Los Angeles International Airport

Second Addendum to the Environmental Impact Report for the Midfield Satellite Concourse

PREPARED FOR:

Los Angeles World Airports

PREPARED BY:

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1. Purpose

The Los Angeles World Airports (LAWA) Board of Airport Commissioners (BOAC) has initiated a new multi-level concourse at Los Angeles International Airport (LAX) west of Tom Bradley International Terminal (TBIT). Development of this new multi-level concourse is called the Midfield Satellite Concourse (MSC) Program. Due to the size and scale of the MSC Program and immediate need to enable rehabilitation and modernization of existing facilities, LAWA has proposed to implement the program in independent phases. Phase 1 of the MSC Program is the construction of the northern portion of the multi-story MSC facility and associated improvements, referred to as the MSC North Project. On July 21, 2014, the BOAC certified a Final Environmental Impact Report (EIR) pursuant to the California Environmental Quality Act (CEQA) for all phases of the MSC Program. The MSC EIR contained a project-level analysis of the MSC North Project, and a program-level analysis of the full MSC Program. Additionally, on March 19, 2015, BOAC considered an Addendum to the EIR (Addendum 1), which addressed the relocation of LAX's existing Remote Transmitter/Receiver (RTR) facility. This facility was within the proposed footprint for the MSC North and was demolished and reconstructed in a different location prior to the commencement of construction of the MSC. While this relocation was analyzed in the MSC Final EIR, subsequent analysis identified a more appropriate location than discussed in the 2014 EIR.

This Addendum (Addendum 2) has been prepared to address modifications to Phase 1 of the MSC Program, the MSC North Project. The modifications analyzed in this Addendum do not modify any other phases of the MSC Program. The adopted EIR, along with Addendum 1, and this Addendum, serve as the environmental review of the proposed Project pursuant to the provisions of CEQA, Public Resources Code Section 21000 *et. seq.*, and State and local CEQA Guidelines.[1]

As part of the natural progression of the design process, plans for the MSC North Project were further refined and altered. Subsequent to completing the CEQA environmental review process for the MSC North Project, LAWA revised its plans to include the following modifications:

- Reconfiguration of the MSC North Project concourse. The modified MSC North concourse would have a footprint of approximately 258,000 square feet (compared with the originally envisioned 200,000 square feet), with estimated dimensions of 1,648 feet in length (north-south) and 125 to 250

[1] California Administrative Code, Title 14, Division 6, Chapter 3, Sections 15000-15387, "Guidelines for Implementation of the California Environmental Quality Act."

feet in width (east-west).[2] The floor space of the modified MSC North concourse would consist of three to five levels and provide approximately 800,000 square feet for facilities such as passenger holdrooms, concessions, restrooms, airline lounges, utility rooms, and circulation. The modified MSC North concourse would have the ability to serve both international and domestic flights and provide 12 aircraft gates (compared with the originally envisioned 11 gates) capable of accommodating Airplane Design Group (ADG) V and ADG VI aircraft, and down to ADG III aircraft.

- Construction of approximately 2,900 linear feet of underground tunneling for baggage conveyance, utilities, and passengers from the MSC North concourse to the TBIT (compared to the 2,600 linear feet originally proposed).
- Construction of a ramp tower, approximately 169 feet in height, to ensure that the LAX airport traffic control tower (ATCT) has a clear, unobstructed, and direct view of aircraft located on runways and taxiways in the vicinity of the MSC North Project. The ramp tower would be constructed on top of the MSC North concourse building.
- Construction of a three-level 'Gateway' building, including approximately 50,000 square feet of floor space, to facilitate passenger transition from TBIT to the underground walkway. The Gateway would provide Airline Club spaces on the concourse level.
- A new location for the relocated Los Angeles Department of Water and Power (LADWP) electrical substation.

[2] Gatehouses are 24 feet, making the concourse 168 feet wide in some areas. Additionally, the 'Core' of the MSC, located at the southern end of Part A, would have a width of approximately 250 feet.

2. Previously Approved MSC North Project

The MSC North Project, as described and analyzed in the EIR certified by the BOAC in July 2014, included 1) construction of the northern portion of a new multi-level concourse west of the Central Terminal Area (CTA) with up to 11-gates and associated facilities; 2) additional taxiways and taxilanes; 3) construction of a ramp tower or Federal Aviation Administration (FAA) supplemental airport traffic control tower to control aircraft movement around the MSC facility and adjacent airfield; 4) construction of tunnels for passenger and baggage conveyance; (5) utilities that support the MSC North Project; and (6) the removal/relocation of existing facilities at the MSC North Project site. The MSC North Project components as identified and analyzed in the MSC EIR are shown in **Figure 1**.

As previously proposed, the MSC North building (the concourse building and associated apron areas) was to have been constructed from the north limit of the concourse[3] to a point just south of World Way West. The concourse was estimated to have a footprint of 200,000 square feet, with approximate dimensions of 1,295 feet in length (north-south) and between 148 feet and 160 feet in width (east-west), and the ability to serve both international and domestic flights and accommodate up to 11 gates for ADG III to ADG VI aircraft. The floor space of the concourse, which would consist of four levels plus an automated people mover (APM) level, was to provide up to 800,000 square feet of floor space for facilities such as passenger holdrooms, concessions, restrooms, airline lounges, utility rooms, and circulation.

The MSC North Project also included space for airline operations, baggage handling, bus station(s), an automated people mover system, and utilities, as well as provisions for future connection(s) between the proposed concourse facility and TBIT and/or the CTA to accommodate passengers, baggage, and utilities.

The MSC EIR assumed a ramp control tower would be integrated into the MSC North concourse building. The ramp control tower was to have been between 131 and 211 feet tall; the height of the tower was to have been determined by FAA based on line-of-sight and shadow analyses.

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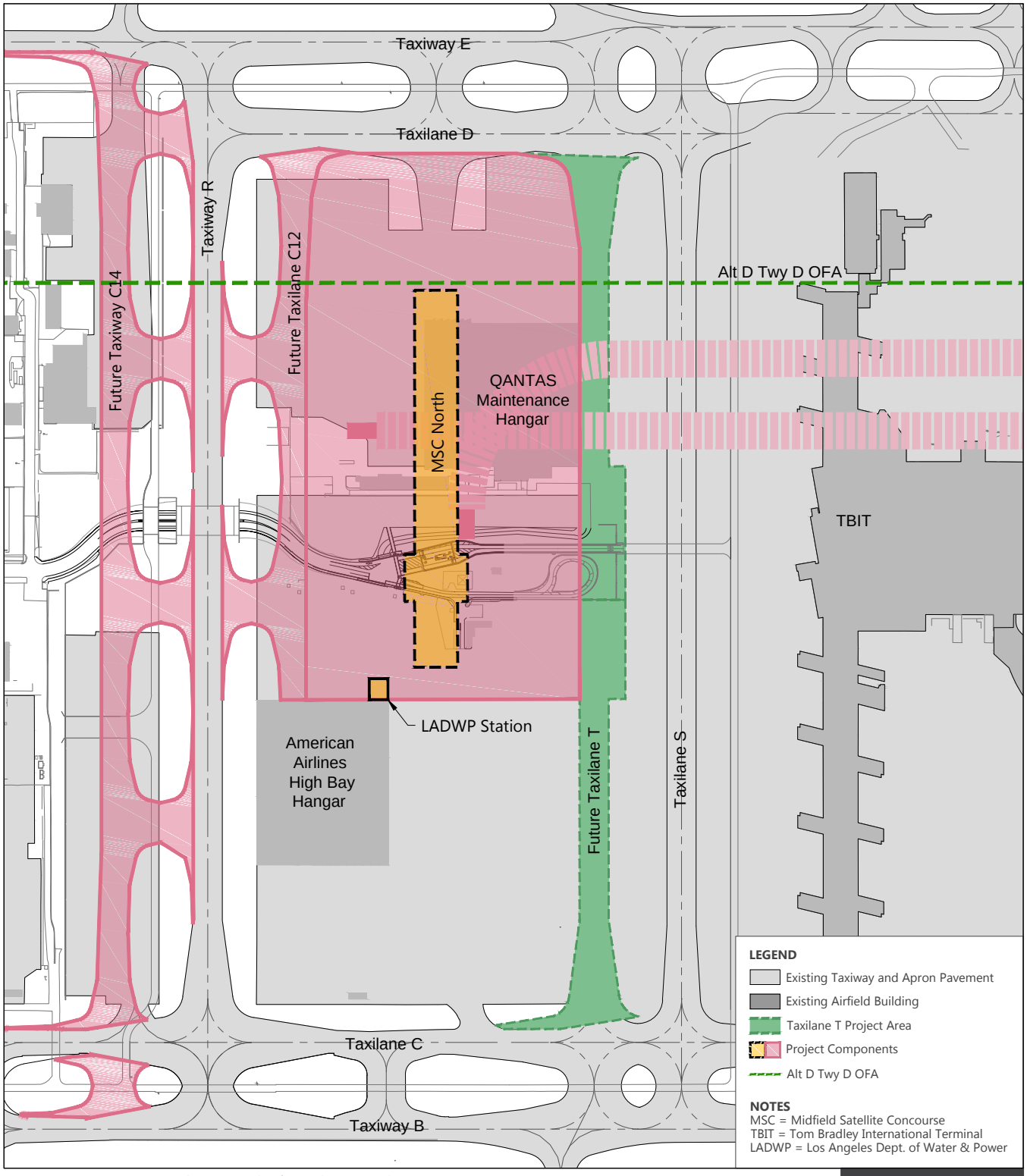
[3] The north limit of the proposed MSC, as described in the MSC EIR, was south of the Alt D line defined by Alternative D of the 2004 LAX Master Plan. Alternative D includes the relocation of Runway 6R-24L by 340 feet to the south. It also included the provision of a new centerfield taxiway (between Runway 6L-24R and Runway 6R-24L) and relocation and improvements to Taxiway E and Taxilane D. The Alt D line was established by the FAA-required object free area limit line south of Taxilane D. The centerfield taxiway was designed to meet ADG VI standards; the realigned Taxiway E and Taxilane D was designed to meet ADG V standards.

The MSC EIR also included a 2,600-foot long segment of the tunnel(s) to be constructed from the MSC North concourse building to an East Station in the CTA. The tunnel(s) were to be a maximum of 90 feet wide by 60 feet tall with the bottom of the tunnel at an average depth of 50 feet below the apron.

Construction of the MSC North Project would also require the relocation and/or removal of several existing airfield facilities located at the Project site. Among these facilities was the demolition and relocation of an electrical industrial station. In the MSC EIR, the industrial station was to be located north of and adjacent to the American Airlines High Bay Hangar.



SOURCE: Source: HNTB, Corp., Los Angeles International Draft ALP, July 2012; Ricondo & Associates, Inc., January 2014.
PREPARED BY: Ricondo & Associates, Inc., September 2016.

FIGURE 1

NORTH 0 500 ft.

LAX Midfield Satellite Concourse Approved Project Overview

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3. Project Changes Addressed in this Addendum: Proposed MSC North Modifications

As part of the natural progression of the design process, components of the MSC North Project assessed in the MSC EIR have been further refined and subsequently altered. As defined in the MSC EIR, the northern limit of the MSC North concourse building was established by the proposed relocated Taxiway D object free area (OFA) limit under the LAX Master Plan Alternative D. LAWA is now proposing to extend the MSC to the north, beyond the proposed Master Plan Alternative D Taxiway/Taxilane D OFA limit. This can be done without impacting existing facilities. In addition, LAWA has refined other components of the MSC North Project. This Addendum to the MSC EIR addresses proposed modifications to the MSC North Project ("the proposed MSC North Modifications") detailed within this section. **Figure 2** illustrates the locations of the proposed modifications. A summary of the proposed MSC North Modifications is below; further details are provided in subsequent sections.

- Modifications to the dimensions and footprint of the MSC Concourse;
- Modifications to the proposed passenger and baggage tunnels;
- A refined concept for the FAA ramp tower;
- The addition of a 'Gateway' facility to provide passenger access to the MSC from TBIT; and
- Relocation of the proposed LADWP electrical facility

All of the MSC North Modifications, except the Gateway, were considered as components of the MSC North Project in the MSC EIR. However, through the design process, dimensions and configurations of these components have been modified to allow for greater flexibility for accommodating existing demand for aircraft gates and improving the overall passenger service at LAX. **Table 1** provides a summary table of what was approved under the MSC North Project in the MSC EIR and the proposed MSC North Modifications.

Table 1: Summary Comparison of the MSC North Project (from the MSC EIR) and Proposed MSC North Modifications

	MSC NORTH PROJECT (FROM MSC EIR)	MSC NORTH MODIFICATIONS
Concourse		
Length (feet)	1,295	1,648
Width (feet)	148 to 160	125 to 250 1/
Footprint (square feet)	200,000	257,580 2/
Total Floor Area (square feet)	800,000	797,100
Tunnels		
Length (feet)	2,600	2,883
Width (feet)	90 max	106 max
Height (feet)	60 max	21 max
Depth (feet)	50 avg	30
Area (square feet)	234,000	133,358
Ramp Tower		
Height (feet)	131 to 211	169
Total Floor Area (square feet)	n/a	2,451
Gateway		
Total Floor Area (square feet)	n/a	50,000
LADWP Power Station		
Total Floor Area (square feet)	4,600	17,000
Total Area (square feet)	**1,038,600**	**999,909**

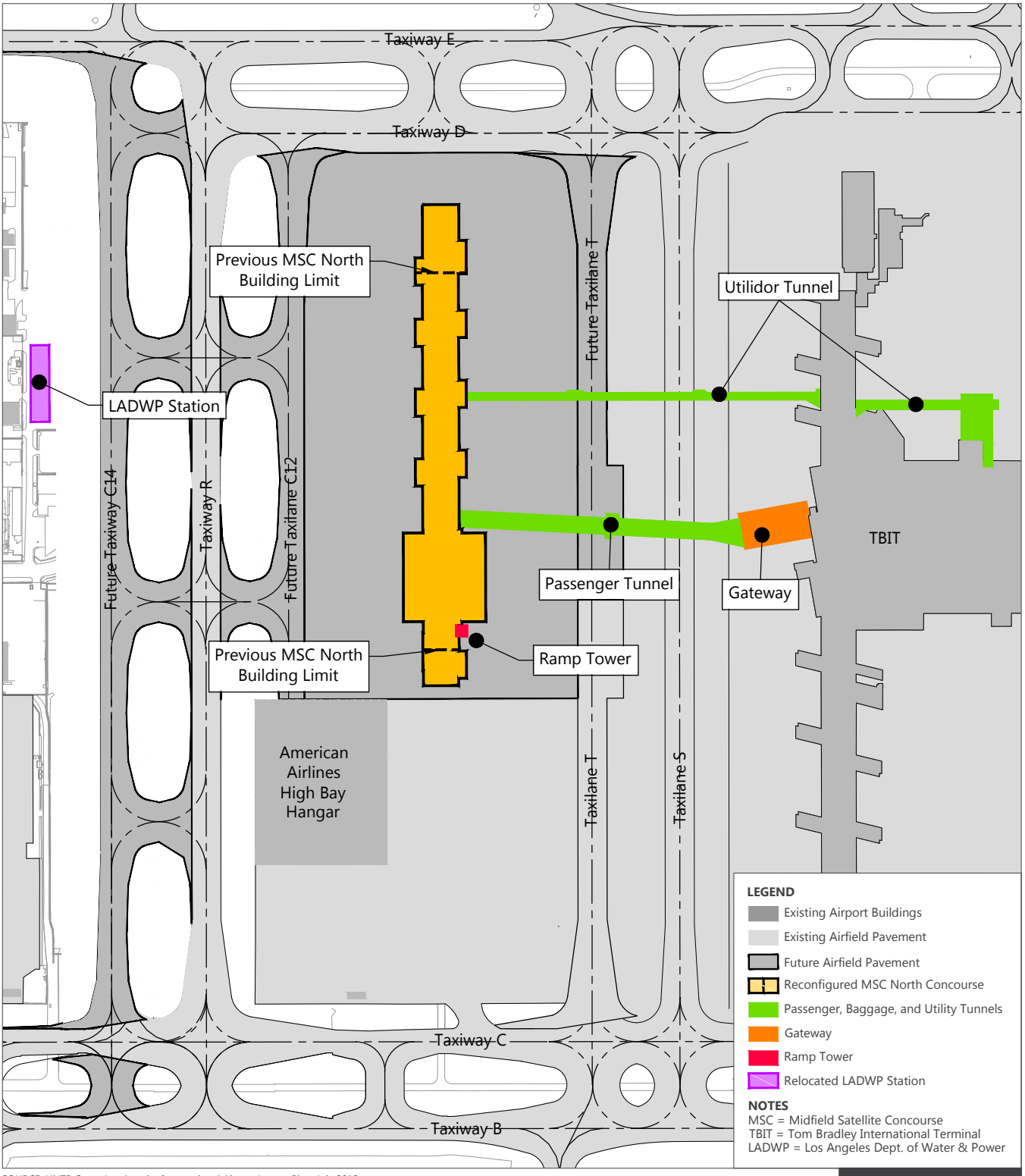
NOTES:

1/ Gatehouses are 24 feet, making the concourse 168 feet wide in some areas. Additionally, the 'Core' of the MSC, located at the southern end of Part A, would have a width of approximately 250 feet.

2/ Assumed concourse level square footage for building footprint

SOURCE: City of Los Angeles, Los Angeles World Airports (LAWA), *Final Environmental Impact Report, Los Angeles International Airport (LAX) Midfield Satellite Concourse (MSC)*, June 2014; Los Angeles World Airports, February 2016.

PREPARED BY: Ricondo & Associates, Inc., June 2016.



SOURCE: HNTB Corp., Los Angeles International Airport Layout Plan, July 2012.
PREPARED BY: Ricondo & Associates, Inc., September 2016.

FIGURE 2

NORTH 0 500 ft.

LAX Midfield Satellite Concourse Proposed Project Overview

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3.1 Concourse

The overall objective of the MSC Program is to provide LAWA with the flexibility to accommodate existing demand for aircraft gates while modernizing other terminals at LAX and reduce the reliance on the West Remote Gates/Pads. The new concourse would operate as an "empty chair" in its early life, providing capacity for the temporary relocation of carrier operations during routine construction or modernization activities in existing facilities, and be supported by existing processing facilities.

The MSC EIR considered a new concourse consisting of 11 gates that would extend from the north limit of the LAX Master Plan Alternative D Taxiway D OFA to just south of World Way West, accommodating a fleet mix of ADG III to VI aircraft. The MSC EIR assumed an 800,000 square foot concourse building, approximately 1,295 feet in length (north-south) and 148 feet to 160 feet in width (east-west), with four levels and an APM level. The approved area of the MSC included in the MSC EIR is considered Part A of the MSC North Modifications, as shown in **Figure 3**.

The reconfigured MSC North would extend past the LAX Master Plan Alternative D Taxiway D OFA[4] to the north by 234 feet (Part B), and would extend south by 110 feet to a point parallel to the northern edge of the American Airlines High Bay Hangar (Part C). The concourse design proposed as part of the MSC North Modifications would be between three and five levels, approximately 1,648 feet in length and generally 125 feet in width. The reconfigured MSC North would not include an APM level. The total area for the revised MSC North concourse building is approximately 797,100 square feet, slightly less than the 800,000 square feet assumed in the MSC EIR. The additional approximately 350 feet of concourse length proposed under the MSC North Modifications would allow for 12 gates, as compared to the 11 gates originally envisioned. These 12 gates would provide a mix of ADG V and ADG VI positions, initially operating as an "empty chair" during construction or modernization activities in existing facilities. Dimensions of the reconfigured MSC North, along with a proposed parking plan, is shown on Figure 3. A comparison of concourse dimensions for the MSC North as discussed in the MSC EIR, and the proposed MSC North Modifications is provided in **Table 2**.

[4] Subsequent to the approval of the LAX Master Plan Environmental Impact Statement (EIS)/EIR, LAWA has determined that the southern shift of Taxiway/Taxilane D is infeasible; therefore, this limit no longer applies.

Table 2: Comparison of Proposed Concourse Dimensions

	MSC NORTH PROJECT (FROM MSC EIR)	MSC NORTH MODIFICATIONS
Length (feet)	1,295	1,648
Width (feet)	148 to 160	125 to 250 [1/]
Footprint (square feet)	200,000	257,580
Total Floor Area (square feet)	800,000	797,100

NOTE:

1/ Gatehouses are 24 feet, making the concourse 168 feet wide in some areas. Additionally, the 'Core' of the MSC, located at the southern end of Part A, would have a width of approximately 250 feet.

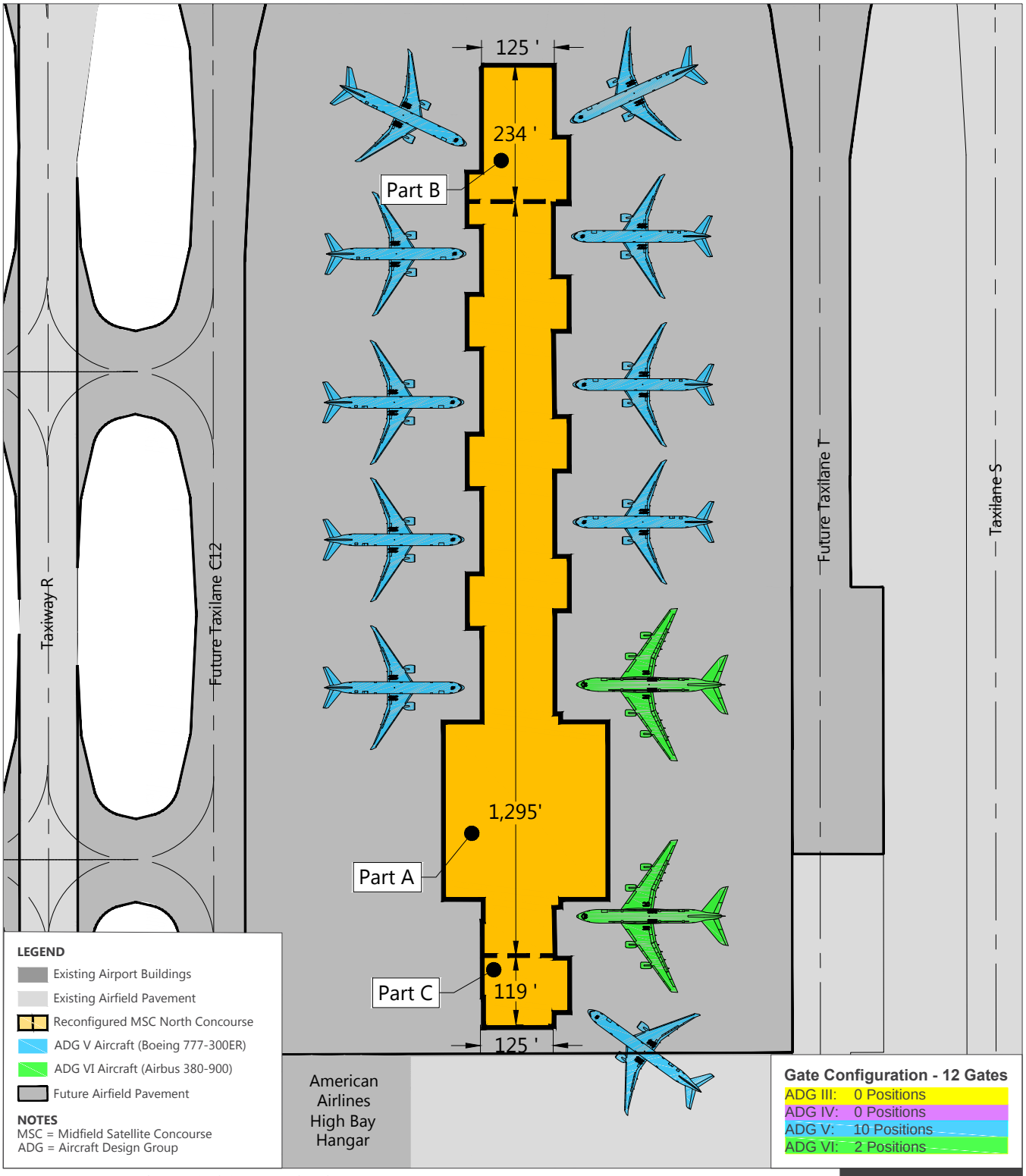
SOURCE: City of Los Angeles, Los Angeles World Airports (LAWA), *Final Environmental Impact Report, Los Angeles International Airport (LAX) Midfield Satellite Concourse (MSC)*, June 2014; Los Angeles World Airports, February 2016.

PREPARED BY: Ricondo & Associates, Inc., May 2016.

The proposed MSC North Modifications would not interfere with American Airlines operations at the High Bay Hangar.

3.2 Tunnels

The MSC EIR considered tunnels for an APM and 'utilidor(s)' for the conveyance of baggage, utilities, and passenger walk back between the MSC and the CTA. The tunnels discussed in the MSC EIR as part of the MSC North Project were only a representation of the proposed tunnels based on planning at that time, and provided the maximum potential sizes of the tunnels under consideration. The tunnels were assumed to be 2,600 feet in length, 90 feet in width, 60 feet in height, and 50 feet below ground level. The total square footage for the tunnels in the MSC EIR was assumed to be 234,000 square feet. As the MSC North design process progressed, the dimensions and locations of the proposed tunnels were refined. The MSC North Modifications includes three tunnel sections: a passenger tunnel connection between TBIT and the MSC; an utilidor tunnel for utilities and baggage conveyance from TBIT to the MSC; and a baggage conveyance tunnel from the east side of TBIT (where passenger processing occurs) to connect to the MSC utilidor tunnel. The proposed total length would be approximately 2,900 feet; however, the width, height, and depth would be less than what was considered in the MSC EIR. The total square footage for the tunnels proposed under the MSC North Modifications is approximately 133,000 square feet. **Table 3** shows a comparison of the dimensions assumed under the MSC North Project in the MSC EIR and the proposed modifications.



SOURCE: HNTB Corp., Los Angeles International Airport Layout Plan, July 2012.
PREPARED BY: Ricondo & Associates, Inc., September 2016.

FIGURE 3

MSC North Modifications
Sample Aircraft Parking

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Table 3: Comparison of Proposed Tunnel Dimensions

		MSC NORTH MODIFICATIONS			
	MSC NORTH PROJECT (FROM MSC EIR)	PASSENGER (TBIT TO MSC)	UTILIDOR (TBIT TO MSC)	BAGGAGE[1/] (TBIT EAST TO UTILIDOR)	TOTAL
Length (feet)	2,600	961	1,263	600	2,824
Width (feet)	90	57	32	40 to 106	32 to 106
Height (feet)	60	21	12	12 to 14	12 to 21
Depth (feet)	50	30	30	25	25 to 30
Area (square feet)	234,000	55,428	40,416	37,514	133,358

NOTES:

MSC = Midfield Satellite Concourse

TBIT = Tom Bradley International Terminal

1/ The baggage tunnel includes the "transitional tunnel" area between TBIT East and the baggage/utilidor tunnel).

SOURCE: City of Los Angeles, Los Angeles World Airports (LAWA), *Final Environmental Impact Report, Los Angeles International Airport (LAX) Midfield Satellite Concourse (MSC)*, June 2014; Los Angeles World Airports, February 2016.

PREPARED BY: Ricondo & Associates, Inc., May 2016.

3.3 Ramp Tower

The MSC EIR anticipated construction of an FAA supplemental airport traffic control tower or a ramp tower to control aircraft movement around the MSC facility and adjacent airfield. The ramp tower was assumed to be between 131 to 211 feet in height. Through the design process of the MSC North, the proposed ramp control tower has been refined to a height of 169 feet, with a minimum cab eye level of 135 feet. **Table 4** provides a comparison of the dimensions assumed in the MSC EIR and the proposed modifications.

Table 4: Comparison of Proposed Ramp Tower Dimensions

	MSC NORTH PROJECT (FROM MSC EIR)	MSC NORTH MODIFICATIONS
Height (feet)	131 to 211	169
Area (square feet)	n/a	2,451

NOTE:

n/a = not applicable because the EIR did not consider the square footage of the ramp tower

SOURCE: City of Los Angeles, Los Angeles World Airports (LAWA), *Final Environmental Impact Report, Los Angeles International Airport (LAX) Midfield Satellite Concourse (MSC)*, June 2014; Los Angeles World Airports, February 2016.

PREPARED BY: Ricondo & Associates, Inc., May 2016.

3.4 Gateway

A component of the MSC North Modifications that was not considered in the MSC EIR is a 'Gateway' that would provide a facility for passengers to transition from TBIT into the underground passenger tunnel. The Gateway would be a 50,000 square feet facility attached to the west side of TBIT at the concourse level. The three-story facility would be approximately 245 feet in length and 100 feet in width. Airline Club spaces would be provided on the concourse level.

3.5 LADWP Station

An existing electrical industrial station (IS-1548) is located on the Project site and would need to be relocated as part of the MSC North Project. The MSC EIR identified this existing facility for relocation in Table 2-2 (Draft EIR, page 2-42). The replacement facility is now proposed to be constructed adjacent to future Taxiway C14, in the western half of what is currently occupied by the U.S. Coast Guard. The station would be approximately 17,000 square feet and would provide power to the MSC, the American Airlines High Bay Hangar, and additional facilities in the area.

4. Required Findings for Use of an Addendum

Public Resources Code section 21166 and Section 15162 of the State CEQA Guidelines identifies the circumstances that necessitate the preparation of a subsequent EIR. When an EIR has been certified or a negative declaration adopted for a project, no subsequent EIR shall be prepared for that project unless the lead agency determines, on the basis of substantial evidence in the light of the whole record, one or more of the following:

(1) Substantial changes are proposed in the project which will require major revisions of the previous EIR or Negative Declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or

(2) Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR or Negative Declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or

(3) New information of substantial importance, which was not known and could not have been known, with the exercise of reasonable diligence at the time the previous EIR was certified as complete or the Negative Declaration was adopted, shows any of the following:

(A) The project will have one or more significant effects not discussed in the previous EIR or Negative Declaration;

(B) Significant effects previously examined will be substantially more severe than shown in the previous EIR;

(C) Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or

(D) Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

Pursuant to Section 15164 of the State CEQA Guidelines, if none of the above conditions are met, the BOAC may prepare an Addendum to make minor technical changes to a previously certified EIR and to document as to why no further environmental review is required. An addendum need not be circulated for public review, but can be included in or attached to the Final EIR, which the decision-making body shall consider prior to making a decision on the project. A brief explanation supported by substantial evidence of why an agency decided not to prepare a subsequent EIR under section 15162 should also be included in the addendum, the findings on the project, or somewhere in the record. This explanation is included in Sections 6 and 8 of this Addendum.

5. Evaluation of Environmental Impacts

In performing the required analysis and determining that the criteria are met for use of an addendum, this Addendum compares impacts of the proposed MSC North Modifications to the MSC North Project as previously approved in the MSC EIR. For purposes of determining whether the proposed modifications trigger the need to prepare a new EIR pursuant to State CEQA Guidelines Section 15162, this Addendum relies on a list of questions regarding relevant environmental issues that has been modified from the sample questions provided in Appendix G of the State CEQA Guidelines (Modified Environmental Checklist Form). Section 6 of this document contains the Modified Environmental Checklist Form, with topic-specific discussions, and summarizes the responses to the questions in Section 4. Section 7 contains the discussion/analysis relative to cumulative impacts. A summary of the changes in potential impacts due to the MSC North Modifications is provided in Section 8 and the reasons why an Addendum is appropriate in this situation is provided in Section 9.

6. Modified Environmental Checklist Form

The Modified Environmental Checklist Form (Form) was used to compare the potential environmental effects of the MSC North Modifications with those disclosed in the certified MSC EIR and to review whether any of the conditions set forth in Section 15162 of the State CEQA Guidelines requiring preparation of a subsequent EIR are met. The Form was used to review the potential environmental effects of the construction and operation of the proposed MSC North Modifications for each of the following areas:

- Aesthetics
- Agriculture and Forestry Resources
- Air Quality
- Biological Resources
- Cultural resources
- Geology and Soils
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Mineral Resources
- Noise
- Population and Housing
- Public Services
- Recreation
- Transportation and Traffic
- Utilities and Service Systems

There are six possible responses to each of the questions included on the Form:

(A) Substantial Change in Project Requiring Major Revision of Previous EIR.

This response is used if the project has changed to such an extent that major revisions of the previous EIR are required due to the involvement of new significant environmental effects or an increase in the severity of the previously identified significant effects.

(B) Substantial Change in Circumstances under which Project is Undertaken Requiring Major Revision of Previous EIR.

This response is used if the circumstances under which the project is undertaken have changed to such an extent that major revisions to the previous EIR is required because such changes would result in the project having new significant environmental effects or would substantially increase the severity of the previously identified significant effects.

(C) New Information of Substantial Importance Showing New or Greater Significant Effects Than Identified in Previous EIR.

This response is used if new information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was adopted, shows that the project would have a new significant environmental effect or more severe significant effect than identified in the previous EIR.

(D) New Information of Substantial Importance Showing an Ability to Substantially Reduce Significant Impacts Identified in Previous EIR.

This response is used if new information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was adopted, shows:

(1) The significant environmental effects of the project could be substantially reduced through imposition of mitigation measures or alternatives that although previously found to be infeasible are in fact now feasible, but the project proponent declines to adopt them; or

(2) The significant environmental effects of the project could be substantially reduced through imposition of mitigation measures or alternatives that are considerably different from those analyzed in the previous EIR, but the project proponent declines to adopt them.

(E) Less Than Significant Impact/No Changes or Circumstances and No New Information That Would Require the Preparation of a new EIR.

This response is used if:

(1) The potential impact of the project is determined to be below known or measurable thresholds of significance and would not require mitigation; or

(2) There are no changes in the project or circumstances and no new information that would require the preparation of a new EIR pursuant to Public Resources Code Section 21166 and Section 15162 or the State CEQA Guidelines.

(F) No Impact

This response is used if the proposed project does not have any measurable environmental impact.

The Form and accompanying evaluation of the responses provide the information and analysis upon which the BOAC makes its determination that no new EIR is required for the proposed MSC North Modifications. The majority of the proposed MSC North Modifications involve adjustments to the dimensions and configuration of components previously considered in the MSC EIR as part of the MSC North Project, and therefore would not result in significant changes or impacts to most of the resources listed below.

6.1 Aesthetics

Issues (and supporting Information Sources)	Substantial Change in Project Requiring Major EIR Revisions	Substantial Change in Circumstances Requiring Major EIR Revisions	New Information Showing New or Greater Significant Effects than Previous EIR	New Information Showing Ability to Reduce, but not Eliminate Significant Effects in Previous EIR	Less Than Significant Impact/No Changes or New Information Requiring Preparation of a Subsequent EIR	No Impact
AESTHETICS: Would the project:						
(a) Have a substantial adverse effect on a scenic vista?						X
(b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?						X
(c) Substantially degrade the existing visual character or quality of the site and its surroundings?						X
(d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?					X	

Discussion: The Notice of Preparation/Initial Study (NOP/IS) for the MSC Program and MSC North Project, published on February 8, 2013, analyzed the potential impacts on aesthetics. The NOP/IS concluded that the MSC North Project and MSC Program would not result in potentially significant environmental impacts to aesthetics, and, therefore, was eliminated from further analysis within the MSC EIR.

The proposed MSC North Modifications would occur in the middle of the Airport in a highly disturbed area surrounded by other airport uses. The site is currently being used for aircraft activities, with no landscaping or other features of aesthetic value. Although the site may be visible from areas off-Airport, it is not located adjacent to or within the viewshed of a designated scenic highway or scenic vista. The project site is not located within close proximity of scenic resources, including native trees, rock outcroppings, or historic buildings within a state scenic highway.

The proposed MSC North Modifications would be consistent in visual character with existing airport-related uses, including TBIT, which is located immediately to the east of the MSC site. As the facility would be constructed as a modern state-of-the-art concourse facility, it should improve the visual character and be more consistent with the new TBIT facility than existing conditions. The proposed MSC North Modifications would include standard lighting for security purposes that would be directed downward. The proposed MSC North Modifications would not introduce significant new sources of light or glare and, as with the MSC North Project, all new lighting would be in compliance with applicable FAA standards and in conformance with relevant LAWA guidelines.

Substantial Changes with Respect to the Circumstances under Which the Project is Undertaken/New Information of Substantial Importance

There are no substantial changes to the circumstances under which the MSC North Project would be undertaken, and there is no new information of substantial importance that has become available relative to visual or aesthetic resources. No substantial changes in the aesthetic or visual environment have occurred since certification of the MSC EIR, and no substantial new scenic resources have been identified within the vicinity of the proposed MSC North Modifications.

Conclusion

Based on the above, no new significant aesthetic impacts or substantial increase in previously identified aesthetic impacts would occur as a result of the proposed MSC North Modifications. All applicable mitigation measures previously adopted for the approved MSC North Project would apply to the proposed MSC North Modifications. Therefore, the impacts to aesthetic resources as a result of the proposed MSC North Modifications would not trigger any of the conditions described in CEQA Guidelines, Section 15162 calling for preparation of a subsequent or supplemental EIR.

6.2 Agriculture and Forestry

Issues (and supporting Information Sources)	Substantial Change in Project Requiring Major EIR Revisions	Substantial Change in Circumstances Requiring Major EIR Revisions	New Information Showing New or Greater Significant Effects than Previous EIR	New Information Showing Ability to Reduce, but not Eliminate Significant Effects in Previous EIR	Less Than Significant Impact/No Changes or New Information Requiring Preparation of a Subsequent EIR	No Impact
AGRICULTURE AND FORESTRY RESOURCES: Would the project:						
(a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?						X
(b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?						X
(c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?						X
(d) Result in the loss of forest land or conversion of forest land to non-forest use?						X
(e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?						X

Discussion: The NOP/IS for the MSC Program and MSC North Project, published on February 8, 2013, analyzed the potential impacts on agricultural and forestry resources. The NOP/IS concluded that the MSC North Project and MSC Program would not result in potentially significant environmental impacts to agricultural and forestry resources, and, therefore, was eliminated from further analysis within the EIR.

As indicated in the LAX Master Plan EIR, there are no agricultural or forestry resources within or near the proposed MSC North Modifications.[5] None of the areas surrounding the proposed MSC North Modifications or the airport are zoned for agricultural or forestry uses. Thus, no impacts to agricultural or forestry resources would occur as a result of the proposed MSC North Modifications.

Substantial Changes with Respect to the Circumstances under Which the Project is Undertaken/New Information of Substantial Importance

There are no substantial changes to the circumstances under which the MSC North Project would be undertaken, and there is no new information of substantial importance that has become available relative to agricultural or forestry resources. No substantial changes in the environment have occurred since certification of the MSC EIR, and no substantial new agricultural or forestry resources have been identified within the vicinity of the proposed MSC North Modifications.

Conclusion

Based on the above, no new significant impacts or substantial increase in previously identified impacts to agricultural or forestry resources would occur as a result of the proposed MSC North Modifications. Therefore, the impacts to agricultural and forestry resources as a result of the proposed MSC North Modifications would not trigger any of the conditions described in CEQA Guidelines, Section 15162 calling for preparation of a subsequent or supplemental EIR.

[5] City of Los Angeles, Los Angeles World Airports (LAWA), *Final Environmental Impact Report, Los Angeles International Airport Proposed Master Plan Improvements*, Section 4.16, April 2004.

6.3 Air Quality

Issues (and supporting Information Sources)	Substantial Change in Project Requiring Major EIR Revisions	Substantial Change in Circumstances Requiring Major EIR Revisions	New Information Showing New or Greater Significant Effects than Previous EIR	New Information Showing Ability to Reduce, but not Eliminate Significant Effects in Previous EIR	Less Than Significant Impact/No Changes or New Information Requiring Preparation of a Subsequent EIR	No Impact
AIR QUALITY: Would the project:						
(a) Conflict with or obstruct implementation of the applicable air quality plan?					X	
(b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?					X	
(c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?					X	
(d) Expose sensitive receptors to substantial pollutant concentrations?					X	
(e) Create objectionable odors affecting a substantial number of people?					X	

Discussion: The MSC EIR concluded that the MSC North Project would result in significant and unavoidable construction-related air quality impacts and would also result in cumulatively considerable significant and unavoidable construction-related air quality impacts.

Substantial Changes with Respect to the Circumstances under Which the Project is Undertaken/New Information of Substantial Importance

Since the approval of the MSC Final EIR, physical components of the MSC North Project have been reconfigured or refined. Additionally, assumptions regarding construction equipment and schedule have been modified. Substantial changes to the Project that would affect air quality impacts include:

- Construction:
  - The addition of the 'Gateway' facility
  - A reduction to the overall size of the passenger and utilidor tunnels
  - A shift in the proposed construction schedule
  - The availability and use of Tier 4 construction equipment at LAX
  - Updated construction equipment emissions factors provided by the California Air Resources Board
- Operations:
  - The relocation of gates at the MSC North above the LAX Master Plan Alternative D Taxiway D OFA
  - An increase from 11 gates to 12 gates at the MSC North
  - Reduced reliance on the West Remote Gates/Pads
  - An increase in expected passengers based on the FAA's Terminal Area Forecast[6]

Based on these changes, an air quality analysis for both construction and operations of the MSC North Modifications has been conducted. The results are included in the following subsections. Further information regarding the substantial changes to analyses including details on assumptions and methodology are included in **Appendix A**.

Conclusion

The proposed MSC North Modifications would not substantially increase the severity of previously identified air quality impacts, nor would they result in any new significant effects related to air emissions that were not previously identified and analyzed in the MSC EIR. All applicable mitigation measures previously adopted for the approved MSC North Project would apply to the proposed MSC North Modifications. Therefore, the impacts to air quality as a result of the proposed MSC North Modifications would not trigger any of the conditions described in CEQA Guidelines, Section 15162 calling for preparation of a subsequent or supplemental EIR.

[6] Annual operations from the MSC EIR were calculated based on an outdated forecast, consisting of approximately 631,242 operations annually. However, in 2016, the Federal Aviation Administration (FAA) released the 2015 Terminal Area Forecast (TAF), which forecasts approximately 706,160 annual operations in 2019. The change in forecasted growth is due to increased travel demand and changes in aircraft fleet mixes that are projected to occur by 2019 irrespective of the proposed MSC North Project.

6.3.1 CONSTRUCTION

6.3.1.1 Regional Construction Impacts

Based on the changes outlined above, a construction emissions inventory was prepared for the proposed MSC North Modifications; all original components of the MSC North from the MSC EIR, along with the proposed modifications were included in the inventory. The worst-case daily emissions were calculated from a peak-month average day for each year of construction. The maximum daily emission rates from the MSC North Project, as previously approved in the MSC EIR, and for the MSC North Modifications, as compared to the SCAQMD thresholds, are shown in **Table 5** for all criteria pollutants. As shown, daily construction emissions from the MSC EIR were above the significance threshold for CO, VOC, NO_X, PM_{10}, and $PM_{2.5}$. Construction emissions of the MSC North Modifications would be the same or less than the MSC North Project values reported in the MSC EIR for all pollutants except for NO_x. Construction emissions for NO_x would be slightly higher with the MSC North Modifications by 2.2 percent; however, this would not be a new significant impact or a substantial increase in severity of a significant effect previously examined in the MSC EIR.

Table 5: Proposed Project Construction Emissions (lbs/day)

POLLUTANT	MSC NORTH PROJECT (FROM MSC EIR)	MSC NORTH MODIFICATIONS	SCAQMD THRESHOLD	NEW SIGNIFICANT IMPACT OR SUBSTANTIAL INCREASE IN SEVERITY?
CO	1,235	992	550	No
VOC	118	98	75	No
NO_X	1,156	1,182	100	No
SO_2	4	3	150	No
PM_{10}	308	286	150	No
$PM_{2.5}$	105	105	55	No

SOURCE: City of Los Angeles, Los Angeles World Airports (LAWA), *Final Environmental Impact Report, Los Angeles International Airport (LAX) Midfield Satellite Concourse (MSC)*, June 2014; South Coast Air Quality Management District, "SCAQMD Air Quality Significance Thresholds," March 2011. Available at: www.aqmd.gov/ceqa/handbook/signthres.pdf, September 25, 2014; Ricondo & Associates Inc., May 2016.
PREPARED BY: Ricondo & Associates Inc., May 2016.

6.3.1.2 Localized Construction Impacts

In addition to regional construction impacts, the localized effects from the on-site portion of daily emissions were evaluated at nearby sensitive receptor locations potentially impacted by the MSC North Modifications consistent with the methodologies in the SCAQMD's Final Localized Significance Threshold Methodology. Receptor locations are shown in Appendix A. As the Project area exceeds five acres in total size, Project-specific dispersion modeling was used to assess localized construction impacts rather than the mass emission rate look-up tables. Peak construction concentrations for the MSC North Project, as previously approved in the MSC EIR, and the proposed MSC North Modifications are shown in **Table 6**. As shown, the MSC EIR concluded that there would be no significant localized construction impacts as a result of the Project.

Table 6: Construction Peak Concentrations

		MSC NORTH PROJECT (FROM MSC EIR)			MSC NORTH MODIFICATIONS				
POLLUTANT	AVERAGING PERIOD	CONSTRUCTION ($\mu g/m^3$)	BACKGROUND ($\mu g/m^3$)	TOTAL ($\mu g/m^3$)	CONSTRUCTION ($\mu g/m^3$)	BACKGROUND ($\mu g/m^3$)	TOTAL ($\mu g/m^3$)	THRESHOLD ($\mu g/m^3$)	NEW SIGNIFICANT IMPACT OR SUBSTANTIAL INCREASE IN SEVERITY?
CO	1-hr	57	4,104	4,161	38	3,420	3,458	23,000	No
	1-hr NAAQS	57	4,104	4,161	38	3,420	3,458	40,000	No
	8-hr	39	2,884	2,919	20	2,166	2,186	10,000	No
NO_2	1-hr	53	184	238	47	164	211	339	No
	1-hr NAAQS	39	122	162	36	112	148	188	No
	Annual	2	26	29	3.7	22	26	57	No
SO_2	1-hr	0.19	68	68	0.14	40	40	655	No
	1-hr NAAQS	0.19	21	21	0.12	21	21	196	No
	3-hr	0.16	39	39	0.11	39	39	1,300	No
	24-hr	0.05	16	16	0.03	16	16	105	No
	Annual NAAQS	0.01	3	3	0.01	3	3	80	No
PM_{10}	24-hr	4.4	-	4.4	2.8	-	2.8	10.4	No
	Annual	0.9	-	0.9	0.7	-	0.7	1.0	No
$PM_{2.5}$	24-hr	1.2	-	1.2	1.2	-	1.2	10.4	No

SOURCE: City of Los Angeles, Los Angeles World Airports (LAWA), *Final Environmental Impact Report, Los Angeles International Airport (LAX) Midfield Satellite Concourse (MSC)*, June 2014; Ricondo & Associates Inc., May 2016.

PREPARED BY: Ricondo & Associates Inc., May 2016.

Construction concentrations of the MSC North Modifications would be the same or less than the MSC North Project values reported in the MSC EIR for all pollutants except for the annual NO_2 concentrations. The peak annual NO_2 concentration would increase from 2.0 µg/m^3 as reported in the MSC EIR to 3.7 µg/m^3 with the MSC North Modifications, still substantially below the threshold of 57 µg/m^3. Therefore, this would not be a new significant impact or a substantial increase in severity of a significant effect previously examined for the MSC North Project as previously approved in the MSC EIR. All the analyzed air pollutants were found to be below the NAAQS and CAAQS thresholds for construction.

6.3.1.3 Evaluation of Cancer Risks and Health Hazards

In addition to criteria pollutants, construction of the proposed MSC North Modifications may increase the potential for impacts to people exposed to toxic air contaminants (TACs) as compared to the analysis of the MSC North Project presented in the MSC EIR. Potential impacts to human health associated with releases of TAC may include increased cancer risks and increased chronic (long-term) and acute (short-term) non-cancer health hazards from inhalation of TACs by people working, living, recreating, or attending school on or near the Project site. These impacts were analyzed consistent with SCAQMD, CalEPA, and USEPA guidance, as documented in **Appendix B**.

There are no significance thresholds related to an *Human Health Risk Assessment (HHRA)* within Appendix G of the CEQA Guidelines. Significance determinations for health impacts were assessed as incremental increases in cancer risks and non-cancer health hazards associated with the construction of the proposed MSC North Modifications, based on guidance from SCAQMD, CalEPA, and EPA. This is the same manner in which the MSC EIR examined health impacts from the MSC North Project. A significant impact to human health would occur if construction activities of the proposed project would result in one or more of the following conditions:

- An incremental TAC cancer risk greater than, or equal to, 10 in one million (10×10^{-6}) people for potentially exposed off-site workers, residents, or school children.
- An incremental TAC chronic hazard index greater than, or equal to, one (1) at any receptor location.
- An incremental acute hazard index greater than, or equal to, one (1) at any receptor location.
- Exceedance of PEL-TWA for on-airport workers.

Health Effects for On-Airport Workers

Effects on on-airport workers were evaluated by comparing estimated maximum 8-hour average TAC concentration to the CalOSHA 8-hour Time-Weighted Average Permissible Exposure Levels (PEL-TWA).[7] The estimated maximum 8-hour average TAC concentrations for on-airport locations for construction, as included in the MSC EIR and for the proposed MSC North Modifications, are shown in **Table 7**.

[7] California Occupational Safety and Health Administration, Permissible Exposure Limits for Chemical Contaminants, Table AC 1, Available: http://www.dir.ca.gov/Title8/5155table_ac1.html, accessed August 2014.

Table 7: Comparison of CalOSHA Permissible Exposure Limits to Maximum Estimated 8-Hour On-Site Air Concentrations

TOXIC AIR CONTAMINANT	MSC NORTH PROJECT (FROM MSC EIR) CONSTRUCTION CONCENTRATIONS (mg/m^3) 1/	MSC NORTH MODIFICATIONS CONSTRUCTION CONCENTRATIONS (mg/m^3) 1/	CALOSHA PEL TWA (mg/m^3) 2/	NEW SIGNIFICANT IMPACT OR SUBSTANTIAL INCREASE IN SEVERITY?
Acetaldehyde	0.002101	0.002436	45	No
Acrolein	0.000036	0.000042	0.25	No
Benzene	0.000572	0.000663	0.32 3/	No
1,3-Butadiene	0.000054	0.000063	2.2	No
Ethylbenzene	0.000087	0.000101	435	No
Formaldehyde	0.004205	0.004874	0.37 3/	No
Hexane, n-	0.000045	0.000052	180	No
Methanol	0.000009	0.000010	260	No
Methyl ethyl ketone	0.000422	0.000489	590	No
Naphthalene	0.000024	0.000028	50	No
Propylene	0.000742	0.000860	N/A	No
Styrene	0.000017	0.000019	215	No
Toluene	0.000421	0.000488	37	No
Xylene (total)	0.000297	0.000345	435	No
Diesel PM	0.001943	0.019678	N/A	No
Arsenic	0.000002	0.000002	0.01	No
Cadmium	0.000003	0.000004	0.005	No
Chlorine	0.000271	0.000332	1.5	No
Chromium (VI)	0.000001	0.000001	0.005	No
Copper	0.000009	0.000011	1	No
Lead	0.000045	0.000054	0.05	No
Manganese	0.000073	0.000089	0.2	No
Mercury	0.000001	0.000002	0.025	No
Nickel	0.000005	0.000006	0.5	No
Selenium	0.000000	0.000000	0.2	No
Silicon	0.015520	0.018704	6	No
Sulfates	0.000409	0.000794	N/A	No
Vanadium	0.000021	0.000026	0.05	No

NOTES: N/A = Not Available

1/ Maximum 1-hour concentrations at on-airport location converted to 8-hour averages by multiplying by a factor of 0.7.

2/ California Occupational Safety and Health Administration. Permissible Exposure Limits for Chemical Contaminants, Table AC-1, 2008, http://www.dir.ca.gov/title8/5155table_ac1.html.

3/ CalOSHA does not have a value; value is from American Conference of Governmental Industrial Hygienists (ACGIH), Documentation of the Threshold Limit Values and Biological Exposure Indices, 8th ed., Cincinnati, Ohio, 1998.

SOURCE: City of Los Angeles, Los Angeles World Airports (LAWA), *Final Environmental Impact Report, Los Angeles International Airport (LAX) Midfield Satellite Concourse (MSC)*, June 2014; Ricondo & Associates, Inc., May 2016.
PREPARED BY: Ricondo & Associates, Inc., May 2016.

Although the construction concentrations of the MSC North Modifications would slightly differ from the MSC North Project values shown in the MSC EIR, the MSC North Modifications would not substantially increase average 8-hour concentrations, or result in a new significant impact. As shown, the average concentrations are several orders of magnitude below the PEL-TWA thresholds and, thus would not exceed those considered acceptable by CalOSHA standards. Therefore, impacts related to health risks to on-airport workers would be less than significant for the MSC North Modifications.

Acute Non-Cancer Health Hazards

Acute non-cancer risk estimates were calculated by dividing estimated maximum 1-hour TAC concentrations in air by acute RELs. An acute REL is a concentration in air below which adverse effects are unlikely for people, including sensitive subgroups, exposed for a short time on an intermittent basis. In most cases, RELs are estimated on the basis of an 1-hour exposure duration. RELs do not distinguish between adults and children, but are established at levels that are considered protective of sensitive populations. Since margins of safety are incorporated to address data gaps and uncertainties, exceeding the REL does not automatically indicate an adverse health impact. A hazard index equal to or greater than 1, the threshold of significance for acute non-cancer health impacts, indicates some potential for adverse acute non-cancer health impacts. A hazard index less than 1 suggests that adverse acute non-cancer health impacts are not expected.

Formaldehyde and manganese are the only TAC of concern from construction-related emissions of the MSC North Project and the proposed MSC North Modifications that might be present at concentrations approaching the thresholds for acute health hazards. Acute health hazards for other TAC are orders of magnitude below their respective acute RELs and thus would not contribute substantially to health hazards. The primary source of formaldehyde is from diesel-powered construction equipment; the primary source of manganese is fugitive dust. Maximum acute health hazards associated with exposure to these chemicals for both the MSC North Project, as previously approved in the MSC EIR, and the MSC North Modifications are summarized in **Table 8**. As shown, construction-related incremental maximum acute hazard quotients for formaldehyde and manganese are all below the significance threshold of 1 for all receptors locations. Although the construction concentrations of the MSC North Modifications would slightly differ from the MSC North Project values shown in the MSC EIR, with some receptors having lower concentrations and some slightly higher, the MSC North Modifications would not substantially increase acute health hazards, or result in a new significant impact. Thus, the MSC North Modifications would have a less than significant impact in regards to exposing sensitive receptors to substantial pollutant concentrations.

Table 8: Maximum Incremental Acute Non-Cancer Hazard Indices from Construction

	MSC NORTH PROJECT (FROM MSC EIR) CONSTRUCTION		MSC NORTH MODIFICATION CONSTRUCTION		NEW SIGNIFICANT IMPACT OR SUBSTANTIAL INCREASE IN SEVERITY?
RECEPTOR TYPE	**FORMALDEHYDE**	**MANGANESE**	**FORMALDEHYDE**	**MANGANESE**	
Residential					
Maximum HI	0.14	0.13	0.011	0.070	No
Minimum HI	0.003	0.02	0.003	0.011	No
Average HI	0.007	0.07	0.005	0.031	No
School					
Maximum HI	0.01	0.08	0.007	0.045	No
Minimum HI	0.003	0.03	0.002	0.011	No
Average HI	0.006	0.06	0.005	0.025	No
Offsite Worker					
Maximum HI	0.01	0.01	0.009	0.049	No
Minimum HI	0.002	0.02	0.002	0.008	No
Average HI	0.004	0.04	0.003	0.017	No
Recreational					
Maximum HI	0.01	0.1	0.009	0.056	No
Minimum HI	0.003	0.02	0.002	0.012	No
Average HI	0.006	0.05	0.004	0.024	No
Overall Off-Airport					
Maximum HI	0.14	0.13	0.011	0.070	No
On-Site Occupational					
Maximum HI	0.11	0.62	0.127	0.746	No

NOTE: HI = Hazard Index

SOURCE: City of Los Angeles, Los Angeles World Airports (LAWA), *Final Environmental Impact Report, Los Angeles International Airport (LAX) Midfield Satellite Concourse (MSC)*, June 2014; Ricondo & Associates, Inc., June 2016.

PREPARED BY: Ricondo & Associates, Inc., June 2016.

Cancer Risks and Chronic Non-Cancer Health Hazards

Cancer risks of TACs were estimated by multiplying exposure estimates for TACs by the pollutant-specific cancer risk factor. The result is a risk estimate expressed as the odds of developing cancer. Cancer risks were based on an exposure duration of 70 years. Chronic non-cancer health hazard estimates of TACs were calculated by dividing exposure estimates of each TAC by the chronic Reference Exposure Level (REL). RELs are estimates of the highest exposure levels that would not cause adverse health effects even if exposures continue over a lifetime. A ratio that is less than one indicates that the proposed project exposure was less than the highest exposure level that would cause adverse health effects and, hence, no impact to human health would be expected.

Peak cancer risks and chronic non-cancer health hazards for Maximally Exposed Individuals (MEI) for construction of both the MSC North Modifications and the MSC EIR are summarized in **Table 9**. As shown, emissions for both the MSC EIR and the MSC North Modifications are well below the significance thresholds.

Table 9: Incremental Cancer Risks and Chronic Non-Cancer Human Health Hazards for Maximally Exposed Individuals

RECEPTOR TYPE	MSC NORTH PROJECT (FROM MSC EIR) CONSTRUCTION	MSC NORTH MODIFICATIONS CONSTRUCTION	SIGNIFICANCE THRESHOLD	NEW SIGNIFICANT IMPACT OR SUBSTANTIAL INCREASE IN SEVERITY?
Incremental Cancer Risks [1/] (per million people)				
Child Resident	0.087	0.137	10	No
School Child	0.017	0.026	10	No
Adult Resident	1.016	1.599	10	No
Adult Worker	0.404	0.682	10	No
Incremental Non-Cancer Chronic Hazards [2/]				
Child Resident	0.085	0.105	1	No
School Child	0.016	0.020	1	No
Adult Resident	0.085	0.105	1	No
Adult Worker	0.057	0.074	1	No

NOTES:

1/ Values provided are changes in the number of cancer cases per million people exposed as compared to baseline conditions. All estimates are rounded to one significant figure.

2/ Hazard indices are totals for all TACs that may affect the respiratory system. This incremental hazard index is essentially equal to the total for all TACs.

SOURCE: City of Los Angeles, Los Angeles World Airports (LAWA), *Final Environmental Impact Report, Los Angeles International Airport (LAX) Midfield Satellite Concourse (MSC)*, June 2014; Ricondo & Associates, Inc., May 2016.

PREPARED BY: Ricondo & Associates, Inc., May 2016.

6.3.2 OPERATIONS

Based on the proposed construction schedule, it is anticipated that the proposed MSC North Modifications would be completed in 2019; therefore, operational impacts were analyzed for year 2019. As previously mentioned, the proposed MSC North Modifications would not alter the airspace traffic, runway operational characteristics, or the practical capacity of the Airport. However, as compared to the MSC North Project as previously approved in the MSC EIR, the operational analysis for the MSC North Modifications has assumed the removal of one gate from the West Remote Gates/Pads and the addition of one gate at the MSC North[8], as well as the increase in forecasted operations for 2019.[9] Therefore, the operational air quality analysis for the MSC North Modifications relies on the incremental difference between two scenarios: the 2019 With 11 Gates at the MSC North,[10] and the 2019 With 12 Gates at the MSC North. To compare against significance thresholds, the incremental difference in emissions from the proposed MSC North Modifications were combined with the incremental difference in emissions from the MSC North 2019 With and Without Project, as previously approved in the MSC EIR.

6.3.2.1 Regional Operational Impacts

The proposed MSC North Modifications would not increase operations at LAX; the proposed Project would provide an additional aircraft gate to reduce reliance on the West Remote Gates/Pads and operate as an "empty chair," providing capacity for the temporary relocation of carrier operations during routine construction or modernization activities in existing facilities. By reducing reliance on the West Remote Gates/Pads, taxi times for the shifted operations to the gates at the MSC North would be decreased. Although the analysis for the MSC North Modifications accounts for the projected increase in annual operations, which is anticipated to occur with or without the MSC North Modifications, it is expected that unimpeded taxi times would decrease due to a reduced travel distance for operations at the MSC North as compared to the West Remote Gates/Pads. However, in the absence of airfield simulations, it is expected that there would also be a slight increase in emissions associated with potential ground delays. Based on previous LAX airfield simulations, including those conducted for the MSC EIR, it was assumed that overall emissions from aircraft operations would slightly decrease based on unimpeded taxi times. Similarly, GSE and busing operations would be reduced from the decrease in operational distance between the MSC North and the West Remote Gates/Pads. APU emissions would not change, as both the gates at the West Remote Gates/Pads and the MSC North would be equipped with ground power units and pre-conditioned air.

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[8] The overall objective of the MSC Program is to provide LAWA with the flexibility to accommodate existing demand for aircraft gates while modernizing other terminals at LAX and reduce the reliance on the West Remote Gates/Pads. The new concourse would operate as an "empty chair" in its early life, providing capacity for the temporary relocation of carrier operations during routine construction or modernization activities in existing facilities, and be supported by existing processing facilities. However, to keep within the 153-aircraft passenger gate limit specified by the Stipulated Settlement, LAWA may need to cease operations at one of the West Remote Gates/Pads.

[9] Annual operations in the MSC EIR were calculated based on an older forecast, consisting of approximately 631,242 operations annually. However, in 2016, the FAA released the 2015 TAF, which forecasts approximately 706,160 annual operations in 2019 at LAX. The change in forecasted growth is due to increased travel demand and changes in aircraft fleet mixes that are projected to occur by 2019 irrespective of the proposed MSC North Project.

[10] The 2019 With 11 Gates at the MSC North scenario analyzes 2019 activity levels per the 2015 FAA TAF and the assumed LAX airfield configuration in 2019, including 11 gates at the MSC North.

Therefore, operations from GSE, busing, and APUs were not included in the MSC North Modifications air quality analysis.

Incremental peak operational emissions for the proposed MSC North Modifications and for the MSC North Project, as previously approved in the MSC EIR, are shown in **Table 10**. Based on the decrease in overall airport taxi times under the MSC North Modifications, operational emissions would be even further reduced than from the MSC North Project, as approved in the MSC EIR. The MSC North Modifications would not increase any criteria pollutant emissions or result in a new significant impact.

Table 10: Incremental Difference in Peak Operational Emissions (lbs/day)

POLLUTANT	MSC NORTH PROJECT (FROM MSC EIR) OPERATIONS 1/	MSC NORTH MODIFICATIONS OPERATIONS 2/	TOTAL	SCAQMD THRESHOLD	NEW SIGNIFICANT IMPACT OR SUBSTANTIAL INCREASE IN SEVERITY?
CO	-68	-82	-149.9	550	No
VOC	-8.7	-10	-18.9	55	No
NO_X	-12	-15	-26.6	55	No
SO_2	-3.7	-4.5	-8.2	150	No
PM_{10}	-0.5	-0.6	-1.1	150	No
$PM_{2.5}$	-0.5	-0.6	-1.1	55	No

NOTES:

1/ The incremental difference between the MSC North 2019 With Project and 2019 Without Project scenarios, as included in the MSC EIR.

2/ The incremental difference between the 2019 MSC North Modifications scenario and the updated 2019 With Project (incorporating updated annual operations).

SOURCE: City of Los Angeles, Los Angeles World Airports (LAWA), *Final Environmental Impact Report, Los Angeles International Airport (LAX) Midfield Satellite Concourse (MSC)*, June 2014; South Coast Air Quality Management District, "SCAQMD Air Quality Significance Thresholds," March 2011. Available at: www.aqmd.gov/ceqa/handbook/signthres.pdf, September 25, 2014; Ricondo & Associates, Inc., February 2015.

PREPARED BY: Ricondo & Associates, Inc., May 2016.

6.3.2.2 Localized Operational Impacts

The localized effects from operational daily emissions were evaluated at nearby sensitive receptor locations potentially impacted by the MSC North Modifications, consistent with the methodologies in the SCAQMD's Final Localized Significance Threshold Methodology, and similar to the methodology for localized construction impacts. Peak incremental operational concentrations are shown in **Table 11** for the proposed MSC North Modifications and the MSC North Project, as previously approved in the MSC EIR. Operational concentrations of the MSC North Modifications would slightly differ from the MSC North Project values shown in the MSC EIR; however, the MSC North Modifications would not substantially increase peak concentrations, or result in a new significant impact. All the analyzed air pollutants were found to be below the NAAQS and CAAQS thresholds for operations.

Table 11: Operational Peak Concentrations

POLLUTANT	AVERAGING PERIOD	MSC NORTH PROJECT (FROM MSC EIR) OPERATIONS 1/ ($\mu g/m^3$)	MSC NORTH MODIFICATIONS OPERATIONS 2/ ($\mu g/m^3$)	SUBTOTAL ($\mu g/m^3$)	BACKGROUND ($\mu g/m^3$)	TOTAL ($\mu g/m^3$)	THRESHOLD ($\mu g/m^3$)	NEW SIGNIFICANT IMPACT OR SUBSTANTIAL INCREASE IN SEVERITY?
CO	1-hr	300	517	816	3,420	4,236	23,000	No
	1-hr NAAQS	300	517	816	3,420	4,236	40,000	No
	8-hr	139	282	421	2,166	2,587	10,000	No
NO_2	1-hr	50	93	144	164	308	339	No
	1-hr NAAQS	34	16	50	112	162	188	No
	Annual	1	0	1	22	23	57	No
SO_2	1-hr	39	1	41	40	81	655	No
	1-hr NAAQS	17	12	30	21	50	196	No
	3-hr	-8	29	21	39	60	1,300	No
	24-hr	2	2	4	16	20	105	No
	Annual NAAQS	1	0	1	3	4	80	No
PM_{10}	24-hr	1.0	0	1.0	-	1.0	2.5	No
	Annual	0.1	0	0.1	-	0.1	1.0	No
$PM_{2.5}$	24-hr	1.1	0	1.1	-	1.1	2.5	No

NOTES:

1/ The incremental difference between the MSC North 2019 With Project and 2019 Without Project scenarios, as included in the MSC EIR.

2/ The incremental difference between the 2019 MSC North Modifications scenario and the updated 2019 With Project (incorporating updated annual operations).

SOURCE: City of Los Angeles, Los Angeles World Airports (LAWA), *Final Environmental Impact Report, Los Angeles International Airport (LAX) Midfield Satellite Concourse (MSC)*, June 2014; Ricondo & Associates Inc., May 2016.

PREPARED BY: Ricondo & Associates Inc., May 2016.

6.3.2.3 Evaluation of Cancer Risks and Health Hazards

Health Effects for On-Airport Workers

Effects to on-airport workers were evaluated by comparing estimated maximum 8-hour average TAC concentration to the CalOSHA 8-hour Time-Weighted Average Permissible Exposure Levels (PEL-TWA). The estimated maximum 8-hour average TAC concentrations for on-airport locations for operations of the MSC North Project, as previously approved in the MSC EIR, and for the proposed MSC North Modifications, are shown in **Table 12**. Although the operational concentrations of the MSC North Modifications would slightly differ from the MSC North Project values shown in the MSC EIR, the MSC North Modifications would not substantially increase average 8-hour concentrations, or result in a new significant impact. As shown, the average concentrations are several orders of magnitude below the PEL-TWA and, thus would not exceed those considered acceptable by CalOSHA standards. Therefore, impacts related to health risks to on-airport workers would be less than significant for the MSC North Modifications.

Acute Non-Cancer Health Hazards

Incremental maximum acute health hazards associated with exposure to acrolein and formaldehyde as a result of operations of the MSC North Project, as previously approved in the MSC EIR, and the MSC North Modifications are summarized in **Table 13**. As shown, operations-related incremental maximum acute hazard quotients for acrolein for operations under the MSC North Project were estimated to be a maximum of 1.9 for residents and 1.4 for off-Airport adult workers. However, only 5 of 326 off-Airport grid point receptor locations, less than 2 percent, showed an incremental acute hazard quotient of greater than 1 (the significance threshold). Analysis for the proposed MSC North Modifications shows an increase in the hazard quotient for acrolein for residents, approximated to be a maximum of 2.2. Receptors representing schools, on- and off-site workers, and recreational uses would not be materially affected. In terms of overall affected receptors, only 7 of 326 off-Airport grid point receptor locations, approximately 2 percent, showed an incremental acute hazard quotient of greater than 1 (the significance threshold).

The acute REL for acrolein has an uncertainty factor of 60. This factor indicates a moderate uncertainty in the REL based on specific sources of variability not addressed in the toxicological studies, such as individual variation and interspecies differences. Although there is a slight increase in the maximum acute hazard quotients for acrolein during operations of the proposed MSC North Modifications, it should be noted that the acute REL is set at or below a level at which no adverse health impacts are expected for the majority of the population. Hence, it represents the tail-end of a distribution and not a specific "bright line" beyond which adverse effects are certain; instead any adverse acute non-cancer health effects (mucous membrane irritation) would be part of a complex probabilistic process. Although the maximum acute hazard quotient estimated as 2.2 is above the threshold of significance of 1, the value is still close to the threshold for acute effects, given the uncertainty in the toxicity factor, and may represent minimal actual acute non-cancer health hazards. Thus, an acute hazard quotient of 2.2 does not mean that adverse effects would definitely occur in the receptor population; rather, it indicates that such effects cannot be ruled out on the basis of current knowledge. Therefore, although the maximum acute acrolein hazard quotients for the MSC North Modifications would slightly differ from the MSC North Project values shown in the MSC EIR, the MSC North Modifications would not substantially increase acute health hazards, or result in a new significant impact.

Table 12: Comparison of CalOSHA Permissible Exposure Limits to Maximum Estimated 8-Hour On-Site Air Concentrations

TOXIC AIR CONTAMINANT	MSC NORTH PROJECT (FROM MSC EIR) OPERATIONS CONCENTRATIONS (mg/m^3) [1/]	MSC NORTH MODIFICATIONS OPERATIONS [2/] CONCENTRATIONS (mg/m^3) [1/]	CALOSHA PEL TWA (mg/m^3) [3/]	NEW SIGNIFICANT IMPACT OR SUBSTANTIAL INCREASE IN SEVERITY?
Acetaldehyde	0.002568	0.0040543	45	No
Acrolein	0.001453	0.0023050	0.25	No
Benzene	0.001593	0.0021778	0.32 [4/]	No
1,3-Butadiene	0.001132	0.0017189	2.2	No
Ethylbenzene	0.000303	0.0003635	435	No
Formaldehyde	0.007433	0.0117158	0.37 [4/]	No
Hexane, n-	0.000000	0.0000000	180	No
Methanol	0.001087	0.0017150	260	No
Methyl ethyl ketone	0.000009	0.0006370	590	No
Naphthalene	0.000330	0.0005182	50	No
Propylene	0.003080	0.0046574	N/A	No
Styrene	0.000207	0.0003145	215	No
Toluene	0.001297	0.0015204	37	No
Xylene (total)	0.001190	0.0013459	435	No
Diesel PM	0.013096	0.0130960	N/A	No
Arsenic	0.000001	0.0000010	0.01	No
Cadmium	0.000001	0.0000010	0.005	No
Chlorine	0.000005	0.0000050	1.5	No
Chromium (VI)	0.0000001	0.0000001	0.005	No
Copper	0.000001	0.0000010	1	No
Lead	0.000001	0.0000011	0.05	No
Manganese	0.000001	0.0000010	0.2	No
Mercury	0.0000004	0.0000004	0.025	No
Nickel	0.000000	0.0000000	0.5	No
Selenium	0.000000	0.0000000	0.2	No
Silicon	0.000033	0.0000330	6	No
Sulfates	0.000232	0.0002320	N/A	No
Vanadium	0.0000004	0.0000004	0.05	No

NOTES: N/A = Not Available

1/ Maximum 1-hour concentrations at on-airport location converted to 8-hour averages by multiplying by a factor of 0.7.

2/ Values from the MSC EIR combined with the incremental difference calculated for the MSC North Modifications.

3/ California Occupational Safety and Health Administration. Permissible Exposure Limits for Chemical Contaminants, Table AC-1, 2008, http://www.dir.ca.gov/title8/5155table_ac1.html.

4/ CalOSHA does not have a value; value is from American Conference of Governmental Industrial Hygienists (ACGIH), Documentation of the Threshold Limit Values and Biological Exposure Indices, 8th ed., Cincinnati, Ohio, 1998.

SOURCE: City of Los Angeles, Los Angeles World Airports (LAWA), *Final Environmental Impact Report, Los Angeles International Airport (LAX) Midfield Satellite Concourse (MSC)*, June 2014; Ricondo & Associates, Inc., May 2016.
PREPARED BY: Ricondo & Associates, Inc., May 2016.

Table 13: Maximum Incremental Acute Non-Cancer Hazard Indices from Operations

	MSC NORTH PROJECT (FROM MSC EIR) OPERATIONS		MSC NORTH MODIFICATIONS OPERATIONS [1/]	
POLLUTANT	**ACROLEIN**	**FORMALDEHYDE**	**ACROLEIN**	**FORMALDEHYDE**
Residential				
Maximum HI [2/]	**1.93**	0.44	**2.16**	0.49
Minimum HI	-1.41	-0.32	-2.55	-0.58
Average HI	-0.07	-0.02	-0.41	-0.09
School				
Maximum HI	0.50	0.12	0.51	0.07
Minimum HI	-0.79	-0.18	-0.46	-0.10
Average HI	0.03	0.01	0.00	0.00
Offsite Worker				
Maximum HI	**1.36**	0.32	**1.27**	0.29
Minimum HI	-1.33	-0.31	-2.47	-0.56
Average HI	-0.06	-0.01	-0.16	-0.04
Recreational				
Maximum HI	0.33	0.07	-0.26	-0.06
Minimum HI	-1.25	-0.29	-1.59	-0.36
Average HI	-0.37	-0.09	-0.76	-0.17
Overall Off-Airport				
Maximum HI	**1.93**	0.44	**2.16**	0.49
On-Site Occupational				
Maximum HI	0.75	0.18	0.72	0.16

NOTES: HI = Hazard Index

1/ Values from the MSC EIR combined with the incremental difference calculated for the MSC North Modifications.

2/ **Bold** HIs are greater than the significance threshold of 1.

SOURCE: City of Los Angeles, Los Angeles World Airports (LAWA), *Final Environmental Impact Report, Los Angeles International Airport (LAX) Midfield Satellite Concourse (MSC)*, June 2014; Ricondo & Associates, Inc., June 2016.
PREPARED BY: Ricondo & Associates, Inc., June 2016.

Thus, the MSC North Modifications would have a less than significant impact in regards to exposing sensitive receptors to substantial pollutant concentrations.

Cancer Risks and Chronic Non-Cancer Health Hazards

Cancer risks of TACs were estimated by multiplying exposure estimates for TACs by the pollutant-specific cancer risk factor. The result is a risk estimate expressed as the odds of developing cancer. Cancer risks were based on an exposure duration of 70 years. Chronic non-cancer health hazard estimates of TACs were calculated by dividing exposure estimates of each TAC by the chronic Reference Exposure Level (REL). RELs are estimates of the highest exposure levels that would not cause adverse health effects even if exposures continue over a lifetime. A ratio that is less than one indicates that the proposed project exposure was less than the highest exposure level that would cause adverse health effects and, hence, no impact to human health would be expected.

Peak cancer risks and chronic non-cancer health hazards for MEI for operations of both the MSC North Modifications and the MSC North Project, as previously approved in the MSC EIR, are summarized in **Table 14**. As shown, incremental cancer risks and non-cancer chronic hazards are well below the significance thresholds. Therefore, the MSC North Modifications would not substantially increase cancer risks or chronic non-cancer health hazards, or result in a new significant impact.

Table 14: Incremental Cancer Risks and Chronic Non-Cancer Human Health Hazards for Maximally Exposed Individuals

RECEPTOR TYPE	MSC NORTH PROJECT (FROM MSC EIR) PROJECT OPERATIONS	MSC NORTH MODIFICATIONS PROJECT OPERATIONS [1/]	SIGNIFICANCE THRESHOLD	NEW SIGNIFICANT IMPACT OR SUBSTANTIAL INCREASE IN SEVERITY?
Incremental Cancer Risks [2/] (per million people)				
Child Resident	0.139	0.140	10	No
School Child	0.027	0.027	10	No
Adult Resident	1.624	1.630	10	No
Adult Worker	0.910	0.911	10	No
Incremental Non-Cancer Chronic Hazards [3/]				
Child Resident	0.014	0.023	1	No
School Child	0.003	0.005	1	No
Adult Resident	0.014	0.023	1	No
Adult Worker	-0.002	-0.015	1	No

NOTES:

1/ Values from the MSC EIR combined with the incremental difference calculated for the MSC North Modifications.

2/ Values provided are changes in the number of cancer cases per million people exposed as compared to baseline conditions.

3/ Hazard indices are totals for all TACs that may affect the respiratory system. This incremental hazard index is essentially equal to the total for all TACs.

SOURCE: City of Los Angeles, Los Angeles World Airports (LAWA), *Final Environmental Impact Report, Los Angeles International Airport (LAX) Midfield Satellite Concourse (MSC)*, June 2014; Ricondo & Associates, Inc., May 2016.

PREPARED BY: Ricondo & Associates, Inc., May 2016.

6.4 Biological Resources

Issues (and supporting Information Sources)	Substantial Change in Project Requiring Major EIR Revisions	Substantial Change in Circumstances Requiring Major EIR Revisions	New Information Showing New or Greater Significant Effects than Previous EIR	New Information Showing Ability to Reduce, but not Eliminate Significant Effects in Previous EIR	Less Than Significant Impact/No Changes or New Information Requiring Preparation of a Subsequent EIR	No Impact
BIOLOGICAL RESOURCES: Would the project:						
(a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?						X
(b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?						X
(c) Have a substantial adverse effect on federally-protected wetlands, as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?						X
(d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?						X
(e) Conflict with any local policies or ordinances protecting biological						X

Issues (and supporting Information Sources)	Substantial Change in Project Requiring Major EIR Revisions	Substantial Change in Circumstances Requiring Major EIR Revisions	New Information Showing New or Greater Significant Effects than Previous EIR	New Information Showing Ability to Reduce, but not Eliminate Significant Effects in Previous EIR	Less Than Significant Impact/No Changes or New Information Requiring Preparation of a Subsequent EIR	No Impact
resources, such as a tree preservation policy or ordinance?						
(f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?						X

Discussion: The NOP/IS for the MSC Program and MSC North Project, published on February 8, 2013, analyzed the potential impacts on biological resources. The NOP/IS concluded that the MSC North Project and MSC Program would not result in potentially significant environmental impacts to biological resources, and, therefore, was eliminated from further analysis within the MSC EIR.

The proposed MSC North Modifications would be developed within the Air Operations Area (AOA), which is highly developed and devoid of relevant biological resources. There are no riparian/wetland areas, trees, or wildlife movement corridors at or adjacent to the site for the proposed MSC North Modifications. There are no current or proposed Habitat Conservation Plans or Natural Community Conservation Plan areas covering, or adjacent to, the proposed MSC North Modifications.

Substantial Changes with Respect to the Circumstances under Which the Project is Undertaken/New Information of Substantial Importance

There are no substantial changes to circumstances under which the MSC North Project would be undertaken, and there is no new information of substantial importance that has become available relative to biological resources. No substantial changes in the biological environment have occurred since certification of the MSC EIR, and no substantial new biological resources have been identified within the vicinity of the proposed MSC North Modifications.

Conclusion

Based on the above, no new significant biological impact or substantial increase in previously identified biological impacts would occur as a result of the proposed MSC North Modifications. Therefore, the impacts to biological resources as a result of the proposed MSC North Modifications would not trigger any of the conditions described in CEQA Guidelines, Section 15162 calling for preparation of a subsequent or supplemental EIR.

6.5 Cultural Resources

Issues (and supporting Information Sources)	Substantial Change in Project Requiring Major EIR Revisions	Substantial Change in Circumstances Requiring Major EIR Revisions	New Information Showing New or Greater Significant Effects than Previous EIR	New Information Showing Ability to Reduce, but not Eliminate Significant Effects in Previous EIR	Less Than Significant Impact/No Changes or New Information Requiring Preparation of a Subsequent EIR	No Impact
CULTURAL RESOURCES: Would the project:						
(a) Cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines §15064.5?						X
(b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines §15064.5?					X	
(c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?					X	
(d) Disturb any human remains, including those interred outside of formal cemeteries?					X	

Discussion: The NOP/IS for the MSC Program and MSC North Project, published on February 8, 2013, analyzed the potential impacts on cultural resources. The NOP/IS concluded that the MSC North Project and MSC Program would not result in potentially significant environmental impacts to cultural resources, and, therefore, was eliminated from further analysis within the MSC EIR.

No historical, archeological, or cultural resources were identified during the literature review or site surveys conducted as part of the MSC NOP/IS in 2013. The proposed MSC North Modifications would be developed within the Air Operations Area (AOA), which is highly developed and has been previously disturbed. Additionally, the MSC Mitigation, Monitoring, and Reporting Program (MMRP) requires that all construction activities adhere to the Archeological Treatment Plan and the Paleontological Treatment Plan, which contain procedures for the handling of any unanticipated discoveries.

On September 29, 2016, the Office of Administrative Law approved final text to update Appendix G of the State CEQA Guidelines, which contains a sample Environmental Checklist for an Initial Study under CEQA, to add provisions for tribal cultural resources, consistent with California Assembly Bill (AB) 52. These provisions amend the sample CEQA Checklist to include a statement explaining whether California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public

Resources Code section 21080.3.1, and if so, whether consultation has begun. The provisions also amend the sample CEQA Checklist to include questions regarding a proposed project's potentially significant impact on tribal cultural resources.

Only projects with a notice of preparation (NOP) completed on or after July 1, 2015 must comply with AB 52. Because the MSC North Project NOP/IS was published on February 8, 2013, it is not subject to AB 52. Nevertheless, as documented in the Initial Study for the MSC EIR, coordination was initiated with the Native American Heritage Commission (NAHC) in association with the MSC project on November 26, 2012.[11] The NAHC was requested to conduct a records search from their Sacred Lands File for the presence of Native American sacred sites or human remains within the cultural resources study area. A written response was received on November 27, 2012[12] advising that the Sacred Lands File did not indicate the presence of any sites within the cultural resources study area. On the recommendation of the NAHC, letters were sent to nine Native American contacts classified by the NAHC as potential sources of information related to cultural resources in the vicinity of the study area, which included the MSC North extension area and Gateway facility area. The letters advised the tribes and specific individuals of the project and its geographic area and requested information regarding cultural resources within the study area, as well as feedback or concerns related to the project. Only one response was received from Mr. John Tommy Rosas of the Tongva Ancestral Territorial Tribal Nation, who provided no information on Native American sacred sites or human remains within the project study area.

Substantial Changes with Respect to the Circumstances under Which the Project is Undertaken/New Information of Substantial Importance

There are no substantial changes to circumstances under which the MSC North Project will be undertaken, and there is no new information of substantial importance regarding cultural/ paleontological resources that has become available relative to cultural and paleontological resources. No substantial changes to cultural and paleontological resources have occurred since certification of the MSC EIR, and no substantial cultural or paleontological resources have been identified within the vicinity of the proposed MSC North Modifications.

Conclusion

Based on the above, no new significant cultural or paleontological impacts or a substantial increase in previously identified cultural or paleontological impacts would occur as a result of the proposed MSC North Modifications. All applicable mitigation measures previously adopted for the approved MSC North Project would apply to the proposed MSC North Modifications. Therefore, the impacts to cultural/paleontological

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11 Clark, Tiffany, Sapphos Environmental, Inc., Pasadena, CA. 26 November 2012. Letter to Larry Myers, Native American Heritage Commission, Sacramento, CA.

12 Singleton, Dave, Native American Heritage Commission, Sacramento, CA. 27 November 2012. Letter response to Tiffany Clark, Sapphos Environmental, Inc., Pasadena, CA

resources as a result of the proposed MSC North Modifications would not trigger any of the conditions described in CEQA Guidelines, Section 15162 calling for preparation of a subsequent or supplemental EIR.

6.6 Geology and Soils

Issues (and supporting Information Sources)	Substantial Change in Project Requiring Major EIR Revisions	Substantial Change in Circumstances Requiring Major EIR Revisions	New Information Showing New or Greater Significant Effects than Previous EIR	New Information Showing Ability to Reduce, but not Eliminate Significant Effects in Previous EIR	Less Than Significant Impact/No Changes or New Information Requiring Preparation of a Subsequent EIR	No Impact
GEOLOGY AND SOILS: Would the project:						
(a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving:						
(i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault?					X	
(ii) Strong seismic ground shaking?					X	
(iii) Seismic-related ground failure, including liquefaction?					X	
(iv) Landslides?						X
(b) Result in substantial soil erosion or the loss of topsoil?					X	
(c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?						X
(d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?					X	
(e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste						X

Issues (and supporting Information Sources)	Substantial Change in Project Requiring Major EIR Revisions	Substantial Change in Circumstances Requiring Major EIR Revisions	New Information Showing New or Greater Significant Effects than Previous EIR	New Information Showing Ability to Reduce, but not Eliminate Significant Effects in Previous EIR	Less Than Significant Impact/No Changes or New Information Requiring Preparation of a Subsequent EIR	No Impact
water?						

Discussion: The NOP/IS for the MSC Program and MSC North Project, published on February 8, 2013, analyzed the potential impacts on geology and soils. The NOP/IS concluded that the MSC North Project and MSC Program would not result in potentially significant environmental impacts to geology and soil resources, and, therefore, was eliminated from further analysis within the MSC EIR.

While the MSC North Project site is located within the seismically active Southern California region, it is not located within an Alquist-Priolo Special Study Zone.[13] Geotechnical literature and mapping data indicates that the Charnock Fault runs north to south approximately 3,000 feet east of Sepulveda Boulevard.[14,15] The Charnock Fault is not considered active by the State of California, and therefore, is not subject to the zoning restrictions of the Alquist-Priolo Fault Zoning Act. Additionally, the Charnock Fault is considered to have low potential for surface rupture independently or in conjunction with movement on the Newport-Inglewood Fault Zone, which is located approximately three miles east of LAX.

The California Department of Conservation (CDC) is mandated by the Seismic Hazards Act of 1990 to identify and map the state's most prominent earthquake hazards in order to help avoid damage resulting from earthquakes.[16] The CDC's Seismic Hazard Zone Mapping Program charts areas prone to liquefaction and earthquake-induced landslides throughout California's principal urban and major growth areas. According to the most recent Seismic Hazard Maps for the Inglewood and Venice Quadrangles, no potential liquefaction zones are located within the vicinity of LAX. Isolated zones of potential seismic slope instability are identified near the western edge of LAX, within the undeveloped dune area to the west of the MSC North Project site.[17,18] Thus, the MSC North Modifications would not be located in an area of high risk for liquefaction or earthquake-induced landslides and would not exacerbate such hazards. All construction would comply with the Uniform Building Code (UBC) and City of Los Angeles Building Code (LABC) requirements; thus, potential impacts associated with strong seismic ground shaking or landslides would be less than significant.

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13 City of Los Angeles, Los Angeles World Airports (LAWA), *Final Environmental Impact Report, Los Angeles International Airport Proposed Master Plan Improvements*, Section 4.22, April 2004.

14 City of Los Angeles, Los Angeles World Airports (LAWA), *Final Environmental Impact Report, Los Angeles International Airport Proposed Master Plan Improvements*, Earth/Geology Technical Report, January 2001.

15 United States Geological Survey, Quaternary Faults, 2010.

16 California Public Resources Code, §2690-2699.6 (Seismic Hazards Mapping Act of 1990).

17 State of California, *Seismic Hazard Zones, Inglewood Quadrangle*, March 25, 1999.

18 State of California, *Seismic Hazard Zones, Venice Quadrangle*, March 25, 1999.

The erosion potential for the proposed MSC North Modifications would be similar to the approved MSC North Project. Conformance with LABC Sections 91.7000 through 91.7016, which include construction requirements for grading, excavation, and use of fill, would reduce the potential for wind or waterborne erosion. In addition, the LABC requires an erosion control plan that is reviewed by the Department of Building and Safety prior to construction if grading exceeds 200 cubic yards and occurs during the rainy season (between November 1 and April 15). LAWA would be required to prepare an erosion control plan to reduce soil erosion.

No impacts related to septic systems would occur. The proposed MSC North Modifications would be located in an urbanized area where wastewater infrastructure is currently in place. The ability of on-site soils to support septic tanks or alternative wastewater systems is not applicable.

Substantial Changes with Respect to the Circumstances under Which the Project is Undertaken/New Information of Substantial Importance

There is no potential for significant changes in geological, seismic, soils, or mineral resource conditions within the area of the MSC North Project since the time of certification of the MSC EIR, because such resources are relatively static. There are no substantial changes to the circumstances under which the MSC North Modifications would be undertaken, and there is no new information of substantial importance that has become available relative to geology and soils.

Conclusion

The proposed MSC North Modifications would not involve new significant impacts or a substantial increase in previously identified impacts to geology, soils, or mineral resources. Therefore, the impacts to geology and soils as a result of the proposed MSC North Modifications would not trigger any of the conditions described in CEQA Guidelines, Section 15162 calling for preparation of a subsequent or supplemental EIR.

6.7 Greenhouse Gas Emissions

Issues (and supporting Information Sources)	Substantial Change in Project Requiring Major EIR Revisions	Substantial Change in Circumstances Requiring Major EIR Revisions	New Information Showing New or Greater Significant Effects than Previous EIR	New Information Showing Ability to Reduce, but not Eliminate Significant Effects in Previous EIR	Less Than Significant Impact/No Changes or New Information Requiring Preparation of a Subsequent EIR	No Impact
GREENHOUSE GAS EMISSIONS: Would the project:						
(a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?					X	
(b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?					X	

Discussion: The MSC EIR concluded that the MSC North Project would result in significant and unavoidable impacts, both project-specific and cumulative, to global climate change. The MSC North Modifications would not conflict with measures adopted to show consistency with greenhouse gas (GHG) reduction plans, policies, and applicable regulation. Therefore, the proposed MSC North Modifications would not result in a new significant impact or a substantial increase in severity of a significant effect previously examined in the MSC EIR.

Substantial Changes with Respect to the Circumstances under Which the Project is Undertaken/New Information of Substantial Importance

The increase in square footage from the "Gateway" proposed as part of the MSC North Modifications would result in a slight increase in both construction and operational GHG emissions as compared to the previously approved MSC North Project. As related to construction, the proposed MSC North Modifications would generate GHG emissions from vehicle exhaust associated with construction-related activities, including off-road construction equipment, construction worker commute trips, and hauling/vendor truck trips. It is anticipated that the MSC North Modifications would ultimately be constructed during the construction period of the concourse facility associated with the broader MSC North Project, which is estimated to be January 2017 through December 2019. Construction-related GHG emissions for the MSC North Modifications are associated with construction equipment and vehicle exhaust, as shown in **Table 15**. Based on SCAQMD guidance, construction emissions were amortized over the lifetime of a proposed project, which is assumed to be 30 years. As shown in Table 15, the amortized construction CO_2e for the MSC North Modifications is equal to 3,955 $MTCO_2e$ per year. For comparison purposes, construction-related GHG emissions from the MSC North Project, as previously approved in the MSC EIR, are also included in Table 15. Construction-related significance is not determined on an individual basis for GHG emissions; rather, it is evaluated based on significance of the combined construction- and operations-related GHG emissions for the proposed project.

The proposed MSC North Modifications would also result in a minimal change to long-term operations at LAX, resulting in minimal increases to operational GHG emissions, as discussed further below.

Table 15: Constriction-Related Greenhouse Gas Emissions

EMISSION SOURCE	MSC NORTH PROJECT (FROM MSC EIR) TOTAL CONSTRUCTION GHG EMISSIONS CO_2e (METRIC TONS)	MSC NORTH MODIFICATIONS TOTAL CONSTRUCTION GHG EMISSIONS CO_2e (METRIC TONS)
On-site Equipment	82,868	72,787
On-site Trucks	42,867	15,970
Off-site Deliveries	19,559	19,606
Off-site Worker Trips	5,160	4,301
Total	**150,454**	**118,663**
30 year Amortized Total (per year)	**5,015**	**3,955**

SOURCE: City of Los Angeles, Los Angeles World Airports (LAWA), *Final Environmental Impact Report, Los Angeles International Airport (LAX) Midfield Satellite Concourse (MSC)*, June 2014; Ricondo & Associates, Inc., February 2015.
PREPARED BY: Ricondo & Associates, Inc., May 2016.

The proposed MSC North Modifications would not increase operations at LAX; the proposed Project would provide an additional aircraft gate to reduce reliance on the West Remote Gates/Pads and operate as an "empty chair," providing capacity for the temporary relocation of carrier operations during routine construction or modernization activities in existing facilities. Although the analysis for the MSC North Modifications accounts for the projected increase in annual operations, which is anticipated to occur with or without the MSC North Modifications, it is expected that unimpeded taxi times would decrease due to a reduced travel distance for operations at the MSC North as compared to the West Remote Gates/Pads. However, in the absence of airfield simulations, it is expected that there would be a slight increase in emissions associated with potential ground delays. However, based on previous LAX airfield simulations, including those conducted for the MSC EIR, it was assumed that GHG emissions from aircraft operations would slightly decrease based on unimpeded taxi times. Similarly, GSE and busing operations would be reduced from the decrease in operational distance between the MSC North and the West Remote Gates/Pads. APU emissions would not change, as both the gates at the West Remote Gates/Pads and the MSC North would be equipped with ground power units and pre-conditioned air. Therefore, operations from GSE, busing, and APUs were not included in the MSC North Modifications GHG analysis. Similarly, based on the decrease in overall square footage of the proposed MSC North Modifications as compared to the MSC North Project (see Table 1), GHG emissions for stationary sources, building electricity, solid waste disposal, and indoor water usage were not quantified. GHG emissions for the incremental difference between the MSC North 2019 With Project scenario compared to the 2019 Without Project scenario, as previously approved in the MSC EIR, and the incremental difference for the MSC North Modifications, along with amortized construction emissions, are shown in **Table 16**.

Table 16: 2019 Incremental Greenhouse Gas Emissions

EMISSION SOURCE	MSC NORTH PROJECT (FROM MSC EIR) INCREMENTAL DIFFERENCE [1/] CO_2E (METRIC TONS)	MSC NORTH MODIFICATIONS INCREMENTAL DIFFERENCE [2/] CO_2E (METRIC TONS)	TOTAL CO_2E (METRIC TONS)
Aircraft [3/]	-1,528	-1,826	-3,354
Ground Support Equipment [3/]	-81	-	-81
Busing Operations [3/]	188	-	188
On-Airport Stationary [4/]	338	-	344
Building Electricity [4/]	5,334	-	5,842
Solid Waste Disposal [4/]	75	-	104
Indoor Water Usage [4/]	1,111	-	1,166
Construction (Amortized) [4/]	5,015	-1,060	3,955
Total Net	**10,452**	**-2,886-**	**8,164**
SCAQMD GHG Threshold for Industrial Projects			10,000
Above the Threshold?			**No**
New Significant Impact Or Substantial Increase in Severity?			**No**

NOTES:

1/ The incremental difference between the MSC North 2019 With Project and 2019 Without Project scenarios, as included in the MSC EIR.

2/ The incremental difference between the 2019 MSC North Modifications scenario and the updated 2019 With Project (incorporating updated annual operations).

3/ Total emissions for LAX.

4/ Emissions for MSC North Project site only.

SOURCE: City of Los Angeles, Los Angeles World Airports (LAWA), *Final Environmental Impact Report, Los Angeles International Airport (LAX) Midfield Satellite Concourse (MSC)*, June 2014; Ricondo & Associates, Inc., June 2016.

PREPARED BY: Ricondo & Associates, Inc., June 2016.

As shown in Table 16, the proposed MSC North Modifications would result in a slight decrease in overall GHG emissions as compared to the emissions calculated in the MSC EIR for the MSC North Project. However, as discussed in the MSC EIR, GHG emissions for the MSC North Project would be substantial and significant. Although the total net GHG emissions are just below the significance threshold of 10,000 $MTCO_2e$ per year, the MSC North Modifications would not change the significance found in the MSC EIR for the MSC North Project.

Conclusion

The proposed MSC North Modifications would not involve new significant impacts or a substantial increase in previously identified impacts to GHG emissions. All mitigation measures previously adopted for the approved

MSC North Project would apply to the proposed MSC North Modifications as applicable. Therefore, the impacts to GHG emissions as a result of the proposed MSC North Modifications would not trigger any of the conditions described in CEQA Guidelines, Section 15162 calling for preparation of a subsequent or supplemental EIR.

6.8 Hazards and Hazardous Materials

Issues (and supporting Information Sources)	Substantial Change in Project Requiring Major EIR Revisions	Substantial Change in Circumstances Requiring Major EIR Revisions	New Information Showing New or Greater Significant Effects than Previous EIR	New Information Showing Ability to Reduce, but not Eliminate Significant Effects in Previous EIR	Less Than Significant Impact/No Changes or New Information Requiring Preparation of a Subsequent EIR	No Impact
HAZARDS AND HAZARDOUS MATERIALS: Would the project:						
(a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?					X	
(b) Create a significant hazard to the public or the environment through the reasonably foreseeable upset and accident conditions involving the likely release of hazardous materials into the environment?					X	
(c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?						X
(d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code §65962.5 and, as a result, would it create a significant hazard to the public or the environment?						X
(e) For a project located within an airport land use plan or, where such a plan has not						X

Issues (and supporting Information Sources)	Substantial Change in Project Requiring Major EIR Revisions	Substantial Change in Circumstances Requiring Major EIR Revisions	New Information Showing New or Greater Significant Effects than Previous EIR	New Information Showing Ability to Reduce, but not Eliminate Significant Effects in Previous EIR	Less Than Significant Impact/No Changes or New Information Requiring Preparation of a Subsequent EIR	No Impact
been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?						
(f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?						X
(g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?					X	
(h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?						X

Discussion: The NOP/IS for the MSC Program and MSC North Project, published on February 8, 2013, analyzed the potential impacts related to hazards and hazardous materials. The NOP/IS concluded that the MSC North Project and MSC Program would not result in potentially significant environmental impacts related to hazards and hazardous materials, and, therefore, was eliminated from further analysis within the MSC EIR.

Construction and operation of the MSC North Modifications would involve some use of hazardous materials, including vehicle fuels, oils, transmission fluids, and cleaning solvents, which would be similar to the MSC North Project. These types of materials are not acutely hazardous, and all storage, handling, and disposal of these materials are regulated. Compliance with existing federal, state, and local regulations and routine precautions would reduce the potential for accidental releases of a hazardous material and would minimize the impact of an accident, should one occur. The use of hazardous materials for the development of the MSC North Modifications would not substantially differ from the MSC North Project; the same type and general

quantity of materials would be used. Therefore, the MSC North Modifications would not result in a new significant impact.

A Phase I environmental site assessment to determine the potential for the presence of hazardous materials contamination of soil and/or groundwater at the MSC North Project site was conducted in January 2013. While no specific hazardous waste sites were located within the Project site, due to the aircraft maintenance and other activities that have historically and are currently occurring in this portion of the airfield, the Phase I environmental site assessment noted several areas of potential concern. Demolition of structures built prior to 1980 may result in the exposure of the public and/or the environment to asbestos-containing material (ACMs) and or lead-based paint (LBP). During construction, previously unidentified underground storage tanks (USTs), hazardous materials, petroleum hydrocarbons, or hazardous or solid wastes may be encountered and may result in the exposure of the public and/or the environment to hazardous materials. Additionally, construction activities, including demolition, may encounter or generate hazardous or solid wastes and debris and may result in the exposure of the public and/or the environment to hazardous materials. The MMRP for the MSC EIR identifies appropriate mitigation measures required to mitigate these potential effects.

LAWA and tenants of LAX maintain Emergency Response Evacuation Plans to minimize the potential for and the effects of an accident. Construction of the MSC North Project may result in temporary closures to local airport circulation roads at LAX. However, this possible obstruction would be temporary and occur only at limited access points at any one time. Other areas of the Airport would be kept clear and unobstructed at all times during construction in accordance with FAA, State Fire Marshal, and Los Angeles Fire Code regulations.

The MSC North Modifications are located not within the vicinity of a private airstrip, but are within a public airport. Numerous safeguards are required by law to minimize the potential for and the effects from an accident if one were to occur. The improvements associated with the MSC North Modifications would meet all applicable safety related design standards.

The MSC North Modifications site and surrounding areas are predominantly paved and/or developed. There are no fire hazard areas containing flammable brush, grass, or trees near the proposed MSC North Modifications. Furthermore, the MSC North Modifications site is not within a City of Los Angeles Wildfire Hazard Area, as delineated in the Safety Element of the General Plan.

Substantial Changes with Respect to the Circumstances under Which the Project is Undertaken/New Information of Substantial Importance

There are no substantial changes to the circumstances under which the MSC North Project would be undertaken, and there is no new information of substantial importance relative to hazards or hazardous materials. No substantial changes to hazards and hazardous materials have occurred since certification of the MSC EIR, and no substantial new hazards and hazardous materials have been identified within the vicinity of the proposed MSC North Modifications.

Conclusion

The proposed MSC North Modifications would not involve new significant impacts or a substantial increase in previously identified impacts regarding hazards or hazardous materials. All mitigation measures previously adopted for the approved MSC North Project would apply to the proposed MSC North Modifications described herein, as applicable. Therefore, the impacts to hazards and hazardous materials as a result of the proposed MSC North Modifications would not trigger any of the conditions described in CEQA Guidelines, Section 15162 calling for preparation of a subsequent or supplemental EIR.

6.9 Hydrology and Water Quality

Issues (and supporting Information Sources)	Substantial Change in Project Requiring Major EIR Revisions	Substantial Change in Circumstances Requiring Major EIR Revisions	New Information Showing New or Greater Significant Effects than Previous EIR	New Information Showing Ability to Reduce, but not Eliminate Significant Effects in Previous EIR	Less Than Significant Impact/No Changes or New Information Requiring Preparation of a Subsequent EIR	No Impact
HYDROLOGY AND WATER QUALITY: Would the project:						
(a) Violate any water quality standards or waste discharge requirements?					X	
(b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?					X	
(c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?					X	
(d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?					X	

Issues (and supporting Information Sources)	Substantial Change in Project Requiring Major EIR Revisions	Substantial Change in Circumstances Requiring Major EIR Revisions	New Information Showing New or Greater Significant Effects than Previous EIR	New Information Showing Ability to Reduce, but not Eliminate Significant Effects in Previous EIR	Less Than Significant Impact/No Changes or New Information Requiring Preparation of a Subsequent EIR	No Impact
(e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?					X	
(f) Otherwise substantially degrade water quality?					X	
(g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?						X
(h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?						X
(i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?						X
(j) Inundation by seiche, tsunami or mudflow?						X

Discussion: The NOP/IS for the MSC Program and MSC North Project, published on February 8, 2013, analyzed the potential impacts related to hydrology and water quality. The NOP/IS concluded that the MSC North Project and MSC Program would not result in potentially significant environmental impacts related to hydrology and water quality, and, therefore, was eliminated from further analysis within the MSC EIR.

The proposed MSC North Modifications would not result in any new significant hydrologic/water quality impacts, and no substantial increase in previously identified hydrologic/water quality impacts would occur with implementation of applicable laws, regulations, and mitigation required for the MSC North Project.

Although construction of the proposed MSC North Modifications could result in the potential for short-term impacts to surface water (i.e., stormwater) quality, due to grading and other temporary surface disturbance, the Storm Water Pollution Prevention Plan (SWPPP) for the MSC North Project addresses construction-related surface water quality impacts and delineates water quality control measures to address those impacts. Control measures such as best management practices are specified in LAWA's existing Construction SWPPP for LAX. Therefore, the proposed MSC North Modifications would have no overall effect on water quality standards or wastewater discharge requirements and any potential impact would be less than significant.

The MSC North Modifications site is located within the boundaries of the LAX Master Plan study area, and as indicated in the LAX Master Plan EIR, no 100-year floodplain areas are located within the LAX Master Plan boundaries. Further, the MSC North Modifications do not involve the construction of housing. Therefore, the proposed MSC North Modifications would have no impact regarding flood hazards.

As delineated on the City of Los Angeles Inundation and Tsunami Hazard Areas map, the proposed MSC North Modifications are not within a boundary of an inundation area from a flood control basin.[19] Further, the MSC North Project site and proposed MSC North Modifications are not located within the downstream influence of any levee or dam.

Substantial Changes with Respect to the Circumstances under Which the Project is Undertaken/New Information of Substantial Importance

There are no substantial changes to the circumstances under which the MSC North Project would be undertaken, and there is no new information of substantial importance that has become available relative to hydrology or water quality. No substantial changes in hydrology and water quality have occurred since certification of the MSC EIR, and no substantial new information on hydrology and water quality have been identified within the vicinity of the proposed MSC North Modifications.

Conclusion

The proposed MSC North Modifications would not result in any new significant hydrologic/water quality impacts, and no substantial increase in previously identified hydrologic/water quality impacts would occur with implementation of applicable laws, regulations, and mitigation. Therefore, the impacts to hydrology and water quality as a result of the proposed MSC North Modifications would not trigger any of the conditions described in CEQA Guidelines, Section 15162 calling for preparation of a subsequent or supplemental EIR.

[19] City of Los Angeles Planning Department, *Safety Element of the City of Los Angeles General Plan*, Exhibit G, Inundation & Tsunami Hazard Areas in the City of Los Angeles, November 1996.

6.10 Land Use and Planning

Issues (and supporting Information Sources)	Substantial Change in Project Requiring Major EIR Revisions	Substantial Change in Circumstances Requiring Major EIR Revisions	New Information Showing New or Greater Significant Effects than Previous EIR	New Information Showing Ability to Reduce, but not Eliminate Significant Effects in Previous EIR	Less Than Significant Impact/No Changes or New Information Requiring Preparation of a Subsequent EIR	No Impact
LAND USE AND PLANNING: Would the project:						
(a) Physically divide an established community?						X
(b) Conflict with any applicable land use plan, policy or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?						X
(c) Conflict with any applicable habitat conservation plan or natural community conservation plan?						X

Discussion: The NOP/IS for the MSC Program and MSC North Project, published on February 8, 2013, analyzed the potential impacts related to land use and planning. The NOP/IS concluded that the MSC North Project and MSC Program would not result in potentially significant environmental impacts related to Land Use and Planning, and, therefore, was eliminated from further analysis within the MSC EIR.

The proposed MSC North Modifications are located entirely within the boundaries of LAX property. Development of the proposed MSC North Modifications would not disrupt or divide the physical arrangement of an established community, as no community exists in this location.

No conflicts with any land use would occur. Land use designations and development regulations applicable to LAX are set forth in the LAX Plan and LAX Specific Plan, both approved by the Los Angeles City Council in December 2004. The LAX Specific Plan was updated and adopted by the Los Angeles City Council in June 2016. The proposed MSC North Modifications would be located within an area designated as "Airport Airside" in the LAX Specific Plan.

No conflicts with any habitat conservation plan would occur. The Los Angeles/El Segundo Dunes Specific Plan Area and El Segundo Blue Butterfly Habitat Restoration Area are located to the west of the proposed MSC North Modifications by approximately one mile. The proposed MSC North Modifications would be located

within an urbanized airport area adjacent to existing airport uses, and would not affect the Dunes Specific Plan Area. There is no adopted or approved habitat conservation plan or natural community conservation plan that includes the proposed MSC North Modifications site.

Substantial Changes with Respect to the Circumstances under Which the Project is Undertaken/New Information of Substantial Importance

There are no substantial changes to the circumstances under which the MSC North Project would be undertaken, because there are no new land uses or substantial changes in land use policies or requirements that would affect the MSC North Project. No substantial changes to land use have occurred since certification of the MSC EIR, and no substantial new land uses have been identified within the vicinity of the proposed MSC North Modifications.

Conclusion

Based on the above, no new significant land use impacts or substantial increase in previously identified land use impacts would occur as a result of the proposed MSC North Modifications. Therefore, the impacts to land use and planning as a result of the proposed MSC North Modifications would not trigger any of the conditions described in CEQA Guidelines, Section 15162 calling for preparation of a subsequent or supplemental EIR.

6.11 Mineral Resources

Issues (and supporting Information Sources)	Substantial Change in Project Requiring Major EIR Revisions	Substantial Change in Circumstances Requiring Major EIR Revisions	New Information Showing New or Greater Significant Effects than Previous EIR	New Information Showing Ability to Reduce, but not Eliminate Significant Effects in Previous EIR	Less Than Significant Impact/No Changes or New Information Requiring Preparation of a Subsequent EIR	No Impact
MINERAL RESOURCES: Would the project:						
(a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?						X
(b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?						X

Discussion: The NOP/IS for the MSC Program and MSC North Project, published on February 8, 2013, analyzed the potential impacts related to mineral resources. The NOP/IS concluded that the MSC North Project and MSC Program would not result in potentially significant environmental impacts related to mineral resources, and, therefore, was eliminated from further analysis within the MSC EIR.

No impacts to the availability of mineral resources would occur from the proposed MSC North Modifications. The proposed MSC North Modifications would occur on land that is currently and has been historically used for aviation and aviation related purposes. The proposed MSC North Modifications, the Airport, and the surrounding areas are not known to contain any significant mineral resources of value to the region or residents of the state. There are no actively mined mineral or timber resources in the vicinity of the proposed MSC North Modifications, nor is the area available for mineral resource extraction given the existing airport uses.

Substantial Changes with Respect to the Circumstances under Which the Project is Undertaken/New Information of Substantial Importance

There are no substantial changes to the circumstances under which the MSC North Project would be undertaken, and there is no new information of substantial importance that has become available relative to mineral resources. No substantial changes to mineral resources have occurred since certification of the MSC EIR, and no substantial new mineral resources have been identified within the vicinity of the proposed MSC North Modifications.

Conclusion

Based on the above, no new significant mineral resource impacts or substantial increase in previously identified mineral resource impacts would occur as a result of the proposed MSC North Modifications. Therefore, the impacts to mineral resources as a result of the proposed MSC North Modifications would not trigger any of the conditions described in CEQA Guidelines, Section 15162 calling for preparation of a subsequent or supplemental EIR.

6.12 Noise

Issues (and supporting Information Sources)	Substantial Change in Project Requiring Major EIR Revisions	Substantial Change in Circumstances Requiring Major EIR Revisions	New Information Showing New or Greater Significant Effects than Previous EIR	New Information Showing Ability to Reduce, but not Eliminate Significant Effects in Previous EIR	Less Than Significant Impact/No Changes or New Information Requiring Preparation of a Subsequent EIR	No Impact
NOISE: Would the project result in:						
(a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?					X	
(b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?					X	
(c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?					X	
(d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?					X	
(e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?						X
(f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?						X

Discussion: The NOP/IS for the MSC Program and MSC North Project, published on February 8, 2013, analyzed the potential impacts associated with noise. The NOP/IS concluded that for all six noise-related thresholds, the proposed MSC North Project and MSC Program would result in a "less than significant impact" and that no further analysis of that topic in an EIR was required. However, during the MSC EIR NOP public comment period, LAWA received a request to analyze the potential impacts of aircraft noise from changes to taxi routes that would occur as a result of the proposed MSC North Project; therefore, the MSC EIR analyzed potential taxi-noise impacts. All other noise related impacts were eliminated from further analysis within the

MSC EIR. The MSC EIR concluded that the MSC North Project would not result in a significant noise impact resulting from changes to taxi routes.

Substantial Changes with Respect to the Circumstances under Which the Project is Undertaken/New Information of Substantial Importance

Since the approval of the MSC EIR, refinement of the MSC North now includes the extension of the concourse north past the LAX Master Plan Alternative D Taxiway D OFA limit, accommodating an additional aircraft gate. The additional gate at the MSC North would not increase capacity at LAX, it would only reduce the reliance on the West Remote Gates/Pads. In addition, the FAA has increased its projected operations for the opening year of the MSC North, expected in 2019; the forecasted operations would be present with or without the MSC North Project. The MSC North Modifications would not increase passenger or gate capacity, nor flights and/or aircraft operations at LAX; the project is only changing the location of aircraft gates. The change in location of aircraft gates could affect the operational noise of taxiing aircraft.

Implementation of the proposed MSC North Modifications would not increase the number of aircraft operations at LAX, but would result in a change to the normal taxi routes that certain aircraft currently take to and from aircraft gates. The evaluation of potential noise impacts associated with that change focuses on the taxi routes aircraft would take going to and from the proposed MSC North Project site that would be different from the routes currently used. Given that the vast majority of existing aircraft taxiing operations at LAX would be unaffected by the proposed MSC North Modifications, the evaluation of Project-related impacts focuses specifically on the number, type, and route of aircraft taxiing to and from the Project site, as opposed to modeling the entirety of taxiing operations at LAX with and without the MSC North Modifications. Details on assumptions and methodology are included in **Appendix C**.

Based on the number of taxiing operations and the day/night split for operations at the MSC North, the Community Noise Equivalent Level (CNEL) value associated with Project-related taxiing was estimated. **Table 17** compares the original taxi-related noise from the MSC EIR to that of the MSC North Modifications.

The proposed MSC North Modifications also include a 50,000-square-foot "Gateway" facility attached to the west side of TBIT at the concourse level that would provide a facility for passengers to transition from TBIT into the underground passenger tunnel. Construction of the Gateway would not result in any noticeable difference in construction noise. The Gateway would be constructed in the midpoint of the Bradley West in the middle of the airfield. The closest noise sensitive receptor is located 3,000 feet to the north in Westchester, further from the Gateway than the MSC North extension. The MSC Initial Study concluded that the background ambient noise is higher than the noise associated with the construction of the MSC and that would hold true for the MSC North Extension and Gateway building.

As shown, the MSC North Modifications would not result in a new significant impact or a substantial increase in severity of a significant effect previously examined in the MSC EIR.

Table 17: Taxiway Noise CNELs

	MSC NORTH PROJECT (FROM MSC EIR)				MSC NORTH MODIFICATIONS					
RECEPTOR ID #	PROJECT (dBA)	BACKGROUND (dBA)	TOTAL (dBA)	INCREMENTAL DIFFERENCE (dBA)	PROJECT (dBA)	BACKGROUND (dBA)	TOTAL (dBA)	INCREMENTAL DIFFERENCE (dBA)	THRESHOLD (dBA)	NEW SIGNIFICANT IMPACT OR SUBSTANTIAL INCREASE IN SEVERITY
TXN1	40.3	68.0	68.01	0.01	41.0	68.0	68.01	0.01	1.5	No
TXN2	42.1	80.0	80.00	0.00	43.0	79.0	79.00	0.00	1.5	No
TXN3	51.8	75.0	75.02	0.02	56.4	75.0	75.06	0.06	1.5	No
TXN4	41.9	61.0	61.05	0.05	43.4	62.0	62.06	0.06	1.5	No
TXN5	35.4	55.0	55.05	0.05	36.7	56.0	56.05	0.05	1.5	No
TXN6	32.2	75.0	75.00	0.00	33.0	75.0	75.00	0.00	1.5	No
TXN7	39.9	75.0	75.00	0.00	40.7	74.0	74.00	0.00	1.5	No
TXN8	50.6	67.0	67.10	0.10	51.1	65.0	65.17	0.17	1.5	No

SOURCE: City of Los Angeles, Los Angeles World Airports (LAWA), *Final Environmental Impact Report, Los Angeles International Airport (LAX) Midfield Satellite Concourse (MSC)*, June 2014; City of Los Angeles, Los Angeles World Airports, "California State Airport Noise Standards Quarterly Report," Fourth Quarter 2015; Ricondo & Associates Inc., May 2016.

PREPARED BY: Ricondo & Associates Inc., May 2016.

Conclusion

Based on the taxi-noise analysis, no new significant noise or vibration impacts or substantial increase in previously identified noise impacts would occur as a result of the proposed MSC North Modifications. Therefore, noise and vibration impacts as a result of the proposed MSC North Modifications would not trigger any of the conditions described in CEQA Guidelines, Section 15162 calling for preparation of a subsequent or supplemental EIR.

6.13 Population and Housing

Issues (and supporting Information Sources)	Substantial Change in Project Requiring Major EIR Revisions	Substantial Change in Circumstances Requiring Major EIR Revisions	New Information Showing New or Greater Significant Effects than Previous EIR	New Information Showing Ability to Reduce, but not Eliminate Significant Effects in Previous EIR	Less Than Significant Impact/No Changes or New Information Requiring Preparation of a Subsequent EIR	No Impact
POPULATION AND HOUSING: Would the project:						
(a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?						X
(b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?						X
(c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?						X

Discussion: The NOP/IS for the MSC Program and MSC North Project, published on February 8, 2013, analyzed the potential impacts related to population and housing. The NOP/IS concluded that the MSC North Project and MSC Program would not result in potentially significant environmental impacts related to population and housing, and, therefore, was eliminated from further analysis within the MSC EIR.

The proposed MSC North Modifications do not include any development of new housing, businesses, or other facilities that would directly induce substantial population growth. The proposed MSC North Modifications are located on Airport property in an area where no housing has been developed nor residential population is located. Thus, no effect to population and housing is expected.

Substantial Changes with Respect to the Circumstances under Which the Project is Undertaken/New Information of Substantial Importance

There are no substantial changes to the circumstances under which the MSC North Project will be undertaken, and there is no new information of substantial importance that has become available relative to population and housing. No substantial changes to population and housing have occurred since certification of the MSC EIR, and no substantial new population or housing has been identified within the vicinity of the proposed MSC North Modifications.

Conclusion

Based on the above, no new significant population and housing impacts or substantial increase in previously identified population and housing impacts would occur as a result of the proposed MSC North Modifications. Therefore, population and housing impacts as a result of the proposed MSC North Modifications would not trigger any of the conditions described in CEQA Guidelines, Section 15162 calling for preparation of a subsequent or supplemental EIR.

6.14 Public Services

Issues (and supporting Information Sources)	Substantial Change in Project Requiring Major EIR Revisions	Substantial Change in Circumstances Requiring Major EIR Revisions	New Information Showing New or Greater Significant Effects than Previous EIR	New Information Showing Ability to Reduce, but not Eliminate Significant Effects in Previous EIR	Less Than Significant Impact/No Changes or New Information Requiring Preparation of a Subsequent EIR	No Impact
PUBLIC SERVICES: Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:						
(a) Fire protection?					X	
(b) Police protection?						X
(c) Schools?						X
(d) Parks?						X
(e) Other public facilities?						X

Discussion: The NOP/IS for the MSC Program and MSC North Project, published on February 8, 2013, analyzed the potential impacts associated with public services. The NOP/IS concluded that four of the five public service related thresholds would result in a "less than significant or no impact" and that no further analysis of that topic in an EIR was required. The EIR analyzed potential impacts to fire protection services with the remaining public service impacts being eliminated from further analysis within the EIR. The MSC EIR concluded that with implementation of LAX Master Plan Commitments and compliance with FAR and fire code requirements, the MSC North Project would result in a less than significant impact to fire protection services.

Although slightly increasing the square footage of passenger-related spaces, the proposed MSC North Modifications would not result in any substantial changes in or create the need for additional fire protection services. The proposed MSC North Modifications would not interfere with emergency access routes from LAFD No. 5 to LAX. Furthermore, the proposed MSC North Modifications would not result in residential, commercial, or industrial growth, and therefore, would not require additional public services.

Substantial Changes with Respect to the Circumstances under Which the Project is Undertaken/New Information of Substantial Importance

There are no substantial changes to the circumstances under which the MSC North Project would be undertaken, and there is no new information of substantial importance that has become available relative to public services. No substantial changes to public services have occurred since certification of the MSC EIR, and no substantial new public services have been identified within the vicinity of the proposed MSC North Modifications.

Conclusion

Based on the above, no new significant public services impacts or substantial increase in previously identified public services impacts would occur as a result of the proposed MSC North Modifications. Therefore, the public services impacts as a result of the proposed MSC North Modifications would not trigger any of the conditions described in CEQA Guidelines, Section 15162 calling for preparation of a subsequent or supplemental EIR.

6.15 Recreation

Issues (and supporting Information Sources)	Substantial Change in Project Requiring Major EIR Revisions	Substantial Change in Circumstances Requiring Major EIR Revisions	New Information Showing New or Greater Significant Effects than Previous EIR	New Information Showing Ability to Reduce, but not Eliminate Significant Effects in Previous EIR	Less Than Significant Impact/No Changes or New Information Requiring Preparation of a Subsequent EIR	No Impact
RECREATION:						
(a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?						X
(b) Does the project include recreational facilities or require the construction or expansion of						X

recreational facilities which might have an adverse physical effect on the environment?	

Discussion: The NOP/IS for the MSC Program and MSC North Project, published on February 8, 2013, analyzed the potential impacts related to recreation. The NOP/IS concluded that the MSC North Project and MSC Program would not result in potentially significant environmental impacts related to recreation, and, therefore, was eliminated from further analysis within the MSC EIR.

The proposed MSC North Modifications would not generate demand for, or affect any existing neighborhood parks, regional parks, or other recreational facilities. Therefore, no impact to recreation resources resulting from the proposed MSC North Modifications would be anticipated.

Substantial Changes with Respect to the Circumstances under Which the Project is Undertaken/New Information of Substantial Importance

There are no substantial changes to the circumstances under which the MSC North Project would be undertaken, and there is no new information of substantial importance that has become available relative to recreation. No substantial changes to recreational resources have occurred since certification of the MSC EIR, and no substantial new recreational resources have been identified within the vicinity of the proposed MSC North Modifications.

Conclusion

Based on the above, no new significant recreation impacts or substantial increase in previously identified recreation impacts would occur as a result of the proposed MSC North Modifications. Therefore, the impacts to recreation as a result of the proposed MSC North Modifications would not trigger any of the conditions described in CEQA Guidelines, Section 15162 calling for preparation of a subsequent or supplemental EIR.

6.16 Transportation and Traffic

Issues (and supporting Information Sources)	Substantial Change in Project Requiring Major EIR Revisions	Substantial Change in Circumstances Requiring Major EIR Revisions	New Information Showing New or Greater Significant Effects than Previous EIR	New Information Showing Ability to Reduce, but not Eliminate Significant Effects in Previous EIR	Less Than Significant Impact/No Changes or New Information Requiring Preparation of a Subsequent EIR	No Impact
TRANSPORTATION / TRAFFIC: Would the project:						
(a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?					X	
(b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?					X	
(c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?						X
(d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?						X
(e) Result in inadequate emergency access?						X
(f) Conflict with adopted policies, plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?						X

Discussion:

The NOP/IS for the MSC Project and MSC Program, published on February 8, 2013, analyzed the potential impacts associated with transportation. The NOP/IS concluded that four of the six transportation-related

thresholds would result in a "less than significant or no impact" and that no further analysis of those topics in an EIR was required. The MSC EIR analyzed potential impacts from conflicts with plans, ordinances, or policy establishing the measures of effectiveness for the performance of the system and conflicts with the congestion management program. The remaining transportation related impacts were eliminated from further analysis within the MSC EIR. The MSC EIR concluded that the MSC North Project would result in significant and unavoidable construction-related traffic impacts at two intersections[20] and would also result in cumulatively considerable significant and unavoidable construction-related traffic impacts.

The proposed MSC North Modifications would not involve any changes to the operational or traffic generating characteristics of the MSC North Project. Based on the overall slight decrease in total square footage of the MSC North Modifications, even including the addition of the 'Gateway' Facility, and shift in construction schedule assumptions, the peak activity period for construction of the MSC North Modifications would not materially change when compared to the MSC North Project, as previously approved in the MSC EIR. Therefore, the construction traffic analysis conducted for the MSC EIR would still be applicable for the MSC North Modifications. As such, there are no potential increases in transportation impacts associated with the proposed MSC North Modifications that were not discussed in the MSC EIR.

Substantial Changes with Respect to the Circumstances under Which the Project is Undertaken/New Information of Substantial Importance

There are no substantial changes to the circumstances under which the MSC North Project would be undertaken, and there is no new information of substantial importance that has become available relative to transportation/traffic. No substantial changes to transportation/traffic have occurred since certification of the MSC EIR, and no substantial new transportation/traffic impacts have been identified associated with the proposed MSC North Modifications.

Conclusion

Based on the above, no new significant traffic impacts or substantial increase in previously identified traffic impacts would occur as a result of the proposed MSC North Modifications. Therefore, the traffic impacts as a result of the proposed MSC North Modifications would not trigger any of the conditions described in CEQA Guidelines, Section 15162 calling for preparation of a subsequent or supplemental EIR.

[20] The two impacted intersections are Imperial Highway and Main Street, and Sepulveda Boulevard and Westchester Parkway.

6.17 Utilities and Service Systems

Issues (and supporting Information Sources)	Substantial Change in Project Requiring Major EIR Revisions	Substantial Change in Circumstances Requiring Major EIR Revisions	New Information Showing New or Greater Significant Effects than Previous EIR	New Information Showing Ability to Reduce, but not Eliminate Significant Effects in Previous EIR	Less Than Significant Impact/No Changes or New Information Requiring Preparation of a Subsequent EIR	No Impact
UTILITIES AND SERVICE SYSTEMS: Would the project:						
(a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?					X	
(b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environment effects?					X	
(c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?					X	
(d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlement needed?					X	
(e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?					X	
(f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?					X	
(g) Comply with federal, state and local statutes and regulations related to solid waste?					X	

Discussion: The NOP/IS for the MSC Program and MSC North Project, published on February 8, 2013, analyzed the potential impacts related to public utilities and service systems. The NOP/IS concluded that the MSC North Project and MSC Program would not result in potentially significant environmental impacts related to public utilities and service systems, and, therefore, was eliminated from further analysis within the MSC EIR.

The proposed MSC North Modifications would not result in residential, commercial, or industrial growth. The utility requirements for the proposed MSC North Modifications would increase slightly due to an increase in passenger-related spaces, but would not be significantly greater than what was anticipated for the MSC North Project. The improvements associated with the MSC North Project and MSC North Modifications are consistent with the LAX Master Plan; therefore, water demand and wastewater generation are not expected to differ from those identified in the LAX Master Plan EIR.

The proposed MSC North Modifications would not have any effect on the approved MSC North Project's requirements to comply with federal, state, and local statutes and regulations related to solid waste that are included in the LAX Master Plan EIR and statutes and regulations adopted after the compilation of the LAX Master Plan EIR.

Substantial Changes with Respect to the Circumstances under Which the Project is Undertaken/New Information of Substantial Importance

There are no substantial changes to the circumstances under which the MSC North Project would be undertaken, and there is no new information of substantial importance that has become available relative to public services and utility systems. No substantial changes to utilities and service systems have occurred since certification of the MSC EIR, and no substantial new utilities and service systems have been identified within the vicinity of the proposed MSC North Modifications.

Conclusion

Based on the above, no new significant public utilities and service system impacts or substantial increase in previously identified public utilities and service system impacts would occur as a result of the proposed MSC North Modifications. Therefore, the public utilities and service system impacts as a result of the proposed MSC North Modifications would not trigger any of the conditions described in CEQA Guidelines, Section 15162 calling for preparation of a subsequent or supplemental EIR.

7. Cumulative Impacts

The MSC EIR concluded that the MSC North Project would have the following cumulatively considerable impacts that cannot be mitigated to a level that is less than significant:

Air Quality

Cumulatively considerable contribution to construction-related air quality impacts, based on significant construction-related MSC North Project impacts.

Greenhouse Gases

Cumulatively considerable contribution to GHG emissions for the MSC North Project and the future phase(s) of the MSC Program.

Human Health Risk Assessment

Cumulatively considerable contribution to acute non-cancer hazards for acrolein for the MSC North Project and the future phase(s) of the MSC Program.

Construction Surface Transportation

Cumulatively considerable contribution to MSC North Project construction-related impacts to two intersections.

Analysis of the Proposed Change in the Project

As examined in the Modified Environmental Checklist Form above, the type and extent of construction activities and the operational characteristics of the proposed MSC North Modifications would not be substantively different from what was evaluated in the MSC EIR for the approved MSC North Project. The MSC North Modifications would not create any new significant environmental effects or cause a substantial increase in the severity of previously identified significant effects, including cumulatively considerable contributions. Thus, no changes relative to the analysis or conclusions regarding cumulative impacts would occur with the proposed MSC North Modifications, and the findings of the MSC EIR and Initial Study remain the same for the revised MSC North Project.

Substantial Changes with Respect to the Circumstances under Which the Project is Undertaken/New Information of Substantial Importance

As described throughout the analysis of resources, there are no substantial changes to the circumstances under which the MSC North Project would be undertaken and there is no new information of substantial importance that has become available relative to cumulative impacts. Therefore, none of the conditions described in CEQA Guidelines, Section 15162 calling for preparation of a subsequent EIR have occurred.

8. Assessment of Changes in Impacts

Section 15164 of the State CEQA Guidelines identifies the circumstances that permit the preparation of an addendum. The State CEQA Guidelines state that, "The lead agency or responsible agency shall prepare an addendum to a previously certified EIR if some changes or additions are necessary but none of the conditions described in Section 15162 calling for preparation of a subsequent EIR have occurred." The State CEQA Guidelines also require that a brief explanation of the decision not to prepare a subsequent EIR pursuant to Section 15162 should be included in an addendum to an EIR, the lead agency's findings on the project, or elsewhere in the record. The explanation must be supported by substantial evidence.

An explanation of why none of the conditions described in Section 15162 calling for the preparation of a subsequent EIR have occurred is provided below.

(1) *Substantial changes are proposed in the project which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects.*

The proposed changes to the MSC North Project analyzed in this EIR Addendum constitute minor changes to the overall MSC North Project. No new or different activities that have the possibility of resulting in a significant physical impact on the environment were identified in this Addendum.

(2) *Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR or Negative Declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects.*

The MSC North Project and the expected operation of the Project have not changed with the proposed modifications assessed in this EIR Addendum. The MSC North Modifications do not represent a substantial change in circumstances, no new significant environmental effects have been identified, and there would be no substantial increase in the severity of previously identified significant effects. There have not been any significant changes in City regulations related to the Airport property. Further, there have not been any significant changes in the federal or State rules related to Airport operations.

(3) *New information of substantial importance, which was not known and could not have been known, with the exercise of reasonable diligence at the time the previous EIR was certified as complete or the Negative Declaration was adopted, shows any of the following:*

(A) The project will have one or more significant effects not discussed in the previous EIR or Negative Declaration.

There is no evidence to suggest that the changes contemplated by this EIR Addendum would result in any new or more significant impacts on the environment. The MSC North Project has not changed in a way that would result in a significant physical impact on the environment that is different from the potential impacts identified in the MSC EIR. All previously identified mitigation measures contained in the MSC EIR's Mitigation Monitoring and Reporting Program remain in effect and applicable per their terms.

(B) Significant effects previously examined will be substantially more severe than shown in the previous EIR.

None of the effects identified in this Addendum would be substantially more severe than those identified in the MSC EIR. All of the effects identified in this Addendum would be similar to those identified in the MSC EIR.

(C) Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative.

The MSC North Project has not changed in any way that would result in significant physical changes in the environment beyond those already contemplated, analyzed, and disclosed in the MSC EIR. The modifications to the MSC North Project have no effect on the mitigation measures contemplated during preparation of the MSC EIR, and no mitigation measures previously found not to be feasible would become feasible with the MSC North Modifications. Further, all mitigation measures identified in the MSC EIR's Mitigation Monitoring and Reporting Program remain applicable.

(D) Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

There would be no change to the significant impacts identified in the MSC EIR as a result of the proposed MSC North Modifications. No additional mitigation measures or alternatives have been identified that would substantially reduce the significant impacts identified in the MSC EIR. Previously identified mitigation measures contained in the MSC EIR's Mitigation Monitoring and Reporting Program remain applicable.

9. Conclusion

Based on this analysis and the information contained in this EIR Addendum, there is no evidence that major changes or revisions to the MSC EIR would be required as a result of the proposed MSC North Modifications, and only the technical changes in the scope of the MSC North Project need to be documented. Comparison of the project design and layout assessed within the MSC EIR and the design and layout of the proposed MSC North Modifications indicates that the proposed changes would not result in a new significant impact or substantial increase in the severity of previously identified impacts in the 2014 MSC EIR and that the initial EIR adequately addresses any additional environmental effects that may be caused by the proposed modification. There are no substantial changes to the circumstances under which the MSC North Project will be undertaken, and no new information of substantial importance which was not known and could not have been known when the MSC EIR was certified has since been identified. Therefore, none of the conditions described in Section 15162 calling for preparation of a subsequent EIR have occurred. As such, this Addendum to the MSC EIR satisfies CEQA requirements for the proposed MSC North Modifications.

Appendix A

Air Quality and Greenhouse Gases

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1. Introduction

This Air Quality and Greenhouse Gases appendix was developed to assist with the public disclosure requirements established under the California Environmental Quality Act (CEQA). The second addendum to the Midfield Satellite Concourse (MSC) EIR addresses the potential effects to air quality and climate change from the development of the proposed MSC North Modifications. This Air Quality and Greenhouse Gases appendix identifies the technical assumptions, methodologies, databases, and models that were used to conduct the Air Quality and Greenhouse Gas Emissions analyses for the EIR addendum.

1.1 Background

Los Angeles World Airports (LAWA) is in the midst of a multi-billion dollar modernization program at Los Angeles International Airport (LAX or the Airport). LAX is the nation's third busiest airport in terms of total annual passengers and in terms of total annual aircraft operations. Although it has functioned as an airport since 1928, the main terminal complex at LAX was constructed in 1961 and its facilities are in need of modernization.

The LAX Master Plan, approved by the City of Los Angeles City Council in December 2004, is the strategic framework for future development at LAX. The main components of the LAX Master Plan include the modernization of the runway and taxiway system, redevelopment of the terminal area, access improvements to the Airport, and enhancement of passenger safety, security, and convenience. The LAX Master Plan was the subject of a joint Environmental Impact Statement (EIS) and Environmental Impact Report (EIR) completed in January 2005. The City of Los Angeles City Council certified the Final EIR as complying with the California Environmental Quality Act (CEQA) and the Federal Aviation Administration (FAA) issued a Record of Decision on the Final EIS in compliance with the National Environmental Policy Act (NEPA).

The approved LAX Master Plan includes the development of the "West Satellite Concourse". Subsequent to the release of the Final EIR/EIS, the West Satellite Concourse was renamed the Midfield Satellite Concourse (MSC). The LAX Master Plan EIS/EIR assessed the MSC at a programmatic level under CEQA, meaning that additional project level CEQA review is required before LAWA can construct and operate one or more components of the MSC Program.

The overall MSC Program, as documented in the LAX Master Plan, includes the following facilities:

- A Midfield Satellite Concourse (MSC);
- A Central Terminal Processor (CTP) in the Central Terminal Area (CTA);
- A connector/conveyance system between the MSC and the CTP; and
- Construction of new taxiways/taxilanes, apron areas, and utilities to service the MSC.

Due to the size and scale of the MSC Program, LAWA proposes to implement the program in phases. Phase I ("MSC North Project") of the MSC Program is the construction of the northern portion of the multi-story MSC facility and associated improvements. Future phase(s) will include extension of the MSC North facility, the CTP, and a connector/conveyance system between the MSC and CTP. The MSC North Project is intended to improve the terminal operations, concessions facilities, and overall passenger experience at LAX. The facility would be designed to serve both domestic and international traffic.

As part of the natural progression of the design process, plans for the MSC North Project have been further refined. Therefore, the City of Los Angeles, through its aviation department, LAWA, proposes to make modifications to the previously approved MSC at LAX, known as the proposed MSC North Modifications. An overview of changes to the proposed MSC North Project are provided in Section 1.3.

1.2 Project Location

The Airport is located on the western end of the Los Angeles Basin and is bounded on the north by the City of Los Angeles communities of Westchester and Playa Del Rey, on the east by the City of Inglewood and the community of Lennox (unincorporated Los Angeles County), to the south by the City of El Segundo and the community of Del Aire (unincorporated Los Angeles County), and to the west by the Pacific Ocean. The MSC facility would be located in the western portion of the LAX airfield within the Air Operations Area (AOA) west of the Tom Bradley International Terminal (TBIT).

1.3 Project Components

As part of the natural progression of the design process, plans for the MSC North Project have been further refined and altered. As defined in the MSC EIR, the northern limit of the MSC North concourse building was established by the proposed relocated Taxiway D object free area (OFA) limit under the LAX Master Plan Alternative D. LAWA is now proposing to extend the MSC to the north, beyond the proposed Master Plan Alternative D Taxiway/Taxilane D OFA limit, since this can be done without impacting existing facilities. In addition, LAWA has refined other components of the MSC North Project. The addendum to the MSC EIR addresses the following proposed MSC North Modifications:

- Modifications to the dimensions and footprint of the MSC Concourse;
- Modifications to the proposed passenger and baggage tunnels;
- A refined concept for the FAA ramp tower;
- The addition of a 'Gateway' facility to provide passenger access to the MSC from TBIT; and
- Relocation of the proposed LADWP electrical facility

1.4 Pollutants of Interest

1.4.1 CRITERIA POLLUTANTS

Six criteria pollutants were evaluated for the proposed MSC North Modfications: ozone (O_3) using as surrogates volatile organic compounds (VOCs) and oxides of nitrogen (NO_X), nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter with an aerodynamic diameter less than or equal to 10 micrometers (PM_{10}), and particulate matter with an aerodynamic diameter less than or equal to 2.5 micrometers ($PM_{2.5}$). These pollutants were analyzed because they were shown to have potentially significant impacts in the air quality analysis documented in Chapter 4.1, *Air Quality,* of the MSC EIR. In addition, these six criteria pollutants are considered to be pollutants of concern based on the type of emission sources associated with construction of the proposed MSC North Modifications, and are thus included in this assessment. Although lead (Pb) is a criteria pollutant, it was not evaluated in the EIR Addendum because the proposed MSC North Modifications would have negligible impacts on Pb levels in the Basin. The only source of lead emissions from LAX is from aviation gasoline (AvGas) associated with piston-engine general aviation aircraft; however, due to the low number of piston-engine general aviation aircraft operations at LAX, AvGas quantities are low and emissions from these sources would not be affected by the proposed MSC North Modifications. Sulfate compounds (e.g., ammonium sulfate) are generally not emitted directly into the air but are formed through various chemical reactions in the atmosphere; thus, sulfate is considered a secondary pollutant. All sulfur emitted by airport-related sources included in this analysis was assumed to be released and to remain in the atmosphere as SO_2. Therefore, no sulfate inventories or concentrations were estimated.

Following standard industry practice, the evaluation of O_3 was conducted by evaluating emissions of VOCs and NO_X, which are precursors in the formation of O_3. O_3 is a regional pollutant and ambient concentrations can only be predicted using regional photochemical models that account for all sources of precursors, which is beyond the scope of this analysis. Therefore, no photochemical O_3 modeling was conducted. Additional information regarding the six criteria pollutants that were evaluated in the air quality analysis is presented below.

1.4.1.1 Ozone (O_3)

O_3, a component of smog, is formed in the atmosphere rather than being directly emitted from pollutant sources. O_3 forms as a result of VOCs and NO_X reacting in the presence of sunlight in the atmosphere. O_3 levels are highest in warm-weather months. VOCs and NO_X are termed "O_3 precursors" and their emissions are regulated in order to control the creation of O_3.

O_3 damages lung tissue and reduces lung function. Scientific evidence indicates that ambient levels of O_3 not only affect people with impaired respiratory systems (e.g., asthmatics), but also healthy children and adults. O_3 can cause health effects such as chest discomfort, coughing, nausea, respiratory tract and eye irritation, and decreased pulmonary functions.

1.4.1.2 Nitrogen Dioxide (NO_2)

NO_2 is a reddish-brown to dark brown gas with an irritating odor. NO_2 forms when nitric oxide reacts with atmospheric oxygen. Most sources of NO_2 are man-made; the primary source of NO_2 is high-temperature combustion. Significant sources of NO_2 at airports are boilers, aircraft operations, and vehicle movements. NO_2 emissions from these sources are highest during high-temperature combustion, such as aircraft takeoff mode.

NO_2 may produce adverse health effects such as nose and throat irritation, coughing, choking, headaches, nausea, stomach or chest pains, and lung inflammation (e.g., bronchitis, pneumonia).

1.4.1.3 Carbon Monoxide (CO)

CO is an odorless, colorless gas that is toxic. It is formed by the incomplete combustion of fuels. The primary sources of this pollutant in Los Angeles County are automobiles and other mobile sources. The health effects associated with exposure to CO are related to its interaction with hemoglobin once it enters the bloodstream. At high concentrations, CO reduces the amount of oxygen in the blood, causing heart difficulties in people with chronic diseases, reduced lung capacity, and impaired mental abilities.

1.4.1.4 Particulate Matter (PM_{10}) and Fine Particulate Matter ($PM_{2.5}$)

Particulate matter consists of solid and liquid particles of dust, soot, aerosols, and other matter small enough to remain suspended in the air for a long period of time. PM_{10} refers to particulate matter with an aerodynamic diameter less than or equal to 10 micrometers (microns, um or µm) and $PM_{2.5}$ refers to particulate matter with an aerodynamic diameter less than or equal to 2.5 micrometers. Particles smaller than 10 micrometers (i.e., PM_{10} and $PM_{2.5}$) represent that portion of particulate matter thought to represent the greatest hazard to public health. PM_{10} and $PM_{2.5}$ can accumulate in the respiratory system and are associated with a variety of negative health effects. Exposure to particulate matter can aggravate existing respiratory conditions, increase respiratory symptoms and disease, decrease long-term lung function, and possibly cause premature death. The segments of the population that are most sensitive to the negative effects of particulate matter in the air are the elderly, individuals with cardiopulmonary disease, and children. Aside from adverse health effects, particulate matter in the air causes a reduction of visibility and damage to paints and building materials.

A portion of the particulate matter in the air comes from natural sources such as windblown dust and pollen. Man-made sources of particulate matter include fuel combustion, automobile exhaust, field burning, cooking, tobacco smoking, factories, and vehicle movement on, or other man-made disturbances of, unpaved areas. Secondary formation of particulate matter may occur in some cases where gases like sulfur oxides (SO_X) and NO_X interact with other compounds in the air to form particulate matter. In the Basin, both VOCs and

ammonia are also considered precursors to $PM_{2.5}$. Fugitive dust generated by construction activities is a major source of suspended particulate matter.

The secondary creators of particulate matter, SO_X and NO_X, are also major precursors to acidic deposition (acid rain). While SO_X is a major precursor to particulate matter formation, NO_X has other environmental effects. NO_X reacts with ammonia, moisture, and other compounds to form nitric acid and related particles. Human health concerns include effects on breathing and the respiratory system, damage to lung tissue, and premature death. Small particles penetrate into sensitive parts of the lungs and can cause or worsen respiratory disease. NO_X has the potential to change the composition of some species of vegetation in wetland and terrestrial systems, to create the acidification of freshwater bodies, impair aquatic visibility, create eutrophication of estuarine and coastal waters, and increase the levels of toxins harmful to aquatic life.

1.4.1.5 Sulfur Dioxide (SO_2)

Sulfur oxides are formed when fuel containing sulfur (typically, coal and oil) is burned, and during other industrial processes. The term "sulfur oxides" accounts for distinct but related compounds, primarily SO_2 and sulfur trioxide. As a conservative assumption for this analysis, it was assumed that all SO_X are emitted as SO_2; therefore, SO_X and SO_2 are considered equivalent in this document. Higher SO_2 concentrations are usually found in the vicinity of large industrial facilities.

The physical effects of SO_2 include temporary breathing impairment, respiratory illness, and aggravation of existing cardiovascular disease. Children and the elderly are most susceptible to the negative effects of exposure to SO_2.

1.4.2 GREENHOUSE GASES

Parts of the earth's atmosphere act as an insulating blanket, trapping sufficient solar energy to keep the global average temperature in a suitable range. The blanket is a collection of atmospheric gases called GHGs. These gases – primarily water vapor, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), ozone, chlorofluorocarbons (CFCs), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6) – all act as effective global insulators, reflecting back to earth visible light and infrared radiation. Human activities, such as producing electricity and driving vehicles, have elevated the concentrations of these gases in the atmosphere. Many scientists believe that these elevated levels, in turn, are causing the earth's temperature to rise. A warmer earth may lead to changes in rainfall patterns, much smaller polar ice caps, a rise in sea level, and a wide range of impacts on plants, wildlife, and humans.

Climate change is driven by "forcings" and "feedbacks." Radiative forcing is the difference between the incoming energy and outgoing energy in the climate system. A feedback is "an internal climate process that amplifies or dampens the climate response to a specific forcing." The global warming potential (GWP) is the potential of a gas or aerosol to trap heat in the atmosphere; it is the "cumulative radiative forcing effects of a gas over a specified time horizon resulting from the emission of a unit mass of gas relative to a reference gas." Individual GHG species have varying GWP and atmospheric lifetimes. The carbon dioxide equivalent (CO_2e) -- the mass emissions of an individual GHG multiplied by its GWP -- is a consistent methodology for comparing GHG emissions because it normalizes various GHG emissions to a consistent metric. The reference gas for

GWP is CO_2; CO_2 has a GWP of 1. Compared to CH_4's GWP of 21, CH_4 has a greater global warming effect than CO_2 on a molecule-per-molecule basis. **Table 1** identifies the GWP of several select GHGs using the IPCC's Second Assessment Report.

Table 1: Global Warming Potentials and Atmospheric Lifetimes of Select Greenhouse Gases

GAS	ATMOSPHERIC LIFETIME (YEARS)	GLOBAL WARMING POTENTIAL (100 YEAR TIME HORIZON)
Carbon Dioxide (CO_2)	50 – 200	1
Methane (CH_4)	12	21
Nitrous Oxide (N_2O)	120	310
HFC-23	264	11,700
HFC-134a	14.6	1,300
HFC-152a	1.5	140
PFC: Perfluromethane (CF_4)	50,000	6,500
PFC: Perfluoroethane (C_2F_6)	10,000	9,200
Sulfur Hexaflouride (SF_6)	3,200	23,900

SOURCE: Intergovernmental Panel on Climate Change, Climate Change 1995: The Science of Climate Change. Contribution of Working Group I to the Second Assessment Report (SAR) of the Intergovernmental Panel on Climate Change, 1996.[1]

PREPARED BY: Ricondo & Associates, Inc., June 2016.

[1] GWP values have been updated in IPCC's subsequent assessment reports (e.g., Third Assessment Report [TAR], etc.). However, in accordance with international and U.S. convention to maintain the value of the carbon dioxide 'currency', GHG emission inventories are calculated using the GWPs from the IPCC SAR.

2. Regulatory Setting

Air quality is regulated by federal, State, and local laws. On the federal level, air quality is governed by the federal Clean Air Act (CAA) administered by the United States Environmental Protection Agency (USEPA). Additionally, air quality in California is governed by regulations under the California Clean Air Act (CCAA) administered by the California Air Resources Board (CARB) and by the regional air quality management districts. Air quality in the Los Angeles region is subject to the rules and regulations established by CARB and the South Coast Air Quality Management District (SCAQMD).

Greenhouse Gas emissions are primarily regulated on the State and local level with some federal regulations concerning GHG and fuel efficiency standards for passenger cars, light-duty trucks, and medium- and heavy-duty engines and vehicles from USEPA and the National Highway Traffic Safety Administration. Various international, federal, State, and local agencies also provide guidance concerning GHG emissions.

2.1 Federal/International

2.1.1 CRITERIA POLLUTANTS

The USEPA is responsible for enforcing the CAA. Under the authority granted by the CAA, USEPA has established National Ambient Air Quality Standards (NAAQS) for the following criteria pollutants: CO, NO_2, O_3, PM_{10}, $PM_{2.5}$, SO_2, and Pb. **Table 2** presents the NAAQS that are currently in effect for criteria air pollutants. O_3 is a secondary pollutant, meaning that it is formed from reactions of precursor compounds under certain conditions. As previously discussed, the primary precursor compounds that can lead to the formation of O_3 include VOCs and NO_X.

The CAA also specifies future dates for achieving compliance with the NAAQS and mandates that states submit and implement a State Implementation Plan (SIP) for local areas not meeting these standards. These plans must include pollution control measures that demonstrate how the standards will be met. The 1990 amendments to the CAA identify specific emission reduction goals for areas not meeting the NAAQS. These amendments require both a demonstration of reasonable further progress toward attainment and incorporation of additional sanctions for failure to attain or meet interim milestones.

Table 2: National and California Ambient Air Quality Standards (NAAQS and CAAQS)

			NAAQS	
POLLUTANT	**AVERAGING TIME**	**CAAQS**	**PRIMARY**	**SECONDARY**
Ozone (O_3)	8-hour	0.070 ppm (137 µg/m^3)	0.075 ppm (147 µg/m^3)	Same as Primary
	1-Hour	0.09 ppm (180 µg/m^3)	N/A [5/]	N/A
Carbon Monoxide (CO)	8-hour	9.0 ppm (10 mg/m^3) [6/]	9 ppm (10 mg/m^3)	N/A
	1-Hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	N/A
Nitrogen Dioxide (NO_2)	Annual	0.030 ppm (57 µg/m^3)	0.053 ppm (100 µg/m^3)	Same as Primary [1/]
	1-Hour	0.18 ppm (339 µg/m^3)	100 ppb (188 µg/m^3) [7/]	N/A
Sulfur Dioxide (SO_2) [2/]	Annual	N/A	0.03 ppm (80 µg/m^3)	N/A
	24-Hour	0.04 ppm (105 µg/m^3)	0.14 ppm (365 µg/m^3)	N/A
	3-Hour	N/A	N/A	0.5 ppm (1300 µg/m^3)
	1-Hour	0.25 ppm (655 µg/m^3)	75 ppb (196 µg/m^3)	N/A
Respirable Particulate Matter (PM_{10})	AAM	20 µg/m^3	N/A	N/A
	24-Hour	50 µg/m^3	150 µg/m^3	Same as Primary
Fine Particulate Matter ($PM_{2.5}$)	AAM	12 µg/m^3	12.0 µg/m^3	15 µg/m^3
	24-Hour	N/A	35 µg/m^3	Same as Primary
Lead (Pb)	Rolling 3-Month Average	N/A	0.15 µg/m^3	Same as Primary
	Monthly	1.5 µg/m^3	N/A	N/A
Visibility Reducing Particles	8-Hour	Extinction of 0.23 per kilometer	N/A	N/A
Sulfates	24-Hour	25 µg/m^3	N/A	N/A

NOTES:

NAAQS = National Ambient Air Quality Standards

CAAQS = California Ambient Air Quality Standards

ppm = parts per million (by volume)

µg/m^3 = micrograms per cubic meter

N/A = Not applicable

mg/m^3 = milligrams per cubic meter

AAM = Annual arithmetic mean

1/ On March 20, 2012, the USEPA took final action to retain the current secondary NAAQS for NO_2 (0.053 ppm averaged over a year) and SO_2 (0.5 ppm averaged over three hours, not to be exceeded more than once per year) (77 Federal Register [FR] 20264).

2/ On June 22, 2010, the 1-hour SO_2 NAAQS was updated and the previous 24-hour and annual primary NAAQS were revoked. The previous 1971 SO_2 NAAQS (24-hour: 0.14 ppm; annual: 0.030 ppm) remains in effect until one year after an area is designated for the 2010 NAAQS (75 FR 35520).

SOURCE: California Air Resources Board, "Ambient Air Quality Standards," May 5, 2016, available: www.arb.ca.gov/research/aaqs/aaqs2.pdf (accessed May 24, 2016).

PREPARED BY: Ricondo & Associates, Inc., July 2016.

LAX is located within the South Coast Air Basin (Basin), which is a sub-region of the SCAQMD's jurisdiction including all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino counties. The Basin is designated as a federal non-attainment area for O_3, $PM_{2.5}$, and Pb. Nonattainment designations under the CAA for O_3 are categorized into levels of severity based on the level of concentration above the standard, which is also used to set the required attainment date. The Basin is classified as an extreme nonattainment area for O_3. The Basin was reclassified on September 22, 1998 to attainment/maintenance for NO_2 and on June 11, 2007 for CO since concentrations of these pollutants dropped below the NO_2 and CO NAAQS for several years. More recently, the Los Angeles Basin was reclassified to attainment/maintenance for PM_{10} on July 26, 2013. Attainment/maintenance means that the pollutant is currently in attainment and that measures are included in the SIP to ensure that the NAAQS for that pollutant are not exceeded again (maintained). **Table 3** presents the NAAQS and CAAQS attainment designation for each of the federal criteria air pollutants.

Table 3: South Coast Air Basin Attainment Status

POLLUTANT	NATIONAL STANDARDS (NAAQS) [1/]	CALIFORNIA STANDARDS (CAAQS) [2/]
Ozone (O_3)	Nonattainment – Extreme	Nonattainment
Carbon Monoxide (CO)	Attainment – Maintenance	Attainment
Nitrogen Dioxide (NO_2)	Attainment – Maintenance	Attainment
Sulfur Dioxide (SO_2)	Attainment	Attainment
Respirable Particulate Matter (PM_{10})	Attainment - Maintenance	Nonattainment
Fine Particulate Matter ($PM_{2.5}$)	Nonattainment [3/]	Nonattainment
Lead (Pb)	Nonattainment	Attainment

NOTES:

1/ Status as of June 17, 2016.

2/ Effective December 2015.

3/ Classified as moderate nonattainment for 2012 NAAQS and serious nonattainment for 2006 NAAQS.

SOURCES: U.S. Environmental Protection Agency, *Green Book Nonattainment Areas*, Available http://www3.epa.gov/airquality/greenbk/index.html. As of May 24, 2016; California Air Resources Board, "Area Designations Maps/State and National," Available: http://www.arb.ca.gov/desig/adm/adm.htm, effective December 2015.

PREPARED BY: Ricondo & Associates, Inc., September 2016.

2.1.2 GREENHOUSE GASES

2.1.2.1 International Governmental Panel on Climate Change (IPCC)

In 1988, the United Nations and the World Meteorological Organization established the IPCC to assess "the scientific, technical and socioeconomic information relevant to understanding the scientific basis of risk of human-induced climate change, its potential impacts, and options for adaptation and mitigation."

2.1.2.2 United Nations Framework Convention on Climate Change

On March 21, 1994, the U.S. joined other countries around the world in signing the United Nations Framework Convention on Climate Change (UNFCCC). Under the Convention, governments gather and share information on GHG emissions, national policies, and best practices; launch national strategies for addressing GHG emissions and adapting to expected impacts, including the provision of financial and technological support to developing countries; and cooperate in preparing for adaptation to the impacts of climate change.

2.1.2.3 Kyoto Protocol

The Kyoto Protocol is a treaty made under the UNFCCC. Countries can sign the treaty to demonstrate their commitment to reduce their emissions of GHGs or engage in emissions trading. More than 160 countries, accounting for 55 percent of global emissions, are under the protocol. The U.S. symbolically signed the Protocol in 1998. However, in order for the Protocol to be formally ratified, it must be adopted by the U.S. Senate, which has not been done to date. The original GHG reduction commitments made under the Protocol expired at the end of 2012. A second commitment period was agreed to at the Doha, Qatar, meeting held December 8, 2012, which extended the commitment period to December 31, 2020.

2.1.2.4 Massachusetts et al. v. United States Environmental Protection Agency et al.

Massachusetts et. al. v. Environmental Protection Agency et. al. (549 U.S. 497 [2007]) was argued before the U.S. Supreme Court on November 29, 2006, in which it was petitioned that USEPA regulate four GHGs, including CO_2, under Section 202(a)(1) of the Clean Air Act (CAA). The Court issued an opinion on April 2, 2007, in which it held that petitioners have standing to challenge the USEPA and that the USEPA has statutory authority to regulate emissions of GHGs from motor vehicles.

2.1.2.5 Endangerment Finding

The USEPA subsequently published its endangerment finding for GHGs in the Federal Register, which responds to the court case noted above. The USEPA Administrator determined that six GHGs, taken in combination, endanger both the public health and welfare of current and future generations. Although the endangerment finding discusses the effects of six GHGs, it acknowledges that transportation sources only emit four of the key GHGs: CO_2, CH_4, N_2O, and HFCs. Further, the USEPA Administrator found that the combined emissions of these GHGs from new motor vehicles contribute to air pollution that endangers the public health and welfare under the CAA, Section 202(a).

2.1.2.6 GHG and Fuel Efficiency Standards for Passenger Cars and Light-Duty Trucks

In April 2010, the USEPA and National Highway Traffic Safety Administration (NHTSA) finalized GHG standards for new (model year 2012 through 2016) passenger cars, light-duty trucks, and medium-duty passenger vehicles. Under these standards, CO_2 emission limits would decrease from 295 grams per mile (g/mi) in 2012 to 250 g/mi in 2016 for a combined fleet of cars and light trucks. If all of the necessary emission reductions were made from fuel economy improvements, then the standards would correspond to a combined fuel economy of 30.1 miles per gallon (mpg) in 2012 and 35.5 mpg in 2016. The agencies issued a joint Final Rule for a coordinated National Program for model years 2017 to 2025 light-duty vehicles on August 28, 2012, that would correspond to a combined fuel economy of 36.6 mpg in 2017 and 54.5 mpg in 2025.

2.1.2.7 GHG and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles

In October 2010, the USEPA and NHTSA announced a program to reduce GHG emissions and to improve fuel efficiency for medium- and heavy-duty vehicles (model years 2014 through 2018). These standards were signed into law on August 9, 2011. The two agencies' complementary standards form a new Heavy-Duty National Program that has the potential to reduce GHG emissions by 270 million metric tons and to reduce oil consumption by 530 million barrels over the life of the affected vehicles.

2.2 State of California

2.2.1 CRITERIA POLLUTANTS

The CCAA, signed into law in 1988, requires all areas of the state to achieve and maintain the CAAQS by the earliest practical date. The CAAQS are at least as stringent as, and in several cases more stringent than, the NAAQS and include several more pollutants such as visibility reducing particles, sulfates, hydrogen sulfide, and vinyl chloride. The currently applicable CAAQS are presented with the NAAQS in Table 2. The attainment status with regard to the CAAQS is presented in Table 3 along with the federal attainment status for each criteria pollutant. Additionally, the area is in attainment for sulfates and unclassified for hydrogen sulfide and visibility reducing particles.

CARB has been granted jurisdiction over a number of air pollutant emission sources that operate in the State. Specifically, CARB has the authority to develop emission standards for on-road motor vehicles, as well as for stationary sources and some off-road mobile sources. In turn, CARB has granted authority to the regional air pollution control and air quality management districts to develop stationary source emission standards, issue air quality permits, and enforce permit conditions.

2.2.2 GREENHOUSE GASES

2.2.2.1 California Air Resources Board

In October 2008, CARB published draft preliminary guidance to agencies on how to establish interim significance thresholds for analyzing GHG emissions in Recommended Approaches for Setting Interim Thresholds for Greenhouse Gases under the California Environmental Quality Act. For industrial projects, the CARB guidance proposed that projects that emit less than 7,000 metric tons of CO_2e ($MTCO_2e$) per year (amortized), as well as meeting performance standards for construction and transportation, may be considered less than significant.

2.2.2.2 Title 24 Energy Standards

Although not originally intended to reduce GHG emissions, California's Energy Efficiency Standards for Residential and Nonresidential Buildings (California Code of Regulations, Title 24, Part 6) were first established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficient technologies and methods. The latest amendments were made in April 2008 and went into effect on January 1, 2010. The premise for the standards is that energy efficient buildings require less electricity, natural gas, and other fuels.

Electricity production from fossil fuels and on-site fuel combustion (typically for water heating) results in GHG emissions. Therefore, increased energy efficiency in buildings results in fewer GHG emissions on a building-by-building basis.

2.2.2.3 California Assembly Bill 1493 (AB 1493) - Pavley

Enacted on July 22, 2002, this bill required CARB to develop and adopt regulations that reduce GHGs emitted by passenger vehicles and light-duty trucks. Regulations adopted by CARB apply to 2009 and later model year vehicles. CARB estimates that the regulation will reduce GHG emissions from the light-duty and passenger vehicle fleet by an estimated 18 percent in 2020 and by 27 percent in 2030, compared to recent years. In 2011, the U.S. Department of Transportation, USEPA, and California announced a single timeframe for proposing fuel and economy standards, thereby aligning the Pavley standards with the federal standards for passenger cars and light-duty trucks. Emission estimates included in this analysis account for the Pavley-I standards.

2.2.2.4 Executive Order S-3-05

California Governor Arnold Schwarzenegger announced on June 1, 2005, through Executive Order S-3-05, the following GHG emission reduction targets for all of California: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; and by 2050, reduce GHG emissions to 80 percent below 1990 levels.

2.2.2.5 California Assembly Bill 32 (AB 32)

AB 32, titled The California Global Warming Solutions Act of 2006 and signed by Governor Schwarzenegger in September 2006, requires CARB to adopt regulations to require the reporting and verification of Statewide GHG emissions and to monitor and enforce compliance with the program. In general, the bill requires CARB to reduce Statewide GHG emissions to the equivalent of those in 1990 by 2020. CARB adopted regulations in December 2007 for mandatory GHG emissions reporting. On August 24, 2011, CARB adopted the scoping plan indicating how emission reductions will be achieved. Part of the scoping plan includes an economy-wide cap-and-trade program. The final cap-and-trade plan was approved on October 21, 2011 and went into effect on January 1, 2013.

2.2.2.6 California Senate Bill 375 (SB 375)

SB 375 requires CARB to set regional targets for 2020 and 2035 to reduce GHG emissions from passenger vehicles. A regional target will be developed for each of the 18 metropolitan planning organizations (MPOs) in the State; the Southern California Association of Governments (SCAG) is the MPO that has jurisdiction over the LAX area. A Regional Targets Advisory Committee (RTAC) was appointed by CARB to provide recommendations to be considered and methodologies to be used in CARB's target setting process. The final RTAC report was released on January 23, 2009.

Each MPO is required to develop Sustainable Community Strategies through integrated land use and transportation planning and to demonstrate an ability to attain the proposed reduction targets by 2020 and 2035. CARB issued an eight percent per capita reduction target to the SCAG region for 2020 and a target of

13 percent per capita reduction by 2035. SCAG adopted the Regional Transportation Plan/Sustainable Community Strategies for the six-county southern California region on April 4, 2012.

2.2.2.7 Executive Order S-01-07 and the Low Carbon Fuel Standard

California Executive Order S-01-07 established a Statewide goal to reduce the carbon intensity of transportation fuels sold in California by at least 10 percent by 2020 from 2005. The Executive Order also mandated the creation of Low Carbon Fuel Standard (LCFS) for transportation fuels. The LCFS requires that the life-cycle GHG emissions for the mix of fuels sold in California decline on average. Each fuel provider may meet the standard by selling fuel with lower carbon content, using previously banked credits from selling fuel that exceeded the LCFS, or purchasing credit from other fuel providers who have earned credits. On December 29, 2011, U.S. District Judge Lawrence O'Neill granted an injunction to prevent CARB from implementing the LCFS because it violates a federal law on interstate commerce. CARB's motion to stay the decision was also subsequently denied on January 24, 2012 (Rocky Mountain Farmers Union v. Goldstene, E.D. Cal., No. 09-cv-02234).

2.2.2.8 Senate Bill 97 (SB 97)

SB 97 requires the Office of Planning and Research (OPR) to prepare guidelines to submit to the California Natural Resources Agency (CNRA) regarding feasible mitigation of GHG emissions or the effects of GHG emissions as required by CEQA. The CNRA adopted amendments to the State CEQA Guidelines for GHG emissions on December 30, 2009. The amendments became effective on March 18, 2010. The guidelines apply retroactively to any incomplete EIR, negative declaration, mitigated negative declaration, or other related document, and are reflected in this appendix.

2.2.2.9 Renewables Portfolio Standard

Senate Bill 1078 (SB 1078) (Chapter 516, Statutes of 2002) requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 20 percent of their supply from renewable sources by 2017. SB 107 (Chapter 464, Statutes of 2006) changed the target date to 2010. In November 2008, the Governor signed Executive Order S-14-08, which expands the State's Renewable (Energy) Portfolio Standard (RPS) to 33 percent renewable power by 2020. On September 15, 2009, the Governor issued Executive Order S-21-0911 requiring CARB, under its AB 32 authority, to adopt regulations to meet a 33 percent RPS target by 2020. The CARB regulations would use a phased-in or tiered requirement to increase the amount of electricity from eligible renewable sources over an eight year period beginning in 2012. CARB adopted the regulations in September 2010. In March 2011, the Legislature passed SB X1-2, which was signed into law by the Governor the following month. SB X1-2 requires utilities to procure renewable energy products equal to 33 percent of retail sales by December 31, 2020 and also establishes interim targets: 20 percent by December 31, 2013 and 25 percent by December 31, 2016. SB X1-2 also applies to publicly-owned utilities in California. According to the most recent data available from the Los

Angeles Department of Water and Power (LADWP), the utility provider for the City of Los Angeles, approximately 20 percent of its electricity purchases in 2014 were from eligible renewable sources.[2]

2.3 Regional

2.3.1 CRITERIA POLLUTANTS

2.3.1.1 South Coast Air Quality Management District

SCAQMD has jurisdiction over an area of 10,743 square miles consisting of Orange County and the urban, non-desert portions of Los Angeles, Riverside, and San Bernardino Counties, and the Riverside County portions of the Salton Sea Air Basin and Mojave Desert Air Basin. The Basin is a sub-region of SCAQMD's jurisdiction and covers an area of 6,745 square miles. While air quality in this area has improved, the Basin requires continued diligence to meet air quality standards.

The SCAQMD has adopted a series of Air Quality Management Plans (AQMPs) to meet the CAAQS and NAAQS. SCAQMD and CARB have adopted the 2012 AQMP which incorporates the latest scientific and technological information and planning assumptions, including the 2012-2035 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), and updated emission inventory methodologies for various source categories. The Final 2012 AQMP was adopted by the AQMD Governing Board on December 7, 2012. SCAQMD released the Draft 2016 AQMP for public review on June 30, 2016. The Draft 2016 AQMP includes baseline emissions assumptions consistent with the 2016 RTP/SCS, approved by SCAG on April 7, 2016. As the 2016 AQMP has not yet been approved, the 2012 AQMP is the most appropriate plan to use for consistency analysis.

The SCAQMD has developed CEQA operational and construction-related thresholds of significance for air pollutant emissions from projects proposed in the Basin. Construction and operational emission thresholds are summarized in **Table 4**.

[2] Los Angeles Department of Water and Power, "Power Content Label", Available: https://ladwp.com/ladwp/faces/ladwp/aboutus/a-power/a-p-powercontentlabel?_adf.ctrl-state=2tz5uxw6k_4, Accessed: June 10, 2016.

Table 4: SCAQMD CEQA Thresholds of Significance for Air Pollutant Emissions in the South Coast Air Basin

	MASS EMISSION THRESHOLDS LBS/DAY	
POLLUTANT	**CONSTRUCTION**	**OPERATIONS**
Carbon monoxide, CO	550	550
Volatile organic compounds, VOC [1/]	75	55
Nitrogen oxides, NO_X	100	55
Sulfur dioxide, SO_2	150	150
Respirable particulate matter, PM_{10}	150	150
Fine particulate Matter, $PM_{2.5}$	55	55
Lead, Pb [2/]	3	3

NOTES:

1/ The emissions of VOCs and reactive organic gases are essentially the same for the combustion emission sources that are considered in this analysis. This appendix will typically refer to organic emissions as VOCs.

2/ The only source of lead emissions from LAX is from aviation gasoline (AvGas) associated with piston-engine general aviation aircraft; however, due to the low number of piston-engine general aviation aircraft operations at LAX, AvGas quantities are low and emissions from these sources would not be materially affected by the Project.

SOURCE: South Coast Air Quality Management District, "SCAQMD Air Quality Significance Thresholds," March 2015. Available at: http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significance-thresholds.pdf?sfvrsn=2, Accessed June 1, 2016.

PREPARED BY: Ricondo & Associates, Inc., June 2016.

The SCAQMD has also developed operational and construction-related thresholds of significance for air pollutant concentration impacts from projects proposed in the Basin. These thresholds are summarized in **Table 5**. The SCAQMD's recommended thresholds for the evaluation of localized air quality impacts are based on the difference between the maximum monitored ambient pollutant concentrations in the area and the CAAQS or NAAQS. Therefore, the thresholds depend upon the concentrations of pollutants monitored locally with respect to a project site. For pollutants that already exceed the CAAQS or NAAQS (e.g., PM_{10} and $PM_{2.5}$), the thresholds are based on SCAQMD Rule 403 for construction and Rule 1303, Table A-2 for operations as described in the Final Localized Significance Threshold Methodology.

The methodology requires that the anticipated increase in ambient air concentrations, determined using a computer-based air quality dispersion model, be compared to localized significance thresholds for PM_{10}, $PM_{2.5}$, NO_2, and CO. The significance threshold for PM_{10} represents compliance with Rule 403 (Fugitive Dust) and Rule 1303 (New Source Review Requirements), while the thresholds for NO_2 and CO represent the allowable increase in concentrations above background levels in the vicinity of the Project site that would not cause or contribute to an exceedance of the relevant ambient air quality standards. The significance thresholds for $PM_{2.5}$ are intended to constrain emissions so as to aid in the progress toward attainment of the ambient air quality standards. For the purposes of this analysis, the localized construction and operations emissions resulting from development of the proposed Project were assessed with respect to the thresholds in Table 5 using detailed dispersion modeling.

Table 5: SCAQMD CEQA Thresholds of Significance for Air Pollutant Concentrations in the South Coast Air Basin

POLLUTANT	AVERAGING PERIOD	CONSTRUCTION	OPERATIONS	PROJECT ONLY OR TOTAL
PM_{10}	Annual[1/]	1.0 µg/m^3	1.0 µg/m^3	Project Only
PM_{10}	24-hour[1/]	10.4 µg/m^3	2.5 µg/m^3	Project Only
$PM_{2.5}$	24-hour[1/]	10.4 µg/m^3	2.5 µg/m^3	Project Only
CO	1-hour[2/]	20 ppm (23 mg/m^3)	20 ppm (23 mg/m^3)	Total incl. Background
CO	8-hour	9.0 ppm (10 mg/m^3)	9.0 ppm (10 mg/m^3)	Total incl. Background
NO_2	1-hour (State)	0.18 ppm (339 µg/m^3)	0.18 ppm (339 µg/m^3)	Total incl. Background
NO_2	1-hour (Federal)[3/]	0.100 ppm (188 µg/m^3)	0.100 ppm (188 µg/m^3)	Total incl. Background
NO_2	Annual (State)[2/]	0.03 ppm (57 µg/m^3)	0.030 ppm (57 µg/m^3)	Total incl. Background
SO_2	1-hour (State)	0.25 ppm (655 µg/m^3)	0.25 ppm (655 µg/m^3)	Total incl. Background
SO_2	1-hour (Federal)[4/]	0.075 ppm (655 µg/m^3)	0.075 ppm (655 µg/m^3)	Total incl. Background
SO_2	24-hour	0.04 ppm (655 µg/m^3)	0.04 ppm (655 µg/m^3)	Total incl. Background

NOTES:

1/ The concentration thresholds for PM_{10} and $PM_{2.5}$ have been developed by SCAQMD for construction or operational impacts associated with the proposed project.

2/ The concentration threshold for 1-hour CO and annual NO_2 is the CAAQS, which is more stringent than the NAAQS for these pollutants and averaging periods.

3/ To evaluate impacts of the proposed Project to ambient 1-hour NO_2 levels, the analysis includes both the current SCAQMD 1-hour State NO_2 threshold and the more stringent revised 1-hour federal ambient air quality standard of 188 µg/m^3. To attain the federal standard, the 3-year average of 98th percentile of the daily maximum 1-hour average at a receptor must not exceed 0.100 ppm.

4/ To attain the SO_2 federal 1-hour standard, the 3-year average of the 99th percentile of the daily maximum 1-hour averages at a receptor must not exceed 0.075 ppm

SOURCE: SCAQMD, 1993, 2011; USEPA, 2010a (Primary National Ambient Air Quality Standards for Nitrogen Dioxide, Final Rule, Federal Register Vol. 75, No. 6474, February 9, 2010) and 2010b (Primary National Ambient Air Quality Standard for Sulfur Dioxide, Final Rule, Federal Register Vol. 75, No. 35520, June 22, 2010).

PREPARED BY: Ricondo & Associates, Inc., September 2016.

2.3.1.2 Southern California Association of Governments (SCAG)

The SCAG is the metropolitan planning organization (MPO) representing six counties, including Los Angeles, and serving as a forum for the discussion of various planning and policy initiatives. As the federally designated MPO for the southern California region, SCAG is mandated by the federal government to research and develop plans for transportation, hazardous waste management, growth management, and air quality. Under the federal CAA, SCAG is also responsible for determining conformity of transportation projects, plans, and programs with applicable air quality plans.

2.3.1.3 Other Related Rules and Policies

In the Basin, the City of Los Angeles, CARB, and the SCAQMD have adopted or proposed additional rules and policies governing the use of cleaner fuels in public vehicle fleets:

- The City of Los Angeles Policy CF#00-0157 requires that City-owned or operated diesel-fueled vehicles be equipped with particulate traps and operate on ultra-low-sulfur diesel fuel.
- CARB has adopted a Risk Reduction Plan for diesel-fueled engines and vehicles.
- The SCAQMD has proposed a series of rules that would require the use of clean fuel technologies in on-road school buses, on-road heavy-duty public fleets, and street sweepers.

These policies were incorporated into the EIR Addendum analyses.

2.3.2 GREENHOUSE GASES

2.3.2.1 California Air Pollution Control Officers Association (CAPCOA) Guidance

CAPCOA published a white paper to provide a common platform of information and tools to address climate change in CEQA analyses, including the evaluation and mitigation of GHG emissions from proposed projects and identifying significance thresholds options. The white paper addresses issues inherent in establishing CEQA thresholds, evaluates tools, catalogues mitigation measures, and provides air districts and lead agencies with options for incorporating climate change into their programs.

2.3.2.2 South Coast Air Quality Management District

The SCAQMD has convened a GHG CEQA Significance Threshold Working Group to provide guidance to local lead agencies on determining significance for GHG emissions in their CEQA documents. Members of the working group include government agencies implementing CEQA and representatives from various stakeholder groups that provide input to the SCAQMD staff on developing GHG CEQA significance thresholds.

SCAQMD released a draft guidance document regarding interim CEQA GHG significance thresholds in October 2008 and adopted this proposal in December 2008. SCAQMD proposed a tiered approach, whereby the level of detail and refinement needed to determine significance increases with a project's total GHG emissions. SCAQMD also proposed a screening level of 10,000 $MTCO_2e$ per year for industrial projects and 3,000 $MTCO_2e$ per year for residential and commercial projects, under which project impacts are considered "less than significant." The 10,000 $MTCO_2e$ per year screening level was intended to achieve the same policy objective of capturing 90 percent of the GHG emissions from new development projects in the industrial sector; similarly, the 3,000 $MTCO_2e$ per year screening level was intended to achieve the same policy objective of capturing 90 percent of the GHG emissions from new development projects in the residential and commercial sector. For projects with GHG emissions increases greater than 10,000 $MTCO_2e$ per year (for industrial projects) or 3,000 $MTCO_2e$ (for residential and commercial projects), the use of a percent emission reduction target (e.g., 30 percent) was proposed to determine significance. This emission reduction target is a reduction below what is considered "business as usual." As noted earlier, SCAQMD also proposes that projects amortize construction emissions over the 30-year lifetime of any given project for comparison relative to these thresholds. Proposed project construction emissions can be amortized by calculating total construction period emissions and dividing by the 30-year lifetime of the project.

The interim GHG significance threshold is for projects where the SCAQMD is lead agency. The SCAQMD has not adopted guidance for CEQA projects under other lead agencies.

2.4 Local Regulations and Directives

2.4.1 CRITERIA POLLUTANTS

2.4.1.1 City of Los Angeles

The City of Los Angeles CEQA significance thresholds applicable to the proposed Project, as it pertains to criteria pollutant emissions, are shown in **Table 6**.

Table 6: City of LA CEQA Significance Thresholds

CEQA SUBCATEGORY	CEQA SIGNIFICANCE THRESHOLD
Construction Emissions	Would site preparation or construction activities for the proposed project result in substantial emissions that would not be controlled on site by existing regulations? Considers: Combustion Emissions from Construction Equipment Fugitive Dust Grading, Excavation and Hauling Heavy-Duty Equipment Travel on Unpaved Roads Other Mobile Source Emissions
Operational Emissions	• Result in a development and/or activity level equal to or greater than the thresholds provided in the CEQA Air Quality Handbook's Screening Table for Operation – Daily Thresholds of Potential Significance for Air Quality? • Conflict with the regional population forecast and distribution in the most recent Air Quality Management Plan (AQMP)? • Have the potential to create or be subjected to an objectionable odor or localized CO hot spot that could impact sensitive receptors? Operational emissions exceed any of the daily thresholds presented in Table 4. • Causes or contributes to an exceedance of the California 1-hour or 8-hour CO standards of 20 or 9.0 parts per million (ppm), respectively, at an intersection or roadway within 1/4 mile of a sensitive receptor.

SOURCE: City of Los Angeles, L.A. CEQA Thresholds Guide, 2006.
PREPARED BY: Ricondo & Associates, Inc., June 2016.

2.4.2 GREENHOUSE GASES

2.4.2.1 Green LA

In May 2007, the City of Los Angeles introduced Green LA: An Action Plan to Lead the Nation in Fighting Global Warming (Green LA). Green LA presents a framework targeted to reduce the City's GHG emissions by 35 percent below 1990 levels by 2030. The plan calls for an increase in the City's use of renewable energy to 35 percent by 2020 in combination with promoting water conservation, improving the transportation system, reducing waste generation, greening the ports and airports, creating more parks and open space, and greening the economic sector. Green LA identifies objectives and actions in various focus areas, including airports. The goal for LA's airports is to "green the airports," and the following actions are identified: 1) fully implement the Sustainability Performance Improvement Management System (discussed below); 2) develop and implement policies to meet the U.S. Green Building Council's Leadership in Energy and Environmental

Design (LEED®) green building rating standards in future construction; 3) improve recycling, increase use of alternative fuel sources, increase use of recycled water, increase water conservation, reduce energy needs, and reduce GHG emissions; and 4) evaluate options to reduce aircraft-related GHG emissions.

2.4.2.2 Climate LA

In 2008, the City of Los Angeles followed up Green LA with an implementation plan called Climate LA Municipal Program Implementing the Green LA Climate Action Plan (Climate LA). A Departmental Action Plan for LAWA is included in Climate LA, which identifies goals to reduce CO_2 emissions 35 percent below 1990 levels by 2030 at LAX and the other three LAWA airports, implement sustainability practices, and develop programs to reduce the generation of waste and pollutants. Actions are specified in the areas of aircraft operations, ground vehicles, electrical consumption, building, and other actions.

2.4.2.3 Executive Directive No. 10

In July 2007, Mayor Antonio Villaraigosa issued Executive Directive No. 10 regarding environmental stewardship practices. Executive Directive No. 10 requires that City departments, including LAWA, create and adopt a "Statement of Sustainable Building Policies," which should encompass sustainable design, energy and atmosphere, materials and resources, water efficiency, landscaping, and transportation resources. In addition, City departments and offices must create and adopt sustainability plans that include all the policies, procedures, programs, and policies that are designed to improve internal environmental efficiency. Finally, City departments are required to submit annual sustainability reports to the Mayor for review.

2.4.2.4 City of Los Angeles Green Building Code (LAGBC)

In December 2010, the Los Angeles City Council approved Ordinance No. 181,481, which amended Chapter IX of the Los Angeles Municipal Code (LAMC) by adding a new Article 9 to incorporate various provisions of the 2010 CALGreen Code. The requirements of the adopted LAGBC apply to new building construction, building renovations, and building additions within the City of Los Angeles. Specific mandatory requirements and elective measures are provided for three categories: (1) low-rise residential buildings; (2) nonresidential and high-rise residential buildings; and (3) additions and alterations to nonresidential and high-rise residential buildings. Key measures in the LAGBC that apply to nonresidential buildings include, but are not limited to, the following:

- Construction – A Storm Water Pollution Prevention Plan conforming to the State Storm Water National Pollutant Discharge Elimination System Construction Permit or local ordinance, whichever is stricter, is required for a project regardless of acreage disturbed;
- Construction – Construction waste reduction of at least 50 percent of construction debris;
- Construction – 100 percent of trees, stumps, rocks and associated vegetation and soils resulting primarily from land clearing shall be reused or recycled;
- Transportation Demand – Designated parking for any combination of low emitting, fuel-efficient, and carpool/vanpool vehicles shall be provided;

- Energy Conservation – Electric vehicle supply wiring for a minimum of 5 percent of the total number of parking spaces shall be provided;
- Energy Conservation – Energy conservation for new buildings must exceed California Energy Commission (CEC) requirements, based on the 2008 Energy Efficiency Standards, by 15 percent using an Alternative Calculation Method approved by the CEC;
- Energy Conservation – Each appliance provided and installed shall meet Energy Star requirements, if an Energy Star designation is applicable for that appliance;
- Renewable Energy – Future access, off-grid prewiring, and space for electrical solar systems shall be provided;
- Water – A schedule of plumbing fixtures and fixture fittings shall be provided that will reduce the overall use of potable water within the building by at least 20 percent based on the maximum allowable water use per plumbing fixture and fittings as required by the California Building Standards Code; and
- Wastewater – Each building shall reduce wastewater by 20 percent based on the maximum allowable water use per plumbing fixture and fittings as required by the California Building Standards Code.

2.4.2.5 LAWA Sustainability Plan

LAWA's Sustainability Plan, developed in April 2008, describes LAWA's current sustainability practices and sets goals and actions that LAWA will undertake to implement the initiatives described above (Green LA, Climate LA, and LAGBC). The Sustainability Plan presents initiatives for the fiscal year 2008-2009 and long-term objectives and targets to meet the fundamental objectives identified above.

LAWA has also developed the Sustainable Airport Planning, Design and Construction Guidelines for Implementation on All Airport Projects (LAWA Guidelines). The LAWA Guidelines were developed to provide a comprehensive set of performance standards focusing on sustainability specifically for Airport projects on a project-level basis. A portion of the LAWA Guidelines is based on the LEED® rating systems for buildings. The LAWA Guidelines incorporate a "LAWA-Sustainable Rating System" based on the number of planning and design points and construction points a project achieves, based on the criteria and performance standards defined in the LAWA Guidelines.

Based on the above, LAWA has taken steps to increase its sustainability practices related to daily Airport operations, many of which directly or indirectly contribute to a reduction in GHG emissions. Actions that LAWA has been undertaking include promoting and expanding the Fly Away non-stop shuttle service to the Airport in an effort to reduce the number of vehicle trips to the Airport, establishment of an employee Rideshare Program, use of alternative fuel vehicles, purchasing renewably generated Green Power from LADWP, and reducing electricity consumption by installing energy-efficient lighting, variable demand motors on terminal escalators, and variable frequency drives on fan units at terminals and LAWA buildings.

LAWA defines sustainability (and measures sustainable performance) as the Triple Bottom Line, consistent with the Global Reporting Initiative (GRI) and CEQA, which are the social, economic, and environmental

impacts of its organization. All projects are subject to various sustainable requirements in the City of Los Angeles and at LAWA, including, but not limited to:

- LAGBC (Ordinance 181479);
- Low Impact Development (Ordinance 181899);
- Standard Urban Stormwater Mitigation Plan (Ordinance 173494);
- Demolition Debris Recycling Program (Ordinance 181519);
- LAX Construction & Maintenance Services – Recycling Program; and
- LAX Master Plan – Mitigation Monitoring and Reporting Program (MMRP). Highlights of the LAX Master Plan MMRP include, but are not limited to the following measures:
  - C-1: Work with LAWA to approve and coordinate staging areas, haul routes, etc.;
  - MM-AQ-2: Utilize on-site rock-crushing facility, when feasible, during construction to reuse rock/concrete and minimize off-site truck-haul trips; and
  - W-1: Maximize use of Reclaimed Water.

All building projects in the City of Los Angeles are subject to the LAGBC, which is based on CALGreen with some modifications unique to the City of Los Angeles. The LAGBC is a code-requirement that is part of Title 24, and is enforced by the Los Angeles Department of Building & Safety (LADBS).

Given that the LAGBC has replaced LEED® in the Los Angeles Municipal Code, LAWA has based its new sustainable construction standards on the mandatory and voluntary tiers defined in the LAGBC. All building projects with an LADBS permit-valuation over $200,000 shall achieve LAGBC Tier 1 conformance, to be certified by LADBS during final plan check (on the issued building permit) and validated by the LADBS inspector during final inspection (on the Certificate of Occupancy). Tier 1 refers specific practices that are to be incorporated into projects to "achieving enhanced construction levels by incorporating additional green building measures." Should a project pose unique issues/circumstances based on the scope and/or location of work, LAWA may require more prescriptive approaches to resolving issues such as energy performance, site drainage, etc.

3. Existing Environmental Setting

3.1 Climatological Conditions

The airport is located within the South Coast Air Basin of California, a 6,745 square-mile area encompassing all of Orange County and the urban, non-desert portions of Los Angeles, Riverside, and San Bernardino Counties. The meteorological conditions at the airport are heavily influenced by the proximity of the airport to the Pacific Ocean to the west and the mountains to the north and east. This location tends to produce a regular daily reversal of wind direction: onshore (from the west) during the day and offshore (from the east) at night. Comparatively warm, moist Pacific air masses drifting over cooler air resulting from coastal upwelling of cooler water often form a bank of fog that is generally swept inland by the prevailing westerly (i.e., from the west) winds. The "marine layer" is generally 1,500 to 2,000 feet deep, extending only a short distance inland and rising during the morning hours producing a deck of low clouds. The air above is usually relatively warm, dry, and cloudless. The prevalent temperature inversion in the Basin tends to prevent vertical mixing of air through more than a shallow layer.

A dominating factor in the weather of California is the semi-permanent high-pressure area of the North Pacific Ocean. This pressure center moves northward in summer, holding storm tracks well to the north, and minimizing precipitation. Changes in the circulation pattern allow storm centers to approach California from the southwest during the winter months and large amounts of moisture are carried ashore. The Los Angeles region receives on average 10 to 15 inches of precipitation per year, of which 83 percent occurs during the months of November through March. Thunderstorms are light and infrequent, and on very rare occasions, trace amounts of snowfall have been reported at the airport.

The annual minimum mean, maximum mean, and overall mean temperatures at the airport are 56 degrees Fahrenheit (°F), 70°F, and 63°F, respectively. The prevailing wind direction at the airport is from the west-southwest with an average wind speed of roughly 6.4 knots (7.4 miles per hour [mph] or 3.3 meters per second [m/s]). Maximum recorded gusts range from 27 knots (31 mph or 13.9 m/s) in July to 56 knots (64

mph or 28.6 m/s) in March. The monthly average wind speeds range from 5.3 knots (6.1 mph or 2.7 m/s) in November to 7.6 knots (8.7 mph or 3.9 m/s) in April.[3]

3.2 Ambient Air Quality

In an effort to monitor the various concentrations of air pollutants throughout the basin, the SCAQMD has divided the region into 38 Source Receptor Areas in which monitoring stations operate. The monitoring station that is most representative of existing air quality conditions at LAX is the Southwest Coastal Los Angeles Monitoring Station located at 7201 W. Westchester Parkway (referred to as the LAX Hastings site), less than 0.5-mile from Runway 6L-24R (northernmost LAX runway). This station monitors O_3, CO, SO_2, NO_2, and PM_{10}. The nearest representative monitoring station that monitors $PM_{2.5}$ is the South Coastal Los Angeles County 1 Station, which is located at 1305 E. Pacific Coast Highway (Long Beach). The most recent data available from the SCAQMD for these monitoring stations encompassed the years 2011 to 2015, as shown in **Table 7**.

Ozone – The maximum 1-hour O_3 concentration recorded during the 2011 to 2015 period was 0.114 parts per million (ppm), recorded in 2014. During the reporting period, the California 1-hour standard was exceeded four times. The maximum 8-hour O_3 concentration was 0.081 ppm recorded in 2013. The California standard was exceeded between 1 and 6 days annually from 2013 to 2015. The 8-hour NAAQS was not exceeded in 2014 or 2015 (not enough data was available in 2013 to determine the Federal 8-hour design value).

Carbon Monoxide – The highest 1-hour CO concentration recorded was 3.1 ppm, recorded in 2013. The maximum 8-hour CO concentration recorded was 2.51 ppm recorded in 2013. As demonstrated by the data, the standards were not exceeded during the five-year period.

Nitrogen Dioxide – The highest 1-hour NO_2 concentration recorded was 0.098 ppm in both 2011 and 2012. The maximum 98th percentile 1-hour concentration was 0.066 ppm, recorded in 2014. The highest recorded NO_2 annual arithmetic mean was 0.013 ppm recorded in 2011. As shown, the standards were not exceeded during the five-year period.

Sulfur Dioxide – The highest 1-hour concentration of SO_2 was 0.015 ppm recorded in 2014 and 2015, while the highest 99th percentile 1-hour concentration recorded was 0.008 ppm in 2011. The maximum 24-hour concentration was 0.003 ppm, recorded in 2014. The highest annual arithmetic mean concentration was 0.001, recorded in 2013. As shown, the standards were not exceeded during the five-year period.

[3] Western Regional Climate Center, Los Angeles International Airport (KLAX), CA Climatological Summary, Period of Record: Jul 1996 to Dec 2008, Available: http//www.wrcc.dri.edu/summary/lax.ca.html, accessed August 1, 2016.

Table 7: Southwest Coastal Los Angeles and South Coastal Los Angeles County Monitoring Station Ambient Air Quality Data

POLLUTANT [1/ 2/]	2011	2012	2013	2014	2015
Ozone (O_3)					
Maximum Concentration 1-hr period, ppm	0.078	0.106	0.105	0.114	0.096
Days over State Standard (0.09 ppm)	0	1	1	1	1
Federal Design Value 8-hr period, ppm	---[4/]	---[4/]	---[4/]	0.064	0.068
Maximum California Concentration 8-hr period, ppm	0.067	0.075	0.081	0.080	0.078
Days over State Standard (0.07 ppm)	0	1	1	6	3
Carbon Monoxide (CO)					
Maximum Concentration 1-hr period, ppm	2.3	2.8	3.1	2.7	1.7
Days over State Standard (20.0 ppm)	0	0	0	0	0
Maximum Concentration 8-hr period, ppm	1.8	1.7	2.5	1.9	---
Days over State Standard (9.0 ppm)	0	0	0	0	0
Nitrogen Dioxide (NO_2)					
Maximum Concentration 1-hr period, ppm	0.098	0.098	0.078	0.087	0.087
98th Percentile Concentration 1-hr period, ppm	0.065	0.055	0.059	0.066	0.060
Days over State Standard (0.18 ppm)	0	0	0	0	0
Annual Arithmetic Mean (AAM), ppm	0.013	0.010	0.012	0.012	0.011
Exceed State Standard? (0.030 ppm)	No	No	No	No	No
Sulfur Dioxide (SO_2)					
Maximum Concentration 1-hr period, ppm	0.011	0.005	0.010	0.015	0.015
Days over State Standard (75 ppb)	0	0	0	0	0
99th Percentile Concentration 1-hr period, ppm	0.008	N/A	0.006	N/A	N/A
Maximum Concentration 24-hr period, ppm	0.002	0.001	0.001	0.003	0.002
Days over State Standard (140 ppb)	0	0	0	0	0
Annual Arithmetic Mean (AAM), ppm	0.000	0.000	0.001	---	0.000
Respirable Particulate Matter (PM_{10}) [3/]					
Maximum Concentration 24-hr period, $\mu g/m^3$	41	31	38	46	31
Days over Federal Standard (150 $\mu g/m^3$)	0	0	0	0	0
Maximum California Concentration 24-hr period, $\mu g/m^3$	41	30	37	45	31
Days over State Standard (50 $\mu g/m^3$)	0	0	---	0	0
Annual California Concentration, $\mu g/m^3$	21.4	19.5	---	21.9	---
Exceed State Standard? (20 $\mu g/m^3$)	Yes	No	---	Yes	Yes
Fine Particulate Matter ($PM_{2.5}$) [3/]					
Federal Design Value 24-hr period, $\mu g/m^3$	30	28	27	---[4/]	---[4/]
Federal Design Value Annual period, $\mu g/m^3$	11.5	10.6	10.9	---[4/]	---[4/]
Maximum California Concentration 24-hr period, $\mu g/m^3$	39.7	49.8	47.2	51.4	48.8
Annual Federal Concentration, $\mu g/m^3$	11.3	10.4	11.3	11.4	12.9
Exceed State Standard? (12 $\mu g/m^3$)	No	No	No	No	Yes

NOTES:

AAM = Annual arithmetic mean

$\mu g/m^3$ = micrograms per cubic meter

ppb = parts per billion (by volume)

--- = insufficient data to determine the value

ppm = parts per million (by volume)

N/A = not applicable

1/ Monitoring data from the Southwest Coastal Los Angeles Station (Station No. 820) was used for O_3, CO, NO_2, SO_2 and PM_{10} concentrations. Monitoring data from the South Coastal Los Angeles County 1 Monitoring Station (Station No. 072) was used for $PM_{2.5}$ concentrations.

2/ An exceedance is not necessarily a violation. Violations are defined in 40 CFR 50 for NAAQS and 17 CCR 70200 for CAAQS

3/ Statistics may include data that are related to an exceptional event.

4/ Insufficient data available to determine the value.

SOURCE: California Air Resources Board, iADAM: Air Quality Data Statistics, Available: http://www.arb.ca.gov/adam/, accessed May 24, 2015; California Air Resources Board, AQMIS2, Available: http://www.arb.ca.gov/aqmis2/aqmis2.php, accessed May 24, 2016.

PREPARED BY: Ricondo & Associates, Inc., July 2016.

Respirable Particulate Matter (PM_{10}) – The highest recorded 24-hour PM_{10} concentration recorded was 46 µg/m^3 in 2014. During the period 2011 to 2015, the CAAQS for 24-hour PM_{10} was not exceeded and the NAAQS was not violated. The maximum annual arithmetic mean recorded was 21.9 µg/m^3 in 2014.

Fine Particulates ($PM_{2.5}$) – The maximum 24-hour $PM_{2.5}$ concentration recorded was 51.5 µg/m^3 in 2014. The highest arithmetic mean of 12.9 was recorded in 2015. Between 2011 and 2013 the 24-hour and annual NAAQS were not violated. Not enough data was recorded or available in 2014 or 2015 to determine the NAAQS design values.

4. Methodology

4.1 Air Quality

As part of the air quality analysis for the EIR Addendum, emission inventories were prepared and dispersion modeling was conducted. The results of these efforts were evaluated to ensure that the proposed MSC North Modifications complies with all Federal, State, and local regulations.

4.1.1 SCOPE OF ANALYSIS

The air quality analysis conducted for the proposed Project addresses both construction- and operations-related emissions. The scope of the evaluation was conducted to:

- Identify construction- and operations-related emissions sources for the identified sources.
- Develop peak daily construction and operational emissions inventories.
- Compare emissions inventories with appropriate CEQA thresholds.
- Conduct dispersion modeling for Project emissions.
- Obtain background concentration data from SCAQMD and estimate future concentrations resulting from the proposed Project.
- Identify potential mitigation measures if warranted beyond what is already required through LAX Master Plan commitments and mitigation measures.

4.1.1.1 Scenarios

The air quality analysis conducted for the MSC North Modifications addressed construction-related impacts for the approximately five years of proposed construction activities, and operations-related impacts for the future horizon year of 2019. Since the MSC North Project was considered at a project level, the year 2019 represents completion of that project. However, in order to determine the impacts of the proposed MSC North Modifications, two additional scenarios were analyzed, taking into account the removal of one gate from the West Remote Gates/Pads and an additional gate at the MSC North, as well as the increase in

forecasted operations for 2019.[4] Therefore, the operational air quality analysis for the MSC North Modifications relies on the incremental difference between two scenarios: the 2019 With 11 Gates at the MSC North, and the 2019 With 12 Gates at the MSC North, as further described below. To compare against significance thresholds, the incremental difference in emissions from the proposed MSC North Modifications were combined with the incremental difference in emissions from the 2019 With and Without Project, as previously approved in the MSC EIR.

Further information for all incorporated scenarios is provided below:

- MSC North Project, as approved in the MSC EIR
  - 2019 Future Without MSC North Project – 2019 activity levels and the 2019 airfield configuration, not including the MSC North Project components
  - 2019 Future With MSC North Project – 2019 activity levels with MSC North Project components
- Proposed MSC North Modifications
  - 2019 Future With 11 Gates at MSC – 2019 activity levels per the updated TAF and the 2019 airfield configuration, including 11 gates at the MSC North
  - 2019 Future With 12 Gates at MSC – 2019 activity levels per the updated TAF and the 2019 airfield configuration, including 12 gates at the MSC North

4.1.1.2 Types of Analysis

Below is an overview of the types of analyses performed for the EIR Addendum, including the emissions inventory and localized dispersion modeling. A detailed approach including technical assumptions, methodologies, databases, and models used to conduct the air quality analysis can be found in Sections 4.1.2 and 4.1.3.

Inventory

Criteria pollutant emission inventories were developed for the projected construction period of the proposed MSC North Modifications, anticipated to occur over a five-year period concluding at the end of 2019. The basic construction inventory process steps are summarized below:

- Identify construction-related emissions sources associated with the proposed MSC North Modifications.
- Capture construction activities of site-preparation, construction of paved and concrete surface, building erection-related activities, material delivery, and construction employee commuter trips.

[4] Annual operations in the MSC EIR were calculated based on an older forecast, consisting of approximately 631,242 operations annually. However, in 2016, the Federal Aviation Administration (FAA) released the 2015 Terminal Area Forecast (TAF), which forecasts approximately 706,160 annual operations in 2019. The change in forecasted growth is due to increased travel demand and changes in aircraft fleet mixes that are projected to occur by 2019 irrespective of the proposed MSC North Project.

- Prepare emissions inventory of construction emissions for the construction year.
- Compare emissions inventories with appropriate CEQA thresholds for construction.
- Identify potential construction-related mitigation measures beyond LAX Master Plan commitments and mitigation measures (if required).

Criteria pollutant emission inventories were also developed for operations of the scenarios listed in Section 4.1.1.1. The overview of the operational inventory process is provided below:

- Identify operational emission sources potentially affected by the proposed MSC North Modifications.
- Develop annual and daily operational emissions inventories for the identified sources.
- Compare emissions inventories with the appropriate CEQA thresholds for operations.

Dispersion Modeling

Air dispersion modeling was conducted to predict pollutant concentrations for construction and operational sources for the proposed Project. Dispersion modeling was conducted for the MSC North Modifications scenarios outlined in Section 4.1.1.1; these incremental results were combined with and then compared to the original dispersion modeling results for the MSC North Project, as approved in the MSC EIR. Basic components of dispersion modeling include inputting inventory data, meteorological data, and receptor locations into FAA's Emissions and Dispersion Modeling System (EDMS), Version 5.1.4.1. Incremental concentrations were compared to CEQA Thresholds. The basic process for dispersion modeling is as follows:

- Receptors were established along the airport fence line and in the CTA.
- Five years of hourly surface data collected at the SCAQMD's on-airport meteorological station at LAX was used in the modeling to determine peak concentrations.
- Background concentration data was obtained from SCAQMD and added to the modeled MSC North Modifications effects to estimate future concentrations of the proposed MSC North Modifications.
- The incremental difference between MSC North Modifications scenarios (the 2019 With 11 Gates at the MSC North versus the 2019 With 12 Gates at the MSC North) was added to the incremental difference from the corresponding MSC North Project, scenarios, as approved in the MSC EIR (the 2019 Future With MSC North Project versus the 2019 Future Without the MSC North Project).
- The MSC North Project concentrations, as approved in the MSC EIR, combined with the MSC North Modifications concentrations, were compared against CEQA thresholds.

4.1.2 EMISSIONS INVENTORY METHODOLOGY

The criteria pollutant emission inventories were developed using standard industry software/models and federal, State, and locally approved methodologies. Results of the emission inventories were compared to mass daily emissions thresholds established by SCAQMD for the Basin. The air quality assessment for the proposed Project was conducted in accordance with the SCAQMD's 1993 CEQA Air Quality Handbook and

updates published on the SCAQMD website. Emissions estimating and modeling used in this analysis are consistent with those used in the preparation of the following documents:

- The LAX Master Plan Final EIR;
- The Final General Conformity Determination;
- The Final EIR for the South Airfield Improvement Project (SAIP);
- The Final EIR for the Crossfield Taxiway Project (CFTP);
- The Final EIR for the Bradley West Project;
- The Final EIR for the LAX Specific Plan Amendment Study (SPAS);
- The Final EIR for the Runway 7L/25R Runway Safety Area (RSA) and Associated Improvements Project;
- The Final EIR for the West Aircraft Maintenance Area (WAMA) Project; and
- The Final EIR for the Runway 6L/24R and Runway 6R/24L Runway Safety Area and Associated Improvements Project.

Mass emissions inventories were prepared for construction and operation of the MSC North Modifications. The construction inventories identify the peak year of construction emissions associated with completing the proposed MSC North Modifications between 2014 and 2019. Operational inventories were prepared for the 2019 With 11 Gates at the MSC North and 2019 With 12 Gates at the MSC North scenarios. The following sections discuss the assumptions associated with the Project-related construction and operations emissions inventory.

4.1.2.1 Construction Activities

Since the approval of the MSC Final EIR, physical components of the MSC North Project have been reconfigured or refined. Additionally, assumptions regarding construction equipment and schedule have been modified. Substantial changes to the Project that may affect air quality impacts include:

- The addition of the 'Gateway' facility
- A reduction to the overall size of the passenger and utilidor tunnels
- A shift in the proposed construction schedule. Due to
- The availability and use of Tier 4 construction equipment at LAX.
- Updated construction equipment emissions factors provided by the California Air Resources Board. CARB's EMFAC2014 emission factor model has been updated since the approval of the MSC EIR. Therefore, emission factors were updated to the current values, as discussed in Section 4.1.2.1.

Based on the changes outlined above, a construction emissions inventory was prepared for the proposed MSC North Modifications; all original MSC North Project components from the MSC EIR, along with the proposed modifications were included in the inventory. This section describes the data and methodologies used to estimate emissions of criteria pollutants (CO, VOC, NO_X, SO_2, PM_{10} and $PM_{2.5}$) generated by construction of

the MSC North Project, as approved in the MSC EIR, and the MSC North Modifications. Estimates of construction-related emissions were developed using standard industry methodologies and techniques, and are consistent with methodologies used to estimate construction emissions in support of other EIR documents for projects at LAX. Emissions inventories for construction activity were prepared commensurate with the CEQA thresholds upon which the project were compared, as outlined in Section 2.3.1.

Construction emissions were quantified for the five years (2014 through 2019) planned for construction of the MSC North Project and the MSC North Modifications. Construction emissions analyses generally require information such as the type of construction equipment to be used, equipment operating time, estimates of required construction material, and the number of employees anticipated to be on site. Much of the data required to conduct the analyses was developed by Connico, Inc. This information generally consisted of overall construction Project schedules; construction equipment vehicle specifications; anticipated operating hours, land development areas, and facility areas; and quantities and sources of construction materials.

Using the provided construction data, monthly construction emissions estimates were developed. Daily emissions were calculated by dividing monthly emissions by the number of work days in the given month, based on a 5-day-per-week workweek, from which maximum daily emissions were derived. These daily emissions were compared against applicable SCAQMD mass daily significance thresholds. Annual emissions were based on the monthly emissions estimates.

Sources of construction emissions estimated in this analysis included construction vehicles and equipment, pavement crushing, asphalt paving and pavement painting activities.[5] Construction equipment emissions are generally estimated using two basic methodologies (off-road and on-road) depending on the type of construction equipment. Off-road construction equipment (e.g., bulldozers, backhoes, front end loaders) are generally operated off road and on the construction site. On-road construction equipment (e.g., semi-trucks for material hauling), in contrast, can be operated on public roads. Emissions for on-road construction equipment and off-road construction equipment were estimated separately, following standard industry practices.

Table 8 shows the corresponding model/reference for each of the construction sources.

[5] It was assumed that asphalt would be batched offsite at batch plant facilities operating under stationary source permits and therefore, emissions were not estimated separately for batch plants.

Table 8: Construction Sources Pollutant and Model Summary

CONSTRUCTION SOURCE	POLLUTANT	MODEL/REFERENCE
Off-Road Equipment	CO, SO_2	OFFROAD2007 [1/]
	VOC, NO_X, PM_{10}	2011 Inventory Model (commonly referred to as OFFROAD2011) [2/]
	$PM_{2.5}$	CARB Speciation Profiles (& Size Distributions) [3/]
On-Road On-Site Equipment	CO, VOC, NO_X, PM_{10}	EMFAC2014 [4/]
On-Road Off-Site Equipment	CO, VOC, NO_X, PM_{10}	EMFAC2014 [4/]
Fugitive Dust	PM_{10}, $PM_{2.5}$	USEPA AP42 [5/]
Fugitive VOCs	VOC	CalEEMod [6/]

NOTES:

1/ California Air Resources Board, OFFROAD2007 Model, available: http://www.arb.ca.gov/msei/documentation.htm (accessed May 24, 2016).

2/ California Air Resources Board, 2011 Inventory Model for In-Use Off-Road Equipment, available: www.arb.ca.gov/msei/categories.htm#offroad_motor_vehicles (accessed May 24, 2016).

3/ South Coast Air Quality Management District, "Final – Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds," October 2006, available: http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/pm-2-5-significance-thresholds-and-calculation-methodology (accessed May 24, 2016); California Environmental Protection Agency, Air Resources Board, "Speciation Profiles Used in ARB Modeling," April 15, 2016, available: http://www.arb.ca.gov/ei/speciate/speciate.htm#assnfrac (accessed May 31, 2016).

4/ California Air Resources Board, EMFAC2014 Model, available: http://www.arb.ca.gov/msei/categories.htm#emfac2014 (access May 24, 2016).

5/ U.S. Environmental Protection Agency, "Emissions Factors & AP 42, Compilation of Air Pollutant Emission Factors," available: http://www.epa.gov/ttn/chief/ap42/index.html (accessed May 24, 2016).

6/ California Air Pollution Control Officers Association, California Emissions Estimator Model (CalEEMod) Version 2013.2.2, prepared by ENVIRON International Corporation and the California Air Districts, available: http://www.caleemod.com/ (accessed on May 24, 2016)

SOURCE: Ricondo & Associates, Inc., May 2016.
PREPARED BY: Ricondo & Associates, Inc., May 2016.

Nonroad Construction Equipment

Nonroad construction equipment includes dozers, loaders, sweepers, and other heavy-duty construction equipment that operates on the construction site, but is not licensed to travel on public roadways. Nonroad equipment emissions were calculated as shown in **Equation 1**.

Equation 1: Nonroad Construction Equipment Emissions Calculation Equation

$E = HP \times L \times H \times e \times EF$

Where:

E	=	emissions (lb/month)
HP	=	horsepower
L	=	load factor
H	=	total hours per month of equipment operation
e	=	efficiency factor
EF	=	emission factor (lb/hp-hr)

SOURCE: Ricondo & Associates, Inc., July 2014.
PREPARED BY: Ricondo & Associates, Inc., May 2016.

Nonroad equipment types, models, horsepower, load factor, and estimated hours of operation were derived from data provided by Connico, Inc. Monthly hours of operation for a given piece of equipment were derived by multiplying operating hours per shift (assumed to be 8 hours for most equipment types) by the number of shifts (2), by the number of pieces of equipment assigned to a specific construction activity, and by the number of workdays in the month, assuming a 5-day-per-week workweek. For equipment anticipated to operate a full 8 hours per shift, an efficiency factor of 83.3 percent was applied, assuming that on average, the equipment would be operated for approximately 50 minutes out of each hour (50/60 = 83.3 percent).

Calendar year 2019 emission factors for CO and SO_X were obtained from the California Air Resources Board's (CARB's) OFFROAD2007 emission factor model. For each construction equipment type, the model generates emissions in tons per day for several horsepower ranges/bins. For each equipment type and horsepower bin combination, the emissions in tons per day were multiplied by 2,000 (pounds per ton) and divided by activity (hours per day), load factor (from the OFFROAD2007 data file), and average horsepower (from the OFFROAD2007 data file). Using this methodology, an emission factor in pounds per horsepower-hour (lb/hp-hr) was derived for each equipment type by horsepower bin. The emission factor applied to a given piece of equipment was then selected based on the horsepower of the equipment.

Emission factors for VOC, NO_X, and PM_{10} were obtained and used based on construction-related air quality control measures developed for LAX. All off-road diesel-powered construction equipment greater than 400 horsepower was assumed to meet USEPA Tier 3 off-road emission standards for these pollutants. Off-road diesel-powered construction equipment less than 400 horsepower, but greater than 50 horsepower was assumed to meet USEPA Tier 4 off-road emission standards for these pollutants (final Tier 4 standards were assumed for NO_X). These emissions standards are reflected in emission factors reported in grams per horsepower-hour (g/hp-hr) for various horsepower ranges. The factors were converted to lb/hp-hr for emissions calculation purposes.

CARB's OFFROAD2011 emission factor model was used for deriving emission factors of VOC, NO_X, and PM_{10} for off-road construction equipment less than 50 horsepower. The computation of emission factors from OFFROAD2011 was performed essentially identical to the methodology described previously for deriving emission factors from OFFROAD2007.

$PM_{2.5}$ emission factors were derived using the PM_{10} emission factors and $PM_{2.5}$ size profiles derived from the CARB-approved California Emission Inventory Development and Reporting System (CEIDARS) database. In this case, a factor of 0.92 was applied to PM_{10} emission factors to derive $PM_{2.5}$ emission factors. This factor represents the size fraction of PM_{10} emissions that can be assumed to be $PM_{2.5}$ emissions with respect to diesel vehicle exhaust.

Consistent with the MSC Final EIR Monitoring, Mitigation and Reporting Program (MMRP) mitigation measure MM-AQ-(MSC)-1, certain off-road equipment types were assumed to be equipped with diesel particulate filters (DPFs) achieving PM_{10} and $PM_{2.5}$ emissions reductions ranging from 8.3 to 74.7 percent. Diesel construction equipment meeting USEPA Tier 4 emissions standards were not assumed to be equipped with DPFs. DPF compatibility and reduction rates were based on information contained in the Final EIR for the Bradley West Project.

On-Road On-Site Construction Equipment

On-road on-site equipment emissions were generated from on-site trucks that are licensed to travel on public roadways, such as pickup trucks and water trucks. **Equation 2** was used to calculate emissions from on-road on-site equipment.

Equation 2: On-Road Construction Equipment Emissions Calculation Equation

$$E = H \times e \times EF$$

Where:

E	=	emissions (lb/month)
H	=	total hours per month of equipment operation
e	=	efficiency factor
EF	=	emission factor (lb/hr)

SOURCE: Ricondo & Associates, Inc., April 2016.
PREPARED BY: Ricondo & Associates, Inc., April 2016.

Typically, emissions from on-road vehicles are calculated by applying an emission factor to the number of miles traveled by each vehicle. However, for this analysis, on-road on-site vehicles were included in the resource schedule provided by Connico, Inc., similar to nonroad equipment. Therefore, emissions for on-road equipment operating on the construction site were calculated by applying an emission factor to the number of hours that the vehicle is assumed to operate. Based on information provided by Connico, Inc., nearly all

on-road on-site equipment was assumed to operate for less than 8 hours per shift and therefore, no efficiency factor was assumed for these vehicles. Water trucks were generally assumed to operate for 8 hours per shift and therefore, an efficiency factor of 83.3 percent was applied to the calculation of emissions for these vehicles, assuming operating times of 50 minutes out of each hour.

Emission factors for all criteria pollutants (including $PM_{2.5}$) for on-road construction equipment were obtained from CARB's EMFAC2014 emission factor model. The EMFAC2014 model was run for the 2019 construction year and each seasonal period (annual, summer, winter) in the South Coast Air Basin.[6] EMFAC2014 is the emissions model developed and used by the California Air Resources Board to assess emissions from on-road vehicles. Effective December 14, 2015, the USEPA has approved the EMFAC2014 emissions model for state implementation plan (SIP) development and conformity purposes in California.[7]

EMFAC2014 contains a comprehensive list of vehicle categories.[8] For this analysis, water trucks were assumed to be represented by the T7 single construction (diesel) EMFAC2011 vehicle category. This category is defined as heavy-heavy duty diesel single unit construction trucks. In accordance with construction-related air quality control measures developed for LAX, emission factors for these vehicles were modeled for model year 2007 vehicles to represent compliance with USEPA 2007 on-road emissions standards. On-site pickup trucks were assumed to be represented by the LHD2 (gasoline) EMFAC2011 vehicle category, which is defined as light-heavy-duty trucks (10,001-140,000 lbs.).

For diesel vehicles, the EMFAC2014 factors account for running and idling emissions for all pollutants. PM_{10} and $PM_{2.5}$ factors include tire and brake wear. Running emissions are expressed in grams per mile (g/mi), while idling emissions are expressed in grams per hour (g/hr). Running emissions were converted to lb/hr by assuming an on-site vehicle speed of 20 miles per hour (mph). For gasoline vehicles, ROG (VOC) emission factors include diurnal, hot soak, running, and resting emissions, and the PM_{10} and $PM_{2.5}$ factors include tire and brake wear. All emission factors for on-site gasoline vehicles were converted to g/mi and then converted to lb/hr by applying a grams-to-pound conversion factor and assuming an on-site vehicle speed of 20 mph.

In accordance with construction-related air quality control measures developed for LAX Airport, diesel vehicles (in this case the T7 single construction vehicles) were assumed to be fitted with exhaust retrofit devices providing an 85-percent reduction in PM_{10} and $PM_{2.5}$ emissions.

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6 For purposes of conducting the most conservative emissions analysis, the selected EMFAC2014 emission factor for each vehicle type was based on the highest emission factor calculated for each seasonal period.

7 "Official Release of EMFAC2014 Motor Vehicle Emission Factor Model for Use in the State of California; notice of availability," 80 Federal Register 239 (December 14, 2015), pp 77337-77340.

8 When using the EMFAC2014 model, users are given a choice between running the model with EMFAC2007 vehicle categories or with EMFAC2011 vehicle categories. For purposes of this analysis, the EMFAC2014 model was run using EMFAC2011 vehicle categories.

On-Road Off-Site Construction Equipment

On-road off-site trips include personal vehicles used by construction workers to access the construction site, as well as hauling trips for the transport of various materials to and from the site. **Equation 3** shows the calculation of emissions from on-road off-site equipment. The calculation is similar to the calculation of on-site on-road vehicles, except that instead of multiplying an emission factor by number of hours, an emission factor is multiplied by total vehicle miles traveled (VMT).

Equation 3: On-Road Construction Equipment Emissions Calculation Equation

E = VMT × EF

Where:

E	=	emissions (lb/day)
VMT	=	vehicle miles traveled per day
EF	=	emission factor (lb/mile)

SOURCE: Ricondo & Associates, Inc., July 2014.
PREPARED BY: Ricondo & Associates, Inc., November 2014.

Emission factors for on-road off-site vehicles were obtained from EMFAC2014 in the same way as described previously for on-road on-site vehicles, although emission factors were used in units of g/mi and applied to the VMT estimates to calculate total emissions. For all on-road off-site vehicles, emission factors were obtained assuming an aggregated speed.[9]

The number of construction workers per crew per shift was provided by Connico, Inc. Total monthly construction workers for a given activity were calculated by multiplying the number of workers per crew per shift by two shifts and by the number of working days in the month, assuming a 5-day-per-week workweek. Total monthly workers were converted to monthly vehicle trips by assuming a factor of 1.15 workers per vehicle per trip. Monthly VMT for construction worker vehicles was then calculated by multiplying the number of monthly vehicle trips by an assumed roundtrip distance of 40 miles. To represent a mix of construction worker vehicles, the analysis assumed a mix of 50 percent passenger cars (EMFAC2011 vehicle category LDA), 30 percent light-duty trucks (0-3,750 lbs.) (LDT1) and 20 percent light duty trucks (3,751-5,750 lbs.) (LDT2). This vehicle mix is identified in the SCAQMD California Emissions Estimator Model (CalEEMod) as an option for modeling emissions from construction worker vehicles and represents a reasonable vehicle mix for such trips.

[9] Based on a calculation performed using data from EMFAC2011, the weighted average speed is approximately 35 mph for these vehicle types.

Off-site delivery trips include the delivery of construction materials and concrete to the construction site, as well as the hauling of excess cut/fill material from the construction site. The calculation of monthly VMT for on-road off-site hauling trips was based on quantities and trip data derived from information provided by Connico, Inc. Haul trucks were assumed to have a capacity of 20 cubic yards, while transit cement mixers were assumed to have a capacity of 10 cubic yards. Based on information from Connico, Inc., haul trucks were assumed to travel a roundtrip distance of 40 miles for all hauling trips, except for concrete deliveries (25 miles). Trips for hauling vehicles were calculated over the course of the project and were divided by the number of days that the trips would take place over the course of the year for each construction activity in order to calculate daily VMT. For off-site hauling trips, the T-7 single construction EMFAC2011 vehicle category was assumed for all vehicles.

Fugitive Dust

Additional sources of PM_{10} and $PM_{2.5}$ emissions associated with construction activities are related to fugitive dust. Fugitive dust includes re-suspended road dust from both off- and on-road vehicles, as well as dust from grading, loading, unloading, and other activities.

Fugitive dust emissions (PM_{10} and $PM_{2.5}$) were calculated using the guidance from the USEPA's AP-42, the SCAQMD's CEQA Air Quality Handbook, and documentation associated with CalEEMod. Fugitive dust emissions were calculated for the following construction activities and incorporated into the nonroad and on-road emissions analyses, as appropriate:

- Vehicles traveling on paved roads. All off-site on-road vehicles are assumed to travel on paved roads.
- Vehicles traveling on unpaved roads. All on-road on-site vehicles are assumed to travel on unpaved roads.
- On-site construction activities (grading, crushing, loading, hauling and storage)

Water, as required under LAWA construction contracts and also being one of the main dust suppression measures recognized in SCAQMD Rule 402, was assumed to reduce fugitive dust emissions by 61 percent.

4.1.2.2 Operational Sources

Since the approval of the MSC Final EIR, physical components of the MSC North Project have been reconfigured or refined. Substantial changes to the Project that may affect operational air quality impacts include:

- The relocation of gates at the MSC North above the LAX Master Plan Alternative D Taxiway D OFA limit
- An increase from 11 gates to 12 gates at the MSC North
- Reduced reliance on the West Remote Gates/Pads
- An increase in expected passengers based on the FAA's Terminal Area Forecast[10]

Operational emissions associated with the MSC North Modification scenarios (2019 With 11 Gates at the MSC North and 2019 With 12 Gates at the MSC North) were calculated using EDMS Version 5.1.4.1. The proposed MSC North Modifications would not increase operations at LAX; the proposed Project would provide an additional aircraft gate to reduce reliance on the West Remote Gates/Pads and operate as an "empty chair," providing capacity for the temporary relocation of carrier operations during routine construction or modernization activities in existing facilities. By reducing reliance on the West Remote Gates/Pads, taxi times for the shifted operations to the gates at the MSC North would be decreased. Similarly, GSE and busing operations would be reduced from the decrease in operational distance between the MSC North and the West Remote Gates/Pads. APU emissions would also decrease, as gates at the MSC North would be equipped with ground power units and pre-conditioned air. Therefore, operations from GSE, busing, and APU were not included in the MSC North Modifications air quality analysis.

Aircraft

Annual aircraft emissions are a function of the number of annual operations, the aircraft fleet mix (types of aircraft/engines used), the length of time aircraft spend in various modes (taxi/idle, takeoff, climbout, approach, and landing roll), and the emission rates of the engine. The EDMS database contains an expansive list of aircraft types (airframes) and engine types for use in air quality analyses.

Annual Operations and Fleet Mix

Annual landing and takeoff (LTO) cycles data were assembled to determine existing and projected pollutant emissions from aircraft operations. LTO cycles are one-half the number of total aircraft operations, because one aircraft operation represents one takeoff or landing. Annual aircraft operations were developed based on FAA's TAF.

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[10] Annual operations in the MSC EIR were calculated based on an older forecast, consisting of approximately 631,242 operations annually. However, in 2016, the FAA released the 2015 TAF, which forecasts approximately 706,160 annual operations in 2019. The change in forecasted growth is due to increased travel demand and changes in aircraft fleet mixes that are projected to occur by 2019 irrespective of the proposed MSC North Project.

Aircraft Time in Mode

To model aircraft emissions, it is necessary to determine the time for each of the five operating modes that make up an LTO cycle – approach, taxi-in, taxi-out, takeoff, and climbout. To derive times spent in the approach, takeoff, and climbout modes, EDMS uses a dynamic flight performance modeling module that accounts for aircraft weight and meteorological conditions. Mixing heights at LAX are adjusted to 1,806 feet. The taxi/idle times were forecasted from existing taxi times at LAX from the FAA's Aviation System Performance Metrics (ASPM) – Airport Taxi Times report tool.[11] Aircraft emissions were then calculated using EDMS and the taxi/idle times derived from the ASPM.

Taxi times for the 2019 With 11 Gates at the MSC North and the 2019 With 12 Gates at the MSC North scenarios were calculated based on the difference of the averages of all runway operating conditions, as shown in **Table 9,** along with the change in taxiing distance for the proposed MSC North Modifications.

Table 9: LAX Primary Runway Operating Configurations

CONFIGURATION	ANNUAL USE
VFR Visual - West Flow	69.2%
VFR ILS – West Flow	24.6%
VFR ILS – East Flow	2.1%
IFR – West Flow	4.1%

SOURCE: Ricondo & Associates, Inc., August 2014.
PREPARED BY: Ricondo & Associates, Inc., June 2016.

Table 10 depicts the total aircraft operations utilized in the revised emissions inventories for the 2019 MSC North Modifications scenarios. The operational levels do not differ between the 2019 With 11 Gates at the MSC North and the 2019 With 12 Gates at the MSC North scenarios, and are based upon total operations reported in the FAA TAF. Table 10 also presents the taxi times utilized in the operational emissions analysis for each alternative. There would be a slight difference in taxi times between the 2019 With 11 Gates at the MSC North and the 2019 With 12 Gates at the MSC North scenarios as a result of a slight taxi route modification for aircraft utilizing the MSC North instead of the West Remote Gates/Pads.

[11] Federal Aviation Administration. 2014. Aviation System Performance Metrics > Airport Taxi Times. Available at: https://aspm.faa.gov/apm/sys/TaxiTimes.asp

Table 10: Total Aircraft Operations and Taxi Times, by Calendar Year

		TAXI-IN TIME (MINUTES)		TAXI-OUT TIME (MINUTES)	
YEAR	OPERATIONS	WITH 11 GATES	WITH 12 GATES	WITH 11 GATES	WITH 12 GATES
2016	706,160	11.81	11.79	17.49	17.41

SOURCES: 2015 Federal Aviation Administration Terminal Area Forecast; Ricondo & Associates, Inc., May 2016.
PREPARED BY: Ricondo & Associates, Inc., June 2016.

Stationary Sources

The emissions of criteria pollutants associated with on-site stationary sources (natural gas space heaters and water heaters), as well as off-site emissions from purchased electricity, were estimated using the CalEEMod Version 2013.2.2. CalEEMod is a State-wide land use emissions computer model that calculates criteria pollutant and GHG emissions associated with a variety of land use projects. The model was developed in collaboration with the air districts of California including the SCAQMD.

Stationary sources for the 2019 With 11 Gates at the MSC North scenario are the same as the 2019 With MSC Project from the MSC EIR. However, the MSC North Modifications (under the 2019 With 12 Gates at the MSC North scenario), would include the additional 'Gateway' facility. Even with the addition of the 'Gateway' Facility, the overall square footage of the proposed Project would decrease in as compared to the MSC North Project. Therefore, an inventory for stationary sources, including building electricity, solid waste disposal, and indoor water usage, were not quantified. However, these emissions were used in dispersion modeling as the location of some of the elements has changed. Emissions for these facilities were calculated using square footage and CalEEMod.

4.1.3 DISPERSION MODELING METHODOLOGY

4.1.3.1 Construction Activities

General Approach

The project-specific air quality modeling of localized construction impacts was conducted consistent with SCAQMD methodology. The USEPA and SCAQMD-approved dispersion model, AMS/EPA Regulatory Model (AERMOD), was used to model the air quality impacts of NO_X, CO, SO_X, PM_{10}, and $PM_{2.5}$ emissions. AERMOD can estimate the air quality impacts of single or multiple point, area, or volume sources using historical meteorological conditions. Volume sources are three-dimensional sources of emissions that can be used to model releases from a variety of industrial uses, including moving diesel trucks and equipment; they were used to represent the emissions from trucks, heavy-duty construction equipment, and fugitive dust. To be conservative, this analysis did not calculate PM_{10} deposition.

The general approach used for construction dispersion modeling is as follows:

1. Emission rates were established for the peak month of construction for each pollutant. The maximum lbs/day were computed based on a peak month average day over the entire construction period. It

was assumed that an average workday would result in 16 hours of emissions-generating activity. Therefore, the maximum daily emissions were divided by 16 to convert the maximum daily emissions into emission rates in units of pounds per hour. These emissions were then converted to grams/second.

2. The construction schedule prepared by Connico has the project divided into several sub-tasks based on project components and projected timing. The emissions rate for each sub-task (g/s) was divided by the number of areas for each source to create a series of emission volume sources by task.
3. Release heights were assigned to each source area based on location of exhaust of equipment.
4. Temporal factors were calculated based on the construction schedule and the assumed hours worked per week. As previously discussed, it is assumed there would be 2-8 hour shifts for a total of 16 work hours per day, and a 5 day workweek (Monday through Friday).

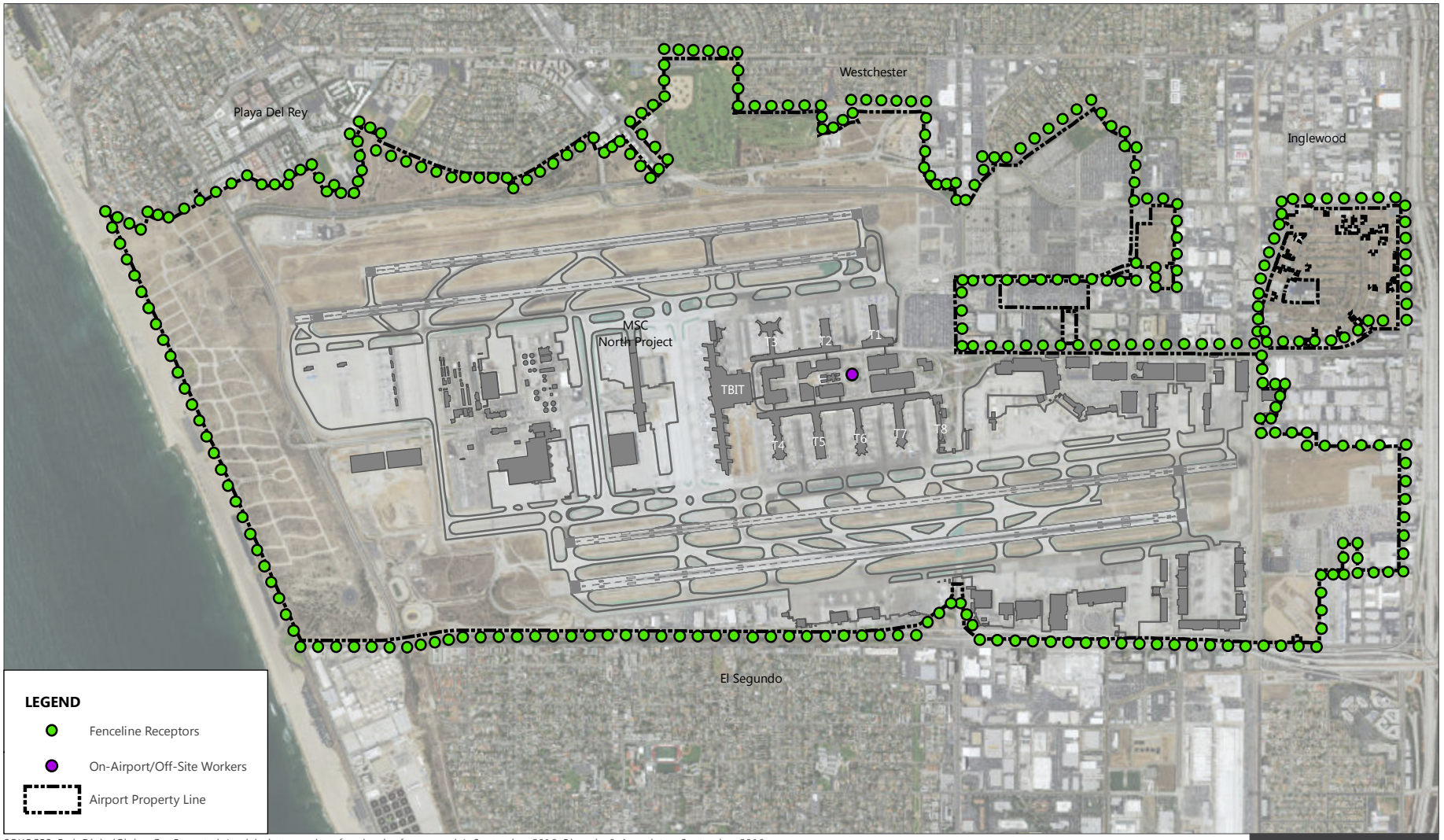
AERMOD Settings

The SCAQMD requires that AERMOD be run using USEPA regulatory default options, unless non-default options are justified; therefore, AERMOD was run using USEPA regulatory default options. AERMOD settings for the MSC North Modifications are consistent with those from MSC North Project, as approved in the MSC EIR, for comparison purposes. Additional modeling options are listed below:

- Urban dispersion (Los Angeles County population of 9,862,049, as per SCAQMD guidance);
- Averaging periods: 1-hour (CO and NO_2), 8-hour (CO), 24-hour (PM_{10} and $PM_{2.5}$); Annual (NO_2, PM_{10} and $PM_{2.5}$);
- Flagpole receptor heights: 1.8 meters; and
- No building downwash (no point sources modeled).

Source and Receptor Locations

Construction activities were assumed to be located at the proposed Project site based individual project components. Receptor points are the geographic locations where the air dispersion model calculates air pollutant concentrations. These discrete Cartesian receptors were used to determine air quality impacts in the vicinity of the Project site. Field receptors were placed at the boundary of LAX (along the fence line), and the Theme Building, as shown in **Figure 1**.



SOURCES: Esri, DigitalGlobe, GeoEye, et al. (aerial photography - for visual reference only), September 2016; Ricondo & Associates, September 2016.
PREPARED BY: Ricondo & Associates, Inc., September 2016.
ABBREVIATION: MSC = Midfield Satellite Concourse

FIGURE 1

MSC North Modifications
Receptor Locations

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Meteorology

The meteorological data from the monitoring station located at the LAX Hastings site was used in the analysis. The meteorological data were obtained from the SCAQMD website, which were preprocessed using AERMET. AERMET is a meteorological preprocessor for organizing available meteorological data into a format suitable for use in the AERMOD air quality dispersion model. These files were also developed by the SCAQMD using site specific surface characteristics (i.e., surface albedo, surface roughness, and Bowen ratio) obtained using AERSURFACE. AERSURFACE is a tool that provides realistic and reproducible surface characteristic values, including albedo, Bowen ratio, and surface roughness length, for input into AERMET. The dataset used consisted of five years of hourly surface data collected at LAX for calendar years 2007 through 2011; the data included ambient temperature, wind speed, wind direction, and atmospheric stability parameters, as well as mixing height parameters from the appropriate upper air station. All five years of meteorological data were loaded into AERMOD to determine the maximum concentrations over the five year period for each pollutant and averaging period combination.

Ozone Limiting Method for NO_2 Modeling

AERMOD contains the ozone limiting method (OLM) and Plume Volume Molar Ratio Method (PVMRM) options, which are used to model the conversion of NO_X to NO_2. The OLM option was used in this modeling analysis. Hourly O_3 data for modeling conversion of NO_X to NO_2 using the OLM option was obtained from the CARB website. In addition, the following values were used in the analysis:

- Ambient Equilibrium NO_2/ NO_X Ratio: 0.90
- In-stack NO_2/ NO_X Ratio: 0.5 (USEPA default)
- Default Ozone Value: 40 parts per billion (used only for missing data in the hourly O_3 data file)

4.1.3.2 Operations

Consistent with SCAQMD methodology, localized operational concentrations were predicted through the AERMOD software. EDMS results (categorized by source for each hour) were used for the operations dispersion in AERMOD. Dispersion accounts for location of sources and not just annual or daily emissions inventory; assumptions for dispersion parameters are outlined below.

The source groups from EDMS include Aircraft, Gates, Taxiway Queues, and Stationary Sources: Detailed information on these is presented below.

General Approach

The Project-specific air quality modeling of localized operational impacts was conducted consistent with SCAQMD methodology using AERMOD. The dispersion model was based on the emissions inventory, source locations, and hourly meteorological data. By distributing aircraft emissions to their respective locations using airport-specific hourly, daily, and monthly temporal factors and meteorological data, EDMS produces an hourly emissions rate (HRE) file. The HRE file contains all of the emissions broken into hourly bins by source; this file was used as input for each pollutant into AERMOD.

An overview of inputs for each emission source group is provided below:

Aircraft:

- Runway use percentages and gate assignments were based on each scenario's design day flight schedule (DDFS).
- Quarter hour profiles for each arrival/departure, aircraft, gate assignment, and runway assignment combination were established based on the peak hour of daily operations.
- Day of the week and monthly operational profiles were obtained from LAWA's Aircraft Noise and Operations Monitoring System (ANOMS) data from calendar year 2015.
- In accordance with EDMS methodology, dynamic sequencing was performed. To align the emissions inventories, a user-adjusted taxiway speed was used for each modeled scenario.

Gates:

- As predefined by EDMS, the source group for gates includes aircraft startup, GSE, and APUs. However, as the proposed Project would not impact use of GSE or APUs, only aircraft startup was quantified at the gate position.
- Aircraft startup emissions were distributed as described above.

Taxiway Queues:

- Corresponding airfield layouts for each scenario were modeled into EDMS and thus AERMOD.
- Taxipaths to/from each runway/gate were defined based on actual operations at LAX.

Stationary Sources:

- Stationary source emissions were calculated using CalEEMod (as described in Section 4.1.2.2)
- The aggregated emissions rates for on-site combustion and off-site purchased electricity were modeled as area sources at the respective project locations.

AERMOD Settings

As required by the SCAQMD, AERMOD was run using USEPA regulatory default options. Additional modeling options are the same as those outlined in Section 4.1.3.1, with the exception of the in-stack NO_2/ NO_X ratio. For aircraft emissions, an on-site stack ratio of 0.135 was used.

In regards to source locations, operational activities were assumed to be located at the respective on-airport locations for individual sources. Aircraft operations were distributed between the taxiways and runways, as well as on the approach and departure paths.

Receptor points for operational dispersion modeling were the same as those depicted in Figure 1. Meteorology and the OLM method for NO_2 modeling were the same as those outlined in Section 4.1.3.1.

4.2 Greenhouse Gas Emissions

The greenhouse gas emissions analysis conducted for the proposed Project addresses construction emissions for the five years of construction as well as operational emissions in 2019. Construction emissions analyzed include on-site and off-site construction equipment; aircraft GHG emissions were also analyzed for operations of the proposed MSC North Modifications (2019).

4.2.1 CONSTRUCTION ACTIVITIES

In addition to criteria pollutant emissions, construction equipment is a source of greenhouse gas (GHG) emissions. The project-related construction activities for which GHG emissions were calculated are the same as those calculated for criteria pollutant emissions and include the following:

- Off-Road Construction Equipment
- On-Road Construction Equipment
- Construction Worker Commute Vehicles and Delivery/Haul Trucks

Data such as the project schedule, quantity data, construction equipment usage and construction activity, are used in the same way for developing the GHG emissions inventory as for the criteria pollutant inventory. Differences in methodology as to how applicable GHG emission factors are derived are described in this section.

4.2.1.1 Off-Road Construction Equipment

In addition to criteria pollutants, OFFROAD2007 provides data for calculating emission factors for GHGs, including CO_2 and CH_4. For off-road on-site equipment, these emission factors were derived and applied using the same methodology described in Section 4.1.2.1. For each equipment type, the appropriate emission factor for CH_4 was multiplied by its global warming potential (21) and added to the appropriate emission factor for CO_2 (with a global warming potential of 1) to calculate an emission factor of CO_2e in lb/hp-hr. This emission factor was then multiplied by equipment horsepower, load factor, an efficiency factor, and total operating hours, resulting in GHG emissions for each construction year.

4.2.1.2 On-Road On-Site Equipment

EMFAC2014 was used to obtain emission factors of CO_2. These emission factors were obtained and applied using the same methodology described in Section 4.1.2.1 for criteria pollutants. CO_2 emission factors obtained from EMFAC2014 and used in this analysis assume Pavley-I and Low Carbon Fuel Standard (LCFS) benefits.

In accordance with CARB guidance, for heavy-duty vehicles (assumed to be all on-road on-site vehicles except on-site pickup trucks) emission factors for CH_4 were calculated by multiplying the TOG emission factor by 0.0408. N_2O emission factors for all on-road on-site diesel vehicles were calculated by applying a factor of 0.3316 grams/gallon of fuel consumed by the vehicles. EMFAC2011 was used to derive the gallons of fuel

consumed per VMT for T7 single construction vehicles by year. The resulting fuel consumption was multiplied by the grams/gallon factor above to derive an emission factor of N_2O in g/mi. This emission factor was then multiplied by an assumed on-site speed of 20 mph, resulting in an emission factor in g/hr.

For on-road on-site gasoline vehicles (i.e., on-site pickup trucks), EMFAC2011-LDV was used to calculate CH_4 emission factors in g/mi and multiplied by an assumed speed of 20 mph to derive emission factors in g/hr. Per CARB guidance, N_2O emission factors for gasoline vehicles were derived by multiplying the appropriate NO_X emission factor (in g/hr) by 4.16 percent.

Once appropriate emission factors for CO_2, CH_4, and N_2O were calculated for each vehicle, a combined emission factor of CO_{2e} was derived by taking the sum of the emission factor of CO_2 (multiplied by a global warming potential of 1), the emission factor for CH_4 (multiplied by a global warming potential of 21) and the emission factor for N_2O (multiplied by a global warming potential of 310). The resulting emission factor of CO_{2e} in g/hr was converted to lb/hr, which was applied to the monthly operating hours for each equipment type to estimate monthly emissions.

4.2.1.3 On-Road Off-Site Equipment

GHG emission factors and resulting emissions for on-road off-site vehicles were obtained and applied using the same methodology described in Section 4.1.2.1 for criteria pollutants. Emission factors of CO_2e for on-road off-site equipment were calculated using the same methodology described previously for on-road on-site equipment, except that emission factors were derived in lb/mi and multiplied by the annual operating hours for each equipment type to estimate monthly emissions.

4.2.2 OPERATIONS

In addition to criteria pollutants, EDMS also provides aircraft CO_2 emissions. Inputs into EDMS were the same as those outlined in Section 4.1.2.2 for criteria pollutants. CH_4 and N_2O emissions are not directly estimated by EDMS; therefore, it was necessary to estimate emissions using other methods. Emissions were calculated using fuel burn (converted from lbs to gallons) from EDMS and emission factors (in g/gal of fuel) from the U.S. Energy Information Administration. Emission factors for CH_4 and N_2O are shown in **Table 11**. Once appropriate emissions for CH_4 and N_2O were calculated, $MTCO_2e$ was calculated by taking the sum of CO_2 emissions (multiplied by a global warming potential of 1), the CH_4 emissions (multiplied by a global warming potential of 21) and the N_2O emissions (multiplied by a global warming potential of 310).

Table 11: Jet Fuel GHG Emission Factors

FUEL TYPE	CH_4 (G/GAL FUEL)	N_2O (G/GAL FUEL)
Jet Fuel	0.27	0.31

SOURCE: U.S. Energy Information Administration, "Voluntary Reporting of Greenhouse Gases Program Fuel Emission Coefficients," January 31, 2011, available: www.eia.gov/oiaf/1605/coefficients.html#tbl7.
PREPARED BY: Ricondo & Associates, Inc., June 2106.

Appendix B

Human Health Risk Assessment

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1. Introduction

The human health risk assessment (HHRA) presented in this appendix estimates cancer, chronic non-cancer, and acute health risks associated with exposure to toxic air contaminants that would be emitted from on-airport construction and operational activities associated with the Los Angeles International Airport (LAX) MSC North Modifications (proposed Project).

1.1 Purpose

The objective of the HHRA is to assess incremental changes to health impacts for people exposed to toxic air contaminants (TAC) resulting from construction and operations associated with the proposed Project. The results of the HHRA identify whether the proposed Project would increase health risks for people living, working, recreating, or attending school near LAX.

The proposed MSC North Modifications would not alter the airspace traffic, runway operational characteristics, or the practical capacity of the Airport. Therefore, the proposed MSC North Modifications would not increase operations at LAX; however, the proposed Project would provide an additional aircraft gate to reduce reliance on the West Remote Gates/Pads and operate as an "empty chair," providing capacity for the temporary relocation of carrier operations during routine construction or modernization activities in existing facilities. Construction of the proposed Project would result in the emissions of TAC. Additionally, the shift in operations from the West Remote Gates/Pads to the MSC North may redistribute TAC concentrations. As such, the emissions evaluated in the HHRA include those from construction sources (e.g., construction equipment), and from long-term operational changes. Human health risks associated with construction and operational activities associated with the proposed Project are evaluated in this HHRA.

Possible human health risks associated with the proposed Project were estimated using modeled TAC concentrations in air and standard methods developed by the California Environmental Protection Agency (CalEPA) and U.S. Environmental Protection Agency (USEPA). Health impacts were evaluated for cancer risks and chronic and acute non-cancer health hazards. An impact was considered significant if cancer or non-cancer health hazards exceeded regulatory thresholds.

1.2 General Approach

This HHRA focuses on analysis of incremental human health risks and hazards associated with airborne releases of TAC during construction and operations of the proposed Project. Cancer risks as well as chronic and acute non-cancer health hazard assessments all depend on estimating TAC concentrations in air in two steps: (1) estimation of emissions of TAC associated with construction and subsequent modeling of dispersion of those TAC to downwind receptor locations; and (2) estimation of health risks associated with inhalation of TAC. Estimated emission rates were used, along with meteorological and geographic information, as inputs to an air dispersion model. The dispersion model predicted possible concentrations of TAC released during airport construction within the study area around the airport. Modeled concentrations were used to estimate human health risks and hazards, which serve as the basis of the significance determinations for the proposed Project.

Potential impacts to human health were estimated using modeled TAC concentrations in air and methods developed by the CalEPA and the USEPA, as described below. Results of the analysis were then interpreted by comparing incremental cancer risks and chronic non-cancer health hazards to regulatory thresholds. For purposes of assessing the significance of any health impacts, these comparisons were made for maximally exposed individuals (MEI) at locations where maximum concentrations of TAC were predicted by air dispersion modeling. An impact was considered significant if cancer risks and/or chronic non-cancer health hazards for MEI exceeded regulatory thresholds. In addition, the range of possible risks and hazards was addressed by evaluating risks for all modeled locations within the defined study area.

Methods for conducting this HHRA are presented in Section 2; TAC emission calculation approach and results and a discussion of the dispersion analysis are presented in Section 3; associated health risks are presented in Section 4; and uncertainties are discussed in Section 5.

2. Methodology

The HHRA was conducted in four steps as defined in South Coast Air Quality Management District (SCAQMD), California Environmental Protection Agency (CalEPA) and U.S. Environmental Protection Agency (EPA) guidance, consisting of:

- Identification of TACs that may be released in sufficient quantities to present a public health risk (Hazard Identification);
- Analysis of ways in which people might be exposed to TACs (Exposure Assessment);
- Evaluation of the toxicity of TACs that may present public health risks (Toxicity Assessment); and
- Characterization of the magnitude and location of potential health risks for the exposed community (Risk Characterization)

Specifically, this HHRA addresses the following issues:

- Quantitative assessment of potential cancer risks and chronic non-cancer health hazards due to the release of TACs associated with the proposed Project construction and operations activities.
- Quantitative evaluation of possible acute non-cancer health hazards due to the release of TACs associated with the proposed Project construction and operations activities.

Protective methods that are likely to overestimate rather than underestimate possible health risks were used to estimate cancer risks and chronic non-cancer health hazards. For example, incremental risks and hazards associated with the proposed Project were calculated for individuals assumed to live, work, recreate, or attend school at locations where TAC concentrations are predicted to be highest. Further, these individuals were assumed to be exposed to TAC for almost all days of the year and for many years to maximize estimates of possible exposure. These "maximally exposed individuals" or MEI are hypothetical individuals used to help ensure that the HHRA is protective.

Risk estimates for MEI are, therefore, upper-bound predictions that could be experienced by people working or living near LAX who breathe TAC released during construction activities associated with the proposed Project. If hypothetical individuals that receive the highest exposures are protected, actual members of the population near LAX will also be protected.

The HHRA for the proposed Project also evaluates the potential for short-term (1-hour) exposures to cause immediate, or acute, non-cancer health impacts. These estimates are also intentionally conservative; they use,

for example, the highest 1-hour concentrations for assessing acute impacts regardless of whether individuals might have access to locations where maximum concentrations occur. This approach helps ensure that actual exposure concentrations in off-airport areas are not underestimated.

2.1 Selection of TACs of Concern

In general, TACs of concern used in the HHRA are based on TACs identified under California Assembly Bill AB2588 and for which the California Environmental Protection Agency, Office of Environmental Health Hazard Assessment (OEHHA) has developed cancer slope factors, chronic reference levels, and/or acute reference levels.

The list of TACs of concern used in this HHRA was developed using regulatory lists, emissions estimates, human toxicity information, results of the LAX Master Plan HHRA, and a review of health risk assessments for construction activities included in the LAX South Airfield Improvement Project (SAIP) Final EIR,[1] LAX Crossfield Taxiway Project (CFTP) Final EIR,[2] LAX Bradley West Project Final EIR,[3] LAX Master Plan Final EIR,[4] LAX Runway 7L/25R Runway Safety Area and Associated Improvements Project Final EIR,[5] LAX West Aircraft Maintenance Area Project Final EIR,[6] and LAX Midfield Satellite Concourse (MSC) Final EIR.[7] The resulting list of TACs of concern evaluated in this HHRA is provided in **Table 1**.

1 City of Los Angeles, Los Angeles World Airports, Final Environmental Impact Report for Los Angeles International Airport (LAX) South Airfield Improvement Project, August 2005.

2 City of Los Angeles, Los Angeles World Airports, Final Environmental Impact Report for Los Angeles International Airport (LAX) Crossfield Taxiway Project, January 2009.

3 City of Los Angeles, Los Angeles World Airports, Final Environmental Impact Report for Los Angeles International Airport (LAX) Bradley West Project, September 2009.

4 City of Los Angeles, Final Environmental Impact Report for Los Angeles International Airport (LAX) Proposed Master Plan Improvements, April 2004.

5 City of Los Angeles, Final Environmental Impact Report for Los Angeles International Airport (LAX) Runway 7L/25R Runway Safety Area (RSA) and Associated Improvements Project, January 2014.

6 City of Los Angeles, Final Environmental Impact Report for Los Angeles International Airport (LAX) West Aircraft Maintenance Area Project, February 2014.

7 City of Los Angeles, Final Environmental Impact Report for Los Angeles International Airport (LAX) Midfield Satellite Concourse, July 2014.

Table 1: Toxic Air Contaminants (TAC) of Concern for the Proposed Project

TOXIC AIR CONTAMINANT	TYPE
Acetaldehyde	VOC
Acrolein	VOC
Benzene	VOC
1,3-Butadiene	VOC
Ethylbenzene	VOC
Formaldehyde	VOC
n-Hexane	VOC
Methyl alcohol	VOC
Methyl ethyl ketone	VOC
Propylene	VOC
Styrene	VOC
Toluene	VOC
Xylene (total)	VOC
Naphthalene	PAH
Arsenic	PM-Metal
Cadmium	PM-Metal
Chromium VI	PM-Metal
Copper	PM-Metal
Lead	PM-Metal
Manganese	PM-Metal
Mercury	PM-Metal
Nickel	PM-Metal
Selenium	PM-Metal
Vanadium	PM-Metal
Diesel PM	Diesel Exhaust
Chlorine	PM-Inorganics
Silicon	PM-Inorganics
Sulfates	PM-Inorganics

NOTES:

PAH = Polycyclic aromatic hydrocarbons

PM = Particulate matter

VOC = Volatile organic compounds

SOURCE: Ricondo & Associates, Inc., June 2016.
PREPARED BY: Ricondo & Associates, Inc., June 2016.

2.2 Exposure Assessment

2.2.1 EXPOSURE POPULATIONS

For analysis of the proposed Project, the HHRA selected the following receptors for quantitative evaluation: on-airport/off-site workers, on-airport/on-site workers, off-airport workers, off-airport adult residents, off-airport child residents, and off-airport school children. Each receptor represents a unique population and set of exposure conditions. As a whole, they cover a range of exposure scenarios for people who may be affected by LAX emissions to the greatest extent. Receptors for which exposure scenarios are prepared were selected to provide protective risks and hazards estimates for MEI and to demonstrate the range of risks and hazards in the vicinity of the airport. As previously noted, by providing estimates for the most exposed individuals for determination of significance, the general population is protected.

2.2.2 EXPOSURE PATHWAYS

Different receptors (e.g., off-site workers, school children) could be exposed to TAC in several ways, deemed exposure pathways. An exposure scenario is developed for each receptor that considers various pathways by which they might be exposed to TAC.

An exposure pathway consists of four parts:

- A TAC source (e.g., diesel/gasoline engines)
- A release mechanism (e.g., diesel/gasoline engine exhaust)
- A means of transport from point of release to point of exposure (e.g., local winds)
- A route of exposure (e.g., inhalation)

If any of these elements of an exposure pathway is absent, no exposure can take place, and, the pathway is considered incomplete. Incomplete pathways were not evaluated in this HHRA. In addition, some exposure pathways may be complete, but may result in little or negligible exposure. Thus, numerous possibly complete exposure pathways exist for receptors at or near LAX, but most are anticipated to make minimal to negligible contribution to total risks and hazards. For this HHRA, the inhalation pathway is the most important complete exposure pathway, contributing the majority of risk associated with the proposed Project, and was therefore quantitatively evaluated for all receptors.

Other exposure pathways -- including deposition of TAC onto soils and subsequent exposure via incidental ingestion of this soil, uptake from soil into homegrown vegetables, and other indirect pathways -- were addressed quantitatively in the programmatic HHRA developed for the LAX Master Plan EIR (see LAX Master Plan Final EIR Technical Report 14a and Technical Report S-9a). No pathway other than inhalation was found to be an important contributor to exposure and thus to risk/hazard. Based on this previous analysis, pathways other than inhalation were not assessed in this HHRA.

2.2.3 EXPOSURE CONCENTRATIONS

Analyses of cancer risk and non-cancer health hazards, both chronic and acute, were included in the exposure assessment for the receptors identified in Section 2.2.1. Chronic and acute exposure to TAC from Project-specific construction activities were estimated by:

- Estimation of construction and operational source emissions for annual (for chronic exposure) and for peak daily (for acute exposure).
- Dispersion modeling of construction and operational emissions over an area that consists of the airport property and urban areas to the north, east, and south.

Modeled concentrations of TAC at locations where highest concentrations are anticipated were used to estimate incremental human health risks and hazards. These estimates serve as the basis for significance determinations for the proposed Project. To estimate cancer risks and the potential for adverse non-cancer health hazards, TAC intakes via inhalation for each receptor were estimated.

In 2009, the EPA released the Risk Assessment Guidance for Superfund (RAGS), Part F (hereafter referred to as RAGS Part F). This guidance recommends that inhalation dosimetry methodology be used to calculate inhalation exposures. In this approach, the concentration of the chemical in air is the exposure metric (e.g., milligrams per cubic meter, mg/m^3), and risks are estimated using a unit risk that predicts cancer risk for each mg/m^3. Inhalation rate and body weight are no longer used in the calculations. RAGS Part F methodology is currently used exclusively by USEPA for calculating risks and hazards for the inhalation pathway and has become universally applied within the United States.

RAGS Part F recommends that the concentration of the chemical in air be used as the exposure metric resulting in **Equation 1** for an exposure concentration.

Averaging time for estimation of cancer risk is 70 years or 25,550 days. Cancer risk is evaluated as the lifetime average daily dose (LADD) according to CalEPA and USEPA guidance. Averaging time for estimation of non-cancer health hazards is the duration of exposure, expressed in days. Non-cancer health hazards are evaluated as average daily dose (ADD) over the period of exposure, again, following CalEPA and USEPA guidance.

Cancer risks and the non-cancer health hazards are then calculated using the **Equation 2**.

Assessment of potential chronic human health impacts due to release of TAC associated with the proposed Project assumes that exposure concentrations of TAC are constant over a 70-year period for residential receptors. For this analysis, chemical concentrations, C, from construction, were assumed to occur during one year. For the remaining 69 years of a 70-year lifetime, construction emissions were assumed to be zero. Risk estimates using these predicted TAC concentrations were based locations where construction impacts were likely to be maximal. Such risk estimates overestimate risks for most people living, working or attending school near LAX. This conservatism (protection) is built into the risk assessment developed for the proposed Project to help counter any future changes in the proposed Project construction that cannot now be anticipated quantitatively.

Equation 1: RAGS Part F Chronic Exposures

$$EC = (CA \times ET \times EF \times ED) / AT$$

Where:

EC = exposure concentration ($\mu g/m^3$)
CA = chemical concentration in air ($\mu g/m^3$)
ET = exposure time (hours/day)
EF = exposure frequency (days/year)
ED = exposure duration (years)
AT = average time; e.g., the period over which exposure is averaged, ED in years x 365 days/year x 24 hours/day (hours)

SOURCE: U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, Risk Assessment Guidance for Superfund, Vol. I, Human Health Evaluation Manual (Part F, Supplemental Guidance for Inhalation Risk Assessment), Final, EPA-540-R-070-002, OSWER 9285.7-82, January 2009.
PREPARED BY: Ricondo & Associates, Inc., September 2016.

Equation 2: RAGS Part F Cancer Risks Characterized by an Inhalation Unit Risk and Hazard Quotients

$$Risk = IUR \times EC$$

$$HQ = EC / (RfC \times 1000\ \mu g/mg)$$

Where:

IUR = inhalation unit risk $(\mu g/m^3)^{-1}$
EC = exposure concentration ($\mu g/m^3$)
HQ = hazard quotient
RfC = reference concentration (mg/m^3)

SOURCE: U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, Risk Assessment Guidance for Superfund, Vol. I, Human Health Evaluation Manual (Part F, Supplemental Guidance for Inhalation Risk Assessment), Final, EPA-540-R-070-002, OSWER 9285.7-82, January 2009.
PREPARED BY: Ricondo & Associates, Inc., September 2016.

Exposure parameters used to calculate LADD and ADD for all receptors for the inhalation pathway are summarized in **Table 2**. Exposure parameters are based on CalEPA Supplemental Guidance for Human Health Multimedia Risk Assessments of Hazardous Waste Sites and Permitted Facilities,[8] USEPA Exposure Factors

[8] California Environmental Protection Agency, Supplemental Guidance for Human Health Multimedia Risk Assessments of Hazardous Waste Sites and Permitted Facilities, 1993.

Handbook,[9] and CalEPA Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments.[10]

Although USEPA has recently released another version of the Exposure Factors Handbook[11] that updates some of the recommended exposure parameters, the exposure parameters in Table 2 were selected to maintain consistency with the health risk analyses conducted for the LAX Master Plan Final EIR, the SAIP EIR, the CFTP EIR, the Bradley West Project EIR, the SPAS EIR, the Runway 7L/25R RSA EIR, the WAMA EIR, and the MSC EIR.

The equation for the RAGS Part F methodology requires exposure time, an exposure parameter that was not previously defined for the LAX Master Plan EIS/EIR and other tiered LAX EIRs (SAIP EIR, CFTP EIR, and Bradley West Project EIR) because it was not required for the Risk Assessment Guidance for Superfund (RAGS), Part A methodology (hereafter referred to as RAGS Part A). For exposure time, assumptions adopted for the SPAS EIR were used. Residents were assumed to be exposed 24 hours a day. A school child was assumed to be exposed eight hours per day to account for six hours of school instruction and two hours of after-school activities. An adult worker was assumed to be exposed 10 hours per day.

Table 2: Parameters Used to Estimate Exposures to TACs of Concern

	OFF-SITE RESIDENT				
EXPOSURE PATHWAY INHALATION OF PARTICULATES AND GASES	**ADULT (70 YEARS)**	**ADULT (30 YEARS)**	**CHILD**	**OFF-SITE SCHOOL CHILD**	**OFF-SITE WORKER**
Daily Breathing Rate (m^3/day)	20[2/]	20[2/]	15[2/]	6[2/]	10[2/]
Exposure Frequency (days/yr)	350[1/,3/]	350[1/,3/]	350[1/,3/]	200[4/]	245[1/]
Exposure Duration (years)	70[1/,5/]	30[1/,5/]	6[2/]	6[4/]	40[1/]
Body Weight (kg)	70[1/,6/]	70[1/,6/]	15[2/]	40	70[1,6/]
Averaging Time - Non-cancer (days)	25,550[1/,6/]	10,929	2,190[6/]	2,190[6/]	14,600[6/]
Averaging Time - Cancer (days)	25,550[1/,6/]	25,550	25,550[1/,6/]	25,550[1/,6/]	25,550[1/,6/]

NOTES:

1/ Cal/EPA, Air Toxic Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments, August 2003.

2/ USEPA, Exposure Factors Handbook, USEPA/600/P-95/002Fa, 1997.

3/ USEPA, Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors, Office of Solid Waste and Emergency Response, Washington D.C., August, 1991.

4/ Site-specific.

5/ 70 year exposure duration will be used as basis for determining significance.

6/ USEPA, Risk Assessment Guidance for Superfund, Volume I - Human Health Evaluation Manual, Part A, USEPA/540/1-89/002, Office of Emergency and Remedial Response, Washington D.C., 1989.

SOURCE: Ricondo & Associates, Inc., June 2016.
PREPARED BY: Ricondo & Associates, Inc., June 2016.

9 U.S. Environmental Protection Agency, Exposure Factors Handbook, USEPA/600/P-95/002Fa, 1997.

10 California Environmental Protection Agency, Office of Environmental Health Hazard Assessment, Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments, August 2003.

11 U.S. Environmental Protection Agency, *Exposure Factors Handbook*, EPA/600/R-090/052F, September 2011.

The CalEPA Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments recommends a range of exposure parameters be evaluated. Additional analyses are presented in the uncertainties analysis to verify how sensitivity of risk estimates to changes in exposure duration and exposure time might affect conclusions concerning impacts of the proposed Project.

2.3 Toxicity Assessment

Risks from exposure to TAC are calculated by combining estimates of potential exposure with chemical-specific toxicity criteria developed by CalEPA, USEPA, or both. The toxicity assessment initially examined quantitative toxicity criteria for TAC selected from regulatory lists.

A toxicity assessment for TAC of concern was conducted for the LAX Master Plan Final EIR, as described in Technical Report 14a of that EIR. Conclusions of that assessment have not changed materially. Both the CalEPA OEHHA and USEPA continually update toxicity values as new studies are completed, and all toxicity information provided in Technical Report 14a was reviewed and updated as appropriate by researching recent information available from USEPA, CalEPA OEHHA, World Health Organization (WHO), and Agency for Toxic Substance and Disease Registry (ATSDR).

Acute RELs developed by the State of California were used in the characterization of potential acute non-cancer health hazards associated with the proposed Project. Other sources of acute toxicity criteria (e.g., Agency for Toxic Substances and Disease Registry (ATSDR)) were also evaluated as a source of acute criteria as part of this re-assessment of toxicity information.

Cancer unit risk factors, cancer slope factors, and chronic RELs developed by the State of California were used to characterize cancer risks and chronic non-cancer health hazards associated with longer term inhalation of emissions from construction activities. Both types of toxicity criteria are based on studies of chronic exposure in animals or, in some cases, to people. Inhalation unit risk (for RAGS Part F calculations) and cancer slope factors are presented in **Table 3**. Chronic RELs and reference concentrations (RfCs) are presented in **Table 4**.

Acute RELs developed by the State of California were used in characterization of potential hazards associated with short-term exposure (usually from exposures on the order of 1-hour). RELs are based on the most sensitive, relevant, adverse health effect reported in the medical and toxicological literature. Since margins of safety are incorporated to address data gaps and uncertainties, exceeding an REL does not automatically indicate an adverse health impact. Acute RELs are applicable to all receptors, children and adults, and hazards are the ratio of estimated or measured concentrations and the REL. Acute RELs for the TAC of concern included in this analysis are provided in **Table 5**.

Table 3: Toxicity Criteria for Systemic Toxicants

TAC OF CONCERN	USEPA CANCER INHALATION RFC[1/ 2/] (µg/m^3)[3/]	CAL/EPA CHRONIC INHALATION REL[4/] (µg/m^3)	TARGET ORGAN	CANCER CLASSIFICATION [4/]
VOC				
Acetaldehyde	0.01	0.0000027	Nasal, Larynx	B2
Acrolein	N/A [5/]	N/A	N/A	C
Benzene	0.1	0.000029	Blood	A
1,3-Butadiene	0.6	0.00017	Reproductive System, Blood, Lung, GI	A
Ethylbenzene	0.0087	0.0000025	Kidney	D
Formaldehyde	0.021	0.000006	Respiratory System	B1
PAH				
Naphthalene	0.12	0.000034	Respiratory System	C
Diesel Exhaust				
Diesel Particulates	1.1	0.0003	Lung	D
PM-Metal				
Arsenic	12	0.0033	Skin	A
Cadmium	15	0.0042	Lung, trachea, bronchus cancer deaths	B1
Chromium VI	510	0.15	Lung	A
Lead	0.042	0.000012	N/A	B2
Nickel	0.91	0.00026	N/A	A
Vanadium pentoxide [6/]	29 [7/]	0.0083 [7/]	N/A	N/A

NOTES:

1/ California Environmental Protection Agency, Office of Environmental Health Hazard Assessment, Toxicity Criteria Online Database, Available: http://www.oehha.ca.gov/tcdb/index.asp, 2013.

2/ mg/kg/day - milligram per kilogram per day

3/ µg/m^3 = microgram per cubic meter

4/ USEPA, EPA Weight of Evidence (EPA 1986, EPA 1996):

- A Human carcinogen
- B1 Probable human carcinogen – indicates limited evidence in humans
- B2 Probable human carcinogen – indicates sufficient evidence in animals and inadequate or no evidence in humans.
- C Possible human carcinogen
- D Not classifiable as human carcinogen

5/ N/A = Not available

6/ Inhalation unit risk value for vanadium pentoxide was used for vanadium in the risk calculations.

7/ USEPA Regional Screening Level (RSL) table, May 2013.

SOURCE: Ricondo & Associates, Inc., June 2016.
PREPARED BY: Ricondo & Associates, Inc., June 2016.

Table 4: Cancer Slope and Unit Risk Factors

TAC OF CONCERN	CAL/EPA[1/] INHALATION CANCER SLOPE FACTOR [(mg/kg/day)$^{-1}$][2/]	CAL/EPA[1/] INHALATION UNIT RISK FACTOR [(µg/m^3)$^{-1}$][3/]	TUMOR SITE/INHALATION	USEPA	CAL/EPA
VOC					
Acetaldehyde	9	140	Respiratory System	1,000	300
Acrolein	0.02	0.35	Respiratory System, Eye	1,000	200
Benzene	30	60	Hematopoietic System, Development, Nervous System, Immune System	300	10
1,3 Butadiene	2	20	Reproductive System	1,000	30
Ethylbenzene	1,000	2,000	Developmental, Liver, Kidney, Endocrine System	300	30
Formaldehyde	9.8 [6/]	9	Respiratory System, Eye	N/A [8/]	10
n-Hexane	700	7,000	Nervous System	300	30
Methyl alcohol	40,006	4,000	Developmental	N/A	30
Methyl ethyl ketone	5,000	N/A	Developmental(skeletal variations)	300	N/A
Propylene	3,000 [6/]	3,000	Respiratory System	N/A	100
Styrene	1,000	900	CNS [9/]	30	3
Toluene	5,000	300	CNS, Respiratory System, Development	10	100
Xylenes	100	700	CNS, Respiratory System	300	30
PAH					
Naphthalene	3	9	Respiratory System	3,000	1,000
Diesel Exhaust					
Diesel Particulates	5	5	Respiratory System	30	30
PM Metal					
Arsenic	0.0156	0.015	Development, Cardiovascular System, Nervous System	N/A	30
Cadmium	0.01	0.02	Kidney; respiratory system	N/A	30
Chromium (VI)	0.16	0.2	Respiratory System	300	100
Copper	N/A	N/A	N/A	N/A	N/A
Lead	N/A	N/A	N/A	N/A	N/A
Manganese	0.05	0.09	Nervous System	1,000	300
Mercury	0.3	0.03	Nervous System	30	300
Nickel	0.09 [6/ 7/]	0.014	Respiratory System, Immune System	N/A	30
Selenium	20 [6/]	20	Alimentary system; nervous system cardiovascular system	N/A	3
Vanadium	0.1 [6/]	N/A	N/A	N/A	N/A
PM Inorganics					
Chlorine	0.15 [6/]	0.2	Respiratory System	N/A	30
Silicon	3	3	Respiratory system	N/A	10
Sulfates	N/A	N/A	N/A	N/A	N/A

NOTES:

1/ Values obtained from the USEPA Integrated Risk Information System (IRIS), 2013.

2/ RfC = Reference Concentration

3/ µg/m^3 = microgram per cubic meter

4/ REL = Reference Exposure Level (obtained from OEHHA Online Toxicity Criteria database, 2013. RELs are concentrations in air that would not result in toxic effects even if exposure continued for a lifetime.)

5/ VOC = volatile organic compounds

6/ Values obtained from the USEPA Regional Screening Level (RSL) table, May 2013.

7/ RfC for nickel soluble salts was used for nickel.

8/ N/A = Not available or not applicable.

9/ CNS = Central Nervous System

SOURCE: Ricondo & Associates, Inc., June 2016.

PREPARED BY: Ricondo & Associates, Inc., June 2016.

Table 5: Acute RELs for TAC of Concern

TAC	ACUTE REL[1/] (µG/M^3)
Acrolein	2.5
Benzene	1,300
Formaldehyde	55
Methyl alcohol	28,000
Methyl ethyl ketone	13,000
Styrene	21,000
Toluene	37,000
Xylenes Total	22,000
Arsenic	0.2
Chlorine	210
Copper	100
Manganese	0.17 [2/]
Mercury	0.6
Nickel	0.2
Vanadium pentoxide [3/]	30
Sulfates	120

NOTES:

1/ Values obtained from OEHHA Online Toxicity Criteria database, accessed June 2014.

2/ 8-hour value.

3/ Acute value for vanadium pentoxide was used for vanadium in the risk calculations.

SOURCE: Ricondo & Associates, Inc., June 2016.
PREPARED BY: Ricondo & Associates, Inc., June 2016.

2.4 Risk Characterization

2.4.1 METHODOLOGY FOR EVALUATING CANCER RISKS AND NON-CANCER HEALTH HAZARDS

Concentrations of TACs of concern in air, locations of potentially exposed populations, including locations for MEI exposure scenarios (worker, resident, student), and toxicity criteria were used to calculate incremental human health risks associated with the proposed Project.

Cancer risks were estimated by multiplying exposure estimates for carcinogenic chemicals by corresponding cancer slope factors. Results were risk estimates expressed as the odds of developing cancer. Commonly,

risks (or odds) of developing cancer of one to ten in one million (1×10^{-6} to 10×10^{-6}) or less are considered *de minimis*.[12] Higher risks may be deemed significant in some instances. Cancer risks were based on an exposure duration of 70 years.

Chronic non-cancer health hazard estimates were calculated by dividing exposure estimates by reference doses. Reference doses are estimates of highest exposure levels that would not cause adverse health effects even if exposures continue over a lifetime. The ratio of exposure concentration to reference concentration is termed the hazard quotient (HQ). A HQ greater than one indicates an exposure concentration greater than that considered safe. A ratio that is less than one indicates that Project-related (incremental) exposure was less than the highest exposure level that would not cause an adverse health effect and, hence, no impact to human health would be expected. Risks or odds of adverse effects cannot be estimated using reference doses. However, because reference concentrations are developed in a conservative fashion, HQs only slightly higher than one are generally accepted as being associated with low risks (or even no risk) of adverse effects, and that potential for adverse effects increases as the HQ gets larger.

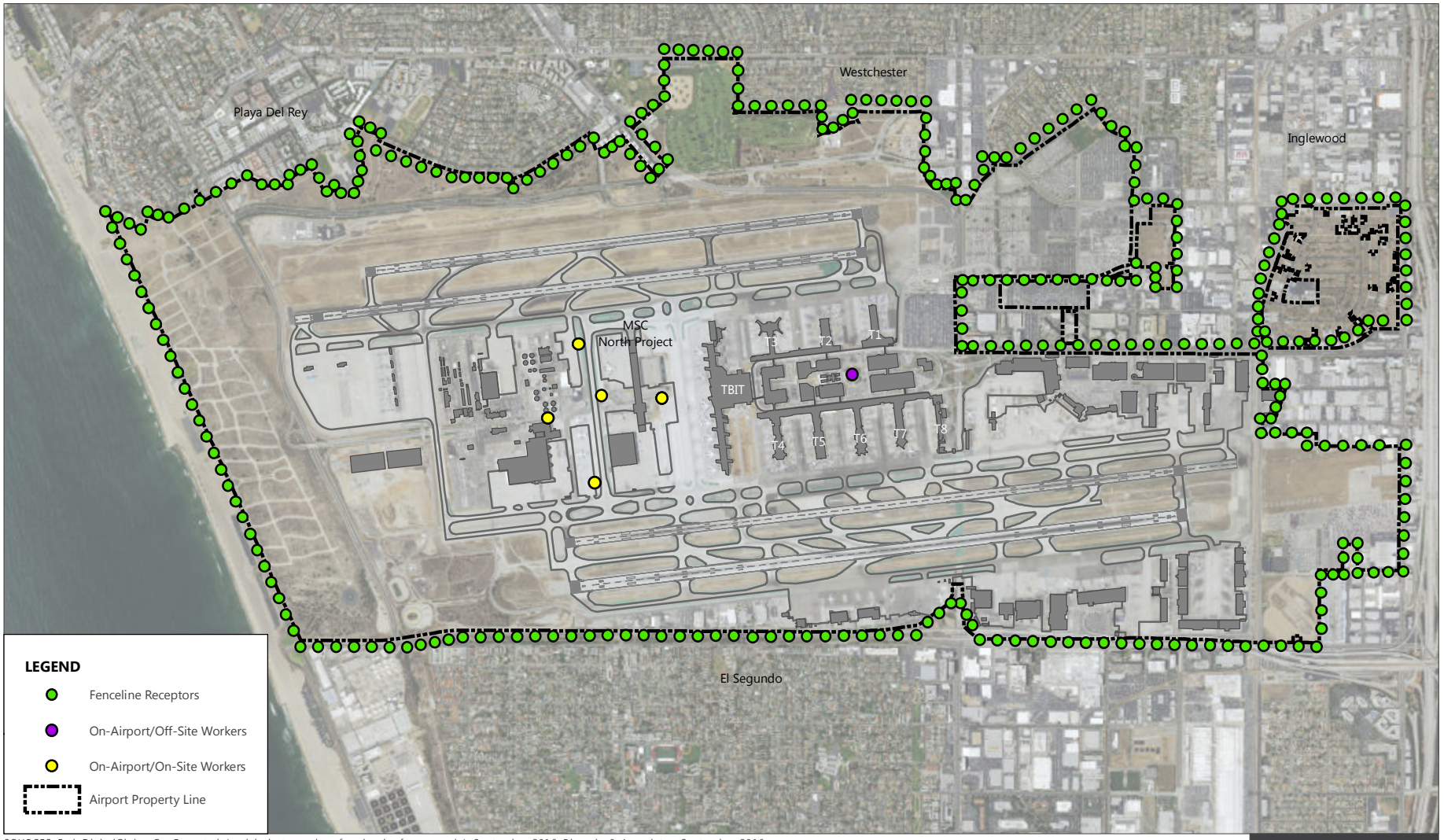
Impacts of exposure to multiple chemicals were accounted for by adding cancer risk estimates for exposure to all carcinogenic chemicals, and by adding estimated HQs for non-carcinogenic chemicals that affect the same target organ or tissue in the body. Addition of HQs for TAC that produce effects in similar organs and tissues results in a Hazard Index (HI) that reflects possible total hazards. Several TAC have effects on the respiratory system including acetaldehyde, acrolein, formaldehyde, xylenes, and diesel particulates. Non-cancer health hazards for the proposed Project were calculated for the respiratory system which accounted for essentially all potential non-cancer health hazards.

To determine whether releases of TAC for the proposed Project would be significant, incremental human health risks for the proposed Project were compared to appropriate thresholds of significance identified in SCAQMD or CalEPA guidance or policy. These comparisons will focus on specific risk thresholds such as ten in one million cancer risk or a hazard index of 1. Differences in incremental human health impacts provide a quantitative assessment of the relative impacts.

2.4.2 MAXIMALLY EXPOSED INDIVIDUALS (MEI)

For the proposed Project, grid points were analyzed along the airport fence-line and within the study area, as shown in **Figure 1**. These locations are anticipated to represent MEI, based on previous dispersion modeling for LAX. Concentrations of each TAC at these nodes were used in calculating cancer risk, and chronic and acute non-cancer health hazard estimates. These calculations were used to identify locations with maximum cancer risks and maximum non-cancer health hazards and serve as the basis for significance determinations.

[12] Clay, Don R., U.S. Environmental Protection Agency, "Memorandum to OSWER, Subject: Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions", April 22, 1991.



SOURCES: Esri, DigitalGlobe, GeoEye, et al. (aerial photography - for visual reference only), September 2016; Ricondo & Associates, September 2016.
PREPARED BY: Ricondo & Associates, Inc., September 2016.
ABBREVIATION: MSC = Midfield Satellite Concourse

FIGURE 1

MSC North Modifications
Receptor Locations

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MEI estimates were partially land use specific. On-airport locations were used to identify on-worker locations. For off-airport locations, all land uses and associated receptors (commercial, residential, etc.) were evaluated for all fence-line grid points under the assumption that such land use could be present now or in the future. Risk and hazard calculations were based on receptors appropriate for land use designations. For example, at each grid node, exposure parameters appropriate for adult commercial workers, for both adult and child residential receptors and for school children were used to estimate exposures, cancer risks, and non-cancer health hazards at that grid point location.

Fence-line concentrations of TAC represent the highest or near-highest concentrations that could be considered "off-airport." Concentrations in areas where people actually work, live, or attend school are predicted to be lower. Thus, impacts for residents, workers, and school children are likely to provide protective estimates for risks and hazards that may occur as a result of implementing the proposed Project.

2.4.3 METHODOLOGY FOR EVALUATING ACUTE IMPACTS

Acute non-cancer risk estimates were calculated by dividing estimated maximum 1-hour TAC concentrations in air by acute RELs. An acute REL is a concentration in air below which adverse effects are unlikely for people, including sensitive subgroups, exposed for a short time on an intermittent basis. In most cases, RELs are estimated on the basis of an 1-hour exposure duration. RELs do not distinguish between adults and children, but are established at levels that are considered protective of sensitive populations. Since margins of safety are incorporated to address data gaps and uncertainties, exceeding the REL does not automatically indicate an adverse health impact.

Toxicity criteria (i.e., RELs) for acute non-cancer health hazards do not distinguish between adults and children, but are established at levels that are considered protective of sensitive populations. An acute REL is a concentration in air below which adverse effects are unlikely, including in sensitive subgroups. In most cases, RELs were estimated on the basis of an 1-hour exposure duration. CalEPA's OEHHA has developed acute RELs for several of the TAC of concern identified in emissions from the airport.

Short-term concentrations for TAC were estimated using the same air dispersion model (AERMOD) used to estimate annual average concentrations, but with the model option for 1-hour maximum concentrations selected. These concentrations represent the highest predicted concentrations of TAC. Acute non-cancer health hazards were then estimated at each grid point by dividing estimated maximum 1-hour TAC concentrations in air by acute RELs. A hazard index equal to or greater than 1, the threshold of significance for acute non-cancer health impacts, indicates some potential for adverse acute non-cancer health impacts. A hazard index less than 1 suggests that adverse acute non-cancer health impacts are not expected.

3. TAC Emissions and Dispersion

3.1 TAC Emissions

Both organic and particulate-bound TACs were analyzed in this HHRA. TACs exist in air as either reactive organic gases or particulate matter. For purposes of the EIR Addendum, organic emissions are represented by volatile organic compounds (VOC). Emission rates of organic TACs were developed from VOC emission inventories for the same construction and operational sources analyzed in Section 6.3 of the EIR Addendum.; details of these emissions estimates are discussed in Appendix A. TACs associated with small particles, or those particles less than 10 microns in diameter (PM_{10}), are the focus for particulate emissions, because this size fraction can deposit in the lung and is therefore primarily responsible for inhalation exposure. Emission rates of particulate-bound TACs were developed from the PM_{10} emission inventories also included in Section 6.3 of the EIR Addendum. Speciation profiles[13] for VOC and PM_{10} emissions from individual source types, primarily developed by the California Air Resources Board (CARB), were used to calculate TAC emissions.[14] These emissions form the basis for modeling concentrations of TACs in air on and around LAX.

3.1.1 CONSTRUCTION ACTIVITIES EMISSIONS

Construction of the proposed Project would result in temporary emissions of various air pollutants from construction equipment, vehicles used by workers commuting to the job site, trucks used for haul/delivery trips, and demolition (material crushing and grading). Methods for estimating source emissions are detailed in Appendix A, Air Quality and Greenhouse Gas Emissions. For emissions estimating, the period of construction for the proposed Project was anticipated to be approximately 5 years.

Emissions of DPM (assumed to be equal to the engine exhaust component of particulates less than 10 microns in diameter) are expected to contribute the majority to total incremental cancer risks for construction sources. Based on previous evaluations of construction impacts at LAX, other TACs have minimal contributions. DPM is classified as a carcinogenic TAC by the California Office of Environmental Health Hazard

[13] Speciation profiles provide estimates of the chemical composition of emissions, and are used in the emission inventory and air quality models. CARB maintains and updates estimates of the chemical composition and size fractions of PM_{10} and the chemical composition and reactive fractions of ROG for a variety of emission source categories. Speciation profiles are used to provide estimates of TAC emissions.

[14] California Air Resources Board, Available at: http://www.arb.ca.gov/ei/speciate/dnldoptvv10001.php, Accessed: December 2, 2013.

Assessment (OEHHA). However, the evaluation of cancer risks and chronic health hazards evaluated the release of DPM as well as other associated TACs from construction equipment.

TAC inventories for construction equipment VOC emissions were developed from Organic Profile No. 818 for diesel-fueled equipment, and Organic Profile No. 2110 for gasoline vehicles. TAC emission inventories for construction equipment PM emissions were developed from Profile No. 425 for diesel-fueled equipment, and Profile No. 420 for construction dust.

3.1.2 OPERATIONAL EMISSIONS

The proposed Project would not alter the airspace traffic, runway operational characteristics, or the practical capacity of the airport. The proposed Project would redistribute aircraft operations from the West Remote Gates/Pads to the MSC North. Therefore, TAC emissions were analyzed for the removal of one gate from the West Remote Gates/Pads and one additional gate at the MSC North. To analyze the incremental impact of this gate, the 2019 With 11 Gates at the MSC North and the 2019 With 12 Gates at the MSC North scenarios were analyzed. This incremental difference was added to the MSC North Project incremental difference found in the MSC EIR, and compared against thresholds to determine any change in significance. Evaluation of potential impacts to human health associated with the proposed MSC North Modifications operational sources (e.g., the difference in taxi times for aircraft operations) were assessed in this HHRA.

TAC inventories for aircraft VOC emissions were developed from EPA Profile No. 5565 for aircraft engine exhaust.

3.2 Exposure Concentrations (Dispersion)

Air dispersion modeling was used to estimate TAC concentrations for the proposed Project. TAC concentrations were estimated in two steps; first, dispersion modeling was used to estimate total VOC and PM_{10} concentrations, and then individual organic or particulate TAC concentrations were calculated using emissions profiles to speciate total VOC and PM_{10} estimates. For example, if total VOC at a given location was 0.1 microgram per cubic meter ($\mu g/m^3$) and a given volatile TAC was expected to make up 1 percent of this total, the concentration of that TAC at that location would be 0.001 $\mu g/m^3$.

Project-related concentrations for TAC from construction sources were estimated using the air dispersion model (AERMOD, Version 15181) with model options for 1-hour maximum, annual, and period average concentrations selected.

3.2.1 SOURCE AREAS

Construction DPM sources were modeled as engine exhaust emissions elevated 5 meters. Construction dust emissions were modeled at ground level. Operational sources were located at their respective on-airport locations; aircraft emissions were located on the appropriate taxiways and runways, as well as the approach and departure paths. Release heights for aircraft are respective to each phase of the landing-takeoff (LTO) cycle.

3.2.2 RECEPTORS

Receptors were modeled along the airport fence-line at approximately 100 m intervals. In addition, five on-airport grid point located at the proposed Project construction site was modeled. A receptor was also located at the LAX Theme Building. The modeled receptors are shown on Figure 1.

3.2.3 METEOROLOGY

The meteorological data from the monitoring station located at the LAX Hastings site was used in the analysis. The meteorological data were obtained from the SCAQMD website, which were preprocessed using AERMET. AERMET is a meteorological preprocessor for organizing available meteorological data into a format suitable for use in the AERMOD air quality dispersion model. These files were also developed by the SCAQMD using site specific surface characteristics (i.e., surface albedo, surface roughness, and Bowen ratio) obtained using AERSURFACE. AERSURFACE is a tool that provides realistic and reproducible surface characteristic values, including albedo, Bowen ratio, and surface roughness length, for input into AERMET. The dataset used consisted of five years of hourly surface data collected at LAX for calendar years 2007 through 2011; the data included ambient temperature, wind speed, wind direction, and atmospheric stability parameters, as well as mixing height parameters from the appropriate upper air station. All five years of meteorological data were loaded into AERMOD to determine the maximum concentrations over the five year period for each pollutant and averaging period combination.

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4. Human Health Risk Assessment

This HHRA assesses incremental changes to health impacts for people exposed to TAC resulting from construction and operations associated with the proposed Project. Cancer risk and chronic non-cancer health hazard estimates for impacts of the proposed Project are based on estimated project emissions and air dispersion modeling as discussed above and in the following sections. Acute health hazard estimates were also addressed using emission estimates and dispersion modeling. Risk calculations indicate that estimates of cancer risks and acute and chronic health hazards would be below the regulatory thresholds of significance. Since assessment of health risks included locations where concentrations of TAC were predicted to be highest, this finding applies to all areas on and around LAX.

The following subsections discuss the incremental cancer risk and chronic non-cancer health hazard estimates for impacts of the proposed Project by receptor.

4.1 Cancer Risks and Non-Cancer Hazards Associated with the Proposed Project

Cancer risk estimates from exposure to construction and operation sources are presented below for adult workers, residents, and school children. Acute and chronic non-cancer health hazards are also discussed. Although construction emissions are only projected to last for one year, for convenience in cancer risk calculations, construction emissions during the construction period were amortized over the entire 70-year exposure period. This approach allowed use of a single exposure concentration in the calculations.

4.1.1 COMPARISON OF ON-SITE AIR CONCENTRATIONS WITH OSHA LIMITS FOR ON-SITE WORKERS

Impacts to on-site workers were evaluated by comparing estimated maximum 1-hour air concentrations of TAC to the California Occupational Safety and Health Administration (CalOSHA) 8-hour Time-Weighted Average Permissible Exposure Levels (PEL-TWAs).[15] Estimated on-site air concentrations and PEL-TWAs for TAC of concern for construction and operations of the proposed Project are presented in **Table 6**. Operational concentrations compare the incremental difference between the 2019 With 11 Gates at the MSC North and the 2019 With 12 Gates at the MSC North scenarios.

[15] California Occupational Safety and Health Administration, Permissible Exposure Limits for Chemical Contaminants, Table AC 1, Available at: http://www.dire.ca.gov/title8/5155.html.

Table 6: Comparison of CalOSHA Permissible Exposure Limits to Maximum 8-Hour On-Site Air Concentrations

TOXIC AIR CONTAMINANT[1/]	INCREMENTAL MSC NORTH MODIFICATIONS CONSTRUCTION CONCENTRATIONS (mg/m^3) [2/]	INCREMENTAL MSC NORTH MODIFICATIONS OPERATION CONCENTRATIONS (mg/m^3) [2/]	CALOSHA PEL TWA (mg/m^3) [3/]
Acetaldehyde	0.002436	0.0014863	45
Acrolein	0.000042	0.0008520	0.25
Benzene	0.000663	0.0005848	0.32 [4/]
1,3-Butadiene	0.000063	0.0005869	2.2
Ethylbenzene	0.000101	0.0000605	435
Formaldehyde	0.004874	0.0042828	0.37 [4/]
Hexane, n-	0.000052	0.0000000	180
Methanol	0.000010	0.0006280	260
Methyl ethyl ketone	0.000489	0.0006280	590
Naphthalene	0.000028	0.0001882	50
Propylene	0.000860	0.0015774	N/A
Styrene	0.000019	0.0001075	215
Toluene	0.000488	0.0002234	37
Xylene (total)	0.000345	0.0001559	435
Diesel PM	0.019678	0.0000000	N/A
Arsenic	0.000002	0.0000000	0.01
Cadmium	0.000004	0.0000000	0.005
Chlorine	0.000332	0.0000000	1.5
Chromium (VI)	0.000001	0.0000000	0.005
Copper	0.000011	0.0000000	1
Lead	0.000054	0.0000001	0.05
Manganese	0.000089	0.0000000	0.2
Mercury	0.000002	0.0000000	0.025
Nickel	0.000006	0.0000000	0.5
Selenium	0.000000	0.0000000	0.2
Silicon	0.018704	0.0000000	6
Sulfates	0.000794	0.0000000	N/A
Vanadium	0.000026	0.0000000	0.05

NOTES: N/A = Not Available

1/ All TACs for which PEL-TWAs are available are listed. PEL-TWAs are not available for diesel exhaust, propylene, and sulfates.

2/ Maximum 1-hour concentrations at on-airport location converted to 8-hour averages by multiplying by a factor of 0.7.

3/ California Occupational Safety and Health Administration. Permissible Exposure Limits for Chemical Contaminants, Table AC-1, 2008, http://www.dir.ca.gov/title8/5155table_ac1.html.

4/ CalOSHA does not have a value; value is from American Conference of Governmental Industrial Hygienists (ACGIH), Documentation of the Threshold Limit Values and Biological Exposure Indices, 8th ed., Cincinnati, Ohio, 1998.

SOURCE: Ricondo & Associates, Inc., June 2016.
PREPARED BY: Ricondo & Associates, Inc., June 2016.

Estimated maximum 1-hour air concentrations at the on-site locations under the proposed Project were converted to an 8-hour average by multiplying by a factor of 0.7.[16] The resulting 8-hour average is a few to several orders of magnitude below PELs for all TAC. This result suggests that air concentrations from airport emissions with implementation of the proposed Project would not exceed those concentrations considered "acceptable" by CalOSHA standards.

4.1.2 CANCER RISKS AND CHRONIC NON-CANCER HEALTH HAZARDS FOR MAXIMALLY EXPOSED INDIVIDUALS (MEI) – RESIDENTS AND SCHOOL CHILDREN

For cancer risks and chronic non-cancer hazards for the proposed Project, 326 grid points were analyzed along the airport fence-line. The concentrations at the 326 fence-line locations represent maximum concentrations of TAC predicted by the air dispersion modeling, can be used to evaluate exposure to a MEI, and thus provide a ceiling for risks and hazards for off-airport residential, commercial, and student receptors. In essence, these calculations assumed that people live, work, and go to school at the LAX fence-line. Although this assumption is incorrect, it is conservative.

Air concentrations for TAC from construction and operations sources were developed using emissions estimates and dispersion modeling as described above. Using these emission estimates, exposure parameters for potential receptors and current toxicity values, cancer risks and chronic non-cancer health hazards were calculated for adult residents, resident children ages 0 to 6 years, and for elementary-aged school children at fence-line locations. Offsite worker risks and hazards were estimated at the fence-line. Peak cancer risks and chronic non-cancer health hazards for MEI for construction and operations of the proposed Project are summarized in **Table 7.**

4.1.2.1 Residents (Adults and Young Children)

The estimated peak incremental cancer risks for adult residents and child residents for construction of the proposed Project range from 0.14 in one million to 1.6 in one million. Cancer risks for operational sources were also evaluated. When compared against the 2019 With 11 Gates at the MSC North scenario, the estimated peak incremental cancer risks for adult residents and child residents for the proposed Project range from 0.001 in one million to 0.006 in one million. Estimated incremental cancer risks are higher for adults than for children, because exposure duration is longer. Exposure to DPM released during construction contributed 96 percent of the peak cancer risks for adults and children. Cancer risks from operational sources are due primarily to exposure of 1,3-butadiene, which contributes to about 65 percent of the risk estimate.

[16] California Air Resources Board. 2003. HARP User Guide: Appendix H Recommendations for Estimating Concentrations of Longer Averaging Periods from the Maximum One-Hour Concentration for Screening Purposes. December. Available at: http://www.arb.ca.gov/toxics/harp/harpug.htm.

Table 7: Incremental Cancer Risks and Chronic Non-Cancer Human Health Hazards for Maximally Exposed Individuals from the Proposed Project

RECEPTOR TYPE	PROJECT CONSTRUCTION	PROJECT OPERATIONS	SIGNIFICANCE THRESHOLD	SIGNIFICANT?
Incremental Cancer Risks [1/] (per million people)				
Child Resident	0.137	0.001	10	No
School Child	0.026	0.0001	10	No
Adult Resident	1.599	0.006	10	No
Adult Worker	0.682	0.001	10	No
Incremental Non-Cancer Chronic Hazards [2/]				
Child Resident	0.105	0.009	1	No
School Child	0.020	0.002	1	No
Adult Resident	0.105	0.009	1	No
Adult Worker	0.074	0.003	1	No

NOTES:

1/ Values provided are changes in the number of cancer cases per million people exposed as compared to baseline conditions. All estimates are rounded to one significant figure.

2/ Hazard indices are totals for all TACs that may affect the respiratory system. This incremental hazard index is essentially equal to the total for all TACs.

SOURCE: Ricondo & Associates, Inc., June 2016.
PREPARED BY: Ricondo & Associates, Inc., June 2016.

Project-related chronic non-cancer hazard indices for construction impacts associated with the proposed Project for adult residents and child residents living at the peak TAC concentration location were estimated to be between 0.02 and 0.11. At the peak hazard index location, hazard indices are primarily attributable to silicon (39 percent), DPM (33 percent) and chlorine (11 percent). Chronic non-cancer hazard indices for operational impacts associated with the proposed Project for adult residents and child residents living at the peak TAC concentration location were estimated to be 0.01. At the peak hazard index location, hazard indices are primarily attributable to acrolein, which contributes to about 82 percent of the risk estimate.

4.1.2.2 School Children

School children were evaluated at all 326 fence-line grid nodes. Incremental cancer risk from construction of the proposed Project for children attending schools at the peak location within the study area is estimated to be 0.03 in one million. Exposure to DPM released during construction contributed 96 percent of the peak cancer risks. When compared against the 2019 With 11 Gates at the MSC North scenario, the estimated peak incremental cancer risk for school children is 0.0001 in one million. Cancer risks from operational sources are due primarily to exposure of 1,3-butadiene, which contributes to about 65 percent of the risk estimate. Risks below 1 in one million are typically considered negligible by regulatory agencies in California.

4.1.2.3 Adult Workers

Adult workers were evaluated at all 326 off-airport grid nodes. Cancer risks for adult workers during construction at the peak location are estimated to be 0.68 in one million. Exposure to DPM released during construction contributed 96 percent of the peak cancer risks. When compared against the 2019 With 11 Gates at the MSC North scenario, the estimated peak incremental cancer risk for adult workers is 0.001 in one million. Cancer risks from operational sources are due primarily to exposure of 1,3-butadiene, which contributes to about 66 percent of the risk estimate.

Overall, project-related cancer risks for the proposed Project for adult workers are predicted to be below the threshold of significance.

4.1.3 ACUTE NON-CANCER HAZARDS RISK

As with cancer risks and chronic non-cancer health hazards, acute health hazards were analyzed at 332 grid points within the study area (326 fence-line receptors and six on-airport receptors). Short-term concentrations of TAC for the proposed Project sources were estimated using AERMOD with the model option for 1-hour maximum concentrations selected. Acute health hazards were estimated at each grid point by comparison of the modeled TAC concentration at each grid point with the acute REL. All TAC identified in Project construction emissions, and for which CalEPA has developed acute RELs, were evaluated for potential acute health hazards. All acute health hazard estimates are specific for airport emissions and are independent of county-wide estimates developed by USEPA.

Land use distinctions and different exposure scenarios are not relevant for assessment of acute health hazards. For example, someone visiting a commercial establishment would potentially be subject to the same acute health hazards as someone working at the establishment. Fence-line concentrations of TAC are likely to represent the highest concentrations and therefore the greatest impacts for residents, school children, or off-airport workers. On-airport grid points were assumed to be commercial receptors (workers).

Acrolein, formaldehyde, and manganese are the only TAC of concern in construction and operational emissions from the proposed Project that might be present at concentrations approaching the thresholds for acute health hazards. Acute health hazards for other TAC are orders of magnitude below their respective acute RELs and thus would not contribute substantially to health hazards. The primary source of acrolein is aircraft emissions; the primary source of formaldehyde is from diesel-powered construction equipment; the primary source of manganese is fugitive dust. Maximum acute health hazards associated with exposure to these three chemicals from the proposed Project construction, and two chemicals from operations, are summarized in **Table 8**.

Table 8: Maximum Incremental Acute Non-Cancer Hazard Indices from Construction and Operations

	CONSTRUCTION		OPERATIONS [1/]	
POLLUTANT	**FORMALDEHYDE**	**MANGANESE**	**ACROLEIN**	**FORMALDEHYDE**
Residential				
Maximum HI [2/]	0.011	0.070	**2.16**	0.49
Minimum HI	0.003	0.011	-2.55	-0.58
Average HI	0.005	0.031	-0.41	-0.09
School				
Maximum HI	0.007	0.045	0.51	0.07
Minimum HI	0.002	0.011	-0.46	-0.10
Average HI	0.005	0.025	0.00	0.00
Offsite Worker				
Maximum HI	0.009	0.049	**1.27**	0.29
Minimum HI	0.002	0.008	-2.47	-0.56
Average HI	0.003	0.017	-0.16	-0.04
Recreational				
Maximum HI	0.009	0.056	-0.26	-0.06
Minimum HI	0.002	0.012	-1.59	-0.36
Average HI	0.004	0.024	-0.76	-0.17
Overall Off-Airport				
Maximum HI	0.011	0.070	**2.16**	0.49
On-Site Occupational				
Maximum HI	0.127	0.746	0.72	0.16

NOTES: HI = Hazard Index

1/ MSC North Project values from the MSC EIR combined with the incremental difference calculated for the MSC North Modifications.

2/ **Bold** HIs are greater than the significance threshold of 1.

SOURCE: Ricondo & Associates, Inc., June 2016.
PREPARED BY: Ricondo & Associates, Inc., June 2016.

As shown in Table 8, construction-related maximum acute hazard quotients for formaldehyde and manganese during construction are all below the significance threshold of 1. However, operations-related incremental maximum acute hazard quotients for acrolein for operations of the proposed Project are estimated to be 2.2 for residents living at the peak hazard location, 0.5 for school children, -0.3 for recreational users, and 1.3 for off-site adult workers. A hazard index equal to or greater than 1 would indicate the potential for acute adverse health effects. Acute exposure to acrolein typically results in mild irritation of eyes and mucous

membranes. Acute exposures to formaldehyde may result in irritation to the eye and respiratory system and potentially adverse effects to the immune system.

4.2 Cumulative Risks and Non-Cancer Health Hazards Associated with the Proposed Project

Unlike air quality, for which standards have been established that determine acceptable levels of pollutant concentrations, no standards exist that establish acceptable levels of human health risks or that identify a threshold of significance for cumulative health risk impacts. Therefore, the discussion below addresses cumulative health risk impacts, and Project-related contributions to those impacts; however, no determination is made regarding the significance of cumulative impacts. Since these results are not used for significance determination, a general discussion of the cumulative impacts for the proposed Project is provided. Based on information available from the South Coast Air Quality Management District (SCAQMD) and U.S. Environmental Protection Agency (USEPA), relative to regional cancer risk estimates and toxic air contaminant (TAC) predictions, the geographic areas considered in the cumulative health risk impacts analysis include the South Coast Air Basin for cancer risk and the LAX area for non-cancer health hazards, as further described below.

4.2.1 CUMULATIVE CANCER RISKS

The SCAQMD has conducted multiple urban air toxics monitoring and evaluation studies for the South Coast Air Basin over the last few decades. Most recently, SCAQMD has released a draft report called Multiple Air Toxics Exposure Study in the South Coast Air Basin (MATES-IV). MATES-IV is a follow up to MATES-III, which updates the monitoring and evaluation study performed from 2004 to 2006. According to MATES-IV, cancer risks in the South Coast Air Basin range from 320 in one million to 480 in one million, with an average of 418 in one million. These cancer risk estimates are relatively high (although substantially lower than those found in MATES-III) and indicate that current impacts associated with ongoing releases of TAC (e.g., from vehicle exhaust) and from sources of TAC from past and present projects in the region are substantial. The MATES-IV study is an appropriate estimate of present cumulative impacts of TAC emissions in the South Coast Air Basin. It does not, however, have sufficient resolution to determine the fractional contribution of current LAX operations to TAC in the airshed. Only possible incremental contributions to cumulative impacts can be assessed.

Meaningful quantification of future cumulative health risk exposure in the entire South Coast Air Basin is not possible. Moreover, the threshold of significance used to determine cancer risk impacts associated with the proposed Project is based on the cancer risks associated with individual projects; this threshold is not appropriately applied to conclusions regarding cumulative cancer risk in the South Coast Air Basin.

However, based on the relatively high cancer risk level associated with TAC in air in the South Coast Air Basin (i.e., an additional 418 cancer cases per million according to MATES-IV), the proposed Project (with a maximum estimated incremental cancer risk of 1.6 cancer cases per million) would not add substantially (less than 0.4 percent) to the already high cumulative cancer risk in the South Coast Air Basin. This small increase

estimated for the proposed Project would not be measurable against urban background conditions in the South Coast Air Basin.

The above comparisons do not account for possible positive changes in air quality in the South Coast Air Basin in the future. SCAQMD and other agencies are consistently working to reduce air pollution. In particular, reductions in emissions of diesel particulates are being considered and implemented. Since diesel particulate matter is the major contributor to estimated cancer risks, substantial reductions in diesel emissions would result in substantial reductions in cumulative cancer risks. These, and other such regulations intended to reduce TAC emissions within the South Coast Air Basin, would reduce cumulative impacts overall. While continued, if not increased, regulation by the SCAQMD of point sources as well as more stringent emission controls on mobile sources would reduce TAC emissions, whether such measures would alter incremental contributions of TAC releases to cumulative impacts under the proposed Project cannot be ascertained.

4.2.2 CUMULATIVE CHRONIC NON-CANCER HEALTH HAZARDS

Acrolein is the TAC of concern that is responsible for the majority of all predicted chronic non-cancer health hazards associated with LAX operations. In 2011, USEPA published an independent study of possible annual average air concentrations within the South Coast Air Basin associated with a variety of TAC, including acrolein.[17] These estimates provide a means for assessing cumulative chronic non-cancer health hazard impacts of airport operations in much the same manner as cumulative cancer risks were assessed using the MATES-IV results.

Within Los Angeles County, USEPA prediction for annual average concentrations yield acrolein hazard indices ranging from 0.3 to 15, with an average of 4; DPM hazard indices ranging from 0.0007 to 1.2, with an average of 0.3. Incremental hazard indices for the proposed Project (Table 7) were estimated to range from 0.02 to 0.11 for construction, and between 0.002 and 0.01 for operations, orders of magnitude below the threshold of significance of one. Given the relatively small hazard indices associated with proposed Project emissions, the Project is not expected to add significantly to cumulative chronic non-cancer health hazards.

Because of the substantial uncertainties associated with the USEPA estimates,[18] the cumulative analysis for chronic non-cancer health hazard impacts is semi-quantitative and based on a range of possible contributions. This cumulative analysis does not address the issue of potential interactions among acrolein and criteria pollutants. Such interactions cannot, at this time, be addressed in a quantitative fashion. A

[17] U.S. Environmental Protection Agency, 2005 National-Scale Air Toxics Assessment, 2011, Available: www.epa.gov/ttn/atw/nata2005/tables.html.

[18] U.S. Environmental Protection Agency, 2005 National-Scale Air Toxics Assessment, 2011, Available: www.epa.gov/ttn/atw/nata2005/tables.html.

qualitative discussion of the issue is presented in the LAX Master Plan Final EIR[19] Technical Report S-9a, Section 7.

4.2.3 CUMULATIVE ACUTE NON-CANCER HEALTH HAZARDS

Acrolein, formaldehyde, and manganese are the primary TAC of concern in the proposed Project emissions that might be present at concentrations approaching the threshold for acute health hazards. Predicted concentrations of TAC released during operations of the proposed Project estimate that acute non-cancer health hazards would be above the significance threshold of one for acrolein. The assessment of cumulative acute non-cancer health hazards follows the methods used to evaluate cumulative acute non-cancer health hazards presented in the LAX Master Plan Final EIR[20] (Section 4.24.1.7 and Technical Report S-9a, Section 6.3), incorporating updated National Scale Air Toxics Assessment (NATA) tables from 2005. USEPA-modeled emission estimates by census tract were used to estimate annual average ambient air concentrations. These census tract emission estimates are subject to high uncertainty, and USEPA warns against using them to predict local concentrations. Thus, for the analysis of cumulative acute non-cancer health hazards, estimates for each census tract within Los Angeles County were identified, and the range of concentrations was used as an estimate of the possible range of annual average concentrations in the general vicinity of the airport. This range of concentrations was used to estimate a range of acute non-cancer hazard indices using the same methods as described in the LAX Master Plan Final EIR[21] (Section 4.24.1.7 and Technical Report S-9a, Section 6.1). The methodology entails converting the USEPA annual average estimates to maximum 1-hour average concentrations by dividing annual average estimates by 0.08. Then the maximum 1-hour average concentrations were divided by the acute REL to calculate acute hazard indices. The range of hazard indices was then used as a basis for comparison with estimated maximum acute non-cancer health hazards for the proposed Project. The relative magnitude of acute non-cancer health hazards calculated on the basis of the USEPA estimates and maximum hazards estimated for the proposed Project were taken as a general measure of relative cumulative impacts. Emphasis must be placed on the relative nature of these estimates. Uncertainties in the analysis preclude estimation of absolute impacts.

When USEPA annual average estimates are converted to possible maximum 1-hour average concentrations, acrolein acute hazard indices are estimated to range from 0.03 to 1.5, with an average of 0.4; formaldehyde acute hazard indices are estimated to range from 0.1 to 2.2, with an average of 1; and manganese acute hazard indices are estimated to range from 0.03 to 0.5, with an average of 0.13 for locations within the HHRA study area. Predicted overall maximum incremental acute non-cancer health hazards for the proposed Project associated with acrolein ranged from 1.3 to 2.2; those associated with formaldehyde ranged from 0.29 to 0.49; and those associated with manganese ranged from 0.05 to 0.07. Results suggest that the proposed MSC

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19 City of Los Angeles, Final Environmental Impact Report for Los Angeles International Airport (LAX) Proposed Master Plan Improvements, April 2004.

20 City of Los Angeles, Final Environmental Impact Report for Los Angeles International Airport (LAX) Proposed Master Plan Improvements, April 2004.

21 City of Los Angeles, Final Environmental Impact Report for Los Angeles International Airport (LAX) Proposed Master Plan Improvements, April 2004.

North Project would add to total 1-hour maximum acrolein concentrations at some locations in the HHRA study area and, therefore, to cumulative acute non-cancer health hazards associated with exposure to acrolein.

4.2.4 CONCLUSIONS

Although no defined thresholds for cumulative health risk impacts are available, it is the policy of the SCAQMD to use the same significance thresholds for cumulative impacts as for the Project-specific impacts analyzed in the EIR Addendum. If cumulative health risks are evaluated following this SCAQMD policy, the Project's contribution to the cumulative cancer risk would not be cumulatively considerable since the incremental cancer risk impacts of the proposed Project are all below the individual cancer risk significance thresholds of 10 in one million.

In contrast to cancer risk, the SCAQMD policy does have different significance thresholds for project-specific and cumulative impacts for hazard indices for TAC emissions. A project-specific significance threshold is one (1.0) while the cumulative threshold is 3.0. Based on this SCAQMD policy, chronic non-cancer hazard indices associated with airport emissions under the proposed MSC North Modifications would be cumulatively considerable.

5. Uncertainties

Uncertainties are present in all facets of human health risk assessment. Potential important uncertainties associated with the HHRA for the LAX Master Plan are discussed in detail in Technical Report 14a and Technical Report S-9a of the LAX Master Plan Final EIR. These same uncertainty considerations apply to the analyses presented in the proposed Project EIR. These uncertainties are briefly summarized below.

5.1 Uncertainties Associated with Emission Estimates and Dispersion Modeling

Risk estimates were based on chemical concentration estimates obtained through emissions and dispersion modeling. Emissions estimates are sensitive to the values used to represent the numerous emission source variables (e.g., future aircraft operation assumptions) and to the air toxic emission factor values used for each source. Consequently, estimated emissions values are subject to uncertainties. Different assumptions and values of variables would result in different emissions estimates. The HHRA used well-accepted methods and best available emission factor data to develop estimates of emissions, and estimates and assumptions are reasonable and appropriate. Actual emissions are unlikely to be meaningfully greater than those used in the analyses.

In accordance with the Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments,[22] a simplification was made in the emissions modeling to model DPM and not the speciated emissions from diesel-fueled engines for the emission concentrations used in the evaluation of cancer risk or chronic non-cancer health impacts. According to the guidance, the inhalation cancer potency factor and chronic REL for DPM already account for inhalation impacts from speciated emissions from diesel-fueled engines. Therefore, this omission in the modeling is not expected to impact the results of the analysis.

Another simplification was made in the estimate of construction emissions. Construction emission sources were limited to diesel engine exhaust, gasoline engine exhaust, and construction dust. Previous studies indicated that these sources account for a substantial majority of all TAC emissions and thus for risks and hazards associated with construction activities come from these sources. Further, methods used assumed that

[22] California Environmental Protection Agency, Office of Environmental Health Hazard Assessment, Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments, Appendix D, August 2003.

all PM from engine exhaust came from diesel engines and all of the engine exhaust TOG came from gasoline engines. Given the high toxicity of diesel PM and the greater emissions of toxic organic chemicals in gasoline engine exhaust, these assumptions compensate for ignoring expected minor contributions from paving and striping emissions.

In addition, recent studies suggest that predicted concentrations of acrolein in air associated with LAX construction and operations may be over-estimated. Acrolein is unlikely to be transported over long distances because of its high reactivity and estimated short half-life in air. A study at Chicago O'Hare International Airport used empirical measurements of acrolein in ambient air to determine that acrolein was not a significant TAC associated with airport operations. The Illinois EPA measured airborne levels of various air contaminants in the vicinity of the O'Hare International Airport as well as at other locations in the Chicago area over a seven-month period in 2000. An objective of the air toxics monitoring program was to determine if emissions associated with O'Hare International Airport had a measurable impact on air quality in areas adjacent to the airport. Acrolein was not reported at measurable levels in air at locations near the airport during the air toxic monitoring program.

5.2 Evaluation of Sensitive Receptor Populations

Certain subpopulations may be more sensitive or susceptible to negative health impacts caused by environmental contaminants than the population at large. Risk estimates presented in the HHRA represent a wide range of potential exposures including the highest that can be reasonably expected. Thus, even though risk estimates are not provided for all potentially sensitive receptors in the area, populations not specifically evaluated are still expected to be represented. For example, quantitatively evaluated populations include those with the highest expected exposure durations and exposure frequencies (e.g., residents). Exposures are therefore expected to be less for other populations, even those with higher chemical sensitivities.

5.3 Uncertainties Associated with Exposure Parameter Assumptions

An exposure duration of 70 years was used to estimate possible cancer risks associated with the proposed Project. A 70-year exposure duration is generally used by the SCAQMD in risk assessments performed for permitting purposes. This exposure duration combined with other exposure parameters used in this HHRA assumes that an individual exists who resides where maximum impacts occur in a location near construction similar to construction anticipated for LAX, and that the individual is sedentary, spending essentially all of his/her time at home. Further, this exposure duration assumes that construction emissions continue for a lifetime (6 years for a child and 70 years for an adult). In essence, SCAQMD assumes that person would constantly be exposed to emissions at the point of greatest impact for their entire lives. This combination of factors never occurs, and any estimates of cancer risk based on such a combination will greatly overestimate possible cancer risks for everyone in the study area.

In the Air Toxics Hot Spots Guidance,[23] OEHHA recommends using a stochastic approach to evaluating cancer risks for residential receptors (it does not recommend this approach for workers or for chronic non-cancer health hazards). It suggests consideration of a range of exposure durations, e.g., 9-year, 30-year, and 70-year exposure durations. Varying exposure duration for residents evaluated for the proposed Project would not materially affect conclusions about the cancer risk impact of the proposed Project because all of the incremental cancer risks estimated for residential receptors are below the threshold of significance. The conclusions regarding potential cancer risk impacts of the proposed Project would remain the same.

5.4 Uncertainties Associated with Toxicity Assessment

Quantitative evaluation of chemical toxicity requires assumptions to extrapolate toxicity information in the literature to possible impacts on people exposure to chemicals in the environment. Key assumptions are discussed briefly below.

5.4.1 UNCERTAINTIES ASSOCIATED WITH TOXICITY CRITERIA

A potentially large source of uncertainty is inherent in the derivation of the CalEPA toxicity criteria (cancer slope factors and RELs). In many cases, data used to develop toxicity criteria must be extrapolated from animals to sensitive humans. For example, the application of uncertainty factors to estimated no-observable-adverse-effects-levels (NOAELs) or lowest-observed-adverse-effects-levels (LOAELs) are typically used to develop RELs. While designed to be protective, in many cases toxicity criteria are likely to overestimate the magnitude of differences that may exist between humans and animals, and among humans.

In some cases, however, toxicity criteria may be based on studies that did not detect the most sensitive adverse effects. For example, many past studies have not measured possible toxic effects on the immune system. Moreover, some chemicals may cause subtle effects not easily recognized in animal studies. Overall, toxicity criteria are likely to be protective for most or all exposed populations. These criteria are constantly being reconsidered in light of new research and are subject to occasional change during this process. The nature and direction of these changes cannot be predicted and currently available criteria are the best source of toxicity information for use in health risk assessments.

5.4.2 UNCERTAINTIES ASSOCIATED WITH UNAVAILABLE TOXICITY VALUES

1,3-Butadiene, ethylbenzene, naphthalene, n-hexane, propylene, silicon, antimony, cadmium, hexavalent chromium, lead, selenium, and DPM do not have acute RELs that have been developed by OEHHA. However, 1,3-butadiene and ethylbenzene have acute toxicity screening levels from the Agency for Toxic Substances and Disease Registry (ATSDR) in the form of published acute minimal risk levels (MRLs) for hazardous substances. MRLs were established to provide a screening tool for public health professionals to use to

[23] California Environmental Protection Agency, Office of Environmental Health Hazard Assessment, Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments, August 2003.

identify if potential human health hazards exist from contamination at hazardous waste sites. MRLs are often based on animal studies because relevant human studies are lacking. ATSDR assumes that humans are more sensitive than animals to the effects of hazardous substances and that certain persons may be particularly sensitive. Thus, ATSDR recommendations for MRLs may be as much as a hundred-fold below levels shown to be non-toxic in laboratory animals. This approach is conservative (i.e., protective) for public health. Acute inhalation MRLs for 1,3-butadiene and ethylbenzene are 0.1 parts per million (ppm) and 5 ppm, respectively. These MRLs are relatively high (compared to acrolein which has an acute MRL of 0.003 ppm), reflecting the low acute toxicity of these chemicals. It's unlikely that acute non-cancer health hazards associated with these organic chemicals would rival acrolein, the risk driver for potential acute non-cancer health hazards from aircraft emissions. Lack of inclusion of these chemicals in the quantitative risk assessment is not expected to change the conclusions of the acute non-cancer health hazard evaluation.

Although DPM does not have an acute REL, several components of DPM (such as arsenic, chlorine, mercury, nickel, vanadium, and sulfates) were evaluated in the acute non-cancer health hazard analysis. As noted in Section 5.1, *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*[24] indicates that toxicity values for DPM were developed for whole diesel exhaust (gas and particulate matter). As such, DPM should be the only TAC considered in the calculation of cancer risks and chronic non-cancer health hazards for diesel engine emissions; speciated diesel exhaust components (e.g., PAHs, metals) should not be evaluated along with DPM. Studies used to support the DPM toxicity value also indicate that "potential cancer risk from inhalation exposure to whole diesel exhaust will outweigh the multipathway cancer risk from the speciated components." DPM does not, however, have an acute REL. Therefore, in order to account for potential acute impacts from DPM, the speciated components of DPM (arsenic, chlorine, mercury, nickel, vanadium, and sulfates) were evaluated in the acute non-cancer health hazard analysis.

Naphthalene, n-hexane, propylene, silicon, antimony, cadmium, hexavalent chromium, lead, and selenium do not have acute toxicity values. Therefore, their potential impact on the conclusions of the acute risk evaluation is unknown.

5.5 Uncertainties in Risk Characterization

Combining estimates of exposure and toxicity to estimate risks and hazards to human health require the use of methods that simplify actual exposure. For the inhalation pathway, important issues for risk characterization are discussed below.

[24] California Environmental Protection Agency, Office of Environmental Health Hazard Assessment, Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments, Appendix D, August 2003.

5.5.1 UNCERTAINTIES ASSOCIATED WITH ELIMINATION OF POTENTIALLY COMPLETE EXPOSURE PATHWAYS

The proposed Project HHRA evaluates the potential complete exposure pathway of direct inhalation of TAC released during construction of the proposed Project. However, other exposure pathways, such as exposure to TAC deposited onto soils, could also be important. For example, children might ingest TAC that deposited onto soil through hand-to-mouth activity during outdoor play, or residents who have gardens could ingest TAC taken up from soil into plants. For the proposed Project HHRA, based on the multi-pathway screening analysis in the LAX Master Plan Final EIR and other airport HHRAs, inhalation of TAC was identified as the primary exposure pathway, and exposures and risks from inhalation of TAC were quantified.

Other potential exposure pathways were analyzed in a two-step screening process described in Technical Report 14a Attachment B, Section 2.5.3 of the LAX Master Plan Final EIR. In the first step, air dispersion modeling was used to determine potential TAC concentrations in air on or near LAX, and these concentrations were used to estimate deposition of TAC onto soils over time. In the second screening step, concentrations of TAC estimated in soil were compared to the range of background concentrations of these chemicals to determine the relative impacts of deposition from air. This analysis indicated that impacts to soils from deposition of TAC from airports would be negligible and that the estimated contribution from LAX emissions would result in no measurable difference in expected background concentrations of metals. Therefore, secondary pathways involving TAC in soil were not further evaluated.

5.6 Interactions among Acrolein and Criteria Pollutants

TAC that act in similar ways to produce toxicity may cause additive, or even greater than additive, impacts to human health. Acrolein and criteria pollutants, such as oxides of nitrogen and ozone, all act as irritants to the upper respiratory system. Thus, interactions among these chemicals are possible.

Whether such interactions actually occur, and are important for emissions from LAX construction, cannot be ascertained with available information. Many uncertainties exist, including:

- Reliability of acrolein concentration estimates (see Section 5.1).
- Lack of information on specific mechanisms of toxicity for the chemicals in question, which will affect the potential for and degree of any interactions.
- Lack of information on thresholds at which interactions may occur.

Without extensive additional research, the potential for impacts related to interactions among acrolein and criteria pollutants cannot be further assessed.

6. Summary

The HHRA addressed possible incremental health impacts associated with construction and operations of the proposed Project. The evaluation assessed cancer risks, chronic non-cancer health hazards, and acute health hazards. The text below summarizes the conclusions regarding significant human health impacts based on modeling estimates.

- Incremental cancer risks associated with construction and operations of the proposed Project are anticipated to be below the threshold of significance of 10 in one million for all receptor types (i.e., child resident, school child, adult resident, and adult worker) within the study area. Incremental cancer risk estimates indicate that impacts would be less than significant.
- Incremental chronic non-cancer hazard indices associated with construction and operations of the proposed Project are anticipated to be below the threshold of significance for all receptor types (i.e., child resident, school child, adult resident, and adult worker). Incremental chronic non-cancer hazard indices indicate that impacts would be less than significant.
- Incremental acute hazard indices for operations of the proposed Project would be at or above the threshold of significance of 1 at 7 of 332 modeled receptor locations. Incremental acute hazard indices indicate that impacts would be significant.
- Estimated maximum air concentrations for all TAC evaluated on the proposed Project site would not exceed PEL-TWA for construction workers. Therefore, health impacts to on-airport workers would be less than significant.
- From a cumulative standpoint, cancer risks, chronic non-cancer hazards, and acute hazards from the proposed Project construction would likely contribute negligibly to the risks and hazards from emissions for anticipated concurrent construction projects at LAX.
- Also from a cumulative standpoint, acute hazards from operations of the proposed Project would likely contribute to the hazards from emissions for anticipated concurrent construction projects at LAX.
- Estimated cumulative risks and hazards from emissions for concurrent construction projects at LAX would not be measurable against urban background conditions in the South Coast Air Basin.

Appendix C

Taxiway Noise

Table of Contents

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1. Introduction

This Taxiway Noise appendix was developed to assist with the public disclosure requirements established under the California Environmental Quality Act (CEQA). The second addendum to the Midfield Satellite Concourse (MSC) EIR addresses the potential effects to taxiway noise from the development of the proposed MSC North Modifications. This Taxiway Noise appendix identifies the technical assumptions, methodologies, and models that were used to conduct the Taxiway Noise analyses for the EIR addendum.

1.1 Background

Los Angeles World Airports (LAWA) is in the midst of a multi-billion dollar modernization program at Los Angeles International Airport (LAX or the Airport). LAX is the nation's third busiest airport in terms of total annual passengers and in terms of total annual aircraft operations. Although it has functioned as an airport since 1928, the main terminal complex at LAX was constructed in 1961 and its facilities are in need of modernization.

The LAX Master Plan, approved by the City of Los Angeles City Council in December 2004, is the strategic framework for future development at LAX. The main components of the LAX Master Plan include the modernization of the runway and taxiway system, redevelopment of the terminal area, access improvements to the Airport, and enhancement of passenger safety, security, and convenience. The LAX Master Plan was the subject of a joint Environmental Impact Statement (EIS) and Environmental Impact Report (EIR) completed in January 2005. The City of Los Angeles City Council certified the Final EIR as complying with the California Environmental Quality Act (CEQA) and the Federal Aviation Administration (FAA) issued a Record of Decision on the Final EIS in compliance with the National Environmental Policy Act (NEPA).

The approved LAX Master Plan includes the development of the "West Satellite Concourse". Subsequent to the release of the Final EIR/EIS, the West Satellite Concourse was renamed the Midfield Satellite Concourse (MSC). The LAX Master Plan EIS/EIR assessed the MSC at a programmatic level under CEQA, meaning that additional project level CEQA review is required before LAWA can construct and operate one or more components of the MSC Program.

The overall MSC Program, as documented in the LAX Master Plan, includes the following facilities:

- A Midfield Satellite Concourse (MSC);
- A Central Terminal Processor (CTP) in the Central Terminal Area (CTA);
- A connector/conveyance system between the MSC and the CTP; and
- Construction of new taxiways/taxilanes, apron areas, and utilities to service the MSC.

Due to the size and scale of the MSC Program, LAWA proposes to implement the program in phases. Phase I ("MSC North Project") of the MSC Program is the construction of the northern portion of the multi-story MSC facility and associated improvements. Future phase(s) will include extension of the MSC North facility, the CTP, and a connector/conveyance system between the MSC and CTP. The MSC North Project is intended to improve the terminal operations, concessions facilities, and overall passenger experience at LAX. The facility would be designed to serve both domestic and international traffic.

As part of the natural progression of the design process, plans for the MSC North Project have been further refined and altered. Therefore, the City of Los Angeles, through its aviation department, LAWA, proposes to make modifications to the previously approved MSC at LAX, known as the proposed MSC North Modifications (proposed Project). An overview of changes to the proposed MSC North Project are provided in Section 1.3.

1.2 Project Location

The Airport is located on the western end of the Los Angeles Basin and is bounded on the north by the City of Los Angeles communities of Westchester and Playa Del Rey, on the east by the City of Inglewood and the community of Lennox (unincorporated Los Angeles County), to the south by the City of El Segundo and the community of Del Aire (unincorporated Los Angeles County), and to the west by the Pacific Ocean. The MSC facility would be located in the western portion of the LAX airfield within the Air Operations Area (AOA) west of the Tom Bradley International Terminal (TBIT).

1.3 Project Components

As part of the natural progression of the design process, plans for the MSC North Project have been further refined and altered. As defined in the MSC EIR, the northern limit of the MSC North concourse building was established by the proposed relocated Taxiway D object free area (OFA) limit under the LAX Master Plan Alternative D. LAWA is now proposing to extend the MSC to the north, beyond the proposed Master Plan Alternative D Taxiway/Taxilane D OFA limit, since this can be done without impacting existing facilities. In addition, LAWA has refined other components of the MSC North Project. The addendum to the MSC EIR addresses the following proposed MSC North Modifications:

- Modifications to the dimensions and footprint of the MSC Concourse;
- The addition of one gate at the MSC Concourse;
- Modifications to the proposed passenger and baggage tunnels;
- A refined concept for the FAA ramp tower;
- The addition of a 'Gateway' facility to provide passenger access to the MSC from TBIT; and
- Relocation of the proposed LADWP electrical facility

2. Methodology

Implementation of the proposed MSC North Modifications would result in the removal of one aircraft gate at the West Remote Gates/Pads and the addition of one aircraft gate at the MSC North. The MSC EIR evaluated the change in aircraft routes that would occur with the implementation of the MSC North Project. This Addendum examined the addition of one aircraft gate to the MSC North Project, and whether the addition of this gate would significantly change the analysis of aircraft taxi noise reported in the MSC EIR. Consistent with the MSC EIR, it was assumed that aircraft utilizing the new aircraft gate would otherwise utilize the West Remote Gates/Pads for arrivals and departures. This would result in a change to the normal taxi route that certain aircraft currently take, as the proposed Project would reduce reliance on the West Remote Gates/Pads located on the far west side of the Airport. These aircraft would now be traveling to/from a new location at the center of the airfield and may travel a different taxi route than what they do today under existing conditions. The proposed MSC North Modification taxi routes would have both increased and decreased taxi distances depending on runway use and operating configuration. A design day flight schedule (DDFS) was produced for 2019 to determine the number of aircraft operations that would transition from the West Remote Gates/Pads to the MSC North under the proposed Project.

Based on the 2019 DDFS, it is estimated that under the proposed Project conditions, 119 aircraft operations (64 arrivals and 55 departures) would use the MSC North on a daily basis. This is an additional six operations per day as compared to the analysis conducted for the MSC EIR. Daily aircraft arriving to and departing from the MSC North concourse based on time of day (day, evening, and night) are presented in **Table 1**.

Based on the above, sound exposure level (SEL) noise footprints were prepared for typical Airplane Design Group (ADG) III (Boeing 737-800), ADG IV (Boeing 767-300), ADG V (Boeing 777-300), and ADG VI (Airbus A380-841) aircraft. **Table 2** presents the footprints prepared for each ADG/runway combination. SEL noise footprints only consider the west flow runway operating configuration as it accounts for 97.9 percent of operations annually.

Table 1: MSC North Modifications Daily Number of Arrivals/Departures

AIRCRAFT	DAY 1/	EVENING 2/	NIGHT 3/	TOTAL
B737-300	3	1	0	4
B737-700	4	2	2	8
B737-800	15	4	9	28
B747-400	9	5	2	16
B757-300	1	1	3	5
B757-RR	2	2	2	6
B767-300	1	1	2	4
B777-200	8	1	4	13
B777-300	6	0	0	6
A319	8	2	1	11
A320	0	1	1	2
A321	1	0	1	2
A340	2	0	0	2
A380	5	0	1	6
CRJ9-ER	2	2	0	4
EMB190	2	0	0	2
Total	**69**	**22**	**28**	**119**

NOTES:

1/ Daytime hours are between 7 a.m. and 6:59 p.m.

2/ Evening hours are between 7 p.m. and 9:59 p.m.

3/ Nighttime hours are between 10 p.m. and 6:59 a.m.

SOURCE: Ricondo & Associates, May 2016.
PREPARED BY: Ricondo & Associates, May 2016.

Table 2: Aircraft SEL Footprints

AIRPLANE DESIGN GROUP (ADG)	REPRESENTATIVE AIRCRAFT	ARRIVAL RUNWAY(S)	DEPARTURE RUNWAY(S)
III	B737-800	25L, 24R	25R, 24L
IV	B767-300	25L, 24R	25R, 24L
V	B777-300	25L, 24R	25R, 24L
VI	A380-841	25L, 24R	25L

SOURCE: Ricondo & Associates, May 2016.
PREPARED BY: Ricondo & Associates, May 2016.

SEL is a time integrated measure that accounts for both the maximum sound level and the duration of one second. The sound level is integrated over the period that the level exceeds a threshold. Therefore, SEL accounts for both the maximum sound level and the duration of the sound. The standardization of discrete noise events into an one-second duration allows the calculation of the cumulative noise exposure of a series of noise events that occur over a period of time. Because of this compression of sound energy, the SEL of an aircraft noise event is typically 7 to 12 dBA greater than the maximum noise level (L_{max}) of the event. SEL values for aircraft noise events depend on the location of the aircraft relative to the noise receptor, the type of operation (landing, takeoff, or overflight), and the type of aircraft. The SEL concept is depicted on **Figure 1**.

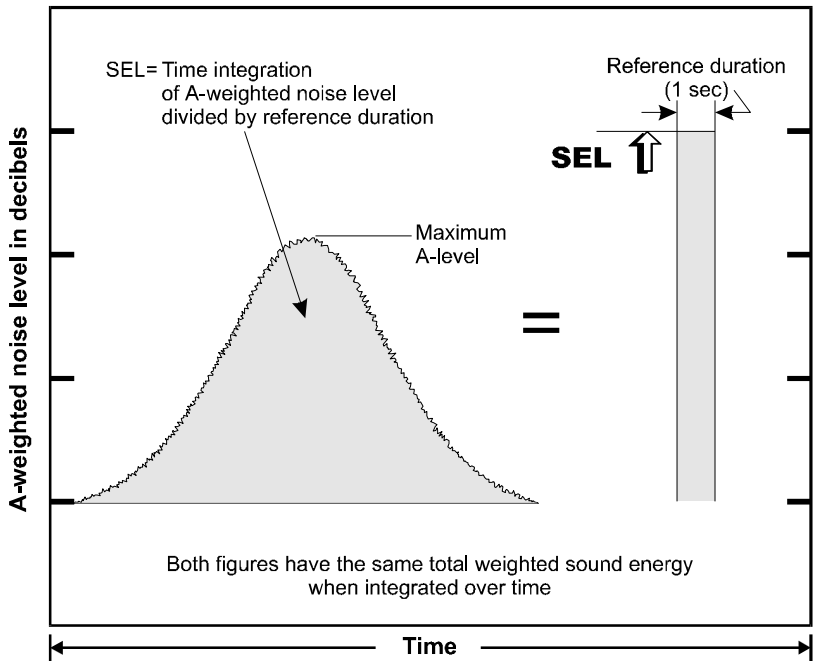
SEL contours were developed for the Boeing 737-800, Boeing 767-300, Boeing 777-300, and Airbus A380-841 aircraft using the Federal Aviation Administration (FAA) Integrated Noise Model (INM), Version 7.0d by approximating an overflight track and a fixed-point overflight profile to represent a taxi operation. Assumptions associated with movement to and from the MSC North site were assumed to be the same as those analyzed in the MSC EIR. Assumptions include:

- Taxi paths delineating the routes of aircraft traveling to and from the Project site were defined based on conservative assumptions (i.e., long taxiing distances) regarding which runways those taxiing trips would begin or end. Modeled taxi paths are as follows:
  - Runway 25L Arrivals, utilizing Taxiways U, C, and R traveling to the west gates of the MSC North building;
  - Runway 25L Arrivals, utilizing Taxiways U and C, and Taxilane T traveling to the east gates of the MSC North building;
  - Runway 24R Arrivals, utilizing Taxiways BB and E, and Taxilane C12 traveling to the west gates of the MSC North building;
  - Runway 24R Arrivals, utilizing Taxiways BB and E, and Taxilane T traveling to the east gates of the MSC North building;
  - Runway 25R Departures, utilizing Taxilane T and Taxiway B traveling from the east gates of the MSC North building;

- Runway 24L Departures, utilizing Taxilane T and Taxiways E and V, traveling from the east gates of the MSC North building; and
- Runway 25L Departures, utilizing Taxilane T and Taxiways C, U, A and F, traveling from the east gates of the MSC North building.

- The altitude was assumed to be the average engine-installation height;
- A constant taxi speed of 15 knots was assumed; and
- Thrust setting assumed to be 10 percent of the maximum thrust value in the noise power distance (NPD) curves associated with the aircraft.

Figure 1: Sound Exposure Level Concept



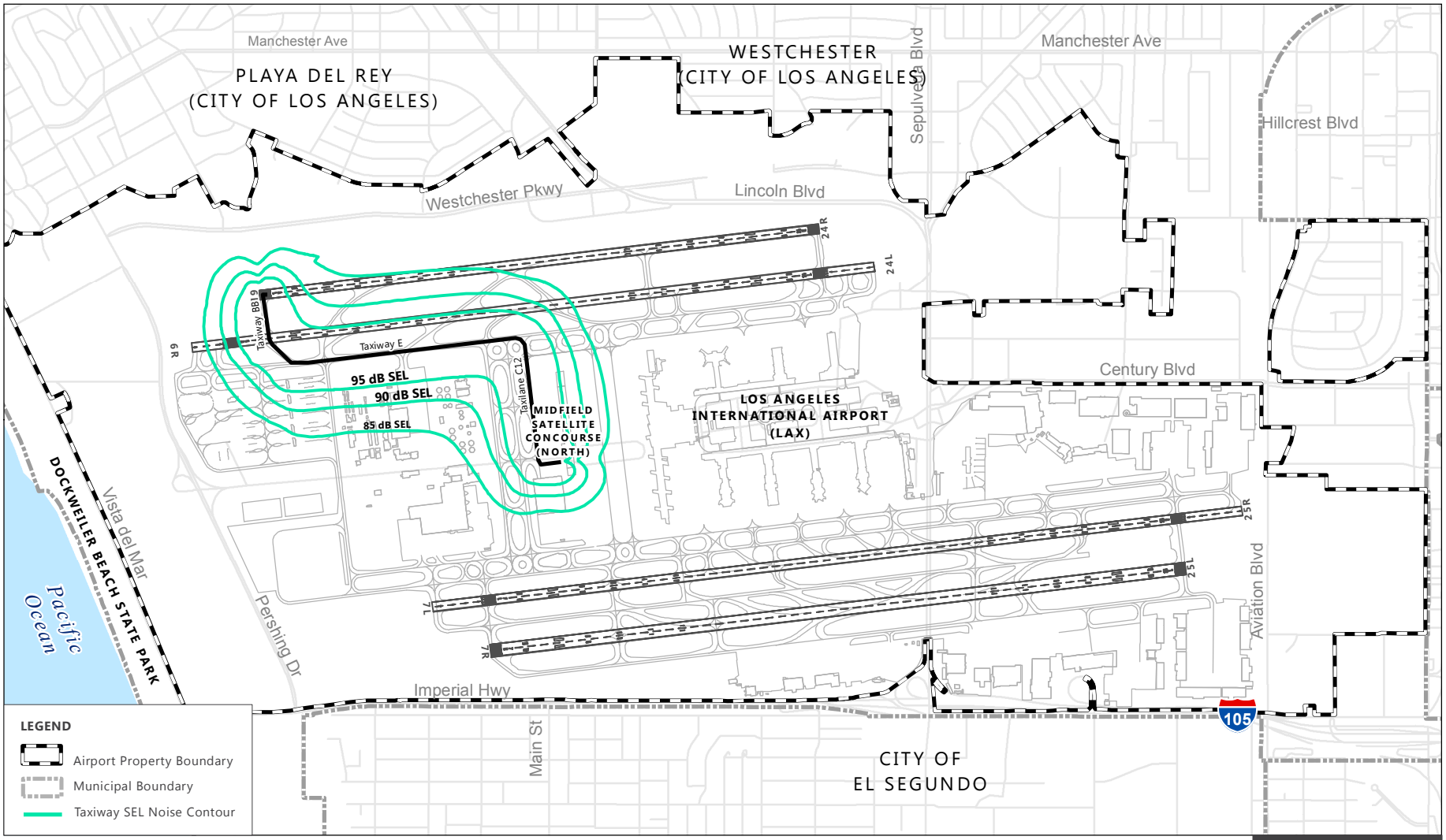
Source: Brown-Buntin Associates, Inc.
Prepared by: Ricondo & Associates, Inc., May 2016.

The following exhibits were created utilizing the corresponding taxiway/taxilane paths as outlined above:

- **Figure 2** shows the SEL noise exposure contour for a single Boeing 737-800 taxi operation from Runway 24R to the MSC North Project site;
- **Figure 3** shows the SEL noise exposure contour for a single Boeing 737-800 taxi operation from the MSC North Project site to Runway 24L;
- **Figure 4** shows the SEL noise exposure contour for a single Boeing 737-800 taxi operation from Runway 25L to the MSC North Project site;

- **Figure 5** shows the SEL noise exposure contour for a single Boeing 737-800 taxi operation from the MSC North Project site to Runway 25R;
- **Figure 6** shows the SEL noise exposure contour for a single Boeing 767-300 taxi operation from Runway 24R to the MSC North Project site;
- **Figure 7** shows the SEL noise exposure contour for a single Boeing 767-300 taxi operation from the MSC North Project site to Runway 24L;
- **Figure 8** shows the SEL noise exposure contour for a single Boeing 767-300 taxi operation from Runway 25L to the MSC North Project site;
- **Figure 9** shows the SEL noise exposure contour for a single Boeing 767-300 taxi operation from the MSC North Project site to Runway 25R;
- **Figure 10** shows the SEL noise exposure contour for a single Boeing 777-300 taxi operation from Runway 24R to the MSC North Project site;
- **Figure 11** shows the SEL noise exposure contour for a single Boeing 777-300 taxi operation from the MSC North Project site to Runway 24L;
- **Figure 12** shows the SEL noise exposure contour for a single Boeing 777-300 taxi operation from Runway 25L to the MSC North Project site;
- **Figure 13** shows the SEL noise exposure contour for a single Boeing 777-300 taxi operation from the MSC North Project site to Runway 25R;
- **Figure 14** shows the SEL noise exposure contour for a single Airbus 380-841 taxi operation from Runway 24R to the MSC North Project site;
- **Figure 15** shows the SEL noise exposure contour for a single Airbus 380-841 taxi operation from Runway 25L to the MSC North Project site; and
- **Figure 16** shows the SEL noise exposure contour for a single Airbus 380-841 taxi operation from the MSC North Project site to Runway 25L.

A noise level of 80 dBA is equivalent to the noise of a busy street. Thus at the airport boundary, the noise associated with the taxi operation may be perceptible if the ambient noise levels are lower than the noise associated with the taxi operation. However, noise levels associated with aircraft departures and arrivals at LAX will overshadow the minimal noise associated with these few aircraft taxi events. The following analysis was conducted to determine whether the noise associated with the taxiing operations resulting from the proposed Project would result in a significant noise impact for purposes of California Environmental Quality Act (CEQA) analysis.



SOURCES: Los Angeles County, 2010, 2011 (city boundaries, streets); Ricondo Associates, Inc. 2013 (noise contour).
PREPARED BY: Ricondo & Associates, Inc., June 2016.

FIGURE 2

NORTH

2,400 ft.

Single Event Footprint Runway 24R Arrival
Boeing 737-800 Taxi Operation

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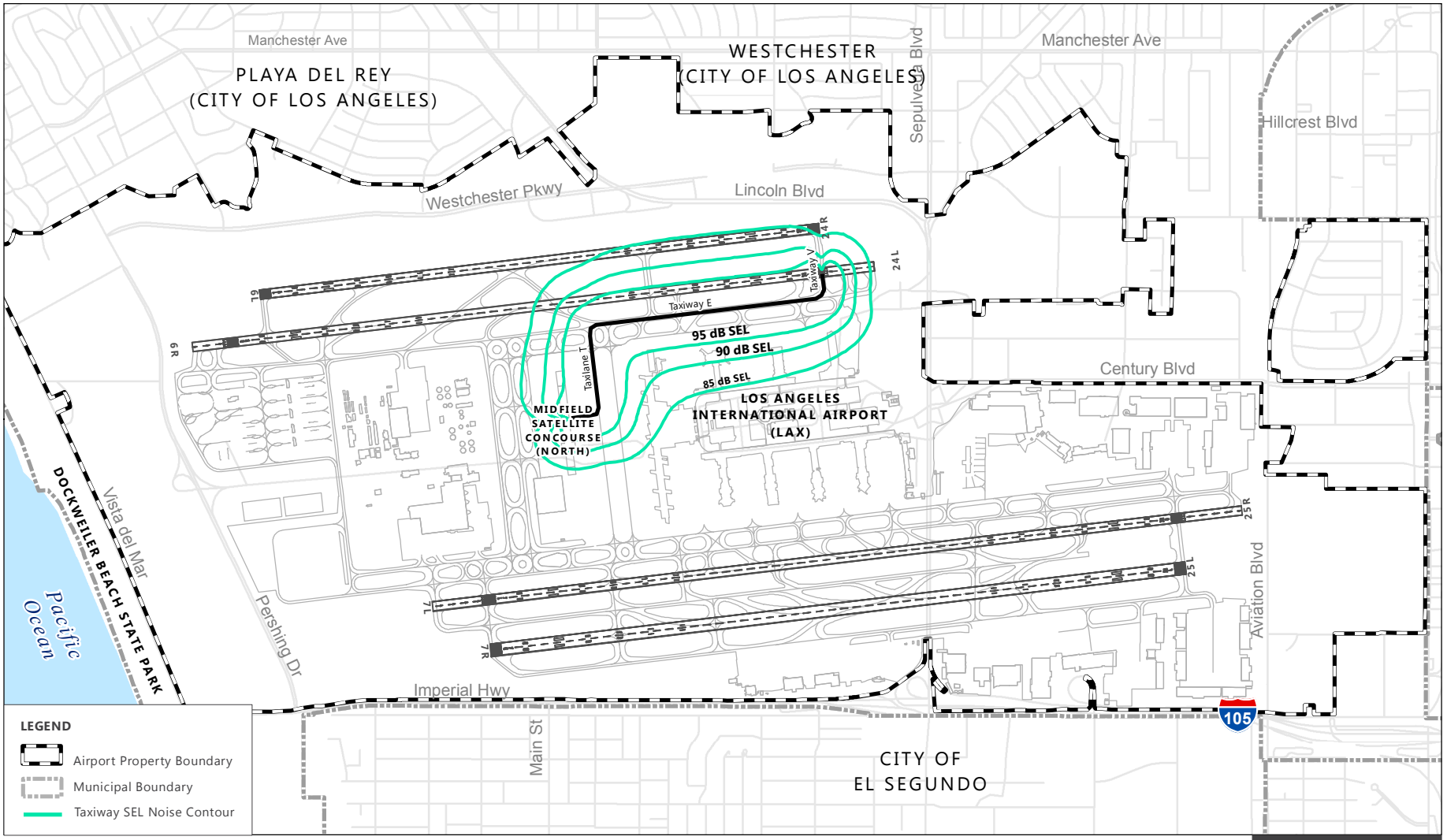

SOURCES: Los Angeles County, 2010, 2011 (city boundaries, streets); Ricondo & Associates, Inc. 2013 (noise contour).
PREPARED BY: Ricondo & Associates, Inc., June 2016.

FIGURE 3

Single Event Footprint Runway 24L Departure
Boeing 737-800 Taxi Operation

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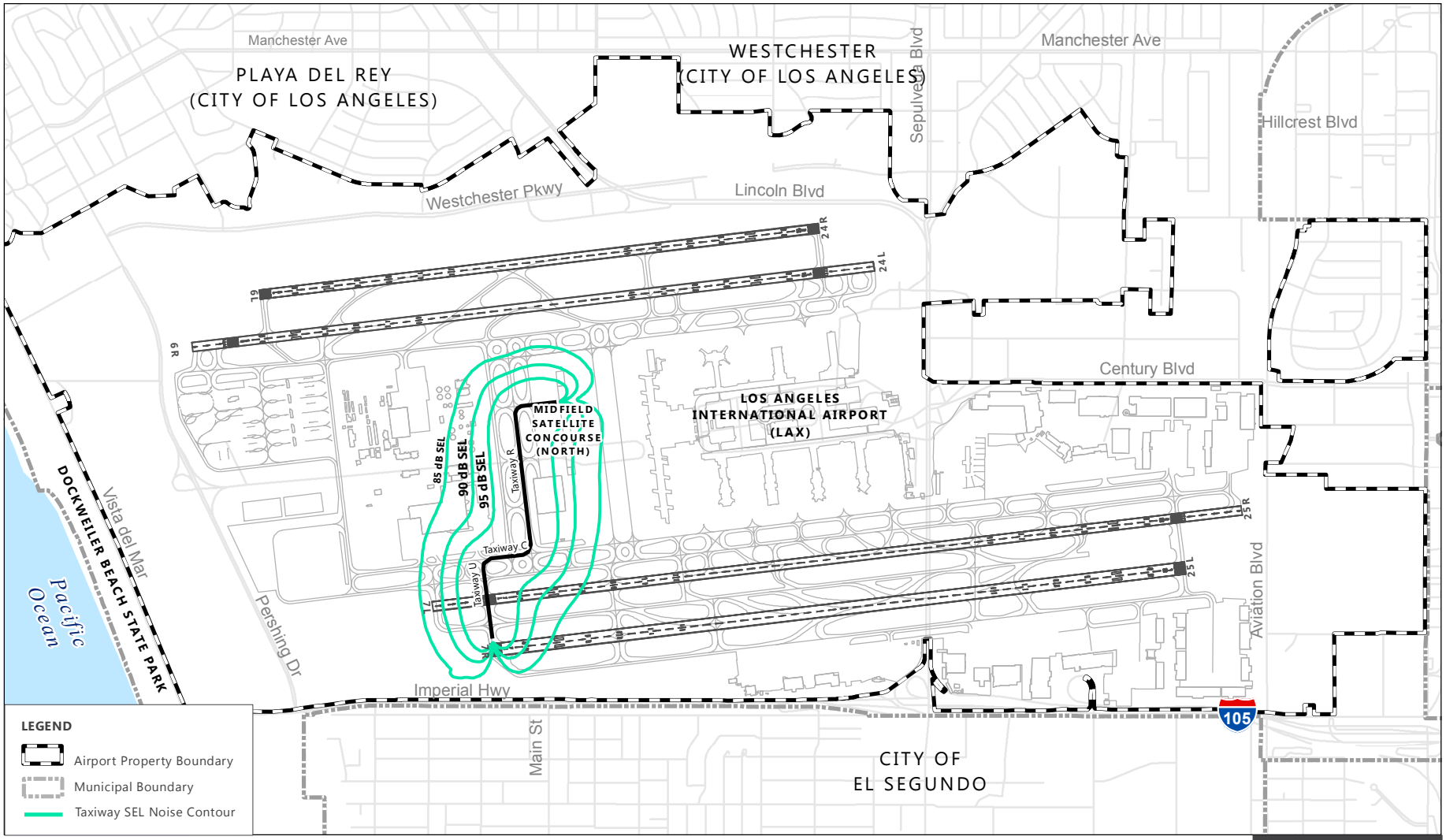

SOURCES: Los Angeles County, 2010, 2011 (city boundaries, streets); Ricondo & Associates, Inc. 2013 (noise contour).
PREPARED BY: Ricondo & Associates, Inc., June 2016.

FIGURE 4

NORTH

2,400 ft.

Single Event Footprint Runway 25L Arrival
Boeing 737-800 Taxi Operation

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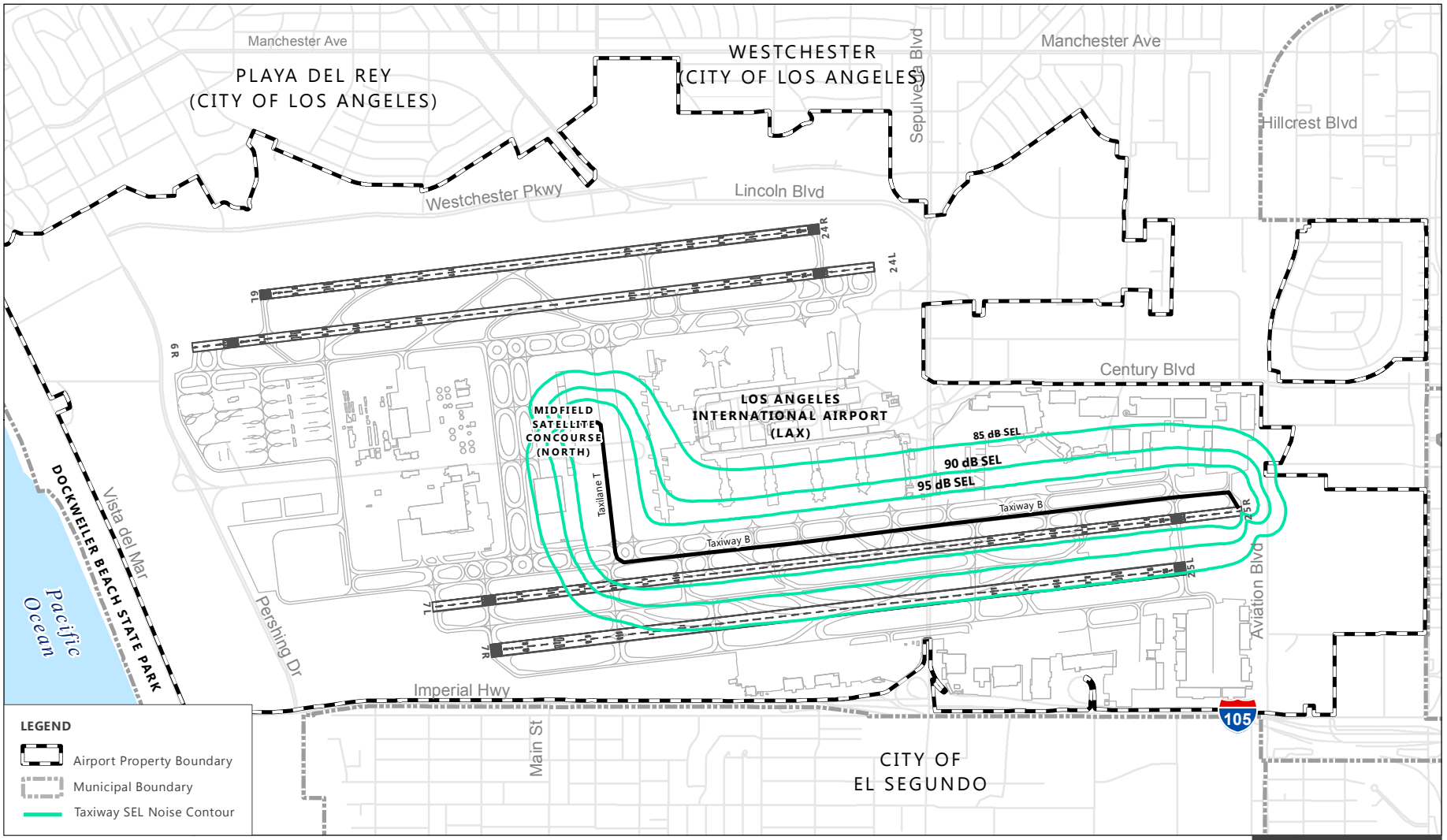

SOURCES: Los Angeles County, 2010, 2011 (city boundaries, streets); Ricondo & Associates, Inc. 2013 (noise contour).
PREPARED BY: Ricondo & Associates, Inc., June 2016.

FIGURE 5

NORTH

2,400 ft.

Single Event Footprint Runway 25R Departure
Boeing 737-800 Taxi Operation

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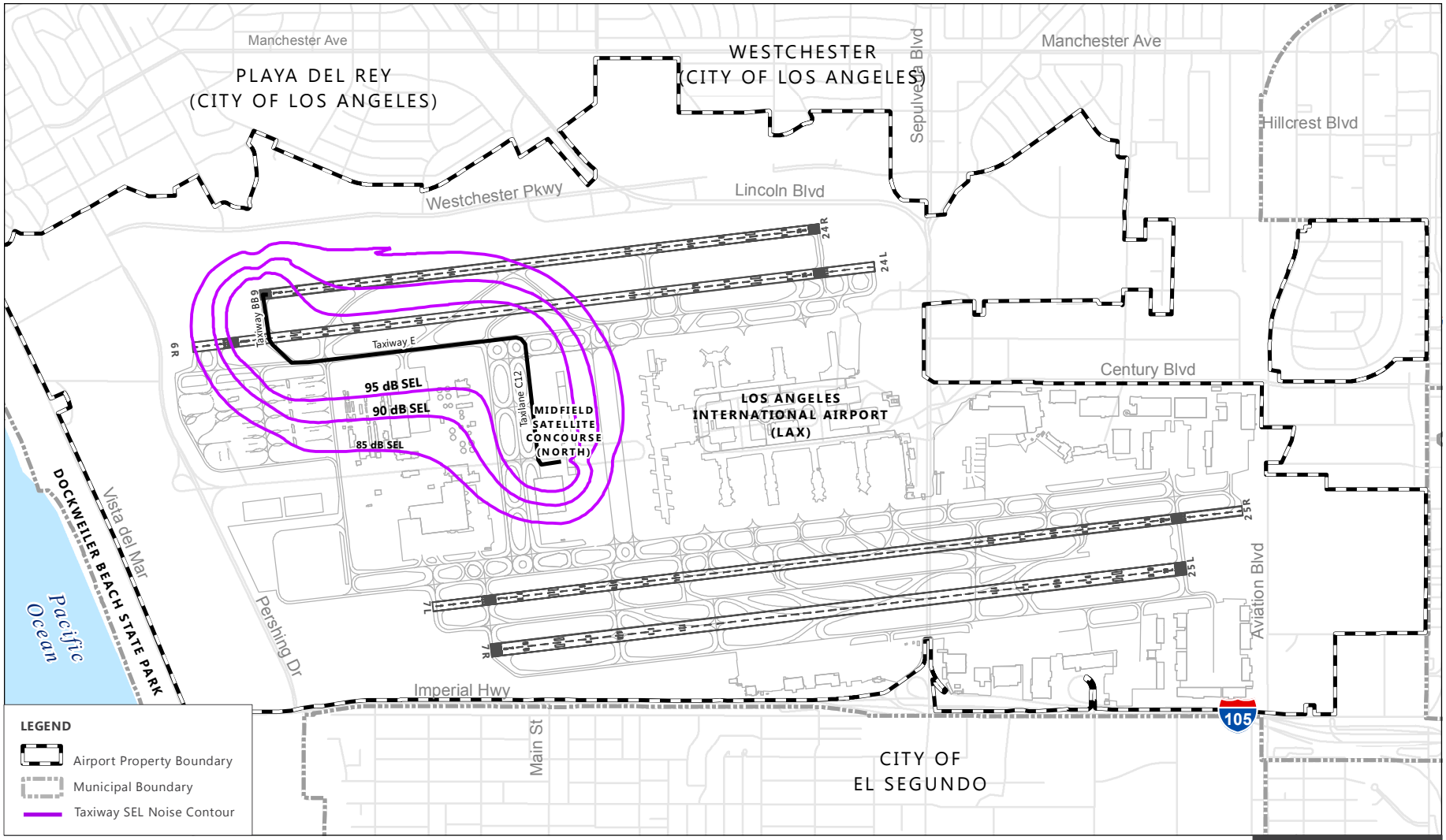

SOURCES: Los Angeles County, 2010, 2011 (city boundaries, streets); Ricondo & Associates, Inc. 2013 (noise contour).
PREPARED BY: Ricondo & Associates, Inc., June 2016.

FIGURE 6

NORTH

2,400 ft.

Single Event Footprint Runway 24R Arrival
Boeing 767-300 Taxi Operation

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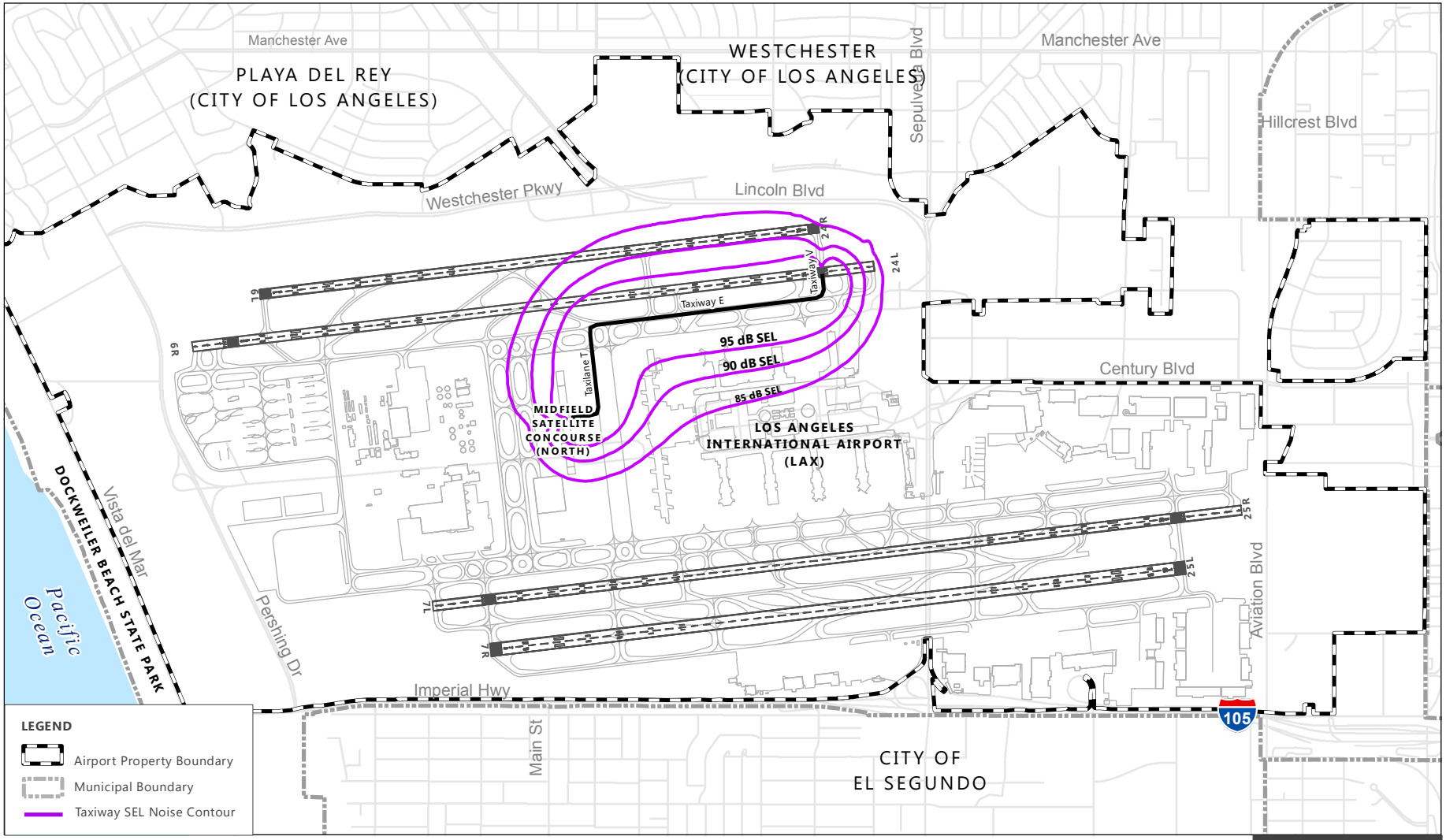

SOURCES: Los Angeles County, 2010, 2011 (city boundaries, streets); Ricondo & Associates, Inc. 2013 (noise contour).
PREPARED BY: Ricondo & Associates, Inc., June 2016.

FIGURE 7

NORTH

2,400 ft.

Single Event Footprint Runway 24L Departure
Boeing 767-300 Taxi Operation

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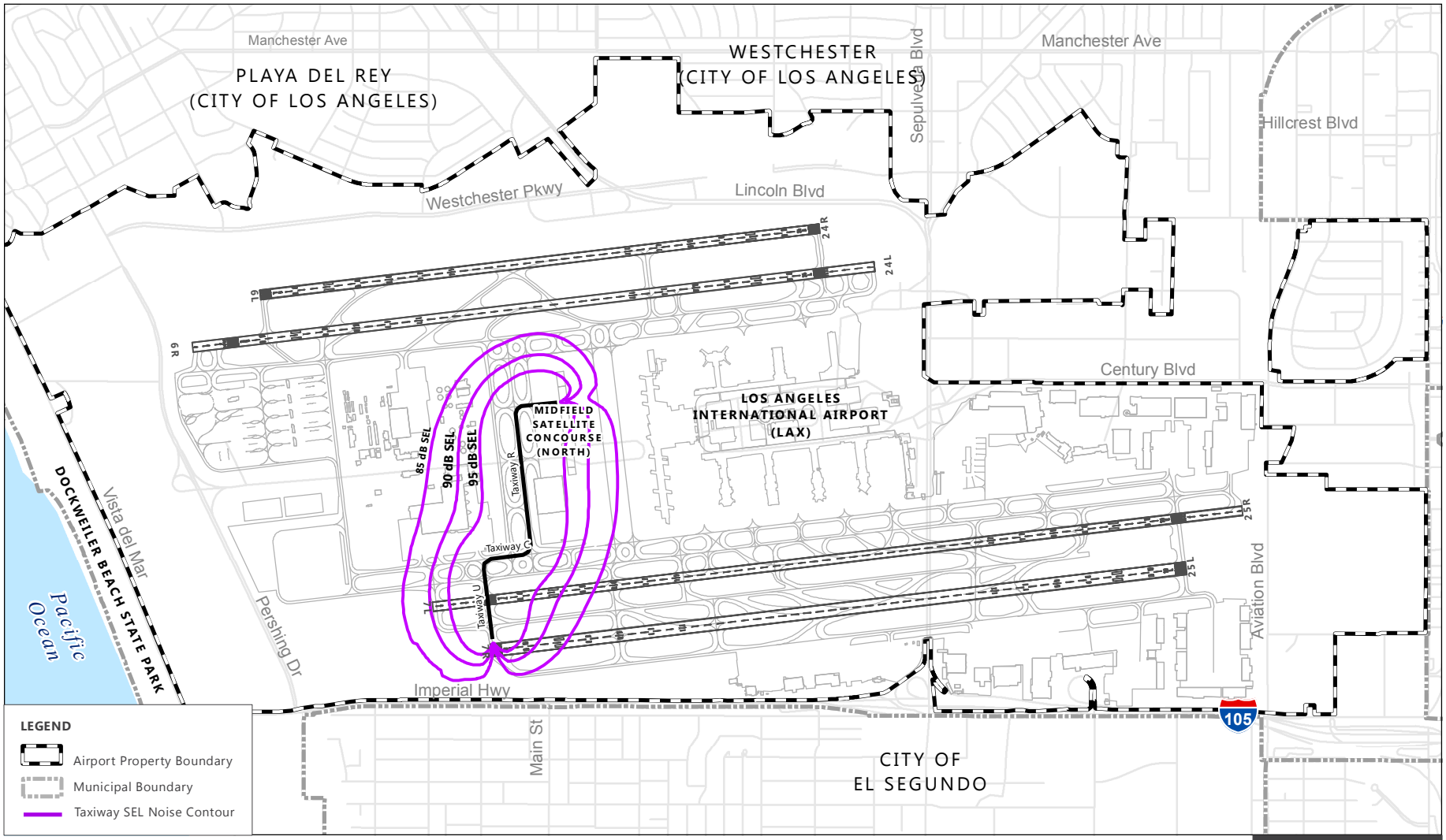

SOURCES: Los Angeles County, 2010, 2011 (city boundaries, streets); Ricondo & Associates, Inc. 2013 (noise contour).
PREPARED BY: Ricondo & Associates, Inc., June 2016.

FIGURE 8

NORTH

2,400 ft.

Single Event Footprint Runway 25L Arrival
Boeing 767-300 Taxi Operation

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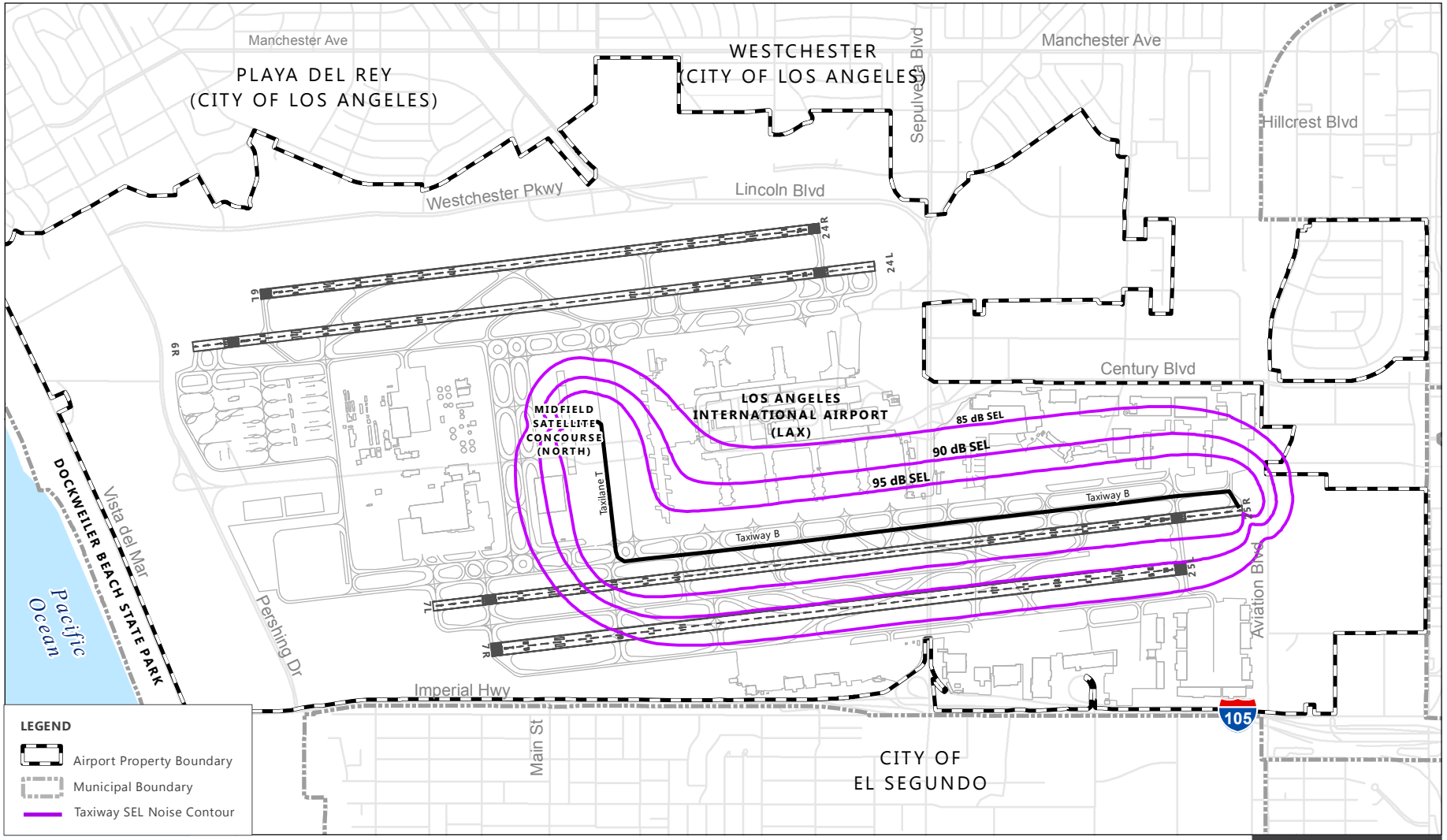

SOURCES: Los Angeles County, 2010, 2011 (city boundaries, streets); Ricondo & Associates, Inc. 2013 (noise contour).
PREPARED BY: Ricondo & Associates, Inc., June 2016.

FIGURE 9

NORTH

2,400 ft.

Single Event Footprint Runway 25R Departure
Boeing 767-300 Taxi Operation

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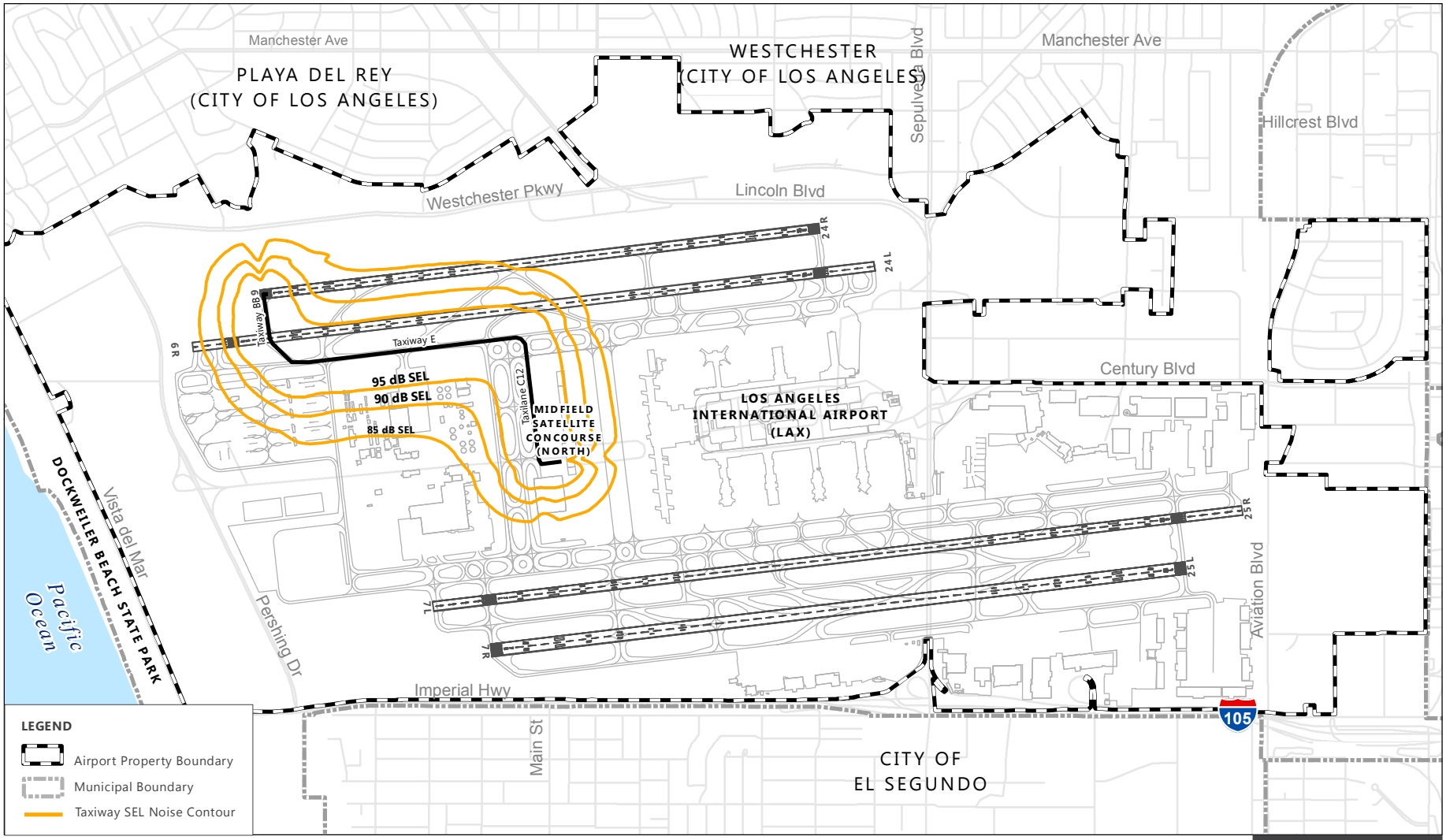

SOURCES: Los Angeles County, 2010, 2011 (city boundaries, streets); Ricondo & Associates, Inc. 2013 (noise contour).
PREPARED BY: Ricondo & Associates, Inc., June 2016.

FIGURE 10

NORTH

2,400 ft.

Single Event Footprint Runway 24R Arrival
Boeing 777-300 Taxi Operation

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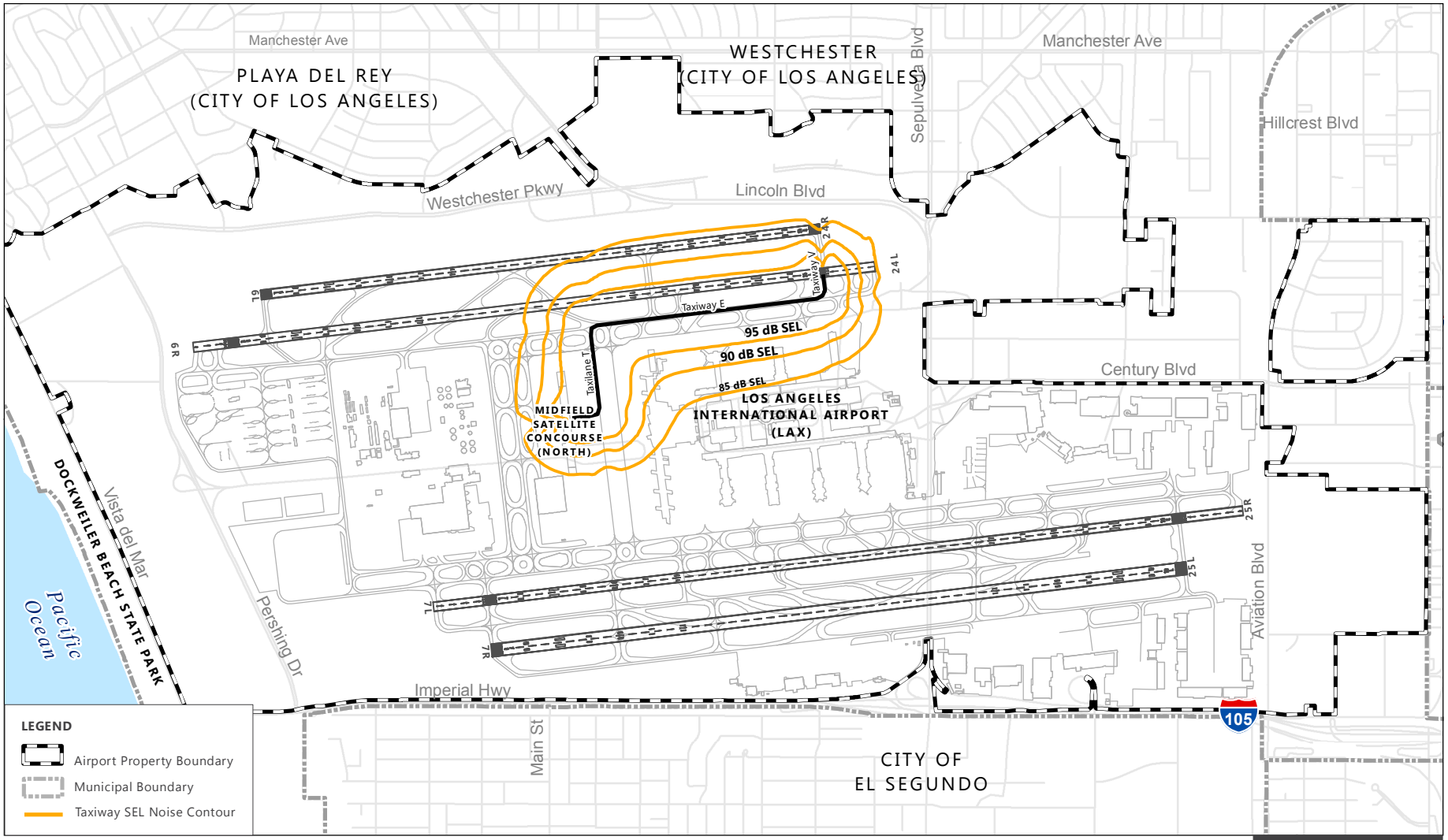

SOURCES: Los Angeles County, 2010, 2011 (city boundaries, streets); Ricondo & Associates, Inc. 2013 (noise contour).
PREPARED BY: Ricondo & Associates, Inc., June 2016.

FIGURE 11

Single Event Footprint Runway 24L Departure
Boeing 777-300 Taxi Operation

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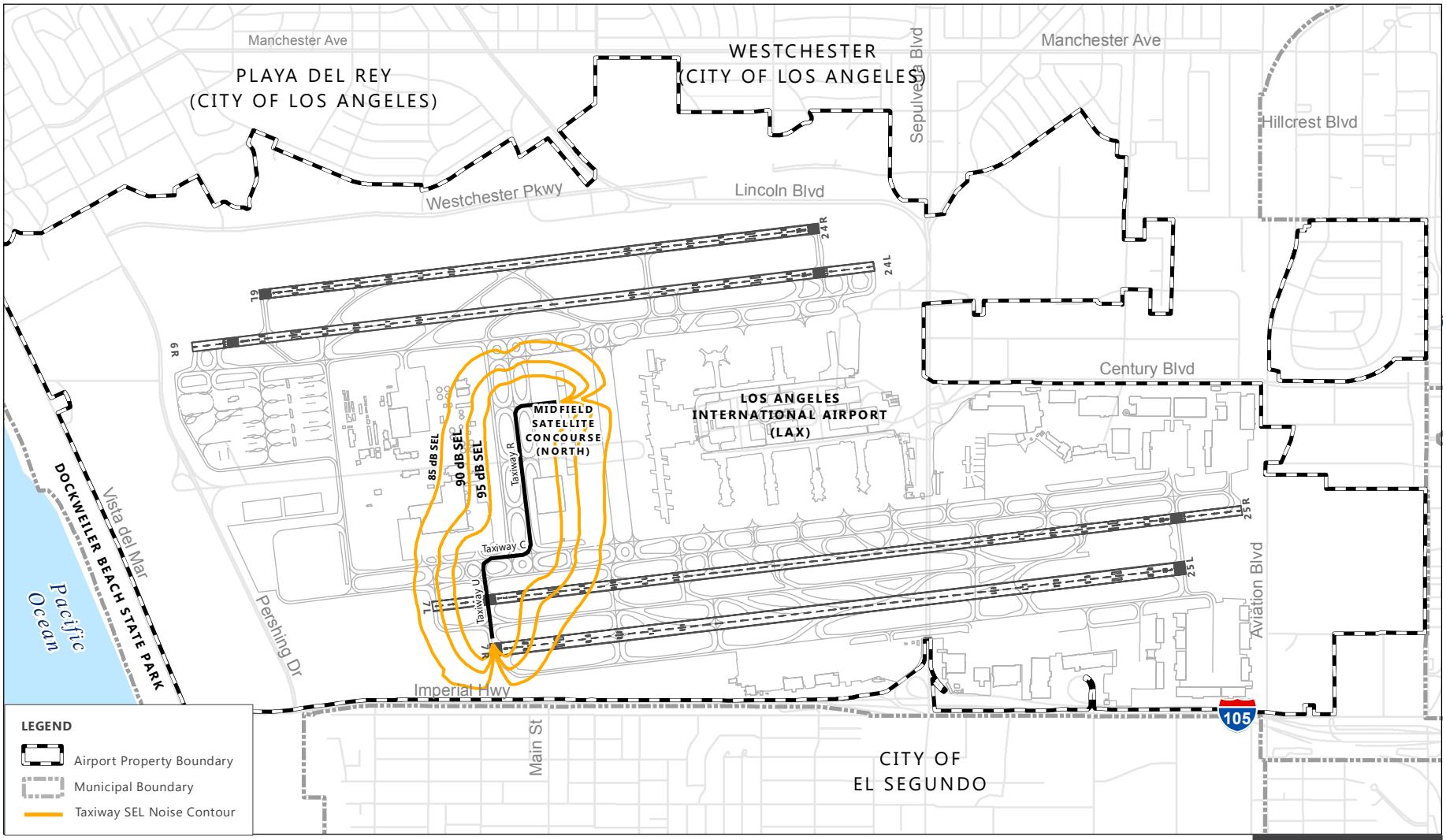

SOURCES: Los Angeles County, 2010, 2011 (city boundaries, streets); Ricondo & Associates, Inc. 2013 (noise contour).
PREPARED BY: Ricondo & Associates, Inc., June 2016.

FIGURE 12

NORTH

2,400 ft.

Single Event Footprint Runway 25L Arrival
Boeing 777-300 Taxi Operation

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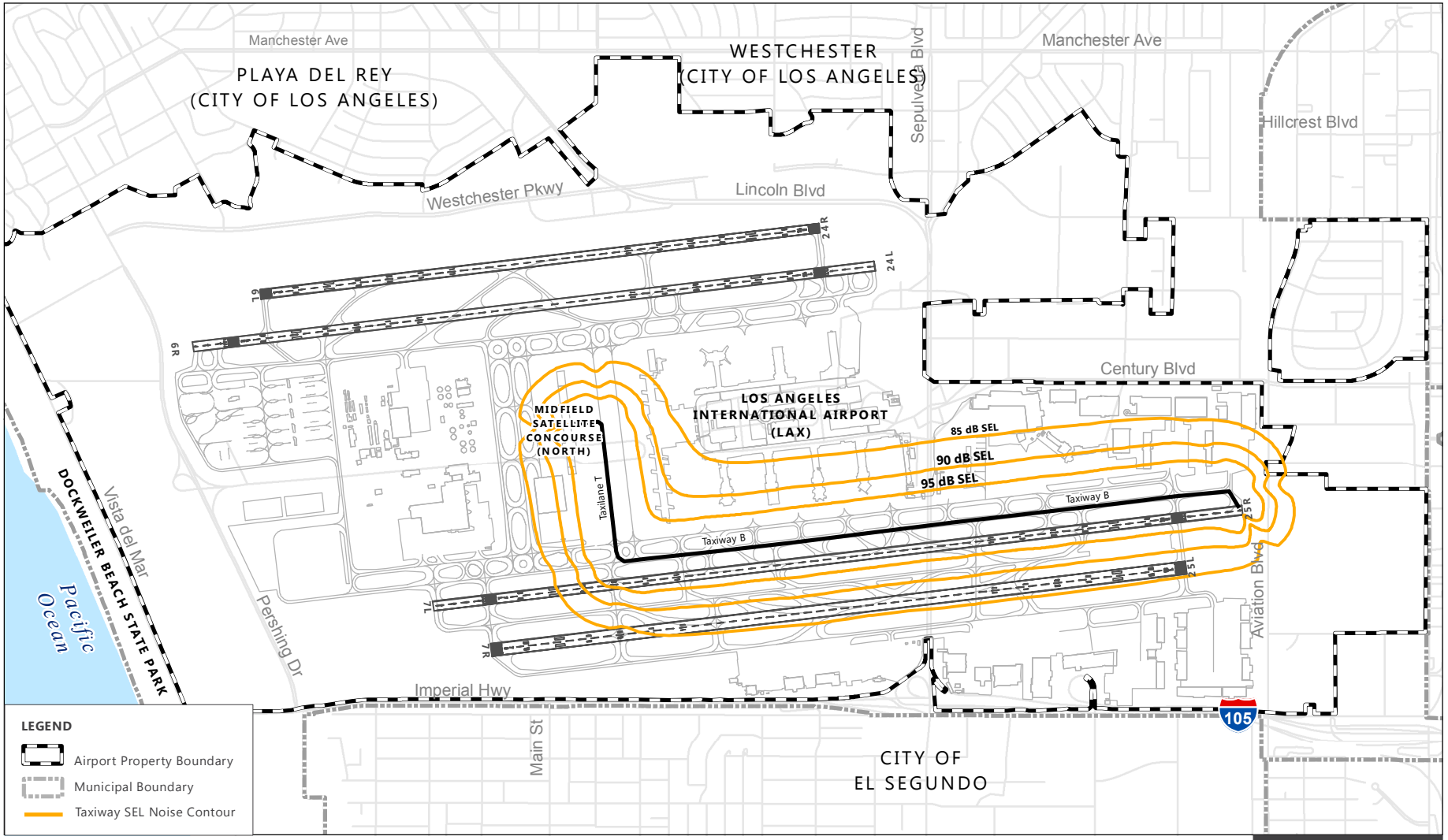

SOURCES: Los Angeles County, 2010, 2011 (city boundaries, streets); Ricondo & Associates, Inc. 2013 (noise contour).
PREPARED BY: Ricondo & Associates, Inc., June 2016.

FIGURE 13

Single Event Footprint Runway 25R Departure
Boeing 777-300 Taxi Operation

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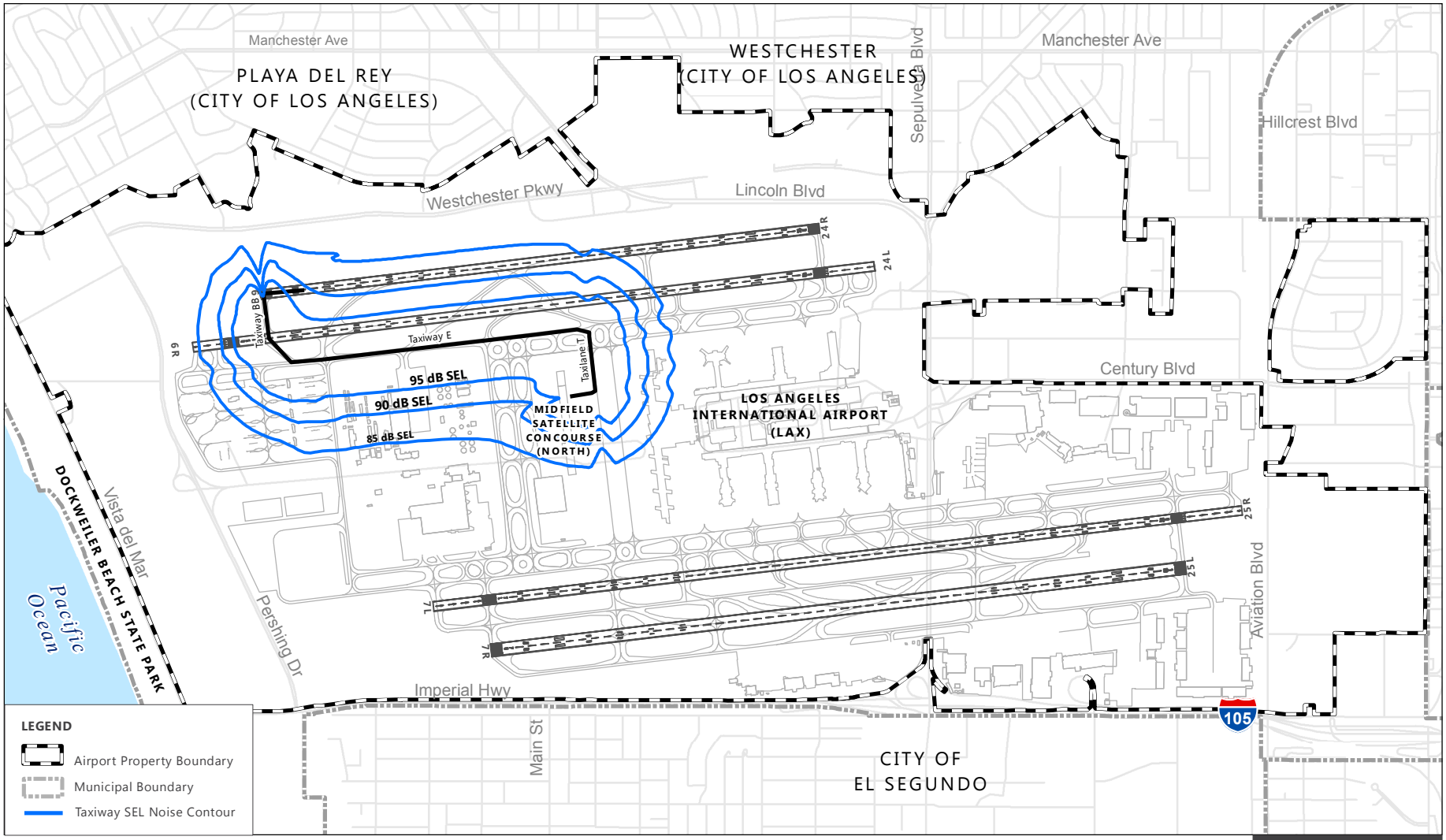

SOURCES: Los Angeles County, 2010, 2011 (city boundaries, streets); Ricondo & Associates, Inc. 2013 (noise contour).
PREPARED BY: Ricondo & Associates, Inc., June 2016.

FIGURE 14

NORTH

2,400 ft.

Single Event Footprint Runway 24R Arrival
Airbus 380-841 Taxi Operation

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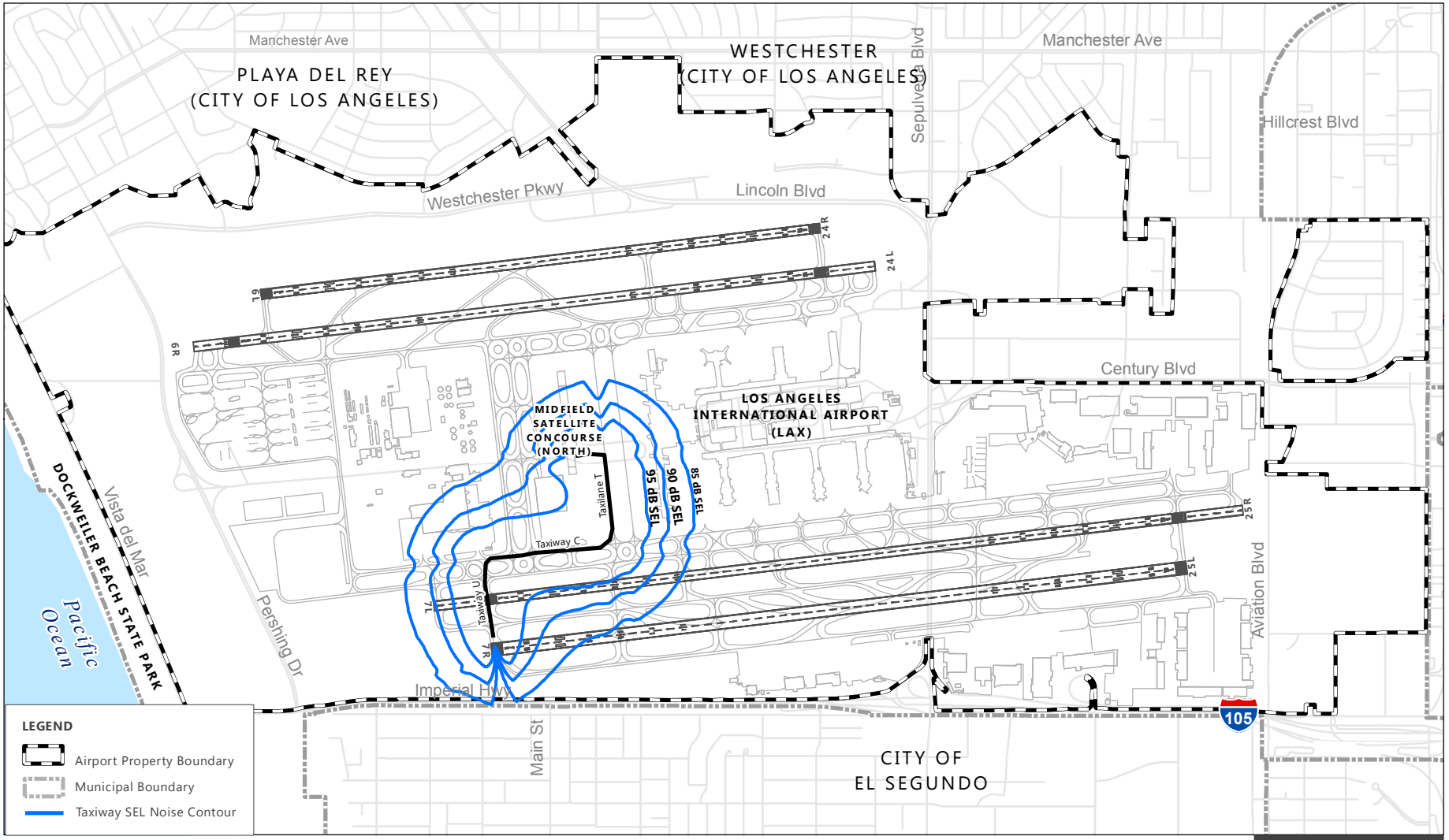

SOURCES: Los Angeles County, 2010, 2011 (city boundaries, streets); Ricondo & Associates, Inc. 2013 (noise contour).
PREPARED BY: Ricondo & Associates, Inc., June 2016.

FIGURE 15

NORTH

2,400 ft.

Single Event Footprint Runway 25L Arrival
Airbus 380-841 Taxi Operation

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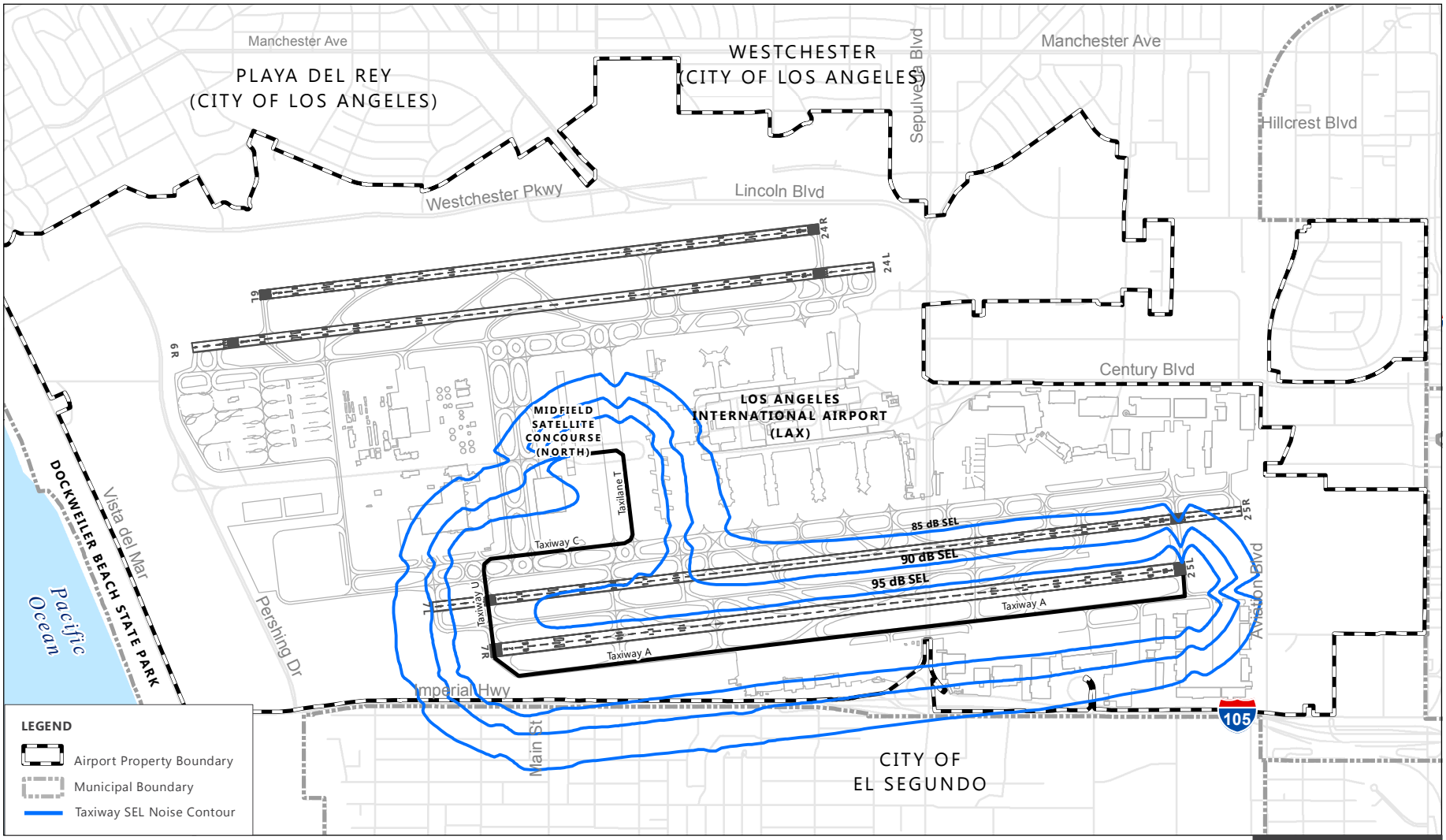

SOURCES: Los Angeles County, 2010, 2011 (city boundaries, streets); Ricondo & Associates, Inc. 2013 (noise contour).
PREPARED BY: Ricondo & Associates, Inc., June 2016.

FIGURE 16

NORTH

2,400 ft.

Single Event Footprint Runway 25L Departure
Airbus 380-841 Taxi Operation

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The Los Angeles CEQA Thresholds Guide defines the significance threshold relative to aircraft taxiing noise as follows:

> *A significant impact on ambient noise levels would normally occur if noise levels at a noise sensitive use attributable to airport operations exceed 65 dB CNEL and the project increases ambient noise levels by 1.5 dB CNEL or greater*

To relate the SEL values associated with the taxiing operations identified above, CNEL values were calculated based on the number and time of day operations were estimated to occur and added to the existing ambient CNELs in residential areas to the north and south of the airport, to determine whether the Project-related aircraft taxiing noise would result in a 1.5 dB CNEL or greater increase at a noise sensitive use. Information regarding existing CNEL values was obtained from LAWA's California State Airport Noise Standards Quarterly Report, Fourth Quarter 2015.

The total average daytime noise level associated with Project operations, defined as occurring between 7:00 am and 7:00 pm, and the total average nighttime noise level associated with Project operations, defined as occurring between 7:00 pm and 7:00 am, were calculated. Those noise levels were compared, for informational purposes only, to the existing daytime ambient noise level and existing nighttime ambient noise levels that occur in residential areas to the north and south of the airport, being the community of Westchester and the City of El Segundo, respectively.

Eight modeled noise receptor locations were chosen based on the proximity to the Project site. To correspond with existing ambient noise data, receptors were chosen at existing noise monitoring locations. These receptors, along with their coordinates, are shown in **Table 3**.

Table 3: Modeled Receptor Locations

RECEPTOR ID #	GRID ID [1/]	LATITUDE	LONGITUDE
TXN1	PDR1	33.952166	-118.442827
TXN2	AIR1	33.933099	-118.432035
TXN3	S1 [2/]	33.931548	-118.418734
TXN4	ESG5	33.926623	-118.400719
TXN5	DEL1	33.924552	-118.376804
TXN6	LNX1	33.938666	-118.362152
TXN7	WCH5	33.952663	-118.385877
TXN8	S7 [2/]	33.953874	-118.414077

NOTES:

1/ Unless noted below, grid points correspond to the grid points in the LAWA "California State Airport Noise Standards Quarterly Report," Fourth Quarter 2015.

2/ These grid nodes were chosen based on their proximity to the Project site.

SOURCE: Ricondo & Associates, May 2016.
PREPARED BY: Ricondo & Associates, May 2016.

3. Results

As described earlier, implementation of the proposed MSC North Modifications would not increase the number of aircraft operations at LAX, but would result in a change to the normal taxi routes that certain aircraft currently take to and from aircraft gates. The evaluation of potential noise impacts associated with that change focuses on the taxi routes aircraft would take going to and from the MSC North Project site that would be different from the routes currently used. Given that the vast majority of existing aircraft taxiing operations at LAX would be unaffected by the proposed MSC North Modifications, the evaluation of Project-related impacts focuses specifically on the number, type, and route of aircraft taxiing to and from the Project site, as opposed to modeling the entirety of taxiing operations at LAX with and without the MSC North Modifications. Assumptions associated with aircraft movement to and from the proposed MSC North Project site are discussed in Section 2, Methodology.

With the taxiing operations identified in Section 2, CNEL values were calculated based on the number and time of day operations were estimated to occur and added to the existing ambient CNELs in residential areas to the north and south of the airport, to determine whether the Project-related aircraft taxiing noise would result in a 1.5 dB CNEL or greater increase at a noise sensitive use.

The total average daytime noise level associated with the MSC North Modifications taxi operations, defined as occurring between 7:00 a.m. and 7:00 p.m., and the total average evening and nighttime noise level associated with proposed MSC North Modifications taxi operations, defined as occurring between 7:00 p.m. and 7:00 a.m., were calculated based on the data in Section 2. Those noise levels were compared to the existing daytime ambient noise level and existing nighttime ambient noise levels that occur in residential areas to the north and south of the airport, being the community of Westchester and the City of El Segundo, respectively.

3.1 Average Hourly Ambient Daytime and Nighttime Noise Levels

The average hourly noise levels associated with Project-related taxiing operations in the daytime and taxiing operations at nighttime were estimated assuming 119 daily aircraft (64 arrivals and 55 departures) along each taxi route between the MSC North Project site and respective runway end. The resultant Project-related taxiing noise levels at the southern edge of Westchester directly north of the nearest taxi route were estimated to be approximately 47.3 dBA in the daytime and 42.7 dBA at night. The MSC North Modifications-related aircraft taxiing noise would be substantially less than existing ambient noise levels, and when added to

existing ambient noise levels, would increase the existing ambient noise levels by approximately 0.09 dB in the daytime and 0.08 dB at night.

At the northern edge of El Segundo directly south of the nearest taxi route, the Project-related taxiing noise levels are estimated to be approximately 52.8 dBA in the daytime and 38.6 dBA at night. Existing ambient noise levels in the northern portion of El Segundo near LAX are approximately 65 dBA or greater in the day and 60 dBA or greater at night. The Project-related aircraft taxiing noise would be substantially less than existing ambient noise levels, and when added to existing ambient noise levels, would increase the existing ambient noise levels by approximately 0.25 dB in the daytime and 0.03 dB at night.

3.2 CNEL

Based on the number of taxiing operations and the day/night split described above in the discussion of ambient noise levels, the CNEL value associated with taxiing was estimated. The resultant CNEL values, as shown in **Table 4**, would range between 40.7 and 51.1 dBA at the noise sensitive uses north of the nearest taxi route (Westchester), and between 36.7 and 56.4 dBA at the noise sensitive uses south of the nearest taxi route in the City of El Segundo. When added to the existing CNELs at each respective receptor location, the proposed MSC North Modifications CNEL values would increase the existing CNEL by between 0.00 and 0.17 dB. As shown in **Table 5**, the increase would be substantially less than the threshold of significance of a 1.5 dB increase; therefore, taxi-related noise for the proposed MSC North Modifications would be less than significant.

Table 4: Taxiway Noise CNELs

RECEPTOR ID #	PROJECT (DBA)	BACKGROUND (DBA)	TOTAL (DBA)	INCREMENTAL DIFFERENCE
TXN1	41.0	68.0	68.01	0.01
TXN2	43.0	79.0	79.00	0.00
TXN3	56.4	75.0	75.06	0.06
TXN4	43.4	62.0	62.06	0.06
TXN5	36.7	56.0	56.05	0.05
TXN6	33.0	75.0	75.00	0.00
TXN7	40.7	74.0	74.00	0.00
TXN8	51.1	65.0	65.17	0.17

SOURCE: Ricondo & Associates, Inc., May 2016.
PREPARED BY: Ricondo & Associates, Inc., May 2016.

Table 5: Taxiway Noise CNELs, Incremental Difference

RECEPTOR ID #	INCREMENTAL DIFFERENCE	THRESHOLD (DBA)	SIGNIFICANT?
TXN1	0.01	1.5	No
TXN2	0.00	1.5	No
TXN3	0.06	1.5	No
TXN4	0.06	1.5	No
TXN5	0.05	1.5	No
TXN6	0.00	1.5	No
TXN7	0.00	1.5	No
TXN8	0.17	1.5	No

SOURCE: Ricondo & Associates, Inc., May 2016.
PREPARED BY: Ricondo & Associates, Inc., May 2016.