Diego design guidelines for minimal burial depths for utilities. The required burial depth would prevent damage of the pipeline from surficial activities (such as road repairs) and potential accidental releases of fuel. Petroleum lines are required to cross below waterlines and have a minimum of 12 inches of vertical separation and ten feet horizontal separation. A waiver of separation distance for the proposed fuel line along Cannington Drive and the existing 42-inch water line would need to be requested from the State Water Resources Control Board. If a waiver of the minimum of ten feet of separation cannot be obtained, the fuel line would need to be shifted to the north side of Cannington Drive. The process of applying for and obtaining a waiver would prevent damage to existing utilities during pipeline construction and would prevent accidental release of fuel into water mains or other utility trenches that could act as conduits for the spread of contamination.

There is a potential to encounter lead-containing surfaces during project construction activities; however, the contractor would comply with the requirements of the California General Industry Safety and Health Standards, and the Safety and Health Regulations for Construction, Title 8, California Code of Regulations, the USEPA Regulations pertaining to handling and disposal of lead-containing materials, as

well as the State of California and any local governmental agencies, which have delegated responsibility for the administration and enforcement of federal regulations.

Analytical testing of soil samples from borings drilled along the proposed alignments did not reveal the presence of petroleum hydrocarbons (Ninyo & Moore 2013a) and RECs were identified during the Phase I ESAs conducted for the two encroachment areas (Ninyo & Moore 2016a and 2016b). However, there is potential to encounter contaminated soils from previous unknown releases or spills adjacent to the planned realigned pipeline segments. As such, the Proposed Action includes the implementation of a Soil and Groundwater Management Plan to address the potential to encounter contaminated soil and groundwater associated with unknown releases in localized areas along the project alignment.

The new pipeline would be constructed in compliance with federal and state regulations, military criteria, and engineering standards to ensure its safety and integrity. It would be constructed of carbon steel that would be compatible for connection with existing pipe sections and would have a high-quality pipe coating as part of the corrosion prevention system. The new pipeline segments would have a cathodic protection system to prevent leaks that would be compatible with the existing cathodic system. The new sections would also be connected to the existing leak-detection system. Once the new pipeline sections are constructed, they would be strength-tested (via hydrostatic pressure testing) before being tied into the existing pipeline and filled with fuel. Hydrostatic pressure testing would ensure that there would be no weak points or leaks in the new sections of the pipeline and the connections before the line is loaded with fuel.

To maintain mission readiness, the existing pipeline must remain fully operational and continue to transfer fuel between NBPL and MCAS Miramar during construction of the new pipeline segments. Once the new segments are tied into the existing pipeline and made operational, the old segments would be disconnected, emptied of remaining fuel, disposed of waste, cleaned, and filled with concrete slurry. The abandonment activities would be accomplished through accessing the existing pipeline at two individual tie-ins at each encroachment area. To address the potential for encountering unknown contamination at the tie-ins, the Proposed Action would include sampling and testing of the soils for petroleum contamination in compliance with the requirements of the Soil and Groundwater Management Plan.

If it is determined that a significant unauthorized release of petroleum hydrocarbons has occurred during abandonment of specific sections of the pipeline, Navy Environmental staff would be notified to determine the required notifications and appropriate regulatory oversight, including, but not limited to the National Response Center, the California Office of Emergency Services, and the County of San Diego Department of Environmental Health Site Assessment and Mitigation Department. The contractor would also notify the project proponent, who would notify NAVSUP, the Navy contracting officer, and the appropriate Navy Environmental subject matter experts. The Navy and state and local regulators would work together to assess and clean up the release and any associated contamination.

Due to the age of the existing pipeline, there is potential to encounter ACM during pipeline abandonment/closing activities. The USEPA has determined that asbestos-impregnated tar or asbestos paper coating used on pipelines is considered Category II Asbestos Containing Material. Typically, if coating is left undisturbed, it would remain non-friable. If coating is exposed to activities that cause at least 260 linear feet of the coating to become friable, the work is regulated and applicable regulations would apply. Based on the relatively small quantity of existing fuel pipe that would be exposed at the four tie-ins to the existing pipeline, and the lack of asbestos coating encountered within the existing pipeline to date, the likelihood of encountering asbestos is low (Navy 2016). However, work involving

the disturbance of materials containing asbestos would be performed using appropriate work practices, and be conducted by, and under the supervision of, properly trained, experienced, and certified personnel. Asbestos encountered would be handled in accordance with applicable regulations. Compliance with applicable regulations would ensure that no significant impacts associated with ACM would occur.

Overall, no increase in human health risk or environmental exposure to hazardous materials or hazardous wastes would result from the construction of Alternative 1. Implementation of the preventative measures described above (proper management of hazardous materials and waste during construction activities, implementation of a Soil and Groundwater Management Plan) and compliance with existing regulatory requirements would minimize impacts. Therefore, construction of Alternative 1 would have a less than significant impact with respect to hazardous materials and hazardous wastes.

Operation

Following the construction activities for the new pipeline segments, the pipeline would continue to operate in compliance with applicable federal, state, and County regulations, and in accordance with Navy policies and procedures for safe storage and transfer of bulk fuels. Pressure-testing of the pipeline before and after each fuel transfer would continue, as would regular five-year hydrostatic tightness testing. The interior of the pipeline would be regularly inspected and maintained. Three personnel would continue to be involved during fuel transfer operation through the pipeline, as described above in the Affected Environment section.

NAVSUP FLC SD would continue to participate in the national Dig Alert program to coordinate with contractors planning excavation or other work along the pipeline alignment, marking the location of the pipeline before contractors' work begins, and monitor them as they work to ensure the pipeline is not damaged. NAVSUP FLC SD would also coordinate with the City of San Diego as needed regarding any maintenance to the pipeline that might require excavation in the City ROW.

The Proposed Action construction contractor would provide NAVSUP FLC SD with required changes to the operations manual to include construction records, maps, and operating history as necessary for safe operations and maintenance. These records would be maintained for the life of the pipeline per the requirements of 49 CFR 195.266 9a-f. The Integrated Contingency Plan for Oil and Hazardous Substance Spill Prevention and Response would be updated and revised to include the new pipeline alignments. In the event of an earthquake or other potential threat of damage to the pipeline, operators would close the isolation valves located in the pipeline and limit potential releases of fuel. NAVSUP FLC SD personnel would follow the procedures in the Integrated Contingency Plan to quickly contain, cleanup, and properly dispose of any accidental releases of fuel and would coordinate with local emergency responders as required.

The existing regulations and procedures that are already adhered to and implemented in the normal operations of the pipeline, as described above, would prevent and minimize potential risk associated with hazardous materials and waste associated with the operation of the realigned pipeline. For this reason, Alternative 1 would not result in significant impacts associated with hazardous materials and waste. In the long term, implementation of Alternative 1 would enhance the pipeline's overall safety by providing improved access for regular inspection, routine maintenance, and emergency response for unplanned fuel releases. Improved access would increase public environmental safety by minimizing the potential for future pipe leaks or breaks through regular inspection and maintenance; and would

increase the ability to implement the Integrated Contingency Plan, if needed. Thus, long-term impacts are considered beneficial.

3.6.3.3 Alternative 2 – Encroachment at High Tech High (Option 2) and Encroachment at Cannington Drive (Option 1)

Alternative 2 would include the same project components and construction activities as Alternative 1, and construction would occur within the same roadways, although under Alternative 2 the High Tech High encroachment area alignment would be located on the south side of Mt. Alifan Drive and the east side of Mt. Acadia Boulevard. As such, the ROI would be the same under Alternative 2 as that identified for Alternative 1. The use of hazardous materials and potential to encounter hazardous materials during construction would be the same as Alternative 1. Construction and operational procedures as related to the safety and integrity of the proposed pipeline would also be the same under Alternative 2 as under Alternative 1. Therefore, implementation of Alternative 2 would not result in significant impacts related to hazardous materials and wastes and would result in long-term beneficial impacts.

3.6.3.4 Alternative 3 – Encroachment at High Tech High (Option 1) and Encroachment at Cannington Drive (Option 2)

Alternative 3 would include the same project components and construction activities as Alternatives 1 and 2, and construction would occur within the same roadways in the High Tech High encroachment area as Alternative 1. In the Cannington Drive encroachment area, the pipeline alignment for Alternative 3 would run north along Mt. Abernathy Avenue and then southeast along Cannington Drive to connect to the existing pipeline located south of the intersection of Mt. Abernathy Avenue and Cannington Drive. The use of hazardous materials and potential to encounter hazardous materials during construction would be the same as Alternative 1. Construction and operational procedures as related to the safety and integrity of the proposed pipeline would also be the same under Alternative 3 as under Alternative 1. Therefore, implementation of Alternative 3 would not result in significant impacts related to hazardous materials and wastes and would result in long-term beneficial impacts.

3.6.3.5 Alternative 4 – Encroachment at High Tech High (Option 2) and Encroachment at Cannington Drive (Option 2)

Alternative 4 would include the same project components and construction activities as Alternatives 1, 2, and 3. Construction would occur within the same roadways in the High Tech High encroachment area as Alternative 2 and within the same roadways in the Cannington Drive encroachment area as Alternative 3. The use of hazardous materials and potential to encounter hazardous materials during construction would be the same as the other alternatives. Construction and operational procedures as related to the safety and integrity of the proposed pipeline would also be the same under Alternative 4 as under Alternative 1. Therefore, implementation of Alternative 4 would not result in significant impacts related to hazardous materials and wastes and would result in long-term beneficial impacts.

3.7 Summary of Potential Impacts to Resources and Impact Avoidance and Minimization

A summary of the potential impacts associated with the proposed action alternatives and the No Action Alternative and impact avoidance and minimization measures are presented in Tables 3-6 and 3-7, respectively. Due to the similarity between the action alternatives and associated similarity of impacts, Table 3-6 presents the summary of potential impacts from each of the four alternatives together as

"Proposed Action Alternatives." Table 3-7 provides a comprehensive list of all mitigation requirements associated with the Proposed Action.

Table 3-6: Summary of Potential Impacts to Resource Areas

Resource Area	*No Action Alternative*	*Proposed Action Alternatives*
Air Quality	The No Action Alternative would not generate air pollutant emissions and there would be no change to the baseline air quality. Therefore, the No Action Alternative would not result in an adverse effect related to air quality.	The Proposed Action Alternatives would result in emissions of air pollutants during construction. Emissions would be below *de minimis* levels. Therefore, implementation of the Proposed Action Alternatives would not result in significant impacts related to air quality.
Land Use	The No Action Alternative would not result in a change to existing land use conditions. Therefore, the No Action Alternative would not result in an adverse effect related to land use.	The Proposed Action Alternatives would not result in changes to existing land uses and does not propose new land uses. No permanent conflict with land uses would occur. Therefore, implementation of the Proposed Action Alternatives would not result in significant impacts related to air quality.
Noise	The No Action Alternative would not generate noise and no change to the baseline noise levels would occur. Therefore, the No Action Alternative would not result in an adverse effect related to land use.	The Proposed Action Alternatives would generate noise during construction from the operation of equipment and vehicles. However, construction would be temporary and noise exposure to a given receptor would be short-term as construction progresses along the linear alignment. Therefore, implementation of the Proposed Action Alternatives would not result in significant impacts related to noise.
Transportation	The No Action Alternative would not affect roadways and no change to existing transportation would occur. Therefore, the No Action Alternative would not result in an adverse effect related to transportation.	The Proposed Action Alternatives would involve construction within roadway rights-of-way and would have the potential to affect driveway access, roadway access and capacity, parking facilities, and pedestrian facilities. Construction effects would be temporary and a traffic control plan would be implemented that would include measures to minimize construction effects. Therefore, implementation of the Proposed Action Alternatives would not result in significant impacts related to transportation.

Table 3-6: Summary of Potential Impacts to Resource Areas (continued)

Resource Area	*No Action Alternative*	*Proposed Action Alternatives*
Public Health and Safety	The No Action Alternative would not result in relocation of the existing pipeline and the encroachment areas would remain encumbered. Although the pipeline does not currently pose a risk to public health and safety, under the No Action Alternative the benefits of increased access for maintenance and repairs would not be realized. However, the Navy would continue to inspect and monitor the pipeline to ensure its safety and reliability; therefore, implementation of the No Action Alternative would have a less than significant public health and safety impact.	The Proposed Action Alternatives would comply with all applicable federal, state, and county regulations, as well as Navy policies and procedures, as related to public health and safety during construction and operation of the proposed pipeline segments. Implementation of all applicable safety procedures would prevent and minimize potential risk to human health and the environment associated with construction and operation of the new pipeline sections; therefore, no significant impacts would occur. The Proposed Action Alternatives would enhance the overall safety, reliability, and integrity, and increase public and environmental safety by minimizing the potential for future pipe leaks or breaks; thus, long-term impacts are considered beneficial. No disproportionate risk of injury or hazardous substances exposure to children per EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, would occur.
Hazardous Materials and Wastes	The No Action Alternative would not involve construction and therefore would not involve the use of hazardous materials or have the potential to encounter hazardous materials. The existing pipeline would continue to operate under existing conditions with routine inspections and monitoring to ensure its safety and reliability; therefore, implementation of the No Action Alternative would have a less than significant public hazardous materials and wastes impact.	The Proposed Action Alternatives would use hazardous materials and have the potential to encounter hazardous materials during construction. Hazardous materials would be handled in accordance with applicable regulations and a Soil and Groundwater Management Plan would be implemented to avoid impacts. Abandonment of the existing pipeline segments and construction and operation of the new pipeline segments would comply with applicable procedures, policies, and regulations. For this reason, the Proposed Action Alternatives would not result in significant impacts associated with hazardous materials and waste. In the long term, implementation of the Proposed Action Alternatives would enhance the pipeline's overall safety by providing improved access for regular inspection, routine maintenance, and emergency response for unplanned fuel releases. Improved access for regular inspection, routine maintenance and emergency response would increase public environmental safety by minimizing the potential for future pipe leaks or breaks; thus, long-term impacts are considered beneficial.

Table 3-7: Impact Avoidance And Minimization Measures

Measure	*Anticipated Benefit / Evaluating Effectiveness*	*Implementing and Monitoring*	*Responsibility*	*Estimated Completion Date*
		Alternative 1		
SCM 1 – Through the use of traffic control, modify existing roadway geometrics to best maintain vehicular access and provide capacity during the construction period within the available roadway ROW.	Vehicular access would be maintained and roadway capacity would be provided to the extent practicable during construction.	The construction contractor would develop and implement a Traffic Control Plan during construction.	Construction contractor	Upon completion of construction
SCM 2 – A flagger should be provided to control traffic at the intersection of Mt. Alifan Drive and Mt. Acadia Boulevard during construction phases where turn lanes are closed to assist traffic flow through the intersection. The flagger would be able to control traffic flow instead of relying on the existing stop-control intersection and help mitigate delays for the westbound direction of travel.	Traffic flow at the intersection of Mt. Alifan Drive and Mt. Acadia Boulevard would be controlled to minimize delays for the westbound direction of travel.	The construction contractor would develop and implement a Traffic Control Plan during construction.	Construction contractor	Upon completion of construction
SCM 3 – Notify in advance residents, schools, and businesses of the upcoming road work, preclusion of access to their driveways, and turn restrictions.	Adjacent land uses would be notified in advance so that they may plan necessary travel and access accordingly.	The construction contractor would develop and implement a Traffic Control Plan during construction.	Construction contractor	Upon completion of construction
SCM 4 – Minimize the duration during which access is precluded by adhering to the City-standard maximum open trench length of 500 feet.	The duration during which access is precluded would be minimized.	The construction contractor would develop and implement a Traffic Control Plan during construction.	Construction contractor	Upon completion of construction

Table 3-7: Impact Avoidance And Minimization Measures (continued)

Measure	*Anticipated Benefit / Evaluating Effectiveness*	*Implementing and Monitoring*	*Responsibility*	*Estimated Completion Date*
SCM 5 – A flagger should be provided to control traffic at the intersection of Mt. Abernathy Avenue and Printwood Way during peak hours of construction at the intersection and up to 200 feet east of the intersection. The flagger would be able to control traffic flow instead of relying on the existing stop-control interaction and help mitigate vehicle delays.	Traffic flow at the intersection of Mt. Abernathy Avenue and Printwood Way would be controlled to minimize vehicle delays.	The construction contractor would develop and implement a Traffic Control Plan during construction.	Construction contractor	Upon completion of construction
SCM 6 – At least one flagger should be provided to control traffic at the intersection of Printwood Way and Cannington Drive during construction of the segment from the west side of the Printwood Court/Printwood Way intersection to Cannington Drive. The flagger would be able to control traffic flow, enforce the limit line setback, and help mitigate vehicle delays.	Traffic flow at the intersection of Printwood Way and Cannington Drive would be controlled to minimize vehicle delays.	The construction contractor would develop and implement a Traffic Control Plan during construction.	Construction contractor	Upon completion of construction
SCM 7 – Restrict construction hours on Mt. Abernathy Avenue and Printwood Way from occurring between 7:00 a.m. and 9:00 a.m. and between 2:00 p.m. and 3:00 p.m. or perform construction activities when school is not in session.	Construction hours would be restricted to avoid effects to school-related traffic.	The construction contractor would develop and implement a Traffic Control Plan during construction.	Construction contractor	Upon completion of construction
SCM 8 – Notify in advance residents and surrounding land uses of upcoming loss of on-street parking prior to beginning construction.	Residents and other surrounding land uses would be notified in advance so that they may plan necessary on-street parking accordingly.	The construction contractor would develop and implement a Traffic Control Plan during construction.	Construction contractor	Upon completion of construction
Alternative 2				

Table 3-7: Impact Avoidance And Minimization Measures (continued)

Measure	*Anticipated Benefit / Evaluating Effectiveness*	*Implementing and Monitoring*	*Responsibility*	*Estimated Completion Date*
SCMs 1 through 8 specified for Alternative 1	See above.	The construction contractor would develop and implement a Traffic Control Plan during construction.	Construction contractor	Upon completion of construction
Alternative 3				
SCMs 1 through 4 and 8 specified for Alternative 1.	See above.	The construction contractor would develop and implement a Traffic Control Plan during construction.	Construction contractor	Upon completion of construction
SCM 9 – A flagger should be provided to control traffic at the intersection of Mt. Abernathy Avenue and Cannington Drive during peak hours when construction is occurring at this intersection. The flagger would be able to control traffic flow instead of relying on the existing stop-control interaction and help mitigate vehicle delays. The flagger would be able to control traffic flow, enforce the limit setback, and help mitigate vehicle delays.	Traffic flow at the intersection of Mt. Abernathy Avenue and Cannington Drive would be controlled to minimize vehicle delays.	The construction contractor would develop and implement a Traffic Control Plan during construction.	Construction contractor	Upon completion of construction
SCM 10 – Restrict construction hours on Mt. Abernathy Avenue from occurring between 7:00 a.m. and 9:00 a.m. and between 3:00 p.m. and 4:00 p.m. or perform construction activities while school is not in session.	Construction hours would be restricted to avoid effects to school-related traffic.	The construction contractor would develop and implement a Traffic Control Plan during construction.	Construction contractor	Upon completion of construction
Alternative 4				
SCMs 1 through 4 and 8 through 10	See above.	The construction contractor would develop and implement a Traffic Control Plan during construction.	Construction contractor	Upon completion of construction

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4 Cumulative Impacts

This section (1) defines cumulative impacts, (2) describes past, present, and reasonably foreseeable future actions relevant to cumulative impacts, (3) analyzes the incremental interaction the Proposed Action may have with other actions, and (4) evaluates cumulative impacts potentially resulting from these interactions.

4.1 Definition of Cumulative Impacts

The approach taken in the analysis of cumulative impacts follows the objectives of the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations, and CEQ guidance. Cumulative impacts are defined in 40 CFR section 1508.7 as "the impact on the environment that results from the incremental impact of the action when added to the other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."

To determine the scope of environmental impact analyses, agencies shall consider cumulative actions, which when viewed with other proposed actions have cumulatively significant impacts and should therefore be discussed in the same impact analysis document.

In addition, CEQ and USEPA have published guidance addressing implementation of cumulative impact analyses—Guidance on the Consideration of Past Actions in Cumulative Effects Analysis (CEQ 2005) and Consideration of Cumulative Impacts in EPA Review of NEPA Documents (USEPA 1999). CEQ guidance entitled *Considering Cumulative Impacts Under NEPA* (1997) states that cumulative impact analyses should

"…determine the magnitude and significance of the environmental consequences of the proposed action in the context of the cumulative impacts of other past, present, and future actions...identify significant cumulative impacts…[and]…focus on truly meaningful impacts."

Cumulative impacts are most likely to arise when a relationship or synergism exists between a proposed action and other actions expected to occur in a similar location or during a similar time period. Actions overlapping with or near the proposed action would be expected to have more potential for a relationship than those more geographically separated. Similarly, relatively concurrent actions would tend to offer a higher potential for cumulative impacts. To identify cumulative impacts, the analysis needs to address the following three fundamental questions.

- Does a relationship exist such that affected resource areas of the proposed action might interact with the affected resource areas of past, present, or reasonably foreseeable actions?
- If one or more of the affected resource areas of the proposed action and another action could be expected to interact, would the proposed action affect or be affected by impacts of the other action?
- If such a relationship exists, then does an assessment reveal any potentially significant impacts not identified when the proposed action is considered alone?

4.2 Scope of Cumulative Impacts Analysis

The scope of the cumulative impacts analysis involves both the geographic extent of the effects and the time frame in which the effects could be expected to occur. For this EA, the study area delimits the geographic extent of the cumulative impacts analysis. In general, the study area will include those areas previously identified in Chapter 3 for the respective resource areas. The time frame for cumulative impacts centers on the timing of the proposed action.

Another factor influencing the scope of cumulative impacts analysis involves identifying other actions to consider. Beyond determining that the geographic scope and time frame for the actions interrelate to the proposed action, the analysis employs the measure of "reasonably foreseeable" to include or exclude other actions. For the purposes of this analysis, public documents prepared by federal, state, and local government agencies form the primary sources of information regarding reasonably foreseeable actions. Documents used to identify other actions include notices of intent for EISs and EAs, management plans, land use plans, and other planning-related studies.

4.3 Past, Present, and Reasonably Foreseeable Actions

This section will focus on past, present, and reasonably foreseeable future projects at and near the Proposed Action locale. In determining which projects to include in the cumulative impacts analysis, a preliminary determination was made regarding the past, present, or reasonably foreseeable action. Specifically, using the first fundamental question included in Section 4.1, it was determined if a relationship exists such that the affected resource areas of the Proposed Action (included in this EA) might interact with the affected resource area of a past, present, or reasonably foreseeable action. If no such potential relationship exists, the project was not carried forward into the cumulative impacts analysis. In accordance with CEQ guidance (CEQ 2005), these actions considered but excluded from further cumulative effects analysis are not catalogued here as the intent is to focus the analysis on the meaningful actions relevant to informed decision-making. Projects included in this cumulative impacts analysis are listed in Table 4-1 and briefly described in the following subsections.

Table 4-1: Cumulative Action Evaluation

Action	*Level of NEPA Analysis Completed*
Past Actions	
City of San Diego CIP Line: B17073	N/A
City of San Diego Transportation Group Job: B17095	N/A
Present and Reasonably Foreseeable Future Actions	
City of San Diego CIP Line: B20026	N/A
City of San Diego CIP Line: B20043	N/A

N/A = not applicable

4.3.1 Past Actions

City of San Diego CIP Line: B17073

This project consists of curb ramp installations, street resurfacing (overlay and/or slurry seal), and other work along Mt. Alifan Drive between Genesee Avenue and Mt. Everest Boulevard. Construction of this project occurred in 2019 and has been completed.

City of San Diego Transportation Group Job: B17095

This project consists of asphalt resurfacing along Cannington Drive between Balboa Avenue and Mt. Abernathy Avenue. Construction of this project began in March 2020 and was completed in June 2021.

4.3.2 Present and Reasonably Foreseeable Actions

City of San Diego CIP Line: B20026

This project consists of construction of 627 linear feet of 8-inch-diameter sewer main to replace existing vitrified clay sewer mains and rehabilitation of 5,659 liner feet of existing 8-inch-diameter vitrified clay sewer mains within various roadways in the High Tech High encroachment area, including within Mt. Alifan Drive west of Genesee Avenue. The sewer improvements also include the replacement of associated sewer laterals, manholes, and other appurtenances. Construction of this project is planned to start in June 2023.

City of San Diego CIP Line: B20043

This project consists of construction of 1,387 linear feet of 16-inch-diameter water mains to replace existing asbestos cement water mains within Mt. Acadia Boulevard south of Mt. Alifan Drive and within Mt. Alifan Drive west of Mt. Acadia Boulevard. The improvements also include replacement of associated water services, fire hydrants, valves, water meters, and other appurtenances. Construction of this project is planned to start in June 2023.

4.4 Cumulative Impact Analysis

Where feasible, the cumulative impacts were assessed using quantifiable data; however, for many of the resources included for analysis, quantifiable data is not available and a qualitative analysis was undertaken. In addition, where an analysis of potential environmental effects for future actions has not been completed, assumptions were made regarding cumulative impacts related to this EA where possible. The analytical methodology presented in Chapter 3, which was used to determine potential impacts to the various resources analyzed in this document, was also used to determine cumulative impacts.

4.4.1 Air Quality

4.4.1.1 Description of Geographic Study Area

The region of influence (ROI) for cumulative effects on air quality is defined as the San Diego Air Basin. For purposes of air quality, the cumulative impact analysis looks beyond cumulative projects per se and instead focuses on the average cumulative air quality conditions within the San Diego Air Basin from day to day. The potential effects of proposed greenhouse gas (GHG) emissions are by nature global and cumulative impacts, as individual sources of GHG emissions are typically not large enough to have an appreciable effect on climate change. Therefore, an appreciable impact to global climate change would only occur when proposed GHG emissions combine with other human-generated GHG emissions in such a way to appreciably and discernably affect climate change on a global scale.

4.4.1.2 Relevant Past, Present, and Future Actions

The four relevant past, present, and future actions have involved or will involve activities associated with roadway improvements and/or infrastructure improvements within roadways. Emissions from the Proposed Action and the cumulative projects identified above in Section 4.3, *Past, Present, and Reasonably Foreseeable Actions*, would comply with San Diego County Air Pollution Control District rules and regulations, which would minimize the impact of project cumulative air quality impacts.

4.4.1.3 Cumulative Impact Analysis

As described in Section 3.1, *Air Quality*, construction activities associated with the Proposed Action would generate emissions that would not exceed designated *de minimis* levels for criteria pollutants (40 Code of Federal Regulations Part 51.853[b]). The Proposed Action would not contribute to the degradation of regional air quality or otherwise contribute to a significant cumulative effect on air quality. Consequently, proposed construction activities would result in less than significant cumulative impacts relative to criteria pollutant levels. Therefore, implementation of the Proposed Action, in addition to the effects from past, present, and reasonably foreseeable projects, would not result in significant cumulative impacts to air quality.

The potential effects of proposed GHG emissions are by nature global and cumulative impacts, as individual sources of GHG emissions are typically not large enough to have an appreciable effect on climate change. The GHG emissions contribute, on a cumulative basis, to the significant adverse environmental impacts of global climate change. Climate change impacts may include an increase in extreme heat days, higher concentrations of air pollutants, sea level rise, impacts to water supply and water quality, public health impacts, impacts to ecosystems, impacts to agriculture, and other environmental impacts. No single project could generate enough GHG emissions to noticeably change the global average temperature. The combination of GHG emissions from past, present, and future projects contribute substantially to the phenomenon of global climate change and its associated environmental impacts. If a project would generate GHG emissions above the threshold level, it would be considered to contribute substantially to a cumulative impact and would be considered significant.

Construction activities associated with the Proposed Action would contribute directly to emissions of GHGs from the combustion of fossil fuels. Emissions of GHGs generated by construction activities are calculated to be approximately 421 tons (382 metric tons) of CO_2e, which would be well below the CEQ threshold of 25,000 metric tons per year. As such, project emissions would not likely contribute to global warming to any discernible extent. Based on the analysis in Section 3.1, *Air Quality*, the Proposed Action would not contribute to a cumulatively considerable air quality or GHG impact.

4.4.2 Land Use

4.4.2.1 Description of Geographic Study Area

The ROI for cumulative effects associated with land use impacts is defined as the land uses along the construction work areas for the Proposed Action. The area considered for the cumulative analysis would only be those projects within the immediate vicinity of the Proposed Action area. Cumulative impacts related to land use are not anticipated beyond this area.

4.4.2.2 Relevant Past, Present, and Future Actions

The four relevant past, present, and future actions have involved or will involve activities associated with roadway improvements and/or infrastructure improvements within roadways. Work within the roadways would have the potential to affect adjacent land uses.

4.4.2.3 Cumulative Impact Analysis

Cumulative land use impacts from past, present, and future actions within the ROI would be less than significant because the projects would be associated with roadway improvements and/or infrastructure improvements within roadways and would not result in changes to land uses. In addition, while construction could result in inconveniences to adjacent land uses, such impacts would be short-term and temporary. Therefore, implementation of the Proposed Action combined with the past, present, and reasonably foreseeable future projects, would not result in significant land use impacts within the ROI.

4.4.3 Noise

4.4.3.1 Description of Geographic Study Area

The ROI for cumulative effects associated with noise is defined as the construction work areas for the proposed pipeline replacements and the surrounding land uses. The area considered for the cumulative analysis would only be those projects within the immediate vicinity of the Proposed Action area. Cumulative impacts related to noise are not anticipated beyond this area.

4.4.3.2 Relevant Past, Present, and Future Actions

The four relevant past, present, and future actions have involved or will involve activities associated with roadway improvements and/or infrastructure improvements within roadways. These projects would involve the use of construction equipment that would generate noise.

4.4.3.3 Cumulative Impact Analysis

Cumulative noise impacts from past, present, and future actions within the ROI would be less than significant because noise generation would be limited to temporary construction activities and would be localized. While construction activities would generate elevated noise levels, such activities and noise generation would be short-term and temporary, and it is therefore unlikely that multiple projects would occur at the same time and location. Therefore, implementation of the Proposed Action combined with the past, present, and reasonably foreseeable future projects, would not result in significant noise impacts within the ROI.

4.4.4 Transportation

4.4.4.1 Description of Geographic Study Area

The ROI for cumulative effects associated with transportation is defined as the construction work areas within roadways for the Proposed Action. The area considered for the cumulative analysis would only be those projects within the immediate vicinity of the Proposed Action area. Cumulative impacts related to transportation are not anticipated beyond this area.

4.4.4.2 Relevant Past, Present, and Future Actions

The four relevant past, present, and future actions have involved or will involve activities associated with roadway improvements and/or infrastructure improvements within roadways. Work within the roadways would have the potential to affect local transportation.

4.4.4.3 Cumulative Impact Analysis

Cumulative transportation impacts from past, present, and future actions within the ROI would be less than significant because impacts within roadways would be temporary and localized. While construction of the Proposed Action would result in reduced residential driveway access, reduced roadway access and capacity, modifications to parking facilities, and modifications to pedestrian facilities, construction activities would be short-term and temporary, and it is therefore unlikely that multiple projects would occur at the same time and location. In addition, the Proposed Action would implement a Traffic Control Plan and SCMs to reduce transportation impacts. Therefore, implementation of the Proposed Action combined with the past, present, and reasonably foreseeable future projects, would not result in significant transportation impacts within the ROI.

4.4.5 Public Health and Safety

4.4.5.1 Description of Geographic Study Area

The ROI for cumulative effects related to public health and safety is defined as the construction work areas for the Proposed Action and adjacent land uses. Cumulative impacts to public health and safety are not anticipated beyond this area.

4.4.5.2 Relevant Past, Present, and Future Actions

The four relevant past, present, and future actions have involved or will involve activities associated with roadway improvements and/or infrastructure improvements within roadways. These projects are required to comply with applicable regulations related to workplace and public safety.

4.4.5.3 Cumulative Impact Analysis

Cumulative public health and safety impacts from past, present, and future actions within the ROI would be less than significant because their temporary construction activities would likely not occur at the same time and location and therefore not combine to result in impacts to public health and safety. In addition, projects would comply with applicable regulations related to workplace and public safety. The Proposed Action would result in an overall benefit related to public health and safety as constructing new underground pipeline segments within the ROW within the two encroachment areas would enhance overall safety, reliability, and integrity, and increase public and environmental safety by providing unencumbered access to the pipeline for inspection, maintenance, and repairs. Therefore, implementation of the Proposed Action combined with the past, present, and reasonably foreseeable future projects, would not result in significant public health and safety impacts within the ROI.

4.4.6 Hazardous Materials and Wastes

4.4.6.1 Description of Geographic Study Area

The ROI for cumulative effects related to hazardous materials and wastes is defined as the construction work areas for the Proposed Action and adjacent land uses, as well as receiving waters fed by storm drains near the Proposed Action construction work areas.

4.4.6.2 Relevant Past, Present, and Future Actions

The four relevant past, present, and future actions have involved or will involve activities associated with roadway improvements and/or infrastructure improvements within roadways. These projects are required to comply with applicable regulations related to the use and handling of hazardous materials and wastes.

4.4.6.3 Cumulative Impact Analysis

Cumulative impacts associated with hazardous materials and wastes from past, present, and future actions within the ROI would be less than significant because appropriate procedures for the handling, storage, and disposal of hazardous materials and wastes would be implemented in accordance with the Resource Conservation and Recovery Act and other applicable regulations. Also, as discussed in Section 3.6, *Hazardous Materials and Wastes*, the proposed pipeline segments would be constructed in compliance with federal and state regulations, military criteria, and engineering standards to ensure its safety and integrity. Potential impacts related to encountering hazardous materials from previous releases or spills are typically localized in nature and not subject to cumulative effects. In addition, the Proposed Action would implement a Soil and Groundwater Management Plan to address the potential to encounter contaminated soil and groundwater associated with unknown releases in localized areas along the project alignment. Therefore, implementation of the Proposed Action combined with the past, present, and reasonably foreseeable future projects, would not result in significant hazardous materials and wastes impacts within the ROI.

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5 Other Considerations Required by NEPA

5.1 Consistency with Other Federal, State, and Local Laws, Plans, Policies, and Regulations

In accordance with 40 Code of Federal Regulations (CFR) section 1502.16(c), analysis of environmental consequences shall include discussion of possible conflicts between the Proposed Action and the objectives of federal, regional, state, and local land use plans, policies, and controls. Table 5-1 identifies the principal federal and state laws and regulations that are applicable to the Proposed Action, and describes briefly how compliance with these laws and regulations would be accomplished.

Table 5-1: Principal Federal and State Laws Applicable to the Proposed Action

Federal, State, Local, and Regional Land Use Plans, Policies, and Controls	*Status of Compliance*
National Environmental Policy Act (NEPA); Council on Environmental Quality (CEQ) NEPA implementing regulations; Command of the U.S. Navy (Navy) procedures for Implementing NEPA	This Environmental Assessment (EA) has been prepared in accordance with CEQA Regulations implementing NEPA and Navy NEPA procedures.
Clean Air Act	The Navy has determined that the Proposed Action would not result in emissions that would exceed the applicable General Conformity *de minimis* thresholds. The General Conformity Record of Non-Applicability is provided in Appendix B of this EA.
Clean Water Act	The Navy has determined that the Proposed Action would not involve dredging or the release of chemicals requiring a discharge permit and would be in compliance with the Clean Water Act (CWA). The Proposed Action would conform with applicable National Pollutant Discharge Elimination System requirements including implementation of one or more Storm Water Pollution Prevention Plans and associated Best Management Practices. Best Management Practices may include erosion control blankets, soil stabilizers, temporary seeding, silt fencing, hay bales, sandbags, and storm drain inlet protection devices. The Proposed Action would not impact Waters of the U.S. and would not require CWA Section 404 permit from the U.S. Army Corps of Engineers (USACE) or CWA Section 401 Water Quality Certification from the Regional Water Quality Control Board.
Rivers and Harbors Act	The Navy has determined that the Proposed Action would not involve in-water demolition and construction activities; therefore, a Rivers and Harbors Act Section 10 permit from the USACE would not be required.
National Historic Preservation Act	The Navy has determined that the Proposed Action would have no effect on historic properties; therefore, the Proposed Action would be in compliance with the National Historic Preservation Act.

Table 5-1: Principal Federal and State Laws Applicable to the Proposed Action (continued)

Federal, State, Local, and Regional Land Use Plans, Policies, and Controls	*Status of Compliance*
Migratory Bird Treaty Act	The Navy has determined that the Proposed Action would have no effect on migratory birds. No destruction of active bird nests, eggs, or nestlings would occur as construction would be limited to roadways and no vegetation clearing or tree removal would be required.
Comprehensive Environmental Response and Liability Act	The Navy has determined that the Proposed Action would be carried out in accordance with federal, state, and county regulations, as well as Navy policies and procedures, to avoid releases of hazardous substances. The Proposed Action would enhance the pipeline's overall safety by providing improved access for regular inspection, routine maintenance, and emergency response for unplanned fuel releases. Therefore, the Proposed Action would be in compliance with the Comprehensive Environmental Response and Liability Act.
Emergency Planning and Community Right-to-Know Act	The Navy would inform Local Emergency Planning Committees of the Proposed Action as required to assist them in developing plans to prepare and respond to emergencies.
Resource Conservation and Recovery Act	The Navy has determined that the Proposed Action would handle any hazardous materials used or encountered during construction in accordance with applicable regulations and would implement a Soil and Groundwater Management Plan. Therefore, the Proposed Action would be in compliance with the Resource Conservation and Recovery Act.
Toxic Substances Control Act	The Navy has determined that the Proposed Action would handle any hazardous materials used or encountered during construction in accordance with applicable regulations and would implement a Soil and Groundwater Management Plan. Therefore, the Proposed Action would be in compliance with the Toxic Substances Control Act.
Executive Order (EO) 11988, Floodplain Management	The Navy has determined that the Proposed Action would not occur within a floodplain. Therefore, the Proposed Action would be in compliance with EO 11988, Floodplain Management
Executive Order 12088, Federal Compliance with Pollution Control Standards	The Navy has determined that the Proposed Action would not exceed National Ambient Air Quality Standards established by the U.S. Environmental Protection Agency under the Clean Air Act. Therefore, the Proposed Action would in compliance with EO 12088.
Executive Order 12114, Environmental Effects Abroad of Major Federal Actions, including the implementing regulation 32 CFR part 187, Environmental Effects Abroad of Major Department of Defense Actions	The Proposed Action would occur within the United States and would therefore not conflict with EO 12114, Environmental Effects Abroad of Major Federal Actions.

Table 5-1: Principal Federal and State Laws Applicable to the Proposed Action (continued)

Federal, State, Local, and Regional Land Use Plans, Policies, and Controls	*Status of Compliance*
Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations	The Navy has determined that the Proposed Action would not cause disproportionately high and adverse health or environmental effects on any minority or low-income populations.
Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks	The Navy has determined that the Proposed Action would not disproportionately expose children to environmental health risks or safety risks and would be in compliance with EO 13045.
Executive Order 13423, Strengthening Federal Environmental, Energy, and Transportation Management	The Proposed Action would incorporate sustainable development concepts to achieve optimum resource efficiency, sustainability, and energy conservation; in addition, construction materials would be recycled in accordance with the Department of Defense Strategic Sustainability Performance Plan. Therefore, the Proposed Action would be in compliance with EO 13423.
Executive Order 13693, Planning for Federal Sustainability in the Next Decade	The Proposed Action would incorporate sustainable development concepts to achieve optimum resource efficiency, sustainability, and energy conservation and would be in compliance with EO 13693.

5.2 Relationship Between Short-Term Use of the Environment and Long-Term Productivity

NEPA requires an analysis of the relationship between a project's short-term impacts on the environment and the effects that these impacts may have on the maintenance and enhancement of the long-term productivity of the affected environment. Impacts that narrow the range of beneficial uses of the environment are of particular concern. This refers to the possibility that choosing one development site reduces future flexibility in pursuing other options, or that using a parcel of land or other resources often eliminates the possibility of other uses at that site.

In the short-term, effects to the human environment with implementation of the Proposed Action would primarily relate to the construction activity itself. Air quality, noise, and transportation would be impacted in the short-term; however, these impacts are not significant. The construction and operation of the relocated pipeline segments would not significantly impact the long-term natural resource productivity of the area. The Proposed Action would not result in any impacts that would significantly reduce environmental productivity or permanently narrow the range of beneficial uses of the environment.

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Appendix A

Air Quality Methodology and Calculations

The maximum pounds per day in row 11 is summed over overlapping phases, but the maximum tons per phase in row 34 is not summed over overlapping phases.

Road Construction Emissions Model, Version 9.0.0

Daily Emission Estimates for -> Encroachments

Project Phases (Pounds)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	SOx (lbs/day)	CO2 (lbs/day)	CH4 (lbs/day)	N2O (lbs/day)	CO2e (lbs/day)
Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation	0.87	9.09	7.11	1.31	0.31	1.00	0.48	0.27	0.21	0.02	2,379.96	0.68	0.06	2,413.70
Drainage/Utilities/Sub-Grade	0.69	6.64	5.15	1.25	0.25	1.00	0.44	0.23	0.21	0.01	1,182.71	0.15	0.05	1,199.76
Paving	1.15	11.79	9.66	0.42	0.42	0.00	0.38	0.38	0.00	0.03	2,814.54	0.80	0.06	2,852.48
Maximum (pounds/day)	2.71	27.53	21.92	2.98	0.98	2.00	1.29	0.88	0.42	0.07	6,377.21	1.62	0.16	6,465.95
Total (tons/construction project)	0.18	1.82	1.45	0.20	0.06	0.13	0.09	0.06	0.03	0.00	420.90	0.11	0.01	426.75

Notes:

Project Start Year ->	2023
Project Length (months) ->	6
Total Project Area (acres) ->	1
Maximum Area Disturbed/Day (acres) ->	0
Water Truck Used? ->	Yes

	Total Material Imported/Exported Volume (yd³/day)		Daily VMT (miles/day)			
Phase	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	0	0	0	0	0	0
Grading/Excavation	0	40	0	40	100	20
Drainage/Utilities/Sub-Grade	0	40	0	40	100	20
Paving	0	40	0	40	100	20

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Total Emission Estimates by Phase for -> Encroachments

Project Phases (Tons for all except CO2e. Metric tonnes for CO2e)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	Total PM10 (tons/phase)	Exhaust PM10 (tons/phase)	Fugitive Dust PM10 (tons/phase)	Total PM2.5 (tons/phase)	Exhaust PM2.5 (tons/phase)	Fugitive Dust PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation	0.06	0.60	0.47	0.09	0.02	0.07	0.03	0.02	0.01	0.00	157.08	0.04	0.00	144.52
Drainage/Utilities/Sub-Grade	0.05	0.44	0.34	0.08	0.02	0.07	0.03	0.02	0.01	0.00	78.06	0.01	0.00	71.84
Paving	0.08	0.78	0.64	0.03	0.03	0.00	0.02	0.02	0.00	0.00	185.76	0.05	0.00	170.79
Maximum (tons/phase)	0.08	0.78	0.64	0.09	0.03	0.07	0.03	0.02	0.01	0.00	185.76	0.05	0.00	170.79
Total (tons/construction project)	0.18	1.82	1.45	0.20	0.06	0.13	0.09	0.06	0.03	0.00	420.90	0.11	0.01	387.15

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

The CO2e emissions are reported as metric tons per phase.

Road Construction Emissions Model **Version 9.0.0**

Data Entry Worksheet

Note: Required data input sections have a yellow background.
Optional data input sections have a blue background. Only areas with a yellow or blue background can be modified. Program defaults have a white background.
The user is required to enter information in cells D10 through D24, E28 through G35, and D38 through D41 for all project types.
Please use "Clear Data Input & User Overrides" button first before changing the Project Type or begin a new project.

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT

Input Type

Project Name	Encroachments	
Construction Start Year	2023	Enter a Year between 2014 and 2040 (inclusive)
Project Type For 4: Other Linear Project Type, please provide project specific off-road equipment population and vehicle trip data	4	1) New Road Construction : Project to build a roadway from bare ground, which generally requires more site preparation than widening an existing roadway 2) Road Widening : Project to add a new lane to an existing roadway 3) Bridge/Overpass Construction : Project to build an elevated roadway, which generally requires some different equipment than a new roadway, such as a crane 4) Other Linear Project Type: Non-roadway project such as a pipeline, transmission line, or levee construction
Project Construction Time	6.00	months
Working Days per Month	22.00	days (assume 22 if unknown)
Predominant Soil/Site Type: Enter 1, 2, or 3 (for project within "Sacramento County", follow soil type selection instructions in cells E18 to E20 otherwise see instructions provided in cells J18 to J22)	2	1) Sand Gravel : Use for quaternary deposits (Delta/West County) 2) Weathered Rock-Earth : Use for Laguna formation (Jackson Highway area) or the Ione formation (Scott Road, Rancho Murieta) 3) Blasted Rock : Use for Salt Springs Slate or Copper Hill Volcanics (Folsom South of Highway 50, Rancho Murieta)
Project Length	0.64	miles
Total Project Area	0.70	acres
Maximum Area Disturbed/Day	0.10	acres
Water Trucks Used?	1	1. Yes 2. No

Please note that the soil type instructions provided in cells E18 to E20 are specific to Sacramento County. Maps available from the California Geologic Survey (see weblink below) can be used to determine soil type outside Sacramento County.

http://www.conservation.ca.gov/cgs/information/geologic_mapping/Pages/googlemaps.aspx#regionalseries

Material Hauling Quantity Input

Material Type	Phase	Haul Truck Capacity (yd^3) (assume 20 if unknown)	Import Volume (yd^3/day)	Export Volume (yd^3/day)
Soil	Grubbing/Land Clearing			
	Grading/Excavation			
	Drainage/Utilities/Sub-Grade			
	Paving			
Asphalt	Grubbing/Land Clearing			
	Grading/Excavation	20.00	20.00	20.00
	Drainage/Utilities/Sub-Grade	20.00	20.00	20.00
	Paving	20.00	20.00	20.00

Mitigation Options

On-road Fleet Emissions Mitigation		Select "2010 and Newer On-road Vehicles Fleet" option when the on-road heavy-duty truck fleet for the project will be limited to vehicles of model year 2010 or newer
Off-road Equipment Emissions Mitigation		Select "20% NOx and 45% Exhaust PM reduction" option if the project will be required to use a lower emitting off-road construction fleet. The SMAQMD Construction Mitigation Calculator can be used to confirm compliance with this mitigation measure (http://www.airquality.org/Businesses/CEQA-Land-Use-Planning/Mitigation). Select "Tier 4 Equipment" option if some or all off-road equipment used for the project meets CARB Tier 4 Standard

The remaining sections of this sheet contain areas that require modification when 'Other Project Type' is selected.

Note: The program's estimates of construction period phase length can be overridden in cells D50 through D53, and F50 through F53.

Construction Periods	User Override of Construction Months	Program Calculated Months	User Override of Phase Starting Date	Program Default Phase Starting Date
Grubbing/Land Clearing	0.00	0.60	1/1/2023	1/1/2023
Grading/Excavation	6.00	2.70	1/1/2023	1/1/2023
Drainage/Utilities/Sub-Grade	6.00	1.80	1/1/2023	7/3/2023
Paving	6.00	0.90	1/1/2023	1/2/2024
Totals (Months)		18		

Please note: You have entered a different number of months than the project length shown in cell D16.
Note: Soil Hauling emission default values can be overridden in cells D61 through D64, and F61 through F64.

Soil Hauling Emissions User Input	User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT
Miles/round trip: Grubbing/Land Clearing				0	0.00
Miles/round trip: Grading/Excavation				0	0.00
Miles/round trip: Drainage/Utilities/Sub-Grade				0	0.00
Miles/round trip: Paving				0	0.00

Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/mile)	0.03	0.40	2.98	0.11	0.05	0.02	1,714.99	0.00	0.27	1,795.36
Draining/Utilities/Sub-Grade (grams/mile)	0.03	0.40	2.98	0.11	0.05	0.02	1,714.99	0.00	0.27	1,795.36
Paving (grams/mile)	0.03	0.40	2.98	0.11	0.05	0.02	1,714.99	0.00	0.27	1,795.36
Grubbing/Land Clearing (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	4.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	4.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)	0.00	0.00	4.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: Asphalt Hauling emission default values can be overridden in cells D91 through D94, and F91 through F94.

Asphalt Hauling Emissions User Input	User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT
Miles/round trip: Grubbing/Land Clearing				0	0.00
Miles/round trip: Grading/Excavation	20.00			2	40.00
Miles/round trip: Drainage/Utilities/Sub-Grade	20.00			2	40.00
Miles/round trip: Paving	20.00			2	40.00

Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/mile)	0.03	0.40	2.98	0.11	0.05	0.02	1,714.99	0.00	0.27	1,795.36
Draining/Utilities/Sub-Grade (grams/mile)	0.03	0.40	2.98	0.11	0.05	0.02	1,714.99	0.00	0.27	1,795.36
Paving (grams/mile)	0.03	0.40	2.98	0.11	0.05	0.02	1,714.99	0.00	0.27	1,795.36
Grubbing/Land Clearing (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	4.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	4.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)	0.00	0.00	4.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.04	0.28	0.01	0.00	0.00	151.24	0.00	0.02	158.32
Tons per const. Period - Grading/Excavation	0.00	0.00	0.02	0.00	0.00	0.00	9.98	0.00	0.00	10.45
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.04	0.28	0.01	0.00	0.00	151.24	0.00	0.02	158.32
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.02	0.00	0.00	0.00	9.98	0.00	0.00	10.45
Pounds per day - Paving	0.00	0.04	0.28	0.01	0.00	0.00	151.24	0.00	0.02	158.32
Tons per const. Period - Paving	0.00	0.00	0.02	0.00	0.00	0.00	9.98	0.00	0.00	10.45
Total tons per construction project	0.00	0.01	0.06	0.00	0.00	0.00	29.94	0.00	0.00	31.35

Note: Worker commute default values can be overridden in cells D121 through D126.

Worker Commute Emissions	User Override of Worker Commute Default Values	Default Values		
User Input				
Miles/ one-way trip	10		Calculated Daily Trips	Calculated Daily VMT
One-way trips/day	2			
No. of employees: Grubbing/Land Clearing			0	0.00
No. of employees: Grading/Excavation	5		10	100.00
No. of employees: Drainage/Utilities/Sub-Grade	5		10	100.00
No. of employees: Paving	5		10	100.00

Emission Rates	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Grubbing/Land Clearing (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/mile)	0.02	0.91	0.07	0.05	0.02	0.00	317.66	0.00	0.01	319.68
Draining/Utilities/Sub-Grade (grams/mile)	0.02	0.91	0.07	0.05	0.02	0.00	317.66	0.00	0.01	319.68
Paving (grams/mile)	0.02	0.91	0.07	0.05	0.02	0.00	317.66	0.00	0.01	319.68
Grubbing/Land Clearing (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	1.04	2.75	0.29	0.00	0.00	0.00	68.26	0.07	0.03	79.50
Draining/Utilities/Sub-Grade (grams/trip)	1.04	2.75	0.29	0.00	0.00	0.00	68.26	0.07	0.03	79.50
Paving (grams/trip)	1.04	2.75	0.29	0.00	0.00	0.00	68.26	0.07	0.03	79.50
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.03	0.26	0.02	0.01	0.00	0.00	71.54	0.00	0.00	72.23
Tons per const. Period - Grading/Excavation	0.00	0.02	0.00	0.00	0.00	0.00	4.72	0.00	0.00	4.77
Pounds per day - Drainage/Utilities/Sub-Grade	0.03	0.26	0.02	0.01	0.00	0.00	71.54	0.00	0.00	72.23
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.02	0.00	0.00	0.00	0.00	4.72	0.00	0.00	4.77
Pounds per day - Paving	0.03	0.26	0.02	0.01	0.00	0.00	71.54	0.00	0.00	72.23
Tons per const. Period - Paving	0.00	0.02	0.00	0.00	0.00	0.00	4.72	0.00	0.00	4.77
Total tons per construction project	0.01	0.05	0.00	0.00	0.00	0.00	14.16	0.00	0.00	14.30

Note: Water Truck default values can be overridden in cells D153 through D156, I153 through I156, and F153 through F156.

Water Truck Emissions	User Override of Default # Water Trucks	Program Estimate of Number of Water Trucks	User Override of Truck Round Trips/Vehicle/Day	Default Values Round Trips/Vehicle/Day	Calculated Trips/day	User Override of Miles/Round Trip	Default Values Miles/Round Trip	Calculated Daily VMT
User Input								
Grubbing/Land Clearing - Exhaust								0.00
Grading/Excavation - Exhaust	1		2.00			10.00		20.00
Drainage/Utilities/Subgrade	1		2.00			10.00		20.00
Paving	1		2.00			10.00		20.00

Emission Rates	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Grubbing/Land Clearing (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/mile)	0.03	0.40	2.98	0.11	0.05	0.02	1,714.99	0.00	0.27	1,795.36
Draining/Utilities/Sub-Grade (grams/mile)	0.03	0.40	2.98	0.11	0.05	0.02	1,714.99	0.00	0.27	1,795.36
Paving (grams/mile)	0.03	0.40	2.98	0.11	0.05	0.02	1,714.99	0.00	0.27	1,795.36
Grubbing/Land Clearing (grams/trip)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	4.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	4.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)	0.00	0.00	4.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.02	0.15	0.00	0.00	0.00	75.62	0.00	0.01	79.16
Tons per const. Period - Grading/Excavation	0.00	0.00	0.01	0.00	0.00	0.00	4.99	0.00	0.00	5.22
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.02	0.15	0.00	0.00	0.00	75.62	0.00	0.01	79.16
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.01	0.00	0.00	0.00	4.99	0.00	0.00	5.22
Pounds per day - Paving	0.00	0.02	0.15	0.00	0.00	0.00	75.62	0.00	0.01	79.16
Tons per const. Period - Paving	0.00	0.00	0.01	0.00	0.00	0.00	4.99	0.00	0.00	5.22
Total tons per construction project	0.00	0.00	0.03	0.00	0.00	0.00	14.97	0.00	0.00	15.67

Note: Fugitive dust default values can be overridden in cells D183 through D185.

Fugitive Dust	User Override of Max Acreage Disturbed/Day	Default Maximum Acreage/Day	PM10 pounds/day	PM10 tons/per period	PM2.5 pounds/day	PM2.5 tons/per period
Fugitive Dust - Grubbing/Land Clearing			0.00	0.00	0.00	0.00
Fugitive Dust - Grading/Excavation			1.00	0.07	0.21	0.01
Fugitive Dust - Drainage/Utilities/Subgrade			1.00	0.07	0.21	0.01

Values in cells D195 through D228, D246 through D279, D297 through D330, and D348 through D381 are required when 'Other Project Type' is selected.

Off-Road Equipment Emissions

Grubbing/Land Clearing Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing	pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing	tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Grading/Excavation	Default Number of Vehicles	Mitigation Option Override of	Default		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Override of Default Number of Vehicles	*Program-estimate*	Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Excavators	0.19	3.26	1.55	0.08	0.07	0.01	500.11	0.16	0.00	505.50
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Off-Highway Trucks	0.50	3.29	3.57	0.13	0.12	0.01	1,279.89	0.41	0.01	1,293.67
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Tractors/Loaders/Backhoes	0.15	2.23	1.54	0.08	0.07	0.00	301.58	0.10	0.00	304.82
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment	If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Number of Vehicles	Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grading/Excavation	pounds per day	0.84	8.78	6.65	0.28	0.26	0.02	2,081.57	0.67	0.02	2,103.99
Grading/Excavation	tons per phase	0.06	0.58	0.44	0.02	0.02	0.00	137.38	0.04	0.00	138.86

Drainage/Utilities/Subgrade Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Air Compressors	0.26	2.41	1.74	0.09	0.09	0.00	375.26	0.02	0.00	376.67
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Tractors/Loaders/Backhoes	0.15	2.23	1.54	0.08	0.07	0.00	301.58	0.10	0.00	304.82
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Welders	0.25	1.68	1.42	0.06	0.06	0.00	207.48	0.02	0.00	208.56

User-Defined Off-road Equipment If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Drainage/Utilities/Sub-Grade	pounds per day	0.66	6.32	4.69	0.23	0.22	0.01	884.32	0.14	0.01	890.05
Drainage/Utilities/Sub-Grade	tons per phase	0.04	0.42	0.31	0.01	0.01	0.00	58.37	0.01	0.00	58.74

Paving	Default Number of Vehicles	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Override of Default Number of Vehicles	*Program-estimate*				pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Cement and Mortar Mixers	0.06	0.31	0.37	0.01	0.01	0.00	50.52	0.01	0.00	50.77
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Off-Highway Trucks	0.50	3.29	3.57	0.13	0.12	0.01	1,279.89	0.41	0.01	1,293.67
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Pavers	0.19	2.88	1.88	0.09	0.08	0.00	455.22	0.15	0.00	460.13
1.00			Model Default Tier	Paving Equipment	0.17	2.56	1.60	0.08	0.07	0.00	394.47	0.13	0.00	398.72
1.00			Model Default Tier	Plate Compactors	0.04	0.21	0.25	0.01	0.01	0.00	34.48	0.00	0.00	34.65
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Tractors/Loaders/Backhoes	0.15	2.23	1.54	0.08	0.07	0.00	301.58	0.10	0.00	304.82
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment

If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
				pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

			ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	Paving	pounds per day	1.12	11.48	9.21	0.40	0.37	0.03	2,516.15	0.80	0.02	2,542.77
	Paving	tons per phase	0.07	0.76	0.61	0.03	0.02	0.00	166.07	0.05	0.00	167.82
Total Emissions all Phases (tons per construction period) =>			0.17	1.75	1.36	0.06	0.06	0.00	361.81	0.11	0.00	365.43

Equipment default values for horsepower and hours/day can be overridden in cells D403 through D436 and F403 through F436.

Equipment	User Override of Horsepower	Default Values Horsepower	User Override of Hours/day	Default Values Hours/day
Aerial Lifts		63		8
Air Compressors		78		8
Bore/Drill Rigs		221		8
Cement and Mortar Mixers		9		8
Concrete/Industrial Saws		81		8
Cranes		231		8
Crawler Tractors		212		8
Crushing/Proc. Equipment		85		8
Excavators		158		8
Forklifts		89		8
Generator Sets		84		8
Graders		187		8
Off-Highway Tractors		124		8
Off-Highway Trucks		402		8
Other Construction Equipment		172		8
Other General Industrial Equipment		88		8
Other Material Handling Equipment		168		8
Pavers		130		8
Paving Equipment		132		8
Plate Compactors		8		8
Pressure Washers		13		8
Pumps		84		8
Rollers		80		8
Rough Terrain Forklifts		100		8
Rubber Tired Dozers		247		8
Rubber Tired Loaders		203		8
Scrapers		367		8
Signal Boards		6		8
Skid Steer Loaders		65		8
Surfacing Equipment		263		8
Sweepers/Scrubbers		64		8
Tractors/Loaders/Backhoes		97		8
Trenchers		78		8
Welders		46		8

END OF DATA ENTRY SHEET

Appendix B

Record of Non-Applicability

RECORD OF NON-APPLICABILITY (RONA)
FOR CLEAN AIR ACT CONFORMITY
SAN DIEGO COUNTY

This Proposed Action falls under the Record of Non-Applicability (RONA) category and is documented with this RONA.

The U.S. Environmental Protection Agency (USEPA) published *Determining Conformity of General Federal Actions to State or Federal Implementation Plans; Final Rule*, in the 30 November 1993, Federal Register (40 CFR Parts 6, 51, and 93). The U.S. Navy published *Clean Air Act Conformity Guidance* in Reference (b) dates July 2013, OPNAV 5090.1, dated June 2021. These publications provide implementing guidance to document Clean Air Act Conformity Determination requirements.

Federal regulations state that no department, agency, or instrumentality of the Federal Government shall engage in, support in any way or provide financial assistance for, license to permit, or approve any activity that does not conform to an applicable implementation plan. It is the responsibility of the Federal agency to determine whether a Federal action conforms to the applicable implementation plan, before the action is taken (40 CFR Part 1 51.850[a]).

Federal actions may be exempt from conformity determinations if they do not exceed designated *de minimis* levels for criteria pollutants (40 CFR Part 51.853[b]). *De minimis* levels (in tons/year) for the air basin potentially affected by the Proposed Action are listed in Table 1.

Table 1
***De minimis* Levels for Criteria Pollutants in San Diego County**

Criteria Pollutant	***De minimis* Level (tons/year)**
Volatile Organic Compounds (VOC)	25
Oxides of Nitrogen (NOx)	25

PROPOSED ACTION

Action Proponent: Naval Base Point Loma

Location: Naval Base Point Loma

Proposed Action Name: Encroachments Along Miramar Pipeline

Proposed Action Summary: The United States (U.S.) Navy proposes to relocate sections of the existing 8-inch Miramar Pipeline to provide enhanced access for regular inspection, routine maintenance, and emergency response. The Proposed Action is needed because non-Navy development has encroached upon Navy easements thereby diminishing the Navy's ability to access and therefore maintain the pipeline. The Proposed Action would include relocating existing pipeline segments that fall within encroachments at High Tech High, formerly Horizon Christian Academy, and the Cannington Drive area. Both encroachment areas are in the community of Clairemont Mesa within the City of San Diego. The existing pipeline would need to remain in service while the new pipeline is being constructed. Once the new pipe segments are tied into the existing pipeline and the pipeline is operational, the existing segments that are no longer needed would be closed in place.

Air Emissions Summary: Construction emissions were calculated by using the Roadway Construction Emissions Model (RCEM). RCEM is an excel-based emissions model developed by the Sacramento Metropolitan Air Quality Management District (SMAQMD) to estimate anticipated emissions associated with the construction of linear projects (e.g., roadways and pipelines).

Specific inputs to RCEM include project site areas, constructions schedules, and construction equipment fleet mixes. Construction input data include, but are not limited to, (1) the anticipated start and finish dates of each Project construction activity; (2) inventories of construction equipment to be used during each activity; (3) areas to be excavated and graded; (4) volumes of materials to be exported from and imported to the Project area; and (5) areas to be paved. The input data and assumptions are based on information contained in Section 2, Proposed Action, of the EA and provided in detail in Appendix A to the EA.

Criteria pollutant emissions would occur during project construction, primarily from trenching/excavation, new pipeline installation, and backfilling/repaving. Construction emissions would include emissions associated with the operation of off-road equipment and on-road vehicles. Construction is assumed to begin in 2023 and last approximately six months. Table 2 shows the estimated annual construction emissions of criteria pollutants generated under the Proposed Action for the year 2023, with the maximum yearly emissions compared to the *de minimis* thresholds. Emissions calculation spreadsheets are included in Appendix A to the EA.

Table 2
Annual Construction Emissions (Proposed Action)

Year	VOC*	NO_X*	CO*	SO_X*	PM_{10}*	$PM_{2.5}$*
Construction – 2023	1.45	0.18	1.82	<0.01	0.20	0.09
de minimis Thresholds[a]	*25*	*25*	*N/A*	*N/A*	*N/A*	*N/A*
Adverse Effect?	***No***	***No***	***No***	***No***	***No***	***No***

Source: CalEEMod (output data is provided in Appendix C)
[a] *De minimis* threshold levels for conformity applicability analysis (Table 1).
* Pollutant Emissions (tons/year)

Table 2 shows that annual construction emissions generated by the Proposed Action are well below the San Diego County conformity *de minimis* levels. As a result, the Proposed Action would not produce adverse air quality impacts.

Date RONA Prepared: 4 March 2022.

EMISSIONS EVALUATION AND CONCLUSION

The Proposed Action would involve minor construction and operational emissions; all emissions are *de minimis*.

The Navy concludes that *de minimis* thresholds for applicable criteria pollutants would not be exceeded as a result of implementation of the Proposed Action. Therefore, the Navy concludes that further formal Conformity Determination procedures are not required, resulting in this Record of Non-Applicability.

RONA APPROVAL

To the best of my knowledge, the information presented in this RONA is correct and accurate and I concur in the finding that the proposed action is not subject to the General Conformity Rule.

Date:_____

Signature:_____

Appendix C

Traffic Analyses Reports

Appendix C-1

Traffic Analysis Miramar Pipeline Relocation High Tech High Encroachment Study (2018)

Traffic Analysis

Miramar Pipeline Relocation
High Tech High Encroachment Study
San Diego, CA

November 2018

Prepared for:

Enterprise Engineering, Inc.

Prepared by:

Kimley»Horn

Table of Contents

Appendices

List of Figures

1 INTRODUCTION

This document analyzes traffic and circulation impacts of planned construction activities associated with the DESC1906 MILCON project Encroachment 2 (High Tech High) project. This project involves the relocation of a segment of the Navy's fuel pipeline from the High Tech High property to City of San Diego public right-of-way. There will not be long-term traffic and circulation impacts, as street geometry will be restored to existing conditions after construction is complete. Construction will result in short-term disturbance of existing roadways, including lane closures and access modification. This analysis documents the effects of those construction activities on traffic and circulation.

This traffic analysis is a precursor to a traffic control plan for the project. The traffic control plan will include detailed routing, lane closure, and warning signage placement information. This traffic analysis provides recommendations on roadway geometric modifications during construction that should be incorporated into the traffic control plan. This document establishes ways to segment the construction activities to minimize traffic flow disruption while not impeding construction feasibility. This document also identifies potential temporary effects on pedestrian and vehicular traffic circulation associated with project construction.

During the design phase, a traffic control plan will be produced to define traffic control parameters for roadway configuration and operations during construction. The goal of this traffic analysis is to identify concept level ways to reduce impacts to the local community, especially along Mount Alifan Drive and Mount Acadia Boulevard, while maintaining standard traffic control geometries and operations during construction. Subsequent detailed traffic control plans, generated during the design phase, may consider alternate means to reduce construction effects compared to the recommendations presented in this analysis.

1.1 PROJECT LOCATION

The project involves relocating a section of pipeline within the High Tech High private property to the City of San Diego public right-of-way. High Tech High is located south of Mount Alifan Drive between Mount Acadia Boulevard and Genesee Avenue in the Clairemont Mesa community within the City of San Diego. Major nearby roadways include Genesee Avenue to the east and Balboa Avenue to the north, as shown in **Figure 1-1**. The community of Clairemont Mesa is situated between I-5 and I-805, and bounded by SR-52 to the north, and the Linda Vista community to the south.

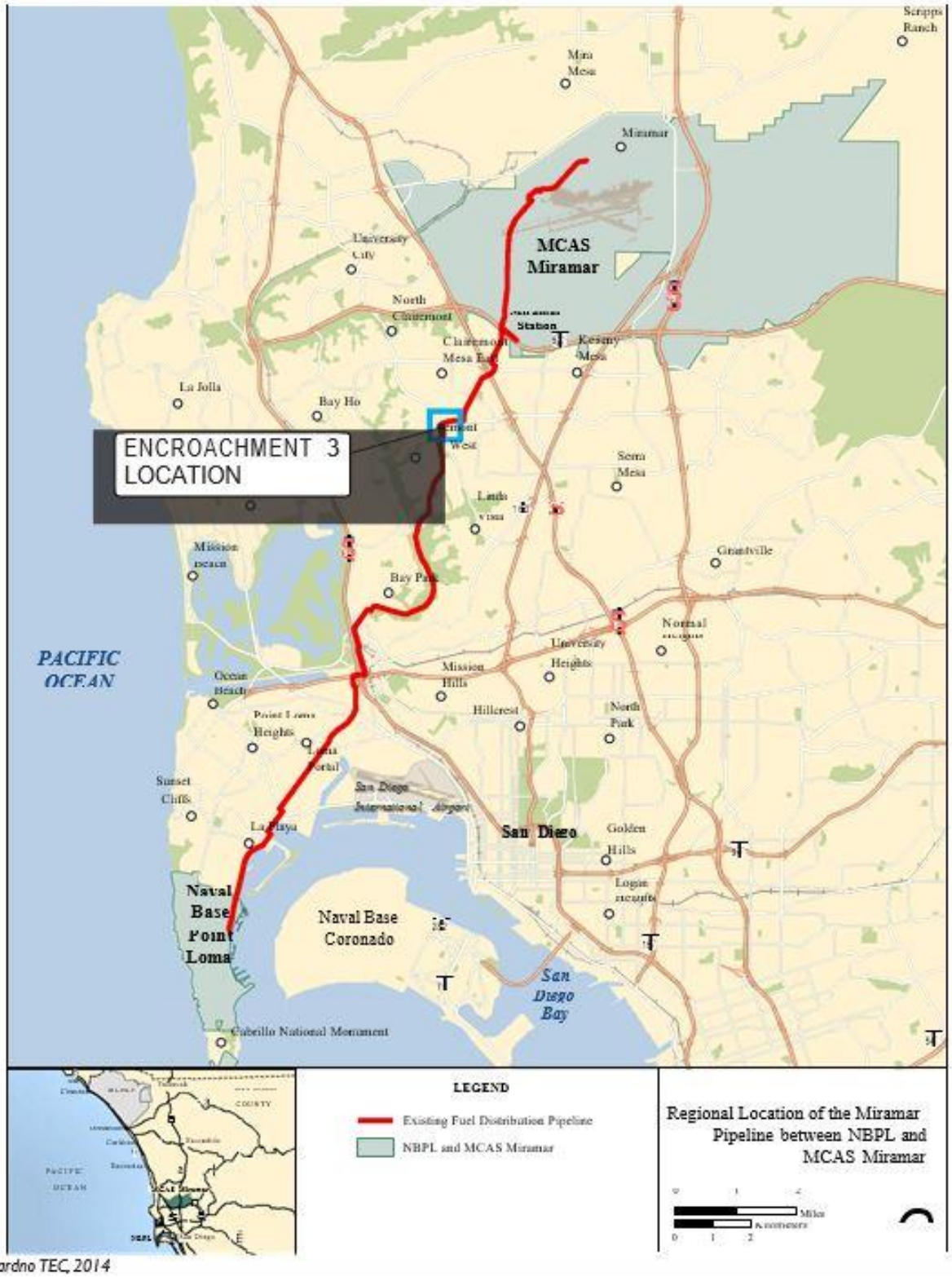
1.2 PURPOSE OF AND NEED FOR THE PROJECT

The purpose of the project is to remedy pipeline anomalies and geohazards to support the Navy's and Department of Homeland Security's existing and future fueling needs and service operations, while allowing the Navy to maintain readiness. This particular encroachment relocates the pipeline from private property to public right-of-way. See **Figure 1-2** for illustration of the existing pipeline alignment running across the High Tech High site.

1.3 PROJECT ALTERNATIVES

Three different alignment alternatives were originally considered for relocation of the pipeline to address the High Tech High encroachment. One alignment was selected as the preferred alternative and is carried forward with full evaluation in this study. The other two alignments are not evaluated in this study.

The Proposed Action is to relocate the pipeline within the City of San Diego public right-of-way along the east side of Mount Acadia Boulevard and north side of Mount Alifan Drive. This alignment is approximately 800 feet within the street. See **Figure 1-3** for illustration of the proposed alignment. Pipeline relocation would be coordinated with the City of San Diego as necessary.



Source: Cardno TEC, 2014

Kimley»Horn

FIGURE 1-1
PROJECT VICINITY MAP

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FIGURE 1-2
EXISTING PIPELINE ALIGNMENT

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FIGURE 1-3
PROPOSED PIPELINE ALIGNMENT

2 ANALYSIS METHODOLOGY

This traffic analysis document examines the impacts associated with construction of the project. This document relies upon the project definition as contained in the High Tech High Encroachment Study document prepared by Enterprise Engineering, Inc., and traffic counts performed as part of this traffic study.

The project is located within the City of San Diego right-of-way and will adhere to City of San Diego standards for public works construction. Standards and regulations governing the implementation of the project include the City of San Diego Municipal Code, Land Development Code, and Standard Specifications and Drawings for Public Works Construction, and the California Manual on Uniform Traffic Control Devices. The City of San Diego Traffic Impact Study Manual (July 1998) was referenced when completing the traffic analysis for this project. However, the nature of the project is unique. The project will not result in additional trips on the roadway network, nor modify the permanent geometry of the roadway. All impacts associated with the project will be temporary. Since there are no permanent or long-term impacts and the project does not generate any new trips, the City of San Diego's standard thresholds for significance for transportation, circulation and parking do not apply. The Traffic Impact Study Manual was therefore utilized for roadway capacity thresholds only.

The project will temporarily affect local access, circulation and parking. This document seeks to determine the temporary effects associated with construction and recommend construction practices to limit those effects. Methods to limit the effects include specifying segments of construction, specifying hours of construction, temporary modifications to roadway geometrics, and detour routes specific to the project.

The project will adhere to City standards that restrict the linear extent of open trench to no more than 500 feet in length. Thus, the project will need to be constructed in 500 foot or less segments. By identifying optimal segment breaks, the circulation detriments associated with open trenching can be reduced. The effects on parcels with multiple access driveways can be lessened by closing one driveway at a time.

This study recommends where lane closures may be applied to reduce the number of vehicles impacted and limit the resulting congestion. To inform this effort, hourly traffic volumes for a 24-hour period were collected at 4 locations on or near the alternative project alignments. The City's roadway capacity thresholds were compared to the hourly volumes on the roadway to assist in determining appropriate time and segment restrictions. These traffic counts were conducted in April 2018. The raw count data is provided in **Appendix A**. At the beginning and end of each construction period, the open trench will be covered with metal plates and the roadway geometry restored to existing conditions. This will serve to limit effects to circulation, access and congestion during non-construction times.

Trenching for the project will be a four-foot wide open trench maximum. The City of San Diego requires roadway resurfacing that extends beyond the excavated area. This roadway resurfacing footprint defines the anticipated width of the construction zone. The project runs along Mount Alifan Drive (four-lane collector) and Mount Acadia Boulevard (two-lane collector). **Table 1** below indicates the construction width outside of the trench area.

Table 1 – Roadway Work Zone Areas

Street Classification	Width Beyond Excavated Area (ft.)
Arterial Streets	62 inches
Major Streets	71 inches
Collector Streets	**82 inches**
Residential Streets	74 inches

As shown in the above table, the work zone will extend 8 feet 10 inches (2 foot trench plus 6 foot 10 inch resurfacing area) from the pipe centerline on both streets. Thus, the project construction will affect at least one lane of traffic, and potentially two lanes of traffic in locations where the pipe centerline is located close to a lane line.

Additionally, access to the adjacent properties are evaluated to determine if and how driveways can be closed during construction.

The width of the construction zone and its effect on traffic lanes was analyzed in conjunction with existing roadway volumes. An optimal roadway configuration was developed to minimize reduction in circulation and connectivity of the roadways where the pipeline will necessitate lane closure. These proposed roadway geometrics will be further developed and defined in the Traffic Control Plans produced during the design phase of the project.

Detour routes are recommended where necessitated through reductions in roadway capacity or roadway closures. These detour routes are identified to shift circulation patterns to roadways with sufficient additional capacity and to avoid residential neighborhoods. Signage for the detour routes will be identified in the Traffic Control Plans.

3 EXISTING CONDITIONS

The project is planned to result in construction along Mount Alifan Drive and Mount Acadia Boulevard. Descriptions of current conditions along those roadways are discussed below. Street classifications were obtained from the Clairemont Mesa Community Plan (April 2011).

3.1 MOUNT ALIFAN DRIVE

Mount Alifan Drive is a four-lane collector east of Mount Acadia Boulevard, and a two-lane collector west of Mount Acadia Boulevard. The segment of Mount Alifan Drive between Mount Acadia Boulevard and Genesee Avenue does not have parking or bike lanes. Sidewalks are provided on both sides. The roadway is fronted by the Pacific Bluffs residential community on the north, and High Tech High on the south. Mount Alifan Drive carries approximately 11,500 vehicles per day, with a posted speed limit of 25 mph.

Where Mount Alifan Drive reduces to two lanes, west of Mount Acadia Boulevard, parking is also provided along both sides of the roadway, but parking is restricted for approximately 80 feet approaching the intersection.

High Tech High has a north parking lot with the primary access point onto Mount Alifan Drive within the limits of the pipeline relocation area. A secondary access point with pick-up/drop-off circulation is located on Mount Acadia Boulevard south of the construction area. This secondary access is very far from the north parking lot and requires vehicles to circulate around the school buildings to get between the north parking.

The residential complex on the north side of Mount Alifan Drive has a driveway to the units as well as two driveways accessing the main office parking lot. The residents have alternative access points further west on Mount Alifan Drive and on Balboa Avenue. One of the two office parking lot driveways should remain open during construction in accordance with office hours.

3.2 MOUNT ACADIA BOULEVARD

Mount Acadia Boulevard is a two-lane collector within the study area, carrying approximately 9,500 ADT and a posted speed limit of 30 mph. Sidewalks and parking are provided along both sides of the roadway. No bicycle facilities are present. High Tech High is located on the east side and a residential complex is located on the west side of the roadway, but no driveways are located along the pipeline construction area of Mount Acadia Boulevard.

4 DISCUSSION OF EFFECTS

The new Miramar Pipeline segment is planned to be installed within the travel lanes of Mount Alifan Drive and Mount Acadia Boulevard. In order to construct the new pipeline, the existing road surface will need to be demolished, and a trench dug to place the pipeline. The trench will need to be filled and the roadway resurfaced. While the trench can be covered with plates during portions of the work period, the excavation of the trench and pavement reconstruction will necessitate the temporary closure of travel lanes and preclude access to adjacent driveways during construction activities.

During construction, effects of the project will be short-term in nature and limited to the duration of the construction activities, which are anticipated to be a matter of a few, possibly non-consecutive, days. Once construction of the pipeline is complete, the construction area will be resurfaced and the geometry will be restored to existing conditions, with portions of the roadway resurfaced. Thus, the long-term effects of the project will be positive in nature, as the roadway surface within the influence area of the trench will be reconstructed.

During construction of the pipeline, adjacent driveway access to the roadway will be temporarily impacted. The use of some driveways will not be feasible until the trench can be covered or resurfacing is complete. Access to properties with adjacent driveways will be affected while the trench is excavated and remains open. All properties that will be affected have an alternative driveway that will remain open to maintain access to the properties.

Construction activity is planned to occur during daytime hours. Following completion of the work activity for the day, the trench will be plated, and traffic control removed. This will restore access to blocked driveways and will restore roadway capacity. Therefore, impacts will only be during daytime hours.

Construction of the pipeline will result in a number of temporary traffic effects, including:

- Reducing access to properties by precluding driveway access;
- Reduction in roadway capacity; and
- Reduction in on-street parking (minimal);

Due to the temporary and short-term nature of the effects, project impacts are considered not significant. To reduce the effects of the project, special conservation measures (SCMs) have been identified. These SCMs will be implemented to reduce the severity of the short-term impacts and reduce, but not eliminate, the resulting inconvenience to adjacent residents, schools, businesses and affected commute trips.

4.2 RECOMMENDED CONSTRUCTION PHASING AND MODIFICATIONS TO GEOMETRY

Proposed construction phases and roadway geometrics were developed based on the location of the new pipeline, the required work area, existing roadway geometrics, and existing roadway volumes. The recommended geometrics attempt to limit the magnitude of congestion and access impacts, given the required parameters of the pipeline construction. These geometrics are encompassed in a SCM that serves to reduce the magnitude of effect on vehicle and bicycle circulation:

SCM 1. Through the use of traffic control, modify existing roadway geometrics to best maintain vehicular access and provide capacity during the construction period within the available roadway right-of-way.

Recommended Construction Phasing

Construction of the pipeline is proposed to occur in the following three phases with the following restrictions or capacity reductions:

1. West side of Mount Acadia Boulevard from Mount Alifan Drive to approximately 150' south of the intersection.
    - Shift northbound and southbound travel lanes east
    - Reduce capacity at Mount Alifan Drive and Mount Acadia Boulevard intersection by removing the northbound right turn lane
    - Restrict west driveway of visitor's loop for the residential complex on the north side of Mount Alifan Drive
    - Restrict parking on the west side of Mount Acadia Boulevard as needed to accommodate the work area.
2. North side of Mount Alifan Drive from within the Mount Acadia Boulevard intersection and up to approximately 100' east of the intersection
    - Reduce capacity on Mount Alifan Drive from four lanes to two lanes, shifting eastbound and westbound lanes onto south side of Mount Alifan Drive
    - Reduce capacity at Mount Alifan Drive and Mount Acadia Boulevard intersection by removing the westbound left turn lane
    - Restrict west driveway of visitor's loop for the residential complex on the north side of Mount Alifan Drive
3. North side of Mount Alifan Drive from approximately 100' east of Mount Acadia Boulevard to Genesee Avenue
    - Reduce capacity on Mount Alifan Drive from four lanes to two lanes
    - Restrict westbound left turns from Mount Alifan Drive into High Tech High parking lot. Access can continue to be provided for eastbound right turns in and right turns out of the driveway.
    - Restrict eastbound left turns from Mount Alifan Drive into residential complex on north side of Mount Alifan Drive. Also restrict left turns out of residential complex driveway.
    - Restrict left turns in and out of residential complex visitor's office loop east driveway on the north side of Mount Alifan Drive

The proposed traffic handling during the construction of each segment is illustrated in **Figure 4-1.** This exhibit summarizes recommendations on the extents of the construction segments and considerations to limit effects on access and circulation. This exhibit will be considered as a basis of design for preparing traffic control plans and for use by the contractor during construction.

Intersection Modifications associated with Construction

- *Mount Alifan Drive and Mount Acadia Boulevard:*
  Construction of the pipeline along Mount Alifan Drive will result in the closure of one lane in each direction of Mount Alifan Drive, and removal of the westbound left turn lane from Mount Alifan Drive to Mount Acadia Boulevard during some phases. During other phases of construction, the eastbound approach to the stop-controlled intersection will be reduced to a single shared lane for all movements (left, through, right). When possible, the northbound and eastbound right turn movements will be maintained, but the channelized nature of the movement will be restricted.

  Construction of the pipeline along Mount Acadia Boulevard will result in a shift in the alignment for both lanes as well as the repurposing of the northbound channelized right-turn lane from Mount Acadia Boulevard to Mount Alifan Drive to be a shared lane for all movements. Access to the western driveway of the Pacific Bluffs office will likely be restricted during this phase. The stop sign located in the channelizing island may need to be temporarily removed and a temporary stop sign installed for the duration of this phase of construction.

- *Mount Alifan Drive and Genesee Avenue:* Construction of the pipeline along Mount Alifan Drive will result in the closure of one travel lane in each direction of Mount Alifan Drive. During this phase of construction, the two through lanes on westbound Mount Alifan Drive approaching Genesee Avenue will need to be reduced to one lane, or a lane drop will need to be installed on the receiving end of the two westbound through lanes. Additionally, the storage available for the eastbound approach will be reduced to a single shared lane for all movements (left, through, right), during some phases.

These closures were evaluated using existing traffic volume data at the intersection. As shown with the evaluation, the Mount Alifan Drive and Genesee Avenue signalized intersection is expected to operate acceptably during all phases of construction with the reduction of eastbound and westbound capacity. The stop-controlled intersection, Mount Alifan Drive and Mount Acadia Boulevard, is expected to experience increased delays on the westbound approach during the phases where the westbound left turn lane is removed.

In addition to modifying roadway geometrics to best serve traffic during construction, it is recommended to provide a flagger to control traffic flow at the intersection of Mount Alifan Drive and Mount Acadia Boulevard to counteract the reduction in turn lanes. This recommendation is encompassed with the following SCM:

SCM 2. A flagger should be provided to control traffic at the intersection of Mount Alifan Drive and Mount Acadia Boulevard during construction phases where turn lanes are closed to assist traffic flow through the intersection. The flagger would be able to control

traffic flow instead of relying on the existing stop-control interaction and help mitigate delays for the westbound direction of travel.

4.3 REDUCTIONS IN ACCESS

There are two properties that will have reduced access at some point during construction of the new pipeline: High Tech High and the Pacific Bluffs residential complex on the north side of Mount Alifan Drive. Both of these properties have alternative access driveways outside of the work area.

Access to High Tech High is assumed to be maintained, but with restrictions on left-turns in and out of the driveway. If necessary, High Tech High can completely restrict access to the school at the Mount Alifan Drive driveway and only use the driveway on Mount Acadia Boulevard. If construction is scheduled for when school is not in session then access would not be a concern.

The residential complex driveway on Mount Alifan Drive just east of Genesee Avenue is also assumed to be maintained, but with restrictions on left-turns in and out of the. The complex has other driveways that residents can use to offset those restrictions.

Access to the Pacific Bluffs main office has two driveways along Mount Alifan Drive. One driveway should remain fully open. If closure of both driveways in this loop is needed, closure should be limited to after business hours for the office.

SCM 3. Notify residents, schools, and businesses of the upcoming road work and preclusion of access to their driveways.

4.4 REDUCTIONS IN ROADWAY CAPACITY

The work area will be limited to the envelope of the trench area and the influence area needed for staging and required for resurfacing. Given the location of the pipeline within the road bed, this will affect the existing location of one or two lanes of vehicular travel. The closure of a lane or lanes of vehicular travel reduces the capacity of the roadway. In order to minimize the extent of effects on travel, the cross-section of the roadway will be modified through the use of temporary traffic control measures such as cones and construction signs. Lanes will be maintained open but shifted where feasible to limit the amount of roadway capacity reduced and eliminate the need for detours.

The only proposed reduction in roadway capacity will occur on Mount Alifan Drive between Mount Acadia Boulevard and Genesee Avenue where the 4-lane collector will be reduced to two lanes (one lane in each direction) in order to construct the new pipeline on the north side of Mount Alifan Drive. The access driveway for High Tech High School can remain open during construction, but westbound left turns into and out of the school should be restricted to avoid queues backing up to Genesee Avenue.

Traffic volumes for this segment are shown in **Figure 4-2**. As shown in the figure, one travel lane is sufficient to handle the traffic volumes experienced on this segment. No congestion impact resulting from the lane closure is anticipated. Traffic volumes do not necessitate any limitations on the hours of construction.

4.5 MODIFICATIONS TO PEDESTRIAN FACILITIES

Pedestrian facilities are not anticipated to be affected by construction. Sidewalks should remain open and accessible during construction.

4.6 MODIFICATIONS TO BICYCLE FACILITIES

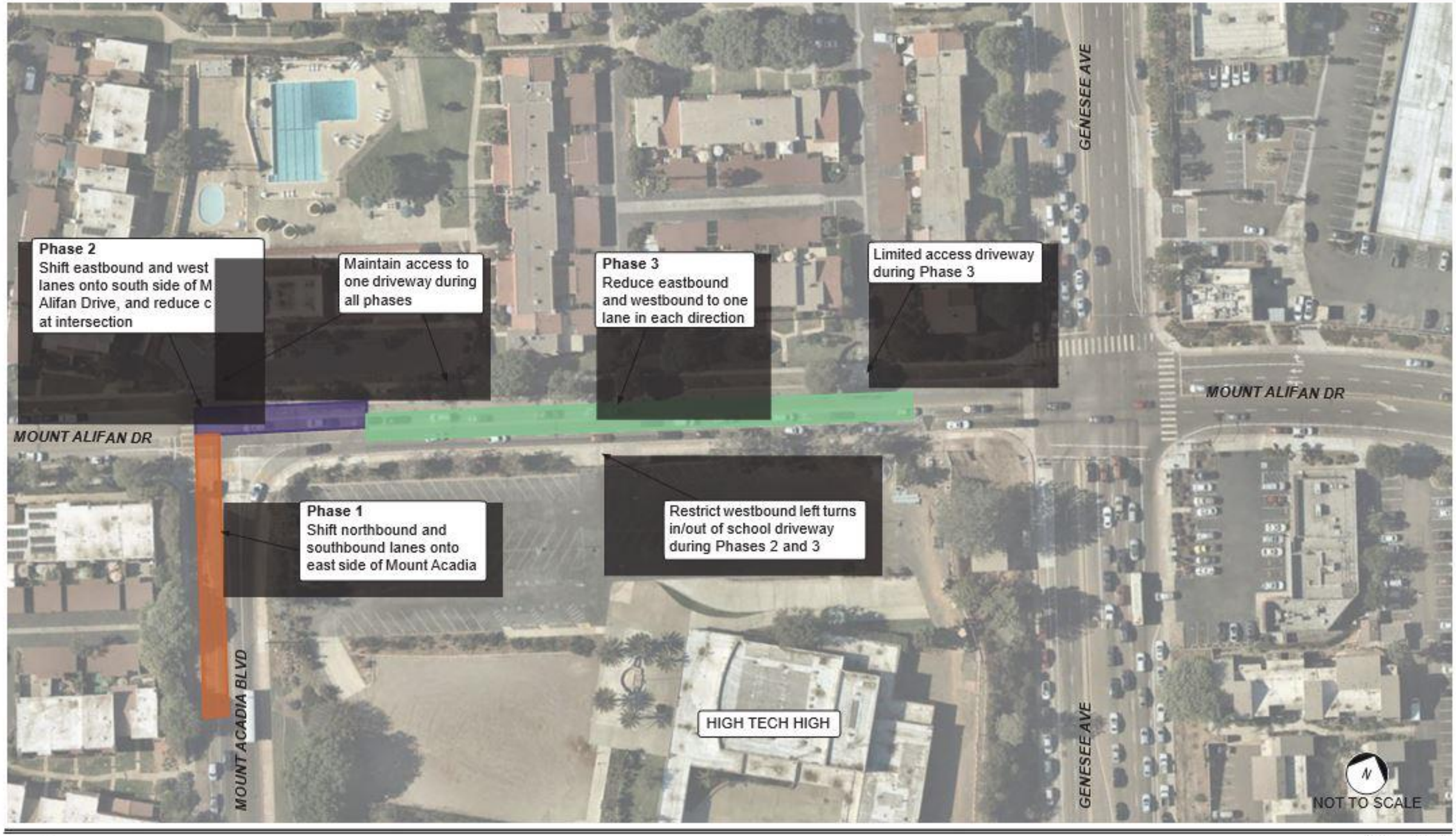
Bicycle facilities are not provided on Mount Alifan Drive or Mount Acadia Boulevard within the vicinity of the project and therefore do not need to be modified. Lane widths during construction should be maintained at 14-feet to the extent feasible to allow for bicyclists to share a lane with a vehicle if needed.

4.7 MODIFICATIONS TO PARKING FACILITIES

Parking is restricted on Mount Alifan Drive between Mount Acadia Boulevard and Genesee Avenue as well as within a certain distance on all approaches of the intersection. On-street parking is provided along both sides of Mount Acadia Boulevard and along both sides of Mount Alifan Drive west of Mount Acadia Boulevard. The on-street parking in this area generally serves the adjacent school and residential uses. All surrounding residential land uses have parking spaces or lots and other roadways in the area also allow on-street parking. A majority of the construction work can be performed where parking is already prohibited. It is not anticipated that parking will be impacted by construction, however, a couple parking spaces on Mount Acadia Boulevard could be restricted based on required shifting tapers for the travel lanes. This will be determined when Traffic Control Plans are developed. Minimal impacts to parking are expected, and parking would not need to be mitigated.

4.8 MODIFICATIONS TO TRANSIT FACILITIES

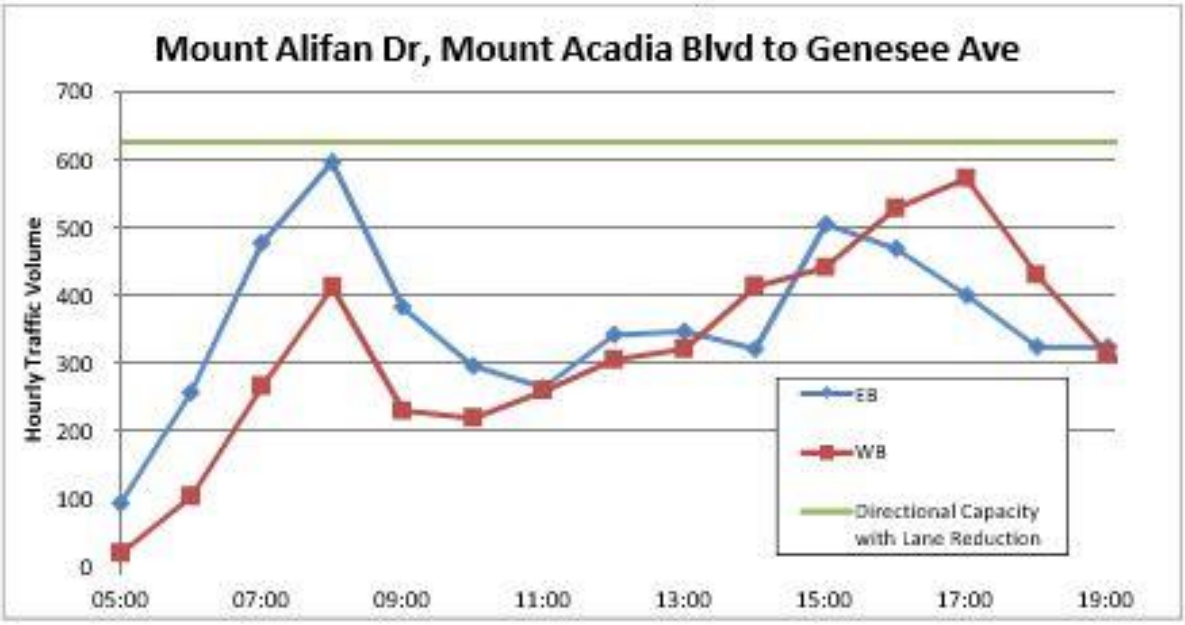
Mount Alifan Drive and Mount Acadia Boulevard do not service transit within the vicinity of this project. Therefore, transit facilities do not need to be modified during construction.



Kimley»Horn

FIGURE 4-1
PIPELINE CONSTRUCTION PHASING AND ROADWAY MODIFICATIONS

Figure 4-2: Hourly Traffic Volumes on Mount Alifan Drive (Mount Acadia Boulevard to Genesee Avenue)



5 SUMMARY OF FINDINGS

5.1 SUMMARY OF IMPACTS

Construction of the Project will result in temporary restrictions to access, effects on circulation, and increases in local congestion. Effects will be very short in duration, ranging from one to a few days, and thus are not considered significant impacts. No long-term impacts will be experienced. Once construction of the project is complete, the roadway will be returned to its current configuration, with portions of the corridor being reconstructed.

5.1.1 Restrictions to Access

The new pipeline will be constructed along Mount Alifan Drive and Mount Acadia Boulevard, both of which are City of San Diego roadways. Due to construction of the pipeline, linear swaths of roadways along the alignment will be temporarily closed during trenching and roadway re-surfacing. The new pipeline will primarily be located near the roadway curb line.

Trenching construction for the pipeline and roadway resurfacing will result in the temporary closure of driveways for the residential complex on the north side of Mount Alifan Drive during construction.

Turn restrictions are recommended at the north driveway for High Tech High, which has an alternative access point on Mount Acadia Boulevard.

To minimize the project effect on access, the following SCMs should be considered:

SCM 1. Through the use of traffic control, modify existing roadway geometrics to best maintain vehicular and bicycle access and provide capacity during the construction period within the available roadway right-of-way.

5.1.2 Increased Congestion and Impacts to Circulation

Construction will result in a capacity reduction along Mount Alifan Drive and at the intersection of Mount Alifan Drive and Mount Acadia Boulevard. This will result in some increased congestion along the work area and may result in some natural detours to nearby streets. Locations where such temporary impacts may be observed include:

- Mount Alifan Drive between Mount Acadia Boulevard and Genesee Avenue: Reduction in capacity for the both directions of travel from two lanes to one lane will result in congestion and queuing on Mount Alifan Drive. It is likely that some traffic will detour to Mount Everest Boulevard for access into the residential area or to Mount Blanca Drive and Mount Acadia Boulevard for access to the school.

- Mount Acadia Boulevard at Mount Alifan Drive: Construction along Mount Acadia Boulevard and Mount Alifan Drive will result in the closure of one turn lanes during construction. The reduction in capacity will result in a temporary increase in congestion at this intersection.

To minimize the project effect on circulation and congestion, the following SCMs should be considered:

SCM 2. A flagger should be provided to control traffic at the intersection of Mount Alifan Drive and Mount Acadia Boulevard during construction phases where turn lanes are closed to assist traffic flow through the intersection. The flagger would be able to control traffic flow instead of relying on the existing stop-control interaction.

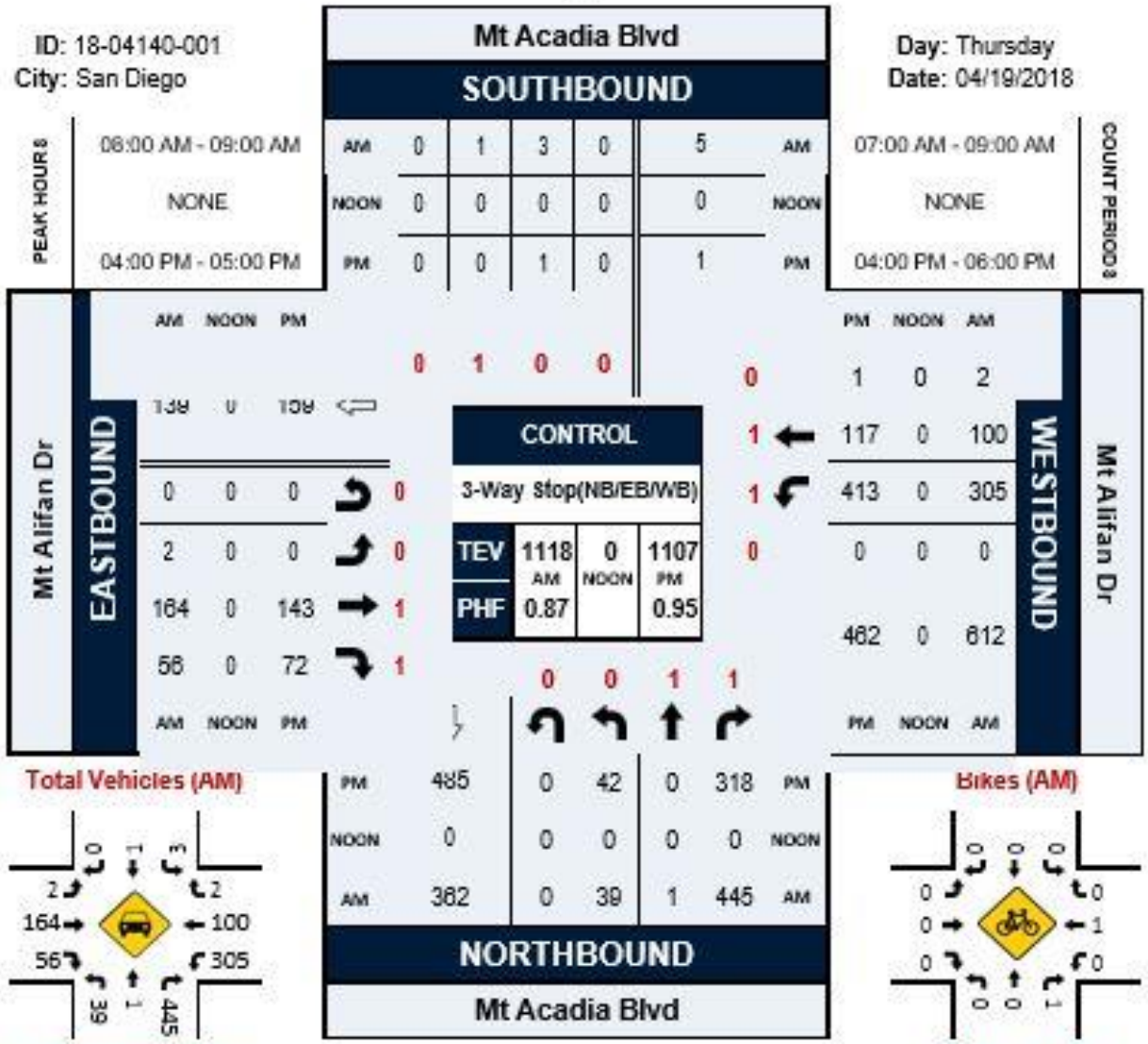
SCM 3. Notify residents, schools, and businesses of upcoming road work and preclusion of access to their driveways.

The limits of construction are expected to have little impact on parking, no impact to pedestrian facilities, and bike facilities currently do not exist on the study roadways.

Appendix A: Traffic Counts

Mt Acadia Blvd & Mt Alifan Dr

Peak Hour Turning Movement Count



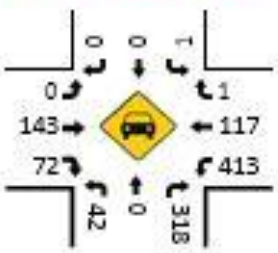
Total Vehicles (AM)

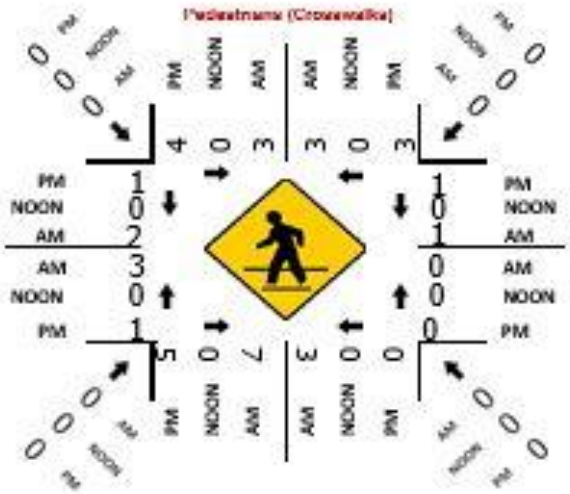
Bikes (AM)

Total Vehicles (Noon)

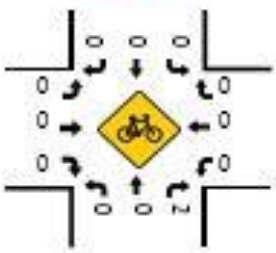
Bikes (NOON)

Total Vehicles (PM)





Bikes (PM)



Prepared by National Data & Surveying Services

Genesee Ave & Mt Alifan Dr

Peak Hour Turning Movement Count

ID: 18-04140-004
City: San Diego

Day: Thursday
Date: 04/19/2018

PEAK HOUR: AM 07:45 AM - 08:45 AM; NOON NONE; PM 04:30 PM - 05:30 PM

COUNT PERIOD: AM 07:00 AM - 09:00 AM; NOON NONE; PM 04:00 PM - 06:00 PM

Genesee Ave — SOUTHBOUND

AM	146	496	30	4	1138	AM
NOON	0	0	0	0	0	NOON
PM	218	988	110	19	796	PM

Mt Alifan Dr — EASTBOUND

AM	NOON	PM		
430	0	557		
0	0	0	0	
192	0	122	0.5	
350	0	234	1	
53	0	71	0.5	

Mt Alifan Dr — WESTBOUND

PM	NOON	AM	
124	0	118	1
288	0	228	1.5
307	0	106	0.5
0	0	0	0
490	0	551	

Genesee Ave — NORTHBOUND

PM	1377	11	51	531	146	PM
NOON	0	0	0	0	0	NOON
AM	658	3	56	824	171	AM

	0	1	3	0
	AM	NOON	PM	

CONTROL			
Signalized			
TEV	2777	0	3220
	AM	NOON	PM
PHF	0.98		0.93

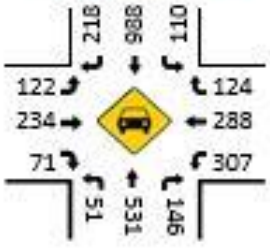
Total Vehicles (AM)

Bikes (AM)

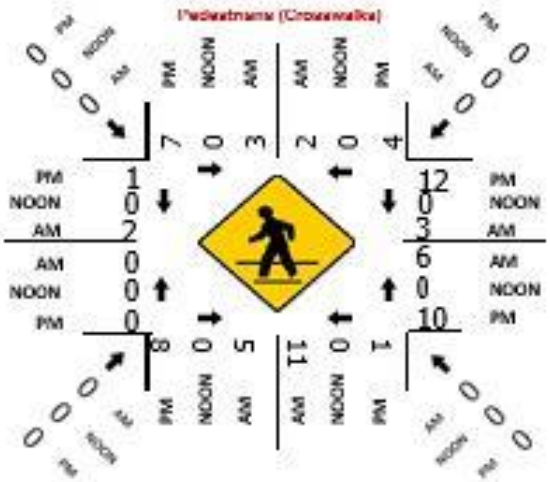
Total Vehicles (Noon)

Bikes (NOON)

Total Vehicles (PM)



Pedestrians (Crosswalks)



Bikes (PM)

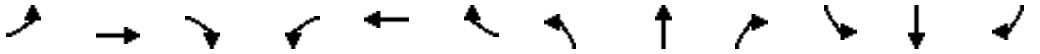
Appendix B: Intersection Evaluation

Intersection	
Intersection Delay, s/veh	32.7
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	164	56	413	117	1	39	1	445	3	1	0
Future Vol, veh/h	2	164	56	413	117	1	39	1	445	3	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	178	61	449	127	1	42	1	484	3	1	0
Number of Lanes	0	1	1	1	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	2	2
HCM Control Delay	13.4	40.4	33.3	11.8
HCM LOS	B	E	D	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	97%	0%	1%	0%	100%	0%	75%
Vol Thru, %	3%	0%	99%	0%	0%	99%	25%
Vol Right, %	0%	100%	0%	100%	0%	1%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	40	445	166	56	413	118	4
LT Vol	39	0	2	0	413	0	3
Through Vol	1	0	164	0	0	117	1
RT Vol	0	445	0	56	0	1	0
Lane Flow Rate	43	484	180	61	449	128	4
Geometry Grp	7	7	7	7	7	7	6
Degree of Util (X)	0.091	0.852	0.372	0.113	0.912	0.242	0.01
Departure Headway (Hd)	7.548	6.34	7.431	6.703	7.313	6.796	8.631
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	476	576	484	534	498	530	414
Service Time	5.269	4.061	5.178	4.45	5.043	4.526	6.697
HCM Lane V/C Ratio	0.09	0.84	0.372	0.114	0.902	0.242	0.01
HCM Control Delay	11	35.3	14.5	10.3	48.6	11.7	11.8
HCM Lane LOS	B	E	B	B	E	B	B
HCM 95th-tile Q	0.3	9.2	1.7	0.4	10.5	0.9	0



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	192	350	53	106	228	118	56	824	171	30	496	146
Future Volume (vph)	192	350	53	106	228	118	56	824	171	30	496	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor		0.95			0.95	1.00	1.00	0.91	1.00	1.00	0.95	1.00
Frt		0.99			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98			0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3436			3484	1583	1770	5085	1583	1770	3539	1583
Flt Permitted		0.98			0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3436			3484	1583	1770	5085	1583	1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	209	380	58	115	248	128	61	896	186	33	539	159
RTOR Reduction (vph)	0	7	0	0	0	99	0	0	74	0	0	75
Lane Group Flow (vph)	0	640	0	0	363	29	61	896	112	33	539	84
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases						3			2			6
Actuated Green, G (s)		24.5			16.3	16.3	6.2	36.5	36.5	3.5	33.8	33.8
Effective Green, g (s)		24.5			16.3	16.3	6.2	36.5	36.5	3.5	33.8	33.8
Actuated g/C Ratio		0.25			0.16	0.16	0.06	0.37	0.37	0.04	0.34	0.34
Clearance Time (s)		4.5			4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		852			574	261	111	1878	584	62	1210	541
v/s Ratio Prot		c0.19			c0.10		c0.03	c0.18		0.02	0.15	
v/s Ratio Perm						0.02			0.07			0.05
v/c Ratio		0.75			0.63	0.11	0.55	0.48	0.19	0.53	0.45	0.16
Uniform Delay, d1		34.3			38.5	35.1	44.9	23.8	21.1	46.8	25.2	22.6
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		3.8			2.3	0.2	5.5	0.9	0.7	8.5	1.2	0.6
Delay (s)		38.1			40.7	35.3	50.4	24.7	21.9	55.4	26.4	23.2
Level of Service		D			D	D	D	C	C	E	C	C
Approach Delay (s)		38.1			39.3			25.6			27.0	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	30.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	98.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	61.4%	ICU Level of Service	B
Analysis Period (min)	15		

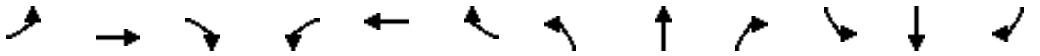
c Critical Lane Group

Intersection	
Intersection Delay, s/veh	14.6
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	143	72	305	100	2	42	0	318	1	0	0
Future Vol, veh/h	0	143	72	305	100	2	42	0	318	1	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	155	78	332	109	2	46	0	346	1	0	0
Number of Lanes	0	1	1	1	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	2	2
HCM Control Delay	10.8	16.7	14.6	10.5
HCM LOS	B	C	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	100%	0%	0%	0%	100%	0%	100%
Vol Thru, %	0%	0%	100%	0%	0%	98%	0%
Vol Right, %	0%	100%	0%	100%	0%	2%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	42	318	143	72	305	102	1
LT Vol	42	0	0	0	305	0	1
Through Vol	0	0	143	0	0	100	0
RT Vol	0	318	0	72	0	2	0
Lane Flow Rate	46	346	155	78	332	111	1
Geometry Grp	7	7	7	7	7	7	6
Degree of Util (X)	0.088	0.548	0.276	0.123	0.604	0.186	0.002
Departure Headway (Hd)	6.924	5.709	6.391	5.678	6.559	6.038	7.425
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	517	629	561	629	550	593	480
Service Time	4.672	3.457	4.144	3.431	4.302	3.781	5.505
HCM Lane V/C Ratio	0.089	0.55	0.276	0.124	0.604	0.187	0.002
HCM Control Delay	10.3	15.2	11.6	9.2	18.9	10.2	10.5
HCM Lane LOS	B	C	B	A	C	B	B
HCM 95th-tile Q	0.3	3.3	1.1	0.4	4	0.7	0



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	122	234	71	307	288	124	51	531	146	110	988	218
Future Volume (vph)	122	234	71	307	288	124	51	531	146	110	988	218
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor		0.95			0.95	1.00	1.00	0.91	1.00	1.00	0.95	1.00
Frt		0.98			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99			0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3402			3450	1583	1770	5085	1583	1770	3539	1583
Flt Permitted		0.99			0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3402			3450	1583	1770	5085	1583	1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	133	254	77	334	313	135	55	577	159	120	1074	237
RTOR Reduction (vph)	0	15	0	0	0	101	0	0	105	0	0	62
Lane Group Flow (vph)	0	449	0	0	647	34	55	577	54	120	1074	175
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases						3			2			6
Actuated Green, G (s)		19.3			26.5	26.5	5.7	30.7	30.7	12.1	37.1	37.1
Effective Green, g (s)		19.3			26.5	26.5	5.7	30.7	30.7	12.1	37.1	37.1
Actuated g/C Ratio		0.18			0.25	0.25	0.05	0.29	0.29	0.11	0.35	0.35
Clearance Time (s)		4.5			4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		615			857	393	94	1464	455	200	1231	550
v/s Ratio Prot		c0.13			c0.19		0.03	0.11		c0.07	c0.30	
v/s Ratio Perm						0.02			0.03			0.11
v/c Ratio		0.73			0.75	0.09	0.59	0.39	0.12	0.60	0.87	0.32
Uniform Delay, d1		41.2			37.0	30.7	49.3	30.5	28.0	44.9	32.5	25.5
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		4.5			3.8	0.1	9.0	0.8	0.5	4.8	8.7	1.5
Delay (s)		45.6			40.9	30.8	58.3	31.3	28.5	49.7	41.2	27.0
Level of Service		D			D	C	E	C	C	D	DC	
Approach Delay (s)		45.6			39.1			32.6			39.6	
Approach LOS		D			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	38.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	106.6	Sum of lost time (s)	18.0
Intersection Capacity Utilization	75.8%	ICU Level of Service	D
Analysis Period (min)	15		

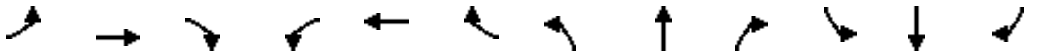
c Critical Lane Group

Intersection	
Intersection Delay, s/veh	44.4
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	164	56	413	117	1	39	1	445	3	1	0
Future Vol, veh/h	2	164	56	413	117	1	39	1	445	3	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	178	61	449	127	1	42	1	484	3	1	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	15	65.1	35.5	11.4
HCM LOS	B	F	E	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	8%	1%	78%	75%
Vol Thru, %	0%	74%	22%	25%
Vol Right, %	92%	25%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	485	222	531	4
LT Vol	39	2	413	3
Through Vol	1	164	117	1
RT Vol	445	56	1	0
Lane Flow Rate	527	241	577	4
Geometry Grp	1	1	1	1
Degree of Util (X)	0.865	0.446	1.009	0.01
Departure Headway (Hd)	5.905	6.66	6.296	8.274
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	612	538	577	435
Service Time	3.948	4.725	4.347	6.274
HCM Lane V/C Ratio	0.861	0.448	1	0.009
HCM Control Delay	35.5	15	65.1	11.4
HCM Lane LOS	E	B	F	B
HCM 95th-tile Q	9.8	2.3	15	0



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	192	350	53	106	228	118	56	824	171	30	496	146
Future Volume (vph)	192	350	53	106	228	118	56	824	171	30	496	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor		0.95			0.95	1.00	1.00	0.91	1.00	1.00	0.95	1.00
Frt		0.99			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98			0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3436			3484	1583	1770	5085	1583	1770	3539	1583
Flt Permitted		0.98			0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3436			3484	1583	1770	5085	1583	1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	209	380	58	115	248	128	61	896	186	33	539	159
RTOR Reduction (vph)	0	7	0	0	0	99	0	0	74	0	0	75
Lane Group Flow (vph)	0	640	0	0	363	29	61	896	112	33	539	84
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases						3			2			6
Actuated Green, G (s)		24.5			16.3	16.3	6.2	36.5	36.5	3.5	33.8	33.8
Effective Green, g (s)		24.5			16.3	16.3	6.2	36.5	36.5	3.5	33.8	33.8
Actuated g/C Ratio		0.25			0.16	0.16	0.06	0.37	0.37	0.04	0.34	0.34
Clearance Time (s)		4.5			4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		852			574	261	111	1878	584	62	1210	541
v/s Ratio Prot		c0.19			c0.10		c0.03	c0.18		0.02	0.15	
v/s Ratio Perm						0.02			0.07			0.05
v/c Ratio		0.75			0.63	0.11	0.55	0.48	0.19	0.53	0.45	0.16
Uniform Delay, d1		34.3			38.5	35.1	44.9	23.8	21.1	46.8	25.2	22.6
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		3.8			2.3	0.2	5.5	0.9	0.7	8.5	1.2	0.6
Delay (s)		38.1			40.7	35.3	50.4	24.7	21.9	55.4	26.4	23.2
Level of Service		D			D	D	D	C	C	E	C	C
Approach Delay (s)		38.1			39.3			25.6			27.0	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	30.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	98.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	61.4%	ICU Level of Service	B
Analysis Period (min)	15		

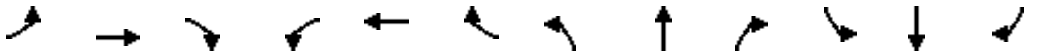
c Critical Lane Group

Intersection	
Intersection Delay, s/veh	16.3
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	143	72	305	100	2	42	0	318	1	0	0
Future Vol, veh/h	0	143	72	305	100	2	42	0	318	1	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	155	78	332	109	2	46	0	346	1	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	11.7	19.7	15.1	9.9
HCM LOS	B	C	C	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	12%	0%	75%	100%
Vol Thru, %	0%	67%	25%	0%
Vol Right, %	88%	33%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	360	215	407	1
LT Vol	42	0	305	1
Through Vol	0	143	100	0
RT Vol	318	72	2	0
Lane Flow Rate	391	234	442	1
Geometry Grp	1	1	1	1
Degree of Util (X)	0.57	0.359	0.682	0.002
Departure Headway (Hd)	5.24	5.531	5.546	6.784
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	685	647	650	523
Service Time	3.293	3.589	3.593	4.879
HCM Lane V/C Ratio	0.571	0.362	0.68	0.002
HCM Control Delay	15.1	11.7	19.7	9.9
HCM Lane LOS	C	B	C	A
HCM 95th-tile Q	3.6	1.6	5.3	0



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	122	234	71	307	288	124	51	531	146	110	988	218
Future Volume (vph)	122	234	71	307	288	124	51	531	146	110	988	218
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor		0.95			0.95	1.00	1.00	0.91	1.00	1.00	0.95	1.00
Frt		0.98			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99			0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3402			3450	1583	1770	5085	1583	1770	3539	1583
Flt Permitted		0.99			0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3402			3450	1583	1770	5085	1583	1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	133	254	77	334	313	135	55	577	159	120	1074	237
RTOR Reduction (vph)	0	15	0	0	0	101	0	0	105	0	0	62
Lane Group Flow (vph)	0	449	0	0	647	34	55	577	54	120	1074	175
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases						3			2			6
Actuated Green, G (s)		19.3			26.5	26.5	5.7	30.7	30.7	12.1	37.1	37.1
Effective Green, g (s)		19.3			26.5	26.5	5.7	30.7	30.7	12.1	37.1	37.1
Actuated g/C Ratio		0.18			0.25	0.25	0.05	0.29	0.29	0.11	0.35	0.35
Clearance Time (s)		4.5			4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		615			857	393	94	1464	455	200	1231	550
v/s Ratio Prot		c0.13			c0.19		0.03	0.11		c0.07	c0.30	
v/s Ratio Perm						0.02			0.03			0.11
v/c Ratio		0.73			0.75	0.09	0.59	0.39	0.12	0.60	0.87	0.32
Uniform Delay, d1		41.2			37.0	30.7	49.3	30.5	28.0	44.9	32.5	25.5
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		4.5			3.8	0.1	9.0	0.8	0.5	4.8	8.7	1.5
Delay (s)		45.6			40.9	30.8	58.3	31.3	28.5	49.7	41.2	27.0
Level of Service		D			D	C	E	C	C	D	DC	
Approach Delay (s)		45.6			39.1			32.6			39.6	
Approach LOS		D			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	38.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	106.6	Sum of lost time (s)	18.0
Intersection Capacity Utilization	75.8%	ICU Level of Service	D
Analysis Period (min)	15		

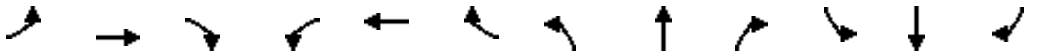
c Critical Lane Group

Intersection	
Intersection Delay, s/veh	55.8
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	164	56	413	117	1	39	1	445	3	1	0
Future Vol, veh/h	2	164	56	413	117	1	39	1	445	3	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	178	61	449	127	1	42	1	484	3	1	0
Number of Lanes	0	1	1	0	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	2
HCM Control Delay	13.5	95.1	32.6	12.2
HCM LOS	B	F	D	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	97%	0%	1%	0%	78%	75%
Vol Thru, %	3%	0%	99%	0%	22%	25%
Vol Right, %	0%	100%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	40	445	166	56	531	4
LT Vol	39	0	2	0	413	3
Through Vol	1	0	164	0	117	1
RT Vol	0	445	0	56	1	0
Lane Flow Rate	43	484	180	61	577	4
Geometry Grp	7	7	7	7	6	6
Degree of Util (X)	0.09	0.84	0.364	0.111	1.1	0.01
Departure Headway (Hd)	7.731	6.516	7.547	6.818	6.864	9.088
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	467	561	480	529	531	396
Service Time	5.431	4.216	5.247	4.518	4.917	7.088
HCM Lane V/C Ratio	0.092	0.863	0.375	0.115	1.087	0.01
HCM Control Delay	11.2	34.5	14.5	10.4	95.1	12.2
HCM Lane LOS	B	D	B	B	F	B
HCM 95th-tile Q	0.3	8.8	1.6	0.4	18.3	0



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	192	350	53	106	228	118	56	824	171	30	496	146
Future Volume (vph)	192	350	53	106	228	118	56	824	171	30	496	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor		1.00		1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.95	1.00
Frt		0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1811		1770	1863	1583	1770	5085	1583	1770	3539	1583
Flt Permitted		0.98		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1811		1770	1863	1583	1770	5085	1583	1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	209	380	58	115	248	128	61	896	186	33	539	159
RTOR Reduction (vph)	0	3	0	0	0	80	0	0	82	0	0	82
Lane Group Flow (vph)	0	644	0	115	248	48	61	896	104	33	539	77
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases						3			2			6
Actuated Green, G (s)		42.7		18.6	18.6	18.6	5.8	34.0	34.0	4.3	32.5	32.5
Effective Green, g (s)		42.7		18.6	18.6	18.6	5.8	34.0	34.0	4.3	32.5	32.5
Actuated g/C Ratio		0.36		0.16	0.16	0.16	0.05	0.29	0.29	0.04	0.28	0.28
Clearance Time (s)		4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		657		279	294	250	87	1470	457	64	978	437
v/s Ratio Prot		c0.36		0.06	c0.13		c0.03	c0.18		0.02	0.15	
v/s Ratio Perm						0.03			0.07			0.05
v/c Ratio		0.98		0.41	0.84	0.19	0.70	0.61	0.23	0.52	0.55	0.18
Uniform Delay, d1		37.0		44.6	48.1	43.0	55.0	36.1	31.8	55.6	36.3	32.4
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		29.7		1.0	19.3	0.4	22.5	1.9	1.2	6.9	2.2	0.9
Delay (s)		66.7		45.6	67.4	43.4	77.5	38.0	33.0	62.5	38.6	33.2
Level of Service		E		D	E	D	E	D	C	E	D	C
Approach Delay (s)		66.7			56.0			39.3			38.5	
Approach LOS		E			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	47.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	117.6	Sum of lost time (s)	18.0
Intersection Capacity Utilization	79.3%	ICU Level of Service	D
Analysis Period (min)	15		

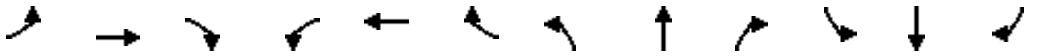
c Critical Lane Group

Intersection	
Intersection Delay, s/veh	18.9
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	143	72	305	100	2	42	0	318	1	0	0
Future Vol, veh/h	0	143	72	305	100	2	42	0	318	1	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	155	78	332	109	2	46	0	346	1	0	0
Number of Lanes	0	1	1	0	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	2
HCM Control Delay	10.8	26.6	15.1	10.7
HCM LOS	B	D	C	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	100%	0%	0%	0%	75%	100%
Vol Thru, %	0%	0%	100%	0%	25%	0%
Vol Right, %	0%	100%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	42	318	143	72	407	1
LT Vol	42	0	0	0	305	1
Through Vol	0	0	143	0	100	0
RT Vol	0	318	0	72	2	0
Lane Flow Rate	46	346	155	78	442	1
Geometry Grp	7	7	7	7	6	6
Degree of Util (X)	0.089	0.557	0.277	0.124	0.763	0.002
Departure Headway (Hd)	7.015	5.796	6.412	5.699	6.213	7.734
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	510	619	558	626	580	465
Service Time	4.772	3.552	4.173	3.46	4.26	5.734
HCM Lane V/C Ratio	0.09	0.559	0.278	0.125	0.762	0.002
HCM Control Delay	10.5	15.7	11.6	9.3	26.6	10.7
HCM Lane LOS	B	C	B	A	D	B
HCM 95th-tile Q	0.3	3.4	1.1	0.4	6.9	0



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	122	234	71	307	288	124	51	531	146	110	988	218
Future Volume (vph)	122	234	71	307	288	124	51	531	146	110	988	218
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor		1.00			0.95	1.00	1.00	0.91	1.00	1.00	0.95	1.00
Frt		0.98			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99			0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1795			3450	1583	1770	5085	1583	1770	3539	1583
Flt Permitted		0.99			0.97	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1795			3450	1583	1770	5085	1583	1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	133	254	77	334	313	135	55	577	159	120	1074	237
RTOR Reduction (vph)	0	6	0	0	0	108	0	0	110	0	0	63
Lane Group Flow (vph)	0	458	0	0	647	27	55	577	49	120	1074	174
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases						3			2			6
Actuated Green, G (s)		31.3			24.1	24.1	5.9	32.7	32.7	12.7	39.5	39.5
Effective Green, g (s)		31.3			24.1	24.1	5.9	32.7	32.7	12.7	39.5	39.5
Actuated g/C Ratio		0.26			0.20	0.20	0.05	0.28	0.28	0.11	0.33	0.33
Clearance Time (s)		4.5			4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		472			699	321	87	1399	435	189	1176	526
v/s Ratio Prot		c0.26			c0.19		0.03	0.11		c0.07	c0.30	
v/s Ratio Perm						0.02			0.03			0.11
v/c Ratio		0.97			0.93	0.09	0.63	0.41	0.11	0.63	0.91	0.33
Uniform Delay, d1		43.3			46.5	38.4	55.4	35.2	32.2	50.8	38.0	29.7
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		33.7			18.1	0.1	14.0	0.9	0.5	6.8	12.3	1.7
Delay (s)		77.0			64.6	38.5	69.4	36.1	32.7	57.6	50.3	31.4
Level of Service		E			E	D	E	D	C	E	D	C
Approach Delay (s)		77.0			60.1			37.7			47.8	
Approach LOS		E			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	52.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	118.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	86.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	32.7
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	164	56	413	117	1	39	1	445	3	1	0
Future Vol, veh/h	2	164	56	413	117	1	39	1	445	3	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	178	61	449	127	1	42	1	484	3	1	0
Number of Lanes	0	1	1	1	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	2	2
HCM Control Delay	13.4	40.4	33.3	11.8
HCM LOS	B	E	D	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	97%	0%	1%	0%	100%	0%	75%
Vol Thru, %	3%	0%	99%	0%	0%	99%	25%
Vol Right, %	0%	100%	0%	100%	0%	1%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	40	445	166	56	413	118	4
LT Vol	39	0	2	0	413	0	3
Through Vol	1	0	164	0	0	117	1
RT Vol	0	445	0	56	0	1	0
Lane Flow Rate	43	484	180	61	449	128	4
Geometry Grp	7	7	7	7	7	7	6
Degree of Util (X)	0.091	0.852	0.372	0.113	0.912	0.242	0.01
Departure Headway (Hd)	7.548	6.34	7.431	6.703	7.313	6.796	8.631
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	476	576	484	534	498	530	414
Service Time	5.269	4.061	5.178	4.45	5.043	4.526	6.697
HCM Lane V/C Ratio	0.09	0.84	0.372	0.114	0.902	0.242	0.01
HCM Control Delay	11	35.3	14.5	10.3	48.6	11.7	11.8
HCM Lane LOS	B	E	B	B	E	B	B
HCM 95th-tile Q	0.3	9.2	1.7	0.4	10.5	0.9	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	192	350	53	106	228	118	56	824	171	30	496	146
Future Volume (vph)	192	350	53	106	228	118	56	824	171	30	496	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor		1.00		1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.95	1.00
Frt		0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1811		1770	1863	1583	1770	5085	1583	1770	3539	1583
Flt Permitted		0.98		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1811		1770	1863	1583	1770	5085	1583	1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	209	380	58	115	248	128	61	896	186	33	539	159
RTOR Reduction (vph)	0	3	0	0	0	80	0	0	82	0	0	82
Lane Group Flow (vph)	0	644	0	115	248	48	61	896	104	33	539	77
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases						3			2			6
Actuated Green, G (s)		42.7		18.6	18.6	18.6	5.8	34.0	34.0	4.3	32.5	32.5
Effective Green, g (s)		42.7		18.6	18.6	18.6	5.8	34.0	34.0	4.3	32.5	32.5
Actuated g/C Ratio		0.36		0.16	0.16	0.16	0.05	0.29	0.29	0.04	0.28	0.28
Clearance Time (s)		4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		657		279	294	250	87	1470	457	64	978	437
v/s Ratio Prot		c0.36		0.06	c0.13		c0.03	c0.18		0.02	0.15	
v/s Ratio Perm						0.03			0.07			0.05
v/c Ratio		0.98		0.41	0.84	0.19	0.70	0.61	0.23	0.52	0.55	0.18
Uniform Delay, d1		37.0		44.6	48.1	43.0	55.0	36.1	31.8	55.6	36.3	32.4
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		29.7		1.0	19.3	0.4	22.5	1.9	1.2	6.9	2.2	0.9
Delay (s)		66.7		45.6	67.4	43.4	77.5	38.0	33.0	62.5	38.6	33.2
Level of Service		E		D	E	D	E	D	C	E	D	C
Approach Delay (s)		66.7			56.0			39.3			38.5	
Approach LOS		E			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	47.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	117.6	Sum of lost time (s)	18.0
Intersection Capacity Utilization	79.3%	ICU Level of Service	D
Analysis Period (min)	15		

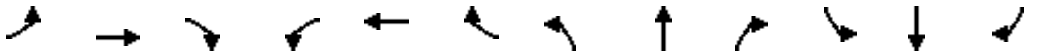
c Critical Lane Group

Intersection	
Intersection Delay, s/veh	14.6
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	143	72	305	100	2	42	0	318	1	0	0
Future Vol, veh/h	0	143	72	305	100	2	42	0	318	1	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	155	78	332	109	2	46	0	346	1	0	0
Number of Lanes	0	1	1	1	1	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	2	2
HCM Control Delay	10.8	16.7	14.6	10.5
HCM LOS	B	C	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	100%	0%	0%	0%	100%	0%	100%
Vol Thru, %	0%	0%	100%	0%	0%	98%	0%
Vol Right, %	0%	100%	0%	100%	0%	2%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	42	318	143	72	305	102	1
LT Vol	42	0	0	0	305	0	1
Through Vol	0	0	143	0	0	100	0
RT Vol	0	318	0	72	0	2	0
Lane Flow Rate	46	346	155	78	332	111	1
Geometry Grp	7	7	7	7	7	7	6
Degree of Util (X)	0.088	0.548	0.276	0.123	0.604	0.186	0.002
Departure Headway (Hd)	6.924	5.709	6.391	5.678	6.559	6.038	7.425
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	517	629	561	629	550	593	480
Service Time	4.672	3.457	4.144	3.431	4.302	3.781	5.505
HCM Lane V/C Ratio	0.089	0.55	0.276	0.124	0.604	0.187	0.002
HCM Control Delay	10.3	15.2	11.6	9.2	18.9	10.2	10.5
HCM Lane LOS	B	C	B	A	C	B	B
HCM 95th-tile Q	0.3	3.3	1.1	0.4	4	0.7	0



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	122	234	71	307	288	124	51	531	146	110	988	218
Future Volume (vph)	122	234	71	307	288	124	51	531	146	110	988	218
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor		1.00		1.00	1.00	1.00	1.00	0.91	1.00	1.00	0.95	1.00
Frt		0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1795		1770	1863	1583	1770	5085	1583	1770	3539	1583
Flt Permitted		0.99		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1795		1770	1863	1583	1770	5085	1583	1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	133	254	77	334	313	135	55	577	159	120	1074	237
RTOR Reduction (vph)	0	6	0	0	0	108	0	0	110	0	0	63
Lane Group Flow (vph)	0	458	0	334	313	27	55	577	49	120	1074	174
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases						3			2			6
Actuated Green, G (s)		31.3		23.8	23.8	23.8	5.9	32.8	32.8	12.7	39.6	39.6
Effective Green, g (s)		31.3		23.8	23.8	23.8	5.9	32.8	32.8	12.7	39.6	39.6
Actuated g/C Ratio		0.26		0.20	0.20	0.20	0.05	0.28	0.28	0.11	0.33	0.33
Clearance Time (s)		4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		473		355	373	317	88	1406	437	189	1181	528
v/s Ratio Prot		c0.26		c0.19	0.17		0.03	0.11		c0.07	c0.30	
v/s Ratio Perm						0.02			0.03			0.11
v/c Ratio		0.97		0.94	0.84	0.09	0.62	0.41	0.11	0.63	0.91	0.33
Uniform Delay, d1		43.2		46.7	45.6	38.5	55.3	35.0	32.0	50.7	37.8	29.6
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		32.9		32.7	15.2	0.1	13.0	0.9	0.5	6.8	11.9	1.7
Delay (s)		76.1		79.4	60.7	38.7	68.3	35.9	32.5	57.5	49.6	31.2
Level of Service		E		E	E	D	E	D	C	E	D	C
Approach Delay (s)		76.1			64.9			37.5			47.2	
Approach LOS		E			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	52.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	118.6	Sum of lost time (s)	18.0
Intersection Capacity Utilization	86.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Appendix C-2

Traffic Analysis Miramar Pipeline Relocation Encroachment 3 Study (2019)

Traffic Analysis

Miramar Pipeline Relocation Encroachment 3 Study

San Diego, CA

January 2019

Prepared for:

HELIX Environmental Planning, Inc.

Prepared by:

Kimley»Horn

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Appendices

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1 INTRODUCTION

This document analyzes traffic and circulation impacts of planned construction activities associated with the DESC1906 MILCON Encroachment 3 project. This project involves the relocation of a segment of the Navy's fuel pipeline from the Church of Jesus Christ of Latter-day Saints property and other private residential properties into City of San Diego public right-of-way. There will not be long-term traffic and circulation impacts, as street geometry will be restored to existing conditions after construction is complete. Construction will result in short-term disturbance of existing roadways, including lane closures and access modification. This analysis documents the effects of those construction activities on traffic and circulation.

This traffic analysis is a precursor to a traffic control plan for the project. The traffic control plan will include detailed routing, lane closure, and warning signage placement information. This traffic analysis provides recommendations on roadway geometric modifications during construction that should be incorporated into the traffic control plan. This document establishes ways to segment the construction activities to minimize traffic flow disruption while not impeding construction feasibility. This document also identifies potential temporary effects on pedestrian and vehicular traffic circulation associated with project construction.

During the design phase, a traffic control plan will be produced to define traffic control parameters for roadway configuration and operations during construction. The goal of this traffic analysis is to identify concept level ways to reduce impacts to the local community, especially along Mount Abernathy Avenue, Printwood Way, and Cannington Drive, while maintaining standard traffic control geometries and operations during construction. Subsequent detailed traffic control plans, generated during the design phase, may consider alternate means to reduce construction effects compared to the recommendations presented in this analysis.

1.1 PROJECT LOCATION

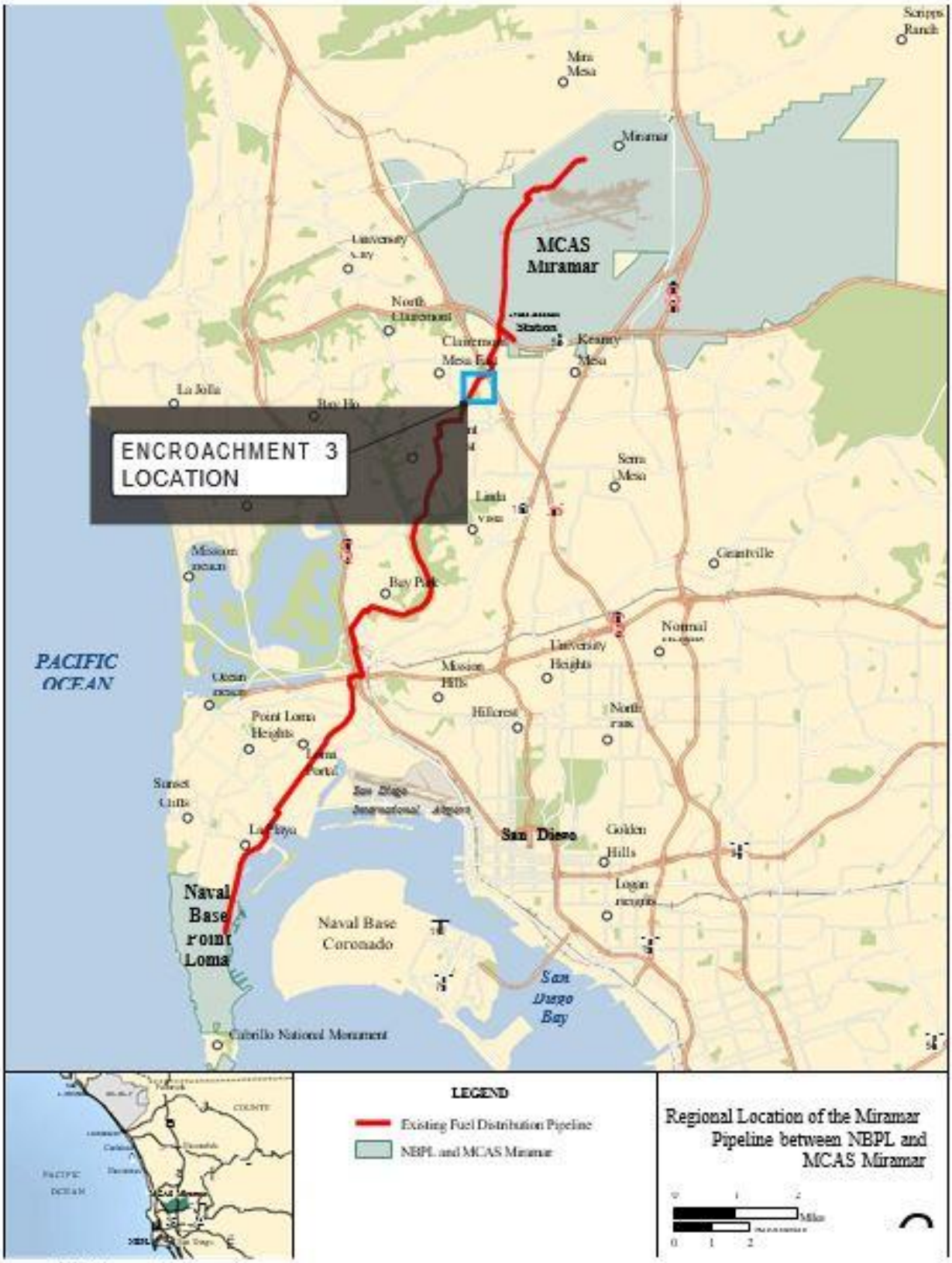
The project involves relocating a section of pipeline within the Church of Jesus Christ of Latter-day Saints property and other private residential properties into the City of San Diego public right-of-way. The project is located in the Clairemont Mesa community within the City of San Diego as shown in **Figure 1-1**. The community of Clairemont Mesa is situated between I-5 and I-805, and bounded by SR-52 to the north and the Linda Vista community to the south. The church is located on the east side of Mount Abernathy Avenue, between Lana Drive and Redbrook Road. Major nearby roadways include Balboa Avenue to the south and Clairemont Mesa Boulevard to the north.

1.2 PURPOSE OF AND NEED FOR THE PROJECT

The purpose of the project is to remedy the acute challenges to the long-term viability of the Miramar Pipeline which equates to making the necessary changes associated within the pipeline easement where encroachments exist that create operational and maintenance encumbrances. See **Figure 1-2** for illustration of the existing pipeline alignment running across the church and private residence properties.

1.3 PROJECT ALIGNMENT

The Proposed Action is to relocate the pipeline within the City of San Diego public right-of-way along the north side of Printwood Way, and the west side of Cannington Drive. This alignment is approximately 1,200 feet within the roadway along Printwood Way and approximately 1,400 feet within the roadway along Cannington Drive. The pipeline alignment also runs into the Mount Abernathy Avenue intersection at Printwood Way. See **Figure 1-3** for illustration of the proposed alignment. Pipeline relocation would be coordinated with the City of San Diego as necessary.



Source: Cardno TEC, 2014

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FIGURE 1-1
PROJECT VICINITY MAP

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FIGURE 1-2
EXISTING PIPELINE ALIGNMENT

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FIGURE 1-3
PROPOSED PIPELINE ALIGNMENT

2 ANALYSIS METHODOLOGY

This traffic analysis document examines the impacts associated with construction of the project. This document relies upon pipeline alignment information prepared by Enterprise Engineering, Inc., and traffic counts performed as part of this traffic study.

The project is located within the City of San Diego right-of-way and will adhere to City of San Diego standards for public works construction. Standards and regulations governing the implementation of the project include the City of San Diego Municipal Code, Land Development Code, and Standard Specifications and Drawings for Public Works Construction, and the California Manual on Uniform Traffic Control Devices. The City of San Diego Traffic Impact Study Manual (July 1998) was referenced when completing the traffic analysis for this project. However, the nature of the project is unique. The project will not result in additional trips on the roadway network, nor modify the permanent geometry of the roadway. All impacts associated with the project will be temporary. Since there are no permanent or long-term impacts and the project does not generate any new trips, the City of San Diego's standard thresholds for significance for transportation, circulation and parking do not apply. The Traffic Impact Study Manual was therefore utilized for roadway capacity thresholds only.

The project will temporarily affect local access, circulation and parking. This document seeks to determine the temporary effects associated with construction and recommend construction practices to limit those effects. Methods to limit the effects include specifying segments of construction, specifying hours of construction, temporary modifications to roadway geometrics, and detour routes specific to the project.

The project will adhere to City standards that restrict the linear extent of open trench to no more than 500 feet in length. Thus, the project will need to be constructed in 500 foot or less segments. By identifying optimal segment breaks, the circulation detriments associated with open trenching can be reduced. The effects on cul-de-sacs with single access points can be lessened by closing one half of the intersection at a time.

This study recommends where and when lane closures may be applied to reduce the number of vehicles impacted and limit the resulting congestion. To inform this effort, hourly traffic volumes for a 24-hour period were collected at three locations on or near the proposed project alignment. These traffic counts were conducted in October 2018. The raw count data is provided in **Appendix A**. The City's roadway capacity thresholds were compared to the hourly volumes on the roadway to assist in determining appropriate time and segment restrictions. At the beginning and end of each construction period, the open trench will be covered with metal plates and the roadway geometry restored to existing conditions. This will serve to limit effects to circulation, access and congestion during non-construction times.

Trenching for the project will be a four-foot wide open trench maximum. The City of San Diego requires roadway resurfacing that extends beyond the excavated area. This roadway resurfacing footprint defines the anticipated width of the construction zone. The project runs along Printwood Way and Cannington Drive, both residential streets, and impacts a small portion of Mount Abernathy Avenue, which is also classified as a residential street at this location. **Table 1** below indicates the construction width outside of the trench area.

Table 1 – Roadway Work Zone Areas

Street Classification	Width Beyond Excavated Area (ft.)
Arterial Streets	62 inches
Major Streets	71 inches
Collector Streets	82 inches
Residential Streets	**74 inches**

As shown in the above table, the work zone will extend 8 feet 2 inches from the pipe centerline on both streets (2 foot trench plus 6 foot 2 inch resurfacing area). Thus, the project construction will affect at least one lane of traffic, resulting in lane shifts or partial closures for the other direction of traffic.

The width of the construction zone and its effect on traffic lanes was analyzed in conjunction with existing roadway volumes. An optimal roadway configuration was developed to minimize reduction in circulation and connectivity of the roadways where the pipeline will necessitate lane closures. These proposed roadway geometrics will be further developed and defined in the Traffic Control Plans produced during the design phase of the project.

Detour routes are recommended where necessitated through partial closures of one direction of traffic. These detour routes are identified to shift circulation patterns to roadways with sufficient additional capacity. Signage for the detour routes will be identified in the Traffic Control Plans.

3 EXISTING CONDITIONS

The project is planned to result in construction along Printwood Way, Cannington Drive, and a small portion of Mount Abernathy Avenue. Descriptions of current conditions along those roadways are discussed below. Street classifications were obtained from the Clairemont Mesa Community Plan (April 2011).

Printwood Way, Cannington Drive, and Mount Abernathy Avenue north of Chandler Drive, are all two-lane residential streets with parking permitted along both sides. Sidewalks are provided on both sides of the three study roadways, and all roadways have a speed limit of 25 mph.

The Reformation Lutheran Church and School is located on the west side of the Mount Abernathy Avenue and Printwood Way intersection, and the driveway for the property is located just south of the intersection. Lafayette Elementary School is located along the south side of Printwood Way, while the north side of Printwood Way is fronted by driveways for residential homes. Cannington Drive within the study area is also fronted with residential driveways on both sides of the roadway. Madison High School is located west of Mount Abernathy Avenue north of the study area. A majority of parking lot and circulation driveways for Madison High School are located on the west and north sides of the school campus rather than on Mount Abernathy Avenue.

Mount Abernathy Avenue north of Printwood Way carries approximately 2,200 vehicles per day, Printwood Way east of Mount Abernathy Avenue carries approximately 850 vehicles per day, and Cannington Drive north of Printwood Way carries approximately 1,100 vehicles per day.

4 DISCUSSION OF EFFECTS

The new Miramar Pipeline segment is planned to be installed within the travel lanes of Mount Abernathy Avenue, Printwood Way, and Cannington Drive. In order to construct the new pipeline, the existing road surface will need to be demolished, and a trench dug to place the pipeline. The trench will need to be filled and the roadway resurfaced. While the trench can be covered with plates during portions of the work period, the excavation of the trench and pavement reconstruction will necessitate the temporary closure of travel lanes and preclude access to adjacent driveways during construction activities. With the City of San Diego restriction on the consecutive linear feet of roadway that can be excavated at any one time, the number of driveways and on-street parking spaces affected at any one time will be limited to 500' segments.

During construction, effects of the project will be short-term in nature and limited to the duration of the construction activities, which are anticipated to be a matter of a few, possibly non-consecutive, days. Once construction of the pipeline is complete, the construction area will be resurfaced and the geometry will be restored to existing conditions, with portions of the roadway resurfaced. Thus, the long-term effects of the project will be positive in nature, as the roadway surface within the influence area of the trench will be reconstructed.

During construction of the pipeline, driveway access to the roadways will be temporarily impacted. The use of some driveways will not be feasible until the trench can be covered or resurfacing is complete. All properties that will be affected are single family dwelling units that do not have alternative access to their homes.

Construction activity is planned to occur during daytime hours. Following completion of the work activity for the day, the trench will be plated, and traffic control removed. This will restore access to blocked driveways and will restore roadway capacity. Therefore, impacts will only be during daytime hours.

Construction of the pipeline will result in a number of temporary traffic effects, including:

- Reducing access to properties by precluding driveway access;
- Inhibiting access to roadways, requiring directional detours to nearby streets;
- Reduction in roadway capacity; and
- Reduction in on-street parking.

Due to the temporary and short-term nature of the effects, project impacts are considered not significant. To reduce the effects of the project, special conservation measures (SCMs) have been identified. These SCMs will be implemented to reduce the severity of the short-term impacts and reduce, but not eliminate, the resulting inconvenience to adjacent residents, schools, businesses and affected commute trips.

4.1 RECOMMENDED CONSTRUCTION PHASING AND MODIFICATIONS TO GEOMETRY

Proposed construction phases and roadway geometrics were developed based on the location of the new pipeline, the required work area, existing roadway geometrics, and existing roadway

volumes. The recommended geometrics attempt to limit the magnitude of congestion and access impacts, given the required parameters of the pipeline construction. These geometrics are encompassed in a SCM that serves to reduce the magnitude of effect on vehicle and bicycle circulation:

SCM 1. Through the use of traffic control, modify existing roadway geometrics to best maintain vehicular access and provide capacity during the construction period within the available roadway right-of-way.

Construction of the pipeline is proposed to occur in the following nine phases with the following restrictions or capacity reductions:

1. West side of Mount Abernathy Avenue at Printwood Way intersection.
    - Shift northbound and southbound Mount Abernathy Avenue travel lanes east.
    - Restrict parking on both sides of Mount Abernathy Avenue as far as necessary to accommodate the work area and shifting tapers approaching the work area.
2. North side of Printwood Way from within the Mount Abernathy Avenue intersection and up to approximately 200' east of the intersection.
    - Shift southbound Mount Abernathy Avenue travel lane west into existing parking lane.
    - Detour northbound Mount Abernathy Avenue to Printwood Way, Printwood Court, and Redbrook Road.
    - Restrict parking on both sides of Mount Abernathy Avenue as far as necessary to accommodate the work area and shifting tapers approaching the work area.
    - Implement one-way travel going eastbound on Printwood Way.
    - Detour westbound Printwood Way traffic to Printwood Court and Redbrook Road.
    - Restrict parking on both sides of Printwood Way.
    - Restrict access to residential driveways on north side of Printwood Way.
3. North side of Printwood Way from approximately 200' east of Mount Abernathy Avenue to west side of Printwood Court intersection.
    - Implement one-way travel going eastbound on Printwood Way.
    - Detour westbound Printwood Way traffic to Printwood Court and Redbrook Road.
    - Restrict parking on both sides of Printwood Way.
    - Restrict access to residential driveways on north side of Printwood Way.

4. North side of Printwood Way from west side of Printwood Court intersection to west side of Cannington Drive intersection.

    - Implement a one-lane two-way travel lane on the south side of Printwood Way.
    - Restrict parking on both sides of Printwood Way.
    - Restrict access to residential driveways on north side of Printwood Way.
    - Close north side of Printwood Way and Printwood Court intersection. Detour westbound right turns at this intersection to Mount Abernathy Avenue and Redbrook Road.

5. Northwest corner of Printwood Way and Cannington Drive intersection

    - Implement a one-lane two-way travel lane on the north and west legs of the intersection.
    - Install temporary limit lines set back at least 50′ from work area to accommodate two-way travel on north and west legs.
    - Restrict parking on both sides of Printwood Way and Cannington Drive as far as necessary to accommodate the work area and temporary lane shifts.

6. West side of Cannington Drive from north side Printwood Way intersection to middle of Hannon Court intersection

    - Implement a one-lane two-way travel lane on east side of Cannington Drive
    - Restrict parking on both sides of Cannington Drive.
    - Restrict access to residential driveways on west side of Cannington Drive.

7. West side of Cannington Drive from middle of Hannon Court to approximately 500′ north of Hannon Court

    - Implement a one-lane two-way travel lane on east side of Cannington Drive
    - Restrict parking on both sides of Cannington Drive.
    - Restrict access to residential driveways on west side of Cannington Drive.

8. West side of Cannington Drive from approximately 500′ north of Hannon Court to middle of Liebel Court

    - Shift northbound and southbound travel lanes to the east side of Cannington Drive.
    - Restrict parking on both sides of Cannington Drive.
    - Restrict access to residential driveways on west side of Cannington Drive.

9. West side of Cannington Drive from middle of Hannon court to existing pipeline tie-in location approximately 300′ north of Liebel Court intersection

    - Shift northbound and southbound travel lanes to the east side of Cannington Drive.
    - Restrict parking on both sides of Cannington Drive.
    - Restrict access to residential driveways on west side of Cannington Drive.

The proposed traffic handling during the construction of each segment is illustrated in **Figure 4-1.** This exhibit summarizes recommendations on the extents of the construction segments and considerations to limit effects on access and circulation. This exhibit will be considered as a basis of design for preparing traffic control plans and for use by the contractor during construction.

4.2 REDUCTIONS IN ACCESS

With the City of San Diego restriction on the consecutive linear feet of roadway that can be excavated at any one time, the number of driveways and on-street parking spaces affected at any one time will be limited.

The northern side of Printwood Way and the western side of Cannington Drive where the proposed pipeline alignment is located are fronted with single-family residential driveways. During the active construction period, on-street parking and vehicle access to driveways will be precluded. To minimize the effects construction of the pipeline will have on access to the driveways, the following SCMs are proposed:

SCM 2. Notify residents and businesses of upcoming road work and preclusion of access to their driveways.

SCM 3. Minimize the duration which access is precluded by adhering to the City-standard maximum open trench length of 500 feet.

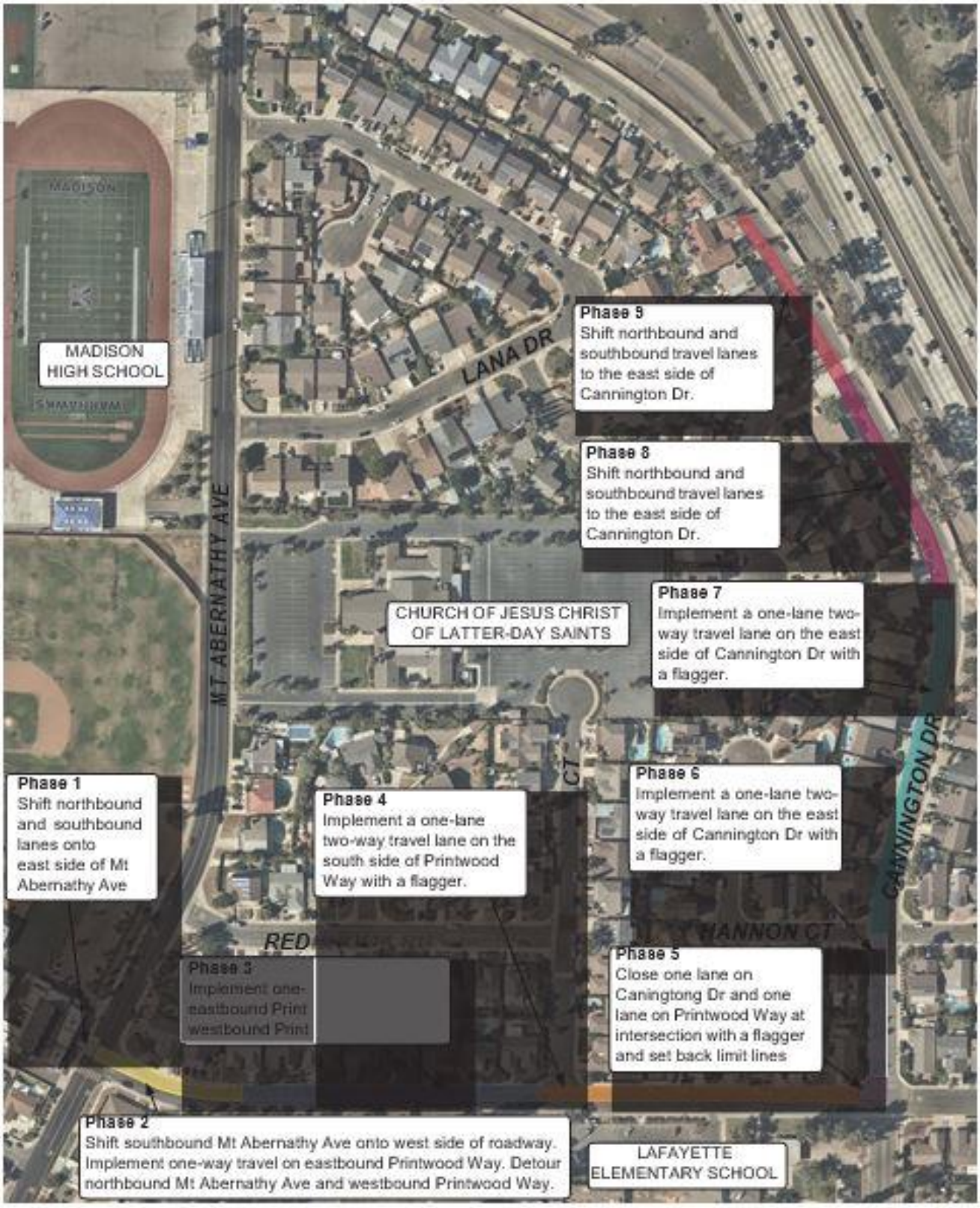
Access to Lafayette Elementary School and the Reformation Lutheran Church and School is assumed to be maintained, but with turn restrictions in and out of the driveways.

SCM 4. Notify schools of the upcoming road work and turn restrictions related to various phases of construction.

4.3 INTERSECTION MODIFICATIONS ASSOCIATED WITH CONSTRUCTION

Construction of the pipeline along Printwood Way across Mount Abernathy Avenue will result in shifting lanes on Mount Abernathy Avenue to either the east or west side during Phases 1 and 2. During Phase 1, the northbound and southbound lanes on Mount Abernathy Avenue will be shifted east as construction of the pipeline on the west side of the intersection occurs. The work zone will extend only about halfway into the existing southbound lane.

During Phase 2 of construction, northbound Mount Abernathy Avenue will be detoured as discussed in Section 4.4, and the southbound direction of traffic will be shifted to the east side of the intersection around the work zone.



Kimley»Horn

FIGURE 4-1
PIPELINE CONSTRUCTION PHASING

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In addition to modifying roadway geometrics to best serve traffic during construction, it is recommended to provide a flagger to control traffic flow at this location to counteract the intersection modifications. This recommendation is encompassed with the following SCM:

SCM 5. A flagger should be provided to control traffic at the intersection of Mount Abernathy Avenue and Printwood Way during peak hours of construction Phases 1 and 2. The flagger would be able to control traffic flow instead of relying on the existing stop-control interaction and help mitigate vehicle delays.

During Phase 5 of construction, the northwest quadrant of the Printwood Way and Cannington Drive intersection will be under construction. A one-lane two-way travel lane will be implemented on the north and west approaches of the intersection. In order to accommodate the two-way operation at each of these legs, temporary limit lines will need to be set back from the intersection. In addition to installing temporary setback limit lines, it is recommended to provide a flagger to control traffic flow at this intersection. This recommendation is encompassed with the following SCM:

SCM 6. At least one flagger should be provided to control traffic at the intersection of Printwood Way and Cannington Drive during construction of Phase 4. The flagger would be able to control traffic flow, enforce the limit line setback, and help mitigate vehicle delays.

4.4 ROADWAY CLOSURE TIMES

The work area will be limited to the envelope of the trench area and the influence area needed for staging and required for resurfacing. Due to the alignment of the pipeline within the road bed, the minimum excavation area, and necessary traffic control devices, two lanes of travel cannot be accommodated within the existing roadway along Printwood Way and along a majority of Cannington Drive. On the north end of the Cannington Drive alignment, the pipeline will be constructed close enough to the western curbline that two lanes of travel can be accommodated within the remaining roadway width.

Roadway segments that will require temporary closure of one direction of traffic will be detoured to alternate routes. During Phases 2 and 3 of construction, Printwood Way will become a one-way roadway in the eastbound direction. Northbound Mount Abernathy Avenue (Phase 2 only) and westbound Printwood Way (Phases 2 and 3) will be detoured to eastbound Printwood Way, northbound Printwood Court, and westbound Redbrook Road, as shown in **Figure 4-2**.

Traffic volumes for Mount Abernathy Avenue and Printwood Way are shown in **Figure 4-3** and **Figure 4-4** respectively. Traffic volumes are low, especially on Printwood Way, and are primarily associated with residential and school traffic. It is evident that school traffic dictates the peak hours of 7:00 – 9:00AM and 2:00 – 3:00PM. As a result, time restrictions should be placed on construction in this area if construction is to occur during a time when school is in session. In order to reduce the magnitude of effects, the following SCM is proposed:

SCM 7. Restrict construction hours on Mount Abernathy Avenue and Printwood Way from occurring between 7:00 – 9:00AM and 2:00 – 3:00PM , or perform construction activities while school is not in session.

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FIGURE 4-2
PROPOSED DETOUR ROUTE FOR PHASES 2 AND 3

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Figure 4-3: Hourly Traffic Volumes: Mt Abernathy Ave (Printwood Way to Cannington Dr)

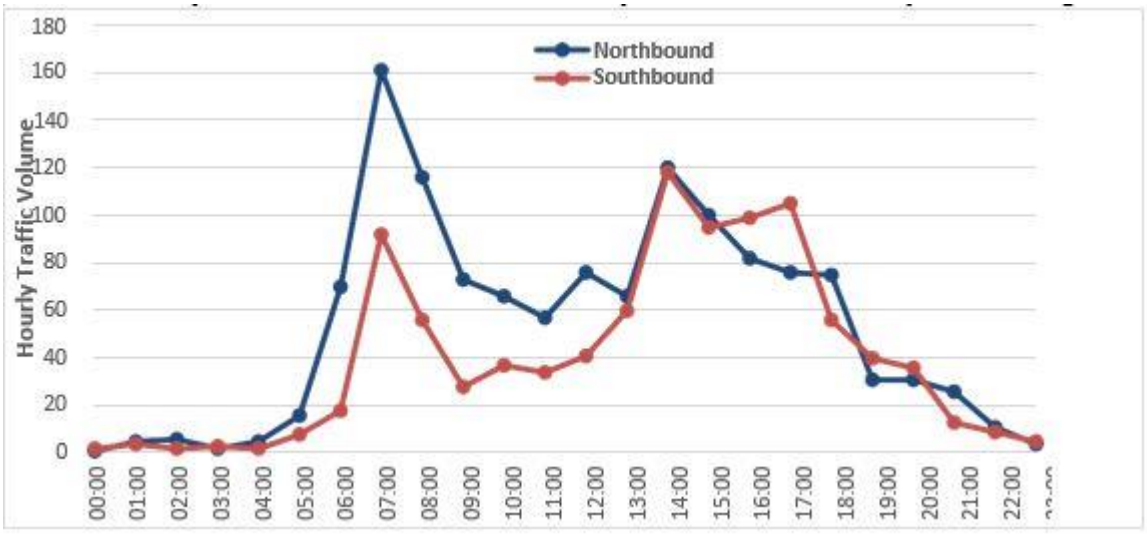
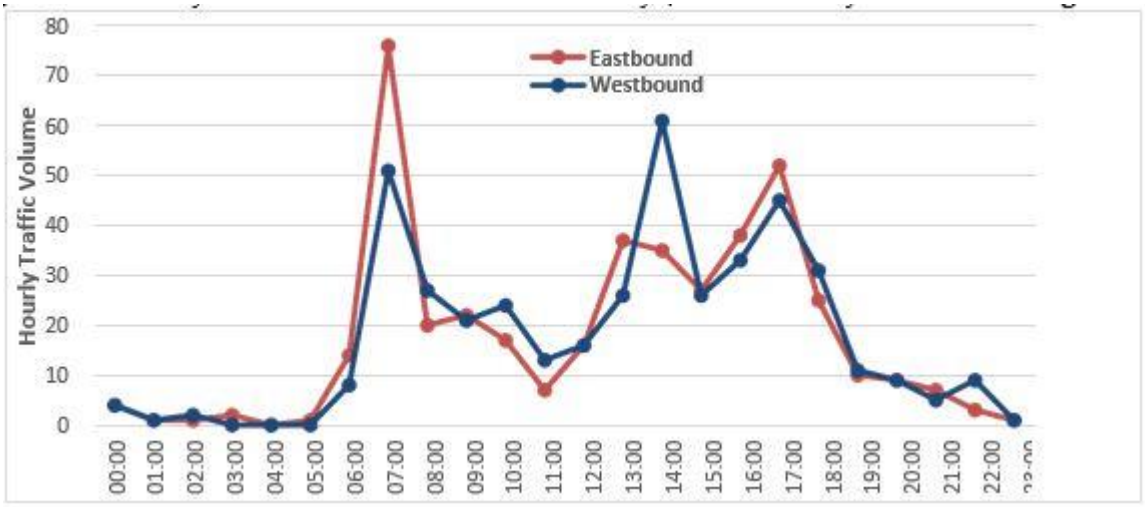


Figure 4-4: Hourly Traffic Volumes: Printwood Way (Mt Abernathy Ave to Cannington Dr)



During Phases 4, 6, and 7 of construction, Printwood Way between Printwood Court and Cannington Drive, and Cannington Drive between Printwood Way and approximately 500' north of Hannon Court will become a one-lane two-way roadway. During this time a flagger is necessary for allowing each direction of travel to navigate through the work zone. Additionally, during Phase 4, the north half of the Printwood Way and Printwood Court intersection will be closed. Westbound left turns from Printwood Way to Printwood Court will be detoured to Mount Abernathy Avenue and Redbrook Road as shown in **Figure 4-5**.

As previously discussed Printwood Way traffic volumes are heavily dictated by school traffic for Lafayette Elementary School. Therefore, in order to reduce the magnitude of construction impacts, it is recommended to minimize construction hours to avoid construction between 7:00 – 9:00AM and 2:00 – 3:00PM , or perform construction activities while school is not in session (SCM7).

Traffic volumes on Cannington Drive, shown in **Figure 4-6** are low, and therefore do not necessitate any limitations on the hours of construction.

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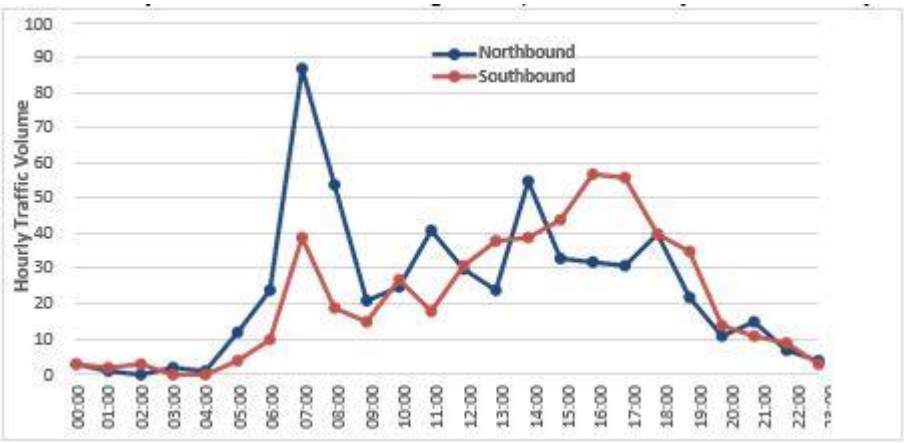
FIGURE 4-5
PROPOSED DETOUR ROUTE FOR PHASE4

Figure 4-6: Hourly Traffic Volumes: Cannington Dr (Printwood Way to Mt Abernathy Ave)



4.5 MODIFICATIONS TO PEDESTRIAN FACILITIES

Pedestrian facilities are not anticipated to be affected by construction. Sidewalks should remain open and accessible during construction. School crossings along Printwood Way at Printwood Court and Cannington Drive will not be affected by construction due to SCM 7.

4.6 MODIFICATIONS TO BICYCLE FACILITIES

Bicycle facilities are not provided on Mount Abernathy Avenue, Printwood Way, or Cannington Drive within the vicinity of the project and therefore do not need to be modified. Lane widths during construction should be maintained at 14-feet when feasible to allow for bicyclists to share a lane with a vehicle if needed.

4.7 MODIFICATIONS TO PARKING FACILITIES

On-street parking is provided along both sides of Mount Abernathy Avenue, Printwood Way, and Cannington Drive. The on-street parking in this area generally serves the adjacent school and residential uses. Parking will be restricted on all roadways where pipeline construction will occur. All surrounding residential land uses have parking spaces or lots and other roadways in the area also allow on-street parking, therefore parking does not need to be mitigated. However, the following SCM should be considered:

SCM 8. Notify residents and surrounding land uses of upcoming loss of on-street parking prior to beginning construction.

4.8 MODIFICATIONS TO TRANSIT FACILITIES

Mount Abernathy Avenue, Printwood Way, and Cannington Drive do not service transit within the vicinity of this project. Therefore, transit facilities do not need to be modified during construction.

5 SUMMARY OF FINDINGS

5.1 SUMMARY OF IMPACTS

Construction of the project will result in temporary restrictions to residential access, temporary turn restrictions at intersections temporary on-street parking restrictions, and partial roadway closures with detours. Effects will be very short in duration, ranging from one to a few days for each phase, and thus are not considered significant impacts. No long-term impacts will be experienced. Once construction of the project is complete, the roadway will be returned to its current configuration, with portions of the corridor being reconstructed.

The new pipeline will be constructed along Printwood Way, Cannington Drive and a portion of the Mount Abernathy Avenue intersection, all of which are City of San Diego residential roadways. Due to construction of the pipeline, linear swaths of roadways along the alignment will be temporarily closed during trenching and roadway re-surfacing. The new pipeline will primarily be located near the roadway curb line.

To minimize the project effect on access, the following SCM should be considered:

SCM 1. Through the use of traffic control, modify existing roadway geometrics to best maintain vehicular access and provide capacity during the construction period within the available roadway right-of-way.

Trenching construction for the pipeline and roadway resurfacing will result in the temporary closure of driveways for the single-family residential driveways on the north side of Printwood Way and the west side of Cannington Drive during construction. Circulation patterns and access driveways for nearby schools including Lafayette Elementary School and the Reformation Lutheran Church and School may be impacted as well. The following SCMs should be considered:

SCM 2. Notify residents and businesses of upcoming road work and preclusion of access to their driveways

SCM 3. Minimize the duration which access is precluded by adhering to the City-standard maximum open trench length of 500 feet.

SCM 4. Notify schools of the upcoming road work and turn restrictions related to various phases of construction.

Construction will result in lane shifts, partial roadway closures, and one-lane two-way traffic operations on all three roadways impacted by construction. This will result in some increased congestion along the work area and may result in some natural detours to nearby streets. The partial roadway closures will also require signed detours.

To minimize the project effect on circulation and congestion, the following SCMs should be considered:

SCM 5. A flagger should be provided to control traffic at the intersection of Mount Abernathy Avenue and Printwood Way during peak hours of construction Phases 1 and

2. The flagger would be able to control traffic flow instead of relying on the existing stop-control interaction and help mitigate vehicle delays.

SCM 6. At least one flagger should be provided to control traffic at the intersection of Printwood Way and Cannington Drive during construction of Phase 4. The flagger would be able to control traffic flow, enforce the limit line setback, and help mitigate vehicle delays.

SCM 7. Restrict construction hours on Mount Abernathy Avenue and Printwood Way from occurring between 7:00 – 9:00AM and 2:00 – 3:00PM, or perform construction activities while school is not in session.

The limits of construction are expected to have no impact to pedestrian facilities, and bike and transit facilities currently do not exist on the study roadways.

Parking will be restricted on all roadways where pipeline construction will occur. All surrounding residential land uses have parking spaces or lots and other roadways in the area also allow on-street parking, therefore parking does not need to be mitigated. However, the following SCM should be considered:

SCM 8. Notify residents and surrounding land uses of upcoming loss of on-street parking prior to beginning construction.

Appendix A: Traffic Counts

Prepared by NDS/ATD

VOLUME

Mt Abernathy Ave Bet. Printwood Way & Cannington Dr

Day: Tuesday
Date: 10/30/2018

City: San Diego
Project #: CA18_4414_001

DAILY TOTALS	NB	SB	EB	WB	Total
	1,276	963	0	0	2,239

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	1		0				1		12:00	17		12				29	
00:15	0		1				1		12:15	24		12				36	
00:30	0		0				0		12:30	13		6				19	
00:45	0	1	1	2			1	3	12:45	22	76	11	41			33	117
01:00	1		1				2		13:00	18		10				28	
01:15	2		2				4		13:15	13		12				25	
01:30	0		1				1		13:30	16		21				37	
01:45	2	5	0	4			2	9	13:45	19	66	17	60			36	126
02:00	2		1				3		14:00	33		26				59	
02:15	1		0				1		14:15	31		50				81	
02:30	2		1				3		14:30	29		21				50	
02:45	1	6	0	2			1	8	14:45	27	120	21	118			48	238
03:00	0		1				1		15:00	28		26				54	
03:15	0		0				0		15:15	20		24				44	
03:30	1		2				3		15:30	27		17				44	
03:45	1	2	0	3			1	5	15:45	25	100	28	95			53	195
04:00	2		0				2		16:00	20		17				37	
04:15	1		1				2		16:15	22		24				46	
04:30	2		1				3		16:30	22		28				50	
04:45	0	5	0	2			0	7	16:45	18	82	30	99			48	181
05:00	1		0				1		17:00	22		33				55	
05:15	1		3				4		17:15	19		28				47	
05:30	5		2				7		17:30	16		22				38	
05:45	9	16	3	8			12	24	17:45	19	76	22	105			41	181
06:00	13		6				19		18:00	20		19				39	
06:15	12		3				15		18:15	16		20				36	
06:30	12		3				15		18:30	17		9				26	
06:45	33	70	6	18			39	88	18:45	22	75	8	56			30	131
07:00	39		22				61		19:00	7		12				19	
07:15	48		31				79		19:15	7		10				17	
07:30	31		29				60		19:30	12		9				21	
07:45	43	161	10	92			53	253	19:45	5	31	9	40			14	71
08:00	28		17				45		20:00	9		13				22	
08:15	30		18				48		20:15	8		5				13	
08:30	26		8				34		20:30	6		8				14	
08:45	32	116	13	56			45	172	20:45	8	31	10	36			18	67
09:00	20		8				28		21:00	13		6				19	
09:15	22		4				26		21:15	8		3				11	
09:30	14		7				21		21:30	4		2				6	
09:45	17	73	9	28			26	101	21:45	1	26	2	13			3	39
10:00	13		5				18		22:00	3		1				4	
10:15	15		14				29		22:15	6		4				10	
10:30	13		9				22		22:30	1		1				2	
10:45	25	66	9	37			34	103	22:45	1	11	3	9			4	20
11:00	15		8				23		23:00	1		1				2	
11:15	18		8				26		23:15	2		3				5	
11:30	17		7				24		23:30	0		0				0	
11:45	7	57	11	34			18	91	23:45	1	4	1	5			2	9
TOTALS		578		286				864	TOTALS		698		677				1375
SPLIT %		66.9%		33.1%				38.6%	SPLIT %		50.8%		49.2%				61.4%

DAILY TOTALS	NB	SB	EB	WB	Total
	1,276	963	0	0	2,239

AM Peak Hour	07:00	07:00			07:00	PM Peak Hour	14:00	16:30			14:00
AM Pk Volume	161	92			253	PM Pk Volume	120	119			238
Pk Hr Factor	0.839	0.742			0.801	Pk Hr Factor	0.909	0.902			0.735
7 - 9 Volume	277	148	0	0	425	4 - 6 Volume	158	204	0	0	362
7 - 9 Peak Hour	07:00	07:00			07:00	4 - 6 Peak Hour	16:15	16:30			16:30
7 - 9 Pk Volume	161	92	0	0	253	4 - 6 Pk Volume	84	119	0	0	200
Pk Hr Factor	0.839	0.742	0.000	0.000	0.801	Pk Hr Factor	0.955	0.902	0.000	0.000	0.909

Prepared by NDS/ATD

VOLUME

Printwood Way Bet. Mt Abernathy Ave & Cannington Dr

Day: Tuesday
Date: 10/30/2018

City: San Diego
Project #: CA18_4414_002

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	425	424	849

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			2		0		2		12:00			4		3		7	
00:15			0		1		1		12:15			1		9		10	
00:30			0		2		2		12:30			4		4		8	
00:45			2	4	1	4	3	8	12:45			7	16	0	16	7	32
01:00			0		1		1		13:00			3		6		9	
01:15			0		0		0		13:15			5		9		14	
01:30			1		0		1		13:30			7		5		12	
01:45			0	1	0	1	0	2	13:45			22	37	6	26	28	63
02:00			0		1		1		14:00			13		26		39	
02:15			0		0		0		14:15			13		12		25	
02:30			0		1		1		14:30			5		7		12	
02:45			1	1	0	2	1	3	14:45			4	35	16	61	20	96
03:00			1		0		1		15:00			6		8		14	
03:15			1		0		1		15:15			10		6		16	
03:30			0		0		0		15:30			4		9		13	
03:45			0	2	0		0	2	15:45			7	27	3	26	10	53
04:00			0		0		0		16:00			10		9		19	
04:15			0		0		0		16:15			8		8		16	
04:30			0		0		0		16:30			13		7		20	
04:45			0		0		0		16:45			7	38	9	33	16	71
05:00			0		0		0		17:00			9		5		14	
05:15			0		0		0		17:15			14		14		28	
05:30			0		0		0		17:30			15		12		27	
05:45			1	1	0		1	1	17:45			14	52	14	45	28	97
06:00			2		2		4		18:00			8		11		19	
06:15			1		1		2		18:15			6		6		12	
06:30			1		1		2		18:30			5		10		15	
06:45			10	14	4	8	14	22	18:45			6	25	4	31	10	56
07:00			6		5		11		19:00			3		3		6	
07:15			24		15		39		19:15			2		1		3	
07:30			38		10		48		19:30			4		6		10	
07:45			8	76	21	51	29	127	19:45			1	10	1	11	2	21
08:00			6		11		17		20:00			3		3		6	
08:15			4		11		15		20:15			4		0		4	
08:30			1		3		4		20:30			1		1		2	
08:45			9	20	2	27	11	47	20:45			1	9	5	9	6	18
09:00			6		6		12		21:00			2		1		3	
09:15			7		6		13		21:15			4		2		6	
09:30			6		6		12		21:30			1		1		2	
09:45			3	22	3	21	6	43	21:45			0	7	1	5	1	12
10:00			4		5		9		22:00			1		1		2	
10:15			2		4		6		22:15			0		5		5	
10:30			8		5		13		22:30			1		2		3	
10:45			3	17	10	24	13	41	22:45			1	3	1	9	2	12
11:00			1		1		2		23:00			0		1		1	
11:15			0		3		3		23:15			1		0		1	
11:30			3		4		7		23:30			0		0		0	
11:45			3	7	5	13	8	20	23:45			0	1	0	1	0	2
TOTALS				165		151		**316**	**TOTALS**				260		273		**533**
SPLIT %				52.2%		47.8%		**37.2%**	**SPLIT %**				48.8%		51.2%		**62.8%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	425	424	849

AM Peak Hour			06:45	07:15	**07:15**	**PM Peak Hour**			13:30	14:00	**13:30**
AM Pk Volume			78	57	**133**	**PM Pk Volume**			55	61	**104**
Pk Hr Factor			0.513	0.679	**0.693**	**Pk Hr Factor**			0.625	0.587	**0.667**
7 - 9 Volume	0	0	96	78	**174**	**4 - 6 Volume**	0	0	90	78	**168**
7 - 9 Peak Hour			07:00	07:15	**07:15**	**4 - 6 Peak Hour**			17:00	17:00	**17:00**
7 - 9 Pk Volume	0	0	76	57	**133**	**4 - 6 Pk Volume**	0	0	52	45	**97**
Pk Hr Factor	0.000	0.000	0.500	0.679	**0.693**	**Pk Hr Factor**	0.000	0.000	0.867	0.804	**0.866**

Prepared by NDS/ATD

VOLUME

Cannington Dr Bet. Printwood Way & Mt Abernathy Ave

Day: Tuesday
Date: 10/30/2018

City: San Diego
Project #: CA18_4414_003

DAILY TOTALS	NB	SB	EB	WB	Total
	575	517	0	0	1,092

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	1		1						2		12:00	9		7						16	
00:15	1		1						2		12:15	4		11						15	
00:30	1		1						2		12:30	6		5						11	
00:45	0	3	0	3					0	6	12:45	11	30	8	31					19	61
01:00	0		0						0		13:00	11		9						20	
01:15	1		1						2		13:15	4		10						14	
01:30	0		0						0		13:30	6		9						15	
01:45	0	1	1	2					1	3	13:45	3	24	10	38					13	62
02:00	0		1						1		14:00	22		4						26	
02:15	0		0						0		14:15	13		10						23	
02:30	0		1						1		14:30	9		9						18	
02:45	0		1	3					1	3	14:45	11	55	16	39					27	94
03:00	1		0						1		15:00	14		7						21	
03:15	0		0						0		15:15	6		11						17	
03:30	1		0						1		15:30	5		7						12	
03:45	0	2	0						0	2	15:45	8	33	19	44					27	77
04:00	0		0						0		16:00	7		9						16	
04:15	0		0						0		16:15	6		16						22	
04:30	0		0						0		16:30	9		17						26	
04:45	1	1	0						1	1	16:45	10	32	15	57					25	89
05:00	0		0						0		17:00	7		10						17	
05:15	6		1						7		17:15	2		17						19	
05:30	1		0						1		17:30	9		10						19	
05:45	5	12	3	4					8	16	17:45	13	31	19	56					32	87
06:00	1		1						2		18:00	11		9						20	
06:15	4		2						6		18:15	15		12						27	
06:30	7		3						10		18:30	6		11						17	
06:45	12	24	4	10					16	34	18:45	8	40	8	40					16	80
07:00	15		10						25		19:00	9		9						18	
07:15	30		12						42		19:15	4		12						16	
07:30	15		13						28		19:30	5		8						13	
07:45	27	87	4	39					31	126	19:45	4	22	6	35					10	57
08:00	25		10						35		20:00	4		2						6	
08:15	5		5						10		20:15	5		2						7	
08:30	10		1						11		20:30	2		4						6	
08:45	14	54	3	19					17	73	20:45	0	11	6	14					6	25
09:00	7		5						12		21:00	8		5						13	
09:15	2		3						5		21:15	3		0						3	
09:30	7		4						11		21:30	3		5						8	
09:45	5	21	3	15					8	36	21:45	1	15	1	11					2	26
10:00	2		4						6		22:00	3		2						5	
10:15	10		10						20		22:15	2		4						6	
10:30	4		6						10		22:30	0		0						0	
10:45	9	25	7	27					16	52	22:45	2	7	3	9					5	16
11:00	10		5						15		23:00	1		1						2	
11:15	10		5						15		23:15	1		1						2	
11:30	10		5						15		23:30	1		0						1	
11:45	11	41	3	18					14	59	23:45	1	4	1	3					2	7
TOTALS		271		140						**411**	**TOTALS**		304		377						**681**
SPLIT %		65.9%		34.1%						**37.6%**	**SPLIT %**		44.6%		55.4%						**62.4%**

DAILY TOTALS	NB	SB	EB	WB	Total
	575	517	0	0	1,092

AM Peak Hour	07:15	06:45				**07:15**	**PM Peak Hour**	14:00	15:45				**17:30**
AM Pk Volume	97	39				**136**	**PM Pk Volume**	55	61				**98**
Pk Hr Factor	0.808	0.750				**0.810**	**Pk Hr Factor**	0.625	0.803				**0.766**
7 - 9 Volume	141	58	0	0		**199**	**4 - 6 Volume**	63	113	0	0		**176**
7 - 9 Peak Hour	07:15	07:00				**07:15**	**4 - 6 Peak Hour**	16:00	16:30				**16:15**
7 - 9 Pk Volume	97	39	0	0		**136**	**4 - 6 Pk Volume**	32	59	0	0		**90**
Pk Hr Factor	0.808	0.750	0.000	0.000		**0.810**	**Pk Hr Factor**	0.800	0.868	0.000	0.000		**0.865**

Appendix C-3

Traffic Analysis Miramar Pipeline Relocation Encroachment 3 (Alternative 2) Study (2022)

Traffic Analysis

Miramar Pipeline Relocation Encroachment 3 (Alternative 2) Study

San Diego, CA

February 2022

Prepared for:

Man Tech Systems Engineering, Inc.

Prepared by:

Kimley»Horn

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Appendices

List of Figures

1 INTRODUCTION

This document analyzes traffic and circulation impacts of planned construction activities associated with the DESC1906 MILCON Encroachment 3 project. This project involves the relocation of a segment of the Navy's fuel pipeline from the Church of Jesus Christ of Latter-day Saints property and other private residential properties into City of San Diego public right-of-way. There will not be long-term traffic and circulation impacts, as street geometry will be restored to existing conditions after construction is complete. Construction will result in short-term disturbance of existing roadways, including lane closures and access modification. This analysis documents the effects of those construction activities on traffic and circulation.

This traffic analysis is a precursor to a traffic control plan for the project. The traffic control plan will include detailed routing, lane closure, and warning signage placement information. This traffic analysis provides recommendations on roadway geometric modifications during construction that should be incorporated into the traffic control plan. This document establishes ways to segment the construction activities to minimize traffic flow disruption while not impeding construction feasibility. This document also identifies potential temporary effects on pedestrian and vehicular traffic circulation associated with project construction.

During the design phase, a traffic control plan will be produced to define traffic control parameters for roadway configuration and operations during construction. The goal of this traffic analysis is to identify concept level ways to reduce impacts to the local community, especially along Mount Abernathy Avenue and Cannington Drive, while maintaining standard traffic control geometries and operations during construction. Subsequent detailed traffic control plans, generated during the design phase, may consider alternate means to reduce construction effects compared to the recommendations presented in this analysis.

1.1 PROJECT LOCATION

The project involves relocating a section of pipeline within the Church of Jesus Christ of Latter-day Saints property and other private residential properties into the City of San Diego public right-of-way. The project is located in the Clairemont Mesa community within the City of San Diego as shown in **Figure 1-1**. The community of Clairemont Mesa is situated between I-5 and I-805, and bounded by SR-52 to the north and the Linda Vista community to the south. The church is located on the east side of Mount Abernathy Avenue, between Lana Drive and Redbrook Road. Major nearby roadways include Balboa Avenue to the south and Clairemont Mesa Boulevard to the north.

1.2 PURPOSE OF AND NEED FOR THE PROJECT

The purpose of the project is to remedy the acute challenges to the long-term viability of the Miramar Pipeline which equates to making the necessary changes associated within the pipeline easement where encroachments exist that create operational and maintenance encumbrances. See **Figure 1-2** for illustration of the existing pipeline alignment running across the church and private residence properties.

1.3 PROJECT ALIGNMENT

The Proposed Action is to relocate the pipeline within the City of San Diego public right-of-way along the west side of Mount Abernathy Avenue, and the east side of Cannington Drive. This

alignment is approximately 1,500 feet within the roadway along Mount Abernathy Avenue and approximately 900 feet within the roadway along Cannington Drive. The pipeline alignment also runs into the Mount Abernathy Avenue intersection at Cannington Drive. See **Figure 1-3** for illustration of the proposed alignment. Pipeline relocation would be coordinated with the City of San Diego as necessary.

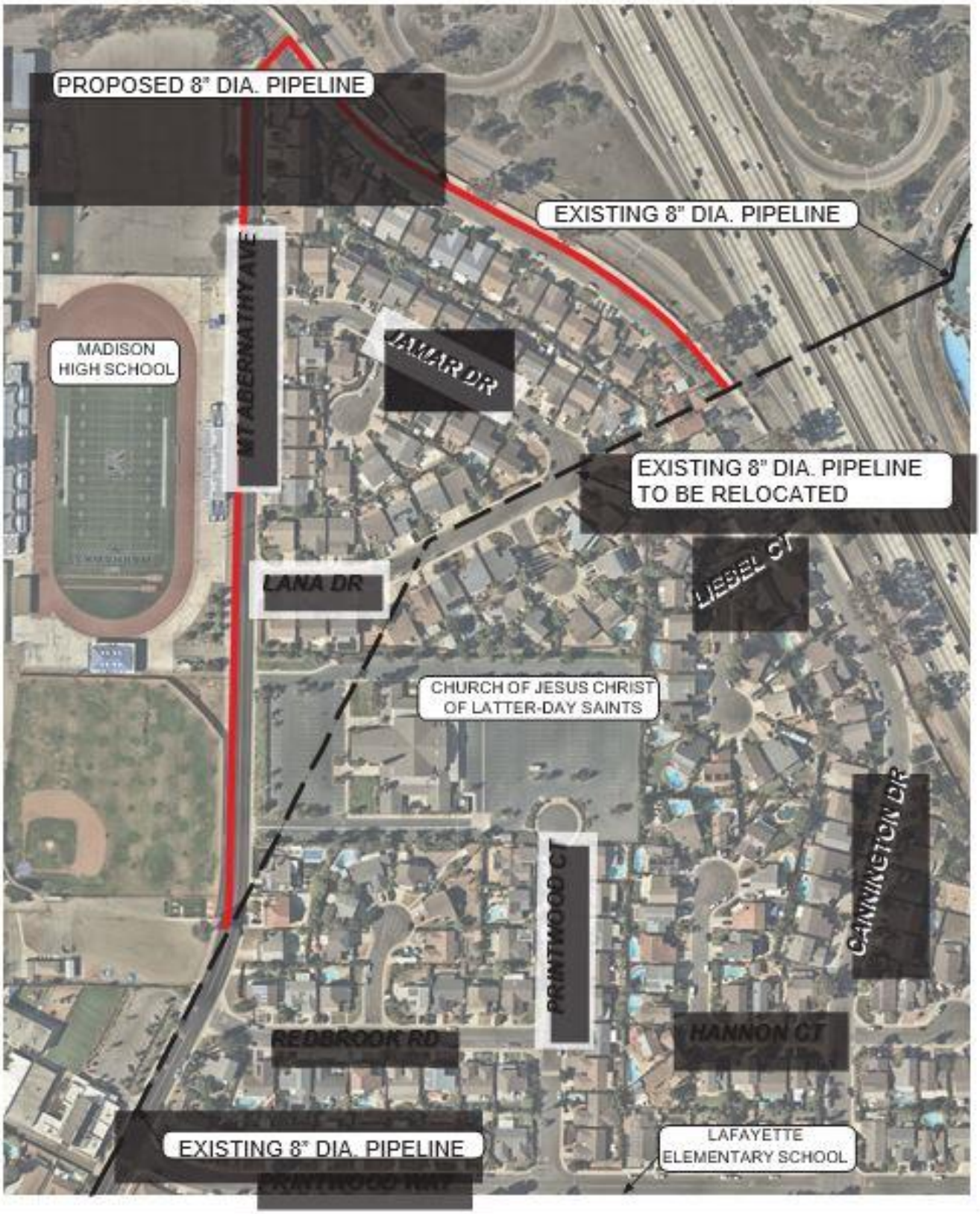
Source: Cardno TEC, 2014

Kimley»Horn

FIGURE 1-1
PROJECT VICINITY MAP

Kimley»Horn

FIGURE 1-2
EXISTING PIPELINE ALIGNMENT



Kimley»Horn

FIGURE 1-3
PROPOSED PIPELINE ALIGNMENT

2 ANALYSIS METHODOLOGY

This traffic analysis document examines the impacts associated with construction of the project. This document relies upon pipeline alignment information prepared by Enterprise Engineering, Inc., and traffic counts performed as part of this traffic study.

The project is located within the City of San Diego right-of-way and will adhere to City of San Diego standards for public works construction. Standards and regulations governing the implementation of the project include the City of San Diego Municipal Code, Land Development Code, and Standard Specifications and Drawings for Public Works Construction, and the California Manual on Uniform Traffic Control Devices. The City of San Diego Transportation Study Manual (TSM) (September 2020) was referenced when completing the traffic analysis for this project. However, the nature of the project is unique, as the project will not result in additional trips on the roadway network, nor modify the permanent geometry of the roadway. All impacts associated with the project will be temporary. Since there are no permanent or long-term impacts and the project does not generate any new trips, the City of San Diego's standard thresholds for significance for transportation, circulation and parking do not apply. The TSM was therefore utilized for roadway capacity thresholds only.

The project will temporarily affect local access, circulation, and parking. This document seeks to determine the temporary effects associated with construction and recommend construction practices to limit those effects. Methods to limit the effects include specifying segments of construction, specifying hours of construction, providing temporary modifications to roadway geometrics, and implementing detour routes specific to the project.

The project will adhere to City standards that restrict the linear extent of open trench to no more than 500 feet in length. Thus, the project will need to be constructed in 500 foot or less segments. By identifying optimal segment breaks, the circulation detriments associated with open trenching can be reduced. The effects on cul-de-sacs with single access points can be lessened by closing one half of the intersection at a time.

This study recommends where and when lane closures may be applied to reduce the number of vehicles impacted and limit the resulting congestion. To inform this effort, hourly traffic volumes for a 24-hour period were collected at two locations on or near the proposed project alignment. These traffic counts were conducted in November 2021. The raw count data is provided in **Appendix A**. The City's roadway capacity thresholds were compared to the hourly volumes on the roadway to assist in determining appropriate time and segment restrictions. At the beginning and end of each construction period, the open trench will be covered with metal plates and the roadway geometry restored to existing conditions. This will serve to limit effects to circulation, access, and congestion during non-construction times.

Trenching for the project will be a four-foot-wide open trench maximum. The City of San Diego requires roadway resurfacing that extends beyond the excavated area. This roadway resurfacing footprint defines the anticipated width of the construction zone. The project runs along Mt. Abernathy Avenue and Cannington Drive, both residential streets. **Table 1** below indicates the construction width outside of the trench area.

Table 1 – Roadway Work Zone Areas

Street Classification	Width Beyond Excavated Area (ft.)
Arterial Streets	62 inches
Major Streets	71 inches
Collector Streets	82 inches
Residential Streets	**74 inches**

As shown in the above table, the work zone will extend 8 feet 2 inches from the pipe centerline on both streets (2-foot trench plus 6 foot 2-inch resurfacing area). Thus, the project construction will affect at least one lane of traffic, resulting in lane shifts and on-street parking restrictions.

The width of the construction zone and its effect on traffic lanes was analyzed in conjunction with existing roadway volumes. An optimal roadway configuration was developed to minimize reduction in circulation and connectivity of the roadways where the pipeline will necessitate lane closures. These proposed roadway geometrics will be further developed and defined in the Traffic Control Plans produced during the design phase of the project.

3 EXISTING CONDITIONS

The project is planned to result in construction along Mount Abernathy Avenue and Cannington Drive. Descriptions of current conditions along those roadways are discussed below. Street classifications were obtained from the Clairemont Mesa Community Plan (April 2011).

Cannington Drive and Mount Abernathy Avenue north of Chandler Drive are both two-lane residential streets with parking permitted along both sides. Sidewalks are provided on both sides of the study roadways, and both roadways have a speed limit of 25 mph.

Cannington Drive within the study area is also fronted with residential driveways on the south/west side of the roadway. Madison High School is located on the west side of Mount Abernathy Avenue. A majority of parking lot and circulation driveways for Madison High School are located on the west and north sides of the school campus rather than on Mount Abernathy Avenue.

Mount Abernathy Avenue, between Jamar Drive and Lana Drive, carries approximately 1,990 vehicles per day, and Cannington Drive east of Mount Abernathy Avenue, carries approximately 900 vehicles per day.

4 DISCUSSION OF EFFECTS

The new Miramar Pipeline segment is planned to be installed within the travel lanes and parking lanes of Mount Abernathy Avenue and Cannington Drive. In order to construct the new pipeline, the existing road surface will need to be demolished, and a trench dug to place the pipeline. The trench will need to be filled and the roadway resurfaced. While the trench can be covered with plates during portions of the work period, the excavation of the trench and pavement reconstruction will necessitate the temporary closure of travel lanes and preclude access to adjacent driveways during construction activities. With the City of San Diego restriction on the consecutive linear feet of roadway that can be excavated at any one time, the number of driveways and on-street parking spaces affected at any one time will be limited to 500' segments.

During construction, effects of the project will be short-term in nature and limited to the duration of the construction activities, which are anticipated to be a matter of a few, possibly non-consecutive, days. Once construction of the pipeline is complete, the construction area will be resurfaced and the geometry will be restored to existing conditions, with portions of the roadway resurfaced. Thus, the long-term effects of the project will be positive in nature, as the roadway surface within the influence area of the trench will be reconstructed.

Construction activity is planned to occur during daytime hours. Following completion of the work activity for the day, the trench will be plated, and traffic control removed. This will restore access to blocked driveways and will restore roadway capacity. Therefore, impacts will only be during daytime hours.

Construction of the pipeline will result in a number of temporary traffic effects, including:

- Reduction in roadway capacity; and
- Reduction in on-street parking.

Due to the temporary and short-term nature of the effects, project impacts are considered not significant. To reduce the effects of the project, special conservation measures (SCMs) have been identified. These SCMs will be implemented to reduce the severity of the short-term impacts and reduce, but not eliminate, the resulting inconvenience to adjacent residents, schools, businesses, and affected commute trips.

4.1 RECOMMENDED CONSTRUCTION PHASING AND MODIFICATIONS TO GEOMETRY

Proposed construction phases and roadway geometrics were developed based on the location of the new pipeline, the required work area, existing roadway geometrics, and existing roadway volumes. The recommended geometrics attempt to limit the magnitude of congestion and access impacts, given the required parameters of the pipeline construction. These geometrics are encompassed in a SCM that serves to reduce the magnitude of effect on vehicle and bicycle circulation:

SCM 1. Through the use of traffic control, modify existing roadway geometrics to best maintain vehicular access and provide capacity during the construction period within the available roadway right-of-way.

Construction of the pipeline is proposed to occur in the following seven phases with the following restrictions or capacity reductions:

1. East side of Cannington Drive approximately 250’ north of Liebel Court.
    - Shift northbound and southbound Cannington Drive travel lanes west.
    - Restrict parking on both sides of Cannington Drive as far as necessary to accommodate the work area and shifting tapers approaching the work area.
2. East side of Cannington Drive from within the Mount Abernathy Avenue intersection to approximately 415’ south of Mount Abernathy Avenue intersection.
    - Shift northbound and southbound Cannington Drive travel lanes west.
    - Restrict parking on both sides of Cannington Drive as far as necessary to accommodate the work area and shifting tapers approaching the work area.
3. Northern corner of Mount Abernathy Avenue and Cannington Drive intersection
    - Shift Mount Abernathy Avenue travel lane east into existing parking lane.
    - Shift Cannington Drive travel lane west into existing parking lane.
    - Restrict parking on both sides of Mount Abernathy Avenue and Cannington Drive as far necessary to accommodate the work area and shifting tapers approaching the work area.
    - Close southbound travel lane on Mount Abernathy Avenue and northbound/westbound travel lane on Cannington Drive.
    - Implement a one-lane two-way travel lane on the south and east legs of the intersection.
    - Install temporary limit lines set back at least 50’ from work area to accommodate two-way travel on north and west legs
4. West side of Mount Abernathy Avenue from Cannington Drive intersection to approximately 350’ south of the intersection.
    - Restrict parking on both sides of Mount Abernathy Avenue.

- Shift northbound and southbound travel lanes to the east side of Mount Abernathy Avenue.

5. West side of Mount Abernathy Avenue from approximately 350’ south of Cannington Drive intersection to just north of Lana Drive.
    - Restrict parking on both sides of Mount Abernathy Avenue.
    - Shift northbound and southbound travel lanes to the east side of Mount Abernathy Avenue.
6. West side of Mount Abernathy Avenue from Lana Drive intersection to 300’ south.
    - Restrict parking on both sides of Mount Abernathy Avenue.
    - Shift northbound and southbound travel lanes to the east side of Mount Abernathy Avenue.
7. West side of Mount Abernathy Avenue from 300’ south of Lana Drive intersection to 150’ north Redbrook Road intersection.
    - Restrict parking on both sides of Mount Abernathy Avenue.
    - Shift northbound and southbound travel lanes to the east side of Mount Abernathy Avenue.

The proposed traffic handling during the construction of each segment is illustrated in **Figure 4-1**. This exhibit summarizes recommendations on the extents of the construction segments and considerations to limit effects on access and circulation. This exhibit will be considered as a basis of design for preparing traffic control plans and for use by the contractor during construction.

4.2 REDUCTIONS IN ACCESS

With the City of San Diego restriction on the consecutive linear feet of roadway that can be excavated at any one time, the number of driveways and on-street parking spaces affected at any one time will be limited.

The western side of Mount Abernathy Avenue and the eastern side of Cannington Drive where the proposed pipeline alignment is located are fronted with parking lanes. The proposed pipeline alignment would not be fronted with single-family residential driveways. Therefore, during the active construction period, vehicle access to driveways will not be affected. To minimize the effects construction of the pipeline will have on parking, the following SCMs are proposed:

SCM 2. Notify residents and businesses of upcoming road work.

SCM 3. Minimize the duration which parking is precluded by adhering to the City-standard maximum open trench length of 500 feet.

Access to the Reformation Lutheran Church and School is assumed to be maintained, but with turn restrictions in and out of the driveways.

SCM 4. Notify schools of the upcoming road work and turn restrictions related to various phases of construction.

4.3 INTERSECTION MODIFICATIONS ASSOCIATED WITH CONSTRUCTION

Construction of the pipeline along Cannington Drive and Mount Abernathy will result in shifting lanes Mount Abernathy to the east and lanes on Cannington Drive to the west during Phases 1-7. During Phase 3, the southbound and eastbound lanes at the intersection will be shifted as construction of the pipeline on the north side and east side of the intersection occurs.. The work zone will extend only about halfway into the existing northbound and westbound lanes.

In addition to modifying roadway geometrics to best serve traffic during construction, it is recommended to provide a flagger to control traffic flow at the intersection of Mount Abernathy Avenue and Cannington Drive to counteract the intersection modifications. This recommendation is encompassed with the following SCM:

SCM 5. A flagger should be provided to control traffic at the intersection of Mount Abernathy Avenue and Cannington Drive during peak hours of construction Phase 3. The flagger would be able to control traffic flow instead of relying on the existing stop-control interaction and help mitigate vehicle delays. The flagger would be able to control traffic flow, enforce the limit line setback, and help mitigate vehicle delays.

4.4 ROADWAY CLOSURE TIMES

The work area will be limited to the envelope of the trench area and the influence area needed for staging and required for resurfacing. On Mount Abernathy Avenue alignment, the pipeline will be constructed close enough to the western curbline that two lanes of travel can be accommodated within the remaining roadway width. On the Cannington Drive alignment, the pipeline will be constructed close enough to the eastern curbline that two lanes of travel can be accommodated within the remaining roadway width.

Traffic volumes for Mount Abernathy Avenue and Cannington Drive are shown in **Figure 4-2** and **Figure 4-3** respectively. Traffic volumes are low, especially on Cannington Drive, and are primarily associated with residential and school traffic. It is evident that school traffic dictates the peak hours of 7:00 – 9:00 AM and 3:00 – 4:00 PM. As a result, time restrictions should be placed on construction in this area if construction is to occur during a time when school is in session. In order to reduce the magnitude of effects, the following SCM is proposed:

SCM 6. Restrict construction hours on Mount Abernathy Avenue from occurring between 7:00 – 9:00 AM and 3:00 – 4:00 PM or perform construction activities while school is not in session.

FIGURE 4-1
PIPELINE CONSTRUCTION PHASING

Figure 4-2: Hourly Traffic Volumes: Mt Abernathy Ave (Jamar Dr to Lana Dr)

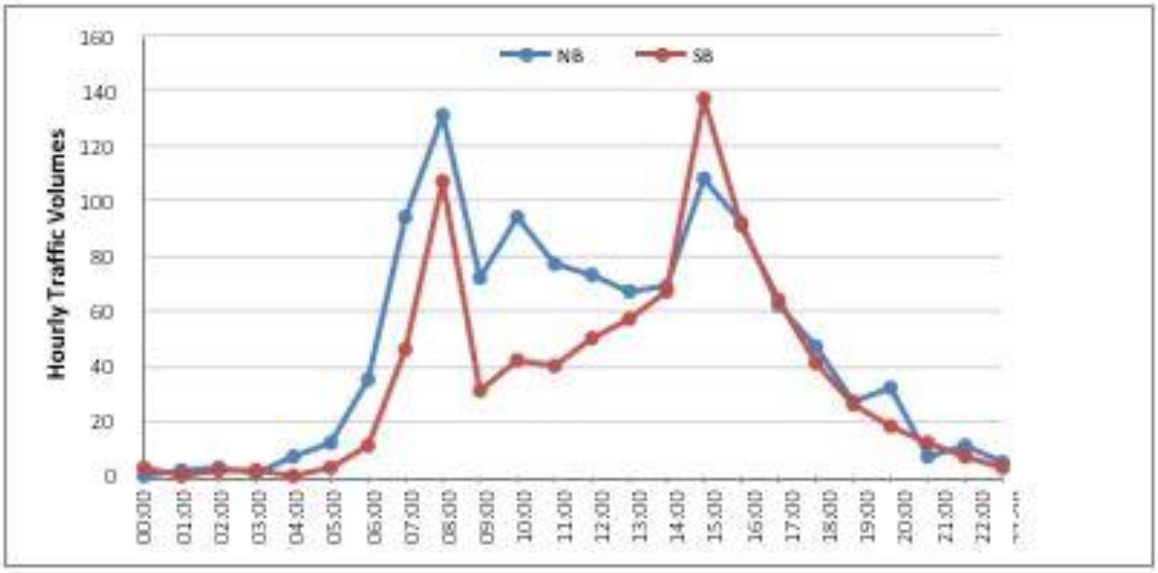
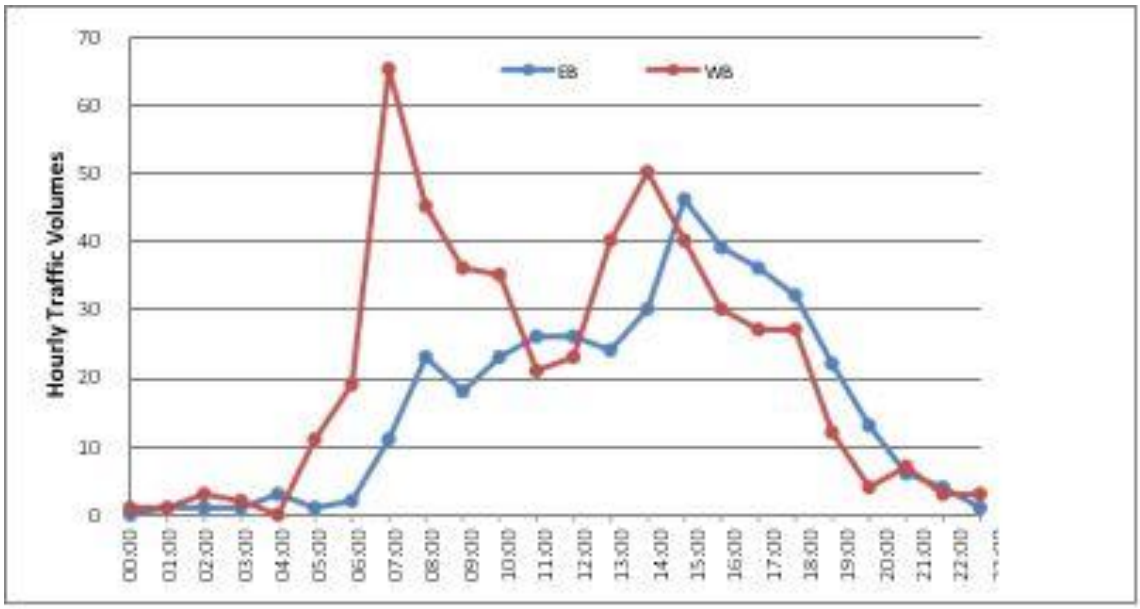


Figure 4-3: Hourly Traffic Volumes: Cannington Drive (Liebel Ct to Mt Abernathy Ave)



During Phases 1-2 and 4-6, travel lanes will be shifted to accommodate two-way travel. Parking will be restricted on both sides of the roadway on Mount Abernathy Avenue and Cannington Drive. Additionally, during Phase 3, the northeast half of the Mount Abernathy Avenue and Cannington Drive intersection will be closed. During this time a flagger is necessary for allowing each direction of travel to navigate through the work zone.

Traffic volumes on Cannington Drive, shown in **Figure 4-3** are low, and therefore do not necessitate any limitations on the hours of construction.

4.5 MODIFICATIONS TO PEDESTRIAN FACILITIES

Pedestrian facilities are not anticipated to be affected by construction. Sidewalks should remain open and accessible during construction. School crossings along Mount Abernathy Avenue and Cannington Drive will not be affected by construction due to SCM 6.

4.6 MODIFICATIONS TO BICYCLE FACILITIES

Bicycle facilities are not provided on Mount Abernathy Avenue or Cannington Drive within the vicinity of the project and therefore do not need to be modified. Lane widths during construction should be maintained at 14-feet when feasible to allow for bicyclists to share a lane with a vehicle if needed.

4.7 MODIFICATIONS TO PARKING FACILITIES

On-street parking is provided along both sides of Mount Abernathy Avenue, and Cannington Drive. The on-street parking in this area generally serves the residential uses. Parking will be restricted on all roadways where pipeline construction will occur. All surrounding residential land uses have parking spaces or lots and other roadways in the area also allow on-street parking, therefore parking does not need to be mitigated. However, the following SCM should be considered:

SCM 7. Notify residents and surrounding land uses of upcoming loss of on-street parking prior to beginning construction.

4.8 MODIFICATIONS TO TRANSIT FACILITIES

Mount Abernathy Avenue and Cannington Drive do not service transit within the vicinity of this project. Therefore, transit facilities do not need to be modified during construction.

5 SUMMARY OF FINDINGS

5.1 SUMMARY OF IMPACTS

Construction of the project will result in temporary turn restrictions at intersections and temporary on-street parking restrictions. Effects will be very short in duration, ranging from one to a few days for each phase, and thus are not considered significant impacts. No long-term impacts will be experienced. Once construction of the project is complete, the roadway will be returned to its current configuration, with portions of the corridor being reconstructed.

The new pipeline will be constructed along Cannington Drive, Mount Abernathy Avenue, and a portion of the Cannington Drive and Mount Abernathy intersection, all of which are City of San Diego residential roadways. Due to construction of the pipeline, linear swaths of roadways along the alignment will be temporarily closed during trenching and roadway re-surfacing. The new pipeline will primarily be located near the roadway curb line.

To minimize the project effect on access, the following SCM should be considered:

SCM 1. Through the use of traffic control, modify existing roadway geometrics to best maintain vehicular access and provide capacity during the construction period within the available roadway right-of-way.

Trenching construction for the pipeline and roadway resurfacing will result in the temporary lane shifts and closure of the east side of Cannington Drive and the west side of Mount Abernathy Avenue during construction. Circulation patterns and access driveways for single-family residential, nearby schools including Lafayette Elementary School and the Reformation Lutheran Church and School may be impacted as well. The following SCMs should be considered:

SCM 2. Notify residents and businesses of upcoming road work.

SCM 3. Minimize the duration which access is precluded by adhering to the City-standard maximum open trench length of 500 feet.

SCM 4. Notify schools of the upcoming road work and turn restrictions related to various phases of construction.

Construction will result in lane shifts and partial roadway closures on both roadways impacted by construction. This will result in some increased congestion along the work area and may result in some natural detours to nearby streets.

To minimize the project effect on circulation and congestion, the following SCMs should be considered:

SCM 5. A flagger should be provided to control traffic at the intersection of Mount Abernathy Avenue and Cannington Drive during peak hours of construction Phase 3. The flagger would be able to control traffic flow instead of relying on the existing stop-control interaction and help mitigate vehicle delays.

SCM 6. Restrict construction hours on Mount Abernathy Avenue from occurring between 7:00 – 9:00AM and 3:00 – 4:00PM or perform construction activities while school is not in session.

The limits of construction are expected to have no impact to pedestrian facilities, and bike and transit facilities currently do not exist on the study roadways.

Parking will be restricted on all roadways where pipeline construction will occur. All surrounding residential land uses have parking spaces or lots and other roadways in the area also allow on-street parking, therefore parking does not need to be mitigated. However, the following SCM should be considered:

SCM 7. Notify residents and surrounding land uses of upcoming loss of on-street parking prior to beginning construction.

Appendix A: Traffic Counts

Prepared by National Data & Surveying Services

VOLUME

Cannington Dr Bet. Liebel Ct & Mt Abernathy Ave

Day: Tuesday
Date: 11/9/2021

City: San Diego
Project #: CA21_040183_001

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	389	505	894

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			0		0		0		12:00			3		7		10	
00:15			0		0		0		12:15			10		4		14	
00:30			0		0		0		12:30			6		4		10	
00:45			0		1	1	1	1	12:45			7	26	8	23	15	49
01:00			0		0		0		13:00			7		10		17	
01:15			0		0		0		13:15			4		10		14	
01:30			1		1		2		13:30			5		9		14	
01:45			0	1	0	1	0	2	13:45			8	24	11	40	19	64
02:00			1		3		4		14:00			10		16		26	
02:15			0		0		0		14:15			9		12		21	
02:30			0		0		0		14:30			7		14		21	
02:45			0	1	0	3	0	4	14:45			4	30	8	50	12	80
03:00			0		1		1		15:00			7		12		19	
03:15			1		1		2		15:15			13		10		23	
03:30			0		0		0		15:30			15		9		24	
03:45			0	1	0	2	0	3	15:45			11	46	9	40	20	86
04:00			0		0		0		16:00			11		7		18	
04:15			2		0		2		16:15			13		11		24	
04:30			1		0		1		16:30			8		5		13	
04:45			0	3	0		0	3	16:45			7	39	7	30	14	69
05:00			0		1		1		17:00			11		8		19	
05:15			0		7		7		17:15			9		13		22	
05:30			1		2		3		17:30			10		3		13	
05:45			0	1	1	11	1	12	17:45			6	36	3	27	9	63
06:00			0		3		3		18:00			9		6		15	
06:15			1		4		5		18:15			7		12		19	
06:30			0		6		6		18:30			5		7		12	
06:45			1	2	6	19	7	21	18:45			11	32	2	27	13	59
07:00			1		5		6		19:00			8		2		10	
07:15			3		7		10		19:15			2		3		5	
07:30			5		26		31		19:30			4		5		9	
07:45			2	11	27	65	29	76	19:45			8	22	2	12	10	34
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08:45			2	23	8	45	10	68	20:45			4	13	0	4	4	17
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09:45			6	18	5	36	11	54	21:45			1	6	0	7	1	13
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11:00			7		5		12		23:00			0		1		1	
11:15			6		4		10		23:15			1		1		2	
11:30			6		7		13		23:30			0		0		0	
11:45			7	26	5	21	12	47	23:45			0	1	1	3	1	4
TOTALS				110		239		349	TOTALS				279		266		545
SPLIT %				31.5%		68.5%		39.0%	SPLIT %				51.2%		48.8%		61.0%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	389	505	894

AM Peak Hour			10:45	07:30	07:30	PM Peak Hour			15:15	13:45	13:45
AM Pk Volume			28	77	101	PM Pk Volume			50	53	87
Pk Hr Factor			0.778	0.713	0.815	Pk Hr Factor			0.833	0.828	0.837
7 - 9 Volume	0	0	34	110	144	4 - 6 Volume	0	0	75	57	132
7 - 9 Peak Hour			07:30	07:30	07:30	4 - 6 Peak Hour			16:00	16:30	16:15
7 - 9 Pk Volume	0	0	24	77	101	4 - 6 Pk Volume	0	0	39	33	70
Pk Hr Factor	0.000	0.000	0.667	0.713	0.815	Pk Hr Factor	0.000	0.000	0.750	0.635	0.729

Prepared by National Data & Surveying Services

VOLUME

Mt Abernathy Ave Bet. Jamar Dr & Lana Dr

Day: Tuesday
Date: 11/9/2021

City: San Diego
Project #: CA21_040183_002

DAILY TOTALS	NB	SB	EB	WB	Total
	1,128	860	0	0	1,988

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	0		0						0		12:00	16		15						31	
00:15	0		3						3		12:15	18		10						28	
00:30	0		0						0		12:30	17		15						32	
00:45	0		0	3					0	3	12:45	22	73	10	50					32	123
01:00	0		0						0		13:00	17		16						33	
01:15	2		0						2		13:15	18		9						27	
01:30	0		0						0		13:30	17		14						31	
01:45	0	2	0						0	2	13:45	15	67	18	57					33	124
02:00	0		2						2		14:00	20		26						46	
02:15	2		0						2		14:15	19		16						35	
02:30	0		0						0		14:30	20		11						31	
02:45	1	3	0	2					1	5	14:45	10	69	14	67					24	136
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03:15	0		1						1		15:15	33		21						54	
03:30	0		1						1		15:30	23		61						84	
03:45	0	1	0	2					0	3	15:45	24	108	28	137					52	245
04:00	1		0						1		16:00	30		21						51	
04:15	2		0						2		16:15	23		27						50	
04:30	2		0						2		16:30	23		26						49	
04:45	2	7	0						2	7	16:45	16	92	17	91					33	183
05:00	1		1						2		17:00	16		19						35	
05:15	1		1						2		17:15	14		16						30	
05:30	6		1						7		17:30	18		22						40	
05:45	4	12	0	3					4	15	17:45	14	62	7	64					21	126
06:00	6		2						8		18:00	12		9						21	
06:15	8		4						12		18:15	10		9						19	
06:30	7		1						8		18:30	12		12						24	
06:45	14	35	4	11					18	46	18:45	13	47	11	41					24	88
07:00	17		3						20		19:00	8		9						17	
07:15	15		6						21		19:15	3		7						10	
07:30	27		23						50		19:30	8		4						12	
07:45	35	94	14	46					49	140	19:45	8	27	6	26					14	53
08:00	24		25						49		20:00	8		3						11	
08:15	45		27						72		20:15	9		8						17	
08:30	39		30						69		20:30	5		4						9	
08:45	23	131	25	107					48	238	20:45	10	32	3	18					13	50
09:00	27		10						37		21:00	2		5						7	
09:15	16		6						22		21:15	3		3						6	
09:30	18		7						25		21:30	2		1						3	
09:45	11	72	8	31					19	103	21:45	0	7	3	12					3	19
10:00	16		12						28		22:00	5		3						8	
10:15	26		11						37		22:15	5		2						7	
10:30	24		13						37		22:30	1		2						3	
10:45	28	94	6	42					34	136	22:45	0	11	0	7					0	18
11:00	21		8						29		23:00	1		2						3	
11:15	13		16						29		23:15	0		1						1	
11:30	22		8						30		23:30	1		0						1	
11:45	21	77	8	40					29	117	23:45	3	5	0	3					3	8
TOTALS		528		287						815	TOTALS		600		573						1173
SPLIT %		64.8%		35.2%						41.0%	SPLIT %		51.2%		48.8%						59.0%

DAILY TOTALS	NB	SB	EB	WB	Total
	1,128	860	0	0	1,988

AM Peak Hour	07:45	08:00			07:45	PM Peak Hour	15:15	15:00			15:00
AM Pk Volume	143	107			239	PM Pk Volume	110	137			245
Pk Hr Factor	0.794	0.892			0.830	Pk Hr Factor	0.833	0.561			0.729
7 - 9 Volume	225	153	0	0	378	4 - 6 Volume	154	155	0	0	309
7 - 9 Peak Hour	07:45	08:00			07:45	4 - 6 Peak Hour	16:00	16:00			16:00
7 - 9 Pk Volume	143	107	0	0	239	4 - 6 Pk Volume	92	91	0	0	183
Pk Hr Factor	0.794	0.892	0.000	0.000	0.830	Pk Hr Factor	0.767	0.843	0.000	0.000	0.897