APPENDIX H

Noise Technical Report

Noise Technical Report
for the
North City Project EIR/EIS
City of San Diego, California
PTS#499621

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ACRONYMS

Acronym/Abbreviation	Definition
AADF	annual average daily flow
BAC	Biological activated carbon
CEQA	California Environmental Quality Act
CNEL	community noise equivalent level
dB	decibel
dBA	A-weighted decibels
HP	horsepower
I-	Interstate
ICE	internal combustion engine
in/sec	inches per second
lb/d	pounds per day
L_{eq}	equivalent sound level
LFG Pipeline	Landfill Gas Pipeline
L_{max}	maximum sound level during measurement interval
MBC	Metro Biosolids Center
MGD	million gallons per day
MR	Miramar Reservoir
MTBS	Mission Trails Booster Station
MW	megawatt
NCPWF	North City Pure Water Facility
NCPWF-MR	North City Pure Water Facility – Miramar Reservoir
NCPWF-SVR	North City Pure Water Facility – San Vicente Reservoir
NCWRP	North City Water Reclamation Plant
O&M	operations and maintenance
Point Loma WWTP	Point Loma Wastewater Treatment Plant
PPV	peak particle velocity
RCNM	Roadway Construction Noise Model
ROW	right-of-way
RS	reinforced steel
SPPF	Small Power Producing Facility
SR-	State Route
SVR	San Vicente Reservoir
TSS	total suspended solids
VdB	velocity decibel
WTP	Water Treatment Plant
WWTP	Wastewater Treatment Plant

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SUMMARY

The North City Project is the first phase of the Pure Water Program and involves the production of 30 million gallons per day (MGD) of potable recycled water. The North City Project will expand the existing North City Water Reclamation Plant (NCWRP) and construct an adjacent North City Pure Water Facility (NCPWF). Two alternative purified water pipelines are considered: one to Miramar Reservoir (NCPWF-MR) and one to San Vicente Reservoir (NCPWF-SVR). Other Project components include a new pump station and forcemain to deliver additional wastewater to the NCWRP, a brine/centrate discharge pipeline, upgrades to the existing Metro Biosolids Center (MBC), a new renewable energy facility at NCWRP, and a new gas pipeline between the Miramar Landfill gas collection system and the NCWRP.

The noise environments through most of the North City Project area (Project area) are characterized by a background or "ambient" noise level generated by vehicular traffic. Typical secondary noise sources include aircraft, rustling leaves, landscaping maintenance, construction noise, birds, and children playing and passing conversations. The noise assessment in this report quantifies construction and operational noise generation and the resulting noise levels at vicinity noise-sensitive receptors that are generally representative of the areas surrounding the Project componentss.

Construction of the Project components would result in temporary localized increases in noise levels from on-site construction equipment and off-site trucks hauling construction materials. Noise generated by construction equipment will occur with varying intensities and durations during the various phases of construction. Section 5.4 of this report discusses the construction noise impacts in detail. Groundborne vibration from heavy equipment operations during North City Project construction is also discussed in Section 5.5 of this report. Following completion of construction activities, the North City Project would result in potential increases in noise levels from mobile sources (vehicular traffic) and operational equipment such as pumps, HVAC units and other equipment. Section 5.6 of this report discusses the operational noise impacts in detail.

This noise impact analysis evaluates the potential for significant adverse impacts due to construction, operation, and maintenance of the Project components. Potential noise impacts during construction were found to be potentially significant under CEQA and adverse under NEPA; with implementation of the recommended mitigation measures, noise impacts would be reduced to a level of less than significant, with the exception of nighttime work related to the North City Project pipelines, which was determined to be a significant unavoidable impact under CEQA and an unavoidable adverse effect under NEPA. During operation and maintenance, noise impacts were determined to be potentially significant under CEQA and adverse under NEPA, because the details of these facilities have not yet been finalized. Mitigation measures in the form of requirements for noise analyses in the final design phase is provided to ensure compliance with relevant City / County of San Diego noise standards

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1 INTRODUCTION

The North City Project would use advanced water purification technology to produce purified water from recycled water and provide a safe, reliable, and cost-effective drinking water supply for San Diego. The North City Project consists of the design and construction of a new North City Pure Water Facility (NCPWF), upgrades to existing water reclamation facilities, and design and construction of new pump stations and pipelines. The North City Project would construct the NCPWF adjacent to the existing North City Water Reclamation Plant (NCWRP). Upgrades would occur at the existing NCWRP in order to provide sufficient tertiary influent for the NCPWF. Pump station and pipeline facilities would convey different types of flows to and from the treatment facilities for: (1) diverting wastewater flows to NCWRP, (2) conveying recycled water to the NCPWF, (3) conveying purified water from the NCPWF to a reservoir, and (4) transporting waste flows (brine/centrate and sludge) from treatment processes to solids handling facilities or back into the Metro Sewer System. Upgrades would also occur at the Metro Biosolids Center (MBC) to handle the additional sludge produced by the NCWRP Expansion and NCPWF. A new renewable energy facility would be constructed at NCWRP, which would receive landfill gas from the City's Miramar Landfill gas collection system via a new gas pipeline.

From the NCPWF, purified water would be piped to either the Miramar Reservoir or San Vicente Reservoir via a purified water pipeline.

The North City Project would create up to 30 MGD of locally controlled potable water and reduce flows to the Point Loma Wastewater Treatment Plant (Point Loma WWTP), which in turn would reduce total suspended solids (TSS) discharged to the ocean.

1.1 Purpose of the Report

The purpose of this report is to estimate and evaluate the potential noise and vibration impacts associated with implementation of the North City Project Alternatives relative to the significance thresholds and noise / vibration standards of the City of San Diego and the other local jurisdictions in which it would be constructed.

1.2 Project Description and Location

The North City Project includes a variety of facilities located throughout the central coastal areas of San Diego County in the North City geographic area (Figure 1, Regional Map; Table 1). The majority of proposed facilities in the North City Project are situated on developed land and/or along existing paved streets. A new pure water facility and three pump stations would be located within the City. Proposed pipelines would traverse a number of local jurisdictions, including the City of San Diego, the City of Santee, and the community of Lakeside and other areas of unincorporated San Diego County, in addition to federal lands within Marine Corps Air Station

(MCAS) Miramar (Figure 2, Vicinity Map). Specifically, the Miramar Reservoir Alternative is within Poway, La Jolla, and Del Mar U.S. Geological Survey 7.5-minute quadrangle maps, and the San Vicente Reservoir Alternative is within San Vicente Reservoir, El Cajon, La Mesa, La Jolla, and Del Mar U.S. Geological Survey 7.5-minute quadrangle maps (Figure 2, Vicinity Map). The components for each alternative are included in Table 1 and described below.

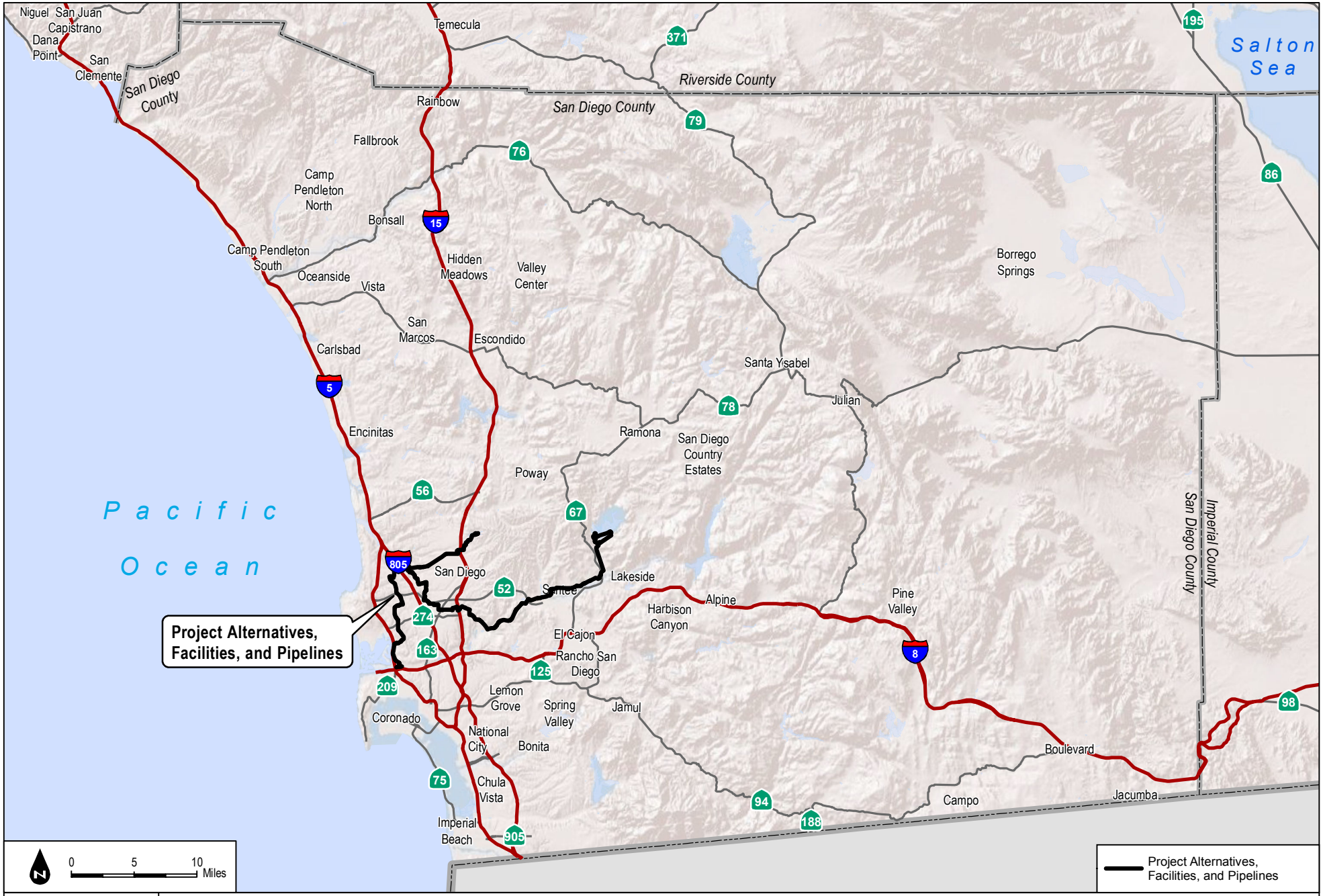
Table 1
North City Project Components

Component	Miramar Reservoir Alternative	San Vicente Reservoir Alternative
Morena Pump Station, Wastewater Forcemain and Brine/Centrate Line (Morena Pipelines)	X	X
North City Water Reclamation Plant (NCWRP) Expansion	X	X
North City Pure Water Facility Influent Pump Station (NCPWF Influent Pump Station)	X	X
North City Pure Water Facility – Miramar Reservoir (NCPWF-MR)	X	
North City Pure Water Pump Station (North City Pump Station)	X	X
North City Pure Water Pipeline (North City Pipeline)	X	
North City Pure Water Facility – San Vicente Reservoir (NCPWF-SVR)		X
San Vicente Pure Water Pipeline (San Vicente Pipeline)		X
Mission Trails Booster Station (MTBS)		X
North City Renewable Energy Facility	X	X
Landfill Gas (LFG) Pipeline	X	X
Metro Biosolids Center (MBC) Improvements	X	X
Miramar Water Treatment Plant (WTP) Improvements	X	
Pure Water Dechlorination Facility (Dechlorination Facility)	X	

1.2.1 Miramar Reservoir Alternative

The Miramar Reservoir Alternative includes (1) a new pump station at Morena Boulevard, a wastewater forcemain, and brine/centrate pipeline (Morena Pump Station and Pipelines); (2) expansion of the existing NCWRP; (3) construction of a new influent pump station at NCWRP and conveyance pipeline between NCWRP and the NCPWF; (4) construction of the new NCPWF; (5) construction of a new North City Pure Water Pump Station (North City Pump Station); (6) construction of a new North City Pure Water Pipeline (North City Pipeline); (7) construction of a new North City Renewable Energy Facility at NCWRP; (8) a new Landfill Gas (LFG) Pipeline between the Miramar Landfill gas collection system and the NCWRP; (9) upgrades at the MBC; and (10) improvements at the Miramar Water Treatment Plant (WTP)).

Figure 3 provides an overview of the Miramar Reservoir Alternative.



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SOURCE: City San Diego 2016; ESRI 2016

FIGURE 1

Regional Map

Pure Water San Diego Program North City Project Noise Technical Report

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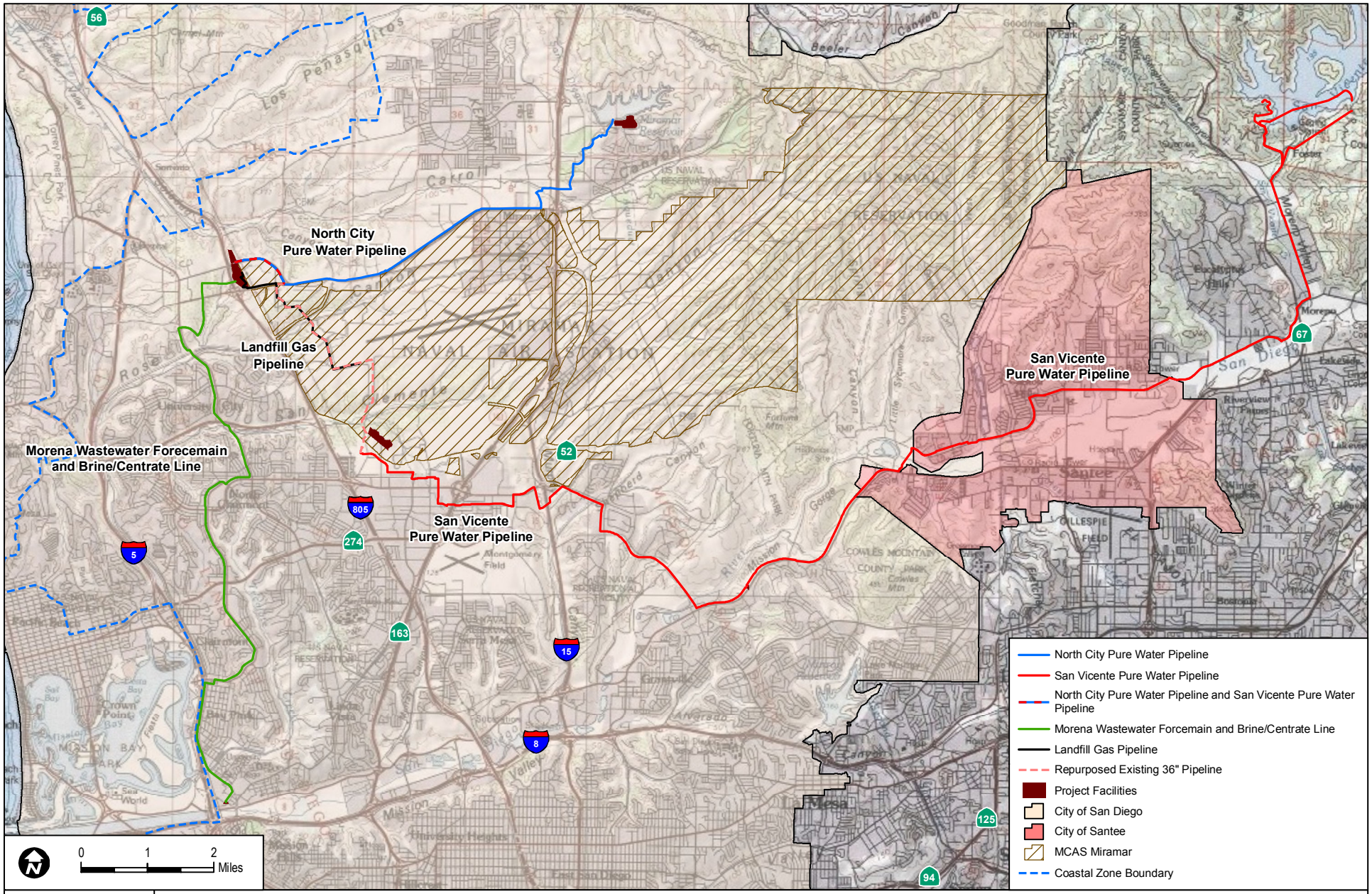

SOURCE: USGS 7.5-Minute Series Del Mar, Poway, San Vicente Reservoir, La Jolla, La Mesa, El Cajon Quadrangles; City of San Diego 2016; CA Coastal Commission

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FIGURE 2

Vicinity Map

Pure Water San Diego Program North City Project Noise Technical Report

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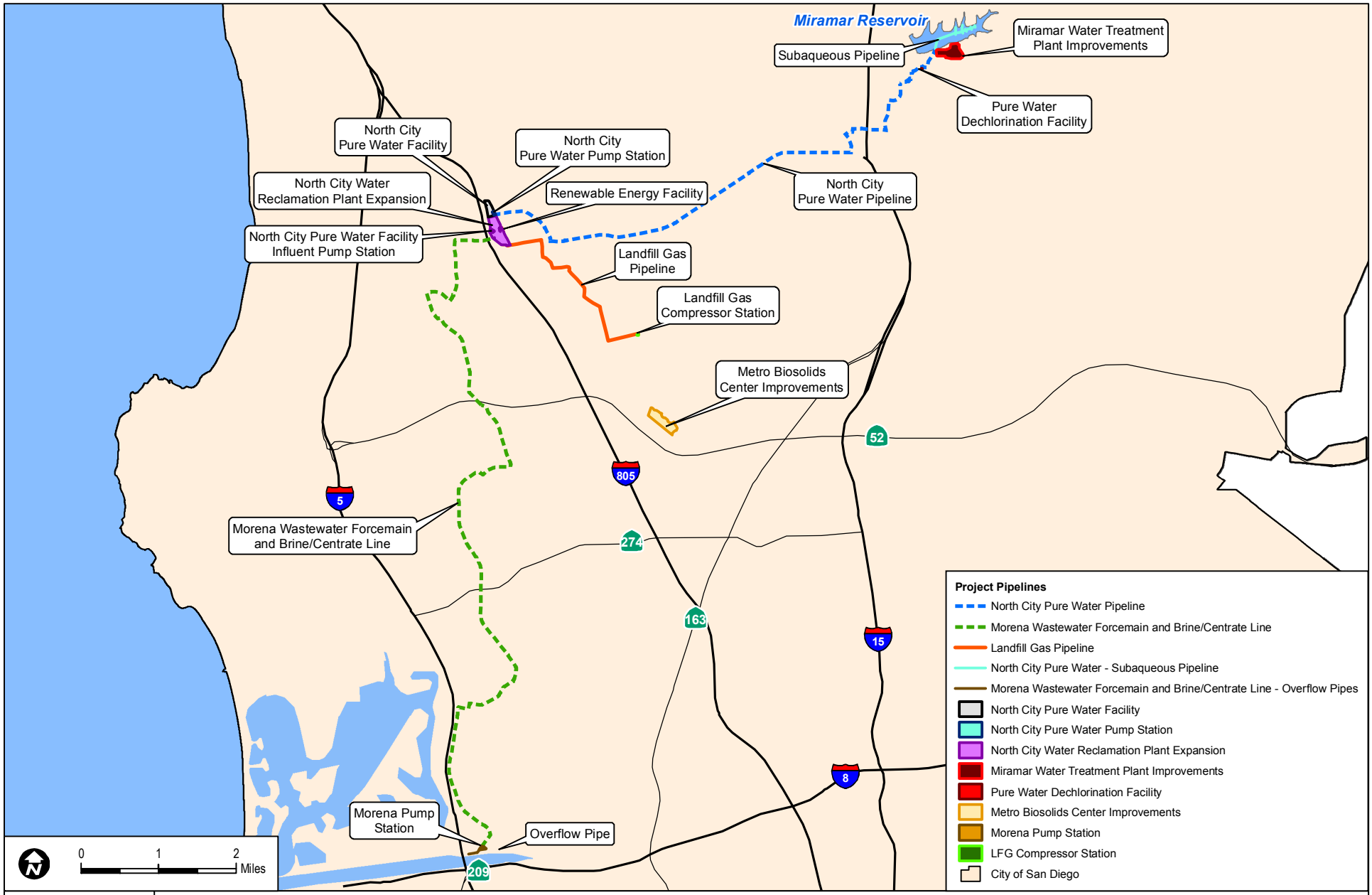

SOURCE: City of San Diego, 2015, 2016; SanGIS 2016

FIGURE 3

Miramar Reservoir Alternative

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The Miramar Reservoir Alternative project facilities and components are described in detail below.

Morena Pump Station and Pipelines

In order to utilize the proposed expanded capacity of the NCWRP, approximately 32 MGD annual average daily flow (AADF) of additional wastewater flows that would normally be conveyed to the Point Loma WWTP would need to be diverted to the NCWRP. The Morena Pump Station and wastewater forcemain are proposed to deliver maximum flow of 37.7 MGD of raw wastewater to the NCWRP, expanding the NCWRP's production capacity from 30 MGD to 52 MGD in dry weather conditions. Wastewater will be conveyed to the Morena Pump Station by connections with four existing sanitary sewer trunk sewers: the 78-inch North Mission Valley Interceptor, the 72-inch Morena Boulevard Interceptor No. 14, the 33-inch Morena Boulevard Trunk Sewer No. 11, and the 60-inch East Mission Bay Trunk Sewer No. 4.

The proposed Morena Pump Station is to be located on a parcel currently owed by the San Diego Humane Society and the Society for the Prevention of Cruelty to Animals. The site is approximately 1 acre and is near the intersection of Sherman Street and Custer Street. The proposed Morena Pump Station would consist of (1) a junction structure and intake screening facility – flow separator and screening structures, (2) a pump station building, (3) odor control and chemical storage, (4) energy dissipater for the 30-inch brine/centrate line, (5) a transformer, (6) an electrical and motor control center building, and (7) a diversion structure.

The pump station will be an approximately 92-foot-long x 66-foot-wide, reinforced, cast-in-place concrete structure. The finished floor of the pump room and wet well will be approximately 52 feet below grade. Due to the location of the pump station, an additional depth of 6 to 10 feet may be required for sub-grade stabilization below the groundwater level. The top slab will extend above finish grade approximately 1 foot, 6 inches at the ridge and taper down to 1 foot, 3 inches at the edges. It is anticipated that the cast-in-place walls will be approximately 4 feet thick and include external buttresses for lateral soil support.

Off-site infrastructure of the pump station facility, excluding the Morena Wastewater Forcemain and Brine/Centrate Line (Morena Pipelines), consists of a storm drainage line, pump station inflow piping, overflow piping, and associated subgrade diversion structures. Diversion structure No. 1 will be approximately 14 feet long by 12 feet wide; diversion structure No. 2 will be approximately 18 feet long by 10 feet wide. Flow control gates will be installed at each diversion structure for flow management into the pump station.

The Morena Pump Station would convey new wastewater approximately 11 miles through a new 48-inch-diameter wastewater forcemain to the existing NCWRP. The wastewater forcemain will connect to the existing 60-inch-diameter reinforced steel (RS) line prior to entering the existing headworks building at NCWRP.

Approximately 6 MGD AADF of brine (produced as a by-product of the advanced water purification treatment process) and 6 MGD AADF of centrate (product remaining after centrifugation at MBC) will be conveyed via a new 30-inch-diameter gravity flow line from the new NCPWF back to Morena Pump Station, and then to a sanitary sewer located in Friars Road where it will ultimately flow to the Point Loma WWTP. The brine/centrate line will combine with the 60-inch diameter overflow sewer and would discharge downstream of the diversion structures back to the Mission Valley Interceptor with sufficient distance as to not recirculate brine flows into the screening facility of the pump station.

The Morena Pipelines will follow the same alignment as depicted in Figure 2. The alignment would begin in an open cut section near the north corner of the Morena Pump Station site, entering the public street right-of-way (ROW) on Custer Street. The alignment would generally head north along Sherman Street, Morena Boulevard, and West Morena Boulevard. The alignment would cross Tecolote Creek just to the east of Tecolote Road bridge, then continue generally heading north and east along Ingulf Street, Denver Street, Clairemont Drive, Clairemont Mesa Boulevard, and Genesee Avenue. It would cross under the bridge at San Clemente Canyon near the State Route 52 (SR-52) on-ramp. Following the bridge, the alignment would continue along Genesee Avenue, crossing SR-52 and the Metropolitan Transit System railroad tracks. After the railroad tracks, the alignment would head east on Nobel Drive and then continue heading north on Towne Centre Drive. The alignment would turn east on Executive Drive and cross Interstate 805 (I-805). The alignment would end at NCWRP. Two trenchless installations are proposed along the Morena Pipelines alignment and include the following: (1) railroad tracks owned by the Metropolitan Transit System at Rose Canyon north of University High School and (5) the I-805 at the terminus of Executive Drive to the NCWRP. An additional trenchless installation would occur where the overflow pipeline crosses MTS right-of-way near the Morena Pump Station.

North City Water Reclamation Plant Expansion

To ensure the 30 MGD of purified water can be produced at the NCPWF, the NCWRP will undergo an expansion of the primary, secondary, and tertiary treatment processes, as well as the corresponding support systems.

To increase capacity at the NCWRP, a number of new process units and tankage would be required. Process units requiring expansion include influent screening, primary sedimentation, flow equalization, aeration basins, secondary clarification, and tertiary filtration. The expanded NCWRP facilities are expected to include an additional bar screen, grit pumps, primary sedimentation with chemically enhanced primary treatment, a primary equalization basin, aeration basins using biological nutrient removal, secondary clarifiers, tertiary filters, and additional ancillary and support systems.

A brine-centrate valve vault will be constructed on the NCWRP site adjacent to the tunnel that conveys the brine/centrate and wastewater force mains on the western edge of the NCWRP next to the existing aeration basins. The brine-centrate valve vault would be approximately 22 by 14 feet, within which the centrate pipeline would connect into the brine/centrate pipeline. The vault would allow for personnel access to check valves and perform routine maintenance.

North City Pure Water Facility Influent Pump Station

The NCPWF Influent Pump Station will be constructed at the NCWRP and will convey tertiary effluent from the NCWRP to the NCPWF. The NCPWF Influent Pump Station will have a maximum capacity of 42.5 MGD to enable the NCPWF to produce a maximum of 34 MGD AADF of purified water after accounting for recycle and other streams. The NCPWF Influent Pump Station would be located on the west side of the NCWRP adjacent to the tertiary filters to divert tertiary effluent from upstream of the chlorination facilities and pump it to the NCPWF. The NCPWF Influent Pump Station would consist of a single enclosed 6,700-square-foot building approximately 45 feet high and would contain three separate rooms: a pump room, HVAC equipment room, and electrical room.

A pump station and associated pipes and appurtenances are currently located within the site. These components will be removed prior to construction of the NCPWF Influent Pump Station. The site is partly covered with grass and is relatively flat.

North City Pure Water Facility

The new NCPWF would be located on the vacant 10-acre City-owned lot across Eastgate Mall to the north of the NCWRP. The NCPWF would produce 30 MGD AADF of purified water. A portion of the purified water would be returned to the NCWRP to reduce the TSS concentration of the disinfected tertiary treated effluent to 1,000 milligrams per liter (mg/L), a level suitable for irrigation. Approximately 30 MGD AADF of purified water will be pumped to Miramar Reservoir.

The treatment process includes an ozone system, biological activated carbon filtration (BAC), membrane filtration, reverse osmosis, and ultraviolet/advanced oxidation process, before it is stabilized and chlorinated prior to pumping out to the reservoir (note under the San Vicente Reservoir Alternative the NCPWF would not include the ozone system or BAC). In addition to process areas for each stage of treatment at the NCPWF, the facility would include chemical feed systems and post-treatment chemical storage.

Access to the site will be from Eastgate Mall, and the entrance will be coordinated with the entrance to the NCWRP to be at the same traffic signal along Eastgate Mall. An approximately 15,000-square-foot operations and maintenance (O&M) building with three above-grade stories

will be built as part of the NCPWF. The third level of the O&M building will be dedicated for a water quality testing laboratory.

North City Pure Water Pump Station

The North City Pump Station would be located on the southeast corner of the NCPWF. The North City Pump Station will have three duty pumps and one standby pump, all of which are 1,000 horsepower (HP) motor pumps and vertical-turbine. Each pump will be design to deliver a flow rate of 7,593 gallons per minute. The North City Pump Station will serve as the NCPWF's only effluent pump station and will convey purified water from the NCPWF Product Water Storage Tank to a reservoir.

North City Pure Water Pipeline

The North City Pipeline will transmit purified water approximately 8 miles from the NCPWF to Miramar Reservoir where it will be blended with the imported raw water in the Miramar Reservoir and receive additional treatment at the Miramar WTP.

The North City Pipeline will be designed for an average daily flow of 30 MGD with a minimum daily flow of 23 MGD and a maximum daily flow of 33 MGD. A 48-inch-diameter welded steel pipe is the recommended width and material for the North City Pipeline as the most suitable for the design conditions.

The North City Pipeline alignment is shown on Figure 2. Detailed cross sections of the North City Pipeline are included on Sheets C1 through C51 in the 30% Design Report for the North City Pipeline (Brown and Caldwell). The North City Pipeline is proposed to travel through the University, Mira Mesa, and Scripps Miramar Ranch communities (City of San Diego). The North City Pipeline would also cross federal lands in MCAS Miramar along segments of Miramar Road and would cross an unincorporated area of the County of San Diego immediately after the I-15 crossing.

The North City Pipeline alignment would begin in an open trench in Eastgate Mall and would head southeast, with a short trenchless section just before Eastgate Court. At Miramar Road, the North City Pipeline would continue east for approximately 4.5 miles, with a bridge over the Metropolitan Transit System Railway crossing and a short trenchless section under the BNSF Railway crossing. The North City Pipeline would turn north on Kearny Villa Road and then turn east on Candida Street. The North City Pipeline would head north on Via Pasar via a trenchless segment, and then continue east on Via Excelencia in an open cut section. A trenchless segment would cross I-15 then would return to an open cut section across private property then turn north on Businesspark Avenue. The North City Pipeline would continue north on Carroll Canyon Road then head east on Hoyt Park Drive and Meanley Drive, continuing east/northeast before crossing Evans Pond in a trenchless segment.

The final segment of the North City Pipeline will consist of a subaqueous pipeline within Miramar Reservoir. The segment of pipeline will begin at the Miramar WTP site and continue to the far, east bank of Miramar Reservoir. The pipeline would be a submerged, 4,800-foot-long HDPE pipe ranging in diameter from 8 inches to 54 inches with 94 outlets and 188 subaqueous diffusers along the bottom of Miramar Reservoir.

North City Renewable Energy Facility

A new North City Renewable Energy Facility would be constructed in order to provide power to the expanded NCWRP as well as the new NCPWF and North City Pump Station. The new facility includes a total of 15.4 megawatts (MW) of new generation capacity. The 5 MW of existing power generation capacity already at NCWRP would remain.

Six new internal combustion engines (ICE) and generator units would be installed. Each of these consists of a 3.8 MW Caterpillar Model CG260-16 IC or equivalent ICE and generator units. Three of the units would be located in a Small Power Producing Facility (SPPF) and would use 100% landfill gas as fuel. The remaining power generation capacity (9.1 MW) would primarily use landfill gas, but may also be supplemented with natural gas as fuel. One additional 3.8 MW Caterpillar Model CG260-16 IC or equivalent ICE will serve as backup to the SPPF engines or the mixed-gas power generation engines.

The engines will be placed inside a building located immediately south of the new circular secondary clarifiers and north of the existing emergency renewable energy facility at NCWRP. The building will include sound suppression features to reduce the noise levels outside the building. The estimated stack height of the engines' exhaust stacks is 55 feet measured from the finished ground elevation immediately adjacent to the renewable energy building (at approximate elevation 354 feet amsl), which is approximately 30 feet above the top of the building.

A skid-mounted equipment package consisting of a natural gas compressor system, air receivers, and oil storage will be located on the site adjacent to the renewable energy building. Two additional buildings will be included on the site for controls equipment and storage. The facility will also include a gas cleaning and cooling equipment skid and an electrical switchyard. An area chemical storage, containment, and feed facility will be provided for emissions control.

The facility layout includes relocation of the City's existing 1.6 MW SPPF engine to a new location on the site near the existing emergency power generation equipment at NCWRP in order to accommodate the layout of the new renewable energy facility.

The expanded renewable energy facility covers an area of approximately 1 acre and is fully contained within the existing NCWRP property. Approximately half of that area is existing impervious paved surface and the entire area will be impervious once the facility is

constructed. The site topography for the new renewable energy facility at NCWRP will necessitate a perimeter retaining wall approximately 300 feet in length with a maximum height of 22 feet. The retaining wall will be either a mechanically stabilized earth (MSE) wall or reinforced concrete. The project will include earthwork and other site preparation activities for construction of the retaining wall. The renewable energy facility will include utility relocations, new utilities, equipment, earthwork, retaining wall, paving, and other site-preparation activities.

Landfill Gas Pipeline

The new North City Renewable Energy Facility will receive landfill gas from the City's Miramar Landfill gas collection system via a new 12-inch diameter LFG Pipeline. The new LFG Pipeline will parallel an existing 10-inch-diameter gas pipeline that conveys landfill gas from the landfill to fuel the existing emergency power generation units at NCWRP. Approximately 3,627 linear feet of the new LFG Pipeline will be constructed within the limits of the City's existing 40-foot utility easement where it crosses the Veteran's Administration (VA) Miramar National Cemetery. An expanded additional 10-foot easement is planned along the remainder of the alignment outside of the VA to facilitate construction and future maintenance activities. The approximately 15,885 linear feet alignment runs from the existing Miramar Landfill north along the western end of the MCAS Miramar property to the NCWRP site.

A new 5,000-square-foot gas compressor station will be sited immediately adjacent to an existing gas compressor station at the Miramar Landfill in order to pressurize and convey the landfill gas from the landfill to NCWRP.

Metro Biosolids Center Improvements

The MBC is located north of State Route 52 (SR-52), adjacent to the Miramar Landfill. Projected flows of raw solids from the NCWRP will increase, while projected flows of digested solids from Point Loma WWTP will remain roughly constant such that MBC will be required to provide on-site anaerobic digestion for a greater percentage of the system's biosolids output. In addition to changes in quantity, changes in treatment processes at the NCWRP and Point Loma WWTP may change the quality, and hence treatability, of the two biosolids streams. Raw solids flows are expected to increase by a factor of 7 from a current maximum operating flow of 0.89 MGD to a projected flow of 6.55 MGD at maximum conditions; solids in pounds per day (lb/d) are expected to increase by a factor of 5:1 from 56,000 lb/d (current) to 294,000 lb/d (maximum conditions).

Improvements at MBC would include expanding the existing closed-loop grit removal system; replacement of the existing thickening centrifuges (a total of six new centrifuges will be installed); upgrades to digesters, including replacing the existing digester gas laterals with larger lines and larger gas handling appurtenances, installing one additional flare, and replacing

existing biogas booster blowers with three new blowers and increasing the size of the biogas feed line from the blowers to the cogeneration facility; installing new thickened sludge supply line; upgrading the sludge feed pumps and polymer feed pumps; installing three new centrate pumps and variable frequency drives; adding a fourth off-the-shelf replacement peristaltic pump; and expansion of existing piping systems. The current centrate pump station at MBC would require pumps to be upgraded to be capable of higher flows and pressure. In addition, the centrate forcemain would need regular maintenance to clean the pipe and restore capacity to its full potential. As part of the pipe cleaning, existing plug valves would need to be replaced with full port valves. Launching and receiving pits may need to be constructed.

Miramar Water Treatment Plant Improvements

Under the Miramar Reservoir Alternative, purified water discharged into the Miramar Reservoir will be pumped via the existing Miramar Reservoir Pump Station to the Miramar WTP for treatment and eventual distribution. Currently, the majority of the water treated at the Miramar WTP is fed directly to the plant, and the Miramar Reservoir is primarily used for balancing flows and emergency storage. Under the Miramar Reservoir Alternative, the Miramar Reservoir will receive approximately 30 MGD AADF of purified water on a more or less continuous basis, meaning that the Miramar Reservoir Pump Station must operate at roughly 30 MGD AADF to maintain the inflow/outflow balance in the reservoir.

This increased use calls for rehabilitation of the Miramar Reservoir Pump Station, which includes upgrading the existing pumps with variable frequency drives along with various mechanical upgrades to the valves and piping. The additional pumping will result in an additional annual power demand of 586,000 kilowatt-hours (kWh). However, an on-site solar photovoltaic system will be installed to completely cover the power needs of the facility.

Pure Water Dechlorination Facility

The Pure Water Dechlorination Facility (Dechlorination Facility) will be located at the end of Meanley Drive off the cul-de-sac on the City's property for the Miramar Recycled Water Storage Tank. The facility will include an approximately 768-square-foot above-grade building to house chemical storage tanks, dosing pumps, analyzers, and associated piping valves and appurtenances. The NCPWF purified water will be chlorinated to maintain chlorine residual and prevent regrowth within the North City Pipeline. Prior to blending the purified water with the raw water at Miramar Reservoir, the remaining free chlorine residual will be removed from the purified water to protect the aquatic life in the lake. The Dechlorination Facility would reduce the residual chlorine concentration to below the required limit.

1.2.2 San Vicente Reservoir Alternative

The San Vicente Reservoir Alternative shares most of the same components with the Miramar Reservoir Alternative. Project components described under the Miramar Reservoir Alternative that are also common to the San Vicente Reservoir Alternative include (1) the Morena Pump Station and Pipelines, (2) expansion of the existing NCWRP, (3) construction of a new influent pump station at NCWRP and conveyance pipeline between NCWRP and the NCPWF, (4) a new renewable energy facility at the NCWRP, (5) a new gas pipeline between the Miramar Landfill gas collection system and the NCWRP; and (6) upgrades at the MBC.

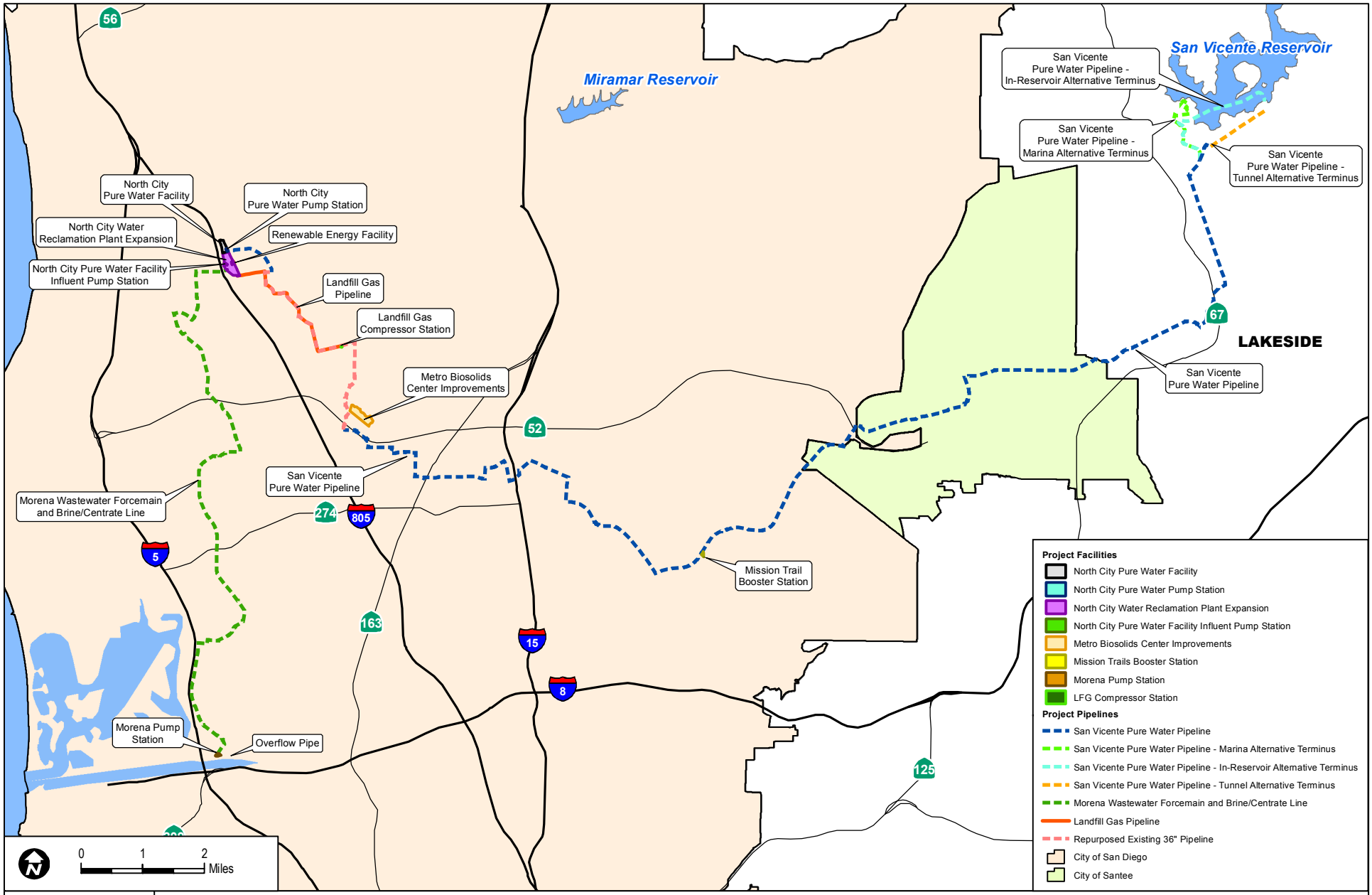
Because of the different sizes of the Miramar Reservoir and San Vicente Reservoir, the design of the NCPWF for each will be slightly different. However, for the purposes of the noise analysis, the facilities would be similar enough that no additional discussion is provided under this alternative and the reader is referred to the discussion under the Miramar Reservoir Alternative. Project components which are applicable only to the San Vicente Reservoir Alternative are discussed separately below and include (1) San Vicente Pure Water Pipeline (San Vicente Pipeline) including the three alternative reservoir inlet options: Tunnel, In-Reservoir, and Marina; and (2) Mission Trails Booster Station (MTBS). Figure 4 provides an overview of the San Vicente Reservoir Alternative.

San Vicente Pipeline

The San Vicente Pipeline will be designed for an average daily flow of 30 MGD with a minimum daily flow of 27 MGD and a maximum daily flow of 35 MGD. The San Vicente Pipeline includes a segment (approximately 21,300 linear feet) of existing recycled water pipe that will be repurposed for purified water conveyance. That segment currently serves non-potable reuse customers. Under the San Vicente Reservoir Alternative, the San Vicente Pipeline will continue to supply those non-potable reuse customers with purified water. Approximately 1.4 MGD AADF will be provided as non-potable reuse to existing customers.

The remaining 133,475 linear feet of the San Vicente Pipeline would be newly constructed using a combination of open cut trench and trenchless construction methods to deliver 30 MGD AADF to the San Vicente Reservoir. A 48-inch-diameter and 60-inch-diameter welded steel pipe is the recommended width and material for the San Vicente Pipeline as the most suitable for the design conditions.

The general alignment of the San Vicente Pipeline is shown on Figure 4. Detailed cross sections of the San Vicente Pipeline are included on Sheets 7 through 89 in Appendix K of the 10% Design Report for the SVRPWPL (Brown and Caldwell 2016). The pipeline is proposed to travel through the University, Kearny Mesa, Navajo, Tierrasanta, and East Elliot communities of the City of San Diego; the City of Santee; and the incorporated community of Lakeside in the County of San Diego.



SOURCE: City of San Diego, 2015, 2016; SanGIS 2016

FIGURE 4

San Vicente Reservoir Alternative

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The first approximately 5,500 linear feet of the San Vicente Pipeline would follow the same alignment as the North City Pipeline along Eastgate Mall. At Miramar Road, purified water would be conveyed via an existing 36-inch-diameter recycled water pipeline for approximately 21,300 linear feet as described above. This repurposed 36-inch-diameter pipeline traverses federal lands, including the Miramar National Cemetery and MCAS Miramar. The new 48-inch-diameter San Vicente Pipeline would begin again in an open cut segment on Copley Drive and would continue southeast until heading due east on Copley Park Place, then south on Convoy Street, then east again on Convoy Court. The San Vicente Pipeline would continue east on Mercury Court, passing through various business park and industrial uses before heading south on Industrial Park Driveway.

A trenchless segment would cross Clairemont Mesa Boulevard, and the San Vicente Pipeline would continue south on Ronson Court before heading east on Ronson Road. A trenchless segment would cross SR-163 and then the San Vicente Pipeline would continue again in an open cut segment east along Lightwave Avenue. The alignment would continue north on Ruffin Road, east on Clairemont Mesa Boulevard and then south on Murphy Canyon Road. At Elanus Canyon, the alignment would head east across a parking lot before crossing I-15 in a trenchless segment and traversing the canyon until rejoining Clairemont Mesa Boulevard. At Santo Road the alignment would head south then east along Tierrasanta Boulevard. A trenchless segment would continue south across the San Diego River and then the alignment would turn east on Mission Gorge Road, traversing the Mission Trails Regional Park. A trenchless segment would cross the SR-52 at West Hills Parkway before continuing east on Carlton Oaks Drive. The alignment would leave the roadway ROW for a short segment and then cross Sycamore Canyon via a trenchless crossing before continuing east again within Carlton Oaks Drive.

The San Vicente Pipeline would continue north on Halberns Boulevard, then east on Mast Boulevard with another trenchless segment between two disconnected portions of Mast Boulevard. The alignment would continue east on Riverside Drive and Lakeside Avenue before connecting with Willow Road. From Willow Road the San Vicente Pipeline would turn north on Moreno Avenue, continuing north to the shore of the San Vicente Reservoir.

San Vicente Reservoir Inlet Alignment Alternatives

The San Vicente Reservoir Alternative proposes three alternative pipeline terminus options: (1) a Tunnel Alternative Terminus, (2) an In-Reservoir Alternative Terminus, and (3) a Marina Alternative Terminus.

For the Tunnel Alternative, an approximately 5,400-linear-foot tunnel would be located at the end of the San Vicente Pipeline. The Tunnel Alternative would discharge 32 feet above the spillway elevation of the San Vicente Dam (elevation 766 feet) into a reinforced concrete

discharge structure and flow down a natural drainage way into the San Vicente Reservoir. Prior to the structure itself, a dechlorination injection point is envisioned to be incorporated to eliminate any residual chlorine in the purified water prior to discharge. Monitoring and injection equipment could be located on an existing City property nearby or at the structure itself, provided regular maintenance can be accommodated.

The In-Reservoir Alternative would continue via open trench from Moreno Avenue approximately 6,900 linear feet up the existing Marina access road to the San Vicente Reservoir's western side near the newly constructed Marina. An approximately 10,000-linear-foot subaqueous pipeline constructed of HDPE would then convey water across the San Vicente Reservoir, existing up the far bank where it would connect to the same discharge structure as proposed for the Tunnel Alternative. The subaqueous pipeline would be weighted to ensure it remains on the San Vicente Reservoir bottom in its final position.

The Marina Alternative would follow the same alignment as the In-Reservoir Alternative from the intersection of Vigilante Road and Moreno Avenue along the Marina access road. At the road's high point, near the saddle dam, the pipeline would continue in the access road to the Marina parking area rather than transition to a subaqueous pipeline. The pipeline would continue in the access road that runs along the shoreline and would discharge at the western shore of the San Vicente Reservoir. The Marina Alternative pipeline would be approximately 8,625 linear feet.

Mission Trails Booster Station

The MTBS will receive purified water pumped from the North City Pump Station via the San Vicente Pipeline. The purified water will be pumped from the MTBS to the San Vicente Reservoir via the San Vicente Pipeline. The MTBS will be located along Mission Gorge Road across two privately owned parcels. The MTBS will have three duty pumps and one standby pump, all of which are 1,000 HP vertical-turbine motor pumps.

2 FUNDAMENTALS OF NOISE AND VIBRATION

The following is a brief discussion of fundamental noise concepts and terminology.

2.1 Sound, Noise, and Acoustics

Sound is actually a process that consists of three components: the sound source, the sound path, and the sound receiver. All three components must be present for sound to exist. Without a source to produce sound, there is no sound. Similarly, without a medium to transmit sound pressure waves, there is no sound. Finally, sound must be received; a hearing organ, sensor, or object must be present to perceive, register, or be affected by sound or noise. In most situations, there are many different sound sources, paths, and receptors rather than just one of each. Acoustics is the field of science that deals with the production, propagation, reception, effects, and control of sound. Noise is defined as sound that is loud, unpleasant, unexpected, or undesired.

2.2 Sound Pressure Levels and Decibels

The amplitude of a sound determines its loudness. Loudness of sound increases with increasing amplitude. Sound pressure amplitude is measured in units of micronewton per square meter, also called micropascal. One micropascal is approximately one-hundred billionth (0.00000000001) of normal atmospheric pressure. The pressure of a very loud sound may be 200 million micropascals, or 10 million times the pressure of the weakest audible sound. Because expressing sound levels in terms of micropascal would be very cumbersome, sound pressure level in logarithmic units is used instead to describe the ratio of actual sound pressure to a reference pressure squared. These units are called bels. To provide a finer resolution, a bel is subdivided into 10 decibels (dB).

2.3 A-Weighted Sound Level

Sound pressure level alone is not a reliable indicator of loudness. The frequency, or pitch, of a sound also has a substantial effect on how humans will respond. Although the intensity (energy per unit area) of the sound is a purely physical quantity, the loudness, or human response, is determined by the characteristics of the human ear.

Human hearing is limited not only in the range of audible frequencies, but also in the way it perceives the sound in that range. In general, the healthy human ear is most sensitive to sounds between 1,000 and 5,000 hertz, and it perceives a sound within that range as more intense than a sound of higher or lower frequency with the same magnitude. To approximate the frequency response of the human ear, a series of sound level adjustments is usually applied to the sound measured by a sound level meter. The adjustments (referred to as a weighting network) are frequency dependent.

The A-scale weighting network approximates the frequency response of the average young ear when listening to ordinary sounds. When people make judgments about the relative loudness or annoyance of a sound, their judgments correlate well with the A-scale sound levels of those sounds. Other weighting networks have been devised to address high noise levels or other special situations (e.g., B-scale, C-scale, D-scale), but these scales are rarely used in conjunction with most environmental noise. Noise levels are typically reported in terms of A-weighted sound levels. All sound levels discussed in this report are A-weighted decibels (dBA). Examples of typical noise levels for common indoor and outdoor activities are depicted in Table 2.

Table 2
Typical Sound Levels in the Environment and Industry

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
Jet fly over at 300 meters (1,000 feet)	110	Rock band
Gas lawn mower at 1 meter (3 feet)	100	Food blender at 1 meter (3 feet)
Diesel truck at 15 meters (50 feet), at 80 kilometers per hour (50 miles per hour)	90	Garbage disposal at 1 meter (3 feet)
Noisy urban area, daytime	80	Vacuum cleaner at 3 meters (10 feet);
Gas lawn mower at 30 meters (100 feet)	70	Normal speech at 1 meter (3 feet)
Commercial area;	60	Large business office
Heavy traffic at 90 meters (300 feet)	50	Dishwasher next room
Quiet urban, daytime	40	Theater; large conference room (background)
Quiet urban, nighttime	30	Library
Quiet suburban, nighttime	20	Bedroom at night; concert hall (background)
Quiet rural, nighttime	10	Broadcast/Recording studio
Lowest threshold of human hearing	0	Lowest threshold of human hearing

Source: Caltrans 2009.

2.4 Human Response to Changes in Noise Levels

Under controlled conditions in an acoustics laboratory, the trained, healthy human ear is able to discern changes in sound levels of 1 dBA when exposed to steady, single-frequency signals in the mid-frequency range. Outside such controlled conditions, the trained ear can detect changes of 2 dBA in normal environmental noise. It is widely accepted that the average healthy ear, however, can barely perceive noise level changes of 3 dBA. A change of 5 dBA is readily perceptible, and a change of 10 dBA is perceived as twice or half as loud. A doubling of sound energy results in a 3 dBA increase in sound, which means that a doubling of sound energy (e.g., doubling the volume of traffic on a road) would result in a barely perceptible change in sound level).

2.5 Noise Descriptors

Additional units of measure have been developed to evaluate the long-term characteristics of sound. The equivalent sound level (L_{eq}) is also referred to as the time-average sound level. It is the equivalent steady-state sound level that in a stated period of time would contain the same acoustical energy as the time-varying sound level during the same time period. The 1-hour A-weighted equivalent sound level, $L_{eq}(h)$, is the energy average of the A-weighted sound levels occurring during a 1-hour period, and is the basis for the City of San Diego's noise ordinance criteria, as well as the basis for the County of San Diego and the other cities in which the North City Project would be constructed.

People are generally more sensitive and annoyed by noise occurring during the evening and nighttime hours. Thus, another noise descriptor used in community noise assessments—the community noise equivalent level (CNEL)—was introduced. The CNEL scale represents a time-weighted, 24-hour average noise level based on the A-weighted sound level. The CNEL accounts for the increased noise sensitivity during the evening hours (7 p.m. to 10 p.m.) and nighttime hours (10 p.m. to 7 a.m.) by adding 5 dBA and 10 dBA, respectively, to the average sound levels occurring during the evening and nighttime hours.

2.6 Sound Propagation

Sound propagation (i.e., the passage of sound from a noise source to a receiver) is influenced by geometric spreading, ground absorption, atmospheric effects, and shielding by natural and/or built features.

Sound levels attenuate (or diminish) at a rate of approximately 6 dBA per doubling of distance from an outdoor point source due to the geometric spreading of the sound waves. Atmospheric conditions such as humidity, temperature, and wind gradients can also temporarily either increase or decrease sound levels. In general, the greater the distance the receiver is from the source, the greater the potential for variation in sound levels due to atmospheric effects. Additional sound attenuation can result from built features such as intervening walls and buildings, and by natural features such as hills and dense woods.

2.7 Groundborne Vibration Fundamentals

Groundborne vibration is a small, rapidly fluctuating motion transmitted through the ground. The strength of groundborne vibration attenuates fairly rapidly over distance. Some soil types transmit vibration quite efficiently; other types (primarily sandy soils) do not. Several basic measurement units are commonly used to describe the intensity of ground vibration. The descriptors used by the Federal Transit Administration are peak particle velocity (PPV), in units

of inches per second, and velocity decibel (VdB). The calculation to determine PPV at a given distance is as follows:

$$PPV_{dist} = PPV_{ref}*(25/D)^{1.5}$$

Where:

PPV_{dist} *= the peak particle velocity in inches per second of the equipment adjusted for distance*

PPV_{ref} *= the reference vibration level in inches per second at 25 feet*

D = the distance from the equipment to the receiver

The velocity parameter (instead of acceleration or displacement) best correlates with human perception of vibration. Thus, the response of humans, buildings, and sensitive equipment to vibration is described in this section in terms of the root-mean square velocity level in VdB units relative to 1 micro-inch per second. As a point of reference, the average person can just barely perceive vibration velocity levels below 70 VdB (typically in the vertical direction). The calculation to determine the root-mean square at a given distance is as follows:

$$L_v(D) = L_v(25\ feet) - 30*\log(D/25)$$

Where:

$L_v(D)$ *= the vibration level at the receiver*

$L_v(25\ feet)$ *= the reference source vibration level*

D = the distance from the vibration activity to the receiver

Typical background vibration levels are between 50 and 60 VdB, and the level for minor cosmetic damage to fragile buildings or blasting generally begins at 100 VdB.

3 REGULATORY SETTING

3.1 Federal

There are no applicable federal regulations related to noise that would apply to the North City Project.

3.2 State

Government Code Section 65302(g)

California Government Code Section 65302(g) requires the preparation of a Noise Element, which shall identify and appraise the noise problems in the community. The Noise Element shall recognize the guidelines adopted by the Office of Noise Control in the State Department of Health Services and shall quantify, to the extent practicable, current and projected noise levels for the following sources:

- Highways and freeways
- Primary arterials and major local streets
- Passenger and freight on-line railroad operations and ground rapid transit systems
- Aviation and airport-related operations
- Local industrial plants
- Other ground stationary noise sources contributing to the community noise environment

3.3 Local

Because the Project components would be located in a number of municipal and unincorporated areas in addition to the City of San Diego, the applicable regulatory provisions of those agencies are described in this section.

3.3.1 City of San Diego

City of San Diego Municipal Code 59.5.0401 (Noise Ordinance)

Section 59.5.0401 of the City of San Diego's Municipal Code sets forth sound level limits. It is unlawful for any person to cause noise by any means to the extent that the 1-hour average sound level exceeds the applicable limit given in the following table (Table 3) at any location in the City of San Diego on or beyond the boundaries of the property on which the noise is produced. The noise subject to these limits is the part of the total noise at the specified location that is due solely to the action of said person/event.

Table 3
City of San Diego Applicable Limits

Land Use	Time of Day	1-Hour Average Sound Level (dBA)
Single-family residential	7 a.m. to 7 p.m.	50
	7 p.m. to 10 p.m.	45
	10 p.m. to 7 a.m.	40
Multi-family residential (up to a maximum density of 1/2,000)	7 a.m. to 7 p.m.	55
	7 p.m. to 10 p.m.	50
	10 p.m. to 7 a.m.	45
All other residential	7 a.m. to 7 p.m.	60
	7 p.m. to 10 p.m.	55
	10 p.m. to 7 a.m.	50
Commercial	7 a.m. to 7 p.m.	65
	7 p.m. to 10 p.m.	60
	10 p.m. to 7 a.m.	60
Industrial or agricultural	Any time	75

Source: City of San Diego 2010.

City of San Diego Municipal Code 59.5.0404 (Noise Ordinance)

Construction Noise

Section 59.5.0404 of the City of San Diego's Municipal Code sets forth limitations related to construction noise (City of San Diego 2010).

A. It shall be unlawful for any person, between the hours of 7:00 p.m. of any day and 7:00 a.m. of the following day, or on legal holidays as specified in Section 21.04 of the San Diego Municipal Code, with exception of Columbus Day and Washington's Birthday, or on Sundays, to erect, construct, demolish, excavate for, alter, or repair any building or structure in such a manner as to create disturbing, excessive, or offensive noise unless a permit has been applied for and granted beforehand by the Noise Abatement and Control Administrator. In granting such permit, the Administrator shall consider whether the construction noise in the vicinity of the proposed work site would be less objectionable at night than during the daytime because of different population densities or different neighboring activities; whether obstruction and interference with traffic, particularly on streets of major importance, would be less objectionable at night than during the daytime; whether the type of work to be performed emits noises at such a low level as to not cause significant disturbances in the vicinity of the work site; the character and nature of the neighborhood of the proposed work site; whether great economic hardship would occur if the work were spread over a longer time; and whether proposed night work is in the general public interest; and he/she shall prescribe such conditions, working times, types

of construction equipment to be used, and permissible noise levels as he/she deems to be required in the public interest.

B. Except as provided in Subsection C hereof, it shall be unlawful for any person, including the City of San Diego, to conduct any construction activity so as to cause, at or beyond the property lines of any property zoned residential, an average sound level greater than 75 decibels during the 12-hour period from 7:00 a.m. to 7:00 p.m.

C. The provisions of Subsection B of this section shall not apply to construction equipment used in connection with emergency work, provided the Administrator is notified within 48 hours after commencement of work.

City of San Diego Significance Determination Thresholds

The City of San Diego has guidance for determination of significance according to the California Environmental Quality Act (CEQA), including what would constitute a significant noise impact (City of San Diego 2011). These thresholds are used in this analysis and are provided in Section 5.2.

3.3.2 City of Santee Municipal Code

8.12.040 Sound level limits

Section 8.12.040 of the City of Santee's Municipal Code sets forth sound level limits, as described below.

A. Unless a variance has been applied for and granted pursuant to Title 8 of the City of Santee's Municipal Code, it shall be unlawful for any person to cause or allow the creation of any noise to the extent that the one-hour average sound level, at any point on or beyond the boundaries of the property on which the sound is produced, exceeds the applicable limits set forth below except that construction noise level limits shall be governed by Section 8.12.290 of City of Santee's Municipal Code.

Table 4 outlines the sound levels within each zoning designations.

Table 4
City of Santee One-Hour Average Sound Level

Zone	Time	Applicable Limit One-Hour Average Sound Level (Decibels)
A-70, A-72, R-S, R-V, R-R, R-MH, S-87, S-88, S-90	7 a.m. to 7 p.m.	50
	7 p.m. to 10 p.m.	45
	10 p.m. to 7 a.m.	40

Table 4
City of Santee One-Hour Average Sound Level

Zone	Time	Applicable Limit One-Hour Average Sound Level (Decibels)
R-U, R-C, and C-31	7 a.m. to 7 p.m.	55
	7 p.m. to 10 p.m.	50
	10 p.m. to 7 a.m.	45
All other commercial zones	7 a.m. to 7 p.m.	60
	7 p.m. to 10 p.m.	55
	10 p.m. to 7 a.m.	50
M-50, M-52	Anytime	70
All other industrial zones	Anytime	75
The sound level at the location on a boundary between an industrial zone and a residential zone	7 a.m. to 7 p.m.	60
	7 p.m. to 10 p.m.	55
	10 p.m. to 7 a.m.	50

Source: City of Santee 1984.

B. For all other zones the sound level limit on a boundary between two zoning districts is the arithmetic mean of the respective limits for the two districts; provided, however, that the noise level limit applicable to extractive industries, including but not limited to borrow pits and mines, shall be the noise level limit applicable to the M-52 zone, or other standard as required for industrial uses adjacent to a residential zone.

C. Fixed-location public utility distribution or transmission facilities located on or adjacent to a property line shall be subject to the noise level limits of this section, measured at or beyond six feet from the boundary of the easement upon which the equipment is located (City of Santee 1984).

8.12.290 Construction equipment

Section 8.12.290 of the City of Santee's Municipal Code sets forth noise limitations on construction equipment.

A. Except for emergency work, it is unlawful for any person, including the city, to operate any single or combination of powered construction equipment at any construction site, except as outlined as follows:

1. It shall be unlawful for any person, including the city, to operate any single or combination of powered construction equipment at any construction site on Sundays, January 1st, the last Monday in May, known as "Memorial Day," July 4th, the first Monday in September, December 25th, and every day appointed by the President, Governor, or the city council for a public fast, thanksgiving, or holiday. When

January 1st, July 4th, or December 25th falls on a Sunday, it shall be unlawful for any person to operate any single or combination of powered construction equipment at any construction site on the following Monday. Notwithstanding the above, a person may operate powered construction equipment on the above-specified days between the hours of ten a.m. and five p.m. in compliance with the requirements of subdivision 2 of this subsection at his residence for himself, provided such operation of powered construction equipment is not carried on for profit or livelihood. In addition, it shall be unlawful for any person to operate any single or combination of powered construction equipment at any construction site on Mondays through Saturdays except between the hours of seven a.m. and seven p.m.

2. No such equipment, or combination of equipment regardless of age or date of acquisition, shall be operated so as to cause noise at a level in excess of seventy-five decibels for more than eight hours during any twenty-four-hour period when measured at or within the property lines of any property which is developed and used either in part or in whole for residential purposes. These sound levels shall be corrected for time duration in accordance with the following table [Table 5]:

Table 5
City of Santee Construction Noise Allowance

Total Duration in 24 Hours	Decibel Level Allowance	Total Decibel Level
Up to 15 minutes	+15	90
Up to 30 minutes	+12	87
Up to 1 hour	+9	84
Up to 2 hours	+6	81
Up to 4 hours	+3	78
Up to 8 hours	0	75

Source: City of Santee n.d.

B. In the event that lower noise limit standards are established for construction equipment pursuant to state or federal law, the lower limits shall be used as a basis for revising and amending the noise level limits specified in subsection A2 of this section.

17.30.030 Performance standards.

The conduct and operation of all uses in all districts shall comply with the minimum standards of performance set forth in Section 17.30.030 of the City of Santee's Municipal Code (City of Santee 1985).

A. Noise.

***

2. Commercial/Industrial. All commercial and industrial uses shall be established and operated in compliance with the city noise ordinance, commencing with Section 8.12.010 of the Santee Municipal Code, or as may be hereafter amended.

***

E. Vibration. No operation or activity is permitted which will create vibration noticeable without instruments at the perimeter of the subject property.

3.3.3 County of San Diego

36.404. General Sound Level Limits

Section 36.404 of the County of San Diego's Municipal Code sets forth general sound level limitations.

A. Except as provided in section 36.409 of the County of San Diego's Municipal Code, it shall be unlawful for any person to cause or allow the creation of any noise, which exceeds the one-hour average sound level limits in [Table 6], when the one-hour average sound level is measured at the property line of the property on which the noise is produced or at any location on a property that is receiving the noise.

Table 6
Sound Level Limits In Decibels (dBA)

Zone	Time	One-Hour Average Sound Level Limits (dBA)
(1) RS, RD, RR, RMH, A70, A72, S80, S81, S90, S92, RV, and RU with a General Plan Land Use Designation density of less than 10.9 dwelling units per acre.	7 a.m. to 10 p.m.	50
	10 p.m. to 7 a.m.	45
(2) RRO, RC, RM, S86, FB-V5, RV and RU with a General Plan Land Use Designation density of 10.9 or more dwelling units per acre.	7 a.m. to 10 p.m.	55
	10 p.m. to 7 a.m.	50
(3) S94, FB-V4, AL-V2, AL-V1, AL-CD, RM-V5, RM-V4, RM-V3, RM-CD and all commercial zones.	7 a.m. to 10 p.m.	60
	10 p.m. to 7 a.m.	55
(4)FB-V1, FB-V2, RM-V1, RM-V2	7 a.m. to 7 p.m.	60
	7 p.m. to 10 p.m.	55
FB-V1, RM-V2	10 p.m. to 7 a.m.	55
FB-V2, RM-V1	10 p.m. to 7 a.m.	50
FB-V3	7 a.m. to 10 p.m.	70
	10 p.m. to 7 a.m.	65
(5) M50, M52, and M54	Anytime	70 70
(6) S82, M56, and M58.	Anytime	75
(7)S88 (see subsection (c) below)		

Source: County of San Diego 2014.

B. Where a noise study has been conducted and the noise mitigation measures recommended by that study have been made conditions of approval of a Major Use Permit, which authorizes the noise-generating use or activity and the decision making body approving the Major Use Permit determined that those mitigation measures reduce potential noise impacts to a level below significance, implementation and compliance with those noise mitigation measures shall constitute compliance with subsection (a) above.

C. S88 zones are Specific Planning Areas which allow different uses. The sound level limits in Table 6 that apply in an S88 zone depend on the use being made of the property. The limits in Table 6, subsection (1) apply to property with a residential, agricultural or civic use. The limits in subsection (3) apply to property with a commercial use. The limits in subsection (5) apply to property with an industrial use that would only be allowed in an M50, M52 or M54 zone. The limits in subsection (6) apply to all property with an extractive use or a use that would only be allowed in an M56 or M58 zone.

D. If the measured ambient noise level exceeds the applicable limit in Table 6, the allowable one-hour average sound level shall be the one-hour average ambient noise level, plus three decibels. The ambient noise level shall be measured when the alleged noise violation source is not operating.

E. The sound level limit at a location on a boundary between two zones is the arithmetic mean of the respective limits for the two zones. The one-hour average sound level limit applicable to extractive industries, however, including but not limited to borrow pits and mines, shall be 75 decibels at the property line regardless of the zone in which the extractive industry is located.

F. A fixed-location public utility distribution or transmission facility located on or adjacent to a property line shall be subject to the sound level limits of this section measured at or beyond six feet from the boundary of the easement upon which the facility is located.

36.408. Hours of Operation of Construction Equipment.

Section 36.408 of the County of San Diego's Municipal Code sets forth limitations on hours of operation of construction equipment. Except for emergency work, it shall be unlawful for any person to operate or cause to be operated, construction equipment:

A. Between 7 p.m. and 7 a.m.

B. On a Sunday or a holiday. For purposes of this section, a holiday means January 1st, the last Monday in May, July 4th, the first Monday in September, the fourth Thursday in November and December 25th. A person may, however, operate construction equipment on a Sunday or holiday between the hours of 10 a.m. and 5 p.m. at the person's residence or for the purpose of constructing a residence for himself or herself, provided that the

operation of construction equipment is not carried out for financial consideration or other consideration of any kind and does not violate the limitations in sections 36.409 and 36.410 of the County of San Diego's Municipal Code.

36.409. Sound Level Limitations on Construction Equipment.

Section 36. 409 of the County of San Diego's Municipal Code sets forth sound level limitations on construction equipment. Except for emergency work, it shall be unlawful for any person to operate construction equipment or cause construction equipment to be operated, that exceeds an average sound level of 75 decibels for an 8-hour period, between 7 a.m. and 7 p.m., when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is being received.

36.410. Sound Level Limitations on Impulsive Noise.

Section 36. 410 of the County of San Diego's Municipal Code sets forth sound level limitations on impulsive noise. In addition to the general limitations on sound levels in section 36.404 of the County of San Diego's Municipal Code and the limitations on construction equipment in section 36.409 of the County of San Diego's Municipal Code, the following additional sound level limitations shall apply:

A. Except for emergency work or work on a public road project, no person shall produce or cause to be produced an impulsive noise that exceeds the maximum sound level shown in [Table 7], when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is received, for 25% of the minutes in the measurement period. The maximum sound level depends on the use being made of the occupied property.

Table 7
Maximum Sound Level (Impulsive) Measured at Occupied Property In Decibels (dBA)

Occupied Property Use	Decibels (dBA)
Residential, village zoning or civic use	82
Agricultural, commercial or industrial use	85

Source: County of San Diego 2009.

4 EXISTING CONDITIONS

Given the wide geographical area encompassed by the North City Project, the existing noise environments are varied. In general, the Project area mainly consists of suburban land uses. The noise environments through most of the Project area are characterized by a background or "ambient" noise level generated by vehicular traffic. Typical secondary noise sources include distant aircraft, rustling leaves, landscaping maintenance, construction noise, birds, children playing, and passing conversations. Noise-sensitive receptors are locations where human activity may be adversely affected by noise. Examples of noise sensitive receptors are residences, hotels and motels, educational institutions, libraries and hospitals and clinics. The locations of noise-sensitive receptors within 1,000 feet of the proposed Project area are shown in Figures 5A through 5D.

4.1 Ambient Noise Monitoring

Noise measurements were made using a Rion NL-52 integrating sound-level meter equipped with a 0.5-inch pre-polarized condenser microphone with pre-amplifier. The sound-level meter meets the current American National Standards Institute standard for a Type 1 (Precision Grade) sound-level meter. The sound-level meter was calibrated before and after the measurements, and the measurements were conducted with the microphone positioned 5 feet above the ground and covered with a windscreen.

Short-term noise measurements were conducted at 16 locations in the North City Project vicinity on April 16 and 17, 2015, and October 6 and 7, 2016, as depicted on Figure 6, Noise Measurement Locations. A brief description of where each noise measurement was conducted as well as the measured time-average sound level and maximum sound level during the measurement interval (L_{max}) are summarized in Table 8. Detailed noise measurement data are included as Appendix A to this report.

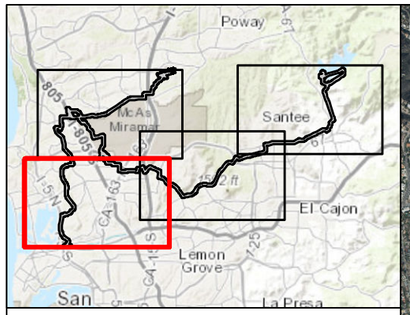
Table 8
Measured Noise Levels

Receptors	Description	L_{eq} (dBA)	L_{max} (dBA)
M1	Vacant parcel adjacent to industrial uses on Eastgate Mall San Diego, California; east of San Vicente Pipeline and southeast of NCPWF	51.2	61.6
M2	Multi-family residential complex on Genesee Avenue San Diego, California; west of Morena Pipelines	68.0	82.9
M3	MCAS Miramar north entrance on Miramar Road San Diego, California; south of North City Pipeline	72.8	89.7
M4	Villa Pacific Apartments Clairemont Drive San Diego, California; east of Morena Pipelines	65.8	87.2

Table 8
Measured Noise Levels

Receptors	Description	L_{eq} (dBA)	L_{max} (dBA)
M5	Junipero Serra High School on Santo Road San Diego, California; west of San Vicente Pipeline	54.8	60.6
M6	Multi-family residential complex on Rancho Mission Road San Diego, California; south of San Vicente Pipeline and northeast of MTBS	56.7	74.7
M7	Single-family residential home on Moreno Avenue Lakeside, California; west of San Vicente Pipeline	64.3	81.1
M8	Scripps Ranch Library on Scripps Lake Drive San Diego, California; west of Miramar Pipeline Alignment	56.1	59.8
M9	Multi-family residential complex on Scripps Lake drive San Diego, California; southeast of Miramar Pipeline Alignment	53.7	79.2
M10	Willowbrook RV Stoarage on Riverside Drive Lakeside, California; south of San Vicente Pipeline	53.2	75.5
M11	Single-family residential home on Mast Boulevard Santee, California; west of San Vicente Pipeline	68.3	81.1
M12	Multi-family residential complex on Tecolote Road San Diego, California; east of Morena Pipelines	60.0	68.8
M13	Multi-family residential complex on Caminito Velasquez San Diego, California; south of San Vicente Pipeline	66.1	77.5
M14	Cul-de-sac on Tierrasanta Boulevard San Diego, California; south of San Vicente Pipeline	50.3	85.5
M15	Multi-family residential complex on W Hills Parkway Santee, California; east of San Vicente Pipeline	64.6	74.1
M16	A & B Saw and Lawnmowers on Highway 67 Lakeside, California; north and west of San Vicente Pipeline	70.3	81.3

Source: Appendix A. Figure 3.
Note: L_{eq} = equivalent continuous sound level (time-averaged sound level); L_{max} = maximum sound level during the measurement interval



Study Area

Sensitive Receptor Location

- Residential
- Recreation
- Public Institution
- Open Space
- Municipal Boundaries
- MCAS Miramar

Project Pipelines

- San Vicente Pure Water Pipeline and Alternatives
- Morena Wastewater Forcemain and Brine/Centrate Line
- Repurposed Existing 36" Pipeline

Project Facilities

- Metro Biosolids Center Improvements
- Morena Pump Station

0 0.5 1 Miles

Morena Wastewater Forcemain and Brine/Centrate Line

San Vicente Pure Water Pipeline

SAN DIEGO

SOURCE: SanGIS 2016; SANDAG 2016

DUDEK

FIGURE 5A

Noise Sensitive Receptors

Pure Water San Diego Program North City Project Noise Technical Report

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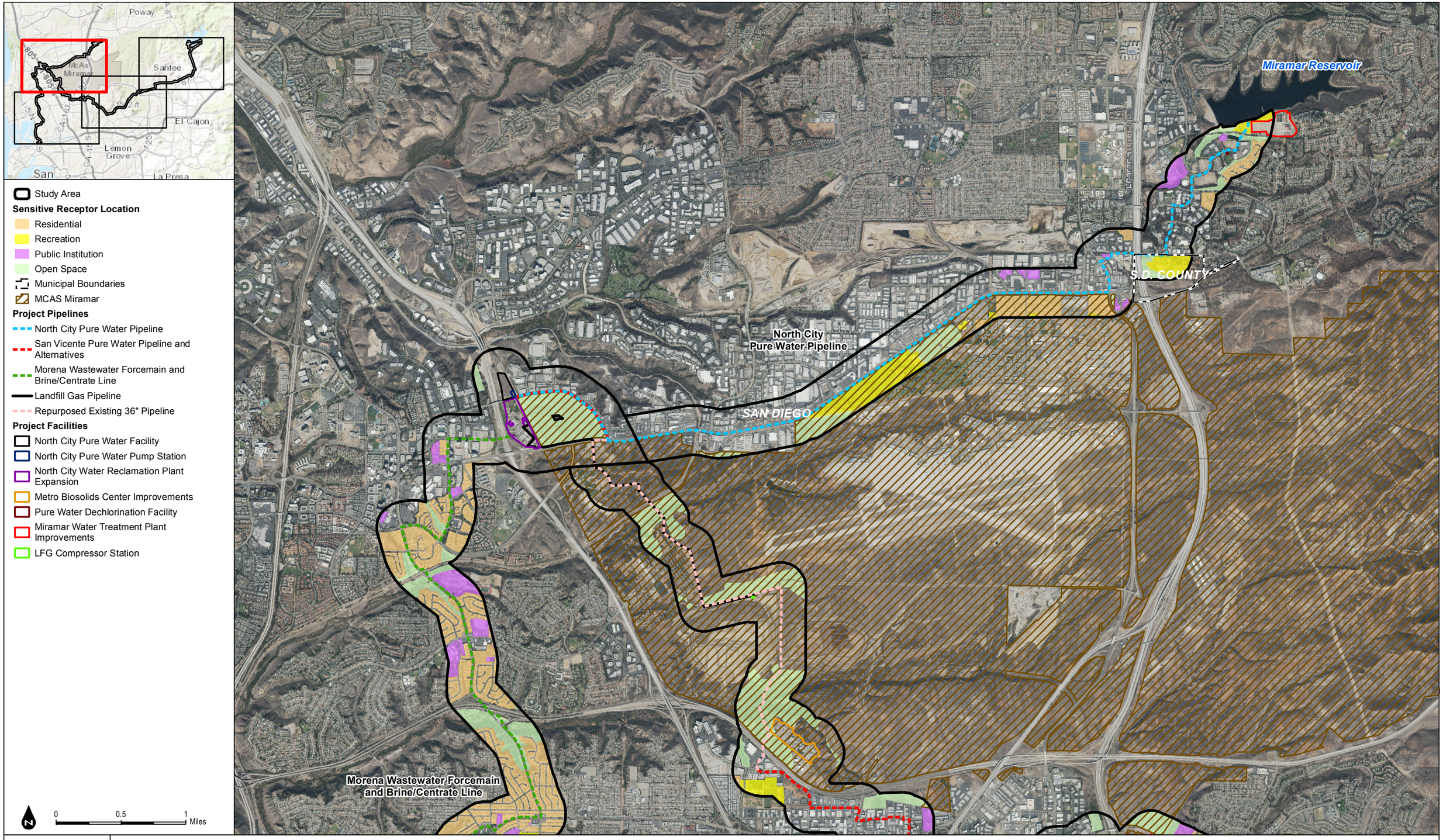

SOURCE: SanGIS 2016; SANDAG 2016

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FIGURE 5B

Noise Sensitive Receptors

Pure Water San Diego Program North City Project Noise Technical Report

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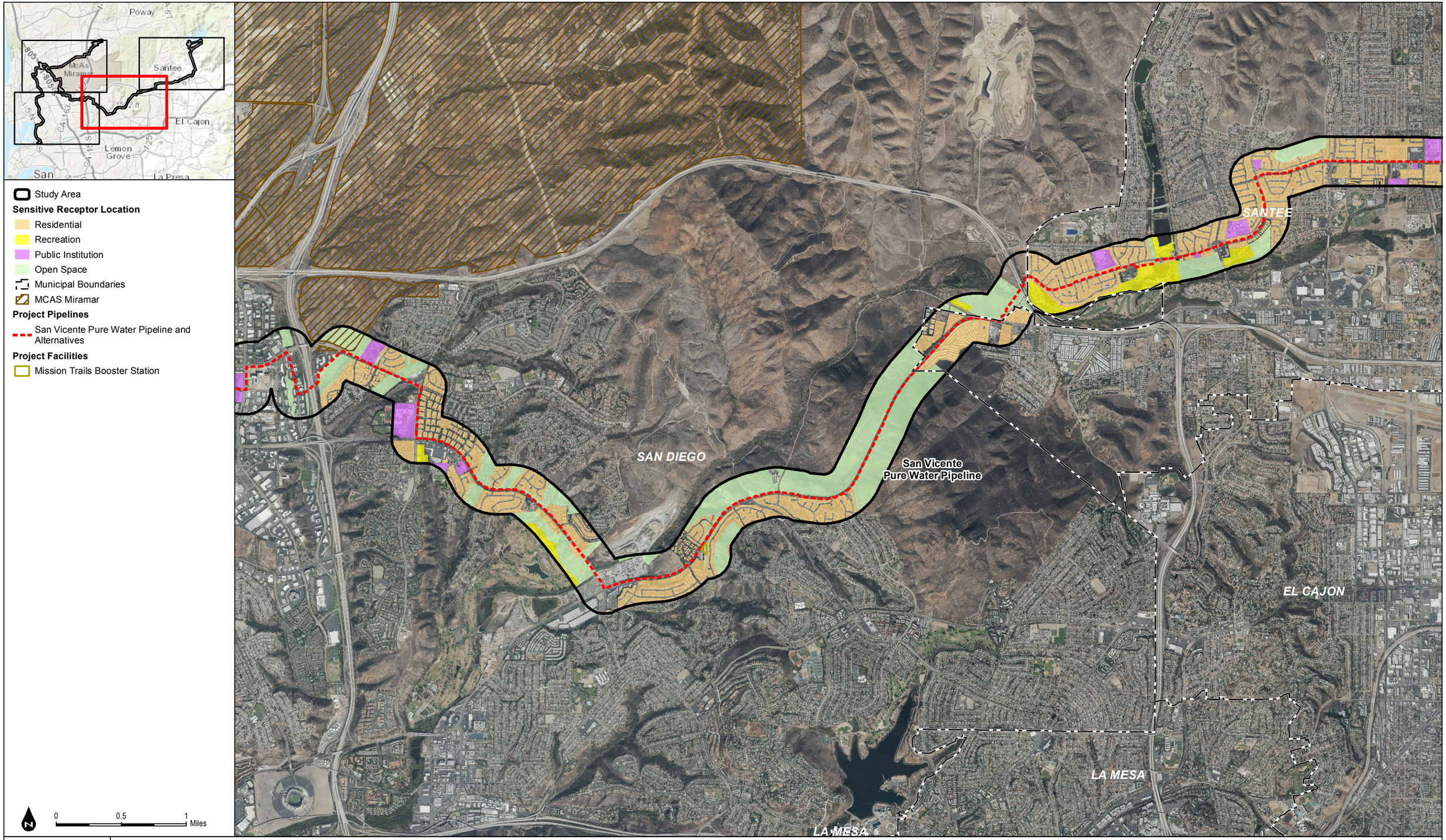

SOURCE: SanGIS 2016; SANDAG 2016

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FIGURE 5C
Noise Sensitive Receptors

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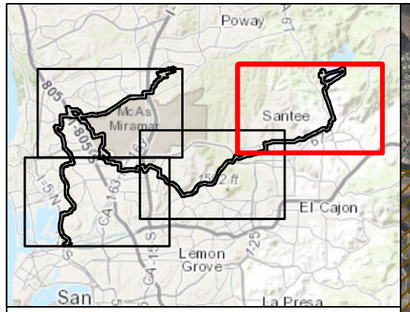

Study Area

Sensitive Receptor Location

- Residential
- Recreation
- Public Institution
- Open Space
- Municipal Boundaries
- MCAS Miramar

Project Pipelines

- San Vicente Pure Water Pipeline and Alternatives

SOURCE: SanGIS 2016; SANDAG 2016

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FIGURE 5D

Noise Sensitive Receptors

Pure Water San Diego Program North City Project Noise Technical Report

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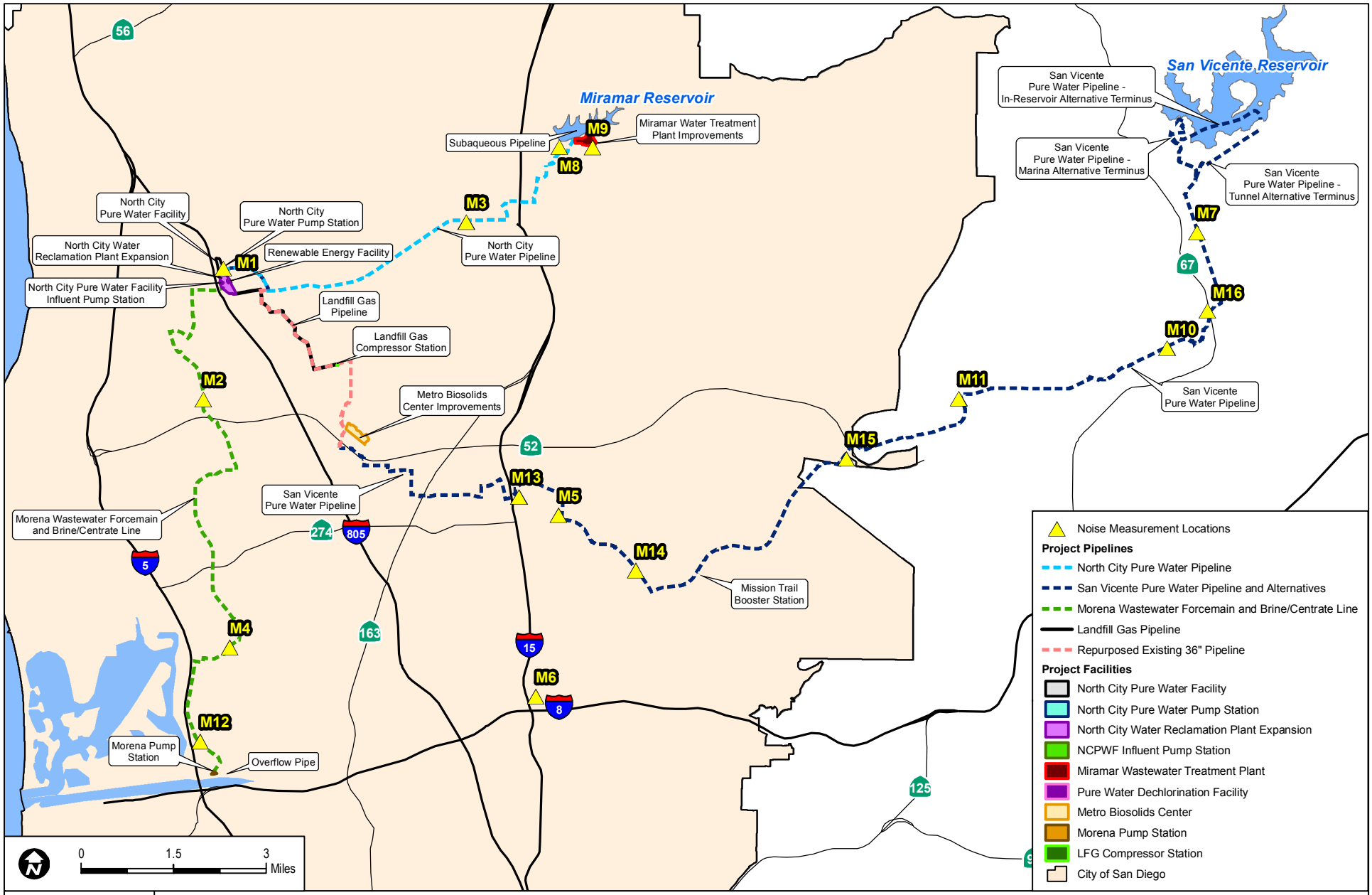

SOURCE: City of San Diego, 2015, 2016; SanGIS 2016

FIGURE 6

Noise Measurement Locations

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5 PROJECT IMPACT ANALYSIS

5.1 Methodology

The noise assessment in this report quantifies construction and operational noise generation and the resulting noise levels at noise-sensitive receptors in the vicinity that are generally representative of the areas surrounding the Project components. Assumptions regarding construction activities, construction equipment, and duration of construction activities are based on information provided by the City and from similar projects. The Federal Highway Administration's Roadway Construction Noise Model (RCNM) (FHWA 2008) was used to estimate construction noise levels at typical distance to the nearest noise-sensitive land uses. Input variables for RCNM consist of the receiver/land use types, the equipment type and number of each (e.g., two excavators, a loader, a dump truck), the duty cycle for each piece of equipment (e.g., percentage of hours the equipment typically works per day), and the distance from the noise-sensitive receiver. The RCNM has default duty cycle values for the various pieces of equipment, which were derived from an extensive study of typical construction activity patterns. Those default duty cycle values were utilized for this analysis. Construction noise levels were assessed at two distances for each project component: the distance from the nearest noise-sensitive receivers (for the purposes of the construction analysis, these were typically residential land uses) to the closest construction activities, and the more typical distance between the noise-sensitive receivers and the construction activities (the average distance between the near and far work areas).

The operational noise impact assessment is based on our review of the project documents and preliminary facility equipment information provided by the City. Ambient noise measurements were conducted to quantify the existing daytime noise environment at the site. The facility equipment noise levels were evaluated based on construction information provided by the applicant and assumptions made in collaboration with the Air Quality/Greenhouse Gas analysts. The criteria established in the cities' and County municipal codes are used to determine the significance of the potential noise impacts. Noise calculations are contained in Appendix B.

5.2 Thresholds of Significance

In order to determine the significance of the North City Project's noise generation, the City of San Diego's Scoping Letter for the North City Project (City of San Diego 2016) as well as the City's *Significance Determination Thresholds* (City of San Diego 2011) were used. With respect to noise, the Scoping Letter recommends the use of the following thresholds.

1. Would the project result in or create a significant increase in the existing ambient noise level?

2. Would construction noise associated with implementation for any component of the project exceed the City's adopted noise ordinance or noise levels as established in the General Plan?

The City of San Diego Development Services Department updated its CEQA *Significance Determination Thresholds* in January 2011 (City of San Diego 2011). This document provides guidance for City of San Diego staff, project proponents, and the public for determining whether, based on substantial evidence, a project may have a significant effect on the environment under Section 21082.2 of CEQA.

Supplemental Thresholds

City of Santee and County of San Diego. In addition to the City of San Diego, the criteria listed above for the City of Santee and the County of San Diego were used for determining CEQA significance levels for construction and operation of the Project components.

Substantial Noise Definition. CEQA does not define what constitutes a substantial increase in noise levels. However, the California Department of Transportation defines a substantial noise increase as being 12 dB above existing noise levels (Caltrans 2007).

5.3 Construction Assumptions

Construction of the Project components would result in temporary localized increases in noise levels from on-site construction equipment, as well as from off-site trucks hauling construction materials. Noise generated by construction equipment will occur with varying intensities and durations during the various phases of construction. The typical maximum noise levels at a distance of 50 feet for various pieces of construction equipment anticipated to be used during construction are depicted in Table 9. Note that these are maximum noise levels, not an average sound level. The equipment operates in alternating cycles of full power and low power, thus, producing noise levels less than the maximum level. The average sound level of the construction activity also depends upon the amount of time that the equipment operates and the intensity of the construction during the time period.

Table 9
Construction Equipment Noise Levels

Equipment Type	Maximum Noise Level dB(A) at 50 feet
Backhoe	80
Compactor	82
Concrete Mixer	85
Crane	83
Generator	81

Table 9
Construction Equipment Noise Levels

Equipment Type	Maximum Noise Level dB(A) at 50 feet
Loader	85
Paver	89
Roller	74
Truck	88
Saw	76

Source: FTA 2006.

Table 10 provides the estimated construction timeline and potential phasing of Project components. The construction schedule has been developed based on available information provided by the City, typical construction practices, and best engineering judgment. Conceptual construction phasing is provided for informational purposes; however, construction phasing and assumptions may change upon final system programming and design.

Table 10
North City Project Construction Phasing Assumptions

Project Component	Construction Start Date	Construction End Date
Project Components Common to Alternatives		
NCWRP Expansion	10/2018	12/2021
NCPWF Influent Pump Station	1/2019	10/2021
Morena Pump Station and Pipelines	4/2019	10/2021
MBC Improvements	4/2019	10/2021
North City Pump Station	5/2019	11/2021
North City Renewable Energy Facility	3/2020	12/2021
Landfill Gas Pipeline	3/2020	10/2021
Miramar Reservoir Alternative		
North City Pure Water Pipeline (North City Pipeline)	11/2018	10/2021
Pure Water Dechlorination Facility	1/2019	102021
NCPWF- MR	10/2018	11/2021
Miramar Water Treatment Plant Improvements	7/2020	9/2021
San Vicente Reservoir Alternative		
San Vicente Pure Water Pipeline (San Vicente Pipeline)	12/2018	5/2021
NCPWF- SVR	10/2018	11/2021
Mission Trails Booster Station	5/2019	9/2021

To estimate the potential effects of construction on noise levels in the North City Project vicinity, typical construction equipment used for similar water infrastructure projects (i.e., pipelines, pump stations, water/wastewater treatment facilities, and existing facility

improvements) was assumed. Equipment mix assumptions for construction activity are based on the design reports and Project Data Summary Sheets for each project component, typical infrastructure construction practices, review of related projects conducted in the Southern California area[1], and the South Coast Air Quality Management District's California Emissions Estimator Model default equipment where appropriate. The equipment mix is meant to represent a reasonably conservative estimate of construction activity. For the analysis, it is generally assumed that heavy construction equipment would be operating at the site for approximately 8 hours per day, 5 days per week.

Pipelines

Pipeline construction would require both open-trench construction and trenchless tunneling depending on the location of the pipeline to be installed. A description of construction activities and equipment associated with each of these methods is provided.

Open Trench

Open-trench construction would involve an open trench to be dug for the direct installation of pipeline. The sequence of activities for open-trench pipeline construction would typically commence with trenching and excavation, followed by pipe installation and covering of the installed pipe, and concluding with paving the pipeline corridor area of disturbance. It was assumed that each contractor would complete construction of approximately 75 linear feet of pipeline per day; however, daily activity and linear feet installed would vary depending on field conditions, site/easement access, and other factors associated with continual site location changes. Assuming concurrent construction by two contractors, approximately 150 linear feet of pipeline installation could occur each day depending on the component under construction and total linear feet of pipeline or conveyance infrastructure to be constructed over a given period.2 For the purposes of modeling, it was assumed that paving activities would occur for approximately 2 weeks every 6 months over a given construction period throughout the pipeline installation phases. It was also assumed that after pipe installation is completed, a portion of the paved roads would require light grading and reapplication of pavement, which was assumed to occur during the last month of pipeline construction for each project component. In addition, for

[1] City of Vista 2008 Sewer Master Plan Update (Dudek 2008); Vallecitos Water District 2008 Water, Wastewater and Recycled Water Master Plan PEIR (PBS&J 2011); Plano Lift Station Force Main Relocation Project (Dudek 2013a); El Toro Water District Recycled Water Distribution System Expansion Project and Addendum (Dudek 2012a; Dudek 2014); El Toro Water District Recycled Water Tertiary Treatment Plant (Dudek 2012b); Lee Lake Water District Temescal Canyon and Dawson Canyon Pipelines and Non-Potable Water Tank Project (Dudek 2012c); South Pasadena Sewer Rehabilitation and Replacement Project (Dudek 2013b); Carpinteria Sanitary District West Padaro Lane Main Sewer Extension Project (Dudek 2013c); and South Orange County Wastewater Authority Export Sludge Force Main Replacement Project (Dudek 2013d).

[2] Linear feet per day assumptions based on typical construction practices for pipeline construction, and review of related projects as listed in footnote 3.

the purposes of estimating noise levels, it was assumed that typical open trench construction phasing would occur as follows:

- Trenching and excavation would be ongoing throughout pipeline construction phase
- Pipe installation would occur intermittently as trenching and excavation activities occur throughout the pipeline construction phase
- Paving, intermittent – approximately 2 weeks every 6 months for duration of pipeline construction
- Final paving – 1 month at the end of the construction phase

Trenchless Tunneling

Trenchless tunneling would involve the excavation of a portal at either end of the pipeline segment to be installed, where the pipeline would be fed through and connected. The sequence of activities for trenchless tunneling construction would typically commence with site preparation of the first portal location followed by excavation of the portal. Excavation of the tunnel would occur following portal excavation. It is assumed all excavated material would be hauled off site. The second portal location would then be prepped and excavated. Installation of pipeline would occur once the tunnel has been fully excavated and portals are clear. The pipeline would then be connected, and the portal sites would be restored to their pre-construction condition. Trenchless tunneling practices would be employed for the specific segments of other pipeline alignments such as freeway or waterway crossings or within avoidance areas where ground disturbance (i.e., an open trench) is not permitted such as wetlands or other environmentally sensitive locations.

It was assumed that typical construction phasing would occur as follows during tunneling:

- Site preparation at first portal site
- Excavation of first portal site
- Tunnel excavation
- Site preparation at second portal site
- Excavation of second portal site
- Pipeline installation
- Pipeline connection
- Site restoration

Pump Stations and Treatment Facilities

For the purposes of estimating emissions, construction timelines vary based on the type of feature and are summarized in Table 10.

5.3.1 Miramar Reservoir Alternative

The Miramar Reservoir Alternative includes (1) a new pump station at Morena Boulevard, a wastewater forcemain, and brine/centrate pipeline (Morena Pump Station and Pipelines); (2) expansion of the existing NCWRP; (3) construction of a new influent pump station at NCWRP and conveyance pipeline between NCWRP and the NCPWF (NCPWF Influent Pump Station); (4) construction of the new NCPWF; (5) construction of a new North City Pump Station; (6) construction of a North City Pipeline; (7) construction of a new renewable energy facility at the NCWRP; (8) a new gas pipeline between the Miramar Landfill gas collection system and the NCWRP; (9) upgrades at the MBC; and (10) improvements at the Miramar WTP.

5.3.1.1 Morena Pump Station and Pipelines

Morena Pump Station

The Morena Pump Station and wastewater forcemain are proposed to deliver additional wastewater to the NCWRP. The assumed construction equipment for the Morena Pump Station is shown in Table 11.

Table 11
Construction Scenario Assumptions – Morena Pump Station

Construction Phase (Duration)	One-way Vehicle Trips			Equipment		
	Average Daily Worker Trips	*Average Daily Vendor Truck Trips*	*Total Haul Truck Trips*	*Equipment Type*	*Quantity*	*Usage Hours*
Demolition (45 days)	14	0	0	Saws	1	8
				Dumpers/Tenders	2	8
				Excavators	1	8
				Rubber-Tired Dozers	1	8
Grading/trenching (90 days)	16	0	400	Dumpers/Tenders	2	8
				Excavators	2	8
				Plate Compactors	2	8

Table 11
Construction Scenario Assumptions – Morena Pump Station

Construction Phase (Duration)	One-way Vehicle Trips			Equipment		
	Average Daily Worker Trips	*Average Daily Vendor Truck Trips*	*Total Haul Truck Trips*	*Equipment Type*	*Quantity*	*Usage Hours*
Building construction (180 days)	16	2	0	Cement and Mortar Mixers	1	8
				Cranes	1	8
				Pumps	1	8
				Tractors/loaders/backhoes	1	8
				Welders	1	8
Paving (14 days)	16	0	0	Paving Equipment	1	8
				Pavers	1	8
				Rollers	1	8
Architectural coating (7 days)	8	0	0	Air compressors	1	8
				Cranes	1	8

Morena Pipelines

The proposed construction equipment for the trenched portion of the Morena Pipelines is shown in Table 12 and the construction equipment for the tunneling sections of the Morena Pipelines is shown in Table 13.

Table 12
Construction Scenario Assumptions – Morena Pipelines Trenched Sections

Construction Phase (Duration)	One-way Vehicle Trips			Equipment		
	Average Daily Worker Trips	*Average Daily Vendor Truck Trips*	*Total Haul Truck Trips*	*Equipment Type*	*Quantity*	*Usage Hours*
Trenching (200 days)	26	0	5,154	Excavators	2	8
				Rubber-Tired Dozers	2	8
				Tractors/loaders/backhoes	4	8
				Trenchers	2	8
Pipeline Installation and Backfill (200 days)	16	2	0	Forklifts	2	8
				Cranes	2	8
				Tractors/loaders/backhoes	2	8
Paving (200 days)	16	0	0	Paving Equipment	2	8
				Pavers	2	8
				Rollers	2	8

Table 13
Construction Scenario Assumptions – Morena Pipelines Trenchless Sections

Construction Phase (Duration)	One-way Vehicle Trips			Equipment		
	Average Daily Worker Trips	*Average Daily Vendor Truck Trips*	*Total Haul Truck Trips*	*Equipment Type*	*Quantity*	*Usage Hours*
Site Preparation at Portal Sites (25 days)	8	0	0	Graders	1	8
				Scrapers	1	8
				Tractors/loaders/backhoes	1	8
Portal Excavation (150 days)	16	0	0	Crushing Equipment	1	8
				Excavators	1	8
				Rubber-Tired Dozers	1	8
				Tractors/loaders/backhoes	1	8
				Trenchers	1	8
Tunnel Excavation (190 days)	26	2	0	Crushing Equipment	1	8
				Excavators	1	8
				Rubber-Tired Dozers	1	8
				Tractors/loaders/backhoes	1	8
				Trenchers	1	8
				Welders	2	8
Site Restoration (150 days)	4	0	0	Tractors/loaders/backhoes	1	8

5.3.1.2 North City Water Reclamation Plant Expansion

To ensure the 30 MGD of pure water can be produced at the NCPWF, the NCWRP will undergo an expansion of the primary, secondary, and tertiary treatment processes as well as the corresponding support systems. The proposed construction equipment for the NCWRP Expansion is shown in Table 14.

Table 14
Construction Scenario Assumptions – NCWRP Expansion

Construction Phase (Duration)	One-way Vehicle Trips			Equipment		
	Average Daily Worker Trips	*Average Daily Vendor Truck Trips*	*Total Haul Truck Trips*	*Equipment Type*	*Quantity*	*Usage Hours*
Demolition (107 days)	16	0	0	Saws	1	8
				Dumpers/Tenders	1	8
				Excavators	1	8
				Rubber-Tired Dozers	1	8
Grading/trenching (150 days)	16	0	1,009	Dumpers/Tenders	2	8
				Excavators	2	8
				Plate Compactors	2	8

Table 14
Construction Scenario Assumptions – NCWRP Expansion

Construction Phase (Duration)	One-way Vehicle Trips			Equipment		
	Average Daily Worker Trips	*Average Daily Vendor Truck Trips*	*Total Haul Truck Trips*	*Equipment Type*	*Quantity*	*Usage Hours*
Building construction (428 days)	102	40	0	Cement and Mortar Mixers	1	8
				Cranes	1	8
				Pumps	1	8
				Tractors/loaders/backhoes	1	8
				Welders	1	8
Paving (107 days)	16	0	0	Dumpers/Tenders	1	8
				Pavers	1	8
				Rollers	1	8
Architectural coating (107 days)	20	0	0	Air compressors	1	8
				Cranes	1	8

5.3.1.3 North City Pure Water Facility Influent Pump Station

The NCPWF Influent Pump Station will be constructed at the NCWRP and will convey tertiary effluent from the NCWRP to the NCPWF. The proposed construction equipment for the NCPWF Influent Pump Station and pipeline are shown in Table 15.

Table 15
Construction Scenario Assumptions – NCPWF Influent Pump Station

Construction Phase (Duration)	One-way Vehicle Trips			Equipment		
	Average Daily Worker Trips	*Average Daily Vendor Truck Trips*	*Total Haul Truck Trips*	*Equipment Type*	*Quantity*	*Usage Hours*
Demolition (21 days)	10	0	0	Saws	1	8
				Dumpers/Tenders	2	8
				Excavators	1	8
				Rubber-Tired Dozers	1	8
Grading (97 days)	10	0	63	Dumpers/Tenders	2	8
				Excavators	2	8
				Plate Compactors	2	8
Building construction (260 days)	100	6	0	Cement and Mortar Mixers	1	8
				Cranes	1	8
				Pumps	1	8
				Tractors/loaders/backhoes	1	8
				Welders	1	8

Table 15
Construction Scenario Assumptions – NCPWF Influent Pump Station

Construction Phase (Duration)	One-way Vehicle Trips			Equipment		
	Average Daily Worker Trips	*Average Daily Vendor Truck Trips*	*Total Haul Truck Trips*	*Equipment Type*	*Quantity*	*Usage Hours*
Paving (80 days)	18	0	0	Dumpers/Tenders	1	8
				Pavers	1	8
				Rollers	1	8
Architectural coating (14 days)	6	0	0	Air compressors	1	8
				Cranes	2	8

5.3.1.4 North City Pure Water Facility

The new NCPWF would be located on the vacant 9-acre City-owned lot across Eastgate Mall to the north of the NCWRP. Table 16 shows the proposed construction equipment associated with the project phase.

Table 16
Construction Scenario Assumptions – NCPWF-MR

Construction Phase (Duration)	One-way Vehicle Trips			Equipment		
	Average Daily Worker Trips	*Average Daily Vendor Truck Trips*	*Total Haul Truck Trips*	*Equipment Type*	*Quantity*	*Usage Hours*
Mass Grading (60 days)	36	0	1,125	Excavators	1	8
				Graders	2	8
				Off-Highway Trucks	1	8
				Plate Compactors	2	8
				Rubber-Tired Dozers	2	8
				Scrapers	4	8
				Tractors/Loaders/Backhoes	2	8
Finish Grading (141 days)	18	0	1,125	Graders	1	8
				Off-Highway Trucks	1	8
				Plate Compactors	2	8
				Scrapers	1	8
				Tractors/Loaders/Backhoes	2	8
Building construction (563 days)	136	54	0	Aerial Lifts	2	8
				Cranes	2	8
				Forklifts	2	8
				Rollers	2	8
				Tractors/Loaders/Backhoes	2	8
				Welders	2	8

Table 16
Construction Scenario Assumptions – NCPWF-MR

Construction Phase (Duration)	One-way Vehicle Trips			Equipment		
	Average Daily Worker Trips	*Average Daily Vendor Truck Trips*	*Total Haul Truck Trips*	*Equipment Type*	*Quantity*	*Usage Hours*
Paving (10 days)	24	0	0	Crushing/Proc. Equipment	1	8
				Off-Highway Trucks	1	8
				Pavers	2	8
				Paving Equipment	1	8
				Rollers	2	8
				Tractors/Loaders/Backhoes	2	8
Architectural coating (141 days)	28	0	0	Aerial Lifts	1	8

5.3.1.5 North City Pump Station

The North City Pump Station will be constructed on the same site as the NCPWF. Any grading associated with the NCPWF will be captured in that phase. The North City Pump Station would operate using three 1,250 HP pumps and one 1,250 HP standby pump. The North City Pump Station will be powered by electrical feed to the NCPWF. The anticipated construction equipment for the North City Pump Station is shown in Table 17.

Table 17
Construction Scenario Assumptions – North City Pump Station

Construction Phase (Duration)	One-way Vehicle Trips			Equipment		
	Average Daily Worker Trips	*Average Daily Vendor Truck Trips*	*Total Haul Truck Trips*	*Equipment Type*	*Quantity*	*Usage Hours*
Demolition (15 days)	14	0	0	Excavators	1	8
				Rubber-Tired Dozers	2	8
				Tractors/loaders/backhoes	1	8
Trenching (50 days)	26	0	0	Concrete / Industrial Saws	1	8
				Excavators	2	8
				Off-Highway Trucks	1	8
				Rollers	2	8
				Tractors/loaders/backhoes	2	8
				Welders	2	8
Building construction (230 days)	18	2	0	Aerial Lifts	2	8
				Cranes	1	8
				Forklifts	2	8
				Rollers	1	8
				Tractors/loaders/backhoes	1	8
				Welders	2	8

Table 17
Construction Scenario Assumptions – North City Pump Station

Construction Phase (Duration)	One-way Vehicle Trips			Equipment		
	Average Daily Worker Trips	*Average Daily Vendor Truck Trips*	*Total Haul Truck Trips*	*Equipment Type*	*Quantity*	*Usage Hours*
Paving (100 days)	18	0	0	Crushing / Proc. Equipment	1	8
				Off-Highway Trucks	1	8
				Pavers	1	8
				Rollers	2	8
				Tractors/loaders/backhoes	2	8

5.3.1.6 North City Pure Water Pipeline

The North City Pipeline will be designed for an average daily flow of 30 MGD with a minimum daily flow of 23 MGD and a maximum daily flow of 33 MGD. A 48-inch-diameter welded steel pipe is the recommended width and material for the North City Pipeline as the most suitable for the design conditions. The pipeline would be located entirely within the City of San Diego. The proposed construction equipment for the North City Pipeline is shown in Tables 18 and 19.

Table 18
Construction Scenario Assumptions – North City Pipeline Open Trench

Construction Phase (Duration)	One-way Vehicle Trips			Equipment		
	Average Daily Worker Trips	*Average Daily Vendor Truck Trips*	*Total Haul Truck Trips*	*Equipment Type*	*Quantity*	*Usage Hours*
Trenching (200 days)	26	0	2,537	Concrete/Industrial Saws	1	8
				Excavators	2	8
				Off-Highway Trucks	1	8
				Rollers	2	8
				Tractors/Loaders/Backhoes	2	8
				Welders	2	8
Tunneling (200 days)	24	0	0	Bore/Drill Rigs	1	8
				Cranes	1	8
				Crushing/Proc. Equipment	1	8
				Generator Sets	1	8
				Off-Highway Trucks	1	8
				Tractors/Loaders/Backhoes	2	8
				Welders	2	8

Table 18
Construction Scenario Assumptions – North City Pipeline Open Trench

Construction Phase (Duration)	One-way Vehicle Trips			Equipment		
	Average Daily Worker Trips	*Average Daily Vendor Truck Trips*	*Total Haul Truck Trips*	*Equipment Type*	*Quantity*	*Usage Hours*
Subaqueous Pipeline (200 days)	18	0	0	Forklifts	1	8
				Generator Sets	1	8
				Other Construction Equipment	4	8
				Tractors/Loaders/Backhoes	1	8
Paving (200 days)	18	0	0	Crushing/Proc. Equipment	1	8
				Off-Highway Trucks	1	8
				Pavers	1	8
				Rollers	2	8
				Tractors/Loaders/Backhoes	2	8

Table 19
Construction Scenario Assumptions – North City Pipeline Trenchless

Construction Phase (Duration)	One-way Vehicle Trips			Equipment		
	Average Daily Worker Trips	*Average Daily Vendor Truck Trips*	*Total Haul Truck Trips*	*Equipment Type*	*Quantity*	*Usage Hours*
Site Preparation at Portal Sites (100 days)	8	0	0	Graders	1	8
				Scrapers	1	8
				Tractors/Loaders/Backhoes	1	8
Portal Excavation (100 days)	14	0	0	Crushing/Proc. Equipment	1	8
				Excavators	1	8
				Rubber-Tired Dozers	1	8
				Tractors/Loaders/Backhoes	1	8
				Trenchers	1	8
Pipe Installation (100 days)	2	2	0	Cranes	1	8
				Tractors/Loaders/Backhoes	1	8
				Welders	2	8
Pipe Connection (100 days)	2	0	0	Other General Industrial Equipment	1	8
Site Restoration (100 days)	4	0	0	Tractors/Loaders/Backhoes	1	8

5.3.1.7 Renewable Energy Facility and Landfill Gas Pipeline

The proposed renewable energy facility will require construction of a main building for the 6 ICEs, a control equipment building, and storage building. The project would also require the

installation of a new 12-inch diameter gas line from the City's Miramar Landfill to the NCWRP. The proposed construction equipment for the renewable energy facility phase of the Project is shown in Table 20 and the LFG pipeline in Tables 21 and 22.

Table 20
Construction Scenario Assumptions – North City Renewable Energy Facility

Construction Phase (Duration)	One-Way Vehicle Trips			Equipment		
	Average Daily Worker Trips	*Average Daily Vendor Truck Trips*	*Total Haul Truck Trips*	*Equipment Type*	*Quantity*	*Usage Hours*
Demolition (10 days)	10	0	14	Concrete/Industrial Saws	1	8
				Rubber-Tired Dozers	1	8
				Tractors/Loaders/Backhoes	2	8
Grading (10 days)	10	0	0	Concrete/Industrial Saws	1	8
				Rubber-Tired Dozers	1	8
				Tractors/Loaders/Backhoes	2	8
Building Construction (300 days)	8	4	0	Cranes	1	8
				Forklifts	2	8
				Tractors/Loaders/Backhoes	2	8
Paving (10 days)	18	0	0	Cement and Mortar Mixers	4	8
				Pavers	1	8
				Rollers	1	8
				Tractors/Loaders/Backhoes	1	8

Table 21
Construction Scenario Assumptions – LFG Pipeline Trenched Sections

Construction Phase (Duration)	One-way Vehicle Trips			Equipment		
	Average Daily Worker Trips	*Average Daily Vendor Truck Trips*	*Total Haul Truck Trips*	*Equipment Type*	*Quantity*	*Usage Hours*
Trenching (135 days)	26	0	50	Excavators	2	8
				Rubber-Tired Dozers	2	8
				Tractors/Loaders/Backhoes	4	8
				Trenchers	2	8
Pipeline Installation and Backfill (135 days)	16	2	0	Forklifts	2	8
				Cranes	2	8
				Tractors/Loaders/Backhoes	2	8
Paving (134 days)	16	0	0	Paving Equipment	2	8
				Pavers	2	8
				Rollers	2	8

Table 22
Construction Scenario Assumptions – LFG Pipeline Trenchless Sections

Construction Phase (Duration)	One-way Vehicle Trips			Equipment		
	Average Daily Worker Trips	*Average Daily Vendor Truck Trips*	*Total Haul Truck Trips*	*Equipment Type*	*Quantity*	*Usage Hours*
Site Preparation at Portal Sites (20 days)	8	0	0	Graders	1	8
				Scrapers	1	8
				Tractors/Loaders/Backhoes	1	8
Portal Excavation (120 days)	16	0	0	Crushing Equipment	1	8
				Excavators	1	8
				Rubber-Tired Dozers	1	8
				Tractors/Loaders/Backhoes	1	8
				Trenchers	1	8
Tunnel Excavation (157 days)	26	2	0	Crushing Equipment	1	8
				Excavators	1	8
				Rubber-Tired Dozers	1	8
				Tractors/Loaders/Backhoes	1	8
				Trenchers	1	8
Site Restoration (120 days)	4	0	0	Tractors/Loaders/Backhoes	1	8

5.3.1.8 Metro Biosolids Center Improvements

Diverting additional wastewater flows to the NCWRP ultimately changes the relative contribution of biosolids received at the MBC from the NCWRP and the Point Loma WWTP. The anticipated construction details for the MBC improvements are shown in Table 23.

Table 23
Construction Scenario Assumptions – MBC Improvements

Construction Phase (Duration)	One-way Vehicle Trips			Equipment		
	Average Daily Worker Trips	*Average Daily Vendor Truck Trips*	*Total Haul Truck Trips*	*Equipment Type*	*Quantity*	*Usage Hours*
Demolition (15 days)	10	0	0	Concrete/Industrial Saws	1	8
				Dumpers/Tenders	2	8
				Excavators	1	8
				Rubber-Tired Dozers	1	8
Grading (30 days)	10	0	0	Dumpers/Tenders	2	8
				Excavators	2	8
				Plate Compactors	2	8

Table 23
Construction Scenario Assumptions – MBC Improvements

Construction Phase (Duration)	One-way Vehicle Trips			Equipment		
	Average Daily Worker Trips	*Average Daily Vendor Truck Trips*	*Total Haul Truck Trips*	*Equipment Type*	*Quantity*	*Usage Hours*
Construction (200 days)	16	2	0	Cement and Mortar Mixers	1	8
				Cranes	1	8
				Pumps	1	8
				Tractors/Loaders/Backhoes	1	8
				Welders	1	8
Paving (7 days)	18	2	0	Pavers	1	8
				Paving Equipment	1	8
				Rollers	1	8

5.3.1.9 Miramar Water Treatment Plant Improvements

Under the Miramar Reservoir Alternative, purified water discharged into the Miramar Reservoir will be pumped to the existing Miramar Reservoir Pump Station to the Miramar WTP for treatment and eventual distribution. The construction assumptions for the Miramar Water Treatment Plant is shown in Table 24.

Table 24
Construction Scenario Assumptions – Miramar Water Treatment Plant Improvements

Construction Phase (Duration)	One-way Vehicle Trips			Equipment		
	Average Daily Worker Trips	*Average Daily Vendor Truck Trips*	*Total Haul Truck Trips*	*Equipment Type*	*Quantity*	*Usage Hours*
Demolition (10 days)	10	0	0	Concrete/Industrial Saws	1	8
				Rubber-Tired Dozers	1	8
				Tractors/Loaders/Backhoes	2	8
Building construction (60 days)	50	10	0	Aerial Lifts	1	8
				Cranes	1	8
				Forklifts	1	8
				Rollers	1	8
				Tractors/Loaders/Backhoes	1	8
				Welders	1	8

5.3.1.10 Pure Water Dechlorination Facility

A Dechlorination Facility will be located at the end of Meanley Drive off the cul-de-sac on the City's property for the Miramar Recycled Water Storage Tank. The proposed construction equipment for the Dechlorination Facility is shown in Table 25.

Table 25
Construction Scenario Assumptions –Dechlorination Facility

Construction Phase (Duration)	One-way Vehicle Trips			Equipment		
	Average Daily Worker Trips	*Average Daily Vendor Truck Trips*	*Total Haul Truck Trips*	*Equipment Type*	*Quantity*	*Usage Hours*
Grading (60 days)	16	0	0	Dumpers/Tenders	2	8
				Excavators	2	8
				Plate Compactors	2	8
Building construction (90 days)	100	10	0	Cement and Mortar Mixers	1	8
				Cranes	1	8
				Pumps	1	8
				Tractors/Loaders/Backhoes	1	8
				Welders	1	8
Paving (7 days)	16	0	0	Dumpers/Tenders	1	8
				Pavers	1	8
				Rollers	1	8

5.3.2 San Vicente Reservoir Alternative

The San Vicente Reservoir Alternative would include those elements in common with the Miramar Reservoir Alternative, but with a longer pipeline and an additional pump station compared to the other Alternative. The following sections describe those components unique to the San Vicente Reservoir and the construction emission assumptions associated with each.

5.3.2.1 San Vicente Pure Water Pipeline

The San Vicente Pipeline will be designed for an average daily flow of 30 MGD with a minimum daily flow of 27 MGD and a maximum daily flow of 35 MGD. A 48-inch-diameter welded steel pipe is the recommended width and material for the San Vicente Pipeline as the most suitable for the design conditions. The proposed construction equipment for the San Vicente Pipeline is shown in Tables 26 and 27.

Table 26
Construction Scenario Assumptions – San Vicente Pipeline Open Trench

Construction Phase (Duration)	One-way Vehicle Trips			Equipment		
	Average Daily Worker Trips	*Average Daily Vendor Truck Trips*	*Total Haul Truck Trips*	*Equipment Type*	*Quantity*	*Usage Hours*
Trenching (200 days)	26	0	13,073	Excavators	2	8
				Rubber-Tired Dozers	2	8
				Tractors/Loaders/Backhoes	4	8
				Trenchers	2	8

Table 26
Construction Scenario Assumptions – San Vicente Pipeline Open Trench

Construction Phase (Duration)	One-way Vehicle Trips			Equipment		
	Average Daily Worker Trips	*Average Daily Vendor Truck Trips*	*Total Haul Truck Trips*	*Equipment Type*	*Quantity*	*Usage Hours*
Pipeline Installation (200 days)	16	0	0	Tractors/Loaders/Backhoes	1	8
Paving (200 days)	16	0	0	Pavers	2	8
				Paving Equipment	2	8
				Rollers	2	8

Table 27
Construction Scenario Assumptions – San Vicente Pipeline Trenchless

Construction Phase (Duration)	One-way Vehicle Trips			Equipment		
	Average Daily Worker Trips	*Average Daily Vendor Truck Trips*	*Total Haul Truck Trips*	*Equipment Type*	*Quantity*	*Usage Hours*
Trenching (200 days)	26	0	0	Excavators	2	8
				Rubber-Tired Dozers	2	8
				Tractors/Loaders/Backhoes	4	8
				Trenchers	2	8
Building Construction (200 days)	14	6	0	Cranes	1	8
				Generator Sets	1	8
				Rubber-Tired Loaders	2	8
				Welders	2	8

5.3.2.2 Mission Trails Booster Station

The MTBS would be located along Mission Gorge Road spread across two privately owned parcels. The proposed construction equipment for the MTBS is shown in Table 28.

Table 28
Construction Scenario Assumptions – MTBS

Construction Phase (Duration)	One-way Vehicle Trips			Equipment		
	Average Daily Worker Trips	*Average Daily Vendor Truck Trips*	*Total Haul Truck Trips*	*Equipment Type*	*Quantity*	*Usage Hours*
Grading (30 days)	30	0	36,750	Graders	2	8
				Off-Highway Trucks	1	8
				Plate Compactors	1	8
				Rubber-Tired Dozers	2	8

Table 28
Construction Scenario Assumptions – MTBS

Construction Phase (Duration)	One-way Vehicle Trips			Equipment		
	Average Daily Worker Trips	*Average Daily Vendor Truck Trips*	*Total Haul Truck Trips*	*Equipment Type*	*Quantity*	*Usage Hours*
				Scrapers	4	8
				Tractors/Loaders/ Backhoes	2	8
Underground Install and Trenching (50 days)	26	0	0	Concrete/Industrial Saws	1	8
				Excavators	2	8
				Off-Highway Trucks	1	8
				Rollers	2	8
				Tractors/Loaders/ Backhoes	2	8
				Welders	2	8
Building construction (230 days)	16	2	0	Aerial Lifts	2	8
				Cranes	1	8
				Forklifts	2	8
				Rollers	1	8
				Tractors/Loaders/ Backhoes	1	8
				Welders	2	8
Paving (5 days)	18	0	0	Crushing/Proc. Equipment	1	8
				Off-Highway Trucks	1	8
				Pavers	1	8
				Rollers	2	8
				Tractors/Loaders/ Backhoes	2	8

5.4 Construction Noise

5.4.1 Miramar Reservoir Alternative

Table 29 summarizes the estimated construction noise levels resulting from the Miramar Reservoir Alternative project phases. Complete details of the noise calculations are provided in Appendix B of this document.

Table 29
Construction Noise Summary – Miramar Reservoir Alternative (dBA L_{eq})

Project Component	Construction Phase	Construction Noise Level at Nearest Source – Receiver Distance (dBA L_{eq})	Construction Noise Level at Typical Source – Receiver Distance (dBA L_{eq})
Project Components Common to both Alternatives			
NCWRP Expansion		*1700'*	*2100'*
	Architectural Coating	45	47
	Building Construction	49	48
	Demolition	54	53
	Grading & Trenching	52	51
	Paving	51	46
	Summary (Maximum level by phase)	**54**	**53**
NCPWF Influent Pump Station		*1700'*	*1850*
	Architectural Coating	47	48
	Building Construction	49	50
	Demolition	54	54
	Grading & Trenching	52	52
	Paving	47	50
	Summary (Maximum level by phase)	**54**	**54**
Morena Pump Station		*960'*	*1100'*
	Architectural Coating	50	52
	Building Construction	54	55
	Demolition	54	54
	Grading & Trenching	52	52
	Paving	47	50
	Summary (Maximum level by phase)	**54**	**54**
Morena Pipeline (Trenched)		*150'*	*250'*
	Paving	76	72
	Pipeline Installation and Backfill	70	68
	Trenching	76	73
	Summary (Maximum level by phase)	**76**	**73**
Morena Pipeline (Trenchless)		*960'*	*1100'*
	Site Preparation	74	70
	Portal Excavation	75	71
	Tunnel Excavation	75	71
	Site Restoration	71	66
	Summary (Maximum level by phase)	**75**	**71**

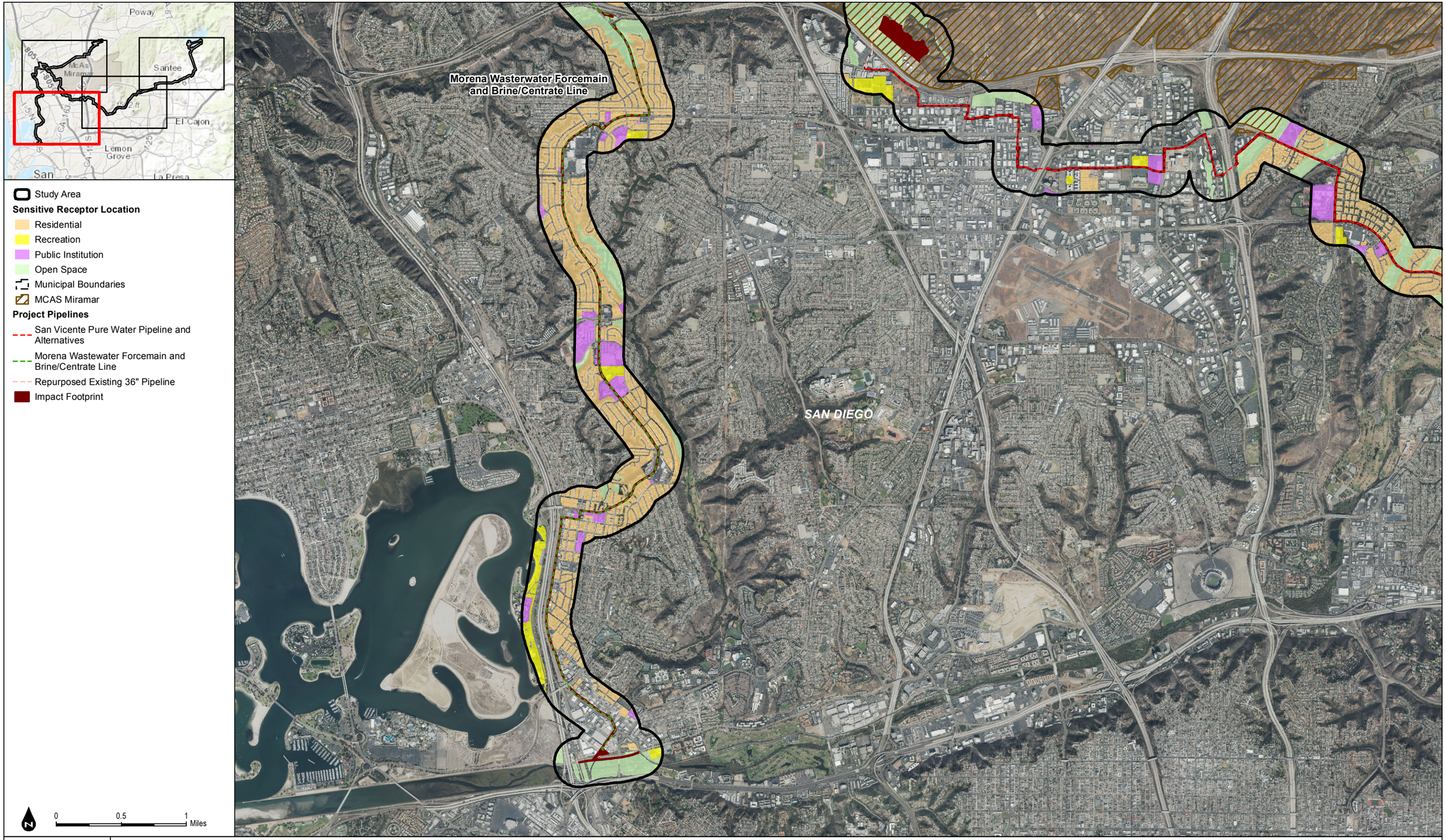
Table 29
Construction Noise Summary – Miramar Reservoir Alternative (dBA L_{eq})

Project Component	Construction Phase	Construction Noise Level at Nearest Source – Receiver Distance (dBA L_{eq})	Construction Noise Level at Typical Source – Receiver Distance (dBA L_{eq})
MBC Improvements		*2600'*	*2800'*
	Construction	46	45
	Demolition	51	50
	Grading	49	48
	Paving	49	45
	Summary (Maximum level by phase)	**49**	**50**
North City Pump Station		*2700'*	*3120'*
	Building Construction	45	45
	Demolition	48	48
	Paving	51	50
	Trenching	51	51
	Summary (Maximum level by phase)	**51**	**51**
NCPWF		*2700'*	*3000'*
	Architectural Coating	47	46
	Building Construction	47	47
	Finish Grading	51	54
	Mass Grading	55	54
	Paving	47	51
	Summary (Maximum level by phase)	**55**	**54**
North City Renewable Energy Facility		*2250'*	*2370'*
	Building Construction	46	45
	Demolition	51	51
	Grading	51	51
	Paving	50	49
	Summary (Maximum level by phase)	**51**	**51**
LFG Pipeline (Trenched)		*2600'*	*3060'*
	Paving	52	50
	Pipeline Installation and Backfill	52	45
	Trenching	52	51
	Summary (Maximum level by phase)	**52**	**51**
LFG Pipeline (Trenchless)		*2600'*	*3060'*
	Portal Excavation	51	50
	Site Preparation	52	48
	Site Restoration	51	44
	Portal Excavation	51	50
	Summary (Maximum level by phase)	**52**	**50**

Table 29
Construction Noise Summary – Miramar Reservoir Alternative (dBA L_{eq})

Project Component	Construction Phase	Construction Noise Level at Nearest Source – Receiver Distance	Construction Noise Level at Typical Source – Receiver Distance
		(dBA L_{eq})	*(dBA L_{eq})*
Miramar Reservoir Alternative			
North City Pipeline (Open Trench)		*100'*	*120'*
	Paving	78	77
	Subaqueous Pipeline	82	79
	Trenching	79	77
	Tunneling	78	76
	Summary (Maximum level by phase)	**82**	**79**
North City Pipeline (Trenchless)		*100'*	*120'*
	Pipe Connection	75	74
	Pipe Installation	75	70
	Portal Excavation	79	78
	Site Preparation	77	76
	Site Restoration	75	72
	Summary (Maximum level by phase)	**79**	**78**
Dechlorination Facility		*550'*	*575'*
	Building Construction	59	62
	Grading & Trenching	62	62
	Paving	61	57
	Summary (Maximum level by phase)	**62**	**62**
Miramar WTP Improvements		*400'*	*900'*
	Building Construction	65	59
	Demolition	68	61
	Summary (Maximum level by phase)	**68**	**61**

As shown in Table 29, construction noise levels would range from approximately 49 dBA L_{eq} to 82 dBA L_{eq}. The loudest noise levels would occur at the nearest noise-sensitive receivers (residences, for example adjacent to measurement location M3) along the North City Pure Water Pipeline (i.e., during pipeline construction work). At noise-sensitive land uses within 200 feet of the pipeline alignments for both the North City Pipeline (during trenched and trenchless construction) and the Morena Pipelines (during trenched construction), noise levels could exceed the City of San Diego's noise standard for construction of 75 dBA L_{eq} over a 12-hour period (see Figures 7A through 7D). Additionally, because the majority of the pipeline alignments would be within roadway rights-of-way, much of the work is anticipated to take place during nighttime hours in order to reduce traffic temporary congestion. Therefore, construction noise impacts for the North City Pipeline and Morena Pipelines would be **potentially significant under CEQA, and adverse under NEPA**.



SOURCE: SanGIS 2016; SANDAG 2016

DUDEK

FIGURE 7A

Noise Sensitive Receptor Impacts

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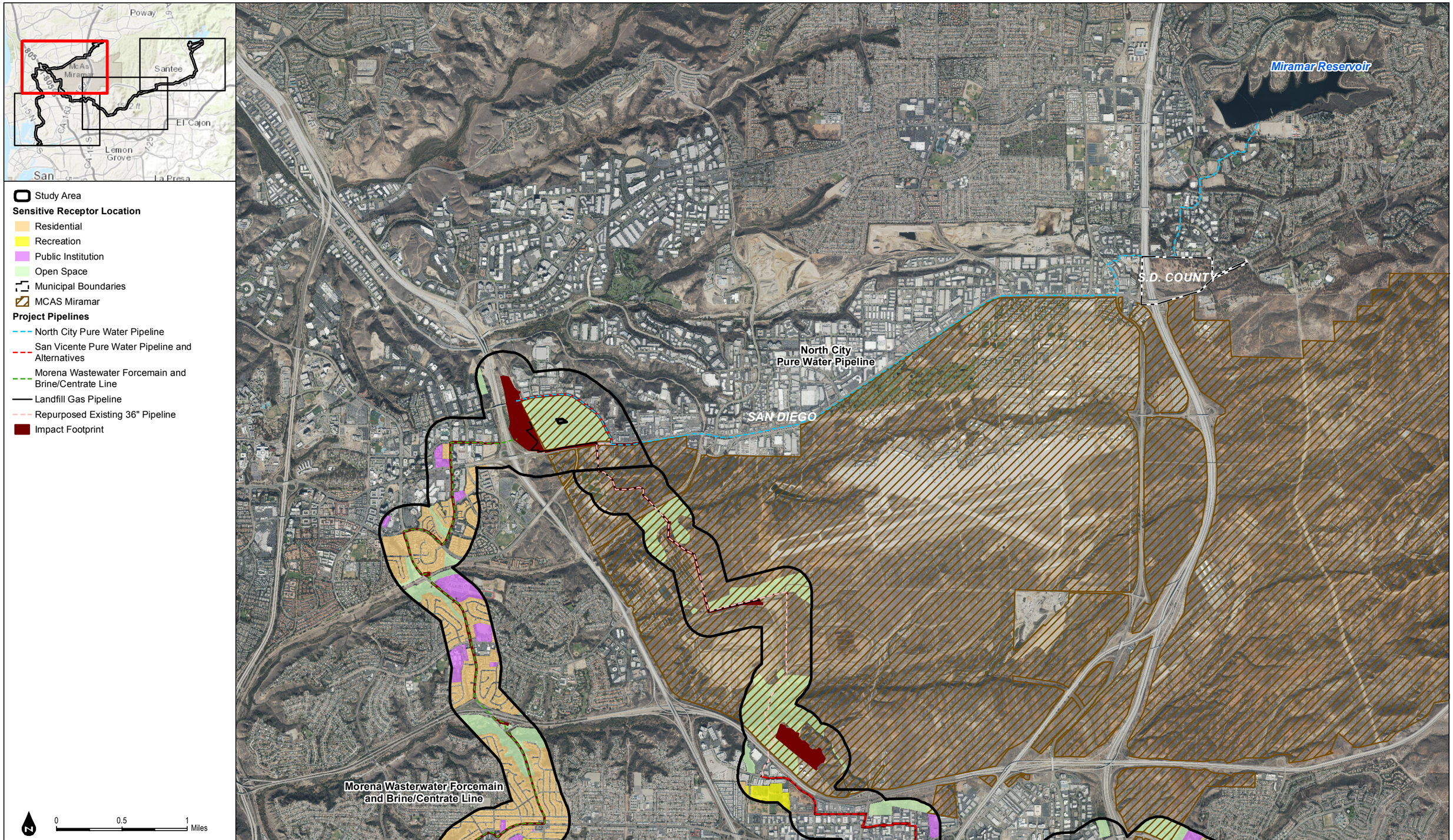

SOURCE: SanGIS 2016; SANDAG 2016

DUDEK

FIGURE 7B

Noise Sensitive Receptor Impacts

Pure Water San Diego Program North City Project Noise Technical Report

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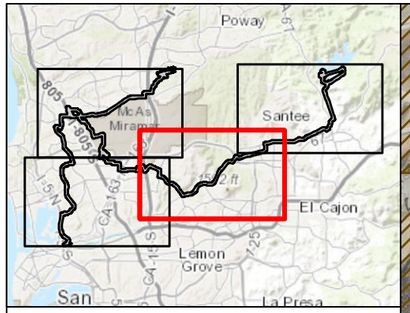


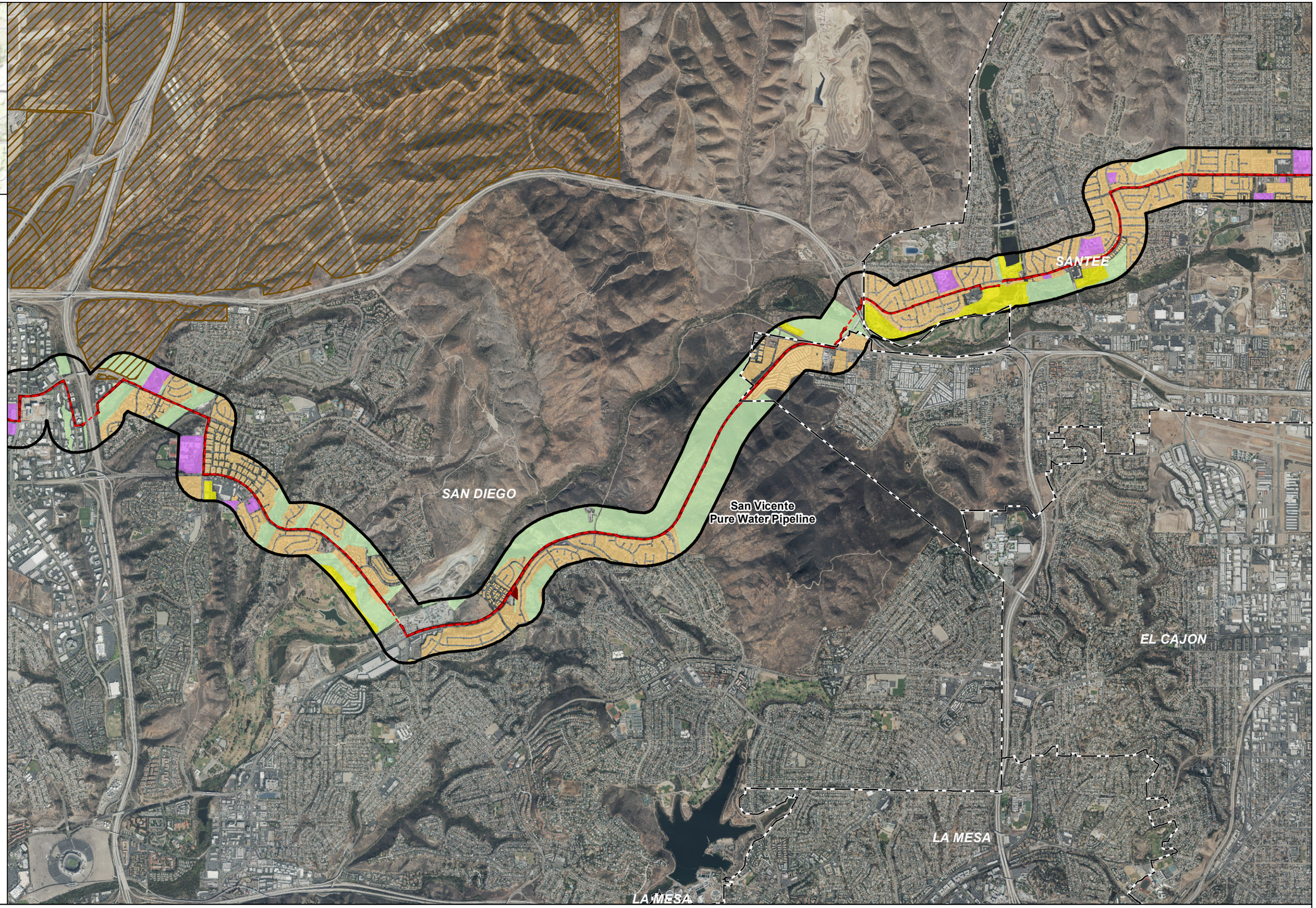
Study Area

Sensitive Receptor Location

- Residential
- Recreation
- Public Institution
- Open Space
- Municipal Boundaries
- MCAS Miramar

Project Pipelines

- San Vicente Pure Water Pipeline and Alternatives
- Impact Footprint



0 0.5 1 Miles

SOURCE: SanGIS 2016; SANDAG 2016

FIGURE 7C

Noise Sensitive Receptor Impacts

DUDEK

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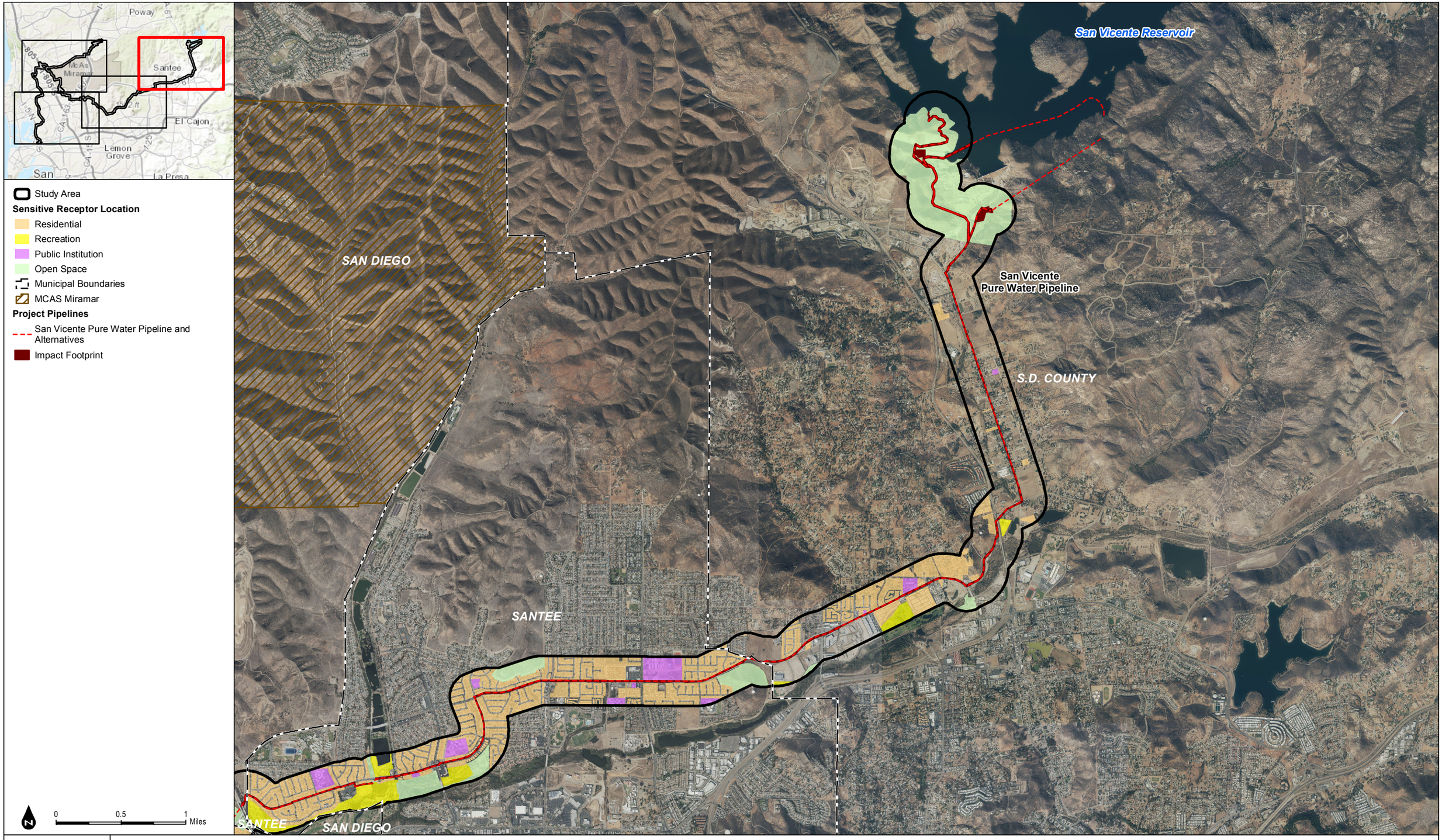

SOURCE: SanGIS 2016; SANDAG 2016

FIGURE 7D

Noise Sensitive Receptor Impacts

DUDEK

Pure Water San Diego Program North City Project Noise Technical Report

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As shown in Table 29, none of the other Project components associated with the Miramar Reservoir Alternative would exceed the City of San Diego's construction noise standard and construction noise impacts under these other Project components would be **less than significant under CEQA, and not adverse under NEPA**.

5.4.1.1 Mitigation Measures

Temporary noise impacts (typically, two to three days at any one location) would occur at noise sensitive receivers within 200 feet during construction of the North City and San Vicente Pipelines during trenched and trenchless construction and the Morena Pipeline during trenched construction. Implementation of the following mitigation measures would reduce noise levels to the extent practicable.

MM-NOI-1

1. Construction activities shall not occur between the hours of 7:00 p.m. and 7:00 a.m. or on legal holidays or on Sundays unless a permit has been applied for and granted beforehand by the Noise Abatement and Control Administrator, in accordance with City of San Diego Municipal Code Section 59.5.0404. All terms and conditions of said permit shall be complied with.
3. Nighttime work, where necessary to avoid daytime traffic jams or service outages, will be planned to the extent practical to minimize the number and type of operating equipment, restrict the movement of equipment adjacent to the noise-sensitive receivers, and minimize noise from back-up alarms.
2. Pumps and associated equipment (e.g., portable generators etc.) shall be shielded from sensitive uses using local temporary noise barriers or enclosures, or shall otherwise be designed or configured so as to comply with applicable municipal code nighttime noise standards. The specific location and design of such barriers will be determined in conjunction with construction plans for individual projects.
3. All noise-producing equipment and vehicles using internal combustion engines shall be equipped with mufflers; air-inlet silencers where appropriate; and any other shrouds, shields, or other noise-reducing features in good operating condition that meet or exceed original factory specification. Mobile or fixed "package" equipment (e.g., arc-welders, air compressors) shall be equipped with shrouds and noise control features that are readily available for that type of equipment.
4. All mobile or fixed noise-producing equipment used on the project facilities that are regulated for noise output by a local, state, or federal agency shall comply with such regulation while in the course of project activity.

5. Idling equipment shall be kept to a minimum and moved as far as practicable from noise-sensitive land uses.
6. Electrically powered equipment shall be used instead of pneumatic or internal combustion powered equipment, where feasible.
7. Material stockpiles and mobile equipment staging, parking, and maintenance areas shall be located as far as practicable from noise-sensitive receptors.
8. Construction site and access road speed limits shall be established and enforced during the construction period.
9. The use of noise-producing signals, including horns, whistles, alarms, and bells, shall be for safety warning purposes only.
10. Construction hours, allowable workdays, and the phone number of the job superintendent shall be clearly posted at all construction entrances to allow surrounding property owners to contact the job superintendent if necessary. In the event the City receives a complaint, appropriate corrective actions shall be implemented and a report of the action provided to the reporting party.

Effectiveness of these mitigation measures would vary from several decibels (which in general is a relatively small change) to ten or more decibels (which subjectively would be perceived as a substantial change), depending upon the specific equipment and the original condition of that equipment, the specific locations of the noise sources and the receivers, etc. Installation of a noise barrier, for example, would vary in effectiveness depending upon the degree to which the line-of-sight between the source and receiver is broken, and typically ranges from 5 to 10 dB. Installation of more effective silencers could range from several decibels to well over 10 decibels. Reduction of idling equipment could reduce overall noise levels from barely any reduction to several decibels. Cumulatively, however, these measures would result in substantial decreases in the noise from construction.

5.4.1.2 Level of Significance After Mitigation

Implementation of the mitigation measures detailed in Section 5.3.2.6 would provide substantial noise reduction at adjacent noise-sensitive land uses at which they apply; within 200 feet of the North City Pure Water Pipeline (during trenched and trenchless construction) and the Morena Pipeline (during trenched construction). However, because nighttime work is anticipated, noise levels from project construction would be substantially higher than the ambient noise levels even with implementation of mitigation measures. Noise from construction of the North City Pipeline and Morena Pipeline is therefore considered a **significant unavoidable impact under CEQA and an unavoidable adverse effect under NEPA.**

5.4.2 San Vicente Reservoir Alternative

Table 30 summarizes the estimated construction noise levels resulting from the San Vicente Reservoir Alternative project phases. Complete details of the noise calculations are provided in Appendix B of this document.

Table 30
Construction Noise Summary – San Vicente Reservoir Alternative (dBA Leq)

Project Component / Location	Construction Phase	Construction Noise Level at Nearest Source – Receiver Distance (dBA L_{eq})	Construction Noise Level at Typical Source – Receiver Distance (dBA L_{eq})
Project Components Common to both Alternatives			
NCWRP Expansion		*1,700 feet*	*2,100 feet*
	Architectural Coating	45	47
	Building Construction	49	48
	Demolition	54	53
	Grading & Trenching	52	51
	Paving	51	46
	Summary (Maximum level by phase)	**54**	**53**
NCPWF Influent Pump Station		*1,700 feet*	*1,850 feet*
	Architectural Coating	47	48
	Building Construction	49	50
	Demolition	54	54
	Grading & Trenching	52	52
	Paving	47	50
	Summary (Maximum level by phase)	**54**	**54**
Morena Pump Station		*960 feet*	*1,100 feet*
	Architectural Coating	50	52
	Building Construction	54	55
	Demolition	54	54
	Grading & Trenching	52	52
	Paving	47	50
	Summary (Maximum level by phase)	**54**	**54**
Morena Pipeline (Trenched)		*150 feet*	*250 feet*
	Paving	76	72
	Pipeline Installation and Backfill	70	68
	Trenching	76	73
	Summary (Maximum level by phase)	**76**	**73**

Table 30
Construction Noise Summary – San Vicente Reservoir Alternative (dBA Leq)

Project Component / Location	Construction Phase	Construction Noise Level at Nearest Source – Receiver Distance	Construction Noise Level at Typical Source – Receiver Distance
		(dBA L_{eq})	*(dBA L_{eq})*
Morena Pipeline (Trenchless)		*960 feet*	*1,100 feet*
	Site Preparation	74	70
	Portal Excavation	75	71
	Tunnel Excavation	75	71
	Site Restoration	71	66
	Summary (Maximum level by phase)	**75**	**71**
MBC Improvements		*2,600 feet*	*2,800 feet*
	Construction	46	45
	Demolition	51	50
	Grading	49	48
	Paving	49	45
	Summary (Maximum level by phase)	**49**	**50**
North City Pump Station		*2,700 feet*	*3,120 feet*
	Building Construction	45	45
	Demolition	48	48
	Paving	51	50
	Trenching	51	51
	Summary (Maximum level by phase)	**51**	**51**
NCPWF		*2,700 feet*	*3,000 feet*
	Architectural Coating	47	46
	Building Construction	47	47
	Finish Grading	51	54
	Mass Grading	55	54
	Paving	47	51
	Summary (Maximum level by phase)	**55**	**54**
North City Renewable Energy Facility		*2,250 feet*	*2,370 feet*
	Building Construction	46	45
	Demolition	51	51
	Grading	51	51
	Paving	50	49
	Summary (Maximum level by phase)	**51**	**51**
LFG Pipeline (Trenched)		*2,600 feet*	*3,060 feet*
	Paving	52	50
	Pipeline Installation and Backfill	52	45
	Trenching	52	51
	Summary (Maximum level by phase)	**52**	**51**

Table 30
Construction Noise Summary – San Vicente Reservoir Alternative (dBA Leq)

Project Component / Location	Construction Phase	Construction Noise Level at Nearest Source – Receiver Distance	Construction Noise Level at Typical Source – Receiver Distance
		(dBA L_{eq})	*(dBA L_{eq})*
LFG Pipeline (Trenchless)		*2,600 feet*	*3,060 feet*
	Portal Excavation	51	50
	Site Preparation	52	48
	Site Restoration	51	44
	Portal Excavation	51	50
	Summary (Maximum level by phase)	**52**	**50**
San Vicente Reservoir Alternative			
San Vicente Pipeline (Open Trench)		*50 feet*	*70 feet*
	Paving	85	81
	Pipeline Installation and Backfill	74	71
	Trenching	83	81
	Summary (Maximum level by phase)	**85**	**81**
San Vicente Pipeline (Trenchless)		*50 feet*	*70 feet*
	Building Construction	81	80
	Trenching	83	83
	Summary (Maximum level by phase)	**83**	**83**
Mission Trails Booster Station		*20 feet*	*65 feet*
	Building Construction	79	78
	Grading	90	83
	Paving	91	82
	Underground install & Trenching	92	84
	Summary (Maximum level by phase)	**92**	**84**

As shown in Table 30, construction noise levels would range from approximately 49 dBA L_{eq} to 92 dBA L_{eq}. The loudest noise levels would occur at the nearest noise-sensitive receivers adjacent to the MTBS. At noise-sensitive land uses within 350 feet of the Mission Trails Booster Station (MTBS), construction noise levels could exceed the City of San Diego's noise standard for construction of 75 dBA L_{eq} over a 12-hour period. The other project components predicted to exceed applicable construction noise standards are the San Vicente Pipeline (during both trenched and trenchless construction) and the Morena Pipelines (during trenched construction work). At noise-sensitive land uses within 200 feet of the pipeline alignments, construction noise levels could exceed the City and County of San Diego and City of Santee noise standards for construction of 75 dBA L_{eq} over either a 12-hour or 8-hour period. Additionally, because the

majority of the pipeline alignments would be within roadway rights-of-way, much of the work is anticipated to take place during nighttime hours in order to reduce traffic temporary congestion. Therefore, construction noise impacts for these Project components would be **potentially significant under CEQA and adverse under NEPA**.

As shown in Table 30, none of the other Project components would exceed the City of San Diego, County of San Diego or City of Santee construction noise standard. Construction noise impacts for all Project components except the Morena Pipelines, San Vicente Pipeline, and MTBS would be **less than significant under CEQA and not adverse under NEPA**.

5.4.2.1 Mitigation Measures

Temporary noise impacts (typically, two to three days at any one location) would occur during construction of the San Vicente Pipeline and Morena Pipelines. Temporary (although of substantially longer duration) noise impacts would occur during construction of the MTBS. Implementation of the measures in **MM-NOI-1** would reduce noise levels to the extent practicable.

Effectiveness of these mitigation measures would vary from several decibels (which in general is a relatively small change) to ten or more decibels (which subjectively would be perceived as a substantial change), depending upon the specific equipment and the original condition of that equipment, the specific locations of the noise sources and the receivers, etc. Installation of a noise barrier, for example, would vary in effectiveness depending upon the degree to which the line-of-sight between the source and receiver is broken, and typically ranges from 5 to 10 dB. Installation of more effective silencers could range from several decibels to well over 10 decibels. Reduction of idling equipment could reduce overall noise levels from barely any reduction to several decibels. Cumulatively, however, these measures would result in substantial decreases in the noise from construction.

5.4.2.2 Level of Significance After Mitigation

Implementation of the mitigation measures detailed in Section 5.4.1.1 would provide substantial noise reduction at adjacent noise-sensitive land uses. Noise levels adjacent to the MTBS would be reduced to a level of **less than significant** with incorporation of mitigation. However, because nighttime work is anticipated for the construction of the San Vicente Pipeline and Morena Pipelines, noise levels from project construction would be substantially higher than the ambient noise levels. Noise from construction of the San Vicente Pipeline and Morena Pipelines is therefore considered a **significant unavoidable impact under CEQA and an unavoidable adverse effect under NEPA**.

5.5 Construction Vibration Impacts

Groundborne vibration from heavy equipment operations during North City Project construction were evaluated and compared with relevant vibration impact criteria. Groundborne vibration is a small, rapidly fluctuating motion transmitted through the ground. Groundborne vibration diminishes (or "attenuates") fairly rapidly over distance. Some soil types transmit vibration quite efficiently; other types (primarily "sandy" soils) do not. The Federal Transit Administration's Transit Noise and Vibration Impact Assessment Manual (FTA 2006) provides vibration impact criteria and recommended methodologies and guidance for assessment of vibration effects.

5.5.1 Miramar Reservoir Alternative

Vibration resulting from activities during North City Project construction was analyzed using the methodology contained in Section 12.2 of the Transit Noise and Vibration Impact Assessment Manual. The vibration levels corresponding to the nearest distances between adjacent noise-sensitive land uses and the Project components for the Miramar Reservoir Alternative are shown in Table 31.

Table 31
Construction Vibration Summary – Miramar Reservoir Alternative

Project Component	Nearest Source - Receiver Distance (feet)	Vibration Level from Heavy Truck and Similar (PPV (inches / sec))	Vibration Level from Vibratory Roller (PPV (inches / sec))
Project Components Common to both Alternatives			
NCWRP Expansion	1700	0.000	0.000
NCPWF Influent Pump Station	1700	0.000	0.000
Morena Pump Station	960	0.000	0.001
Morena Pipeline (Trenched)	150	0.006	0.014
Morena Pipeline (Trenchless)	960	0.000	0.001
MBC Improvements	2600	0.000	0.000
North City Pump Station	2700	0.000	0.000
NCPWF	2700	0.000	0.000
North City Renewable Energy Facility	2250	0.000	0.000
LFG Pipeline (Trenched)	2600	0.000	0.000
LFG Pipeline (Trenchless)	2600	0.000	0.000
Miramar Reservoir Alternative			
North City Pipeline (Open Trench)	100	0.011	0.026
North City Pipeline (Trenchless)	100	0.011	0.026
Dechlorination Facility	550	0.001	0.002
Miramar WTP Improvements	400	0.001	0.003

As shown in Table 31, the nearest source receiver for the Miramar Reservoir Alternative is located approximately 100 feet from the North City Pipeline alignment. Vibration levels at this location would be 0.001 inches per second (in/sec) from heavy construction machinery (such as a heavy truck or large bulldozer), or 0.026 in/sec from a vibratory roller. Vibration levels of this magnitude would be below the threshold of perception of 0.10 in/sec or the damage threshold for structures of engineered concrete and masonry (0.30 in/sec).

Other Project components with measurable vibration levels include the Morena Pipelines, Morena Pump Station, Dechlorination Facility, and the Miramar WTP. Similarly, vibration levels at each of these Project components would be below the threshold of perception of 0.10 in/sec or the damage threshold for structures of engineered concrete and masonry (0.30 in/sec).

Therefore, vibration impacts from construction activities under the Miramar Reservoir Alternative would be **less than significant under CEQA and not an adverse effect under NEPA**.

5.5.1.1 Mitigation Measures

No mitigation is required for the Miramar Reservoir Alternative.

5.5.1.2 Level of Significance After Mitigation

Construction vibration impacts associated with the Miramar Reservoir Alternative would be **less than significant** and not adverse without mitigation.

5.5.2 San Vicente Reservoir Alternative

The vibration levels corresponding to the nearest distances between adjacent noise-sensitive land uses and the Project components for the San Vicente Reservoir Alternative are shown in Table 32.

Table 32
Construction Vibration Summary – San Vicente Reservoir Alternative

Project Component	Nearest Source - Receiver Distance (feet)	Vibration Level from Heavy Truck and Similar (PPV (inches / sec))	Vibration Level from Vibratory Roller (PPV (inches / sec))
Project Components Common to both Alternatives			
NCWRP Expansion	1700	0.000	0.000
NCPWF Influent Pump Station	1700	0.000	0.000
Morena Pump Station	960	0.000	0.001
Morena Pipeline (Trenched)	150	0.006	0.014
Morena Pipeline (Trenchless)	960	0.000	0.001
MBC Improvements	2600	0.000	0.000
North City Pump Station	2700	0.000	0.000

Table 32
Construction Vibration Summary – San Vicente Reservoir Alternative

Project Component	Nearest Source - Receiver Distance (feet)	Vibration Level from Heavy Truck and Similar (PPV (inches / sec))	Vibration Level from Vibratory Roller (PPV (inches / sec))
NCPWF	2700	0.000	0.000
North City Renewable Energy Facility	2250	0.000	0.000
LFG Pipeline (Trenched)	2600	0.000	0.000
LFG Pipeline (Trenchless)	2600	0.000	0.000
San Vicente Reservoir Alternative			
San Vicente Pipeline (Open Trench)	50	0.031	0.074
San Vicente Pipeline (Trenchless)	50	0.031	0.074
Mission Trails Booster Station	20	0.124	0.293

As shown in Table 31, the vibration levels at the nearest distances of the San Vicente Reservoir Alternative (for the MTBS component) from heavy construction machinery (such as a heavy truck or large bulldozer) would be 0.124 in/sec, or 0.293 in/sec from a vibratory roller. These levels are predicted to occur at the nearest residence, located approximately 20 feet east of the MTBS boundary. Vibration levels of this magnitude would exceed the threshold of perception of 0.10 in/sec but would not exceed the potential damage threshold for structures of engineered concrete and masonry (0.30 in/sec). It should be noted that construction activities within approximately 20 feet of the nearest sensitive receptor with vibratory rollers or similar equipment would be short term and relatively brief (likely on the order of several days or less). In general, heavy construction equipment would create lower vibration levels and would operate at greater distances. Nonetheless, the vibration levels from construction activities at the nearest residential land uses to the MTBS would be clearly perceptible. Therefore, construction vibration at the MTBS is considered to be a **potentially significant impact under CEQA and an adverse effect under NEPA**.

Other Project components with measurable vibration levels include the Morena Pipelines, Morena Pump Station, and the San Vicente Pipeline. However, vibration levels at each of these Project components would be below the threshold of perception of 0.10 in/sec or the damage threshold for structures of engineered concrete and masonry (0.30 in/sec). Therefore, vibration impacts from construction activities under the San Vicente Reservoir Alternative for all Project components except the MTBS would be **less than significant under CEQA and not adverse under NEPA**.

5.5.2.1 Mitigation Measures

Mitigation measure MM-NOI-1 would be applicable.

5.5.2.2 Level of Significance After Mitigation

Impacts related to ground-borne vibration at the MTBS are considered to be **significant and unavoidable under CEQA and an adverse effect under NEPA that cannot be reliably mitigated,** even with mitigation incorporated. Impacts related to ground-borne vibration would be **less than significant** for all other Project components under the San Vicente Reservoir Alternative without mitigation.

5.6 Operational Noise Impacts

5.6.1 Traffic Noise – Miramar Reservoir Alternative and San Vicente Reservoir Alternative

Following the completion of construction activities, the North City Project would generate noise from vehicular traffic as a result of 60 additional staff for the Miramar Reservoir Alternative and the San Vicente Reservoir Alternative. The motor vehicle assumptions are the same for the Miramar Reservoir Alternative and the San Vicente Reservoir Alternative. It is expected that during normal operations, these workers would generate 120 one-way trips (i.e., 1 one-way trip from home to work and 1 one-way trip from work to home). Additionally, operational trips would be generated as a result of routine maintenance, periodic inspections and repairs of system facilities, monitoring, brush maintenance, and other operational procedures similar to those under the City's current water and wastewater treatment and distribution system. It was assumed that only a minor increase in O&M trips would be required; therefore, it was assumed on a worst-case day that an additional 10 one-way O&M-related trips would occur. In total, the North City Project operations would be expected to generate approximately 140 average daily trips for the Miramar Reservoir Alternative and the San Vicente Reservoir Alternative. Because of the relatively small number of trips associated with North City Project operations compared to the number of non-project vehicle trips (generally in the thousands to tens of thousands per day) on the same City and County roadways in the existing and future years, the noise increase from North City Project-related vehicular traffic would be well below 1 dB, which would not result in a measurable or audible increase. Therefore, impacts would be **less than significant under CEQA and not adverse under NEPA.**

Mitigation Measures

No mitigation is required for the Miramar Reservoir Alternative or for the San Vicente Reservoir Alternative.

Level of Significance After Mitigation

Impacts associated with the Miramar Reservoir Alternative and for the San Vicente Reservoir Alternative would be less than significant and not adverse without mitigation.

5.6.2 Pipelines – Miramar Reservoir Alternative and San Vicente Reservoir Alternative

Once constructed, the pipeline segments (including the LFG Pipeline) for either the Miramar Reservoir Alternative or the San Vicente Reservoir Alternative would not result in noise impacts as the flow of water or wastewater within the underground pipelines would not be audible. Noise levels would not exceed the limits expressed in the respective City and County of San Diego or City of Santee municipal codes. Occasional maintenance and emergency repair activities will generate some additional noise; however, these activities are sporadic in nature and do not occur at the same location for long periods of time. Noise impacts would be **less than significant under CEQA and not adverse under NEPA**.

Mitigation Measures

No mitigation is required for the Miramar Reservoir Alternative or for the San Vicente Reservoir Alternative.

Level of Significance After Mitigation

Impacts associated with the Miramar Reservoir Alternative and for the San Vicente Reservoir Alternative would be **less than significant and not adverse without mitigation**.

5.6.3 Pump Stations – Miramar Reservoir Alternative and San Vicente Reservoir Alternative

The primary noise sources from pump station facilities are the motors and the pumps. Noise from the heating, ventilation and air conditioning units (HVAC) often used within the pump station building is also a source of noise. Based upon the Technical Noise Memorandum prepared for the Basis of Design Report for the North City Pipeline, North City Pump Station, and Dechlorination Facility (HDR, 2016), the North City Pump Station will have four 1,000-Hp pumps, three of which would be operational at any one time. The specific pump manufacturer has not yet been selected, but a noise level of 90 dBA per pump/motor at a distance of 1 meter (3.28 feet) was utilized. The HVAC equipment is estimated to produce approximately 64 dBA L_{eq} at 1 meter from the indoor inlet, 74 dBA L_{eq} at 1 meter from the indoor exhaust, and 80 dBA L_{eq} at 1 meter from the outdoor compressor. The Technical Noise Memorandum analyzed the noise levels resulting from the North City Pump Station at the three

nearest off-site land uses (a repair and maintenance facility, the NCWRP and an office park, respectively). Resultant noise levels at the nearest off-site land use, located 340 feet away, were preliminarily estimated to be 44 dBA L_{eq}, and thus lower than the City noise threshold of 60 dBA L_{eq} daytime and 55 dBA L_{eq} nighttime. At the nearest residential land uses located approximately 2,700 feet away and with numerous buildings in between, the noise levels would be substantially lower. Similarly, the Influent Pump Station and the Morena Pump Station would be located approximately 1,700 feet and 960 feet away from the nearest noise-sensitive land uses, and would be designed and constructed to ensure that City of San Diego noise standards are met (City of San Diego NC01 Project Data Summary Sheet). Pump station machinery will be housed within concrete structures with acoustically absorptive treatments where necessary, as well as additional measures such as sound enclosures, separate rooms for high noise equipment, etc. Because the site designs and equipment specifications are still in a preliminary stage, the noise impact from these facilities is considered **potentially significant under CEQA and adverse under NEPA**. A mitigation measure in the form of a requirement for noise analyses in the final design phase is provided to ensure compliance with relevant City/County of San Diego noise standards.

Mitigation Measures

Because details of the pump station facilities have not yet been completed, the potential for operational noise and/or vibration impacts exists. Implementation of the following mitigation measure would reduce noise / vibration levels to a level that would be **less than significant under CEQA and not adverse under NEPA**.

MM-NOI-2 A noise and vibration study shall be conducted during the final design phase for the NCPWF Influent Pump Station, Morena Pump Station, North City Pump Station, North City Renewable Energy Facility (both Project Alternatives), and the Mission Trails Booster Station (San Vicente Reservoir Alternative only). Pump station machinery and/or generators shall be housed within concrete structures with acoustically absorptive treatments where necessary, and additional measures such as sound enclosures, separate rooms for high noise equipment, etc. shall be incorporated into the final project design as necessary to assure that noise and vibration produced by operation of the facility shall not exceed the applicable limits in the municipal code.

Level of Significance After Mitigation

With implementation of MM-NOI-2, impacts would be less than significant under CEQA and not adverse under NEPA.

5.6.4 North City Renewable Energy Facility – Miramar Reservoir Alternative and San Vicente Reservoir Alternative

As described in more detail in Section 1.2.1, the new renewable energy facility consists of 6.3 MW of new capacity in a Small Power Producing Facility (SPPF) that uses 100% landfill gas as fuel. The additional 9.1 MW of new renewable energy capacity within the facility uses landfill gas supplemented with natural gas as fuels. Combined, a total of six new ICE and generator units (also 3.8 MW Caterpillar Model CG260-16 IC or equivalent) will be operational at any one time, and one additional 3.8 MW Caterpillar Model CG260-16 IC or equivalent will serve as backup to the SPPF engines or the mixed-gas power generation engines.

The engines will be within a building located immediately south of the new circular secondary clarifiers and north of the existing emergency power generation facility at NCWRP. The building will include sound suppression features to reduce the noise levels outside the building. The estimated stack height of the engines' exhaust stacks is 55 feet, which is approximately 30 feet above the top of the building.

Based upon reference data sheets provided by the equipment manufacturer, each of the Caterpillar CG260-16 units would produce a sound power level of 136 dBA at the exhaust stack, which is equivalent to approximately 101 dBA at a distance of 50 feet in the free field. The nearest noise-sensitive land uses would be located approximately 2,250 feet from the proposed facility, with numerous structures in between, including the I-805 freeway. Nonetheless, because the site design and equipment specifications are still in a preliminary stage, the noise impact from the Renewable Energy Facility is considered **potentially significant under CEQA and adverse under NEPA**. A mitigation measure in the form of a requirement for noise analyses in the final design phase is provided to ensure compliance with relevant City of San Diego noise standards.

Mitigation Measures

Because details of the renewable energy facility have not yet been finalized, the potential for operational noise and/or vibration impacts exists. Implementation of the following mitigation measure would reduce noise / vibration levels to a level that would be **less than significant under CEQA and not adverse under NEPA.**

See MM-NOI-2.

Level of Significance After Mitigation

With implementation of MM-NOI-2, impacts would be **less than significant under CEQA and not adverse under NEPA**.

5.6.5 Treatment Facilities – Miramar Reservoir Alternative and San Vicente Reservoir Alternative

With the exception of the Miramar WTP, treatment facilities (i.e., the NCPWF, as well as improvements and/or expansion of existing facilities, including the NCWRP, and MBC) would be located 500 feet or more from noise-sensitive land uses (residences, churches, schools, recreational land uses). The Miramar WTP would be located within approximately 100__ feet from residences. Treatment facilities, similar to pump stations, involve the use of large pumps and motors with similar high noise levels. However, treatment facilities are commonly located within or near residential communities and other noise-sensitive land uses and thus are successfully designed and constructed to achieve compatible noise levels. Based upon the project's design reports and data summary sheets, and upon the large distances to noise-sensitive land uses, the facilities will incorporate necessary enclosures and noise treatments and will be designed and constructed to comply with applicable noise standards. Machinery will be housed within concrete structures with acoustically absorptive treatments where necessary, as well as additional measures such as sound enclosures, separate rooms for high noise equipment, etc. Noise impacts would be **less than significant under CEQA and not adverse under NEPA**.

Mitigation Measures

No mitigation is required for the Miramar Reservoir Alternative or for the San Vicente Reservoir Alternative.

Level of Significance After Mitigation

Impacts associated with the Miramar Reservoir Alternative and for the San Vicente Reservoir Alternative would be **less than significant and not adverse without mitigation**.

5.7 Operational Vibration Impacts - Miramar Reservoir Alternative and San Vicente Reservoir Alternative

The pump stations and treatment facilities would utilize large machinery such as pumps, motors and other rotating machinery, which generates groundborne vibration. However, because of the relatively large distances between these facilities and noise- and vibration-sensitive receivers, and because vibration through ground generally dissipates fairly rapidly, vibration at noise- and vibration-sensitive uses would be **less than significant under CEQA and not adverse under NEPA.**

Mitigation Measures

No mitigation is required for the Miramar Reservoir Alternative or for the San Vicente Reservoir Alternative.

Level of Significance After Mitigation

Impacts associated with the Miramar Reservoir Alternative and for the San Vicente Reservoir Alternative would be **less than significant and not adverse without mitigation**.

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APPENDIX A

Noise Measurement Data

APPENDIX B

Noise Calculations