AL2 Carson 420K Industrial Building
Initial Study
Mitigated Negative Declaration

Prepared for:

City of Carson
Planning Division
701 East Carson Street
Carson, California 90745

Project Proponent:

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Los Angeles, California 90023

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- This document is designed for double-sided printing -

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1 Introduction

The City of Carson (Lead Agency) received applications for Design Review and Lot Consolidation for a 420,000-gross-square foot industrial building located at the northeast corner of the intersection of Wilmington Avenue and East 220th Street in the City of Carson. The approval of these applications constitutes a project that is subject to review under the California Environmental Quality Act (CEQA) 1970 (Public Resources Code, Section 21000 et seq.), and the State CEQA Guidelines (California Code of Regulations, Section 15000 et. seq.).

This Initial Study has been prepared to assess the short-term, long-term, and cumulative environmental impacts that could result from the proposed project.

This report has been prepared to comply with Section 15063 of the State CEQA Guidelines, which sets forth the required contents of an Initial Study. These include:

- A description of the project, including the location of the project (See Section 2);
- Identification of the environmental setting (See Section 2.11);
- Identification of environmental effects by use of a checklist, matrix, or other methods, provided that entries on the checklist or other form are briefly explained to indicate that there is some evidence to support the entries (See Section 4.);
- Discussion of ways to mitigate significant effects identified, if any (See Section 4);
- Examination of whether the project is compatible with existing zoning, plans, and other applicable land use controls (See Sections 4.10); and
- The name(s) of the person(s) who prepared or participated in the preparation of the Initial Study (See Section 5).

1.1 – Purpose of CEQA

The body of state law known as *CEQA* was originally enacted in 1970 and has been amended a number of times since then. The legislative intent of these regulations is established in Section 21000 of the California Public Resources Code, as follows:

The Legislature finds and declares as follows:

a) The maintenance of a quality environment for the people of this state now and in the future is a matter of statewide concern.
b) It is necessary to provide a high-quality environment that at all times is healthful and pleasing to the senses and intellect of man.
c) There is a need to understand the relationship between the maintenance of high-quality ecological systems and the general welfare of the people of the state, including their enjoyment of the natural resources of the state.
d) The capacity of the environment is limited, and it is the intent of the Legislature that the government of the state take immediate steps to identify any critical thresholds for the health and safety of the people of the state and take all coordinated actions necessary to prevent such thresholds being reached.
e) Every citizen has a responsibility to contribute to the preservation and enhancement of the environment.
f) The interrelationship of policies and practices in the management of natural resources and waste disposal requires systematic and concerted efforts by public and private interests to enhance environmental quality and to control environmental pollution.
g) It is the intent of the Legislature that all agencies of the state government which regulate activities of private individuals, corporations, and public agencies which are found to affect the quality of the environment, shall regulate such activities so that major consideration is given to preventing environmental damage, while providing a decent home and satisfying living environment for every Californian.

The Legislature further finds and declares that it is the policy of the State to:

h) Develop and maintain a high-quality environment now and in the future, and take all action necessary to protect, rehabilitate, and enhance the environmental quality of the state.
i) Take all action necessary to provide the people of this state with clean air and water, enjoyment of aesthetic, natural, scenic, and historic environmental qualities, and freedom from excessive noise.
j) Prevent the elimination of fish or wildlife species due to man's activities, insure that fish and wildlife populations do not drop below self-perpetuating levels, and preserve for future generations representations of all plant and animal communities and examples of the major periods of California history.
k) Ensure that the long-term protection of the environment, consistent with the provision of a decent home and suitable living environment for every Californian, shall be the guiding criterion in public decisions.
l) Create and maintain conditions under which man and nature can exist in productive harmony to fulfill the social and economic requirements of present and future generations.
m) Require governmental agencies at all levels to develop standards and procedures necessary to protect environmental quality.
n) Require governmental agencies at all levels to consider qualitative factors as well as economic and technical factors and long-term benefits and costs, in addition to short-term benefits and costs and to consider alternatives to proposed actions affecting the environment.

A concise statement of legislative policy, with respect to public agency consideration of projects for some form of approval, is found in Section 21002 of the Public Resources Code, quoted below:

> The Legislature finds and declares that it is the policy of the state that public agencies should not approve projects as proposed if there are feasible alternatives or feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects, and that the procedures required by this division are intended to assist public agencies in systematically identifying both the significant effects of proposed projects and the feasible alternatives or feasible mitigation measures which will avoid or substantially lessen such significant effects. The Legislature further finds and declares that in the event specific economic, social, or other conditions make infeasible such project alternatives or such mitigation measures, individual projects may be approved in spite of one or more significant effects thereof.

1.2 – Tiering

This Initial Study *tiers* from the City's General Plan EIR. Section 15152 et seq of the CEQA Guidelines describes *tiering* as a streamlining tool as follows:

(a) *Tiering* refers to using the analysis of general matters contained in a broader EIR (such as one prepared for a general plan or policy statement) with later EIRs and negative declarations on narrower projects; incorporating by reference the general discussions from the broader EIR; and concentrating the later EIR or negative declaration solely on the issues specific to the later project.

(b) Agencies are encouraged to tier the environmental analyses which they prepare for separate but related projects including general plans, zoning changes, and development projects. This approach can eliminate repetitive discussions of the same issues and focus the later EIR or negative declaration on the actual issues ripe for decision at each level of environmental review. Tiering is appropriate when the sequence of analysis is from an EIR prepared for a general plan, policy, or program to an EIR or negative declaration for another plan, policy, or program of lesser scope, or to a site-specific EIR or negative declaration. Tiering does not excuse the lead agency from adequately analyzing reasonably foreseeable significant environmental effects of the project and does not justify deferring such analysis to a later tier EIR or negative declaration. However, the level of detail contained in a first tier EIR need not be greater than that of the program, plan, policy, or ordinance being analyzed.

(c) Where a lead agency is using the tiering process in connection with an EIR for a large-scale planning approval, such as a general plan or component thereof (e.g., an area plan or community plan), the development of detailed, site-specific information may not be feasible but can be deferred, in many instances, until such time as the lead agency prepares a future environmental document in connection with a project of a more limited geographical scale, as long as deferral does not prevent adequate identification of significant effects of the planning approval at hand.

(d) Where an EIR has been prepared and certified for a program, plan, policy, or ordinance consistent with the requirements of this section, any lead agency for a later project pursuant to or consistent with the program, plan, policy, or ordinance should limit the EIR or negative declaration on the later project to affects which:

(1) Were not examined as significant effects on the environment in the prior EIR; or

(2) Are susceptible to substantial reduction or avoidance by the choice of specific revisions in the project, by the imposition of conditions, or other means.

(e) Tiering under this section shall be limited to situations where the project is consistent with the general plan and zoning of the city or county in which the project is located, except that a project requiring a rezone to achieve or maintain conformity with a general plan may be subject to tiering.

(f) A later EIR shall be required when the initial study or other analysis finds that the later project may cause significant effects on the environment that were not adequately addressed in the prior EIR. A negative declaration shall be required when the provisions of Section 15070 are met.

(1) Where a lead agency determines that a cumulative effect has been adequately addressed in the prior EIR that effect is not treated as significant for purposes of the later EIR or negative declaration, and need not be discussed in detail.

(2) When assessing whether there is a new significant cumulative effect, the lead agency shall consider whether the incremental effects of the project would be considerable when viewed in the context of past, present, and probable future projects. At this point, the question is not whether there is a significant cumulative impact, but whether the effects of the project are cumulatively considerable. For a discussion on how to assess whether project impacts are cumulatively considerable, see Section 15064(i).

(3) Significant environmental effects have been *adequately addressed* if the lead agency determines that:

(A) they have been mitigated or avoided as a result of the prior environmental impact report and findings adopted in connection with that prior environmental report; or

(B) they have been examined at a sufficient level of detail in the prior environmental impact report to enable those effects to be mitigated or avoided by site specific revisions, the imposition of conditions, or by other means in connection with the approval of the later project.

(g) When tiering is used, the later EIRs or negative declarations shall refer to the prior EIR and state where a copy of the prior EIR may be examined. The later EIR or negative declaration should state that the lead agency is using the tiering concept and that it is being tiered with the earlier EIR.

1.3 – Public Comments

Comments from all agencies and individuals are invited regarding the information contained in this Initial Study. Such comments should explain any perceived deficiencies in the assessment of impacts, identify the information that is purportedly lacking in the Initial Study or indicate where the information may be found. All comments on the Initial Study are to be submitted to:

McKina Alexander, Associate Planner
City of Carson, Planning Division
701 East Carson Street
Carson, California 90745
(310) 952-1761
malexand@carson.ca.us

Following a 20-day period of circulation and review of the Initial Study, all comments will be considered by the City of Riverside prior to adoption.

1.4 – Availability of Materials

All materials related to the preparation of this Initial Study are available for public review. To request an appointment to review these materials, please contact:

McKina Alexander, Associate Planner
City of Carson, Planning Division
701 East Carson Street
Carson, California 90745
(310) 952-1761
malexand@carson.ca.us

2.1 – Project Title

AL2 Carson 420K Industrial Building, also known as AL2 Industrial Development Project

2.2 – Lead Agency Name and Address

City of Carson, Planning Division
701 East Carson Street
Carson, California 90745

2.3 – Contact Person and Phone Number

McKina Alexander, Associate Planner
310-952-1761
malexand@carson.ca.us

2.4 – Project Location

21900 South Wilmington Avenue
Carson, California 90810
(See Exhibit 1, Regional Context and Vicinity Map)

2.5 – Project Sponsor's Name and Address

AL2 LLC
1815 South Soto Street
Los Angeles, California 90023

2.6 – General Plan Land Use Designation

Light Industrial (LI)

2.7 – Zone

ML – Manufacturing Light

2.8 – Project Description

The proposed building includes a 405,800-square foot footprint, with 14,200-square feet of mezzanine office space, for a total of 420,000-gross-square-feet on 19.85 acres (see Exhibit 2, Site Plan). The proposed site is located at the northeast corner of the intersection of Wilmington Avenue and East 220th Street in the City of Carson (APNs 7316-025-061, 7316-025-062, and 7316-025-097). The building could be used for any number of commercial or light industrial uses as permitted in the ML zone; however, end users have not been identified at this time. Therefore, specific details about the future operation of the facility are not currently available other than the building will not be refrigerated. The proposed design will be a concrete tilt-up building. The project includes 100,300 square feet of landscaping, 300 passenger vehicle parking stalls, 100 truck trailer parking stalls, and 65 loading docks. The project applications include Design Review and Lot Consolidation. Future use of the industrial building is speculative at this time, and operation could occur during nighttime hours.

Access to the proposed development is provided via three driveways on East 220th Street and one driveway on Wilmington Avenue. Two of the three driveways on East 220th Street are 30-feet wide and the third is 40-feet wide. The driveway on Wilmington Avenue is 50-feet wide. The 40-foot wide driveway on East 220th Street and the 50-foot wide driveway on Wilmington Avenue will provide truck trailer access to the rear of the building along the north side of the site where the truck trailer parking stalls and loading docks are located. All four driveways provide passenger vehicle access to passenger vehicle parking along the south and west sides of the site. Interior drive aisles along the western, northern, and southern sides of the building will have a minimum width of 40 feet to provide adequate vehicle and emergency access as required by the Fire Department. Existing street improvements include street pavement and roadway striping on both Wilmington Avenue and East 220th Street. However, while there are currently gutters, sidewalks, and parkway landscape improvements along Wilmington Avenue, these improvements currently do not exist along East 220th Street. The proposed project will include the construction of a new street parkway, public sidewalk, landscaping, and curb and gutters along both Wilmington Avenue and East 220th Street. The project site is primarily vacant with an industrial building located on the northwestern portion of the site.

<u>Construction Scheduling</u>

It was estimated that 3,740 tons of existing on-site structures, asphalt, and concrete will be demolished and removed to accommodate the project. Construction of the building is anticipated to start in early 2017 and take approximately 19 months to complete.

<u>Grading and Drainage</u>

The project site is relatively flat and generally flows from north to south. The proposed building will include roof drains that are directed over proposed landscaped areas before being routed to the proposed landscaped infiltration basins. The proposed infiltration basins will be located at the southwestern corner and along the eastern boundary of the project site and will exceed the existing infiltration capacity of the project site under existing conditions.

<u>Landscaping</u>

The proposed landscape coverage for the site is 100,300 square feet. The landscaping will be designed to significantly reduce the required water consumption of the site as compared to traditional landscape designs. Landscaped areas are to be located around the perimeter of the site. In addition, a bio-swale will be located along the eastern edge of the project site while and a detention basin will be located at the southwest corner of the site.

<u>Utilities</u>

Water service will be provided by Golden State Water Company. The proposed project will connect to existing water lines in Wilmington Avenue to provide for domestic, landscape, and fire suppression. Electrical service will be provided by Southern California Edison via connections to existing circuits on Wilmington Avenue. Sewer service will be provided by the City of Carson. Natural gas will be provided by Southern California Edison. The proposed project will be served by AT&T for phone service and Charter Cable for cable television.

2.9 – Surrounding Land Uses

Existing development surrounds the project site on all sides. Residential uses are located west of the project site. Light industrial uses are located to the north, east, and south. Table 1 (Surrounding Land Uses) lists the existing land use, General Plan Designations, and Zoning districts surrounding the project site.

Table 1
Surrounding Land Uses

Direction	General Plan Designation	Zoning District	Existing Land Use
Project Site	Light Industrial (LI)	ML – Manufacturing Light	Vacant, Industrial Building
North	Light Industrial (LI)	ML – Manufacturing Light	Commercial Office/ Industrial Building
South	Light Industrial (LI)	ML – Manufacturing Light	Commercial Office/ Metal Recycling
East	Light Industrial (LI)	ML – Manufacturing Light	Industrial Building
West	Low-Density Residential (LDR) Recreational Open Space (ROS)	RS – Residential Single-Family OS – Open Space	Single-Family Homes Pocket Park

2.10 – Environmental Setting

The project site is primarily vacant with a light industrial building located on the northwestern portion of the site and is located within a light industrial area. Residential uses are located to the west of the project site. The project site is bound by Wilmington Avenue to the west and East 220th Street to the south. Existing on-site vegetation includes grasses, limited shrubs, and ornamental tree species along the site's fence lines. Existing drainage proceeds to the south westerly corner of the site. Regional transportation is provided by Interstate 405 to the south, State Route 110 to the west, and State Route 710 to the east.

2.11 – Required Approvals

The City of Carson is the only land use authority for this project and this project will require the following City approvals:

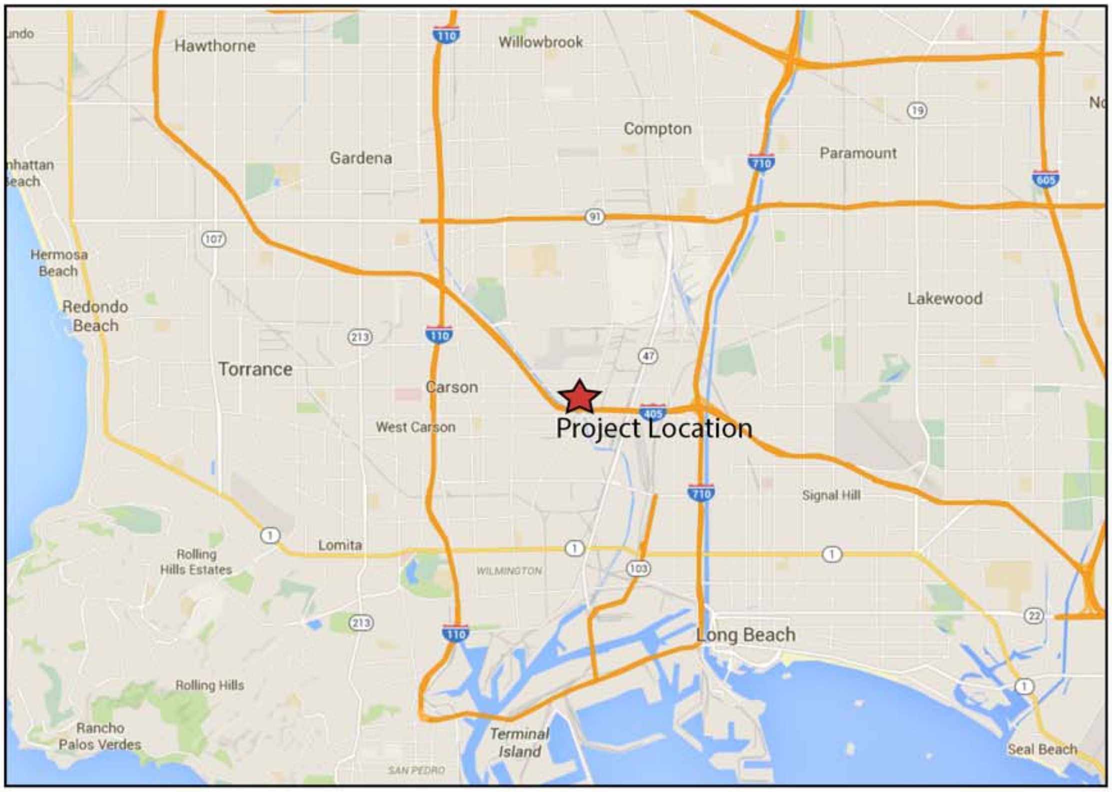
- Design Overlay Review (#1607-16)
- Lot Consolidation

2.12 – Other Public Agencies Whose Approval is Required

None

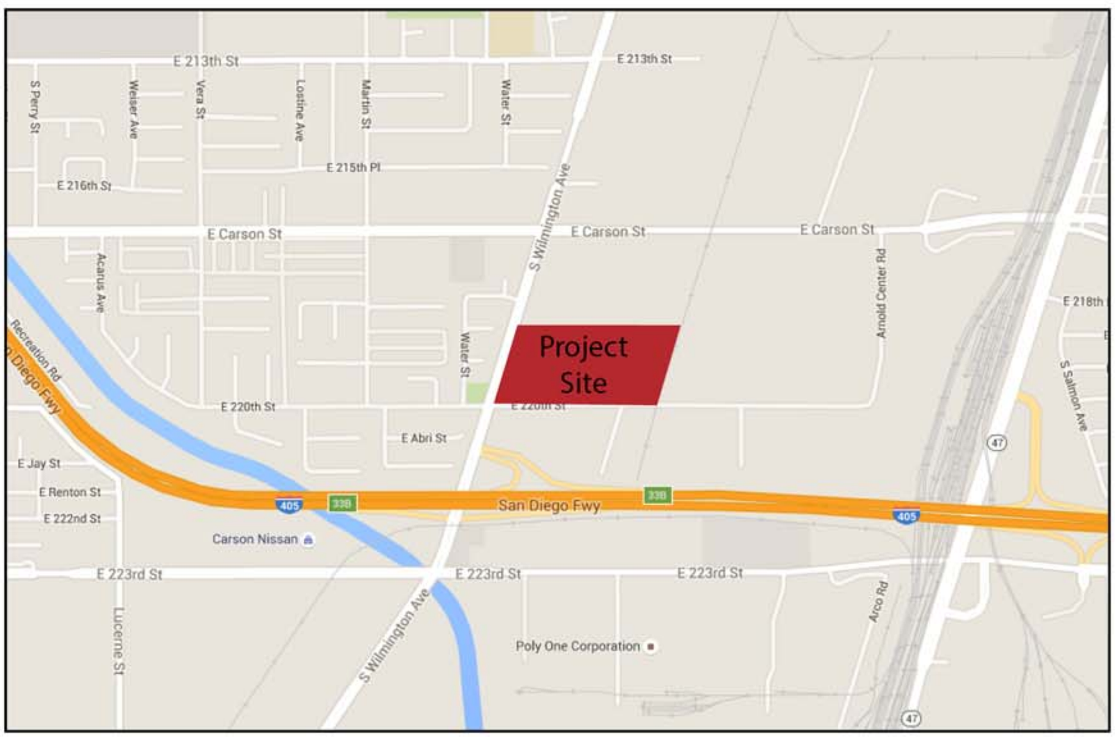
2.13 – Project Specific Technical Studies

- Air Quality/Climate Change Assessment
- Health Risk Assessment
- Water Quality Management Plan
- Noise Study
- Traffic Impact Analysis



Source: Google Maps

Regional



Source: Google Maps

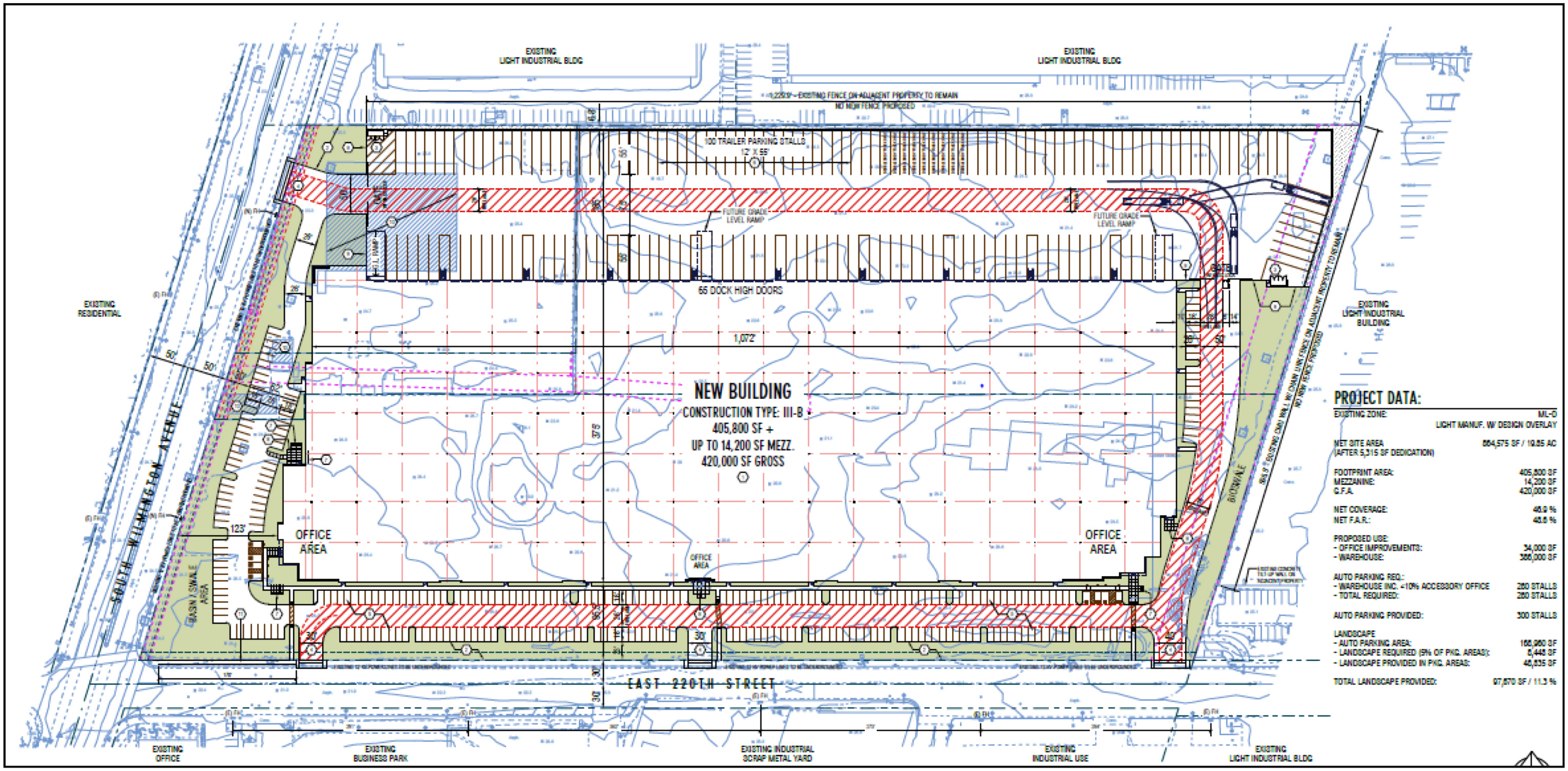
Vicinity

Not to Scale

Exhibit 1 Regional and Vicinity Map

AL2 Carson 420K Industrial Building

Carson, California

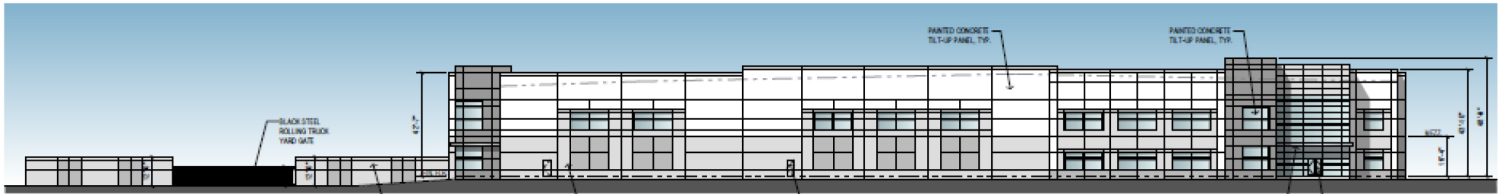


Not to Scale

Exhibit 2 Site Plan

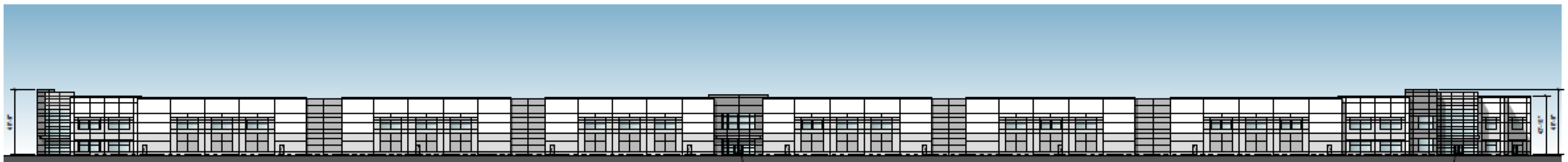
AL2 Carson 420K Industrial Building
Carson, California

MIG



WEST ELEVATION - WILMINGTON AVENUE

SCALE: 1"=20'-0"



SOUTH ELEVATION - 220TH STREET

SCALE: 1"=30'-0"

EAST ELEVATION

SCREENWALL & GATE ELEVATION

SCALE: 1"=20'-0"

NORTH ELEVATION

SCALE: 1"=30'-0"

3.1 – Environmental Factors Potentially Affected

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a 'Potentially Significant Impact' as indicated by the checklist on the following pages.

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

3.2 – Determination

☐	The City of Carson finds that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
☑	The City of Carson finds that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
☐	The City of Carson finds that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
☐	The City of Carson finds that the proposed project MAY have a 'potentially significant impact' or 'potentially significant unless mitigated' impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
☐	The City of Carson finds that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Signature

Date

City of Carson

Printed Name & Title

4.1 – Aesthetics

Would the project:

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

a) Less than Significant Impact. Scenic vistas can be impacted by development in two ways. First, a structure may be constructed that blocks the view of a vista. Second, the vista itself may be altered (i.e., development on a scenic hillside). The project site is primarily vacant with a light industrial building on the northwestern portion of the site and a material storage yard on the southeast corner of the site. The City of Carson is relatively flat, with limited views of the Santa Monica Mountains to the north and the Palos Verdes Hills to the southwest. The Carson Municipal Code (CMC) does not have height restrictions in industrial zones, given additional yard spaces are provided as required in CMC 9146.21 through 9146.29. Views could be blocked with the development of the proposed project; however, the project is proposed within an area designated for light industrial uses and surrounding properties to the north, east, and south are developed with similar uses. Moreover, the proposed building is consistent with the height of other buildings in the vicinity and would not result in the permanent loss of views of surrounding mountains or hills from the public right-of-way. Impacts will be less than significant.

b) No Impact. The project is not adjacent to a designated state scenic highway as identified on the California Scenic Highway Mapping System.[1] The project site is primarily vacant with a light industrial building on the northwest portion of the site and industrial storage on the southeast portion of the site. However, the structure is not deemed of importance to the history, architecture, or culture of the area and is not listed on any national, state or local historical registers or official inventories, such as the National Register of Historic Places, State Historical Landmarks, State Points of Historical Interest, and city or county registers or inventories of historical or architecturally significant sites, places, historic districts, or landmarks. The site does not contain rock outcroppings, significant trees, or other features that could qualify as a scenic resource. Considering no scenic resources are located on the project site or will be altered as a result of the project, no impact will occur.

1 California Department of Transportation. California Scenic Highway Mapping System. http://www.dot.ca.gov/hq/LandArch/scenic_highways/ [Accessed April 2016].

c) **Less than Significant Impact.** Degradation of visual character or quality is defined by substantial changes to the existing site appearance through construction of structures such that they are poorly designed or conflict with the site's existing surroundings. Construction of the proposed building on the existing site would alter the existing visual character of the primarily vacant site. However, the project site is located in an area designated for light industrial uses. Wilmington Avenue and East 220th Street east of Wilmington Avenue are developed with similar uses with industrial buildings to the north, east, and southeast as well as material storage yards to the south. The project will comply with all pertinent design requirements of the Zoning Code, to assure quality site design and building architecture that is well constructed. This includes installation of landscaping, undulating and decorative screening walls and facades, window fenestration, and varying roof design. Development of the proposed project will improve the overall character of the area by introducing a high-quality design and replacing dilapidated structures on the northwestern portion of the project site. The City of Carson Municipal code states that City-wide design guidelines prevent the use of highly reflective surfaces and metal siding. The buildings will be of concrete tilt up panel style construction with architecturally enhanced main entrance and blue window glazing. With design features included, the project will have less than significant impacts on the visual character of the site and the surroundings.

d) **Less than Significant Impact.** Excessive or inappropriately directed lighting can adversely impact night-time views by reducing the ability to see the night sky and stars. Glare can be caused from unshielded or misdirected lighting sources. Reflective surfaces (i.e., polished metal) can also cause glare. Impacts associated with glare range from simple nuisance to potentially dangerous situations (i.e., if glare is directed into the eyes of motorists).

Development of the proposed project will require installation of outdoor lighting necessary for safety and maintenance. Single-family homes to the west of the project could potentially be impacted by light and glare from the proposed project. However, all lighting will comply with the development standards contained in the City's Zoning Code. Municipal Code Section 9147.1 (Exterior Lighting) requires that all lighting of buildings, landscaping, parking lots, and similar facilities shall be directed away from all adjoining and nearby residential property. Such lighting shall be arranged so as not to create a nuisance or hazard to traffic or to the living environment.

The project site is surrounded by industrial uses to the north, east, and south and there is currently substantial nighttime lighting in the surrounding areas of the project site due to the surrounding developments. The addition of new sources of permanent light and glare as a result of implementation of the proposed project would not significantly increase ambient lighting in the project vicinity. Moreover, due to the built-up nature of the project area, there is a significant amount of existing ambient light both in the project area and in the immediately surrounding vicinity. With adherence to existing standards and guidelines, impacts related to light and glare will be less than significant.

4.2 – Agriculture and Forest Resources

Would the project:

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☑
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☑
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104 (g))?	☐	☐	☐	☑
d) Result in loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☑
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?	☐	☐	☐	☑

a) No Impact. As indicated in the California Department of Conservation Division of Land Resource Protection, the project site is not identified as being farmland of any importance.[2] However, according to the Carson General Plan Open Space and Conservation Element, excluding small agricultural areas along utility transmission corridors, there are approximately 62 acres of property within the City that are under agricultural production. Under the Zoning Ordinance, agricultural uses are permitted within the Residential-Agricultural, General Commercial, and Open Space zones.[3] The project site is currently developed and zoned for light industrial uses. The project site has been previously graded for the existing development. In addition, the project site is not designated or zoned for agricultural use according to the General Plan and Zoning Map. Therefore, the proposed project will not result in the conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. No impact will occur.

2 California Department of Conservation. Division of Land Resource Protection. Farmland Mapping and Monitoring Program. ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP/pdf/2012/ [Accessed April 2016].

3 City of Carson. City of Carson General Plan Open Space and Conservation Element. p. OSC-4. 2014.

b) No Impact. No Williamson Act contracts are active for the project site.[4] In addition, the project site is zoned ML (Manufacturing Light) in the General Plan, which does not permit agricultural uses. Therefore, there will be no conflict with existing zoning for agricultural use or a Williamson Act contract. No impact would occur.

c) No Impact. Public Resources Code Section 12220(g) identifies forest land as "land that can support 10-percent native tree cover of any species, including hardwoods, under natural conditions, and that allows for management of one or more forest resources, including timber, aesthetics, fish and wildlife, biodiversity, water quality, recreation, and other public benefits." The project site and surrounding properties are not currently being managed or used for forest land as identified in Public Resources Code Section 12220(g). The project site has been cleared of all natural vegetation and is zoned for industrial uses, with onsite landscaping to complement the existing office buildings. Therefore, development of this project will have no impact to any timberland zoning.

d) No Impact. The project site is primarily vacant with a light industrial building located at the northwest portion of the site. The project site is not being managed or used for forest land and is not zoned for forest land use; thus, there will be no loss of forest land or conversion of forest land to non-forest use as a result of this project.

e) No Impact. The project site is currently developed and contains no Farmland or forest land. The project is surrounded by other developed industrial properties to the west, north, and east with limited ornamental trees. None of the surrounding sites contain existing forest uses. Development of this project will not change the existing environment in a manner that will result in the conversion of Farmland to non-agricultural use or forest land to a non-forest use.

[4] California Department of Conservation. Williamson Act Program. ftp://ftp.consrv.ca.gov/pub/dlrp/wa/LA_11_12_WA.pdf [Accessed November 2015].

4.3 – Air Quality

Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☑	☐
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☑	☐	☐
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☑	☐
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☑	☐
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☐	☑

a) Less than Significant Impact. A significant impact could occur if the proposed project conflicts with or obstructs implementation of the South Coast Air Basin 2012 Air Quality Management Plan (AQMP). Conflicts and obstructions that hinder implementation of the AQMP can delay efforts to meet attainment deadlines for criteria pollutants and maintaining existing compliance with applicable air quality standards. Pursuant to the methodology provided in Chapter 12 of the 1993 South Coast Air Quality Management District (SCAQMD) CEQA Air Quality Handbook, consistency with the South Coast Air Basin 2012 AQMP is affirmed when a project (1) does not increase the frequency or severity of an air quality standards violation or cause a new violation and (2) is consistent with the growth assumptions in the AQMP.[5] A consistency review is presented below:

1. The project would result in short-term construction and long-term pollutant emissions that are less than the CEQA significance emissions thresholds established by the SCAQMD, as demonstrated in Section 4.3(b) et seq of this report; therefore, the project could not result in an increase in the frequency or severity of any air quality standards violation and will not cause a new air quality standard violation.

2. The CEQA Air Quality Handbook indicates that consistency with AQMP growth assumptions must be analyzed for new or amended General Plan elements, Specific Plans, and *significant projects*. *Significant projects* include airports, electrical generating facilities, petroleum and gas refineries, designation of oil drilling districts, water ports, solid waste

5 South Coast Air Quality Management District. CEQA Air Quality Handbook. 1993.

disposal sites, and off-shore drilling facilities; therefore, the proposed project is not defined as *significant*. This project does not include a General Plan Amendment and therefore does not require consistency analysis with the AQMP.

Based on the consistency analysis presented above, the proposed project will not conflict with the AQMP.

b) Less than Significant Impact with Mitigation Incorporated. A project may have a significant impact if project related emissions would exceed federal, state, or regional standards or thresholds, or if project-related emissions would substantially contribute to existing or project air quality violations. The proposed project is located within the South Coast Air Basin, where efforts to attain state and federal air quality standards are governed by the SCAQMD. Both the State of California (State) and the Federal government have established health-based ambient air quality standards (AAQS) for seven air pollutants (known as 'criteria pollutants'). These pollutants include ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), inhalable particulate matter with a diameter of 10 microns or less (PM_{10}), fine particulate matter with a diameter of 2.5 microns or less ($PM_{2.5}$), and lead (Pb). The state has also established AAQS for additional pollutants. The AAQS are designed to protect the health and welfare of the populace within a reasonable margin of safety. Where the state and federal standards differ, California AAQS are more stringent than the national AAQS.

Air pollution levels are measured at monitoring stations located throughout the air basin. Areas that are in nonattainment with respect to federal or state AAQS are required to prepare plans and implement measures that will bring the region into attainment. Table 2 (South Coast Air Basin Attainment Status) summarizes the attainment status in the Basin for the criteria pollutants. Discussion of potential impacts related to short-term construction impacts and long-term area source and operational impacts are presented below.

Table 2
South Coast Air Basin Attainment Status

Pollutant	Federal	State
O_3 (1-hr)	--	Nonattainment
O_3 (8-hr)	Nonattainment	Nonattainment
PM_{10}	Nonattainment	Nonattainment
$PM_{2.5}$	Nonattainment	Nonattainment
CO	Attainment	Attainment
NO_2	Attainment	Nonattainment
SO_2	Attainment	Attainment
Pb	Nonattainment	Nonattainment
VRP	--	Unclassified
SO_4	--	Attainment
H_2S	--	Unclassified
Sources: ARB 2015		

Construction Emissions

Short-term criteria pollutant emissions will occur during demolition, site grading, building construction, paving, and architectural coating activities. Emissions will occur from use of equipment, worker, vendor, and hauling trips, and disturbance of onsite soils (fugitive dust). To determine if construction of the proposed project could result in a significant air quality impact, the California Emissions Estimator Model (CalEEMod) has been utilized. CalEEMod defaults have generally been used as construction inputs into the model (see Appendix A). The methodology for calculating emissions is included in the CalEEMod *User Guide*, freely available at http://www.caleemod.com.

It was estimated that 3,740 tons of existing, on-site structures, including asphalt and concrete, will be demolished and removed to accommodate the project. Construction of the building is anticipated to start in early 2017. CalEEMod defaults for construction schedule phase duration and equipment needs were utilized. Based on the results of the model, maximum daily emissions from the construction of the project will result in excessive emissions of volatile organic chemicals (identified as reactive organic gases) associated with interior and exterior coating activities. To compensate for excessive VOC emissions from coating activities, the model includes use of zero grams per liter (g/l) VOC content for interior and exterior coatings, as identified in the project description. Mitigation Measure AQ-1 requires use of zero-VOC coatings during construction activities, which will reduce VOC emissions to 2.95 lbs/day, less than the threshold established by SCAQMD. As shown in Table 3 (Maximum Daily Construction Emissions (lbs/day)), impacts related to construction will be less than the threshold established by SCAQMD with mitigation incorporated.

Table 3
Maximum Daily Construction Emissions (lbs/day)

Source	ROG	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Summer						
2017	2.82	15.43	52.73	0.11	7.31	3.99
2018	2.62	14.34	50.11	0.11	5.29	1.58
Winter						
2017	2.95	15.89	53.84	0.11	7.31	3.99
2018	2.73	14.75	51.28	0.11	5.29	1.59
Threshold	75	100	550	150	150	55
Substantial?	No	No	No	No	No	No

Mitigation Measures

AQ-1 Prior to issuance of building permits, construction drawings shall indicate the types of architectural coatings proposed to be used in interior and exterior applications on the proposed buildings and verification that daily application will conform to the performance standard that emissions of volatile organic compounds from application of interior or exterior coatings will not exceed the daily emissions thresholds established by the South Coast Air Quality Management District. The performance standard shall be met through use of zero-volatile organic compound coatings. Construction drawings shall specify use of High-Volume, Low Pressure (HVLP) spray guns for application of coatings. This mitigation measure shall be incorporated to the satisfaction of and with oversight by the Building Division.

Operational Emissions

Long-term criteria air pollutant emissions will result from the operation of the proposed project. Long-term emissions are categorized as area source emissions, energy demand emissions, and operational emissions. Operational emissions will result from automobile, truck, and other vehicle sources associated with daily trips to and from the project. Area source emissions are the combination of many small emission sources that include use of outdoor landscape maintenance equipment, use of consumer products such as cleaning products, and periodic repainting of the proposed project. Energy demand emissions result from use of electricity and natural gas. Emissions from area sources were estimated using CalEEMod defaults.

The California Emissions Estimator Model (CalEEMod) was utilized to estimate mobile source emissions. Trip generation (1.68 daily trips per 1,000 SF) is based on the trip generation rates provided in the Institute of Transportation Engineers *Trip Generation Manual* (9th Edition).[6] Based on SCAQMD recommendations, an average rate of 0.64 trucks per 1,000 square feet has been applied for purposes of this analysis.[7] Passenger vehicles will consist of 61.9 percent of the fleet mix, light-duty trucks will consist of 6.74 percent of the fleet mix, medium-heavy duty trucks will consist of 8.38 percent of the truck

6 Institute of Transportation Engineers. Trip Generation Manual. 9th ed. September 2012.

7 South Coast Air Quality Management District. *Warehouse Truck Trip Study Data Results and Usage.* July 25, 2014.

trips, and heavy-heavy duty truck trips consist of 22.98 percent of the fleet mix. Trip lengths have been adjusted based on a study of metropolitan commercial and freight travel conducted by the National Cooperative Highway Research Program. According to observed data collected in the field for the Southern California Association of Governments (SCAG) region, trip lengths for similar uses are estimated at 5.92 miles for light-duty trucks, 13.06 for medium-duty trucks, and 22.40 for heavy-duty trucks. Total vehicle miles were calculated using the average daily trips for each vehicle class and divided by total daily truck trips to get to an average truck distance of 17.41 miles. Assuming an opening year of 2019, the results of the CalEEMod model for summer and winter operation of the project are summarized in Table 4 (Daily Operational Emissions (lbs/day)). Based on the results of the model, impacts associated with operation of the Project will not exceed the threshold established by SCAQMD. Impacts will be less than significant.

Table 4
Daily Operational Emissions (lbs/day)

Source	ROG	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Summer						
Area Sources	20.98	0.00	0.09	0.00	0.00	0.00
Energy Demand	0.02	0.16	0.13	0.00	0.01	0.01
Mobile Sources	3.55	37.06	46.52	0.19	9.77	3.08
Summer Total	24.56	37.22	46.74	0.19	9.78	3.09
Winter						
Area Sources	20.98	0.00	0.09	0.00	0.00	0.00
Energy Demand	0.02	.016	0.13	0.00	0.01	0.01
Mobile Sources	3.69	38.43	50.01	0.18	9.77	3.08
Winter Total	24.69	38.59	50.27	0.18	9.78	3.09
Maximum Daily	20.98	38.43	50.01	0.19	9.77	3.08
Threshold	55	55	550	150	150	55
Substantial?	No	No	No	No	No	No

c) Less than Significant Impact. Cumulative short-term, construction-related emissions from the project will not contribute considerably to any potential cumulative air quality impact because short-term project emissions will be less than significant and other concurrent construction projects in the region will be required to implement standard air quality regulations and mitigation pursuant to State CEQA requirements, just as this project has.

The SCAQMD CEQA Air Quality Handbook identifies methodologies for analyzing long-term cumulative air quality impacts for criteria pollutants for which the Basin is nonattainment. These methodologies identify three performance standards that can be used to determine if long-term emissions will result in cumulative impacts. Essentially, these methodologies assess growth associated with a land use project and are evaluated for consistency with regional projections. These methodologies are outdated, and are no longer recommended by SCAQMD. SCAQMD allows a project to be analyzed using the projection method such that consistency with the AQMP will indicate that a project will not contribute considerably to cumulative air quality impacts. As discussed in AQMP Consistency, the proposed project is consistent with growth assumptions in the AQMP, and would not exceed any applicable SCAQMD thresholds for short- and long-term emissions. Therefore, the proposed project will not contribute to any potential cumulative air quality impacts.

d) Less than Significant Impact. Sensitive receptors are those segments of the population that are most susceptible to poor air quality such as children, the elderly, the sick, and athletes who perform outdoors. Land uses associated with sensitive receptors include residences, schools, playgrounds, childcare centers, athletic facilities, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes.

Localized Significance Thresholds

As part of SCAQMD's environmental justice program, attention has recently been focusing more on the localized effects of air quality. Although the region may be in attainment for a particular criteria pollutant, localized emissions from construction activities coupled with ambient pollutant levels can cause localized increases in criteria pollutant that exceed national and/or State air quality standards.

Construction

Construction-related criteria pollutant emissions and potentially significant localized impacts were evaluated pursuant to the SCAQMD Final Localized Significance Thresholds Methodology. This methodology provides screening tables for one through five-acre project scenarios, depending on the amount of site disturbance during a day using the Fact Sheet for equipment usage in CalEEMod.[8] Daily oxides of nitrogen (NO_X), carbon monoxide (CO), and particulate matter (PM_{10} and $PM_{2.5}$) emissions will occur during construction of the project, grading of the project site, and paving of facility parking lots and drive aisles. Table 5 (Localized Significance Threshold Analysis (Construction) (lbs/day)) summarize on- and off-site emissions as compared to the local thresholds established for Source Receptor Area (SRA) 4 (South Coastal LA County 1). Based on the use of four tractors and three dozers during site preparation activities, a 3.5-acre threshold will be used (using linear regression). A 25-meter receptor distance was used to reflect the proximity of residential uses to the west of the project site. Note that particulate matter emissions account for daily watering required by SCAQMD Rule 403 (three times per day for a 55 percent reduction in fugitive dust). Emissions from construction activities will not exceed any localized threshold.

Table 5
Localized Significance Threshold Analysis (Construction) (lbs/day)

Phase	CO	NO_X	PM^{10}	$PM^{2.5}$
Demolition	23.83	2.05	1.62	0.30
Site Preparation	21.24	2.06	7.12	3.94
Grading	34.78	3.28	3.49	1.50
Building Construction	17.53	23.26	1.49	1.40
Paving	16.93	1.19	0.04	0.04
Architectural Coating	1.83	0.13	0.00	0.00
Threshold	1,063	93	9	6
Potentially Substantial?	No	No	No	No

Operation

Operation-related LSTs become a concern when there are substantial on-site stationary and on-site mobile sources that could impact surrounding receptors. The proposed building does not have a tenant and is speculatively considered for manufacturing uses, thus the type and extent of on-site stationary or on-site mobile sources is unknown. In order to generally assess operational impacts related to LSTs, the ARB *Characterization of the Off-Road Equipment Population* for the state was used to estimate the amount of on-site equipment that may be used as part of future operations. The "residual" category of business was queried. This category includes manufacturing uses as the result of survey inquiries throughout the state and extrapolated to the County level. According to the ARB report, manufacturing uses in Los Angeles County average 0.0313 pieces of equipment per employee. An estimate of 187 employees was calculated for the proposed project based on the NAIOP logistics trends analysis for industrial and warehousing uses. This results in an estimated six pieces of equipment, specifically, five fork-lifts and one generator set. It is standard practice to operate a generator once a month for approximately one hour for maintenance purposes and this practice was considered in the analysis. According to Southern California Edison, the Dominguez Hills District (which includes the City of Carson) experiences an average of 108 minutes of "sustained" outages (from 2010 through 2015 for outages over five minutes in duration) at a frequency of 0.80 outages annually. Using a composite of this information, the generator set was assumed to operate for a total of 13.69 hours annually. Forklifts were assumed to operate 24 hours a day. Use of on-site equipment coupled with on-site truck idling (limited to five minutes per hour) comprises the on-site emissions inventory that were evaluated for localized impacts. The emissions calculations are summarized in Table 6 (Localized Significance Thresholds Analysis (Operation) (lbs/day)). As shown in Table 6, no criteria pollutant will be emitted that will exceed applicable LST's.

8 South Coast Air Quality Management District. Fact Sheet for Applying CalEEMod to Localized Significance Thresholds.

Table 6
Localized Significance Thresholds Analysis (Operation) (lbs/day)

Source	CO	NOX	PM10	PM2.5
Landscaping	<1	<1	<1	<1
Natural Gas	<1	<1	<1	<1
On-Site Idling	4.7	37.8	<1	<1
On-Site Equipment	3.4	4.0	<1	<1
Total	8.1	41.8	~3	~2
Threshold	1,530	123	14	4
Potentially Significant?	No	No	No	NO

Carbon Monoxide Hot Spots

A carbon monoxide (CO) hotspot is an area of localized CO pollution that is caused by severe vehicle congestion on major roadways, typically near intersections. CO hotspots have the potential to violate State and Federal CO standards at intersections, even if the broader Basin is in attainment for Federal and State levels. The California Department of Transportation Project-Level Carbon Monoxide Protocol (Protocol) screening procedures have been utilized to determine if the proposed project could potentially result in a CO hotspot. Based on the recommendations of the Protocol, a screening analysis should be performed for the proposed project to determine if a detailed analysis will be required. The California Department of Transportation notes that because of the age of the assumptions used in the screening procedures and the obsolete nature of the modeling tools utilized to develop the screening procedures in the Protocol, they are no longer accepted. More recent screening procedures based on more current methodologies have been developed. The Sacramento Metropolitan Air Quality Management District (SMAQMD) developed a screening threshold in 2011, which states that any project involving an intersection experiencing 31,600 vehicles per hour or more will require detailed analysis. In addition, the Bay Area Air Quality Management District developed a screening threshold in 2010, which states that any project involving an intersection experiencing 44,000 vehicles per hour would require detailed analysis. The proposed project's operations would not involve an intersection experiencing this level of traffic; therefore, the proposed project passes the screening analysis and impacts are deemed less than significant. Based on the local analysis procedures, the proposed project would not result in a CO hotspot.

Toxic Air Contaminants

SCAQMD has established thresholds for emissions of toxic air contaminants. Toxic air emissions from a project are considered potentially significant if maximum incremental cancer risk (MICR) is greater than ten persons in 1,000,000 (1E-05). Cancer risk is determined by calculating the combinatory effects of the cancer potency factor (CPF) when inhaling the toxic, the daily inhalation dose, the age group the receptor is cohort to, the duration of exposure over a lifetime (25, 30, or 70 years depending on the analysis), and the amount of time spent at the location of exposure. Cancer risk was assessed for three specific locations within one-quarter mile of the proposed project, as recommended by OEHHA: the maximum exposed individual resident (MEIR) over a 30-year exposure duration that characterizes the maximum residency tendency in California, the maximum exposed individual worker (MEIW) over a 25-year exposure duration characterizing the maximum job tenure tendency in California, and the point of maximum impact (PMI) irrespective of receptor type. Residential risk calculations account for presumed sensitivity to carcinogens and differences in intake rates for the third-trimester to birth, birth to two-years, two-years to nine-years, two-years to nine-years, two-years to 16-years, 16-year to 30-years, and 16-years to 70 years' age bins.

Concentrations were modeled using AERMOD and then input into the Hot Spots and Reporting Program (HARP) Health Risk Assessment Standalone Tool (RAST) computer software to calculate cancer risk based on the methods and recommendations found in the HRA Guidelines. The results of the HARP evaluation of cancer risk for residential 9-years, 30 years, and 70 years, and worker 25-years exposure scenarios for grid receptors and discrete receptors are summarized in Tables 5 (30 Years (Maximum) Residential Cancer Risk (Discrete Receptors)), 6 (70 Years (Lifetime) Population-Wide

Cancer Burden (Grid Receptors)), and 7 (25 Years (High-End) Worker Cancer Risk) of the project health risk assessment. Detailed program results are also summarized in the project health risk assessment (see Appendix B, Health Risk Assessment).

The breadth of averaging options was included in this study to provide the broadest depth of information regarding cancer risk to the public and local decision makers. In regards to the health risk assessment and CEQA, identifying the MICR is based on the greater of the MEIW and MEIR using the appropriate scenario for those receptors categories and PMI is assessed through community exposure. The lifetime exposure scenario is appropriate for determining cancer burden in those areas that may be exposed to cancer risk greater than one in one million cases. Evaluation of these scenarios will identify any receptors that exceed the MICR of 10 in one million or the 0.5 increased cancer burden thresholds promulgated by SCAQMD.

The MEIR is located at the residential dwelling unit immediately west of the project, located at 1814 East 219th Street. The incremental increase in cancer risk at these properties is 0.00000924 in one million. The MEIW is Watson Land Company, located across the street to the south of the project site at 22010 Wilmington Avenue. The incremental increase in cancer risk at this business is 0.000000396 in one million. MICR at these locations does not exceed 1 in one million.

Cancer burden is the product of public cancer risk and the population exposed to the carcinogen. There are 271 residential properties located within ¼-mile of the project site. Census data indicates that the average owner-occupied household size in the city is 3.46 persons per dwelling unit, thus, an estimated population of 938 people live within one-quarter mile of the project site. The average cancer risk based on the lifetime exposure scenario is 2.81E-06 (approximately 2.81 cases per million people). The product of cancer risk and the estimated population is 0.00263. This does not exceed the SCAQMD threshold of 0.5 excess cancer cases. Under a worst-case scenario, the PMI calculated as cancer burden of 0.0000145 cases per one millions is located at the eastern half of the project site. This point on the receptor grid is identified as Index 231 of Table 6 of the project health risk assessment. Under neither scenario would cancer burden exceed the applicable threshold.

Chronic non-cancer risks are considered significant if the project toxic air contaminant emissions result in a hazard index greater than or equal to one. The hazard index is determined by calculating the average annual toxic concentration (µg/m3) divided by the reference exposure level (REL) for a particular toxic. The REL is the concentration at which no adverse health impacts are anticipated and is established by OEHHA. The chronic REL for DPM was established by OEHHA as 5 µg/m3. Non-cancer risk is estimated using Equation 7 (Chronic Hazard Quotient in the Project Health Risk Assessment). Chronic non-cancer risk was evaluated using HARP and identified the highest hazard index or 0.01485, identified as Index 310 of the lifetime receptor grid in the project health risk assessment. This does not exceed the hazard index threshold of one promulgated by SCAQMD. Impacts will be less than significant.

e) No Impact. According to the CEQA Air Quality Handbook, land uses associated with odor complaints include agricultural operations, wastewater treatment plants, landfills, and certain industrial operations (such as manufacturing uses that produce chemicals, paper, etc.). The proposed project is sited within an existing industrial and commercial area. The proposed project is a speculative industrial building, and as such an end-user has not been identified. However, the proposed project will likely include light industrial, storage, or distribution uses. Therefore, the proposed project would not produce odors that would affect a substantial number of people considering that the proposed project will not result in heavy manufacturing activities. No impact will occur.

4.4 – Biological Resources

Would the project:

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☑	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or US Fish and Wildlife Service?	☐	☐	☐	☑
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☑	☐
d) Interfere substantially with the movement of any 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?	☐	☐	☐	☑
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☑	☐
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☑	☐

a) **Less than Significant Impact with Mitigation Incorporated.** The project site has been partially cleared, graded, and developed with light industrial uses and is zoned for light industrial uses. The project site currently lacks any substantial vegetation, consisting mostly of ornamental trees and shrubs around the boundary of the site. The proposed project includes construction of an industrial building totaling 420,000 square feet of floor space, along with associated parking and landscaping improvements. The project site is located in an area that is almost completely developed with industrial uses and some residential uses.

According to the California Natural Diversity Data Base (CNDDB), there are six (6) federally endangered species and two (2) federally threatened species with the potential to occur within the Long Beach quadrangle area around the project site.[9] Additionally, there are six (6) state endangered and one state threatened species with the potential to occur within the same study location. Additional species of special concern and candidate species have been identified in the area. However, no sightings have been recorded on the project site itself. Table 7 (Federal and State Listed Species) lists the sensitive, special status species that have been recorded within the project vicinity, as listed in the CNDDB. The project site is currently vacant with a portion consisting of light industrial uses. Little to no habitat is located on the project site that would support any federal or state listed species. Although no endangered species or their habitats will be immediately and directly affected by the proposal, there is the potential for migratory birds to be present on the project site, those of which may be sensitive and are protected by the Migratory Birds Treaty Act (MBTA) due to the presence of mature, on-site trees. Mitigation has been included to survey for MBTA species prior to tree removal. Impacts will be less than significant with mitigation incorporation.

Table 7
Federal and State Listed Species

Species		Listing Status		
Scientific Name	Common Name	Federal	State	CDFW
Aquila chrysaetos	Golden eagle	--	--	--
Ardea herodias	Great blue heron	--	--	--
Egretta thula	Snowy egret	--	--	--
Nycticorax nycticorax	Black-crowned night heron	--	--	--
Coccyzus americanus occidentalis	Western yellow-billed cuckoo	T	E	--
Phoebastria albatrus	Short-tailed albatross	E	--	SSC
Ammodramus savannarum	Grasshopper sparrow	--	--	SSC
Passerculus sandwichensis beldingi	Belding's savannah sparrow	--	E	--
Passerculus sandwichensis rostratus	Large-billed savannah sparrow	--	--	SSC
Spizella breweri	Brewer's sparrow	--	--	--
Falco peregrinus anatum	American peregrine falcon	D	D	--
Grus canadensis canadensis	Lesser sandhill crane	--	--	SSC
Progne subis	Purple martin	--	--	SSC
Riparia riparia	Bank swallow	--	T	--
Agelaius tricolor	Tricolored blackbird	--	--	SSC
Xanthocephalus xanthocephalus	Yellow-headed blackbird	--	--	SSC
Sternula antillarum browni	California least tern	E	E	--
Setophaga petechia	Yellow warbler	--	--	SSC
Pelecanus occidentalis californicus	California brown pelican	D	D	--
Picoides albolarvatus	White-headed woodpecker	--	--	--
Polioptila californica californica	Coastal California gnatcatcher	T	--	SSC
Pyrocephalus rubinus	Vermilion flycatcher	--	--	SSC
Bombus crotchii	Crotch bumble bee	--	--	--
Cicindela gabbii	Western tidal-flat tiger beetle	--	--	--

9 California Department of Fish and Wildlife. California Natural Diversity Data Base (CNDDB). Long Beach Quadrangle. https://www.dfg.ca.gov/biogeodata/cnddb/mapsanddata.asp [Accessed May 2016].

Cicindela hirticollis gravida	Sandy beach tiger beetle	--	--	--
Cicindela latesignata latesignata	Western beach tiger beetle	--	--	--
Danaus plexippus pop. 1	California monarch	--	--	--
Perognathus longimembris pacificus	Pacific pocket mouse	E	--	SSC
Nyctinomops macrotis	Big free-tailed bat	--	--	SSC
Lasionycteris noctivagans	Silver-haired bat	--	--	--
Gonidea angulata	Western ridged mussel	--	--	--
Phrynosoma blainvillii	Coast horned lizard	--	--	SSC
Centromadia parryi ssp. australis	Southern tarplant	--	--	--
Lasthenia glabrata ssp. coulteri	Coulter's goldfields	--	--	--
Pentachaeta lyonii	Lyon's pentachaeta	E	E	--
Symphyotrichum defoliatum	San Bernardino aster	--	--	--
Atriplex coulteri	Coulter's saltbush	--	--	--
Atriplex parishii	Parish's brittlescale	--	--	--
Suaeda esteroa	Estuary seablite	--	--	--
Chloropyron maritimum ssp. maritimum	Salt marsh bird's-beak	E	E	--
Orcuttia californica	California Orcutt grass	E	E	--
Navarretia prostrata	Prostrate vernal pool navarretia	--	--	--
Nemacaulis denudata var. denudata	Coast woolly-heads	--	--	--
Listing Status Codes: E=Endangered, T=Threatened, D= Delisted, SSC=Species of Special Concern				

Mitigation Measures

BIO-1 To avoid impacts to nesting birds and violation of state and federal laws pertaining to birds, all construction-related activities (including but not limited to clearing and grubbing, vegetation removal, fence installation, demolition, and grading) should occur outside the avian nesting season (prior to February 1 or after September 1). If construction and construction noise occurs within the avian nesting season (during the period from February 1 to September 1), all suitable habitats within 250 feet of the areas of disturbance shall be thoroughly surveyed, as feasible, for the presence of active nests by a qualified biologist no more than five days before commencement of any site disturbance activities and equipment mobilization. If it is determined that birds are actively nesting within 250 feet of the Project Site, Mitigation Measure BIO-2 shall apply. Conversely, if the survey area is found to be absent of nesting birds, Mitigation Measure BIO-2 shall not be required. Active nesting is present if a bird is sitting in a nest, a nest has eggs or fledglings in it, or adults are observed carrying food to the nest.

BIO-2 If pre-construction nesting bird surveys result in the location of active nests, no site disturbance and mobilization of heavy equipment (including but not limited to clearing and grubbing, vegetation removal, fence installation, demolition, and grading) shall take place within 300 feet of non-raptor nests and 500 feet of raptor nests, or as determined by a qualified biologist in consultation with CDFW. Protective measures (e.g., monitoring) shall be required to ensure compliance with the MBTA and relevant California Fish and Game Code requirements.

b) No Impact. The project site is currently developed and does not contain any riparian features or habitat. There are no trees or streams located on or adjacent to the project site. No impact will occur.

c) Less than Significant Impact. According to the federal National Wetlands Inventory, there are no data for the project site. The project site does not contain any wetlands and the proposed project will not disturb any offsite wetlands (see Section 4.9 for discussion of project drainage features).[10] No impact will occur.

10 United States Fish and Wildlife Service. National Wetlands Inventory. http://www.fws.gov/wetlands/data/mapper.HTML [Accessed May 2016].

d) **No Impact.** The project site is mostly vacant with light industrial uses on the northwest portion of the site. The site is surrounded by industrial development to the north, east, and south as well as residential development to the west. The project site's location in a mostly developed, urban area prevents use of the site and the surrounding area as a wildlife corridor. The existing site and surrounding area does not currently provide for the movement of any native resident or migratory fish or terrestrial wildlife. No impact will occur.

e) **Less than Significant Impact.** The City of Carson Municipal Code Chapter 9 (City Tree Preservation and Protection) prohibits the removal of trees or shrubs planted or growing in the public streets except pursuant to the issuance of a tree removal permit. The project does not propose the removal of any existing street trees; therefore no street trees or shrubs will be removed. While the project will require the removal of all on-site trees, this removal of trees would not be from public rights-of-way, as prohibited under CMC Chapter 9. Less than significant impacts will occur.

f) **Less than Significant Impact.** The proposed project is located within an industrial area and is not within the planning area of any Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional or state habitat conservation plan.[11] No impact will occur.

[11] California Department of Fish and Game. Natural Community Conservation Planning. http://www.dfg.ca.gov/habcon/nccp/ [Accessed May 2016].

4.5 – Cultural Resources

Would the project:

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Cause a substantial adverse change in the significance of a historical resource as defined in '15064.5?	☐	☐	☑	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to '15064.5?	☐	☑	☐	☐
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☑	☐	☐
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☑	☐	☐

a) **Less than Significant Impact.** The proposed project site is mostly vacant with a light industrial building on the northwest corner and is zoned for light industrial uses. The existing on-site industrial building is not historical in nature. The project site has been previously disturbed and is partially developed, while some parts of the site are vacant. Pursuant to AB 52, notices were sent to local tribes by the City of Carson regarding possible tribal resources located on or around the proposed project site (See Appendix C, Tribal Notification Letters). These tribes included the Torres Martinez Desert Cahuilla Indians, the Gabrieleno Band of Mission Indians- Kizh nation, and the Soboba Band of Luiseno Indians. The City did not receive any responses from the tribes; therefore, tribal consultation was not triggered. As such, the project will have no impact on historical resources.

b) **Less than Significant Impact with Mitigation Incorporated.** The project site has been previously graded during previous development of the site and is currently partially developed with a light industrial use. Any buried archaeological resources would have already been uncovered or destroyed at the time of initial grading of the project site. Moreover, as the site is already developed, it is unlikely archaeological resources would be encountered during ground disturbing activities. However, in the unlikely event that archeological materials are uncovered during ground-disturbing activities, Mitigation Measures CUL-1 through CUL-4 have been implemented to reduce potentially significant impacts to previously undiscovered archaeological resources that may be accidentally encountered during project implementation to a less than significant level. Mitigation Measure CUL-1 requires that a qualified archaeologist conduct an archaeological sensitivity training for construction personnel. Mitigation Measure C-2 requires that all ground-disturbing activities be halted or diverted away from the find and that a buffer of at least 50 feet be established around the find until an appropriate treatment plan is coordinated. Mitigation Measure C-3 requires that a qualified archaeological monitor be present during all construction excavations into non-fill sediments. Mitigation Measure CUL-4 requires that the archaeological monitor prepare a final report at the conclusion of archaeological monitoring. With implementation of Mitigation Measures CUL-1 through CUL-4, impacts will be less than significant.

Mitigation Measures

CUL-1 Conduct Archaeological Sensitivity Training for Construction Personnel. The Applicant must retain a qualified professional archaeologist, approved by the Director of Community and Economic Development, or designee, who meets U.S. Secretary of the Interior's Professional Qualifications and Standards, to conduct an Archaeological Sensitivity Training for construction personnel before commencing excavation activities. The training session must be carried out by a cultural resources professional with expertise in archaeology, who meets the U.S. Secretary of the Interior's Professional Qualifications and Standards. The training session will include a handout and will focus on how to identify archaeological resources that may be encountered during earthmoving activities and the procedures to be followed in such an event, the duties of archaeological monitors, and, the general steps a qualified professional archaeologist would follow in conducting a salvage investigation if one is necessary.

CUL-2 Cease Ground-Disturbing Activities and Implement Treatment Plan if Archaeological Resources Are Encountered. In the event that archaeological resources are unearthed during ground-disturbing activities, ground-disturbing activities must be halted or diverted away from the vicinity of the find so that the find can be evaluated. A buffer area of at least 50 feet must be established around the find where construction activities cannot be allowed to continue until a qualified archaeologist examines the newly discovered artifact(s) and evaluates the area of the find. Work may be allowed to continue outside of the buffer area. All archaeological resources unearthed by project construction activities must be evaluated by a qualified professional archaeologist, who meets the U.S. Secretary of the Interior's Professional Qualifications and Standards and is approved by the Director of Community and Economic Development, or designee. Should the newly discovered artifacts be determined to be prehistoric, Native American Tribes/Individuals must be contacted and consulted and Native American construction monitoring should be initiated. The Applicant must coordinate with the archaeologist to develop an appropriate treatment plan for the resources. The plan may include implementation of archaeological data recovery excavations to address treatment of the resource along with subsequent laboratory processing and analysis.

CUL-3 Monitor Construction Excavations for Archeological Resources in Younger Alluvial Sediments. The Applicant must retain a qualified archaeological monitor, who will work under the direction and guidance of a qualified professional archaeologist, who meets the U.S. Secretary of the Interior's Professional Qualifications and Standards and is approved by the Director of Community and Economic Development, or designee. The archaeological monitor must be present during all construction excavations (e.g., grading, trenching, or clearing/grubbing) into non-fill younger Pleistocene alluvial sediments. Multiple earth-moving construction activities may require multiple archaeological monitors. The frequency of monitoring will be based on the rate of excavation and grading activities, proximity to known archaeological resources, the materials being excavated (native versus artificial fill soils), and the depth of excavation, and if found, the abundance and type of archaeological resources encountered. Full-time monitoring can be reduced to part-time inspections if determined adequate by the project archaeologist.

CUL-4 Prepare Report Upon Completion of Monitoring Services. The archaeological monitor, under the direction of a qualified professional archaeologist who meets the U.S. Secretary of the Interior's Professional Qualifications and Standards, and is approved by the Director of Community and Economic Development, or designee, must prepare a final report at the conclusion of archaeological monitoring. The report must be submitted to the Applicant, the South Central Costal Information Center, the City, and representatives of other appropriate or concerned agencies to signify the satisfactory completion of the project and required mitigation measures. The report must include a description of resources unearthed, if any, evaluation of the resources with respect to the California Register and CEQA, and treatment of the resources.

c) Less than Significant Impact with Mitigation Incorporated. The project site has been previously graded during previous development of the site and is currently partially developed with light industrial uses, while some parts of the site are vacant. Any buried paleontological resources would have already been uncovered or destroyed at the time of initial grading of the project site. However, in the event that paleontological materials are uncovered, Mitigation Measures CUL-5 through CUL-8 are required to reduce potentially significant impacts to previously undiscovered paleontological resources and/or unique geological features that may be accidentally encountered during project implementation to a less than significant level. Mitigation Measure CUL-5 requires that a paleontological sensitivity training for construction personnel be conducted before commencement of excavation activities. Mitigation Measure CUL-6 requires that a qualified paleontologist conduct periodic paleontological spot checks to determine if excavations have extended into older Pleistocene alluvial deposits as well as the presence of a paleontological monitor during all excavations into the local geologic formation or into older Pleistocene alluvial deposits. Mitigation Measure CUL-7 requires that ground-disturbing activities be halted or diverted away from the vicinity and that a buffer of at least 50 feet be established if paleontological materials are encountered until an appropriate treatment plan is coordinated. Mitigation Measure CUL-8 requires that a professional paleontologist prepare a report summarizing the results of the monitoring efforts, methodology used, and the description of fossils collected and their significance. With implementation of Mitigation Measures CUL-5 through CUL-8, impacts to paleontological resources will be less than significant.

Mitigation Measures

CUL-5 Conduct Paleontological Sensitivity Training for Construction Personnel. The Applicant must retain a professional paleontologist, who meets the qualifications set forth by the Society of Vertebrate Paleontology and is approved by the Director of Community and Economic Development, or designee. That paleontologist must conduct a Paleontological Sensitivity Training for construction personnel before commencement of excavation activities. The training will include a handout and will focus on how to identify paleontological resources that may be encountered during earthmoving activities, and the procedures to be followed in such an event; the duties of paleontological monitors; notification and other procedures to follow upon discovery of resources; and, the general steps a qualified professional paleontologist would follow in conducting a salvage investigation if one is necessary.

CUL-6 Conduct Periodic Paleontological Spot Checks during grading and earth-moving activities. The Applicant must retain a professional paleontologist, who meets the qualifications set forth by the Society of Vertebrate Paleontology and is approved by the Director of Community and Economic Development, or designee. The paleontologist must conduct periodic Paleontological Spot Checks beginning at depths below four feet to determine if construction excavations have extended into the local geologic formation or into older Pleistocene alluvial deposits. After the initial Paleontological Spot Check, further periodic checks will be conducted at the discretion of the qualified paleontologist. If the qualified paleontologist determines that construction excavations have extend into the local geologic formation or into older Pleistocene alluvial deposits, construction monitoring for Paleontological Resources will be required. The Applicant must retain a qualified paleontological monitor, who will work under the guidance and direction of a professional paleontologist, who meets the qualifications set forth by the Society of Vertebrate Paleontology and is approved by the Director of Community and Economic Development, or designee. The paleontological monitor must be present during all construction excavations (e.g., grading, trenching, or clearing/grubbing) into the local geologic formation or into older Pleistocene alluvial deposits. Multiple earth-moving construction activities may require multiple paleontological monitors. The frequency of monitoring will be based on the rate of excavation and grading activities, proximity to known paleontological resources and/or unique geological features, the materials being excavated (native versus artificial fill soils), and the depth of excavation, and if found, the abundance and type of paleontological resources and/or unique geological features encountered. Full-time monitoring can be reduced to part-time inspections if determined adequate by the qualified professional paleontologist.

CUL-7 Cease Ground-Disturbing Activities and Implement Treatment Plan if Paleontological Resources Are Encountered. In the event that paleontological resources and or unique geological features are unearthed during ground-disturbing activities, ground-disturbing activities must be halted or diverted away from the vicinity of the find so that the find can be evaluated. A buffer area of at least 50 feet shall be established around the find where construction activities will not be allowed to continue until appropriate paleontological treatment plan has been approved by the Director of Community and Economic Development, or designee. Work may be allowed to continue outside of the buffer area. The Applicant must coordinate with a professional paleontologist, who meets the qualifications set forth by the Society of Vertebrate Paleontology and is approved by the Director of Community and Economic

Development, or designee, to develop an appropriate treatment plan for the resources. Treatment may include implementation of paleontological salvage excavations to remove the resource along with subsequent laboratory processing and analysis or preservation in place. At the paleontologist's discretion and to reduce construction delay, the grading and excavation contractor must assist in removing rock samples for initial processing.

CUL-8 Prepare Report Upon Completion of Monitoring Services. Upon completion of the above activities, the professional paleontologist must prepare a report summarizing the results of the monitoring and salvaging efforts, the methodology used in these efforts, as well as a description of the fossils collected and their significance. The report must be submitted to the Applicant, the Director of Community and Economic Development, or designee, the Natural History Museums of Los Angeles County, and representatives of other appropriate or concerned agencies to signify the satisfactory completion of the project and required mitigation measures.

d) Less than Significant Impact with Mitigation Incorporated. No human remains were identified during the site survey of the project site. Because the project site has been disturbed, no human remains or cemeteries are anticipated to be disturbed by the proposed project. Any buried human remains would have been uncovered, collected, and/or destroyed at that time of initial development of the site. However, these findings do not preclude the existence of previously unknown human remains located below the ground surface, which may be encountered during construction excavations associated with the proposed project. It is also possible to encounter buried human remains during construction given the proven prehistoric occupation of the region, the identification of multiple surface archaeological resources within a half-mile of the project site, and the favorable natural conditions that would have attracted prehistoric inhabitants to the area. As a result, mitigation measure CUL-9 is required to reduce potentially significant impacts to previously unknown human remains that may be unexpectedly discovered during project implementation to a less than significant level. Mitigation Measure CUL-9 requires that in the unlikely event that human remains are uncovered the contractor is required to halt work in the immediate area of the find and to notify the County Coroner, in accordance with Health and Safety Code § 7050.5, who must then determine whether the remains are of forensic interest. If the Coroner, with the aid of a supervising archaeologist, determines that the remains are or appear to be of a Native American, he/she must contact the Native American Heritage Commission for further investigations and proper recovery of such remains, if necessary. Impacts will be less than significant with implementation of mitigation.

Mitigation Measures

CUL-9 Cease Ground-Disturbing Activities and Notify County Coroner If Human Remains Are Encountered. If human remains are unearthed during construction, the Applicant must comply with Health and Safety Code Section 7050.5. The Applicant must immediately notify the County Coroner and no further disturbance can occur until the County Coroner has made the necessary findings as to origin and disposition pursuant to Public Resources Code § 5097.98. If the remains are determined to be of Native American descent, the coroner has 24 hours to notify the Native American Heritage Commission (NAHC). The NAHC will then identify the person(s) thought to be the Most Likely Descendent (MLD). After the MLD has inspected the remains and the site, it has 48 hours to recommend to the landowner the treatment and/or disposal, with appropriate dignity, the human remains and any associated funerary objects. Upon the reburial of the human remains, the MLD must file a record of the reburial with the NAHC and the project archaeologist shall file a record of the reburial with the CHRIS-SCCIC. If the NAHC is unable to identify a MLD, or the MLD identified fails to make a recommendation, or the landowner rejects the recommendation of the MLD and the mediation provided for in Public Resources Code § 5097.94(k), if invoked, fails to provide measures acceptable to the landowner, the landowner or his or her authorized representative must inter the human remains and items associated with Native American human remains with appropriate dignity on the property in a location not subject to further and future subsurface disturbance.

4.6 – Geology and Soils

Would the project:

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a)	Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i)	Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☐	☑
ii)	Strong seismic ground shaking?	☐	☐	☑	☐
iii)	Seismic-related ground failure, including liquefaction?	☐	☐	☑	☐
iv)	Landslides?	☐	☐	☐	☑
b)	Result in substantial soil erosion or the loss of topsoil?	☐	☐	☑	☐
c)	Be located on 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?	☐	☐	☑	☐
d)	Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1997), creating substantial risks to life or property?	☐	☐	☑	☐
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 water?	☐	☐	☐	☑

a.i) **No Impact.** The proposed project is not located on a known fault as delineated on the Alquist-Priolo Earthquake Fault Zoning Map.[12] No impact will occur.

12 California Department of Conservation. Special Study Zones. San Bernardino South Quadrangle. 1977.

a.ii) **Less than Significant Impact.** The proposed project will be subject to ground shaking impacts should a major earthquake occur in the future. Potential impacts include injury or loss of life and property damage.

The proposed project is subject to the seismic design criteria of the California Building Code (CBC). Adherence to these requirements will reduce the potential of the buildings from collapse during an earthquake, thereby minimizing injury and loss of life. Although structures may be damaged during earthquakes, adherence to seismic design requirements will minimize damage to property within the structure because the structure is designed not to collapse. The CBC is intended to provide minimum requirements to prevent major structural failure and loss of life. Adherence to existing regulations will reduce the risk of loss, injury, and death; impacts due to strong ground shaking will be less than significant.

a.iii) **Less than Significant Impact.** According to the California Department of Conservation Seismic Hazard Maps for the Long Beach 7.5-minute Quadrangle Map, the project is located within an area where historic occurrences of liquefaction have been recorded.[13] However, the proposed project would be subject to standard CBC measures to provide for sound structural design that include considerations for on-site soil conditions, occupancy, and the configuration of the structure including the structural system and height. Therefore, with adherence to CBC requirements, project impacts with relation to liquefaction will be less than significant.

a.iv) **No Impact.** Structures built below or on slopes subject to failure or landslides may expose people and structures to harm. The project site is relatively flat and is not located within an area of required investigation for landslides. No impact will result.

b) **Less than Significant Impact.** Erosion and loss of topsoil could result in damage to on-site structures and landscaping or to neighboring properties. Erosion can also impact downstream water bodies while loss of nutrient-rich topsoil impacts the ability for vegetation to grow. The proposed project is subject to SCAQMD Rule 403 and the erosion control requirements of the CBC to prevent wind-blown and stormwater-related erosion. Rule 403 will minimize wind-blown erosion by requiring stabilization of disturbed soils during construction activities through measures such as daily watering. All individual construction project activities greater than one acre will be subject to the State's General Permit for Construction Activities that is administered by the California Regional Water Quality Control Board (RWQCB). Employment of Best Management Practices (BMPs) implemented through a Storm Water Pollution Prevention Plan (SWPPP) would be required to limit the extent of eroded materials from a construction site. Development that is one acre or more would be required to comply with the provisions of the NPDES regulations concerning the discharge of eroded materials and pollutants from construction sites and prepare and implement a SWPPP. With implementation of existing regulations, impacts due to erosion and loss of topsoil will be less than significant.

c) **Less than Significant Impact.** As stated in the Section 4.a.iii), the soils on the project are susceptible to historic occurrences of liquefaction. However, based on the project site's slope conditions being relatively flat, potential for lateral spreading and landslide would be minimal. Standard CBC requirements for construction will be implemented during grading. Impacts related to on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse will be less than significant with adherence to existing regulations.

d) **Less than Significant Impact.** Expansive soils shrink and swell in response to moisture due to high percentages of clay. Expansive soils can result in damage to structures when clay within the soil swells due to moisture. Should expansive soil be discovered during construction activities, the project would be subject to Standard CBC measures to provide for sound structural design. With adherence to existing regulations, impacts related to expansive soils will be less than significant.

e) **No Impact.** The project site is served by a fully functional sewer system. The project will connect to this system and will not require use of septic tanks. No impact will occur.

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13 California Department of Conservation. CGS Information Warehouse: Regulatory Maps. http://maps.conservation.ca.gov/cgs/informationwarehouse/index.html?map=regulatorymaps [Accessed April 2016].

4.7 – Greenhouse Gas Emissions

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☑	☐
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☑	☐

a) Less than Significant Impact. Climate change is the distinct change in measures of climate for a long period of time.[14] Climate change is the result of numerous, cumulative sources of greenhouse gas emissions all over the world. Natural changes in climate can be caused by indirect processes such as changes in the Earth's orbit around the Sun or direct changes within the climate system itself (i.e. changes in ocean circulation). Human activities can affect the atmosphere through emissions of greenhouse gases (GHG) and changes to the planet's surface. Human activities that produce GHGs are the burning of fossil fuels (coal, oil and natural gas for heating and electricity, gasoline and diesel for transportation); methane from landfill wastes and raising livestock, deforestation activities; and some agricultural practices.

Greenhouse gases differ from other emissions in that they contribute to the "greenhouse effect." The greenhouse effect is a natural occurrence that helps regulate the temperature of the planet. The majority of radiation from the Sun hits the Earth's surface and warms it. The surface in turn radiates heat back towards the atmosphere, known as infrared radiation. Gases and clouds in the atmosphere trap and prevent some of this heat from escaping back into space and re-radiate it in all directions. This process is essential to supporting life on Earth because it warms the planet by approximately 60° Fahrenheit. Emissions from human activities since the beginning of the industrial revolution (approximately 250 years ago) are adding to the natural greenhouse effect by increasing the gases in the atmosphere that trap heat, thereby contributing to an average increase in the Earth's temperature. Greenhouse gases occur naturally and from human activities. Greenhouse gases produced by human activities include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). Since 1750, it is estimated that the concentrations of carbon dioxide, methane, and nitrous oxide in the atmosphere have increased over 36 percent, 148 percent, and 18 percent, respectively, primarily due to human activity. Emissions of greenhouse gases affect the atmosphere directly by changing its chemical composition while changes to the land surface indirectly affect the atmosphere by changing the way the Earth absorbs gases from the atmosphere.

A numerical threshold for determining the significance of greenhouse gas emissions in the South Coast Air Basin (Basin) has not been established by the South Coast Air Quality Management District (SCAQMD). As an interim threshold based on guidance provided in the CAPCOA *CEQA and Climate Change* handbook, a non-zero threshold approach based on Approach 2 of the handbook has been used. Threshold 2.5 (Unit-Based Thresholds Based on Market Capture) establishes a numerical threshold based on capture of approximately 90 percent of emissions from future development. The latest threshold developed by SCAQMD using this method is 10,000 metric tons carbon dioxide equivalent (MTCO2E) per year for

[14] United States Environmental Protection Agency. Frequently Asked Questions About Global Warming and Climate Change. Back to Basics. April 2009.

industrial projects.[15] This threshold is based on the review of 711 CEQA projects. This threshold will be utilized herein to determine if emissions of greenhouse gases from this project will be significant.

The proposed project will include activities that emit greenhouse gas emissions over the short- and long-term. While one project could not be said to cause global climate change, individual projects contribute cumulatively to greenhouse gas emissions that result in climate change. A greenhouse gas emissions inventory was prepared for the project using under BAU conditions and is analyzed below.

Short-Term Emissions

The project will result in short-term greenhouse gas emissions from construction and installation activities associated with construction of the proposed project. Greenhouse gas emissions will be released by equipment used for grading, paving, and building construction activities. GHG emissions will also result from worker and vendor trips to and from the project site. Table 8 (Construction Greenhouse Gas Emissions) summarizes the estimated yearly emissions from construction activities. Carbon dioxide emissions from construction equipment and worker/vendor trips were estimated utilizing the California Emissions Estimator Model (CalEEMod) version 2013.2.2 (see Appendix A). Construction activities are short-term and cease to emit greenhouse gases upon completion, unlike operational emissions that are continuous year after year until operation of the use ceases. Because of this difference, SCAQMD recommends in its draft threshold to amortize construction emissions over a 30-year operational lifetime. This normalizes construction emissions so that they can be grouped with operational emissions in order to generate a precise project GHG inventory. Amortized construction emissions are included in Table 8.

Table 8
Construction Greenhouse Gas Emissions

Construction Year	GHG Emissions (MT/YR)			
	CO_2	CH_4	N_2O	TOTAL*
2017	1,054.73	0.12	0.00	1,057.29
2018	464.14	0.05	0.00	465.10
*AMORTIZED TOTAL^*	*50.63*	*0.01*	*0.00*	*50.75*

* MTCO2E
Note: Slight variations may occur due to rounding and variations in modeling software
^ Amortized over 30-years

Long-Term Emissions

Warehousing and distribution activities will result in continuous greenhouse gas emissions from mobile and operational sources. Mobile sources including vehicle trips to and from the project site will result primarily in emissions of CO_2 with minor emissions of CH_4 and N_2O. The most significant GHG emission from natural gas usage will be methane. Electricity usage by the project and indirect usage of electricity for water and wastewater conveyance will result primarily in emissions of carbon dioxide. Disposal of solid waste will result in emissions of methane from the decomposition of waste at landfills coupled with CO_2 emission from the handling and transport of solid waste. These sources combine to define the long-term greenhouse gas emissions for the build-out of the proposed project.

To determine long-term emissions, CalEEMod was used. The methodology utilized for each emissions source is based on the CAPCOA *Quantifying Greenhouse Gas Mitigation Measures* handbook.[16] A summary of the project's net long-term greenhouse gas emissions is included in Table 9 (Operational Greenhouse Gas Emissions). Emissions are presented as metric tons of carbon dioxide equivalent (MTCO2E) meaning that all emissions have been weighted based on their Global Warming Potential (GWP) (a metric ton is equal to 1.102 US short tons).

[15] South Coast Air Quality Management District. CEQA Significance Thresholds Working Group. Meeting # 15, Main Presentation. September 28, 2010.
[16] California Air Pollution Control Officers Association. Quantifying Greenhouse Gas Emissions. August 2010

Table 9
Operational Greenhouse Gas Emissions

Source	GHG Emissions (MT/YR)			
	CO_2	CH_4	N_2O	TOTAL*
Area	0.02	0.00	0.00	0.02
Energy	708.03	0.03	0.01	710.87
Mobile	2,680.85	0.04	0.00	2,681.78
Solid Waste	80.10	4.73	0.00	179.51
Water/Wastewater	392.44	3.14	0.07	482.37
TOTAL	3,861.44	7.95	0.08	4,054.55

* MTCO2E/YR
Note: Slight variations may occur due to rounding

Mobile sources are based on annual vehicle miles traveled (VMT) based on daily trip generation identified in the trip generation memorandum.[17] Trip lengths have been adjusted based on a study of metropolitan commercial and freight travel conducted by the National Cooperative Highway Research Program. According to observed data collected in the field for the Southern California Association of Governments (SCAG) region, trip lengths for similar uses are estimated at 5.92 miles for light-duty trucks, 13.06 for medium-duty trucks, and 22.40 for heavy-duty trucks. Total vehicle miles were calculated using the average daily trips for each vehicle class and divided by total daily truck trips to get to an average truck distance of 17.41 miles. Natural gas usage and electricity usage are based on default demand figures utilized in CalEEMod. Solid waste generation is also based on CalEEMod defaults.

CalEEMod does not include outdoor landscape irrigation demand defaults for this type of project. Estimated irrigation needs for landscaping was calculated at 1,371,963 gallons per year. Landscape irrigation requirements were calculated using the California Department of Water Resources (DWR) *Water Budget* Workbook that calculates the Maximum Applied Water Allowance (MAWA) for landscaping based on the requirements of the state water conservation in landscaping act.[18] This reflects the maximum allowable amount of water that is permitted to be used annually after consideration of effective precipitation (25 percent of annual rainfall). MAWA is calculated using the following equation:

$$MAWA = (ET_O - Eppt) * 0.62 * [(0.70 * LA) + (0.30 * SLA)]$$

Where:

MAWA = Maximum Applied Water Allowance (gallons per year)
ET_O = Reference Evapotranspiration for Locale (inches per year)
Eppt = Effective Precipitation (inches per year)
LA = Landscape Area (square feet)
SLA = Special Landscape Area (square feet)

Indoor water demand and wastewater discharges are based on CalEEMod defaults.

Greenhouse Gas Emissions Inventory

Table 10 (Greenhouse Gas Emissions Inventory) summarizes the yearly estimated greenhouse gas emissions from construction and operational sources. The total yearly carbon dioxide equivalent emissions for the proposed project are estimated at 4,105 MTCO2E. This does not exceed the SCAQMD threshold of 10,000 MTCO2E per year.

17 Urban Crossroads. Carson Warehouse Traffic Impact Analysis. April 22, 2016.
18 California Department of Water Resources. Water Budget Workbook. www.water.ca.gov/wateruseefficiency/docs/WaterBudget.xls [October 2014]

Table 10
Greenhouse Gas Emissions Inventory

Source	GHG Emissions (MT/YR)			
	CO_2	CH_4	N_2O	TOTAL*
Construction	*50.63*	*0.01*	*0.00*	*50.75*
Operation	*3,861.44*	*7.95*	*0.08*	*4,054.55*
			Total	4,105.30
* MTCO2E/YR Note: Slight variations may occur due to rounding ^ Construction impacts amortized over 30-years				

b) **Less than Significant Impact.** ARB's *Scoping Plan* identifies strategies to reduce California's greenhouse gas emissions in support of AB32. Many of the strategies identified in the Scoping Plan are not applicable at the project level, such as long-term technological improvements to reduce emissions from vehicles. Some measures are applicable and supported by the project, such as energy efficiency. Finally, while some measures are not directly applicable, the project would not conflict with their implementation. Reduction measures are grouped into 18 action categories, as follows:

1. **California Cap-and-Trade Program Linked to Western Climate Initiative Partner Jurisdictions.** Implement a broad-based California cap-and-trade program to provide a firm limit on emissions. Link the California cap–and-trade program with other Western Climate Initiative Partner programs to create a regional market system to achieve greater environmental and economic benefits for California.[19] Ensure California's program meets all applicable AB 32 requirements for market-based mechanisms.
2. **California Light-Duty Vehicle Greenhouse Gas Standards.** Implement adopted Pavley standards and planned second phase of the program. Align zero-emission vehicle, alternative and renewable fuel and vehicle technology programs with long-term climate change goals.
3. **Energy Efficiency.** Maximize energy efficiency building and appliance standards, and pursue additional efficiency efforts including new technologies, and new policy and implementation mechanisms. Pursue comparable investment in energy efficiency from all retail providers of electricity in California (including both investor-owned and publicly owned utilities).
4. **Renewables Portfolio Standards.** Achieve 33 percent renewable energy mix statewide.
5. **Low Carbon Fuel Standard.** Develop and adopt the Low Carbon Fuel Standard.
6. **Regional Transportation-Related Greenhouse Gas Targets.** Develop regional greenhouse gas emissions reduction targets for passenger vehicles.
7. **Vehicle Efficiency Measures.** Implement light-duty vehicle efficiency measures.
8. **Goods Movement.** Implement adopted regulations for the use of shore power for ships at berth. Improve efficiency in goods movement activities.
9. **Million Solar Roofs Program.** Install 3,000 megawatts of solar-electric capacity under California's existing solar programs.
10. **Medium- and Heavy-Duty Vehicles.** Adopt medium- (MD) and heavy-duty (HD) vehicle efficiencies. Aerodynamic efficiency measures for HD trucks pulling trailers 53-feet or longer that include improvements in trailer aerodynamics and use of rolling resistance tires were adopted in 2008 and went into effect in 2010.[20] Future, yet to be determined improvements, includes hybridization of MD and HD trucks.
11. **Industrial Emissions.** Require assessment of large industrial sources to determine whether individual sources within a facility can cost-effectively reduce greenhouse gas emissions and provide other pollution reduction co-benefits. Reduce greenhouse gas emissions from fugitive emissions from oil and gas extraction and gas transmission. Adopt and implement regulations to control fugitive methane emissions and reduce flaring at refineries.
12. **High Speed Rail.** Support implementation of a high speed rail system.

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[19] California Air Resources Board. California GHG Emissions – Forecast (2002-2020). October 2010.
[20] California Air Resources Board. Scoping Plan Measures Implementation Timeline. October 2010.

13. **Green Building Strategy.** Expand the use of green building practices to reduce the carbon footprint of California's new and existing inventory of buildings.
14. **High Global Warming Potential Gases.** Adopt measures to reduce high warming global potential gases.
15. **Recycling and Waste.** Reduce methane emissions at landfills. Increase waste diversion, composting and other beneficial uses of organic materials, and mandate commercial recycling. Move toward zero-waste.
16. **Sustainable Forests.** Preserve forest sequestration and encourage the use of forest biomass for sustainable energy generation. The 2020 target for carbon sequestration is 5 million MTCO2E/YR.
17. **Water.** Continue efficiency programs and use cleaner energy sources to move and treat water.
18. **Agriculture.** In the near-term, encourage investment in manure digesters and at the five-year Scoping Plan update determine if the program should be made mandatory by 2020.

Table 11 (Scoping Plan Consistency Summary) summarizes the project's consistency with the State Scoping Plan. As summarized, the project will not conflict with any of the provisions of the Scoping Plan and in fact supports seven of the action categories through water conservation and recycling.

Table 11
Scoping Plan Consistency Summary

Action	Supporting Measures	Consistency
Cap-and-Trade Program	--	**Not Applicable.** These programs involve capping emissions from electricity generation, industrial facilities, and broad scoped fuels. Caps do not directly affect this type of project.
Light-Duty Vehicle Standards	T-1	**Not Applicable.** This is a statewide measure establishing vehicle emissions standards.
Energy Efficiency	E-1 E-2 CR-1 CR-2	**Consistent.** The project will not conflict with any State mandated energy efficiency requirements.
Renewables Portfolio Standard	E-3	**Not Applicable.** Establishes the minimum statewide renewable energy mix.
Low Carbon Fuel Standard	T-2	**Not Applicable.** Establishes reduced carbon intensity of transportation fuels.
Regional Transportation-Related Greenhouse Gas Targets	T-3	**Consistent.** The project includes features that reduce greenhouse gas emissions, assisting the region in meeting emissions targets.
Vehicle Efficiency Measures	T-4	**Not Applicable.** Identifies measures such as minimum tire-fuel efficiency, lower friction oil, and reduction in air conditioning use.
Goods Movement	T-5 T-6	**Not applicable.** Identifies measures to improve goods movement efficiencies such as advanced combustion strategies, friction reduction, waste heat recovery, and electrification of accessories. While these measures are yet to be implemented and will be voluntary, the proposed project would not interfere with their implementation.
Million Solar Roofs Program	E-4	**Not Applicable.** Sets goal for use of solar systems

Action	Supporting Measures	Consistency
		throughout the state. While the project currently does not include solar energy generation, the buildings could support solar panels in the future.
Medium- & Heavy-Duty Vehicles	T-7 T-8	**Consistent.** MD and HD trucks and trailers working from the proposed project will be subject to aerodynamic and hybridization requirements as established by ARB; no feature of the project would interfere with implementation of these requirements and programs.
Industrial Emissions	I-1 I-2 I-3 I-4 I-5	**Not Applicable.** These measures are applicable to large industrial facilities (> 500,000 MTCOE2/YR) and other intensive uses such as refineries.
High Speed Rail	T-9	**Not Applicable.** Supports increased mobility choice.
Green Building Strategy	GB-1	**Consistent.** The project includes water and solid waste efficiencies consistent with 2011 CALGREEN requirements.
High Global Warming Potential Gases	H-1 H-2 H-3 H-4 H-5 H-6 H-7	**Not Applicable.** The proposed project is not a substantial source of high GWP emissions and will comply with any future changes in air conditioning, fire protection suppressant, and other requirements.
Recycling and Waste	RW-1 RW-2 RW-3	**Consistent.** The project is subject to a minimum 50 percent recycling standard and will recycle a minimum of 50 percent of construction debris per State and City requirements.
Sustainable Forests	F-1	**Consistent.** The project will increase carbon sequestration by maintaining on-site trees in project landscaping.
Water	W-1 W-2 W-3 W-4 W-5 W-6	**Consistent.** The project includes use of recycled water and low-flow fixtures.
Agriculture	A-1	**Not Applicable.** The project is not an agricultural use.

4.8 – Hazards and Hazardous Materials

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☑	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☑	☐	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☑
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☑
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☑
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☑
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☑	☐
h) Expose people or structures to 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?	☐	☐	☐	☑

a) Less than Significant Impact. The proposed project could result in a significant hazard to the public if the project includes the routine transport, use, or disposal of hazardous materials or places housing near a facility which routinely transports, uses, or disposes of hazardous materials. According to the EPA, the proposed project is not located within a quarter-mile of listed facilities that produce hazardous wastes.[21]

Known site contamination from previous use of the site was determined to occur. A Phase I Environmental Site Assessment was not performed for the proposed site. However, according to the County of Los Angeles Fire Department, no further remedial action is required at the site (see Appendix D, No Further Action Notice). Contamination to soil, soil vapor, and groundwater contamination have been satisfactorily mitigated for commercial/industrial site use and no further action is required at the subject site. The proposed project will not necessarily, but may engage in the routine transport, use, or disposal of hazardous materials or wastes. Widely used hazardous materials common at any industrial land use include paints and other solvents, cleaners, automobile fluids, and pesticides. The remnants of these and other products are disposed of as household hazardous waste (HHW) that includes used motor oil, dead batteries, electronic wastes, and other wastes that are prohibited or discouraged from being disposed of at local landfills. Use of common household hazardous materials and their disposal does not present a substantial health risk to the community. If hazardous materials are proposed on site in the future, they will be subject to state and federal regulation for permitting and inspection by the Hazardous Materials Division of the City Fire Department. Impacts associated with the routine transport, use of hazardous materials or wastes will be less than significant.

b) Less than Significant Impact with Mitigation Incorporated. Construction of the proposed project and future tenant improvements will require the use and transport of hazardous materials such as asphalt, paints, and other solvents. Construction activities could also produce hazardous wastes associated with the use of such products. Construction of the proposed project requires ordinary construction activities and will not require a substantial or uncommon amount of hazardous materials to complete.

Activities associated with the demolition of existing structures on the southeastern portion of the site may pose a hazard with regard to asbestos containing materials (ACM) and lead-based paints. ACM were used on a widespread basis in building construction prior to and into the 1980s; therefore, it is assumed that ACM is present on the project site and will need to be handled following specific regulations/guidelines described below. Asbestos generally does not pose a threat when it remains intact. When asbestos is disturbed and becomes airborne. SCAQMD Rule 1403 (Asbestos Emissions from Demolition/Renovation Activities) requires work practices that limit asbestos emissions from building demolition and renovation activities, including the removal and disturbance of ACM.[22] This rule is designed to protect uses and persons adjacent to demolition or renovation activity from exposure to asbestos emissions. Rule 1403 requires a certified inspector to survey any facility being demolished or renovated for the presence of all friable and Class I and Class II non-friable ACM. The applicant must also notify SCAQMD of their intent to perform demolition or renovation of any buildings that may contain asbestos prior to demolition and requires that all ACM is removed prior to any demolition. Rule 1403 also establishes notification procedures, removal procedures, handling and clean-up procedures, storage, disposal, landfilling requirements, and warning label requirements, including HEPA filtration, the *glovebag* method, wetting, and some methods of dry removal that must be implemented when disturbing appreciable amounts of ACM (more than 100 square feet of surface area). All ACM shall be disposed of at a waste disposal site operated in accordance with Rule 1403. The applicant will also ensure the safety of constructor workers involved in the ACM removal by complying with all California Asbestos Standards in Construction, including, but not limited to minimum air circulations, use of respirators, wetting of materials, clothing laundering, construction and demolition equipment requirements, and shielding specifications. In compliance with State regulations, Mitigation Measure HAZ-1 has been incorporated to ensure adherence to SCAQMD Rule 1403 and would ensure impacts related to the release of ACM are less than significant.

Exposure of construction workers to lead-based paint during demolition activities is also of concern, similar to exposure to asbestos. Exposure of surrounding land uses to lead from demolition activities is generally not a concern because

21 United States Environmental Protection Agency. Envirofacts. http://www.epa.gov/enviro/index.html [Accessed April 2016].

22 South Coast Air Quality Management District. Rule 1403: Asbestos Emissions from Demolition/Renovation Activities. Amended October 5, 2007

demolition activities do not result in appreciable emissions of lead.[23] The primary emitters of lead are industrial processes. Any lead-based paint utilized on the exterior and interior of the existing structures would generally remain inside the structure or close to the exterior of the building and would be removed during demolition. Improper disposal of lead-based paint could contaminate soil and subsurface groundwater in and under landfills not properly equipped to handle hazardous levels of this groundwater in and under landfills not properly equipped to handle hazardous levels of this material. Due to the age of the buildings it is assumed that lead-based paint is present. Therefore, 8 CCR Section 1532.1 (California Construction Safety Orders for Lead) must be followed for the demolition of all existing structures requiring exposure assessment and compliance measures to keep worker exposure below action levels. The proposed project is also subject to Title 22 requirements for the disposal of solid waste contaminated with excessive levels of lead. Testing, monitoring, containment, and disposal of lead-based materials will comply with all Cal/OSHA standards and regulations under California Construction Safety Orders for Lead section 1532. In compliance with State regulations, Mitigation Measure HAZ-2 has been incorporated to ensure adherence to standard regulation and would ensure that impacts related to the release of lead based paints would be less than significant.

<u>Mitigation Measures</u>

HAZ-1 Prior to demolition activities, the Applicant shall retain an Asbestos Hazard Emergency Response Act (AHERA) and California Division of Occupational Safety and Health (Cal/OSHA) certified building inspector to conduct an asbestos survey to determine the presence or absence of asbestos-containing materials (ACMs). If ACMs are located, the abatement of asbestos shall be completed by the Applicant prior to any activities that would disturb ACMs or create an airborne asbestos hazard. Asbestos removal shall be performed by a State certified asbestos containment contractor in accordance with the South Coast Air Quality Management District (SCAQMD) Rule 1403. Contractors performing asbestos abatement activities shall provide evidence of abatement activities to the City Building Official.

HAZ-2 If paint is separated from building materials (chemically or physically) during demolition of the structures, the paint waste shall be evaluated independently from the building material by a qualified Lead Specialist. If lead-based paint is found, the Applicant shall retain a qualified Lead Specialist to conduct abatement prior to any activities that would create lead dust or fume hazard. Lead-based paint removal and disposal shall be performed in accordance with California Code of Regulation Title 8, Section 1532.1, which specifies exposure limits, exposure monitoring and respiratory protection, and mandates good worker practices by workers exposed to lead. Contractors performing lead-based paint removal shall provide evidence of abatement activities to the City Building Official.

c) No Impact. No schools are located within one-quarter mile of the project site. The closest school to the proposed project site is Del Amo Elementary School, which is located approximately 0.39 miles north of the site. Therefore, no impact will occur.

d) No Impact. The proposed project is not located on a site listed on the State 'Cortese List', a compilation of various sites throughout the state that have been compromised due to soil or groundwater contamination from past uses. Therefore, no impact will occur.

Based upon review of the Cortese list, the project site is not:

- listed as a hazardous waste and substance site by the Department of Toxic Substances Control (DTSC),[24]
- listed as a leaking underground storage tank (LUFT) site by the State Water Resources Control Board (SWRCB),[25]
- listed as a hazardous solid waste disposal site by the SWRCB,[26]

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23 California Department of Toxic Substances. *Draft Lead Report.* June 2004.

24 California Department of Toxic Substances Control. Hazardous Waste and Substances Site List – Site Cleanup (Cortese List). http://www.dtsc.ca.gov/SiteCleanup/Cortese_List.cfm [Accessed April 2016].

25 California State Water Resources Control Board. GeoTracker. geotracker.waterboards.ca.gov [Accessed April 2016].

- currently subject to a Cease and Desist Order (CDO) or a Cleanup and Abatement Order (CAO) as issued by the SWRCB,[27] or
- developed with a hazardous waste facility subject to corrective action by the DTSC.[28]

e-f) **No Impact.** The proposed project is not located within two miles of a public or private airstrip or within an airport land use plan. No Impact will occur.

g) **Less than Significant Impact.** The proposed project site is primarily vacant with an industrial building located at the northwest corner of the site. The project will therefore increase trips in the area. Per state Fire and Building codes, sufficient space will have to be provided around the buildings for emergency personnel and equipment access and emergency evacuation. All project elements, including landscaping, would be sited with sufficient clearance from existing and proposed structures so as not to interfere with emergency access to and evacuation from the site. The project is required to comply with the California Fire Code (Title 24, California Code of Regulations, Section 9). The site plan includes three ingress/egress access points on East 220th Street and one ingress/egress access point on Wilmington Avenue.

The project driveways will allow emergency access and evacuation from the site, and will be constructed to California Fire Code specifications. The project would not impair implementation of or physically interfere with an adopted emergency response plan or evacuation plan because no permanent public street or lane closures are proposed. Construction work in the street associated with the buildings would be limited to lateral utility connections that would be limited to nominal potential traffic diversion. Traffic control will be provided for any lane closures. Project impacts will be less than significant.

h) **No Impact.** The project site is surrounded to the north, east, and south by other primarily developed parcels consisting of industrial land uses. There are also residential development to the west of the proposed site. According to the California Department of Forestry and Fire Protection's Fire Hazard Severity Zone (FHSZ) Map for Los Angeles County, the project site is not located in a high fire hazard area for either local or state or federal responsibility.[29] No impact will result.

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26 California State Water Resources Control Board. Sites Identified with Waste Constituents Above Hazardous Waste Levels Outside the Waste Management Unit. www.calepa.ca.gov/SiteCleanup/CorteseList/CurrentList.pdf [Accessed April 2016].

27 California State Water Resources Control Board. List of Active CDO and CAO. http://www.calepa.ca.gov/sitecleanup/corteselist/ [Accessed April 2016].

28 California Department of Toxic Substances Control. Hazardous Facilities Subject to Corrective Action. www.calepa.ca.gov/SiteCleanup/CorteseList/SectionA.htm#Facilities [Accessed April 2016].

29 California Department of Forestry and Fire Protection. *Fire Hazard Severity Zone Map: Los Angeles County*. http://www.fire.ca.gov/fire_prevention/fhsz_maps_losangeles [Accessed April 2016].

4.9 – Hydrology and Water Quality

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Violate any water quality standards or waste discharge requirements?	☐	☑	☐	☐
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (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)?	☐	☐	☑	☐
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?	☐	☑	☐	☐
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?	☐	☐	☑	☐
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?	☐	☑	☐	☐
f) Otherwise substantially degrade water quality?	☐	☑	☐	☐
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☑
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☑	☐

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☑
j) Inundation by seiche, tsunami, or mudflow?	☐	☐	☑	☐

a) **Less than Significant Impact with Mitigation Incorporated.** Violations of water quality standards or waste discharge requirements, or degradation of water quality can result in potentially significant impacts to water quality and result in environmental damage or sickness in people. The project would result in a significant impact to water quality if water quality standards, waste discharge requirements, or degradation of water quality occurred.

Point-source pollutants can be traced to their original source. Point-source pollutants are discharged directly from pipes or spills. Raw sewage draining from a pipe directly into a stream is an example of a point-source water pollutant. The project consists of the development of a single building totaling 420,000 square feet and does not propose any uses that would generate point source pollutants. Therefore, water quality impacts due to point sources would be less than significant.

Non-point-source pollutants (NPS) cannot be traced to a specific original source. NPS pollution is caused by rainfall or snowmelt moving over and through surface areas. As the runoff moves, it picks up and carries away natural and human-made pollutants, finally depositing them into lakes, rivers, wetlands, coastal waters, and even underground sources of drinking water. These pollutants include:

- Excess fertilizers, herbicides and insecticides from agricultural lands and residential areas
- Oil, grease, and toxic chemicals from urban runoff and energy production
- Sediment from improperly managed construction sites, crop and forest lands, and eroding streambanks
- Salt from irrigation practices and acid drainage from abandoned mines
- Bacteria and nutrients from livestock, pet wastes, and faulty septic systems
- Atmospheric deposition and hydromodification

Impacts associated with water pollution include ecological disruption and injury or death to flora and fauna, increased need and cost for water purification, sickness or injury to people, and degradation or elimination of water bodies as recreational opportunities. Accidents, poor site management or negligence by property owners and tenants can result in accumulation of pollutant substances on parking lots, loading and storage areas, or result in contaminated discharges directly into the storm drain system.

The Santa Ana Regional Water Quality Control Board (RWQCB) administers the National Pollutant Discharge Elimination System (NPDES) permit in the region. The City is required to implement all pertinent regulations of the program to control pollution discharges from new development. These regulations reduce NPS pollutant loading through the implementation of Best Management Practices (BMPs) and other control measures that minimize or eliminate pollutants from urban runoff, thereby protecting downstream water resources. BMPs implemented to address commercial pollutant sources generally involve maintenance of storm drain facilities, parking lots, vegetated areas, and educational programs. Violations of water quality standards due to urban runoff can be prevented through the continued implementation of existing regional water quality regulations. The proposed project would not interfere with the implementation of NPDES water quality regulations and standards.

Construction Impacts

The proposed project would disturb approximately 19.85 gross acres of land and therefore will be subject to National Pollutant Discharge Elimination System (NPDES) permit requirements during construction activities in addition to standard NPDES operational requirements. The proposed project will require submittal to the local reviewing agency, the Santa Ana RWQCB, a Storm Water Pollution Prevention Plan (SWPPP) that will include BMPs to protect water quality during construction activities. The City will require BMPs as listed in the California Stormwater Quality Association's California Storm Water Best Management Practice Handbooks. These measures, which include resident/owner education, activity restrictions, parking lot sweeping, basin inspection, landscaping, roof runoff controls, efficient irrigation, slope and channel protection, storm drain signage, trash racks, and trash storage areas, will reduce pollutants in storm water runoff and reduce non-storm water discharges to the City's storm water drainage through controlling the discharge of pollutants.

Operation Impacts

Operational BMPs will be identified in a Stormwater Runoff Management Plan that will be submitted to the City for review and approval. Impacts related to violation of water quality standards during construction and operation will be less than significant with implementation of existing regulations. However, to ensure compliance with existing water quality standards, Mitigation Measures HWQ-1 through HWQ-4 are incorporated herein. With incorporation of mitigation, impacts will be less than significant.

<u>Mitigation Measures</u>

HWQ-1 Prior to Grading Permit issuance and as part of the project's compliance with the National Pollutant Discharge Elimination System (NPDES) requirements, a Notice of Intent (NOI) shall be prepared and submitted to the State Water Resources Quality Control Board (SWRQCB), providing notification and intent to comply with the State of California General Permit.

HWQ-2 Prior to Grading Permit issuance, the Chief Building Official shall confirm that the project plans and specifications conform to the requirements of an approved Storm Water Pollution Prevention Plan (SWPPP)(to be applied for during the Grading Plan process) and the National Pollutant Discharge Elimination System (NPDES) Permit for General Construction Activities No. CAS000002, Order No. 2009-0009-DWQ, including implementation of all recommended Best Management Practices (BMPs), as approved by the State Water Resources Quality Control Board (SWRQCB).

HWQ-3 Upon completion of project construction, the project applicant shall submit a Notice of Termination (NOT) to the State Water Resources Quality Control Board (SWRQCB) to indicate construction is completed.

HWQ-4 As part of the plan review process (prior to Grading Permit issuance), the City of Carson shall ensure that project plans identify a suite of stormwater quality Best Management Practices (BMPs) that are designed to address the most likely sources of stormwater pollutants resulting from operation of the proposed project, consistent with the Standard Urban Stormwater Mitigation Plan (SUSMP). Pollutant sources to be addressed by these BMPs include, but are not necessarily limited to landscaped areas, trash storage locations, and storm drain inlets. The design and location of these BMPs shall be subject to review and comment by the City but shall generally adhere to the standards associated with the Phase II NPDES stormwater permit program. Implementation of these BMPs shall be assured by the City Engineer prior to the issuance of Grading or Building Permits.

b) **Less than Significant Impact.** If the project removed an existing groundwater recharge area or substantially reduced runoff that results in groundwater recharge, a potentially significant impact could occur.

The site is primarily vacant with an industrial building on the northwest corner of the site. The proposed project will construct impervious pavement with areas of landscaping as well as two water quality basins that could provide for similar levels of groundwater recharge compared to the existing conditions. The site does not accommodate any substantial natural drainage or managed recharge areas. The project site is surrounded by light industrial uses to the north, east, and south and residential uses to the west. The project site is not the location of an existing groundwater spreading basin and will not significantly change the runoff from the project that may otherwise recharge groundwater basins; therefore, impacts to groundwater recharge will be less than significant.

c) Less than Significant Impact with Mitigation Incorporated. Potentially significant impacts to the existing drainage pattern of the site or area could occur if development of the project results in substantial on- or off-site erosion or siltation. As was previously detailed in Section 3.9.b, the site is primarily vacant but surrounded by various uses on all sides. The site generally surface drains south-westerly.

Proposed on-site low impact development (LID) principles include the implementation of BMPs including landscaping and an infiltration basin. A Project Specific Standard Urban Stormwater Mitigation Plan (SUSMP) has been prepared for the proposed project and is included in Appendix E. The SUSMP indentifies proposed drainage management areas and the effectiveness of proposed BMPs. According to the SUSMP, the design capture volume required to capture on-site runoff is 19,200 cubic feet. The proposed infiltration basin is proposed to capture approximately 20,073 cubic feet of runoff and infiltrate at a rate of 0.7 inches per hour. According to the SUSMP, proposed LID BMPs fully address all drainage management areas and no alternative compliance measures are required for the proposed project. The design of the proposed project will not substantially alter drainage patterns in the area to the extent that substantial on- or off-site erosion or siltation will occur; therefore, impacts will be less than significant. However, to ensure compliance with existing water quality standards, Mitigation Measures HWQ-1 through HWQ-4 have been incorporated. With incorporation of mitigation, impacts will be less than significant.

d) Less than Significant Impact. As was previously detailed in Section 4.9.c, the project would not result in an alteration of the drainage pattern or increase in flows that would result in flooding on- or off-site because all on- and off-site drainage will be controlled by storm drain and flood control facilities. The proposed project's detention basins have been designed to accommodate enough runoff to reduce proposed runoff to amounts that can be accommodated with existing infrastructure. Impacts to flooding on- or off-site as a result of a change in the drainage pattern or increase in runoff will thus be less than significant.

e) Less than Significant Impact with Mitigation Incorporated. A potentially significant impact could occur if the project creates or contributes runoff that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of runoff. As was previously detailed in Section 4.9.c, project-related stormwater flows will be directed to proposed water quality/detention basins prior to discharging to existing storm drain facilities. The proposed water quality function of the basins would reduce the amount of polluted runoff that would be conveyed into the storm drain system. However, to ensure compliance with existing water quality standards, Mitigation Measures HWQ-1 through HWQ-4 have been incorporated. With incorporation of mitigation, impacts will be less than significant..

f) No Impact with Mitigation Incorporated. The project does not propose any uses that will have the potential to otherwise degrade water quality beyond those issues discussed in Section 3.9 herein. However, to ensure compliance with existing water quality standards, Mitigation Measures HWQ-1 through HWQ-4 have been incorporated. With incorporation of mitigation, impacts will be less than significant.

g) No Impact. The project does not include housing, therefore no impact will occur.

h) Less than Significant Impact. The proposed project is not located within a designated 100-year flood hazard area or zone.[30] Therefore, the project will not impede or redirect flood flows. The project will have a less than significant impact.

i) No Impact. According to the Carson General Plan Safety Element, the City is not subject to inundation associated with dam failure.[31] As such, no impact will result from the project.

30 Federal Emergency Management Agency. Flood Insurance Rate Maps. Map Number 06037C1955F. September 26, 2008.
31 City of Carson. Carson General Plan Safety Element. p. SAF-3. 2014.

j) **Less than Significant Impact.** The proposed project is located approximately 9 miles inland from the Pacific Ocean with on-site elevations ranging from 157 to 196 feet AMSL. However, exposure of people or structures to significant risk or loss, injury or death involving inundation by seiche, tsunami, or mudflow is considered low. The City requires standard construction BMPs to control erosion and protect areas with steep slopes for all new developments. Impacts will be less than significant.

4.10 – Land Use and Planning

Would the project:

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Physically divide an established community?	☐	☐	☐	☑
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☑	☐
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☑

a) **No Impact.** The project is surrounded by industrial uses to the north, east, and south as well as residential uses to the west. The proposed project is consistent and compatible with the surrounding land uses and will not divide an established community. The project does not propose construction of any roadway, flood control channel, or other structure that would physically divide any portion of the community. Therefore, no impact will occur.

b) **Less than Significant Impact.** The proposed project consists of one 420,000-gross-square foot industrial building building. According to City of Carson Municipal Code Section 9162.21 (Parking Spaces Required), the proposed project is required to provide at least 280 passenger vehicle parking stalls. The project proposes the inclusion of 300 parking stalls; therefore, the project is consistent with the City's parking requirements. The proposed project would not conflict with any plans or programs adopted to avoid or mitigate an environmental impact. The proposed project is also subject to General Plan EIR mitigation measures designed to avoid cumulative and site specific environmental impacts, as well as other applicable regulations required to mitigate or avoid environmental impacts. Therefore, there will be no conflict between the proposed project and plans, policies, or regulations designed to avoid or mitigate environmental impacts; a less than significant impact will occur.

c) **No Impact.** The project site is not located within any habitat conservation plan or community conservation plan. Therefore no impact will occur.

4.11 – Mineral Resources

Would the project:

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☑	☐
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☑	☐

a-b) **Less than Significant Impact.** According to the California Department of Conservation Mineral Land Classification mapping system, the City of Carson contains both MRZ-1 and MRZ-3 resources sectors. MRZ-1 resource sectors are areas where adequate information indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence. MRZ-3 resource sectors are areas containing mineral deposits, the significance of which cannot be evaluated from available data.[32] However, the proposed project site is not located within a portion of the City that is designated MRZ-3; therefore, no significant mineral deposits are present at the site. As such, the proposed project will not result in the loss of availability of a known or locally-important mineral resource. No impact will occur.

[32] California Department of Conservation. Mineral Land Classification Mapping System. Plate 4-1. ftp://ftp.consrv.ca.gov/pub/dmg/pubs/sr/SR_143/PartIV/ [Accessed May 2016].

4.12 – Noise

Would the project result in:

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☑	☐	☐
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☑	☐
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☑	☐
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☑	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☑
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☑

Noise can be defined as unwanted sound. Sound (and therefore noise) consists of energy waves that people receive and interpret. Sound pressure levels are described in logarithmic units of ratios of sound pressures to a reference pressure, squared. These units are called *bels*. In order to provide a finer description of sound, a *bel* is subdivided into ten *decibels*, abbreviated dB. To account for the range of sound that human hearing perceives, a modified scale is utilized known as the A-weighted decibel (dBA). Since decibels are logarithmic units, sound pressure levels cannot be added or subtracted by ordinary arithmetic means. For example, if one automobile produces a sound pressure level of 70 dBA when it passes an observer, two 2 cars passing simultaneously would not produce 140 dBA. In fact, they would combine to produce 73 dBA. This same principle can be applied to other traffic quantities as well. In other words, doubling the traffic volume on a street or the speed of the traffic will increase the traffic noise level by 3 dBA. Conversely, halving the traffic volume or speed will reduce the traffic noise level by 3 dBA. A 3 dBA change in sound is the beginning at which humans generally notice a *barely perceptible* change in sound and a 5 dBA change is generally *readily perceptible*.[33] Noise consists of pitch, loudness, and

[33] California Department of Transportation. Basics of Highway Noise: Technical Noise Supplement. November 2009.

duration; therefore, a variety of methods for measuring noise has been developed. According to the California General Plan Guidelines for Noise Elements, the following are common metrics for measuring noise:[34]

L_{EQ} (Equivalent Energy Noise Level): The sound level corresponding to a steady-state sound level containing the same total energy as a time-varying signal over given sample periods. L_{EQ} is typically computed over 1-, 8-, and 24-hour sample periods.

CNEL (Community Noise Equivalent Level): The average equivalent A-weighted sound level during a 24-hour day, obtained after addition of five decibels to sound levels in the evening from 7:00pm to 10:00pm and after addition of ten decibels to sound levels in the night from 10:00pm to 7:00am.

L_{DN} (Day-Night Average Level): The average equivalent A-weighted sound level during a 24-hour day, obtained after the addition of ten decibels to sound levels in the night after 10:00pm and before 7:00am.

CNEL and L_{DN} are utilized for describing ambient noise levels because they account for all noise sources over an extended period of time and account for the heightened sensitivity of people to noise during the night. L_{EQ} is better utilized for describing specific and consistent sources because of the shorter reference period. A noise study was prepared by MIG and is included as Appendix F.

Existing Noise Levels

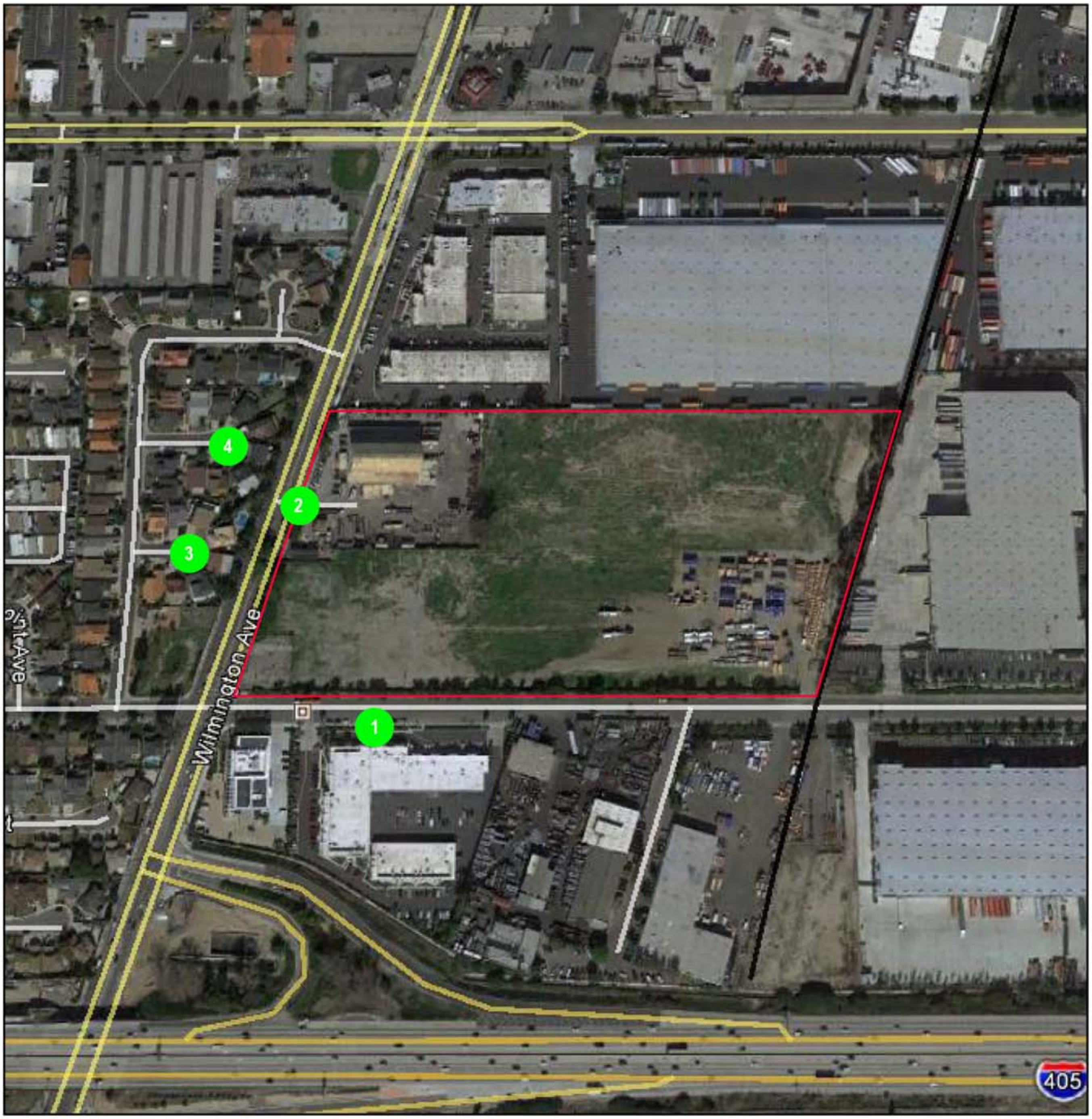
Short-term noise measurements at the project site and nearby receptors were conducted to identify the ambient noise in the project vicinity both in the daytime and at night. An American National Standards Institute (ANSI Section SI4 1979, Type 1) Larson Davis model LxT sound level meter was used to monitor existing ambient noise levels in the project area. The noise meter was programmed in "slow" mode to record noise levels in A-weighted form. The microphone height was set at five feet. Two 15-minute daytime noise measurements were taken on Wednesday, May 25, 2016 at the existing driveway on South Wilmington and at the commercial use located immediately adjacent to the project to the south. Two additional 15-minute daytime noise measurements were taken Wednesday, February 8, 2017 at the residential neighborhood to the west of the site. These two additional measurement locations were the cul-de-sacs of East 219th Street and East Abila Street. Nighttime noise measurements were conducted at all four locations on the night of Thursday, February 9, 2017/ Friday, February 10, 2017. Vehicular traffic along Wilmington Avenue and East 220th Street and operational noise from neighboring industrial uses were the dominant noise sources observed during the measurements.

Ambient noise levels are a composite of noise from all sources, near and far. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location. Ambient noise levels are presented in Table 12 (Ambient Noise Levels) and measurement output data is included as an appendix to the noise study. As shown in Table 12, ambient noise levels at the existing project driveway on Wilmington Avenue ranged from 68.0 CNEL during the nighttime to 72.4 dBA CNEL during the daytime. The existing driveway currently exhibits the highest levels of ambient noise of the four measurements locations. This is due to the fact that the existing driveway is the only entrance and exit point for the existing industrial development located on the site. Moreover, trucks and passenger vehicles entering or exiting the driveway are currently permitted to make both left and right turns. The proposed industrial building project will include four total driveways- one on Wilmington Avenue and three on East 220th Street. The new driveway on Wilmington Avenue will be located further north than the existing driveway, and will only permit right-in and right-out turns. Additionally, one of the three driveways on East 220th Street will allow truck ingress and egress and which will allow trucks leaving the site to travel south on Wilmington Avenue in order to access I-405, which is one block south of the site. As also shown in Table 12, ambient noise levels at the commercial use to the south ranged from 57.7 CNEL during the nighttime and 65.4 CNEL during the daytime. Finally, as shown in Table 12, ambient noise levels at the residential uses to the west of the project site on East 219th Street and East Abila Street ranged from 48.7 CNEL during the nighttime and 52.2 CNEL during the daytime.

[34] California Governor's Office of Planning and Research. General Plan Guidelines. 2003

Table 12
Ambient Noise Levels

Location	Date	Time Period	Measurement Period	Description	Existing Ambient Noise Levels (dBA Leq)
001	05/25/16	12:48 PM – 1:03 PM	15 Minutes	South side of E 220th Street	65.4
002	05/25/16	1:05 PM – 1:20 PM	15 Minutes	Existing Driveway/Wilmington Ave.	72.4
003	02/08/17	11:36 AM – 11:51 AM	15 Minutes	East 219th Street Cul-de-Sac	50.5
004	02/08/17	11:54 AM – 12:09 PM	15 Minutes	East Abila Street Cul-de-Sac	48.7
001	02/09/17	11:21 PM – 11:36 PM	15 Minutes	South side of E 220th Street	57.7
002	02/09/17	11:41 PM – 11:56 PM	15 Minutes	Existing Driveway/Wilmington Ave.	68.0
003	02/10/17	12:01 AM – 12:16 AM	15 Minutes	East 219th Street Cul-de-Sac	52.2
004	02/10/17	12:19 AM – 12:34 AM	15 Minutes	East Abila Street Cul-de-Sac	51.7



Project Site

XX Measurement Location

Exhibit 4 Noise Measurement Locations

AL2 Carson 420K Industrial Building

Carson, California

a) **Less than Significant Impact with Mitigation Incorporated.** Existing land uses surrounding the project site and within the project vicinity generally consists of industrial facilities and single family residences. The City of Carson Municipal Code, under Chapter 5 (Noise Control Ordinance) Section 5500, adopts the Los Angeles County Noise Control Ordinance.

Exterior Noise Standards

Pursuant to Los Angeles County Municipal Code Section 12.08.390 (Exterior Noise Standards), exterior noise levels should not exceed 50 dBA between the hours of 7:00 AM and 10:00 PM at residential uses, 60 dBA at commercial uses, and 70 dBA at industrial uses. The County's exterior noise standards are summarized in Table 13 (Los Angeles County Exterior Noise Standards).

Table 13
Los Angeles County Exterior Noise Standards

Noise Zone	Designated Noise Zone Land Use (Receptor Property)	Time Interval	Exterior Noise Level (dB)
I	Noise-sensitive area	Anytime	45
II	Residential Properties	10:00 PM – 7:00 AM (nighttime)	45
		7:00 AM – 10:00 PM	50
III	Commercial Properties	10:00 PM – 7:00 AM (nighttime)	55
		7:00 AM – 10:00 PM	60
IV	Industrial Properties	Anytime	70
Source: Los Angeles County Municipal Code Section 12.08.390 (Exterior Noise Standards)			

Construction Noise Standards

Pursuant to Section 12.08.440 of the Los Angeles County Code, noise sources created by construction are prohibited between the hours of 7:00 PM and 7:00 AM Monday through Saturday or any time on Sundays or holidays. The City of Carson Municipal Code Section 5502(c) amends Los Angeles County Code Section 12.8.440 to require that for affected residential receptors between the hours of 7:00 AM and 8:00 PM, maximum noise levels for nonscheduled, intermittent, short-term operation (less than 20 days) of mobile equipment shall not exceed 75 dBA at single-family residences, 80 dBA at multi-family residences, or 85 dBA for semi-residential/commercial use. The maximum noise level for repetitively scheduled and relatively long-term periods (21 days or more) of construction equipment shall not exceed 65 dBA at single-family residences, 70 dBA at multi-family residences, or 70 dBA at semi-residential/commercial uses between the hours of 7:00 AM and 8:00 PM. For commercial receptors, the maximum noise level generated by mobile or stationary equipment shall not exceed 85 dBA.

Vibration Standards

Pursuant to Section 12.08.560 (Vibration) of the Los Angeles County Municipal Code, operating or permitting the operation of any device that creates vibration which is above the vibration perception threshold of any individual at or beyond the property boundary of the source if on private property, or at 150 feet from the source if on a public right-of-way is prohibited.

Construction Noise Levels

Construction noise levels were estimated for nearby receptors using the FHWA Roadway Construction Noise Model (RCNM). See Exhibit 5 (Receptors) for receptor locations. The City of Carson Municipal Code adopts the County of Los Angeles County Code Noise Ordinance, which does not include a regulation for industrial uses during construction activities. According to the Carson General Plan Noise Ordinance Table N-2, noise levels at industrial uses, including agriculture, are normally acceptable up to 70 dBA CNEL. Temporary noise increases will be greatest during the demolition phase. The model indicates that use of construction equipment such as excavators, dozers, and concrete saws could expose the industrial uses located approximately 350 feet to the north and 450 feet to the south of the center of the project site to combined noise levels of 72.7 dBA L_{max} and 70.5 dBA $L_{max.}$ Demolition equipment could also expose the residential uses located approximately 700 feet to the west of the center of the project site to a combined noise level of 66.7 dBA $L_{max.}$ Construction activity during all other phases would be within allowable noise levels. Construction activity could result in noise levels in excess of the allowable noise levels at the industrial uses to the north and south and the residential uses to the west during the demolition phase. Therefore, Mitigation Measure NOI-1 has been incorporated to reduce the impact to neighboring uses during demolition.

Because noise levels during demolition activities are anticipated to exceed the City's exterior noise standards, mitigation measures will be necessary to minimize noise levels at neighboring uses during the demolition phase. Mitigation Measure NOI-1 will be incorporated to minimize noise associated with general construction activities. Mitigation Measure NOI-1 requires the use of engineered controls to reduce noise from equipment. Engineered controls include retrofitting equipment with improved exhaust and intake muffling, disengaging equipment fans, and installation of sound panels around equipment engines. These types of controls can achieve noise level reductions of approximately 10 dBA.[35, 36] Mitigation Measure NOI-1 also requires that stationary construction noise sources to be located at least 100 feet from sensitive land uses when feasible, equipment staging areas to be placed at maximum distance from receptors, that all idling equipment be turned off when not in use, and that all equipment be maintained and their loads are secured. Implementation of Mitigation Measure NOI-1 will reduce temporary noise impacts to within allowable levels. Therefore, with implementation of Mitigation Measure NOI-1, construction noise will feasibly be reduced to unsubstantial levels.

Off-Site Operational Noise levels

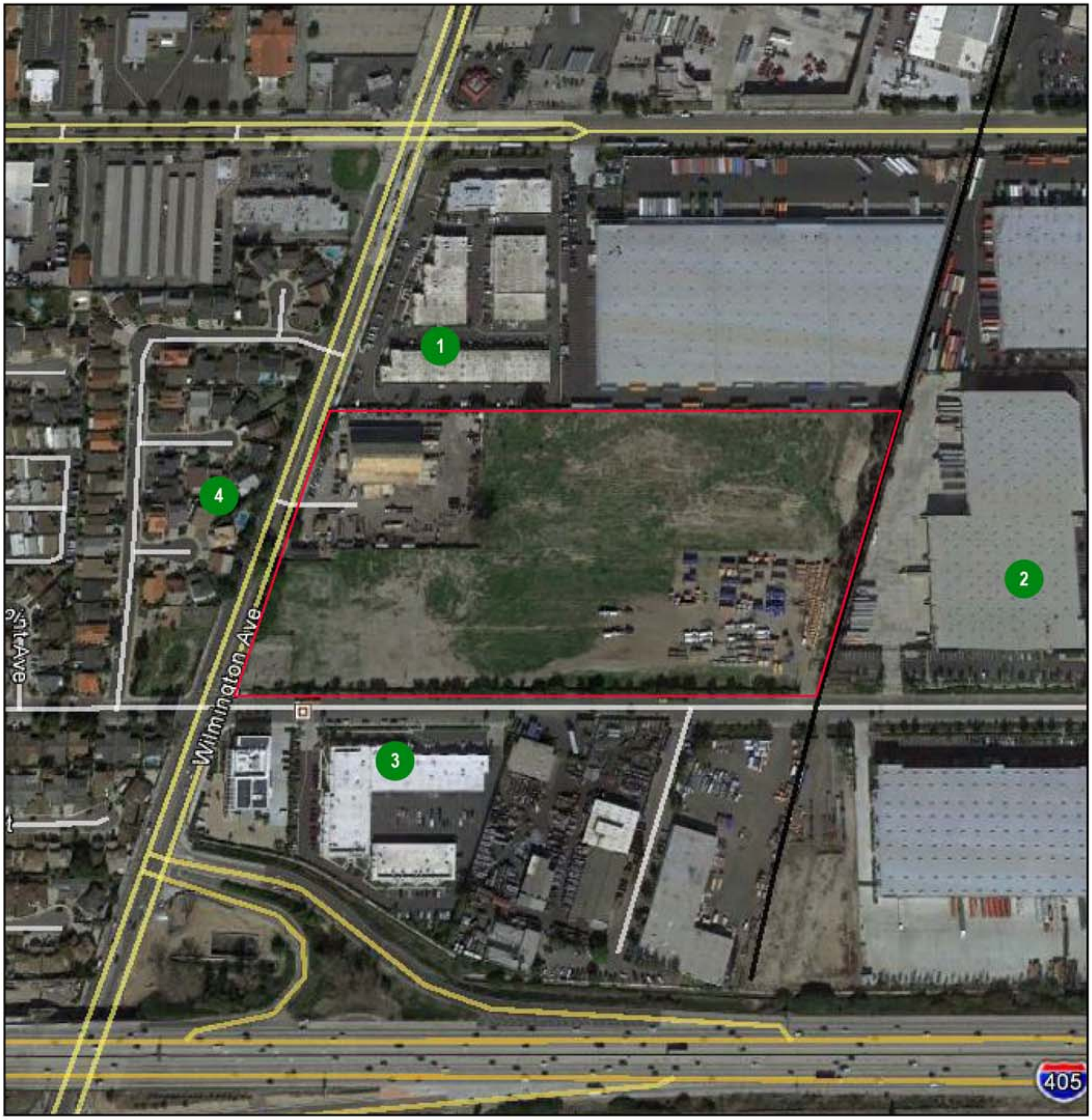
The City of Carson Municipal Code adopts the County of Los Angeles County Code Noise Ordinance, which sets an allowable noise level of 70 dBA at industrial uses and 50 dBA between the hours of 7:00 AM and 10:00 PM for residential uses. Ambient noise at the project site and surrounding uses is generally defined by traffic on Wilmington Avenue and East 220th Street and operational noise from neighboring industrial uses. In particular, ambient noise in the project vicinity is characterized by 24-hour heavy truck traffic associated with nearby industrial uses. Traffic noise from vehicular traffic generated by the proposed project, including project-generated truck traffic, was projected using TNM Version 2.5 software and was based on estimated trip generation provided by Urban Crossroads (see Appendix G, Traffic Impact Analysis). A substantial increase in ambient noise is an increase that is *barely perceptible* (3 dBA). Operationally, the proposed project is a speculative use; therefore, the project could include 24-hour activities.

The *Opening Year 2018 Without* Project and With Project noise levels at neighboring uses were calculated using TNM Version 2.5 (see Appendix F,). The *Opening Year 2018 Without* Project and With Project traffic noise levels at neighboring uses are summarized in Table 14 (Opening Year 2018 Roadway Noise Levels).

Table 14
Opening Year 2018 Roadway Noise Levels

Receptors	Day		Night		Max Difference	Significant? AM/PM
	Without Project	With Project	Without Project	With Project		
	dBA CNEL		dBA CNEL			
1 – Industrial (N)	76.4	76.5	--	--	0.1	No
2 – Industrial (E)	66.3	66.9	--	--	0.6	No
3 – Industrial (S)	68.5	69.1	--	--	0.6	No
4 – Residential (W)	78.7	78.7	51.7	51.7	0.0	No

35 United States Bureau of Mines. Mining Machinery Noise Control Guidelines. 1983.
36 United States Bureau of Mines. Noise Abatement Techniques for Construction Equipment. August 1979.



Project Site

Receptor

Exhibit 5 Receptors

AL2 Carson 420K Industrial Building

Carson, California

Exterior daytime noise levels during Opening Year 2018 will be within the allowable exterior noise levels at the industrial uses to the north and east of the project site. Exterior daytime noise levels will exceed the allowable 70 dBA for industrial uses and 50 dBA for residential uses at the industrial use to the north and the residential uses to the west, respectively. Exterior nighttime noise levels during Opening Year 2018 will be within the allowable exterior noise levels at the industrial uses to the east and south of the project site. Exterior nighttime noise levels will exceed the allowable 70 dBA for industrial uses and 50 dBA for residential uses at the industrial use to the north and the residential uses to the west, respectively. Because noise levels will exceed allowable levels under Without Project conditions, the proposed project will not cause noise levels to exceed normally acceptable levels. In addition, the proposed project will not result in a perceptible noise increase at any of the studied receptors. Therefore, no substantial impacts will result under Opening Year 2018 conditions.

On-Site Operational Noise Levels

Residential uses are located to the west of the project site on the west side of South Wilmington Avenue. Noise levels due to the operation of the proposed facility will result from truck activity at docking bays and drive aisles, HVAC units and passenger vehicle operation along the drive aisles and parking areas. Equipment activity at the loading/unloading docks includes loading and unloading activity and engine start-up, acceleration, idling, and back-up alarms from trucks have been included in the calculation. These activities are periodic and common for industrial uses. The Federal Occupational Health and Safety Administration (OSHA) *Technical Manual* was referenced to identify typical noise level exposure for workers in a variety of industrial occupations.[37] Per worker exposure records of approximately 1,200 samples collected by OSHA, the median noise level for transportation-related facilities is 80.89 dBA. Using the inverse squares law for distance attenuation of noise, at a distance of 775 feet from the central dock area, residents west of the project site on the opposing side of Wilmington Avenue would be exposed to noise levels of approximately 23 dBA. Assuming a +10 dBA sensitivity factor for noise occurring during the night, exposure to an operational noise level of 33 dBA will not exceed the City's noise standard of 50 dBA. These calculations do not account for the existing CMU wall or landscaping existing between the project site and the residential units on the opposing side of Wilmington Avenue.

<u>Mitigation Measures</u>

The following mitigation measures are required to ensure that project-related short-term noise levels are consistent with applicable federal, State, and local regulations.

NOI-1 The following measures shall be implemented during the demolition phase of construction to ensure that construction noise levels do not exceed allowable exterior noise levels at neighboring industrial and residential uses:

- Stationary construction noise sources such as generators or pumps must be located at least 100 feet from sensitive land uses, as feasible, or at maximum distance when necessary to complete work near sensitive land uses. This mitigation measure must be implemented throughout construction and may be periodically monitored by the Planning Director, or designee during routine inspections.

- Construction staging areas must be located as far from noise sensitive land uses as feasible. This mitigation measure must be implemented throughout construction and may be periodically monitored by the Planning Director or designee during routine inspections.

- Throughout construction, the contractor shall ensure all construction equipment is equipped with included noise attenuating devices and are properly maintained. This mitigation measure shall be periodically monitored by the Planning Director, or designee during routine inspections.

- Idling equipment must be turned off when not in use. This mitigation measure may be periodically monitored by the Planning Director, or designee during routine inspections.

[37] Federal Occupational Health and Safety Administration. Technical Manual. Section III, Chapter 5, Noise. August 15, 2013

- Equipment must be maintained so that vehicles and their loads are secured from rattling and banging. This mitigation measure may be periodically monitored by the Planning Director, or designee during routine inspections.

- Nighttime construction activities will not be permitted (10:00 PM to 7:00 AM).

b) **Less than Significant Impact.** Vibration is the movement of mass over time. It is described in terms of frequency and amplitude and unlike sound; there is no standard way of measuring and reporting amplitude. Vibration can be described in units of velocity (inches per second) or discussed in decibel (dB) units in order to compress the range of numbers required to describe vibration. Vibration impacts to buildings are generally discussed in terms of peak particle velocity (PPV) that describes particle movement over time (in terms of physical displacement of mass). For purposes of this analysis, PPV will be used to describe all vibration for ease of reading and comparison. Vibration can impact people, structures, and sensitive equipment. The primary concern related to vibration and people is the potential to annoy those working and residing in the area. Vibration with high enough amplitudes can damage structures (such as crack plaster or destroy windows). Groundborne vibration can also disrupt the use of sensitive medical and scientific instruments such as electron microscopes. Common sources of vibration within communities include construction activities and railroads.

According to the Caltrans vibration manual, large bulldozers, vibratory rollers (used to compact earth), and loaded trucks utilized during grading activities can produce vibration, and depending on the level of vibration, could cause annoyance at uses within the project vicinity or damage structures. Caltrans has developed a screening tool to determine if vibration from construction equipment is substantial enough to impact surrounding uses. The Caltrans vibration manual establishes thresholds for vibration impacts on buildings and humans. These thresholds are summarized in Tables 15 (Vibration Damage Potential Threshold Criteria) and 16 (Vibration Annoyance Potential Threshold Criteria).

Table 15
Vibration Damage Potential Threshold Criteria

Structural Integrity	Maximum PPV (in/sec)	
	Transient	Continuous
Historic and some older buildings	0.50	0.25
Older residential structures	0.50	0.30
New residential structures	1.00	0.50
Modern industrial and commercial structures	2.00	0.50
Source: Caltrans 2013		

Table 16
Vibration Annoyance Potential Threshold Criteria

Human Response	PPV Threshold (in/sec)	
	Transient	Continuous
Barely perceptible	0.035	0.012
Distinctly perceptible	0.24	0.035
Strongly perceptible	0.90	0.10
Severely perceptible	2.00	0.40
Source: Caltrans 2013		

Construction Vibration

Construction activities that use vibratory rollers and bulldozers are repetitive sources of vibration; therefore, the *continuous* threshold is used. Industrial structures are located to the east and south of the project site. As a worst case scenario, the *historic and some older buildings* threshold is used. Based on the threshold criteria summarized in Tables 15 and 16, vibration from use of heavy construction equipment for the proposed project would be below the thresholds to cause damage to nearby structures shown in Table 17 (Construction Vibration Impacts).

Construction of the project does not require rock blasting, pile driving, or the use of a jack hammer, but will use a vibratory roller, and large bulldozer, and loaded trucks. All of the receptors will experience less than *barely perceptible* vibration from construction of the proposed project. Furthermore, these construction activities will be limited to the allowable hours as discussed above. With regard to long-term operational impacts, activities associated with the project will not result in any vibration-related impacts to adjacent or on-site properties.

Table 17
Construction Vibration Impacts

Receptors	Equipment	PPVref	Distance (feet)	PPV
1 – Industrial (N)	Vibratory Roller	0.21	350	0.0068
2 – Industrial (E)	Vibratory Roller	0.21	815	0.0023
3 – Industrial (S)	Vibratory Roller	0.21	450	0.0049
4 – Residential (W)	Vibratory Roller	0.21	700	0.0028
1 – Industrial (N)	Large Bulldozer	0.089	350	0.0029
2 – Industrial (E)	Large Bulldozer	0.089	815	0.0010
3 – Industrial (S)	Large Bulldozer	0.089	450	0.0021
4 – Residential (W)	Large Bulldozer	0.089	700	0.0012
1 – Industrial (N)	Loaded Truck	0.076	350	0.0025
2 – Industrial (E)	Loaded Truck	0.076	815	0.0008
3 – Industrial (S)	Loaded Truck	0.076	450	0.0018
4 – Residential (W)	Loaded Truck	0.076	700	0.0010

Operational Vibration

Operation of the proposed project will include heavy-duty truck traffic along South Wilmington Avenue. According to the Federal Transit Administration, it is unusual for vibration from sources such as trucks to be perceptible.[38] However, according to Caltrans, heavy trucks can impart groundborne vibration when the pavement is not smooth.[39] Therefore, to provide a worst case analysis, potential building damage due to project operation has been analyzed for the residences located to the west of the project site on the opposite side of Wilmington Avenue.

The residences are located approximately 60 feet from the centerline of Wilmington Avenue. According to Caltrans, the highest truck traffic vibrations generated on freeway shoulders (at average speeds of 55 mph) is 2.0 PPV mm/sec (0.079 PPV in/sec). At 60 feet, the vibration level reaching the residences is 0.015 PPV. According to project trip generation as estimated by Urban Crossroads, the proposed project is anticipated to generate 486 heavy-duty trucks per day, with a maximum of 23 heavy-duty trucks during the AM peak hour and 30 heavy-duty truck trips during the PM peak hour. Although truck trips will occur periodically, the continuous threshold has been utilized to provide a worst case analysis. Based on the Caltrans threshold for older residential structures as summarized in Table 15 above, and the vibration annoyance potential threshold criteria summarized in Table 16, heavy truck traffic on Wilmington Avenue will not result in structural damage to residences or perceptible annoyance to inhabitants due to operation-related groundborne vibration.

c) **Less than Significant Impact.** A substantial increase in ambient noise is an increase that is *barely perceptible* (3 dBA). Operationally, the proposed project will result in periodic landscaping and other occasional noise generating activities. These activities are common in urban uses and do not represent a substantial increase in periodic noise in consideration that the project site is located in an industrialized area. Traffic noise levels will not increase more than 3 dBA as a result of the proposed project, as shown in the project Noise Study. Therefore, impacts will be less than significant.

38 Federal Transit Administration. Transit Noise and Vibration Impact Assessment. May 2006
39 California Department of Transportation, Transportation and Construction Vibration Guidance Manual, September 2013

d) **Less than Significant Impact.** As discussed in question a) above, implementation of Mitigation Measure NOI-1 will feasibly reduce temporary construction noise to within the allowable noise levels at neighboring land uses. Impacts related to temporary construction noise will be less than significant with mitigation incorporated.

Operationally, the project will result in periodic landscaping and other occasional noise generating activities. These activities are common in industrial uses and do not represent a substantial increase in periodic noise in consideration that the project vicinity is characterized primarily by industrial uses. Furthermore, the operation of the project will net exceed 70 dBA. Therefore, periodic operational noise increases will be less than significant.

e,f) **No Impact.** The project site is located approximately 4.2 miles south of Compton Airport. According to the Carson General Plan, the 60 dBA and 65 dBA noise contours from Compton Airport do not extend into the City of Carson. Therefore, no substantial impacts will occur.

4.13 – Population and Housing

Would the project:

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☑	☐
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☑
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☑

a) **Less than Significant Impact.** The proposed project includes construction of a light industrial building totaling 420,000-gross-square-feet as well as associated parking and landscaping improvements. At this time, future tenants have not been identified for the proposed industrial building and the number of future employees is not known. However, given its size, the proposed project is not anticipated to generate more than 200 employees, depending on the nature of the use(s). According to the Southern California Association of Governments' (SCAG) 2012 Regional Transportation Plan (RTP), the City of Carson had approximately 51,900 employees in 2008. According to the RTP's growth forecast, the City of Carson is projected to have 52,500 employees by 2020 and 54,000 by 2035. This represents an increase of 2,100 employees in the City. As such, the proposed project is within SCAG's projected range of growth. Furthermore, the project does not add any additional roads or include any infrastructure extension or expansion and therefore will not result in any indirect population growth. Impacts will be less than significant.

b) **No Impact.** The project site is mostly vacant with a light industrial building located on the northwest corner of the site. There is no housing located on the site and the proposed project does not require removal of any residential units, thus no impact will occur.

c) **No Impact.** Displacement, in the context of housing, can generally be defined as persons or groups of persons who have been forced or obliged to flee or to leave their homes or places of habitual residence.[40] There is currently no housing present on the site. As such, there is no *forced or obliged* removal of persons, and therefore no displacement. No impact will occur.

[40] The Brookings Institute. Handbook for Applying the Guiding Principles on Internal Displacement. 1999.

4.14 – 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:

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Fire protection?	☐	☐	☑	☐
b) Police protection?	☐	☐	☑	☐
c) Schools?	☐	☐	☑	☐
d) Parks?	☐	☐	☐	☑
e) Other public facilities?	☐	☐	☑	☐

a) **Less than Significant Impact.** The City of Carson is served by the Los Angeles County Fire Department. The project site is serviced by Station No. 10, located at 1860 East Del Amo Boulevard, approximately 1.15 miles north of the project site. The project includes construction of a light industrial building totaling 420,000-gross-square-feet on a partially developed site in a primarily industrial area. No new or expanded fire protection facilities would be required as a result of this project because the project is within the existing service area of the County of Los Angeles Fire Department. Furthermore, the proposed project does not propose to use substantially hazardous materials or engage in hazardous activities that will require new or modified fire protection equipment to meet potential emergency demand. Impacts related to expansion of fire protection services will be less than significant.

b) **Less than Significant Impact.** The City of Carson is served by the Los Angeles County Sheriff's Department. The project site is served by the LA County Sheriff's Department located at 21356 Avalon Boulevard, approximately 1.35 miles west of the project site. The proposed project will not result in any unique or more extensive crime problems that cannot be handled with the existing level of police resources. No new or expanded police facilities would need to be constructed as a result of this project because the project is within the existing service area of the Sheriff's Department. Impacts related to expansion of police protection services will be less than significant.

c) **Less than Significant Impact.** The proposed industrial project will not result in indirect population growth or potential associated growth in students, within the Los Angeles Unified School District. In accordance with California Government Code and the Los Angeles Unified School District, any incremental impacts that result from the project would be addressed through payment of property taxes that go to serve City and County public services. No new or expanded school facilities would need to be constructed as a result of this project because the project is within the existing service area of LAUSD. Impacts to school facilities will be less than significant.

d) **No Impact.** The proposed industrial project will not result in direct population growth that would incrementally impact recreation facilities. Impacts to recreation facilities are further discussed in section 4.15. No new or expanded recreation facilities would need to be constructed as a result of this project. Any expansion or new construction of recreation facilities resulting from the proposed project would be subject to its own environmental review pursuant to CEQA. No impact will occur.

e) **Less than Significant Impact.** The proposed industrial project will not result in employment growth or population growth that would incrementally impact other public services such as libraries or hospitals. No new or expanded facilities will need to be constructed as a result of the proposed project, as the service needs of the project will be paid for through the payment of property taxes. As such, any incremental impacts that result from the project would be addressed through payment of property taxes that go to serve City and County public services. With the payment of property taxes, a less than significant impact will occur.

4.15 – Recreation

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
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?	☐	☐	☐	☑
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☑

a) **No Impact.** The proposed industrial project will not directly result in population growth that would impact recreation facilities. Furthermore, the project will not be adding employees to the area due to the fact that there is currently an industrial building on-site that is in use. Moreover, industrial uses such as the proposed project do not generate the need for recreation facilities. As such, impacts to recreational facilities and/or parks will be less than significant.

b) **No Impact.** The proposed project requires no on- or off-site construction of recreational facilities. No impact will occur.

4.16 – Transportation and Traffic

Would the project:

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☑	☐	☐
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☑	☐
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☑
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☑	☐
e) Result in inadequate emergency access?	☐	☐	☑	☐
f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☑	☐

a) **Less than Significant Impact with Mitigation Incorporated.** Operation of the proposed project could reduce the performance of the circulation system if the project-related vehicle trips or any proposed improvements decrease the Level of Service (LOS) on existing streets. In addition, impacts could occur if project improvements reduce the performance of any mode of transportation including mass transit and non-motorized travel.

The project site has been designed to take direct access via a driveway on Wilmington Avenue and three driveways on East 220th Street (See Exhibit 6, Location Map). The driveway on Wilmington Avenue and the easternmost driveway on East 220th Street will be dedicated to truck ingress/egress while the remaining two driveways on East 220th Street will be designated for passenger vehicle ingress/egress. Wilmington Avenue is a four-lane divided roadway that is aligned north to south. East 220th Street is a two-lane undivided roadway that is aligned east to west. Regional access to the project site is provided by I-405 freeway to the south, I-710 freeway to the east, and I-110 freeway to the west.

Trip Generation

Trip generation in the project traffic study was estimated based on the Institute of Transportation Engineers 9th edition *Trip Generation* manual (See Appendix G, Traffic Impact Analysis). ITE land use code 152 (High-Cube Warehousing) has been used to derive site specific trip generation estimates for the Proposed Project. Total vehicle mix percentages were also obtained from the ITE *Trip Generation* manual in conjunction with the South Coast Air Quality Management District's (SCAQMD) recommended truck mix, by axle type. The SCAQMD is currently recommending the use of the ITE *Trip Generation* manual in conjunction with their truck mix by axle-type to better quantify trip rates associated with local industrial/distribution projects, as truck emission represent more than 90 percent of air quality impacts from these projects. This recommended procedure has been utilized for the purposes of this analysis in effort to be consistent with other technical studies being prepared for the Project (e.g., air quality analysis). The percentage of trucks has been determined from the table shown on page 267 of the ITE *Trip Generation* manual. As shown on page 267, the truck trip generation rate for weekday daily traffic is 0.64 or 38.1% of the total traffic. Similarly, the truck trip generation rate for the weekday AM peak hour is 0.03 (27.3% of the total traffic) and 0.04 (or 33.3% of the total traffic) for the weekday PM peak hour. Trip generation for heavy trucks was further broken down by truck type (or axle type). The total truck percentage is comprised of different truck types: 2-axle, 3-axle, and 4+-axle trucks. For the purposes of this analysis, the percentage of trucks, by axle type, were obtained from the SCAQMD interim recommended truck mix.

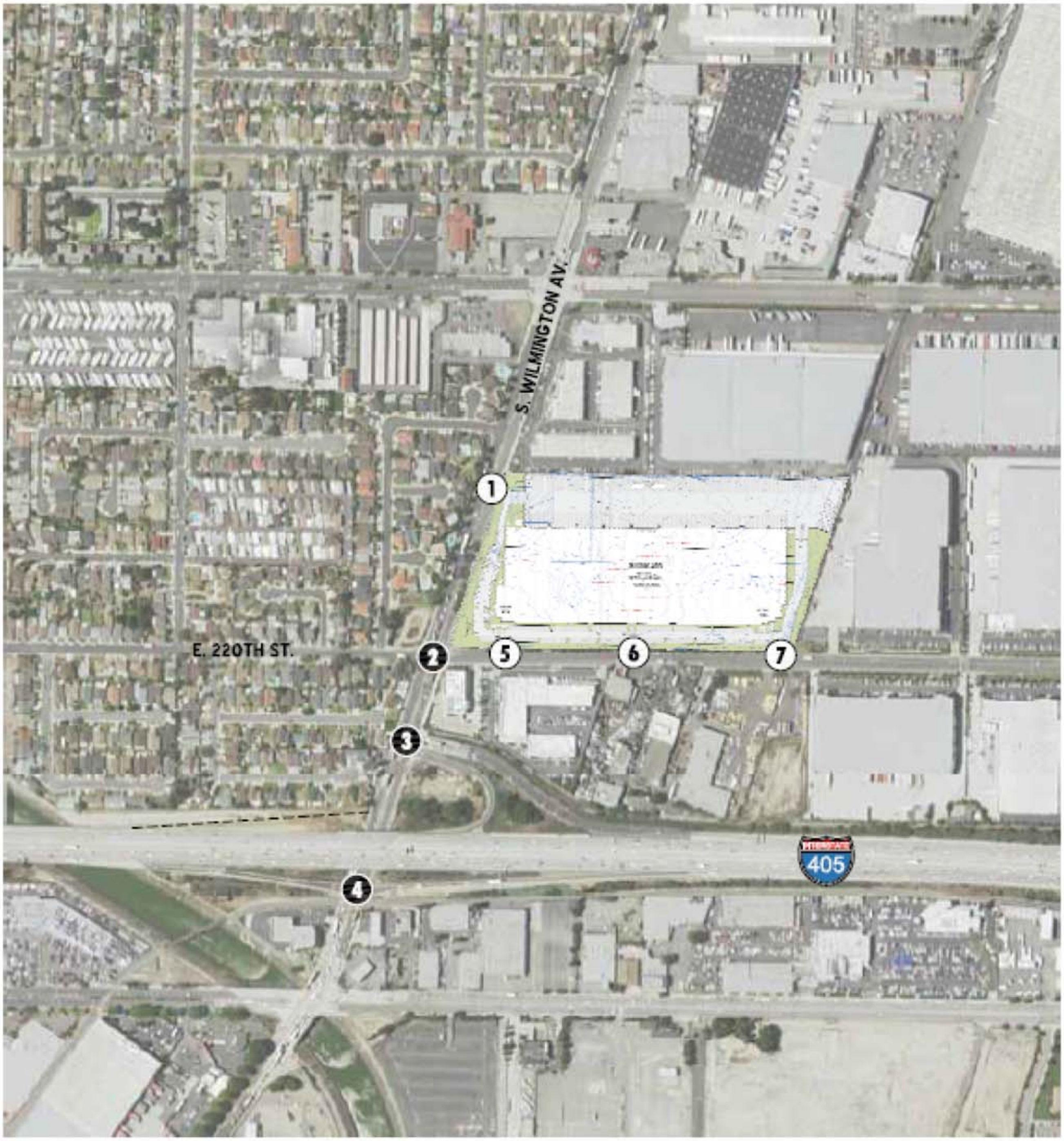
The SCAQMD has recently performed surveys of existing facilities and compiled the data to provide interim guidance on the mix of heavy trucks for these types of high-cube warehousing/distribution facilities. Based on this interim guidance from the SCAQMD, the following truck fleet mix was utilized for the purposes of estimating the truck trip generation for the site: 22.0% of the total trucks as 2-axle trucks, 17.7% of the total trucks as 3-axle trucks, and 60.3% of the total trucks as 4+-axle trucks. PCE factors were also applied to the proposed Project consistent with the factors applied to the existing site trip generation. The Project is anticipated to generate a net total of approximately 1,107 PCE trip-ends per day with 64 PCE AM peak hour trips and 75 PCE PM peak hour trips. The Project site is currently occupied by an existing building on S. Wilmington Avenue. However, in an effort to conduct a conservative analysis, no reductions have been taken for the trips being generated by the existing use.[41]

Construction Traffic

Traffic operations during the proposed construction phase of the project may potentially result in traffic deficiencies related to construction employees, export of materials, and import of construction materials, etc. It is anticipated that construction-related activities such as contractor/employee trips to and from the site, the import of construction materials, and the use of heavy equipment would generate traffic and may potentially result in construction-related traffic deficiencies.

Each of the traffic generating activities listed above is discussed thoroughly in the subsequent sections. It has been assumed that construction activity will occur during the hours of 7:00 AM and 8:00 PM from Monday to Saturday, consistent with the City's Municipal Code. The Applicant would be required to develop and implement a City-approved Construction Traffic Management Plan addressing potential construction-related traffic detours and disruptions. The Construction Traffic Management Plan would ensure that to the extent practical, construction traffic would access the Project site during off-peak hours; and that construction traffic would be routed to avoid travel through, or proximate to, sensitive land uses. As such, Mitigation Measure TRAN-4 has been incorporated to ensure construction-related traffic is properly controlled.

41 Urban Crossroads. Carson Warehouse Traffic Impact Analysis. April 22, 2016



LEGEND:

= EXISTING INTERSECTION ANALYSIS LOCATION

- FUTURE INTERSECTION ANALYSIS LOCATION

--- = CURRENTLY UNDER CONSTRUCTION (ESTIMATED COMPLETION END OF 2016)

N

Employee trips are estimated based on the number of employees anticipated to be on-site throughout the various stages of construction. Each employee is assumed to drive to and from the construction site each day. It has been assumed that employees will arrive up to 30 minutes prior to the workday and will leave up to 30 minutes after the workday ends. Initially, parking for employees and non-employee vehicles can be accommodated on-site near the construction staging area. Once the internal roadway network is constructed, employee parking can be accommodated on-site. It is anticipated that the majority of employees would arrive and depart from the site outside of the peak commute traffic periods (i.e., 7:00 AM – 9:00 AM and 4:00 PM – 6:00 PM) with a period of overlap. Employee trips are based on the number of employees estimated to be on site during different points throughout the project. The potential impacts resulting from construction-related parking and employee trips are considered less-than-significant.

Construction materials will be moved to and from the site. Import of construction materials is anticipated to consist of the importation of raw building materials, building pad, concrete, parking lot base, asphalt, fill, concrete masonry unit, pipes, landscaping, road base, building equipment, steel, roofing, etc. In order to minimize the impact of construction truck traffic to the surrounding roadway network, it is recommended that trucks utilize the most direct route between the site and the I- 405 Freeway via S. Wilmington Avenue. It is recommended that a Construction Traffic Management Plant be implemented for the duration of the construction phase, and has been included as Mitigation Measure TRAN-4. As these measures will be imposed and the haul trips generated during the construction phase are anticipated to be less than 50 peak hour trips, it can be assumed that truck traffic impacts associated with the export of demolition material could be considered less-than-significant. The City of Carson allows hauling between the hours of 7:00 AM and 8:00 PM. S. Wilmington Avenue is an existing truck route within the City.

Project Driveway Queuing Analysis

A queuing analysis was conducted along the site adjacent roadways of S. Wilmington Avenue and E. 220th Street for Opening Year Cumulative (2018) traffic conditions to determine the turn pocket lengths necessary to accommodate near term 95th percentile queues. The analysis was conducted for the weekday AM and weekday PM peak hours. The traffic modeling and signal timing optimization software packages Synchro and SimTraffic (Version 9.1) has been utilized to assess queues at the Project access points. Synchro is a macroscopic traffic software program that is based on the signalized and unsignalized intersection capacity analyses as specified in the HCM. Macroscopic level models represent traffic in terms of aggregate measures for each movement at the study intersections. Equations are used to determine measures of effectiveness such as delay and queue length in Synchro. The LOS and capacity analysis performed by Synchro takes into consideration optimization and coordination of signalized intersections within a network.

SimTraffic is designed to model networks of signalized and unsignalized intersections, with the primary purpose of checking and fine tuning signal operations. SimTraffic uses the input parameters from Synchro to generate random simulations. The average queue is the average of all the two-minute maximum queues observed by SimTraffic. The maximum back of queue observed for every two-minute period is recorded by SimTraffic. SimTraffic has been utilized to assess peak hour queuing at the site access driveways for Opening Year Cumulative With Project traffic conditions. The random simulations generated by SimTraffic have been utilized to determine the 50th and 95th percentile queue lengths observed for each turn lane. A SimTraffic simulation has been recorded five (5) times, during the weekday AM and weekday PM peak hours, and has been seeded for 15-minute periods with 60-minute recording intervals. Storage length recommendations for the turning movements at the Project driveways were included in the project Traffic Impact Analysis and have been incorporated herein as Mitigation Measure TRAN-1 through TRAN-3. The recommendations consist of improvements to the Project egress/ingress driveways only, while lanes along S. Wilmington Avenue will remain consistent with existing conditions. With implementation of the recommended on-site and site-adjacent improvements, queuing impacts at project driveways will be less than significant.

<u>Mitigation Measures</u>

TRAN-1 Construction of on-site and site-adjacent improvements shall occur in conjunction with adjacent Project development activity or as needed for Project access purposes. The recommended site access driveway improvements for the project include:

1. S. Wilmington/ Driveway 1 – Install a stop control on the westbound approach and construct the intersection with the following geometrics:
    - Northbound Approach: One through lane and one shared through-right turn lane.
    - Southbound Approach: Two through lanes.
    - Eastbound Approach: Not Applicable (N/A).
    - Westbound Approach: One right turn lane.

2. E. 220th Street/ Driveway 2 – Install a stop control on the southbound approach and construct the intersection with the following geometrics:
    - Northbound Approach: N/A.
    - Southbound Approach: One left-right turn lane.
    - Eastbound Approach: One shared left-through lane.
    - Westbound Approach: One shared through-right turn lane.

3. E. 220th Street/ Driveway 3 – Install a stop control on the southbound approach and construct the intersection with the following geometrics:
    - Northbound Approach: N/A.
    - Southbound Approach: One left-right turn lane.
    - Eastbound Approach: One shared left-through lane.
    - Westbound Approach: One shared through-right turn lane.

4. E. 220th Street/ Driveway 4 – Install a stop control on the southbound approach and construct the intersection with the following geometrics:
    - Northbound Approach: N/A.
    - Southbound Approach: One left-right turn lane.
    - Eastbound Approach: One shared left-through lane.
    - Westbound Approach: One shared through-right turn lane.

TRAN-2 On-site signing and striping should be implemented in conjunction with detailed construction plans for the project.

TRAN-3 Sight distance at each project access point shall be designed to comply with standard Caltrans and City of Carson sight distance standards; compliance will be determined at the time of preparation of final grading, landscape, and street improvement plans.

<u>TRAN-4 The project proponent shall implement a Construction Traffic Management Plan</u> addressing potential construction-related traffic detours and disruptions. The Construction Traffic Management Plan shall ensure that, to the extent practical, construction traffic would access the Project site during off-peak hours, and that construction traffic would be routed to avoid travel through, or proximate to, sensitive land uses.

Freeway Ramp Queuing Analysis

Consistent with Caltrans requirements, the freeway ramp queuing has been assessed to determine potential queuing impacts at the freeway off-ramp intersections on S. Wilmington Avenue at the I-405 Freeway. Specifically, the off-ramp queuing analysis is utilized to identify any potential queuing and “spill back” onto the I-405 Freeway mainline from the off-ramps.

The traffic progression analysis tool and HCM intersection analysis program, Synchro, has been used to assess the potential impacts/needs of the intersections with traffic added from the proposed Project. Storage (turn-pocket) length recommendations at the ramps have been based upon the 95th percentile queue resulting from the Synchro progression analysis. The 95th percentile queue is the maximum back of queue with 95th percentile traffic volumes. The queue length reported is for the lane with the highest queue in the lane group.

There are two footnotes which appear on the Synchro outputs. One footnote indicates if the 95th percentile cycle exceeds capacity. Traffic is simulated for two complete cycles of the 95th percentile traffic in Synchro in order to account for the effects of spillover between cycles. In practice, the 95th percentile queue shown will rarely be exceeded and the queues shown with the footnote are acceptable for the design of storage bays. The other footnote indicates whether or not the volume for the 95th percentile queue is metered by an upstream signal. In many cases, the 95th percentile queue will not be experienced and may potentially be less than the 50th percentile queue due to upstream metering. If the upstream intersection is at or near capacity, the 50th percentile queue represents the maximum queue experienced.

A vehicle is considered queued whenever it is traveling at less than 10 feet/second. A vehicle will only become queued when it is either at the stop bar or behind another queued vehicle. Although only the 95th percentile queue has been reported in the tables, the 50th percentile queue can be found in the appendix alongside the 95th percentile queue for each ramp location. The 50th percentile maximum queue is the maximum back of queue on a typical cycle during the peak hour, while the 95th percentile queue is the maximum back of queue with 95th percentile traffic volumes during the peak hour. In other words, if traffic were observed for 100 cycles, the 95th percentile queue would be the queue experienced with the 95th busiest cycle (or 5% of the time). The 50th percentile or average queue represents the typical queue length for peak hour traffic conditions, while the 95th percentile queue is derived from the average queue plus 1.65 standard deviations. The 95th percentile queue is not necessarily ever observed; it is simply based on statistical calculations.

A freeway off-ramp queuing analysis was performed for Northbound and Southbound off-ramps at I-405 Freeway and S. Wilmington Avenue interchanges to assess vehicle queues for the off ramps that may potentially impact peak hour operations at the ramp-to-arterial intersections and may potentially “spill back” onto the I-405 Freeway mainline. As shown on Table 6-2 of the project Traffic Impact Analysis, no queuing issues are anticipated on the freeway off-ramps during the peak hours. Therefore, impacts will be less than significant.

Truck Access and Circulation

Due to the typical wide turning radius of large trucks, a truck turning template has been overlaid on the site plan at each applicable Project driveway and site adjacent intersection anticipated to be utilized by heavy trucks in order to determine appropriate curb radii and to verify that trucks will have sufficient space to execute turning maneuvers. As shown in Exhibit 7 (Truck Access and Circulation), the Project driveways and site adjacent intersections are anticipated to accommodate the wide turning radius of the heavy trucks with the proposed curb radius at each of the applicable driveways and site adjacent intersections.

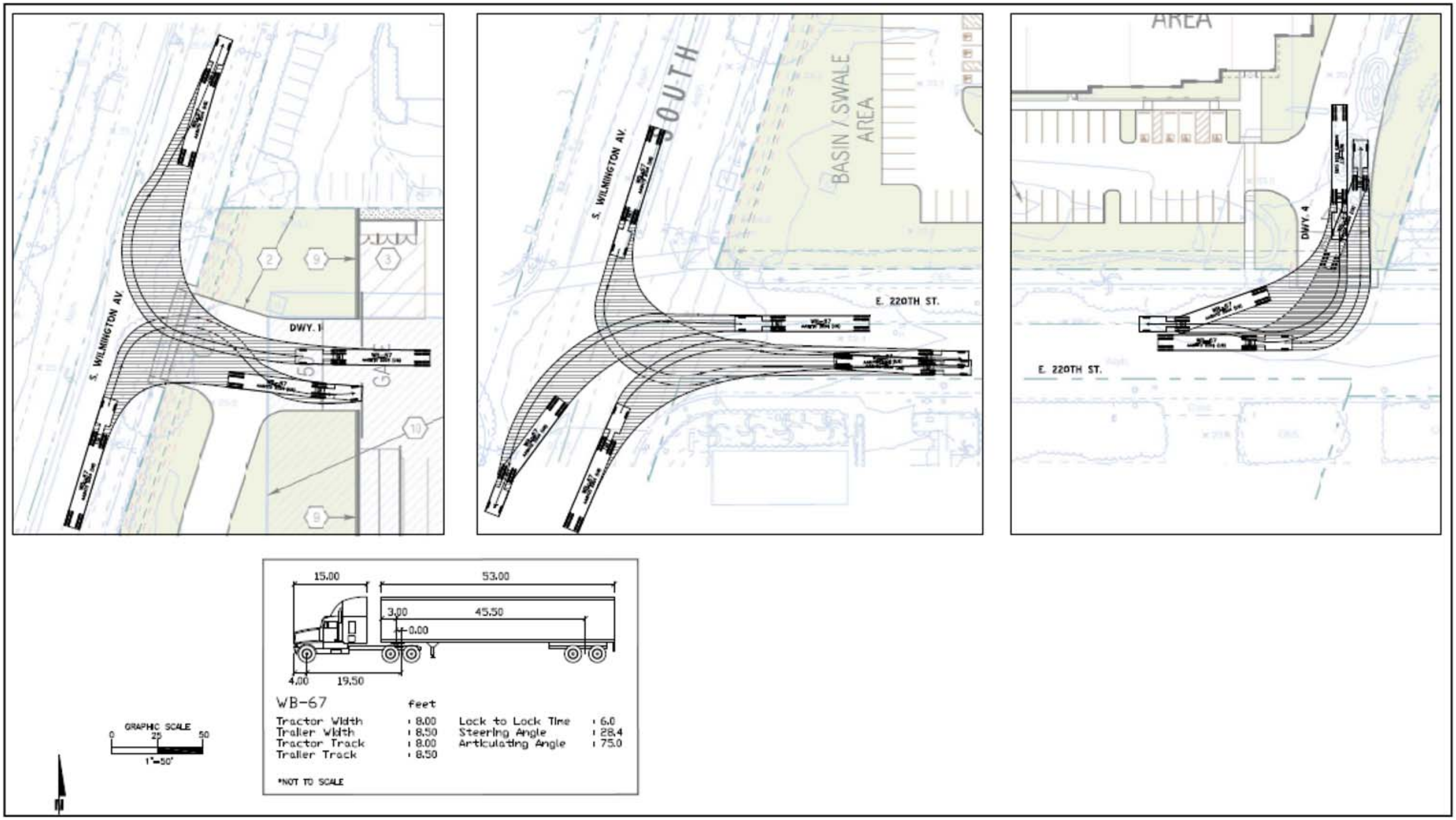


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Exhibit 7 Truck Access & Circulation

AL2 Carson 420K Industrial Building

Carson, California

Roadway Improvements

There are currently improvement projects occurring at the interchange of I-405 and S. Wilmington Avenue. The improvements include widening S. Wilmington Avenue between East 220th Street and East 223rd Street in addition as well as the addition of a northbound on-ramp to I-405 for vehicles travelling south on Wilmington Avenue. The interchange improvement project is anticipated to be completed by the end of 2017. As such, this analysis was conducted with both the existing interchange configuration and with the proposed interchange improvements.

Opening Year Cumulative (2018) with Project Traffic Conditions

To assess Opening Year traffic conditions, existing traffic is combined with area-wide growth to characterize Opening Year conditions and potential impacts. The Opening Year for analysis purposes in this report is 2018. To account for area-wide growth on roadways, traffic volumes have been calculated based on a conservative 2.0 percent annual growth rate of existing traffic volumes. The results of the Opening Year analysis are summarized in Table 18 (Opening Year Cumulative (2018) Intersection Performance).

Table 18
Opening Year Cumulative (2018) Intersection Performance

No.	Intersection	Without Project				With Project				Significant Impact?
		Delay		LOS		Delay		LOS		
		AM	PM	AM	PM	AM	PM	AM	PM	
1	S. Wilmington Ave./ Project Driveway #1	--	--	--	--	9.9	9.5	A	A	No
2	S. Wilmington Ave./ E. 220th Street	0.593	0.567	B	B	0.596	0.590	B	B	No
3	S. Wilmington Ave./ I-405 NB Ramps	50.0	43.8	D	D	53.8	43.7	D	D	--
	-With Improvements	25.4	20.1	C	C	28.1	26.3	C	C	No
4	S. Wilmington Ave./ I-405 SB Ramps	43.6	47.9	C	C	47.5	53.0	D	D	--
	-With Improvements	14.3	12.3	B	B	14.5	20.1	B	C	No
5	Project Driveway #2/ E. 220th Street	--	--	--	--	8.9	9.5	A	A	No
6	Project Driveway #3/ E. 220th Street	--	--	--	--	8.9	9.5	A	A	No
7	Project Driveway #4/ E. 220th Street	--	--	--	--	8.6	9.3	A	A	No
Source: Urban Crossroads, 2016										

A significant impact occurs at a study intersection when the addition of project-generated trips causes either peak hour Level of Service to degrade from acceptable Level of Service (A through D) to unacceptable Level of Service (E or F) or if the proposed project result in increases in peak hour delay by ten seconds for LOS A through B, eight seconds for LOS C, five seconds for LOS D, two seconds for LOS E, and one second for LOS F. As shown in Table 17, the proposed project does not significantly impact study area intersections under Opening Year 2018 With Project traffic conditions. Impacts will be less than significant.

b) **Less than Significant Impact.** The proposed project could result in significant impacts if it conflicts with the Los Angeles County Congestion Management Program (CMP) through reducing the Level of Service of a non-exempt segment to fall to "F". If LOS for a non-exempt segment is reduced to "F", a deficiency plan outlining specific mitigation measure and a schedule for mitigating the deficiency will be required. According to the project traffic impact analysis, the project will not impact any Congestion Management Program (CMP) facilities. No impact will occur.

c) **No Impact.** The proposed project is located within two miles of an airport or private airstrip. The nearest airport to the project site is Compton/Woodley Airport, which is located approximately 4.05 miles to the north. The proposed building would not encroach into air traffic space and this project would have no effects on demand for local air service or volumes of air traffic. The proposed project will not alter air traffic patterns, therefore no impact will occur.

d) **Less than Significant Impact.** If the project will substantially increase hazards due to a design feature, a significant impact could occur. No existing traffic hazards are known to exist in the immediate vicinity of the project. Roadways and intersections provide sufficient sight distance to limit the potential of any hazards and stop signs and traffic signals are placed at intersections to safely control traffic movements. Impacts from the project will be less than significant to any potentially existing or future traffic hazard.

e) **Less than Significant Impact.** The proposed project will be accessible via four entrances. These driveways will provide access to the front and rear of the buildings and provide sufficient clearance for emergency vehicles. Therefore, the project will have less than significant impacts on the provision of adequate emergency access.

f) **Less than Significant Impact.** The project will not result in conflicts with adopted policies or plans related to alternative modes of travel, such as bus transit, bicycles or walking paths. Metro Bus Route #202 (Alameda/Carson) runs along Carson Street to the north of the site. There is an existing bus stop at the Corner of Alameda Street and Carson Street that will remain in place and will not be impacted by the proposed project. The project will not impact any dedicated bike trails. The proposed project will not remove or restrict access to any existing alternative modes of transport. Impacts will be less than significant.

4.17 – Tribal Cultural Resources

Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a Cultural Native American tribe, and that is:

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

(a & b) **Less than Significant Impact with Mitigation Incorporated.** Assembly Bill (AB) 52 specifies that a project that may cause a substantial adverse change to a defined Tribal Cultural Resource (TCR) may result in a significant effect on the environment. AB 52 requires tribes interested in development projects within a traditionally and culturally affiliated geographic area to notify a lead agency of such interest and to request notification of future projects subject to CEQA prior to determining if a negative declaration, mitigated negative declaration, or environmental impact report is required for a project. The lead agency is then required to notify the tribe within 14 days of deeming a development application subject to CEQA complete to notify the requesting tribe as an invitation to consult on the project. AB 52 identifies examples of mitigation measures that will avoid or minimize impacts to TCR. The bill makes the above provisions applicable to projects that have a notice of preparation or a notice of intent to adopt a negative declaration/mitigated negative declaration circulated on or after July 1, 2015. AB 52 amends Sections 5097.94 and adds Sections 21073, 21074, 2108.3.1., 21080.3.2, 21082.3, 21083.09, 21084.2, and 21084.3 to the California Public Resources Code (PRC), relating to Native Americans.

The project site has been previously disturbed during previous development of the site and is currently partially developed with light industrial uses, while a majority of the site is vacant. Despite the heavy disturbances of the Study Area that may have displaced or submerged archaeological resources relating to TCR's on the surface, it is possible that intact tribal cultural resources exist at depth. Due to this uncertainty, Mitigation Measures CUL-1 and CUL-9 are included in Section 4.5 to address any previously undiscovered archaeological resources relating to TCR's encountered during project implementation. Incorporation of mitigation will ensure that potential impacts to buried TCRs are less than significant through requirements for evaluation, salvage, curation, and reporting.

Although there is no indication of TCRs at the project site and the research and surveys conducted by MIG qualified archaeologists were negative for known or anticipated TCRs, AB 52 (Gatto, 2014) is clear in stating that it is the responsibility of the Public Agency (e.g. Lead Agency) to consult with Native American tribes early in the CEQA process to allow tribal governments, lead agencies, and project proponents to discuss the appropriate level of environment review, identify and address potential adverse impacts to TCRs, and reduce the potential for delay and conflict in the environmental review process (see PRC Section 2108..3.2). Specifically, government-to-government consultation may provide "tribal knowledge" of the Study Area that can be used in identifying TCRs that cannot be obtained through other investigative means.

4.18 – Utilities and Service Systems

Would the project:

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

a) **Less than Significant Impact.** The proposed project could result in potentially significant impacts related to Regional Water Quality Control Board treatment standards by increasing wastewater production, which would require expansion of existing facilities or construction of new facilities. Exceeding the RWQCB treatment standards could result in contamination of surface or ground waters with pollutants such as pathogens and nitrates. Wastewater conveyance and treatment is provided to the city of Carson by the Sanitation districts of Los Angeles County (LACSD).[42]

[42] Los Angeles County Sanitation Districts. Wastewater Treatment and Water Reclamation. http://www.lacsd.org/wastewater/wwfacilities/moresanj.asp [Accessed May 2016].

According to the LA County Sanitation District's Southern Division-Los Angeles County 2010 Urban Water Management Plan, the District's wastewater treatment capacity at LACSD's Joint Water Pollution Control Plant (JWPCP) is 400 million gallons per day (MGD).[43] Wastewater flows associated with the proposed project would consist of the same kinds of substances typically generated by industrial buildings and no modifications to any existing wastewater treatment systems or construction of any new facilities would be required to treat this project's wastewater. According to CalEEMod default settings, total indoor and outdoor water demand for the project will be 93,536,663 gallons per year (GPY) or 256,265 gallons per day (GPD). Estimated wastewater generated by the proposed industrial development is approximately 205,012 gallons per day (gpd) (wastewater is estimated to be 80 percent of total water use). This project would thus have a less-than-significant impact on the ability of the Sanitation Districts of Los Angeles to operate within its established wastewater treatment requirements, which are enforced via NPDES requirements adopted by Los Angeles County. Therefore, the project will have a less than significant impact related to wastewater treatment requirements of the RWQCB.

b) **Less than Significant Impact.** Golden State Water Company provides water services to the city of Carson. The City of Carson is located within Golden State Water Company's Southwest System Service Area. Water delivered to customers in the Southwest System is a blend of groundwater pumped from the West Coast and Central Groundwater Basins and imported water from the Colorado River Aqueduct and the State Water Project (imported and distributed by the Metropolitan Water District of Southern California). The West Coast Groundwater Basin stretches southwesterly from the Newport – Inglewood Fault Zone. The Central Groundwater Basin is bounded on the north by the La Brea Uplift; on the east by the Elysian, Repetto, Merced and Puente hills; on the southeast by the Orange County Groundwater Basin; and on the west by the Newport-Inglewood Fault Zone.[44] In addition, recycled water is available from the City's Wastewater Treatment Plant.[45]

Golden State Water Company provides water service to the project area, and will provide water service to the proposed project upon completion. Sections 10910-10915 of the state Water Code require the preparation of a water supply assessment (WSA) demonstrating sufficient water supplies for any subdivision that involves the construction of more than 500 dwelling units, or the equivalent thereof. As the project does not include the construction of dwelling units, no WSA is required.[46] Water use within the City includes domestic, commercial, industrial and landscape irrigation. Most connections within the City's service area, including landscaped areas and City parks, are metered. Water demands within the City's service area over the past five years have been met by Golden State Water Company's groundwater supplies from groundwater basins, surface supplies from the JWPCP and purchased supplies from Metropolitan Water District. Annual water demand within the southwest system was measured at 38,997 AFY in 2005 and is currently 38,101 AFY. Demand in the year 2020 is anticipated to be 38,457 AFY.[47] Based on CalEEMod assumptions, the proposed project's estimated water demand is approximately 287.05 AFY. The project will fall within the City's annual water demand of 38,101 AFY; therefore, impacts will be less than significant.

Regarding wastewater facilities, as discussed in the preceding response, wastewater generated at the project site is treated at LACSD's Joint Water Pollution Control Plant. The proposed project is estimated to have a wastewater generation of approximately 205,012 gpd (plus a nominal increase from additional floor area). This generation is well within the existing remaining treatment capacity of the SARWQCP. Connections to local water and sewer mains would involve temporary construction impacts that would occur in conjunction with other on-site improvements. No additional improvements are needed to either sewer lines or treatment facilities to serve the proposed project. Standard connection fees will address any incremental impacts of the proposed project. Therefore, the project will result in less than significant impacts as a result of new or expanded wastewater treatment facilities.

c) **No Impact.** Potentially significant impacts could occur as a result of this project if storm water runoff was increased to a level that would require construction of new storm drainage facilities. As discussed in the Hydrology section, the proposed project would not generate any increased runoff from the site that would require construction of new storm drainage

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43 Los Angeles County Sanitation Districts – Southern Division. *Final 2010 Urban Water Management Plan*. February 6, 2012.
44 Golden State Water Company. *Southwest Water Quality Report.* 2014.
45 Los Angeles County Sanitation Districts – Southern Division. *Final 2010 Urban Water Management Plan*. February 6, 2012.
46 Public Resources Code. State Water Code Sections 10910-10915. http://www.swrcb.ca.gov/laws_regulations/ [Accessed May 2016].
47 Golden State Water Company. *2010 Urban Water Management Plan- Southwest System*. July 2011.

facilities. Any additional runoff generated by development of the site will be stored and treated on site to ensure the site's present drainage condition will remain unchanged with project implementation. On-site detention basins are proposed to treat runoff created by the proposed project before entering the municipal sewer system. The City's NPDES permit requires most new development projects to incorporate best management practices to minimize pollutant levels in runoff. Inclusion of on-site detention basins and implementation of infiltration BMPs would reduce pollutants in stormwater and urban runoff from the project site. The proposed storm drainage system and BMPs will be designed to the satisfaction of the City's Public Works Director and in conformance with all applicable permits and regulations. The project applicant/developer would be required to provide all necessary on-site infrastructure. The project will have no impact related the construction of new facilities or expansion of existing storm drainage facilities.

d) **Less than Significant Impact.** The project could result in significant impacts if the project required additional water supplies than are currently entitled. Water demand is provided by survey data utilized in the CalEEMod air quality model. Water demand is estimated at 93,536,663 gallons per year or 287.05 acre feet per year (plus a nominal increase from additional floor area). Water demand within the Golden State Water Company's southwest service area is currently between 38,101 AFY and 38,997 AFY. The proposed project's estimated water demand is within the remaining projected use for the City. Therefore, the project would not substantially deplete water supplies, and the project would have a less than significant impact on entitled water supplies.

e) **Less than Significant Impact.** As detailed in Sections 4.17.a) and 4.17.b), the proposed project will be adequately served by existing facilities. Therefore a less than significant impact will occur.

f) **Less than Significant Impact.** Significant impacts could occur if the proposed project will exceed the existing permitted landfill capacity or violates federal, state, and local statutes and regulations. Waste Management, Inc. collects trash from all households and businesses in the City. Regional landfill capacity fluctuates daily and is regularly monitored by the Los Angeles County Sanitation Districts (LACSD) to ensure there is sufficient landfill space available to dispose of municipal solid wastes throughout the region. This project's additional solid waste stream would have a less than significant impact on regional landfill capacity. Cities must meet the 50% landfill diversion mandate required by State law. According to the California Department of Resources Recycling and Recovery (CalRecycle), the City of Carson disposes of waste at several area landfills, including[48]:

- Antelope Valley Public Landfill
- Azusa Land Reclamation Co. Landfill
- California Street Landfill
- Chemical Waste Management, Inc. Unit B-17
- Chiquita Canyon Sanitary Landfill
- Commerce Refuse-To-Energy Facility
- El Sobrante Landfill
- Frank R. Bowerman Sanitary Landfill
- Highway 59 Disposal Site
- Kettleman Hills – B18 Nonhaz Codisposal
- Lancaster Landfill and Recycling Center
- McKittrick Waste Treatment Site
- Mid Valley Sanitary Landfill
- Olinda Alpha Sanitary Landfill
- Otay Landfill
- San Timoteo Sanitary Landfill
- Simi Valley Landfill & Recycling Center

[48] CalRecycle. Jurisdiction Disposal by Facility. City of Carson Reporting Information. http://www.calrecycle.ca.gov/LGCentral/Reports/DRS/Destination/JurDspFa.aspx [Accessed May 2016].

- Southeast Resource Recovery Facility
- Sunshine Canyon City/County Landfill

The majority of waste in the City of Carson goes to the El Sobrante Landfill and the Azusa Land Reclamation Co. Landfill. The El Sobrante Landfill, located in Corona, has a permitted daily capacity of 16,054 tons, with a permitted total capacity of 184,930,000 cubic yards and a remaining capacity of 145,530,000 cubic yards. This landfill is projected to close in 2045.[49] The Azusa Land Reclamation Co. Landfill, located in Azusa, has a permitted daily capacity of 8,000 tons per day and a total capacity of 80,571,760 tons, with a remaining capacity of 51,512,201 tons. This landfill is estimated to close in 2045.[50] Each of these existing landfills currently used by Carson are anticipated to close in 2045. Also, regional plans are underway to transport waste by rail to landfill sites in the desert areas to the east.

Different uses have varying levels of estimated solid waste production. Using the default calculations in the CalEEMod model, the proposed Project will generate approximately 395 tons of solid waste per year. There is adequate landfill capacity in the region to accommodate project-generated waste. Considering the availability of landfill capacity and the relatively nominal amount of solid waste generation from the proposed project, project solid waste disposal needs can be adequately met without a significant impact on the capacity of the nearest and optional, more distant, landfills. Therefore, it is not expected that the proposed project would impact the City's compliance with state-mandated (AB 939) waste diversion requirements. Impacts will be less than significant.

g) No Impact. The proposed project is required to comply with all applicable federal, state, County, and City statutes and regulations related to solid waste as a standard project condition of approval. Therefore, no impact will occur.

49 CalRecycle. Facility/Site Summary Details: El Sobrante Landfill (33-AA-0217) http://www.calrecycle.ca.gov/SWFacilities/Directory/33-AA-0217/Detail/ [Accessed May 2016].

50 CalRecycle. Facility/Site Summary Details: Azusa Land Reclamation Co. Landfill (19-AA-0013) http://www.calrecycle.ca.gov/SWFacilities/Directory/19-AA-0013/ [Accessed May 2016].

4.19 – Mandatory Findings of Significance

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☑	☐	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of the past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☑	☐	☐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☑	☐	☐

a) **Less than Significant with Mitigation Incorporated.** The proposed project would not substantially impact any scenic vistas, scenic resources, or the visual character of the area, as discussed in Section 4.1. The proposed project would not significantly impact any sensitive plants, plant communities, fish, or wildlife, as discussed in Section 4.4. Mitigation Measure BIO-1 has been incorporated to ensure that impacts to potential nesting birds and roosting bats would remain less than significant. Adverse impacts to historic resources would not occur. Construction-phase procedures would be implemented in the event any important archaeological or paleontological resources are discovered during grading, consistent with Mitigation Measures CUL-1 through CUL-9. This site is not known to have any association with an important example of California's history or prehistory. The environmental analysis provided in Section 4.2 concludes that impacts related to emissions of criteria pollutants and other air quality impacts will be less than significant. Section 4.7 concludes that impacts related to climate change would be less then significant. Section 4.9 concludes that impacts related to hydrology and water quality will be less than significant. Based on the preceding analysis of potential impacts in the responses to items 4.1 thru 4.17, no evidence is presented that this project would degrade the quality of the environment. The City hereby finds that impacts related to degradation of the environment, biological resources, and cultural resources will be less than significant with mitigation incorporated.

b) **Less than Significant with Mitigation Incorporated.** Cumulative impacts can result from the interactions of environmental changes resulting from one proposed project with changes resulting from other past, present, and future projects that affect the same resources, utilities and infrastructure systems, public services, transportation network elements, air basin, watershed, or other physical conditions. Such impacts could be short-term and temporary, usually consisting of overlapping construction impacts, as well as long term, due to the permanent land use changes involved in the project.

Non-Cumulative Impacts

Impacts related to aesthetics, geology and soils, and airport hazards at the project-level have no potential for cumulative impacts because impacts are limited to on-site conditions and include no component that could result in similar impacts over time or space. Therefore, no cumulative impacts related to these topics will occur.

Local Impacts

Projects can contribute considerably to cumulative impacts in context of the local environment. Local cumulative impacts are limited to agricultural and forestry resources, air quality, biological resources, cultural resources, hazardous materials, wildfires, groundwater levels, drainage and water quality, land use and planning, mineral resources, noise, population and housing, public services, recreation, transportation and traffic, and utilities and service systems. A general discussion of potentially significant cumulative impacts in the local context is summarized below.

The analysis provided in Sections 4.2 and 4.11 found that no individual impacts would occur; therefore, the project could not contribute considerably to local agricultural or mineral resources impacts. The analysis provided in Section 4 related to agricultural and forestry resources, air quality, greenhouse gas emissions, hazards and hazardous materials, hydrology and water quality, land use and planning, mineral resources, population and housing, transportation and traffic, and utilities and service systems found that impacts would be less than significant; therefore, while the project will contribute to localized cumulative impacts, the project contribution will not be considerable.

Impacts related to biological resources, cultural resources, and construction noise were found to be potentially significant and require mitigation to reduce to less than significant levels; therefore, the project could contribute considerably to significant localized cumulative impacts in these topical areas. These topics are discussed in detail below.

Biological Resources. The context for assessing cumulative impacts to local biological resources includes sensitive species and their habitat in the project vicinity. As discussed in Section 4.4, the project site lacks any substantial vegetation. Mitigation Measures BIO-1 and BIO-2 have been included to ensure that impacts to potential nesting birds would remain less than significant. Therefore, the proposed project would not result in cumulative impacts related to the loss of sensitive species in the project area.

Cultural Resources. The context for assessing cumulative impacts to local archeological knowledge of our past is the geographical extent of local historic and pre-historic knowledge. Loss of on-site archaeological resources could reduce or eliminate important information relevant to the City of Carson and/or the Los Angeles area. Mitigation Measures CUL-1 through CUL-9 have been incorporated requiring evaluation of any discovered potential archaeological resources, the uniqueness of the archaeological sample, and appropriate steps to preserve or curate the artifact. This will eliminate any potential loss of important local archaeological information that may be buried under the project site; therefore, the project will have no contribution to a cumulative loss of important local archaeological knowledge.

Noise. The project is not a substantial source of daytime or nighttime operational noise, as discussed in Section 4.12, and therefore would not contribute considerably to noise levels in the immediate vicinity of the project. The project will contribute to temporary increase in noise levels in the immediate project vicinity during construction activities; however, Mitigation Measures NOI-1 will be incorporated to minimize construction-related noise and therefore the project's contribution will not be considerable. The project will increase traffic in the project area; however, project traffic-related noise and vibration will not be discernible to the public and therefore will have no considerable contribution to cumulative traffic-related noise.

Regional Impacts

Projects can contribute considerably to cumulative impacts in context of the regional environment. Regional cumulative impacts are limited to air quality, biological resources, cultural resources, hazardous materials, wildfires, groundwater levels, drainage and water quality, flooding, land use and planning, mineral resources, transportation and traffic, and utilities and service systems. A general discussion of potentially significant cumulative impacts in the regional context is summarized below.

The analysis provided in Sections 4.2 and 4.11 found that no individual impacts would occur; therefore, the project could not contribute considerably to regional agricultural or mineral resources impacts. The analysis provided in Section 4 related to agricultural and forestry resources, air quality, greenhouse gas emissions, hazards and hazardous materials, hydrology and water quality, land use and planning, mineral resources, population and housing, transportation and traffic, and utilities and service systems found that impacts would be less than significant; therefore, while the project will contribute to regional cumulative impacts, the project contribution will not be considerable.

Impacts related to biological resources, cultural resources, and construction noise were found to be potentially significant and require mitigation to reduce to less than significant levels; therefore, the project could contribute considerably to significant localized cumulative impacts in these topical areas. These topics are discussed in detail below.

Biological Resources. The context for assessing cumulative impacts to regional biological resources includes sensitive species and their habitat in the project vicinity. As discussed in Section 4.4, the project site lacks any substantial vegetation. Mitigation Measures BIO-1 and BIO-2 have been included to ensure that impacts to potential nesting birds would remain less than significant. Therefore, the proposed project would not result in cumulative impacts related to the loss of sensitive species in the region.

Cultural Resources. The context for assessing cumulative impacts to regional archeological knowledge of our past is the geographical extent of regional historic and pre-historic knowledge. Loss of on-site archaeological resources could reduce or eliminate important information relevant to the City of Carson and/or the Los Angeles area. Mitigation Measures CUL-1 through CUL-9 have been incorporated requiring evaluation of any discovered potential archaeological resources, the uniqueness of the archaeological sample, and appropriate steps to preserve or curate the artifact. This will eliminate any potential loss of important local archaeological information that may be buried under the project site; therefore, the project will have no contribution to a cumulative loss of important regional archaeological knowledge.

Noise. The context for assessing cumulative noise impacts to the region is the extent to which temporary or permanent noise generating sources exist in the area. The project is not a substantial source of daytime or nighttime operational noise, as discussed in Section 4.12, and therefore would not contribute considerably to noise levels in the immediate vicinity of the project. The project will contribute to temporary increases in noise levels in the immediate project vicinity during construction activities; however, Mitigation Measures NOI-1 and NOI-2 will be incorporated to minimize construction-related noise and therefore the project's contribution will not be considerable. The project will increase traffic in the project area; however, project traffic-related noise and vibration will not be discernible to the public and therefore will have no considerable contribution to cumulative traffic-related noise.

<u>Global Impacts</u>
One topic of global concern is climate change. As discussed in Section 4.7, climate change is the result of numerous, cumulative sources of greenhouse gas emissions all over the world. The project will not contribute considerably to global climate change with implementation of existing regulations.

Based on the above analysis concerning the local, regional, and global impacts of the project in consideration of past, current, and future projects, the City of Carson hereby finds that the contribution of the proposed project to cumulative impacts will be less than significant with mitigation incorporated.

c) Less than Significant with Mitigation Incorporated. Based on the analysis of the project's impacts in the responses to items 4.1 thru 4.17, there is no indication that this project could result in substantial adverse effects on human beings. While there would be temporary adverse effects during construction related to noise, these will be reduced to less than significant levels through mitigation and incorporation of standard requirements for noise. Less than significant long-term effects would include air quality, greenhouse gas emissions, hazards, population and housing, public services, traffic, utilities and service systems, and changing the visual character of the site, with a majority of these impacts affecting the project site itself. The analysis herein concludes that direct and indirect environmental effects will at worst require mitigation to reduce to less than significant levels. Generally, environmental effects will result in less than significant impacts. Based on the analysis in this Initial Study, the City finds that direct and indirect impacts to human beings will be less than significant with mitigation incorporated.

5.1 – List of Preparers

City of Carson (Lead Agency)
City of Carson
701 East Carson Street
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(310) 952-1761

- McKina Alexander, Associate Planner

MIG (Environmental Analysis, Air Quality, Biological Resources, Noise)
1500 Iowa Avenue, Suite 110
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951-787-9222

- Christopher Brown, Director of Environmental Services
- Olivia Chan, Senior Analyst
- Cameron Hile, Assistant Analyst

Urban Crossroads (Transportation and Traffic)
41 Corporate Park, Suite 300
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- Aric Evatt, Professional Transportation Planner
- Charlene So, P.E.
- Brandon Booth

5.2 – Persons and Organizations Consulted

None

6 Summary of Mitigation Measures

Biological Resources

BIO-1 To avoid impacts to nesting birds and violation of state and federal laws pertaining to birds, all construction-related activities (including but not limited to clearing and grubbing, vegetation removal, fence installation, demolition, and grading) should occur outside the avian nesting season (prior to February 1 or after September 1). If construction and construction noise occurs within the avian nesting season (during the period from February 1 to September 1), all suitable habitats within 250 feet of the areas of disturbance shall be thoroughly surveyed, as feasible, for the presence of active nests by a qualified biologist no more than five days before commencement of any site disturbance activities and equipment mobilization. If it is determined that birds are actively nesting within 250 feet of the Project Site, Mitigation Measure BIO-2 shall apply. Conversely, if the survey area is found to be absent of nesting birds, Mitigation Measure BIO-2 shall not be required. Active nesting is present if a bird is sitting in a nest, a nest has eggs or fledglings in it, or adults are observed carrying food to the nest.

BIO-2 If pre-construction nesting bird surveys result in the location of active nests, no site disturbance and mobilization of heavy equipment (including but not limited to clearing and grubbing, vegetation removal, fence installation, demolition, and grading) shall take place within 300 feet of non-raptor nests and 500 feet of raptor nests, or as determined by a qualified biologist in consultation with CDFW. Protective measures (e.g., monitoring) shall be required to ensure compliance with the MBTA and relevant California Fish and Game Code requirements.

Cultural Resources

CUL-1 Conduct Archaeological Sensitivity Training for Construction Personnel. The Applicant must retain a qualified professional archaeologist, approved by the Director of Community and Economic Development, or designee, who meets U.S. Secretary of the Interior's Professional Qualifications and Standards, to conduct an Archaeological Sensitivity Training for construction personnel before commencing excavation activities. The training session must be carried out by a cultural resources professional with expertise in archaeology, who meets the U.S. Secretary of the Interior's Professional Qualifications and Standards. The training session will include a handout and will focus on how to identify archaeological resources that may be encountered during earthmoving activities and the procedures to be followed in such an event, the duties of archaeological monitors, and, the general steps a qualified professional archaeologist would follow in conducting a salvage investigation if one is necessary.

CUL-2 Cease Ground-Disturbing Activities and Implement Treatment Plan if Archaeological Resources Are Encountered. In the event that archaeological resources are unearthed during ground-disturbing activities, ground-disturbing activities must be halted or diverted away from the vicinity of the find so that the find can be evaluated. A buffer area of at least 50 feet must be established around the find where construction activities cannot be allowed to continue until a qualified archaeologist examines the newly discovered artifact(s) and evaluates the area of the find. Work may be allowed to continue outside of the buffer area. All archaeological resources unearthed by project construction activities must be evaluated by a qualified professional archaeologist, who meets the U.S. Secretary of the Interior's Professional Qualifications and Standards and is approved by the Director of Community and Economic Development, or designee. Should the newly discovered artifacts be determined to be prehistoric, Native American Tribes/Individuals must be contacted and consulted and Native American construction monitoring should be initiated. The Applicant must coordinate with the archaeologist to develop an appropriate treatment plan for the resources. The plan may include implementation of archaeological data recovery excavations to address treatment of the resource along with subsequent laboratory processing and analysis.

CUL-3 Monitor Construction Excavations for Archeological Resources in Younger Alluvial Sediments. The Applicant must retain a qualified archaeological monitor, who will work under the direction and guidance of a qualified professional archaeologist, who meets the U.S. Secretary of the Interior's Professional Qualifications and Standards and is approved by the Director of Community and Economic Development, or designee. The archaeological monitor must be present during all construction excavations (e.g., grading, trenching, or clearing/grubbing) into non-fill younger Pleistocene alluvial sediments. Multiple earth-moving construction activities may require multiple archaeological monitors. The frequency of monitoring will be based on the rate of excavation and grading activities, proximity to known archaeological resources, the materials being excavated (native versus artificial fill soils), and the depth of excavation, and if found, the abundance and type of archaeological resources encountered. Full-time monitoring can be reduced to part-time inspections if determined adequate by the project archaeologist.

CUL-4 Prepare Report Upon Completion of Monitoring Services. The archaeological monitor, under the direction of a qualified professional archaeologist who meets the U.S. Secretary of the Interior's Professional Qualifications and Standards, and is approved by the Director of Community and Economic Development, or designee, must prepare a final report at the conclusion of archaeological monitoring. The report must be submitted to the Applicant, the South Central Costal Information Center, the City, and representatives of other appropriate or concerned agencies to signify the satisfactory completion of the project and required mitigation measures. The report must include a description of resources unearthed, if any, evaluation of the resources with respect to the California Register and CEQA, and treatment of the resources.

CUL-5 Conduct Paleontological Sensitivity Training for Construction Personnel. The Applicant must retain a professional paleontologist, who meets the qualifications set forth by the Society of Vertebrate Paleontology and is approved by the Director of Community and Economic Development, or designee. That paleontologist must conduct a Paleontological Sensitivity Training for construction personnel before commencement of excavation activities. The training will include a handout and will focus on how to identify paleontological resources that may be encountered during earthmoving activities, and the procedures to be followed in such an event; the duties of paleontological monitors; notification and other procedures to follow upon discovery of resources; and, the general steps a qualified professional paleontologist would follow in conducting a salvage investigation if one is necessary.

CUL-6 Conduct Periodic Paleontological Spot Checks during grading and earth-moving activities. The Applicant must retain a professional paleontologist, who meets the qualifications set forth by the Society of Vertebrate Paleontology and is approved by the Director of Community and Economic Development, or designee. The paleontologist must conduct periodic Paleontological Spot Checks beginning at depths below four feet to determine if construction excavations have extended into the local geologic formation or into older Pleistocene alluvial deposits. After the initial Paleontological Spot Check, further periodic checks will be conducted at the discretion of the qualified paleontologist. If the qualified paleontologist determines that construction excavations have extend into the local geologic formation or into older Pleistocene alluvial deposits, construction monitoring for Paleontological Resources will be required. The Applicant must retain a qualified paleontological monitor, who will work under the guidance and direction of a professional paleontologist, who meets the qualifications set forth by the Society of Vertebrate Paleontology and is approved by the Director of Community and Economic Development, or designee. The paleontological monitor must be present during all construction excavations (e.g., grading, trenching, or clearing/grubbing) into the local geologic formation or into older Pleistocene alluvial deposits. Multiple earth-moving construction activities may require multiple paleontological monitors. The frequency of monitoring will be based on the rate of excavation and grading activities, proximity to known paleontological resources and/or unique geological features, the materials being excavated (native versus artificial fill soils), and the depth of excavation, and if found, the abundance and type of paleontological resources and/or unique geological features encountered. Full-time monitoring can be reduced to part-time inspections if determined adequate by the qualified professional paleontologist.

CUL-7 Cease Ground-Disturbing Activities and Implement Treatment Plan if Paleontological Resources Are Encountered. In the event that paleontological resources and or unique geological features are unearthed during ground-disturbing activities, ground-disturbing activities must be halted or diverted away from the vicinity of the find so that the find can be evaluated. A buffer area of at least 50 feet shall be established around the find where construction activities will not be allowed to continue until appropriate paleontological treatment plan has been approved by the Director of Community and Economic Development, or designee. Work may be allowed to continue outside of the buffer area. The Applicant must coordinate with a professional paleontologist, who meets the qualifications set forth by the Society of Vertebrate Paleontology and is approved by the Director of Community and Economic Development, or designee, to develop an appropriate treatment plan for the resources. Treatment may include implementation of paleontological salvage excavations to remove the resource along with subsequent laboratory processing and analysis or preservation in place. At the paleontologist's discretion and to reduce construction delay, the grading and excavation contractor must assist in removing rock samples for initial processing.

CUL-8 Prepare Report Upon Completion of Monitoring Services. Upon completion of the above activities, the professional paleontologist must prepare a report summarizing the results of the monitoring and salvaging efforts, the methodology used in these efforts, as well as a description of the fossils collected and their significance. The report must be submitted to the Applicant, the Director of Community and Economic Development, or designee, the Natural History Museums of Los Angeles County, and representatives of other appropriate or concerned agencies to signify the satisfactory completion of the project and required mitigation measures.

CUL-9 Cease Ground-Disturbing Activities and Notify County Coroner If Human Remains Are Encountered. If human remains are unearthed during construction, the Applicant must comply with Health and Safety Code Section 7050.5. The Applicant must immediately notify the County Coroner and no further disturbance can occur until the County Coroner has made the necessary findings as to origin and disposition pursuant to Public Resources Code § 5097.98. If the remains are determined to be of Native American descent, the coroner has 24 hours to notify the Native American Heritage Commission (NAHC). The NAHC will then identify the person(s) thought to be the Most Likely Descendent (MLD). After the MLD has inspected the remains and the site, it has 48 hours to recommend to the landowner the treatment and/or disposal, with appropriate dignity, the human remains and any associated funerary objects. Upon the reburial of the human remains, the MLD must file a record of the reburial with the NAHC and the project archaeologist shall file a record of the reburial with the CHRIS-SCCIC. If the NAHC is unable to identify a MLD, or the MLD identified fails to make a recommendation, or the landowner rejects the recommendation of the MLD and the mediation provided for in Public Resources Code § 5097.94(k), if invoked, fails to provide measures acceptable to the landowner, the landowner or his or her authorized representative must inter the human remains and items associated with Native American human remains with appropriate dignity on the property in a location not subject to further and future subsurface disturbance.

Hazards and Hazardous Materials

HAZ-1 Prior to demolition activities, the Applicant shall retain an Asbestos Hazard Emergency Response Act (AHERA) and California Division of Occupational Safety and Health (Cal/OSHA) certified building inspector to conduct an asbestos survey to determine the presence or absence of asbestos-containing materials (ACMs). If ACMs are located, the abatement of asbestos shall be completed by the Applicant prior to any activities that would disturb ACMs or create an airborne asbestos hazard. Asbestos removal shall be performed by a State certified asbestos containment contractor in accordance with the South Coast Air Quality Management District (SCAQMD) Rule 1403. Contractors performing asbestos abatement activities shall provide evidence of abatement activities to the City Building Official.

HAZ-2 If paint is separated from building materials (chemically or physically) during demolition of the structures, the paint waste shall be evaluated independently from the building material by a qualified Lead Specialist. If lead-based paint is found, the Applicant shall retain a qualified Lead Specialist to conduct abatement prior to any activities that would create lead dust or fume hazard. Lead-based paint removal and disposal shall be performed in accordance with California Code of Regulation Title 8, Section 1532.1, which specifies exposure limits, exposure monitoring and respiratory protection, and mandates good worker practices by workers exposed to lead. Contractors performing lead-based paint removal shall provide evidence of abatement activities to the City Building Official.

Noise

NOI-1 The following measures shall be implemented during the demolition phase of construction to ensure that construction noise levels do not exceed allowable exterior noise levels at neighboring industrial and residential uses:

- Stationary construction noise sources such as generators or pumps must be located at least 100 feet from sensitive land uses, as feasible, or at maximum distance when necessary to complete work near sensitive land uses. This mitigation measure must be implemented throughout construction and may be periodically monitored by the Planning Director, or designee during routine inspections.

- Construction staging areas must be located as far from noise sensitive land uses as feasible. This mitigation measure must be implemented throughout construction and may be periodically monitored by the Planning Director or designee during routine inspections.

- Throughout construction, the contractor shall ensure all construction equipment is equipped with included noise attenuating devices and are properly maintained. This mitigation measure shall be periodically monitored by the Planning Director, or designee during routine inspections.

- Idling equipment must be turned off when not in use. This mitigation measure may be periodically monitored by the Planning Director, or designee during routine inspections.

- Equipment must be maintained so that vehicles and their loads are secured from rattling and banging. This mitigation measure may be periodically monitored by the Planning Director, or designee during routine inspections.

- Nighttime construction activities will not be permitted (10:00 PM to 7:00 AM).

Transportation and Traffic

TRAN-1 <u>Construction of on-site and site-adjacent improvements shall occur in conjunction with adjacent Project development activity or as needed for Project access purposes. The recommended site access driveway improvements for the project include:</u>

1. <u>S. Wilmington/ Driveway 1 – Install a stop control on the westbound approach and construct the intersection with the following geometrics:</u>
    - <u>Northbound Approach: One through lane and one shared through-right turn lane.</u>
    - <u>Southbound Approach: Two through lanes.</u>
    - <u>Eastbound Approach: Not Applicable (N/A).</u>
    - <u>Westbound Approach: One right turn lane.</u>

2. <u>E. 220th Street/ Driveway 2 – Install a stop control on the southbound approach and construct the intersection with the following geometrics:</u>
    - <u>Northbound Approach: N/A.</u>
    - <u>Southbound Approach: One left-right turn lane.</u>
    - <u>Eastbound Approach: One shared left-through lane.</u>
    - <u>Westbound Approach: One shared through-right turn lane.</u>

3. <u>E. 220th Street/ Driveway 3 – Install a stop control on the southbound approach and construct the intersection with the following geometrics:</u>
    - <u>Northbound Approach: N/A.</u>

- Southbound Approach: One left-right turn lane.
- Eastbound Approach: One shared left-through lane.
- Westbound Approach: One shared through-right turn lane.

4. E. 220th Street/ Driveway 4 – Install a stop control on the southbound approach and construct the intersection with the following geometrics:
   - Northbound Approach: N/A.
   - Southbound Approach: One left-right turn lane.
   - Eastbound Approach: One shared left-through lane.
   - Westbound Approach: One shared through-right turn lane.

TRAN-2 On-site signing and striping should be implemented in conjunction with detailed construction plans for the project.

TRAN-3 Sight distance at each project access point shall be designed to comply with standard Caltrans and City of Carson sight distance standards; compliance will be determined at the time of preparation of final grading, landscape, and street improvement plans.

TRAN-4The project proponent shall implement a Construction Traffic Management Plan addressing potential construction-related traffic detours and disruptions. The Construction Traffic Management Plan shall ensure that, to the extent practical, construction traffic would access the Project site during off-peak hours, and that construction traffic would be routed to avoid travel through, or proximate to, sensitive land uses.

AL2 CARSON 420K INDUSTRIAL BUILDING Mitigated Negative Declaration: Mitigation Monitoring Reporting Program					Verification of Compliance		
Mitigation Measures		Monitoring Timing/ Frequency	Action Indicating Compliance	Monitoring Agency	Initials	Date	Remarks
Biological Resources Mitigation Measure							
BIO-1	To avoid impacts to nesting birds and violation of state and federal laws pertaining to birds, all construction-related activities (including but not limited to clearing and grubbing, vegetation removal, fence installation, demolition, and grading) should occur outside the avian nesting season (prior to February 1 or after September 1). If construction and construction noise occurs within the avian nesting season (during the period from February 1 to September 1), all suitable habitats within 250 feet of the areas of disturbance shall be thoroughly surveyed, as feasible, for the presence of active nests by a qualified biologist no more than five days before commencement of any site disturbance activities and equipment mobilization. If it is determined that birds are actively nesting within 250 feet of the Project Site, Mitigation Measure BIO-2 shall apply. Conversely, if the survey area is found to be absent of nesting birds, Mitigation Measure BIO-2 shall not be required. Active nesting is present if a bird is sitting in a nest, a nest has eggs or fledglings in it, or adults are observed carrying food to the nest.	Within 5 days before vegetation removal	Survey for presence of nests	Community Development Department			
BIO-2	If pre-construction nesting bird surveys result in the location of active nests, no site disturbance and mobilization of heavy equipment (including but not limited to clearing and grubbing, vegetation removal, fence installation, demolition, and grading) shall take place within 300 feet of non-raptor nests and 500 feet of raptor nests, or as determined by a qualified biologist in consultation with CDFW. Protective measures (e.g., monitoring) shall be required to ensure compliance with the MBTA and relevant California Fish and Game Code requirements.	Throughout construction	Establish required buffer area around sensitive bird nests and raptor nests	Community Development Department			
Cultural Resources Mitigation Measures							
CUL-1	Conduct Archaeological Sensitivity Training for Construction Personnel. The Applicant must retain a qualified professional archaeologist, approved by the Director of Community and Economic Development, or designee, who meets U.S. Secretary of the Interior's Professional Qualifications and Standards, to conduct an Archaeological Sensitivity Training for construction personnel before commencing excavation activities. The training session must be carried out by a cultural resources professional with expertise in archaeology, who meets the U.S. Secretary of the Interior's Professional Qualifications and Standards. The training session will include a handout and will focus on how to identify archaeological resources that may be encountered during earthmoving activities and the procedures to be followed in such an event, the duties of archaeological monitors, and, the general steps a qualified professional archaeologist would follow in conducting a salvage investigation if one is necessary.	Prior to Grading or Earth Moving Activities	Condition of Approval	Community Development Department			
CUL-2	Cease Ground-Disturbing Activities and Implement Treatment Plan if Archaeological Resources Are Encountered. In the event that archaeological resources are unearthed during ground-disturbing activities, ground-disturbing activities must be halted or diverted away from the vicinity of the find so that	During Grading or Earth Moving Activities	Halt work and implement treatment plan	Community Development Department			

AL2 CARSON 420K INDUSTRIAL BUILDING Mitigated Negative Declaration: Mitigation Monitoring Reporting Program							
Mitigation Measures		Monitoring Timing/ Frequency	Action Indicating Compliance	Monitoring Agency	Verification of Compliance		
					Initials	Date	Remarks
	the find can be evaluated. A buffer area of at least 50 feet must be established around the find where construction activities cannot be allowed to continue until a qualified archaeologist examines the newly discovered artifact(s) and evaluates the area of the find. Work may be allowed to continue outside of the buffer area. All archaeological resources unearthed by project construction activities must be evaluated by a qualified professional archaeologist, who meets the U.S. Secretary of the Interior's Professional Qualifications and Standards and is approved by the Director of Community and Economic Development, or designee. Should the newly discovered artifacts be determined to be prehistoric, Native American Tribes/Individuals must be contacted and consulted and Native American construction monitoring should be initiated. The Applicant must coordinate with the archaeologist to develop an appropriate treatment plan for the resources. The plan may include implementation of archaeological data recovery excavations to address treatment of the resource along with subsequent laboratory processing and analysis.						
CUL-3	Monitor Construction Excavations for Archeological Resources in Younger Alluvial Sediments. The Applicant must retain a qualified archaeological monitor, who will work under the direction and guidance of a qualified professional archaeologist, who meets the U.S. Secretary of the Interior's Professional Qualifications and Standards and is approved by the Director of Community and Economic Development, or designee. The archaeological monitor must be present during all construction excavations (e.g., grading, trenching, or clearing/grubbing) into non-fill younger Pleistocene alluvial sediments. Multiple earth-moving construction activities may require multiple archaeological monitors. The frequency of monitoring will be based on the rate of excavation and grading activities, proximity to known archaeological resources, the materials being excavated (native versus artificial fill soils), and the depth of excavation, and if found, the abundance and type of archaeological resources encountered. Full-time monitoring can be reduced to part-time inspections if determined adequate by the project archaeologist.	During Grading or Earth Moving Activities	Retain qualified archaeologist	Community Development Department			
CUL-4	Prepare Report Upon Completion of Monitoring Services. The archaeological monitor, under the direction of a qualified professional archaeologist who meets the U.S. Secretary of the Interior's Professional Qualifications and Standards, and is approved by the Director of Community and Economic Development, or designee, must prepare a final report at the conclusion of archaeological monitoring. The report must be submitted to the Applicant, the South Central Costal Information Center, the City, and representatives of other appropriate or concerned agencies to signify the satisfactory completion of the project and required mitigation measures. The report must include a description of resources unearthed, if any, evaluation of the resources with respect to the California Register and CEQA, and treatment of the resources.	Upon completion of monitoring services	Submission of report	Community Development Department			
CUL-5	Conduct Paleontological Sensitivity Training for Construction Personnel. The Applicant must retain a professional paleontologist, who meets the qualifications set forth by the Society of Vertebrate Paleontology and is approved by the Director of Community and Economic Development, or	Prior to Grading or Earth Moving Activities	Condition of Approval	Community Development Department			

AL2 CARSON 420K INDUSTRIAL BUILDING Mitigated Negative Declaration: Mitigation Monitoring Reporting Program							
Mitigation Measures		Monitoring Timing/ Frequency	Action Indicating Compliance	Monitoring Agency	Verification of Compliance		
					Initials	Date	Remarks
	designee. That paleontologist must conduct a Paleontological Sensitivity Training for construction personnel before commencement of excavation activities. The training will include a handout and will focus on how to identify paleontological resources that may be encountered during earthmoving activities, and the procedures to be followed in such an event; the duties of paleontological monitors; notification and other procedures to follow upon discovery of resources; and, the general steps a qualified professional paleontologist would follow in conducting a salvage investigation if one is necessary.						
CUL-6	Conduct Periodic Paleontological Spot Checks during grading and earth-moving activities. The Applicant must retain a professional paleontologist, who meets the qualifications set forth by the Society of Vertebrate Paleontology and is approved by the Director of Community and Economic Development, or designee. The paleontologist must conduct periodic Paleontological Spot Checks beginning at depths below four feet to determine if construction excavations have extended into the local geologic formation or into older Pleistocene alluvial deposits. After the initial Paleontological Spot Check, further periodic checks will be conducted at the discretion of the qualified paleontologist. If the qualified paleontologist determines that construction excavations have extend into the local geologic formation or into older Pleistocene alluvial deposits, construction monitoring for Paleontological Resources will be required. The Applicant must retain a qualified paleontological monitor, who will work under the guidance and direction of a professional paleontologist, who meets the qualifications set forth by the Society of Vertebrate Paleontology and is approved by the Director of Community and Economic Development, or designee. The paleontological monitor must be present during all construction excavations (e.g., grading, trenching, or clearing/grubbing) into the local geologic formation or into older Pleistocene alluvial deposits. Multiple earth-moving construction activities may require multiple paleontological monitors. The frequency of monitoring will be based on the rate of excavation and grading activities, proximity to known paleontological resources and/or unique geological features, the materials being excavated (native versus artificial fill soils), and the depth of excavation, and if found, the abundance and type of paleontological resources and/or unique geological features encountered. Full-time monitoring can be reduced to part-time inspections if determined adequate by the qualified professional paleontologist.	During Grading or Earth Moving Activities	Retain qualified paleontologist	Community Development Department			
CUL-7	Cease Ground-Disturbing Activities and Implement Treatment Plan if Paleontological Resources Are Encountered. In the event that paleontological resources and or unique geological features are unearthed during ground-disturbing activities, ground-disturbing activities must be halted or diverted away from the vicinity of the find so that the find can be evaluated. A buffer area of at least 50 feet shall be established around the find where construction activities will not be allowed to continue until appropriate paleontological treatment plan has been approved by the Director of Community and Economic Development, or designee. Work may be allowed to continue	During Grading or Earth Moving Activities	Halt work and implement treatment plan	Community Development Department			

AL2 CARSON 420K INDUSTRIAL BUILDING Mitigated Negative Declaration: Mitigation Monitoring Reporting Program								
Mitigation Measures		Monitoring Timing/ Frequency	Action Indicating Compliance	Monitoring Agency	Verification of Compliance		
					Initials	Date	Remarks
	outside of the buffer area. The Applicant must coordinate with a professional paleontologist, who meets the qualifications set forth by the Society of Vertebrate Paleontology and is approved by the Director of Community and Economic Development, or designee, to develop an appropriate treatment plan for the resources. Treatment may include implementation of paleontological salvage excavations to remove the resource along with subsequent laboratory processing and analysis or preservation in place. At the paleontologist's discretion and to reduce construction delay, the grading and excavation contractor must assist in removing rock samples for initial processing.						
CUL-8	Prepare Report Upon Completion of Monitoring Services. Upon completion of the above activities, the professional paleontologist must prepare a report summarizing the results of the monitoring and salvaging efforts, the methodology used in these efforts, as well as a description of the fossils collected and their significance. The report must be submitted to the Applicant, the Director of Community and Economic Development, or designee, the Natural History Museums of Los Angeles County, and representatives of other appropriate or concerned agencies to signify the satisfactory completion of the project and required mitigation measures.	Upon completion of monitoring services	Submission of report	Community Development Department			
CUL-9	Cease Ground-Disturbing Activities and Notify County Coroner If Human Remains Are Encountered. If human remains are unearthed during construction, the Applicant must comply with Health and Safety Code Section 7050.5. The Applicant must immediately notify the County Coroner and no further disturbance can occur until the County Coroner has made the necessary findings as to origin and disposition pursuant to Public Resources Code § 5097.98. If the remains are determined to be of Native American descent, the coroner has 24 hours to notify the Native American Heritage Commission (NAHC). The NAHC will then identify the person(s) thought to be the Most Likely Descendent (MLD). After the MLD has inspected the remains and the site, it has 48 hours to recommend to the landowner the treatment and/or disposal, with appropriate dignity, the human remains and any associated funerary objects. Upon the reburial of the human remains, the MLD must file a record of the reburial with the NAHC and the project archaeologist shall file a record of the reburial with the CHRIS-SCCIC. If the NAHC is unable to identify a MLD, or the MLD identified fails to make a recommendation, or the landowner rejects the recommendation of the MLD and the mediation provided for in Public Resources Code § 5097.94(k), if invoked, fails to provide measures acceptable to the landowner, the landowner or his or her authorized representative must inter the human remains and items associated with Native American human remains with appropriate dignity on the property in a location not subject to further and future subsurface disturbance.	During Grading or Earth Moving Activities	Halt work and implement treatment plan	Community Development Department			
Hazards Mitigation Measures							

AL2 CARSON 420K INDUSTRIAL BUILDING Mitigated Negative Declaration: Mitigation Monitoring Reporting Program								
Mitigation Measures		Monitoring Timing/ Frequency	Action Indicating Compliance	Monitoring Agency	Verification of Compliance		
					Initials	Date	Remarks
HAZ-1	Prior to demolition activities, the Applicant shall retain an Asbestos Hazard Emergency Response Act (AHERA) and California Division of Occupational Safety and Health (Cal/OSHA) certified building inspector to conduct an asbestos survey to determine the presence or absence of asbestos-containing materials (ACMs). If ACMs are located, the abatement of asbestos shall be completed by the Applicant prior to any activities that would disturb ACMs or create an airborne asbestos hazard. Asbestos removal shall be performed by a State certified asbestos containment contractor in accordance with the South Coast Air Quality Management District (SCAQMD) Rule 1403. Contractors performing asbestos abatement activities shall provide evidence of abatement activities to the City Building Official.	Prior to Demolition Activities	Retain certified asbestos containment contractor	City Building Official			
HAZ-2	If paint is separated from building materials (chemically or physically) during demolition of the structures, the paint waste shall be evaluated independently from the building material by a qualified Lead Specialist. If lead-based paint is found, the Applicant shall retain a qualified Lead Specialist to conduct abatement prior to any activities that would create lead dust or fume hazard. Lead-based paint removal and disposal shall be performed in accordance with California Code of Regulation Title 8, Section 1532.1, which specifies exposure limits, exposure monitoring and respiratory protection, and mandates good worker practices by workers exposed to lead. Contractors performing lead-based paint removal shall provide evidence of abatement activities to the City Building Official.	During Demolition Activities	Retain qualified Lead Specialist	City Building Official			
Hydrology and Water Quality Mitigation Measures							
HWQ-1	Prior to Grading Permit issuance and as part of the project's compliance with the National Pollutant Discharge Elimination System (NPDES) requirements, a Notice of Intent (NOI) shall be prepared and submitted to the State Water Resources Quality Control Board (SWRQCB), providing notification and intent to comply with the State of California General Permit.	Prior to Grading Permit issuance	Submit NOI	City Building Official			
HWQ-2	Prior to Grading Permit issuance, the Chief Building Official shall confirm that the project plans and specifications conform to the requirements of an approved Storm Water Pollution Prevention Plan (SWPPP)(to be applied for during the Grading Plan process) and the National Pollutant Discharge Elimination System (NPDES) Permit for General Construction Activities No. CAS000002, Order No. 2009-0009-DWQ, including implementation of all recommended Best Management Practices (BMPs), as approved by the State Water Resources Quality Control Board (SWRQCB).	Prior to Grading Permit issuance	Submit project plans	City Building Official			
HWQ-3	Upon completion of project construction, the project applicant shall submit a Notice of Termination (NOT) to the State Water Resources Quality Control Board (SWRQCB) to indicate construction is completed.	Upon project completion	Submit NOT	SWRCB			

AL2 CARSON 420K INDUSTRIAL BUILDING Mitigated Negative Declaration: Mitigation Monitoring Reporting Program							
Mitigation Measures		Monitoring Timing/ Frequency	Action Indicating Compliance	Monitoring Agency	Verification of Compliance		
					Initials	Date	Remarks
HWQ-4	As part of the plan review process (prior to Grading Permit issuance), the City of Carson shall ensure that project plans identify a suite of stormwater quality Best Management Practices (BMPs) that are designed to address the most likely sources of stormwater pollutants resulting from operation of the proposed project, consistent with the Standard Urban Stormwater Mitigation Plan (SUSMP). Pollutant sources to be addressed by these BMPs include, but are not necessarily limited to landscaped areas, trash storage locations, and storm drain inlets. The design and location of these BMPs shall be subject to review and comment by the City but shall generally adhere to the standards associated with the Phase II NPDES stormwater permit program. Implementation of these BMPs shall be assured by the City Engineer prior to the issuance of Grading or Building Permits.	Prior to Grading Permit issuance	Submit SWPPP, SUSMP, and BMP plans	City Engineer			
Noise Mitigation Measures							
NOI-1	• Stationary construction noise sources such as generators or pumps must be located at least 100 feet from sensitive land uses, as feasible, or at maximum distance when necessary to complete work near sensitive land uses. This mitigation measure must be implemented throughout construction and may be periodically monitored by the Planning Director, or designee during routine inspections. • Construction staging areas must be located as far from noise sensitive land uses as feasible. This mitigation measure must be implemented throughout construction and may be periodically monitored by the Planning Director or designee during routine inspections. • Throughout construction, the contractor shall ensure all construction equipment is equipped with included noise attenuating devices and are properly maintained. This mitigation measure shall be periodically monitored by the Planning Director, or designee during routine inspections. • Idling equipment must be turned off when not in use. This mitigation measure may be periodically monitored by the Planning Director, or designee during routine inspections. Equipment must be maintained so that vehicles and their loads are secured from rattling and banging. This mitigation measure may be periodically monitored by the Planning Director, or designee during routine inspections. • Nighttime construction activities will not be permitted (10:00 PM to 7:00 AM).	Throughout Construction	Limit construction activity to indicated hours	Planning Director			
Transportation and Traffic Mitigation Measures							
TRAN-1	Construction of on-site and site-adjacent improvements shall occur in conjunction with adjacent Project development activity or as needed for Project access purposes. The recommended site access driveway improvements for the project include: 1. S. Wilmington/ Driveway 1 – Install a stop control on the westbound approach and construct the intersection with the following geometrics:	Prior to Issuance of Grading Permits	Submission and Approval of Plans	City Traffic Engineer			

AL2 CARSON 420K INDUSTRIAL BUILDING Mitigated Negative Declaration: Mitigation Monitoring Reporting Program							
Mitigation Measures		Monitoring Timing/ Frequency	Action Indicating Compliance	Monitoring Agency	Verification of Compliance		
					Initials	Date	Remarks
	• Northbound Approach: One through lane and one shared through-right turn lane. • Southbound Approach: Two through lanes. • Eastbound Approach: Not Applicable (N/A). • Westbound Approach: One right turn lane. 2. E. 220th Street/ Driveway 2 – Install a stop control on the southbound approach and construct the intersection with the following geometrics: • Northbound Approach: N/A. • Southbound Approach: One left-right turn lane. • Eastbound Approach: One shared left-through lane. • Westbound Approach: One shared through-right turn lane. 3. E. 220th Street/ Driveway 3 – Install a stop control on the southbound approach and construct the intersection with the following geometrics: • Northbound Approach: N/A. • Southbound Approach: One left-right turn lane. • Eastbound Approach: One shared left-through lane. • Westbound Approach: One shared through-right turn lane. 4. E. 220th Street/ Driveway 4 – Install a stop control on the southbound approach and construct the intersection with the following geometrics: • Northbound Approach: N/A. • Southbound Approach: One left-right turn lane. • Eastbound Approach: One shared left-through lane. • Westbound Approach: One shared through-right turn lane.						
TRAN-2	On-site signing and striping should be implemented in conjunction with detailed construction plans for the project.	Prior to Issuance of Grading Permits	Submission and Approval of Plans	City Traffic Engineer			
TRAN-3	Sight distance at each project access point shall be designed to comply with standard Caltrans and City of Carson sight distance standards; compliance will be determined at the time of preparation of final grading, landscape, and street improvement plans.	Prior to Issuance of Grading Permits	Submission and Approval of Plans	City Traffic Engineer			
TRAN-4	The project proponent shall implement a Construction Traffic Management Plan addressing potential construction-related traffic detours and disruptions. The Construction Traffic Management Plan shall ensure that, to the extent practical, construction traffic would access the Project site during off-peak hours, and that construction traffic would be routed to avoid travel through, or proximate to, sensitive land uses.	Prior to Issuance of Grading Permits	Submission and Approval of Plan	City Traffic Engineer			

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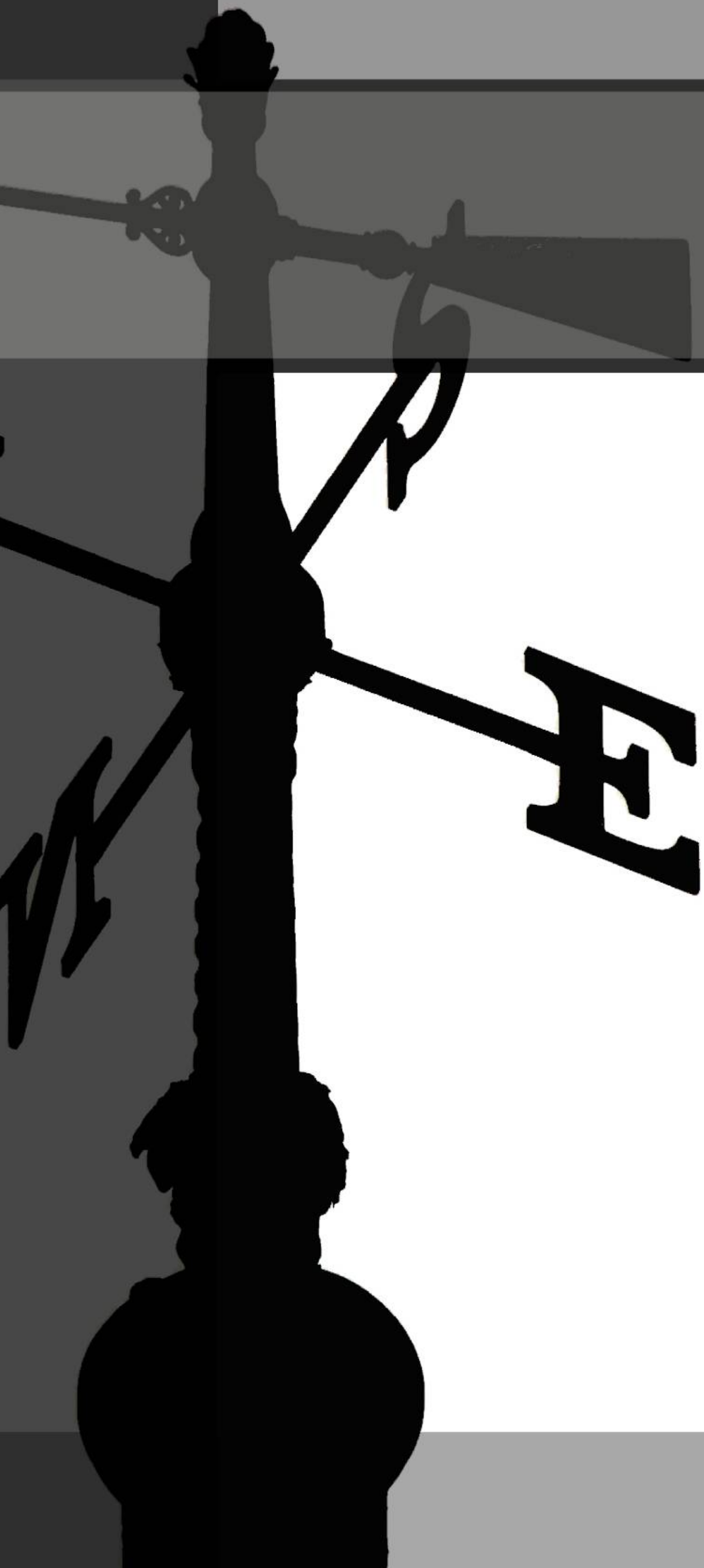

AL2 Carson 420K Warehouse

Air Quality & Climate Change Assessment

July 2016 (13509)

Prepared for:

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AL2 Carson 420K Warehouse

Air Quality & Climate Change Assessment

June 2016

City of Carson

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Appendix A CalEEMod Results

1 Executive Summary

Construction-related and operational emissions of criteria pollutants were modeled and analyzed for the proposed AL2 Carson 420K Industrial Building project. The proposed site is located at the northwest corner of the intersection of Wilmington Avenue and East 220th Street in the City of Carson. This report also analyzes the project's consistency with the South Coast Air Quality Management District (SCAQMD) 2012 Air Quality Management Plan (AQMP) for the South Coast Air Basin. Cumulative impacts were analyzed using the methodology provided by the 1993 SCAQMD California Environmental Quality Act (CEQA) Air Quality Handbook. Please note that a Health Risk Assessment (HRA) was prepared for this project under separate cover.

Additionally, this report models and analyzes construction- and operation-related emissions of greenhouse gases from the proposed project. This analysis utilizes guidance provided in the California Air Pollution Control Officers Association (CAPCOA) *CEQA and Climate Change* white paper and the *Quantifying Greenhouse Gas Mitigation Measures* handbook. Modeling of emissions utilizes the California Emissions Estimator Model (CalEEMod) v 2013.2.2.

1.1 Project Description

The building includes a 404,925-square foot footprint, with 15,075-square feet of mezzanine floor space, for a total of 420,000-gross-square-feet on 19.85 acres. The proposed site is located at the northeast corner of the intersection of Wilmington Avenue and East 220th Street in the City of Carson, California. The project includes 101,600 square feet of landscaping, 300 passenger vehicle parking stalls, 100 truck trailer parking stalls, and 65 loading docks. Access to the site is provided via three driveways on East 220th Street and one driveway on Wilmington Avenue. Two of the three driveways on East 220th Street are 30-feet wide and the third is 40-feet wide. The driveway on Wilmington Avenue is 50-feet wide. The 40-foot wide driveway on East 220th Street and the 50-foot wide driveway on Wilmington Avenue will provide truck trailer access to the rear of the building along the north side of the site where the truck trailer parking stalls and loading docks are located. All four driveways provide passenger vehicle access to passenger vehicle parking along the south and west sides of the site. Bioswales and detention basins will be located along the eastern boundary of the site as well as at the southwest corner of the site. The project includes use of low-VOC coatings on interiors and exterior surface of 37 grams per liter or less.

1.2 Air Quality

The project will not result in substantial emissions of oxides of nitrogen (with mitigation incorporated), volatile organic compounds, or particulate matter and would not exceed the regional growth assumptions used in the Air Quality Management Plan (AQMP). The project will not individually cause or cumulatively contribute to an air quality standard violation. Emissions of carbon monoxide and localized construction emissions will not substantially impact sensitive receptors in vicinity of the project. The project will not emit substantial amounts of diesel particulate matter due to the operation of heavy-duty trucks on the project site. The project will not expose a substantial number of people to odors.

1.3 Climate Change

Greenhouse gas emissions will not exceed the annual 10,000 metric ton carbon dioxide equivalent threshold established by the South Coast Air Quality Management District and will not conflict with state greenhouse gas emissions strategies.

1.4 Mitigation Measures

N/A

2 Introduction

This report models and analyzes construction- and operation-related emissions of criteria air pollutants and greenhouse gas emissions from the proposed AL2 Carson 420K Warehouse Building project totaling 420,000-gross-square-feet on 19.85 acres located in City of Carson, California.

The air quality analysis provided herein utilizes guidance provided in the South Coast Air Quality Management District (SCAQMD) the 1993 California Environmental Quality Act (CEQA) Air Quality handbook as amended and supplemented (http://www.aqmd.gov/ceqa/hdbk.html). Please note that analysis of toxic air contaminants (TAC) is provided under separate cover. Pollutant emissions were modeled by utilizing the following:

- California Emissions Estimator Model (CalEEMod) v 2013.2.2
- EMFAC2014

The climate change analysis provided herein utilizes guidance provided in the California Air Pollution Control Officers Association (CAPCOA) *CEQA and Climate Change* white paper and the *Quantifying Greenhouse Gas Mitigation Measures* handbook. Modeling of greenhouse gas emissions utilizes the California Emissions Estimator Model (CalEEMod) v 2013.2.2.

This report has been prepared utilizing project-specific characteristics where available. In those instances, where project-specific data is not available, the analysis has been supplemented by model defaults or other standardized sources of comparable data. In any case where non-project defaults or other data have been used, a "worst-case" scenario was developed to ensure a conservative estimate of emissions.

This report has been prepared for use by the Lead Agency to assess potential project-related air quality impacts in compliance with the State CEQA Statutes and Guidelines, particularly in respect to the air quality issues identified in Appendix G of the State CEQA Guidelines. This report does not make determinations of significance pursuant to CEQA because such determinations are required to be made solely in the purview of the Lead Agency.

This document has been reviewed in accordance with the *Table 7-2, Checklist for an Air Quality Analysis Section* of the SCAQMD Air Quality Handbook for quality control purposes.

This report was prepared by Christopher Brown (Director of Environmental Services) of MIG under contract by AL2 LLC.

Christopher Brown
Director of Environmental Services

Olivia Chan
Associate Analyst

Cameron Hile
Assistant Analyst

3.1 Climate

The project is located in the City of Carson. The City of Carson and the broader Los Angeles Basin are defined by a semi-arid, Mediterranean climate with mild winters and warm summers. Annual rainfall averages 12.72 inches with the rainy season occurring during the winter.[1] The coolest month of the year is January with an average monthly low of 44.8° Fahrenheit (F). The warmest month is August with an average monthly high of 80.7° F. Carson is located at an elevation of approximately 39 feet to 50 feet above mean sea level (AMSL).[2] The project site is located at an approximate elevation of 45 AMSL. Wind generally blows from the west.[3]

3.2 Regional Air Quality

The proposed project is located within the South Coast Air Basin (Basin).[4] The basin includes Orange County and the non-desert portions of Los Angeles, San Bernardino, and Riverside Counties. The San Gabriel, San Bernardino, and San Jacinto Mountains bound the Basin to the north and east that trap ambient air and pollutants within the Los Angeles and Inland Empire valleys below. The South Coast Air Quality Management District (SCAQMD) manages the Basin. Pursuant to the California Clean Air Act (CCAA), SCAQMD is responsible for bringing air quality within the Basin into conformity with federal and State air quality standards by reducing existing emission levels and ensuring that future emission levels meet applicable air quality standards. SCAQMD works with federal, State, and local agencies to reduce pollutant sources through the development of rules and regulations.

Both California and the federal government have established health-based ambient air quality standards (AAQS) for seven air pollutants (known as *criteria pollutants*). These pollutants include ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), inhalable particulate matter with a diameter of 10 microns or less (PM_{10}), fine particulate matter with a diameter of 2.5 microns or less ($PM_{2.5}$), and lead (Pb). The State has also established AAQS for the additional pollutants of visibility reducing particles, sulfates, hydrogen sulfide, and vinyl chloride. The AAQS are designed to protect the health and welfare of the populace within a reasonable margin of safety. Where the State and federal standards differ, State AAQS are more stringent than federal AAQS. Federal and State standards are shown in Table 1 (Ambient Air Quality Standards). A brief description of each criteria pollutant is provided below.

Ozone. Ozone is a pungent, colorless, and highly reactive gas that forms from the atmospheric reaction of organic gases with nitrogen oxides in the presence of sunlight. Ozone is most commonly associated with smog. Ozone precursors such as reactive organic gases (ROG) and oxides of nitrogen (NO_X) are released from mobile and stationary sources. Ozone is a respiratory irritant and can cause cardiovascular diseases, eye irritation, and impaired cardiopulmonary function. Ozone can also damage building materials and plant leafs.

Carbon Monoxide. Carbon monoxide is primarily emitted from vehicles due to the incomplete combustion of fuels. Carbon monoxide has wide ranging impacts on human health because it combines with hemoglobin in the body and reduces the amount of oxygen transported in the bloodstream. Carbon monoxide can result in reduced tolerance for exercise, impairment of mental function, impairment of fetal development, headaches, nausea, and death at high levels of exposure.

Nitrogen Dioxide. Nitrogen dioxide and other oxides of nitrogen (NO_X) contribute to the formation of smog and results in the brownish haze associated with it. They are primarily emitted from motor vehicle exhaust but can be omitted from other high-temperature stationary sources. Nitrogen oxides can aggravate respiratory illnesses, reduce visibility, impair plant growth, and form acid rain.

Table 1
Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[1]		National Standards[2]		
		Concentration[3]	Method[4]	Primary[3,5]	Secondary[3,6]	Method[7]
Ozone (O_3)	1 Hour	0.09 ppm (180 µg/m^3)	Ultraviolet Photometry	-	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.07 ppm (137 µg/m^3)		0.075 ppm (147 µg/m^3)		
Respirable Particulate Matter (PM_{10}) [8]	24 Hour	50 µg/m^3	Gravimetric or Beta Attenuation	150 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m^3		-		
Fine Particulate Matter($PM_{2.5}$) [8]	24 Hour	-	-	35 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m^3	Gravimetric or Beta Attenuation	12 µg/m^3	15 µg/m^3	
Carbon Monoxide (CO)	1 Hour	20 ppm (23 mg/ m^3)	Non-Dispersive Infrared Photometry (NDIR)	35 ppm (40 mg/m^3)	-	Non-Dispersive Infrared Photometry (NDIR) -
	8 Hour	9.0 ppm (10mg/m^3)		9 ppm (10 mg/m^3)	-	
	8 Hour (Lake Tahoe)	6 ppm (7 mg/ m^3)		-	-	
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.03 ppm (57 µg/m^3)	Gas Phase Chemiluminescence	0.053 ppm (100 µg/m^3)	Same as Primary Standard	Gas Phase Chemiluminescence
	1 Hour	0.18 ppm (339 µg/m^3)		100 ppb (188 µg/m^3)	-	
Sulfur Dioxide (SO_2)	1 Hour	0.25 ppm (655 µg/m^3)	Ultraviolet Fluorescence	75 ppb (196 µg/m^3)	-	Ultraviolet Fluorescence; Spectrophotometry (Pararosaniline Method) -
	3 Hour	-		-	0.5 ppm (1,300 µg/m^3)	
	24 Hour	0.04 ppm (105 µg/m^3)		0.14 ppm (for certain areas)[10]	-	
	Annual Arithmetic Mean	-		0.030 ppm (for certain areas)[10]	-	
Lead[11,12]	30 Day Average	1.5 µg/m^3	Atomic Absorption	-	-	High Volume Sampler and Atomic Absorption
	Calendar Quarter	-		1.5 µg/m^3 (for certain areas)[12]	Same as Primary Standard	
	Rolling 3-Month Average[10]	-		0.15 µg/m^3		
Visibility Reducing Particles[13]	8 Hour	See footnote 13	Beta Attenuation and Transmittance through Filter Tape	No Federal Standards		
Sulfates	24 Hour	25 µg/m^3	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m^3)	Ultraviolet Fluorescence			
Vinyl Chloride[11]	24 Hour	0.01 ppm (26 µg/m^3)	Gas Chromatography			

Source: ARB, October 2015
PPM, parts per million
µg/m3, micrograms per cubic meter
Footnotes for this table can be found at http://www.arb.ca.gov/research/aaqs/aaqs2.pdf

Particulate Matter. Particulate matter is a complex mixture of small-suspended particles and liquid droplets in the air. Particulate matter between ten microns and 2.5 microns is known as PM_{10}, also known as coarse or inhalable particulate matter. PM_{10} is emitted from diverse sources including road dust, diesel soot, combustion products, abrasion of tires and brakes, construction operations, and windstorms. PM_{10} can also be formed secondarily in the atmosphere when NO_2 and SO_2 react with ammonia. Particulate matter less than 2.5 microns in size are called $PM_{2.5}$ or fine particulate matter. $PM_{2.5}$ is primarily emitted from point sources such as power plants, industrial facilities, automobiles, wood-burning fireplaces, and construction sites. Particulate matter is deposited in the lungs and cause permanent lung damage, potentially resulting in lung disease and respiratory symptoms like asthma and bronchitis. Particulate matter has also been linked to cardiovascular problems such as arrhythmia and heart attacks. Particulate matter can also interfere with the body's ability to clear the respiratory tract and can act as a carrier of absorbed toxic substances. Particulate matter causes welfare issues because it scatters light and reduces visibility, causes environmental damage such as increasing the acidity of lakes and streams, and can stain and damage stone, such as that applied in statues and monuments.

Sulfur Dioxide. Sulfur dioxide and other oxides of sulfur (SO_X) are reactive gases emitted from the burning of fossil fuels, primarily from power plants and other industrial facilities.[5] Other less impacting sources include metal extraction activities, locomotives, large ships, and off-road equipment. Human health impacts associated with SO_X emissions include bronchoconstriction and increased asthma symptoms.

Lead. Lead is primarily emitted from metal processing facilities (i.e. secondary lead smelters) and other sources such as manufacturers of batteries, paints, ink, ceramics, and ammunition. Historically, automobiles were the primary sources before lead was phased out of gasoline. The health effects of exposure to lead include gastrointestinal disturbances, anemia, kidney diseases, and potential neuromuscular and neurologic dysfunction. Lead is also classified as a probable human carcinogen.

3.3 Non-Attainment Status

Air pollution levels are measured at monitoring stations located throughout the Basin. Areas that are in nonattainment with respect to criteria pollutants are required to prepare plans and implement measures that will bring the region into attainment. Table 2 (South Coast Air Basin Attainment Status) summarizes the attainment status in the Basin for the criteria pollutants. The Basin is currently in nonattainment status for ozone and inhalable and fine particulate matter.

Pollution problems in the Basin are caused by emissions within the area and the specific meteorology that promotes pollutant concentrations. Emissions sources vary widely from smaller sources such as individual residential water heaters and short-term grading activities to extensive operational sources including long-term operation of electrical power plants and other intense industrial use. Pollutants in the Basin are blown inward from coastal areas by sea breezes from the Pacific Ocean and are prevented from horizontally dispersing due to the surrounding mountains. This is further complicated by atmospheric temperature inversions that create inversion layers. The inversion layer in Southern California refers to the warm layer of air that lies over the cooler air from the Pacific Ocean. This is strongest in the summer and prevents ozone and other pollutants from dispersing upward. A ground-level surface inversion commonly occurs during winter nights and traps carbon monoxide emitted during the morning rush hour.

Table 2
South Coast Air Basin Attainment Status

Pollutant	Federal	State
O_3 (1-hr)	--	Nonattainment
O_3 (8-hr)	Nonattainment	Nonattainment
PM_{10}	Nonattainment	Nonattainment
$PM_{2.5}$	Nonattainment	Nonattainment
CO	Attainment	Attainment
NO_2	Attainment	Nonattainment
SO_2	Attainment	Attainment
Pb	Nonattainment	Nonattainment
VRP	--	Unclassified
SO_4	--	Attainment
H_2S	--	Unclassified
Sources: ARB 2015		

3.4 Local Air Quality

The City of Carson is located within the South Coast Air Basin (SCAB), which is under the jurisdiction of the South Coast Air Quality Management District (SCAQMD). The project site is located in Source Receptor Area (SRA) 4 – South Coastal LA County 1. Air quality in SRA 4 is monitored at Monitoring Station Number 033 in Long Beach. Air monitoring results for station 033 over the last three years of available data is summarized in Table 3 (2011-2013 Local Air Quality) (Note: Air Quality Data for years 2014 to present is not yet available).[6] [7] [8] Table 4 (2011-2013 Air Quality Standards Exceedance) summarizes the number of days for each monitoring year that air quality standards were exceeded. Based on the 2011-2013 air quality monitoring data, ozone pollution did not exceed the State-8-hour standard or the Federal 8-hour standard in 2013. The data also shows that particulate matter pollution (PM_{10}) did not exceed the Federal- or State-24-hour standard, with approximately.

Table 3
2011-2013 Local Air Quality

Monitoring Station	CO		O_3 (PPM)		NO_2 (PPB)		PM_{10} (µg/m³)		$PM_{2.5}$ (µg/m³)		TSP (µg/m³)		Pb (µg/m³)		SO_4 (µg/m³)
	Max 1-hr	Max 8-hr	Max 1-hr	Max 8-hr	Max 1-hr	AAM	Max 24-hr	AAM	Max 24-hr	AAM	Max 24-hr	AAM	Max Month	Max Qtr	Max 24-hr
South Coastal LA County 1															
2013	--	2.0	0.092	0.070	66.9	14.0	37	23.2	47.2	11.34	--	--	0.006	0.006	4.5
2012	--	2.2	0.084	0.067	77.2	20.8	45	23.3	49.8	10.37	74	41.2	0.005	0.005	5.2
2011	--	2.6	0.073	0.061	106.4	17.7	43	24.2	39.7	11.0	91	44.0	0.010	0.007	6.1

Source: SCAQMD 2011-2013
* specific station data is not provided by SCAQMD; however, all stations are noted as not exceeding the 20 PPM state 1-hour standard
-- pollutant not monitored
PPM, parts per million
µg/m3, micrograms per cubic meter
AAM, annual arithmetic mean

Table 4
2011-2013 Air Quality Standards Exceedance

Monitoring Station	O_3 (PPM)			PM_{10} (µg/m³)		$PM_{2.5}$ (µg/m³)
	Fed* 8-hr	State 1-hr	State 8-hr	Fed 24-hr	State 24-hr	Fed^ 24-hr
South Coastal LA County 1						
2013	0	0	0	0	0	2
2012	0	0	0	0	0	4
2011	0	0	0	0	0	1

Source: SCAQMD 2011-2013
-- pollutant not monitored
* 0.075 ppm
^35 µg/m3

3.5 Sensitive Receptors

Some populations are more susceptible to the effects of air pollution than the population at large; these populations are defined as sensitive receptors. Sensitive receptors include children, the elderly, the sick, and the athletic. Land uses associated with sensitive receptors include residences, schools, playgrounds, childcare centers, athletic facilities, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes. Sensitive receptors are located west and south of the project site. Single-family homes are located on the west side of Wilmington Avenue immediately adjacent to the project site. Del Amo Elementary School is located approximately 0.40 miles north of the project site. Exhibit 2 (Radius Map) identifies existing development in the project vicinity based on recent assessor's parcel data.

3.6 Local Transportation

The proposed project is located at the intersection of Wilmington Avenue and East 220th Street. Wilmington Avenue is a four-lane, divided roadway and East 220th Street is a two-lane, undivided roadway.

3.7 Odors

According to the CEQA Air Quality Handbook, land uses associated with odor complaints include agricultural operations, wastewater treatment plants, landfills, and certain industrial operations (such as manufacturing uses that produce chemicals, paper, etc.). The proposed project is a speculative warehouse, and as such and end-user has not been identified. However, the proposed project will likely include light industrial, storage, or distribution uses. Therefore, the proposed project would not produce odors that would affect a substantial number of people considering that the proposed project will not result in heavy manufacturing activities.

3.8 Climate Change

3.8.1 Defining Climate Change

Climate change is the distinct change in measures of climate for a long period of time. Climate change can result from natural processes and from human activities. Natural changes in the climate can be caused by indirect processes such as changes in the Earth's orbit around the Sun or direct changes within the climate system itself (i.e. changes in ocean circulation). Human activities can affect the atmosphere through emissions of gases and changes to the planet's surface. Emissions affect the atmosphere directly by changing its chemical composition, while changes to the land surface indirectly affects the atmosphere by changing the way the Earth absorbs gases from the atmosphere. The term "climate change" is preferred over the term "global warming" because "climate change" conveys the fact that other changes can occur beyond just average increase in temperatures near the Earth's surface. Elements that indicate that climate change is occurring on Earth include:

- Rising of global surface temperatures by 1.3° Fahrenheit (F) over the last 100 years
- Changes in precipitation patterns
- Melting ice in the Arctic
- Melting glaciers throughout the world
- Rising ocean temperatures
- Acidification of oceans
- Range shifts in plant and animal species

Climate change is intimately tied to the Earth's greenhouse effect. The greenhouse effect is a natural occurrence that helps regulate the temperature of the planet. The majority of radiation from the Sun hits the Earth's surface and warms it. The surface in turn radiates heat back towards the atmosphere, known as infrared radiation. Gases and clouds in the atmosphere trap and prevent some of this heat from escaping back into space and re-radiate it in all directions. This process is essential to supporting life on Earth because it keeps the planet approximately 60° F warmer than without it. Emissions from human activities since the beginning of the industrial revolution (approximately 150 years) are adding to the natural greenhouse effect by increasing the gases in the atmosphere that trap heat, thereby contributing to an average increase in the Earth's temperature. Human activities that enhance the greenhouse effect are detailed below.

Greenhouse Gases

The greenhouse effect is caused by a variety of "greenhouse gases". Greenhouse gases (GHGs) occur naturally and from human activities. Greenhouse gases produced by human activities include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). Since the year 1750, it is estimated that the concentrations of carbon dioxide, methane, and nitrous oxide in the atmosphere have increased over 36 percent, 148 percent, and 18 percent, respectively, primarily due to human activity. The primary GHGs are discussed below.[9]

Carbon Dioxide. CO_2 is emitted and removed from the atmosphere naturally. Animal and plant respiration involves the release of carbon dioxide from animals and its absorption by plants in a continuous cycle. The ocean-atmosphere exchange results in the absorption and release of CO_2 at the sea surface. Carbon dioxide is also released from plants during wildfires. Volcanic eruptions release a small amount of CO_2 from the Earth's crust.

Human activities that affect carbon dioxide in the atmosphere include burning of fossil fuels, industrial processes, and product uses. Combustion of fossil fuels is the largest source of carbon dioxide emissions in the United States, accounting for approximately 85 percent of all equivalent emissions. Because of the fossil fuels used, the largest of these sources is electricity generation and transportation. When fossil fuels are burned, the carbon stored in them is released into the atmosphere entirely as CO_2. Emissions from on site industrial activities also emit carbon dioxide such as cement, metal, and chemical production and use of petroleum produced in plastics, solvents, and lubricants.

Methane. Methane (CH_4) is emitted from human activities and natural sources. Natural sources of methane include wetlands, gas hydrates, permafrost, termites, oceans, freshwater bodies, soils, and wildfires. Human activities that cause methane releases include fossil fuel production, animal digestive processes from farms, manure management, and waste management. It is estimated that 50 percent of global methane emissions are human generated. Wetlands are the primary natural producers of methane in the world because the habitat is conducive to bacteria that produce methane during decomposition of organic material. Methane is produced from landfills as solid waste decomposes. Methane is a primary component of natural gas and is emitted during its production, processing, storage, transmission, distribution, and use. Decomposition of organic material in manure stocks or in liquid manure management systems also releases methane. Releases from animal digestive processes are the primary source of human-related methane.

Nitrous Oxide. Anthropogenic (human) sources of nitrous oxide include agricultural soil management, animal manure management, sewage treatment, combustion of fossil fuels, and production of certain acids. N_2O is produced naturally in soil and water, especially in wet, tropical forests. The primary human-related source of N_2O is agricultural soil management due to use of synthetic nitrogen fertilizers and other techniques to boost nitrogen in soils. Combustion of fossil fuels (mobile and stationary) is the second leading source of nitrous oxide, although parts of the world where catalytic converters are used (such as California) have significantly lower levels than those areas that do not.

High Global Warming Potential Gases. High global warming potential (GWP) gases (or fluorinated gases) are entirely manmade and are mainly used in industrial processes. HFCs, PFCs, and SF_6 are high GWP gases. These types of gases are used in aluminum production, semiconductor manufacturing, electric power transmission, magnesium production and processing, and in the production of hydrochlorofuorocarbon-22 (HCFC-22). High GWP gases are also used as substitutes for ozone-depleting gases like chlorofluorocarbons (CFCs) and halons. Use of high GWP gases as substitutes for ozone-depleting substances is the primary use of these gases in the United States.

Water Vapor. It should be noted that water vapor is also a significant GHG in the atmosphere; however, concentration of water vapor in the air is primarily dependent on air temperature and cannot be influenced by humans.

GHGs behave differently in the atmosphere and contribute to climate change in different ways. Some gases have more potential to reflect infrared heat back towards the earth while some persist in the atmosphere longer than others. To equalize the contribution of GHGs to climate change, the Intergovernmental Panel on Climate Change (IPCC) devised a weighted metric to compare all greenhouse gases to carbon dioxide.[10] The weighting depends on the lifetime of the gas in the atmosphere and its radiative efficiency. As an example, over a time horizon of 100-years, emissions of nitrous oxide will contribute to climate change 298 times more than the same amount of emissions of carbon dioxide while emissions of HFC-23 would contribute 14,800 times more than the same amount of carbon dioxide. These differences define a gas's GWP. Table 5 (Global Warming Potential of Greenhouse Gases) identifies the lifetime and GWP of select GHGs. The lifetime of the GHG represents how many years the GHG will persist in the atmosphere. The GWP of the GHG represents the GHG's relative potential to induce climate change as compared to carbon dioxide.

<u>Carbon Sequestration</u>

Carbon sequestration is the process by which plants absorb CO_2 from the atmosphere and store it in biomass like leaves and grasses. Agricultural lands, forests, and grasslands can all sequester carbon dioxide, or emit it. The key is to determine if the land use is emitting carbon dioxide faster than it is absorbing it. Young, fast-growing trees are particularly good at absorbing more than they release and are known as a *sink*. Agricultural resources often end up being sources of carbon release because of soil management practices. Deforestation contributes to carbon dioxide emissions by removing trees, or carbon sinks, that would otherwise absorb CO_2. Forests are a crucial part of sequestration in some parts of the world, but not much in the United States. Another form of sequestration is geologic sequestration. This is a manmade process that results in the collection and transport of CO_2 from industrial emitters (i.e. power plants) and injecting it into underground reservoirs.

Table 5
Global Warming Potential (GWP) of Greenhouse Gases (GHG)

GHG	Lifetime (yrs)	GWP
Carbon Dioxide	50-200	1
Methane	12	25
Nitrous Oxide	114	298
HFC-23	270	14,800
HFC-134a	14	1,430
HFC-152a	1.4	124
PFC-14	50,000	7,390
PFC-116	10,000	12,200
Sulfur Hexafluoride	3,200	22,800
Source: IPCC 2007		

3.8.2 Climate Change and California

Specific, anticipated impacts to California have been identified in the 2009 California Climate Adaptation Strategy prepared by the California Natural Resources Agency (CNRA) through extensive modeling efforts.[11] General climate changes in California indicate that:

- California is likely to get hotter and drier as climate change occurs with a reduction in winter snow, particularly in the Sierra Nevadas
- Some reduction in precipitation is likely by the middle of the century
- Sea-levels will rise up to an estimated 55 inches
- Extreme events such as heat waves, wildfires, droughts, and floods will increase
- Ecological shifts of habitat and animals are already occurring and will continue to occur

It should be noted that changes are based on the results of several models prepared under different climatic scenarios; therefore, discrepancies occur between the projections. The potential impacts of global climate change in California are detailed below.

Public Health and Welfare

Concerns related to public health and climate change includes higher rates of mortality and morbidity, change in prevalence and spread of disease vectors, decreases in food quality and security, reduced water availability, and increased exposure to pesticides. These concerns are all generally related to increase in ambient outdoor air temperature, particularly in summer.

Higher rates of mortality and morbidity could arise from more frequent heat waves at greater intensities. Health impacts associated with extreme heat events include heat stroke, heat exhaustion, and exacerbation of medical conditions such as cardiovascular and respiratory diseases, diabetes, nervous system disorders, emphysema, and epilepsy. Climate change would result in degradation of air quality promoting the formation of ground-level pollutants, particularly ozone. Degradation of air quality would increase the severity of health impacts from criteria and other air pollutants discussed in Section 4.3 (Air Quality). Temperature increases and increases in carbon dioxide are also expected to increase plant production of pollens, spores, and fungus. Pollens and spores could induce or aggravate allergic rhinitis, asthma, and obstructive pulmonary diseases.

Precipitation projections suggest that California will become drier over the next century due to reduced precipitation and increased evaporation from higher temperatures. These conditions could result in increased occurrences of drought. Surface water reductions will increase the need to pump groundwater, reducing supplies and increasing the potential for land subsidence.

Precipitation changes are also suspected to impact the Sierra snowpack (see “Water Management” herein). Earlier snowmelts could coincide with the rainy season and could result in failure of the flood control devices in that region. Flooding can cause property damage and loss of life for those affected. Increased wildfires are also of concern as the State “dries” over time. Wildfires can also cause property damage, loss of life, and injuries to citizens and emergency response services.

Sea-level rises would also threaten human health and welfare. Flood risks will be increased in coastal areas due to strengthened storm surges and greater tidal damage that could result in injury and loss of property and life. Gradual rising of the sea will permanently inundate many coastal areas in the state.

Other concerns related to public health are changes in the range, incidence, and spread of infectious, water-borne, and food-borne diseases. Changes in humidity levels, distribution of surface water, and precipitation changes are all likely to shift or increase the preferred range of disease vectors (i.e. mosquitoes). This could expose more people and animals to potential for vector-borne disease.

Biodiversity and Habitat

Changes in temperature will change the livable ranges of plants and animals throughout the state and cause considerable stress on these species. Species will shift their range if appropriate habitat is available and accessible if they cannot adapt to their new climate. If they do not adapt or shift, they face local extirpation or extinction. As the climate changes, community compositions and interactions will be interrupted and changed. These have substantial implications on the ecosystems in the state. Extreme events will lead to tremendous stress and displacement on affected species. This could make it easier for invasive species to enter new areas, due to their ability to more easily adapt. Precipitation changes would alter stream flow patterns and affect fish populations during their life cycle. Sea level rises could impact fragile wetland and other coastal habitat.

Water Management

Although disagreement among scientists on long-term precipitation patterns in the State has occurred, it is generally accepted by scientists that rising temperatures will impact California's water supply due to changes in the Sierra Nevada snowpack.

Currently, the State's water infrastructure is designed to both gather and convey water from melting snow and to serve as a flood control device. Snowpack melts gradually through spring warming into early summer, releasing an average of approximately 15 million acre-feet of water. The State's concern related to climate change is that due to rising temperatures, snowpack melt will begin earlier in the spring and will coincide with the rainy season. The combination of precipitation and snowmelt would overwhelm the current system, requiring tradeoffs between water storage and flood protection to be made. Reduction in reserves from the Sierra Nevada snowpack is troublesome for California and particularly for Southern California. Approximately 75-percent of California's available water supply originates in the northern third of the state while 80 percent of demand occurs in the southern two-thirds. There is also concern is that rising temperatures will result in decreasing volumes from the Colorado River basin. Colorado River water is important to Southern California because it supplies water directly to Metropolitan Water District of Southern California. Water from the Colorado River is also used to recharge groundwater basins in the Coachella Valley.

<u>Agriculture</u>

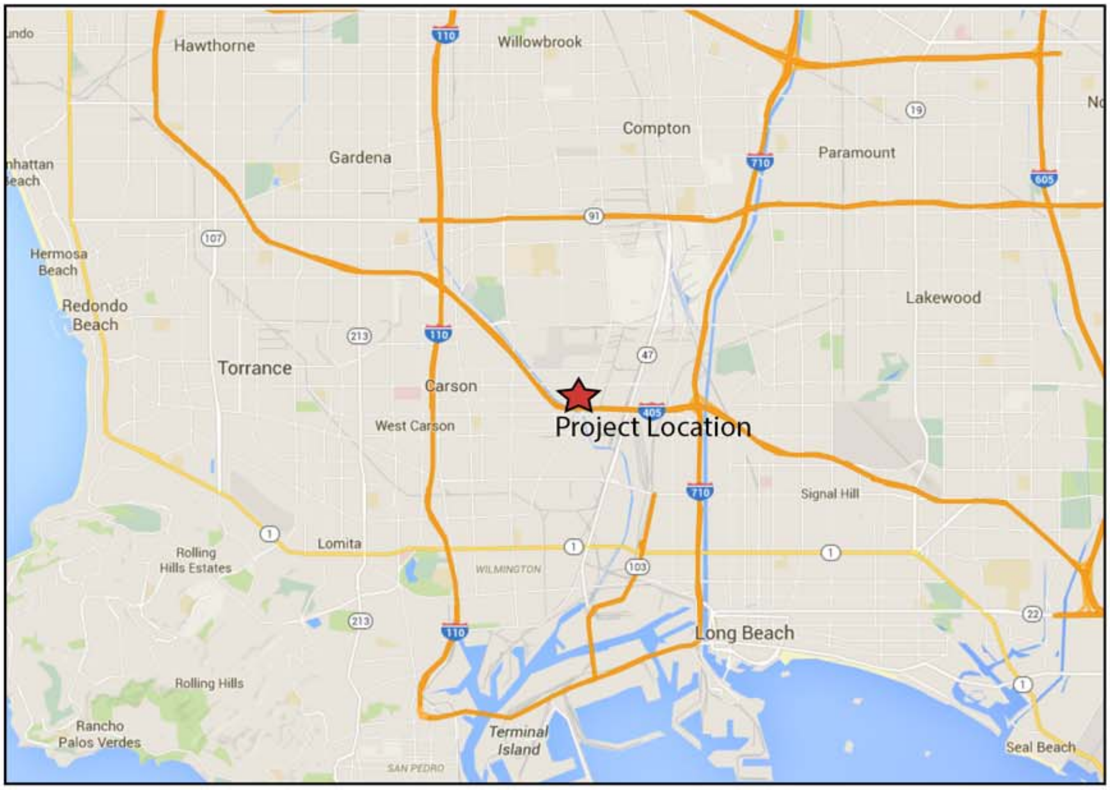
California is the most agriculturally productive state in the US resulting in more than 37 billion dollars in revenue in 2008. California is the nation's leading producer of nearly 80 crops and livestock commodities, supplying more than half of the nation's fruit and vegetables and over 90 percent of the nation's production of almonds, apricots, raisin grapes, olives, pistachios, and walnuts. Production of crops is not limited to the Central Valley but also occurs in Southern California. Strawberries and grapes are grown in San Bernardino and Riverside Counties. Orange County and San Diego County also contribute to strawberry production. Cherries are also grown in Los Angeles and Riverside County. Anticipated impacts to agricultural resources are mixed when compared to the potentially increased temperatures, reduced chill hours, and changes in precipitation associated with climate change. For example, wheat, cotton, maize, sunflower, and rice are anticipated to show declining yields as temperatures rise. Conversely, grapes and almonds would benefit from warming temperatures. Anticipated increases in the number and severity in heat waves would have a negative impact on livestock where heat stress would make livestock more vulnerable to disease, infection and mortality. The projected drying trend and changes in precipitation are a threat to agricultural production in California. Reduced water reliability and changes in weather patterns would impact irrigated farmlands and reduce food security. Furthermore, a drying trend would increase wildfire risk. Overall, agriculture in California is anticipated to suffer due to climate change impacts.

<u>Forestry</u>

Increases in wildfires will substantially impact California's forest resources that are prime targets for wildfires. This can increase public safety risks, property damage, emergency response costs, watershed quality, and habitat fragmentation. Climate change is also predicted to affect the behavior or plant species including seed production, seedling establishment, growth, and vigor due to rising temperatures. Precipitation changes will affect forests due to longer dry periods and moisture deficits and drought conditions that limit seedling and sapling growth. Prolonged drought also weakens trees, making them more susceptible to disease and pest invasion. Furthermore, as trees die due to disease and pest invasion (i.e. the Bark Beetle invasion of the San Bernardino Forest), wildfires can spread more rapidly.

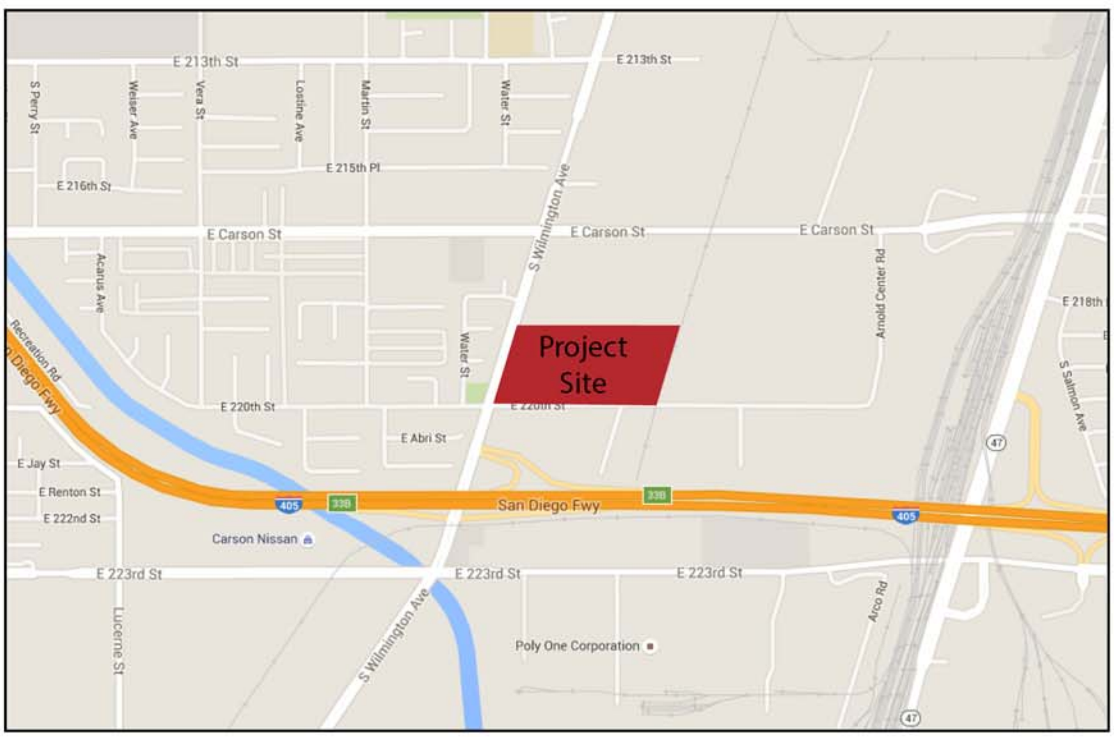
<u>Transportation and Energy Infrastructure</u>

Higher temperatures will require increased cooling, raising energy production demand. Higher temperatures also decrease the efficiency of distributing electricity and could lead to more power outages during peak demand. Climate changes would impact the effectiveness of California's transportation infrastructure as extreme weather events damage, destroy, and impair roadways and railways throughout the state causing governmental costs to increase as well as impacts to human life as accidents increase. Other infrastructure costs and potential impacts to life would increase due to the need to upgrade levees and other flood control devices throughout the state. Infrastructure improvement costs related to climate change adaptation are estimated in the tens of billions of dollars.



Source: Google Maps

Regional



Source: Google Maps

Vicinity

Not to Scale

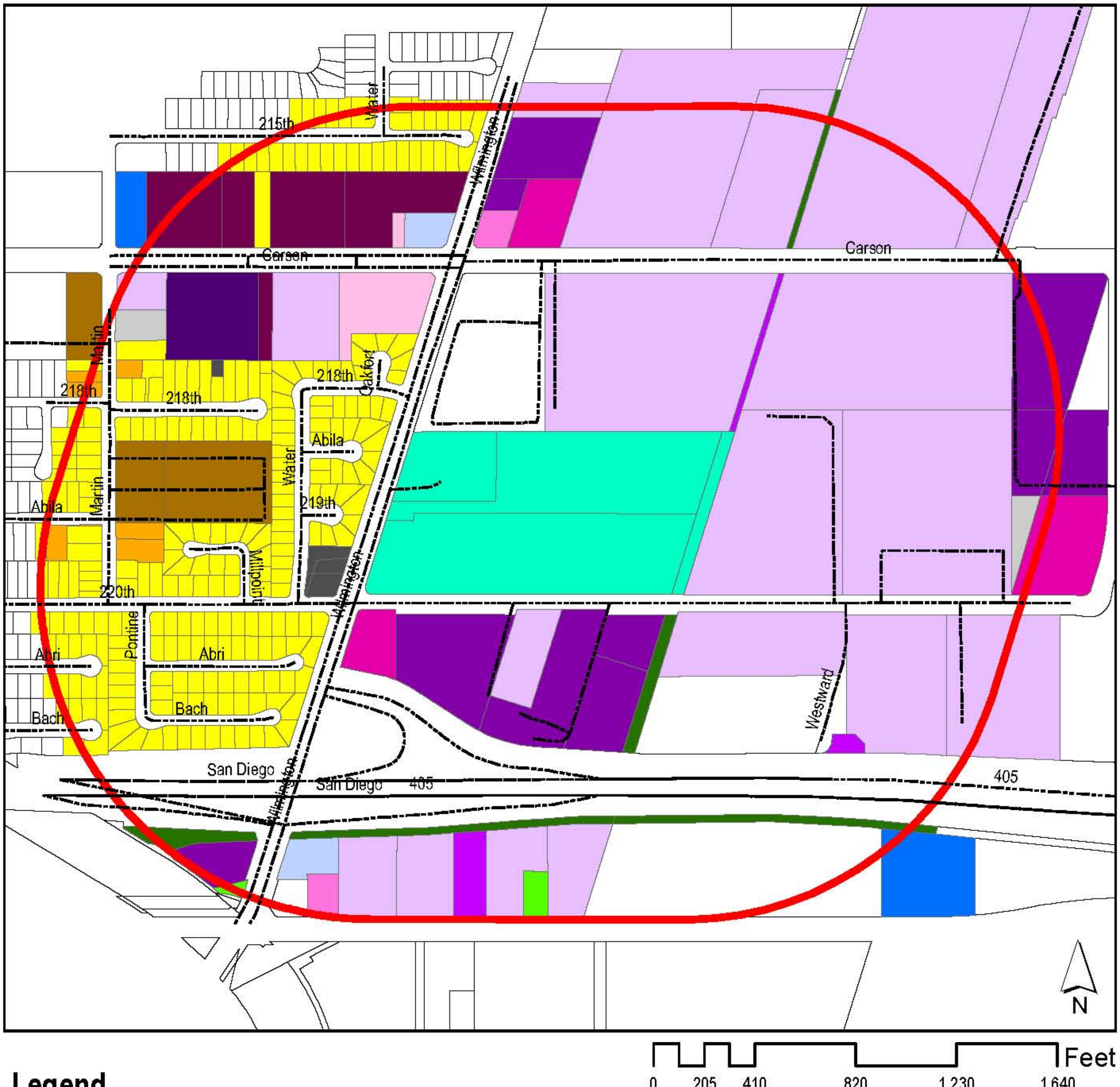
Exhibit 1 Regional and Vicinity Map

AL2 Carson 420K Warehouse

Carson, California

http://www.migcom.com • 951-787-9222

MIG



Legend

- Project Site
- 0.25 Mile Radius

Land Use

- Single Family Residential
- Multiple-Family Residential
- Manufactured Home
- Retail
- Restaurant
- Office
- Church
- Service Station
- Auto, Recreation Equipment Sales & Service
- Warehouse
- Industrial
- Manufacturing
- Food Processing Plant
- Utility
- Open Space
- Parking Lot
- Vacant

Exhibit 2 Radius Map

AL2 Carson 420K Warehouse

Carson, California

4 Regulatory Framework

The following summarizes Federal, State, and local regulations related to air quality, pollution control, and greenhouse gas emissions.

4.1 Clean Air Act

The Federal Clean Air Act (CAA) defines the Environmental Protection Agency's (EPA) responsibilities for protecting and improving the United States air quality and ozone layer.[12] Key components of the CAA include reducing ambient concentrations of air pollutants that cause health and aesthetic problems, reducing emission of toxic air pollutants, and stopping production and use of chemicals that destroy the ozone.

Federal clean air laws require areas with unhealthy levels of ozone, inhalable particulate matter, Carbon monoxide, nitrogen dioxide, and sulfur dioxide to develop State Implementation Plans (SIPs); comprehensive documents that identify how an area will attain NAAQS. Deadlines for attainment were established in the 1990 amendments to the CAA based on the severity of an area's air pollution problem. Failure to meet air quality deadlines can result in sanctions against the State or the EPA taking over enforcement of the CAA in the affected area. SIPs are a compilation of new and previously submitted plans, programs, district rules, and State and Federal regulations. The SCAQMD implements the required provisions of an applicable SIP through its AQMP. Currently, SCAQMD implements the 8-hr Ozone and $PM_{2.5}$ SIP in the 2007 AQMP and the PM_{10} SIP in the 2003 AQMP. The $PM_{2.5}$ SIP is currently being revised by SCAQMD in response to partial disapproval by the EPA. The 2012 Lead SIP for the Los Angeles County portion of SCAB was adopted by the SCAQMD Board on May 4, 2012 and approved by ARB on May 24, 2012 and forwarded to the EPA for approval as a revision to the California SIP.

4.2 California Clean Air Act

The California Clean Air Act (CCAA) of 1988 was enacted to develop plans and strategies for attaining California Ambient Air Quality Standards (CAAQS). The California Air Resources Board (ARB), which is part of the California Environmental Protection Agency (Cal-EPA), develops statewide air quality regulations, including industry-specific limits on criteria, toxic, and nuisance pollutants. The CCAA is more stringent than Federal law in a number of ways including revised standards for PM^{10} and ozone and State for visibility reducing particles, sulfates, hydrogen sulfide, and vinyl chloride.

4.3 2012 Air Quality Management Plan

The purpose of an Air Quality Management Plan (AQMP) is to bring an air basin into compliance with federal and state air quality standards and is a multi-tiered document that builds on previously adopted AQMPs.[13] The 2003 AQMP was adopted in August 2003 and demonstrated O_3 and PM_{10} for the Basin. It also provides the maintenance plans for CO and NO_2, which the Basin has been in attainment for since 1997 and 1992, respectively. The 2007 AQMP for the Basin was approved by the SCAQMD Board of Directors in June 2007. The 2007 AQMP builds on the 2003 AQMP and is designed to address the federal 8-hour ozone and $PM_{2.5}$ air quality standards. The AQMP identifies short- and long-term control measures designed to reduce stationary, area, and mobile source emissions, organized into four primary components:

1. District Stationary and Mobile Source Control Measures
2. Air Resources Board (ARB) State Strategy
3. Supplement to ARB Control Strategy
4. SCAG Regional Transportation Strategy and Control Measures

The 2012 AQMP was adopted by the SCAQMD board on December 7, 2012. The 2012 AQMP incorporated the latest scientific and technological information and planning assumptions, including the 2012 Regional Transportation Plan/Sustainable Communities Strategy and updated emission inventory methodologies for various source categories. The 2012 AQMP includes the new and changing federal requirements, implementation of new technology measures, and the continued development of economically sound, flexible compliance approaches. The SCAQMD is currently initiating an early development process for preparation of the 2016 AQMP.

4.4 SCAQMD Rule Book

In order to control air pollution in the Basin, SCAQMD adopts rules that establish permissible air pollutant emissions and governs a variety of businesses, processes, operations, and products to implement the AQMP and the various federal and state air quality requirements. SCAQMD does not adopt rules for mobile sources; those are established by ARB or the United States Environmental Protection Agency (EPA). Rules that will be applicable during construction of the proposed project include Rule 403 (Fugitive Dust) and Rule 1113 (Architectural Coatings). Rule 403 prohibits emissions of fugitive dust from any grading activity, storage pile, or other disturbed surface area if it crosses the project property line or if emissions caused by vehicle movement cause substantial impairment of visibility (defined as exceeding 20 percent opacity in the air). Rule 403 requires the implementation of Best Available Control Measures (BACM) and includes additional provisions for projects disturbing more than five acres and those disturbing more than fifty acres. Rule 1113 establishes maximum concentrations of VOCs in paints and other applications and establishes the thresholds for low-VOC coatings.

4.5 Executive Order S-3-05

Executive Order S-3-05 was issued by California Governor Arnold Schwarzenegger and established targets for the reduction of greenhouse gas emission at the milestone years of 2010, 2020, and 2050. Statewide GHG emissions must be reduced to 1990 levels by year 2020 and by 80 percent beyond that by year 2050. The Order requires the Secretary of the California Environmental Protection Agency (CalEPA) to coordinate with other State departments to identify strategies and reduction programs to meet the identified targets. A Climate Action Team (CAT) was created and is headed by the Secretary of CalEPA who reports on the progress of the reduction strategies. The latest CAT *Biennial Report to the Governor and Legislature* was completed in April 2010.[14] CAT also works in 11 subgroups to support development and implementation of the Scoping Plan (see “California Global Warming Solutions Act” herein).

4.6 Executive Order B-30-15

Executive Order B-30-15 was issued by California Governor Edmund G. Brown Jr. on April 29, 2015 to establish a California greenhouse gas reduction target of 40 percent below 1990 levels by 2030. This is meant as an interim target to ensure the state meets its ultimate goal of 80 percent below 1990 levels by 2050.

4.7 California Global Warming Solutions Act

The California State Legislature adopted the California Global Warming Solutions Act in 2006 (AB32). AB32 establishes the caps on statewide greenhouse gas emissions proclaimed in Executive Order S-3-05 and establishes a regulatory timeline to meet the reduction targets. The timeline is as follows:

January 1, 2009	Adopt Scoping Plan
January 1, 2010	Early action measures take effect
January 1, 2011	Adopt GHG reduction measures
January 1, 2012	Reduction measures take effect
December 31, 2020	Deadline for 2020 reduction target

As part of AB32, CARB had to determine what 1990 GHG emissions levels were and projected a business-as-usual (BAU) estimate for 2020 to determine the amount of GHG emissions that will need to be reduced. BAU is a term used to define emissions levels without considering reductions from future or existing programs or technologies. 1990 emissions are estimated at 427 million metric tons of carbon dioxide equivalent (MMTCO2E) while 2020 emissions (after accounting for the economic downturn in 2008 and implementation of Pavley 1 vehicle emissions reductions and the State Renewable Portfolio Standard identified in Air Resources Board Scoping Plan below) are estimated at 507 MMTCO2E; therefore, California GHG emissions must be reduced 80 MMTCO2E (507 – 427 = 80) by 2020, a reduction of approximately 16 percent below BAU. Emissions are required to be reduced an additional 80 percent below 1990 levels by 2050.

4.8 Sustainable Communities and Climate Protection Act

In January 2009, California Senate Bill (SB) 375 went into effect known as the Sustainable Communities and Climate Protection Act.[15] The objective of SB375 is to better integrate regional planning of transportation, land use, and housing to reduce sprawl and ultimately reduce greenhouse gas emissions and other air pollutants. SB375 tasks ARB to set greenhouse gas reduction targets for each of California's 18 regional Metropolitan Planning Organizations (MPOs). Each MPO is required to prepare a Sustainable Communities Strategy (SCS) as part of their Regional Transportation Plan (RTP). The SCS is a growth strategy in combination with transportation policies that will show how the MPO will meet its GHG reduction target. If the SCS cannot meet the reduction goal, an Alternative Planning Strategy (APS) may be adopted that meets the goal through alternative development, infrastructure, and transportation measures or policies.

In the Southern California Association of Governments (SCAG) region (in which the proposed project is located), sub-regions can also elect to prepare their own SCS or APS. In August 2010, ARB released the proposed GHG reduction targets for the MPOs to be adopted in September 2010. The proposed reduction targets for the SCAG region were 8-percent by year 2020 and 13-percent by year 2035. The 8-percent year 2020 target was adopted in September 2010 and tentatively adopted the year 2035 until February 2011 to provide additional time for SCAG, ARB, and other stakeholders to account for additional resources (such as state transportation funds) needed to achieve the proposed targets. In February 2011, the SCAG President affirmed the year 2035 reduction target and SCAG Staff updated ARB on additional funding opportunities.

4.9 Air Resources Board Scoping Plan

The ARB Scoping Plan is the comprehensive plan to reach the GHG reduction targets stipulated in AB32. The key elements of the plan are to expand and strengthen energy efficiency programs, achieve a statewide renewable energy mix of 33 percent, develop a cap-and-trade program with other partners in the Western Climate Initiative (includes seven states in the United States and four territories in Canada), establish transportation-related targets, and establish fees.[16] The Scoping Plan measures are identified in Table 6 (Scoping Plan Measures). Note that the current early discrete actions are incorporated into these measures. ARB estimates that implementation of these measures will reduce GHG emissions in the state by 174 MMTCO2E by 2020; therefore, implementation of the Scoping Plan will meet the 2020 reduction target. In a report prepared on September 23, 2010, ARB indicates that 40 percent of the reduction measures identified in the Scoping Plan have been secured.[17] The cap-and-trade program began on January 1, 2012 after ARB completes a series of activities that deal with the registration process, compliance cycle, and tracking system; however, covered entities will not have an emissions obligation until 2013.[18] ARB is currently working on the low carbon fuel standard where public hearings and workshops are currently being conducted. In August 2011, the Scoping plan was reapproved by the ARB Board with the program's environmental documentation.

The ARB has prepared the First Update to the Scoping Plan (Update) with a draft made available for public review on February 10, 2014. The Update to the Scoping Plan builds upon the 2008 Scoping Plan with new strategies and recommendations. The Update identifies opportunities to leverage existing and new funds to further drive GHG emission reductions through strategic planning and targeted low carbon investments. The Update defines ARB's climate change priorities for the next five years and sets the groundwork to reach post-2020 goals set forth in Executive Orders S-3-05 and B-16-2012. The Update highlights California's progress toward meeting the 2020 GHG emission reduction goals defined in the 2008 Scoping Plan. It also evaluates how to align the State's long-term GHG reduction strategies with other State policy priorities for water, waste, natural resources, clean energy, transportation, and land use. A draft Environmental Analysis (EA) was released for a 45-day public review period on March 14, 2014. After considering public comments and Board direction, the final First Update, summary of comments received on the draft EA, and ARB's responses to those comments were released on May 15, 2014. The First Update to the Scoping Plan was approved by the Board on May 22, 2014.

4.10 Water Conservation in Landscaping Act

Section 65591 of the Government Code requires all local jurisdictions to adopt a water efficient landscape ordinance. The ordinance is to address water conservation through appropriate use and grouping of plants based on environmental conditions, water budgeting to maximize irrigation efficiency, storm water retention, and automatic irrigation systems. Failure to adopt a water efficiency ordinance requires a local jurisdiction to enforce the provisions of the State's model water efficiency ordinance. In 2009, the Department of Water Resources (DWR) updated the Model Water Efficient Landscape Ordinance pursuant to amendments to the 1991 Act. These amendments and the new model ordinance went into effect on January 1, 2010. The amended Act is applicable to any new commercial, multi-family, industrial or tract home project containing 2,500 square feet (SF) or more of landscaping. Individual landscape projects of 5,000 SF or more on single-family properties will also be subject to the Act. All landscape plans are required to include calculations verifying conformance with the maximum applied water allowance and must be prepared and stamped by a licensed landscape architect.

4.11 California Green Building Standards

New California Green Building Standards Code (CALGREEN) went into effect on January 1, 2011.[19] The purpose of the new addition to the California Building Code (CBC) is to improve public health, safety, and general welfare by enhancing the design and construction of buildings using concepts to reduce negative impacts or produce positive impacts on the environment. The CALGREEN regulations cover planning and design, energy efficiency, water efficiency and conservation, material conservation and resources efficiency, and environmental quality. Many of the new regulations have the effect of reducing greenhouse gas emissions from the operation of new buildings. Table 7 (CALGREEN Requirements) summarizes the previous requirements of the CBC and the new requirements of CALGREEN that went into effect in January 2011. Minor technical revisions and additional requirements went into effect in July 2012. The Code was further updated in 2013, effective January 1, 2014 through 2016.

Table 6
Scoping Plan Measures

Measure	Description
T-1	Pavely I and II – Light Duty Vehicle Greenhouse Gas Standards
T-2	Low Carbon Fuel Standard
T-3	Regional Transportation-Related Greenhouse Gas Targets
T-4	Vehicle Efficiency Measures
T-5	Ship Electrification at Ports
T-6	Good Movement Efficiency Measures
T-7	Heavy-Duty Vehicle Aerodynamic Efficiency
T-8	Medium and Heavy-Duty Vehicle Hybridization
T-9	High Speed Rail
E-1	Energy Efficiency (Electricity Demand Reduction)
E-2	Increase Combined Heat and Power Use
E-3	Renewable Portfolio Standard
E-4	Million Solar Roofs
CR-1	Energy Efficiency (Natural Gas Demand Reduction)
CR-2	Solar Water Heating
GB-1	Green Buildings
W-1	Water Use Efficiency
W-2	Water Recycling
W-3	Water System Energy Efficiency
W-4	Reuse Urban Runoff
W-5	Increase Renewable Energy Production
W-6	Public Good Charge (Water)
I-1	Energy Efficiency for Large Industrial Sources
I-2	Oil and Gas Extraction GHG Reductions
I-3	Oil and Gas Transmission Leak Reductions
I-4	Refinery Flare Recovery Process Improvements
I-5	Removal of Methane Exemption from Existing Refinery Regulations
RW-1	Landfill Methane Control
RW-2	Increase Landfill Methane Capture Efficiency
RW-3	Recycling and Zero Waste
F-1	Sustainable Forest Target
H-1	Motor Vehicle Air Conditioning
H-2	Non-Utilities and Non-Semiconductor SF_6 Limits
H-3	Semiconductor Manufacturing PFC Reductions
H-4	Consumer Products High GWP Limits
H-5	High GWP Mobile Source Reductions
H-6	High GWP Stationary Source Reductions
H-7	High GWP Mitigation Fees
A-1	Large Dairy Methane Capture

Table 7
CALGREEN Requirements

Item		Requirements: Previous	Requirements: CALGREEN
4.1	Stormwater Management	Stormwater management required on projects > than one acre	All projects subject to stormwater management.
4.1	Surface Drainage	Surface water must flow away from building	Drainage patterns must be analyzed
4.2	Energy Efficiency	California Energy Code	Minimum energy efficiency to be established by California Energy Commissions
4.3	Indoor Water Use	HCD maximum flush rates; CEC water use standards for appliances and fixtures	Indoor water use must decrease by at least 20 percent (prescriptive or performance based)
4.3	Multiple Showerheads	Not covered	Multiple showerheads cannot exceed combined flow of the code
4.3	Irrigation Controllers	Not covered	Irrigation controllers must be weather or soil moisture based controllers
4.4	Joint Protection	Plumbing and Mechanical Codes	All openings must be sealed with materials that rodents cannot penetrate
4.4	Construction Waste	Local Ordinances	Establishes minimum 50 percent recycling and waste management plan
4.4	Operation	Plumbing Code for gray water systems	Educational materials and manuals must be provided to building occupants and owners to ensure proper equipment operation
4.5	Fireplaces	Local Ordinances	Gas fireplaces must be direct-vent sealed-combustion type; Wood stoves and pellet stoves must meet USEPA Phase II emissions limits
4.5	Mechanical Equipment	Not covered	All ventilation equipment must be sealed from contamination during construction
4.5	VOCs	Local Ordinances	Establishes statewide limits on VOC emissions from adhesives, paints, sealants, and other coatings
4.5	Capillary Break	No prescriptive method of compliance	Establishes minimum requirements for vapor barriers in slab on grade foundations
4.5	Moisture Content	Current mill moisture levels for wall and floor beams is 15-20 percent	Moisture content must be verified prior to enclosure of wall or floor beams
4.5	Whole House Fans	Not covered	Requires insulated louvers and closing mechanism when fan is off
4.5	Bath Exhaust Fans	Not covered	Requires Energy Star compliance and humidistat control
4.5	HVAC Design	Minimal requirements for heat loss, heat gain, and duct systems	Entire system must be designed in respects to the local climate
7	Installer Qualifications	HVAC installers need not be trained	HVAC installers must be trained or certified
7	Inspectors	Training only required for structural materials	All inspectors must be trained

Source: HCD 2010

5 Project Description

The building includes a 404,925-square foot footprint, with 15,075-square feet of mezzanine floor space, for a total of 420,000-gross-square-feet on 19.85 acres located at the northeast corner of the intersection of Wilmington Avenue and East 220th Street in the City of Carson, California. The project includes 101,600 square feet of landscaping, 300 passenger vehicle parking stalls, 100 truck trailer parking stalls, and 65 loading docks.

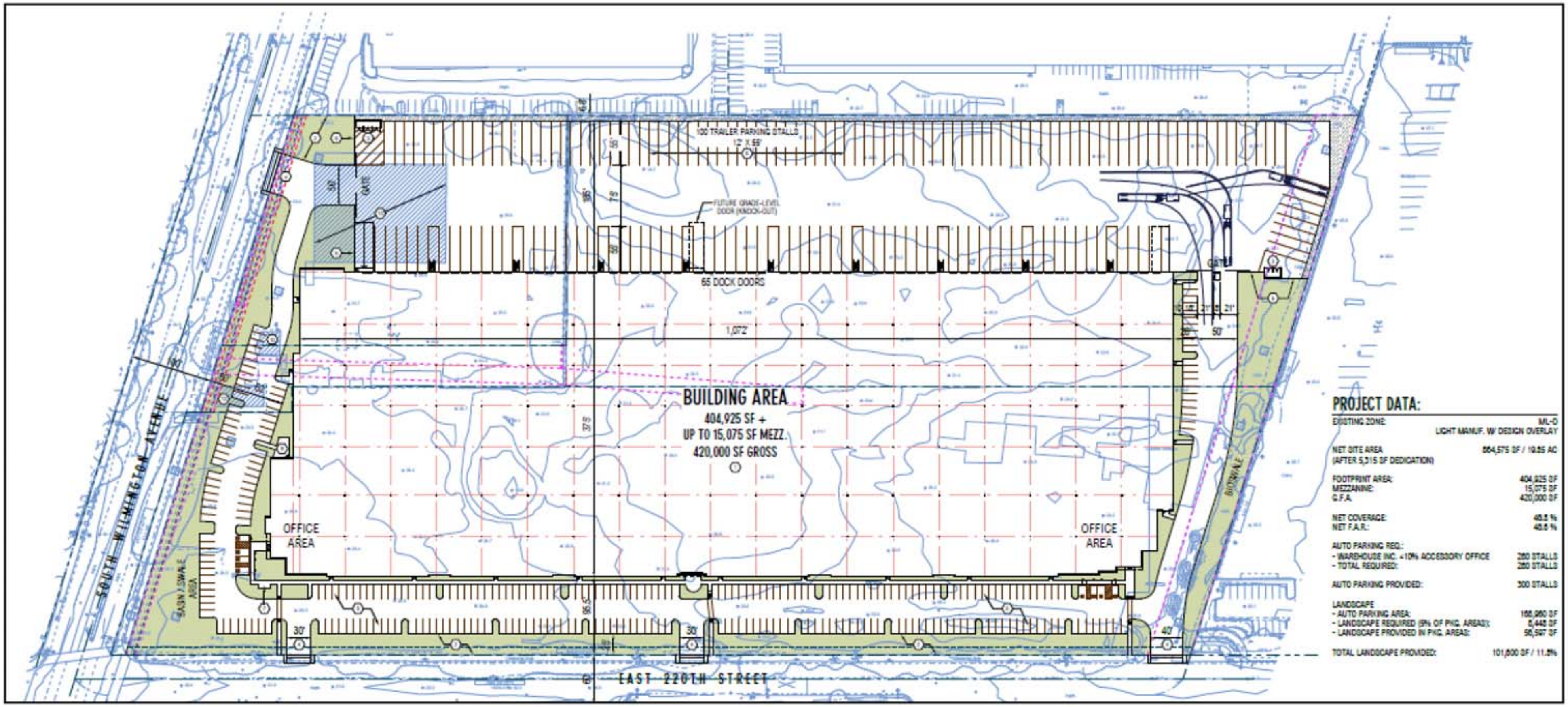


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Exhibit 3 Site Plan

AL2 Carson 420K Warehouse
Carson, California

6 Air Quality Impact Analysis

The impact analysis contained herein was prepared utilizing guidance provided in the 1993 SCAQMD California Environmental Quality Act (CEQA) Air Quality Handbook. The thresholds identified in Appendix G of the State CEQA Guidelines, as implemented by the City of Carson, have been utilized to determine the significance of potential impacts.

6.1 Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines and the local implementation procedures of the City of Carson, the project could result in potentially significant impacts related to air quality if it:

A. Conflicts with or obstructs implementation of the applicable air quality plan.
B. Violates any air quality standard or contributes substantially to an existing or projected air quality violation.
C. Results in a cumulatively considerable net increase of any criteria pollutant that the region is non-attainment under an applicable Federal or State ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors).
D. Exposes sensitive receptors to substantial pollutant concentrations.
E. Create objectionable odors affecting a substantial number of people.

To determine if maximum daily criteria pollutant emissions from construction and operation of the proposed project are significant, the SCAQMD significance thresholds are used. These thresholds are identified in Table 8 (SCAQMD Maximum Daily Emissions Thresholds (lbs/day)).

Table 8
SCAQMD Maximum Daily Emissions Thresholds (lbs/days)

Pollutant	Construction	Operation
NO_X	100	55
VOC/ROG	75	55
PM_{10}	150	150
$PM_{2.5}$	55	55
SO_X	150	150
CO	550	550
Lead	3	3
Source: SCAQMD 2015		

6.2 AQMP Consistency

A significant impact could occur if the proposed project conflicts with or obstructs the implementation of South Coast Air Basin 2012 Air Quality Management Plan. Conflicts and obstructions that hinder implementation of the AQMP can delay efforts to meet attainment deadlines for criteria pollutants and maintaining existing compliance with applicable air quality standards. Pursuant to the methodology provided in Chapter 12 of the 1993 SCAQMD CEQA Air Quality Handbook, consistency with the South Coast Air Basin 2012 Air Quality Management Plan (AQMP) is affirmed when a project (1) does not increase the frequency or severity of an air quality standards violation or cause a new violation and (2) is consistent with the growth assumptions in the AQMP.[20] Consistency review is presented below:

1. The project would result in short-term construction and long-term pollutant emissions that are less than the CEQA significance emissions thresholds established by the SCAQMD, as demonstrated in Section 6.3 et seq of this report; therefore, the project could not result in an increase in the frequency or severity of any air quality standards violation and will not cause a new air quality standard violation.

2. The CEQA Air Quality Handbook indicates that consistency with AQMP growth assumptions must be analyzed for new or amended General Plan elements, Specific Plans, and *significant projects*. *Significant projects* include airports, electrical generating facilities, petroleum and gas refineries, designation of oil drilling districts, water ports, solid waste disposal sites, and off-shore drilling facilities; therefore, the proposed project is not defined as *significant*. This project does not include a General Plan Amendment and therefore does not required consistency analysis with the AQMP.

Based on the consistency analysis presented above, the proposed project will not conflict with the AQMP.

6.3 Pollutant Emissions

6.3.1 Construction

Short-term criteria pollutant emissions will occur during demolition, site grading, building construction, paving, and architectural coating activities. Emissions will occur from use of equipment, worker, vendor, and hauling trips, and disturbance of onsite soils (fugitive dust). To determine if construction of the proposed project could result in a significant air quality impact, the California Emissions Estimator Model (CalEEMod) has been utilized. CalEEMod defaults have generally been used as construction inputs into the model (see Appendix A for input values). The methodology for calculating emissions is included in the CalEEMod *User Guide,* freely available at http://www.caleemod.com.

It was estimated that 3,740 square feet of existing, on-site structures, including asphalt and concrete, will be demolished to accommodate the project. Construction of the building is anticipated to start in early 2017. CalEEMod defaults for construction schedule phase duration and equipment needs were utilized. Based on the results of the model, maximum daily emissions from the construction of the project will result in excessive emissions of volatile organic chemicals (identified as reactive organic gases) associated with interior and exterior coating activities. To compensate for excessive VOC emissions from coating activities, the model includes use of zero grams per liter (g/l) VOC content for interior and exterior coatings, as identified in the project description. Use of low-VOC coatings during construction activities will reduce VOC emissions to 2.95 lbs/day, less than the threshold established by SCAQMD.

Table 9
Daily Construction Emissions (lbs/day)

Source	ROG	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Summer						
2017	2.82	15.43	52.73	0.11	7.31	3.99
2018	2.62	14.34	50.11	0.11	5.29	1.58
Winter						
2017	2.95	15.89	53.84	0.11	7.31	3.99
2018	2.73	14.75	51.28	0.11	5.29	1.59
Threshold	75	100	550	150	150	55
Substantial?	No	No	No	No	No	No

6.3.2 Operational and Area Sources

Long-term criteria air pollutant emissions will result from the operation of the proposed project. Long-term emissions are categorized as area source emissions, energy demand emissions, and operational emissions. Operational emissions will result from automobile, truck, and other vehicle sources associated with daily trips to and from the project. Area source emissions are the combination of many small emission sources that include use of outdoor landscape maintenance equipment, use of consumer products such as cleaning products, and periodic repainting of the proposed project. Energy demand emissions result from use of electricity and natural gas. Emissions from area sources were estimated using CalEEMod defaults.

The California Emissions Estimator Model (CalEEMod) was utilized to estimate mobile source emissions. Trip generation (1.68 daily trips per 1,000 SF) is based on the trip generation rates provided in the Institute of Transportation Engineers *Trip Generation Manual* (9th Edition).[21] Based on SCAQMD recommendations, an average rate of 0.64 trucks per 1,000 square feet has been applied for purposes of this analysis.[22] Passenger vehicles will consist of 61.80 percent of the fleet mix, light-duty trucks will consist of 6.46 percent of the fleet mix, medium-heavy duty trucks will consist of 8.70 percent of the truck trips, and heavy-heavy duty truck trips consist of 23.04 percent of the fleet mix. Trip lengths have been adjusted based on a study of metropolitan commercial and freight travel conducted by the National Cooperative Highway Research Program. According to observed data collected in the field for the Southern California Association of Governments (SCAG) region, trip lengths for similar uses are estimated at 5.92 miles for light-duty trucks, 13.06 for medium-duty trucks, and 22.40 for heavy-duty trucks. Total vehicle miles were calculated using the average daily trips for each vehicle class and divided by total daily truck trips to get to an average truck distance of 17.41 miles. Assuming an opening year of 2019, the results of the CalEEMod model for summer and winter operation of the project are summarized in Table 10 (Daily Operational Emissions). Based on the results of the model, impacts associated with operation of the Project will not exceed the threshold established by SCAQMD. Impacts will be less than significant.

Table 10
Daily Operational Emissions (lbs/day)

Source	ROG	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Summer						
Area Sources	20.98	0.00	0.09	0.00	0.00	0.00
Energy Demand	0.02	0.16	0.13	0.00	0.01	0.01
Mobile Sources	3.55	37.06	46.52	0.19	9.77	3.08
Summer Total	24.56	37.22	46.74	0.19	9.78	3.09
Winter						
Area Sources	20.98	0.00	0.09	0.00	0.00	0.00
Energy Demand	0.02	.016	0.13	0.00	0.01	0.01
Mobile Sources	3.69	38.43	50.01	0.18	9.77	3.08
Winter Total	24.69	38.59	50.27	0.18	9.78	3.09
Maximum Daily	20.98	46.07	67.11	0.22	11.38	3.59
Threshold	55	55	550	150	150	55
Substantial?	No	No	No	No	No	No

6.4 Sensitive Receptors

6.4.1 Localized Significance Thresholds

As part of SCAQMD's environmental justice program, attention has recently been focusing more on the localized effects of air quality. Although the region may be in attainment for a particular criteria pollutant, localized emissions from construction activities coupled with ambient pollutant levels can cause localized increases in criteria pollutant that exceed national and/or State air quality standards.

Construction-related criteria pollutant emissions and potentially significant localized impacts were evaluated pursuant to the SCAQMD Final Localized Significance Thresholds Methodology. This methodology provides screening tables for one through five-acre project scenarios, depending on the amount of site disturbance during a day using the Fact Sheet for equipment usage in CalEEMod.[23] Daily oxides of nitrogen (NO_X), carbon monoxide (CO), and particulate matter (PM_{10} and $PM_{2.5}$) emissions will occur during construction of the project, grading of the project site, and paving of facility parking lots and drive aisles. Table 11 (Localized Significance Threshold Analysis) summarize on- and off-site emissions as compared to the local thresholds established for Source Receptor Area (SRA) 4 (South Coastal LA County 1). Based on the use of four tractors and three dozers during site preparation activities, a 3.5-acre threshold will be used (using linear regression). A 25-meter receptor distance was used to reflect the proximity of residential uses to the west of the project site. Note that particulate matter emissions account for daily watering required by SCAQMD Rule 403 (three times per day for a 55 percent reduction in fugitive dust). Emissions from construction activities will not exceed any localized threshold.

Table 11
Localized Significance Threshold Analysis (lbs/day)

Phase	CO	NO_X	PM^{10}	$PM^{2.5}$
Demolition	23.83	2.05	1.62	0.30
Site Preparation	21.24	2.06	7.12	3.94
Grading	34.78	3.28	3.49	1.50
Building Construction	17.53	23.26	1.49	1.40
Paving	16.93	1.19	0.04	0.04
Architectural Coating	1.83	0.13	0.00	0.00
Threshold	1,063	93	9	6
Potentially Substantial?	No	No	No	No

Operation-related LSTs become a concern when there are substantial on-site stationary sources that could impact surrounding receptors. The proposed project does not include such on-site operations; therefore, impacts related to operational LSTs will not occur.

6.4.2 Carbon Monoxide Hotspots

A carbon monoxide (CO) hotspot is an area of localized CO pollution that is caused by severe vehicle congestion on major roadways, typically near intersections. CO hotspots have the potential to violate State and Federal CO standards at intersections, even if the broader Basin is in attainment for Federal and State levels. The California Department of Transportation Project-Level Carbon Monoxide Protocol (Protocol) screening procedures have been utilized to determine if the proposed project could potentially result in a CO hotspot. Based on the recommendations of the Protocol, a screening analysis should be performed for the proposed project to determine if a detailed analysis will be required. The California Department of Transportation notes that because of the age of the assumptions used in the screening procedures and the obsolete nature of the modeling tools utilized to develop the screening procedures in the Protocol, they are no longer accepted. More recent screening procedures based on more current methodologies have been developed. The Sacramento Metropolitan Air Quality Management District (SMAQMD) developed a screening threshold in 2011, which states that any project involving an intersection experiencing 31,600 vehicles per hour or more will require detailed analysis. In addition, the Bay Area Air Quality Management District developed a screening threshold in 2010, which states that any project involving an intersection experiencing 44,000 vehicles per hour would require detailed analysis. The proposed project's operations would not involve an intersection experiencing this level of traffic; therefore, the proposed project passes the screening analysis and impacts are deemed less than significant. Based on the local analysis procedures, the proposed project would not result in a CO hotspot.

6.5 Odors

According to the CEQA Air Quality Handbook, land uses associated with odor complaints include agricultural operations, wastewater treatment plants, landfills, and certain industrial operations (such as manufacturing uses that produce chemicals, paper, etc.). The proposed project is sited within an existing industrial and commercial area. The proposed project is a speculative warehouse, and as such an end-user has not been identified. However, the proposed project will likely include light industrial, storage, or distribution uses. Therefore, the proposed project would not produce odors that would affect a substantial number of people considering that the proposed project will not result in heavy manufacturing activities.

6.6 Cumulative Impacts

6.6.1 Cumulative Construction Impacts

Cumulative short-term, construction-related emissions from the project will not contribute considerably to any potential cumulative air quality impact because short-term project emissions will be less than significant and other concurrent construction projects in the region will be required to implement standard air quality regulations and mitigation pursuant to State CEQA requirements, just as this project has.

6.6.2 Cumulative Operational Impacts

The SCAQMD CEQA Air Quality Handbook identifies methodologies for analyzing long-term cumulative air quality impacts for criteria pollutants for which the Basin is nonattainment. These methodologies identify three performance standards that can be used to determine if long-term emissions will result in cumulative impacts. Essentially, these methodologies assess growth associated with a land use project and are evaluated for consistency with regional projections. These methodologies are outdated, and are no longer recommended by SCAQMD. SCAQMD allows a project to be analyzed using the projection method such that consistency with the AQMP will indicate that a project will not contribute considerably to cumulative air quality impacts. As discussed in AQMP Consistency, the proposed project is consistent with growth assumptions in the AQMP, and would not exceed any applicable SCAQMD thresholds for short- and long-term emissions. Therefore, the proposed project will not contribute to any potential cumulative air quality impacts.

7.1 Thresholds of Significance

The proposed project could result in potentially significant impacts related to greenhouse gas emissions and global climate change if it would:

A. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.

B. Conflict with an applicable plan, policy, or regulation adopted for the purposes of reducing the emissions of greenhouse gases.

A numerical threshold for determining the significance of greenhouse gas emissions in the South Coast Air Basin (Basin) has not been established by the South Coast Air Quality Management District (SCAQMD). As an interim threshold based on guidance provided in the CAPCOA *CEQA and Climate Change* handbook, a non-zero threshold approach based on Approach 2 of the handbook has been used. Threshold 2.5 (Unit-Based Thresholds Based on Market Capture) establishes a numerical threshold based on capture of approximately 90 percent of emissions from future development. The latest threshold developed by SCAQMD using this method is 10,000 metric tons carbon dioxide equivalent (MTCO2E) per year for industrial projects.[24] This threshold is based on the review of 711 CEQA projects. This threshold will be utilized herein to determine if emissions of greenhouse gases from this project will be significant.

7.2 Direct and Indirect Emissions

The proposed project will include activities that emit greenhouse gas emissions over the short- and long-term. While one project could not be said to cause global climate change, individual projects contribute cumulatively to greenhouse gas emissions that result in climate change. A greenhouse gas emissions inventory was prepared for the project using under BAU conditions and is analyzed below.

7.2.1 Short-Term Emissions

The project will result in short-term greenhouse gas emissions from construction and installation activities associated with construction of the proposed project. Greenhouse gas emissions will be released by equipment used for grading, paving, and building construction activities. GHG emissions will also result from worker and vendor trips to and from the project site. Table 12 (Construction Greenhouse Gas Emissions) summarizes the estimated yearly emissions from construction activities. Carbon dioxide emissions from construction equipment and worker/vendor trips were estimated utilizing the California Emissions Estimator Model (CalEEMod) version 2013.2.2 (see Appendix A). Construction activities are short-term and cease to emit greenhouse gases upon completion, unlike operational emissions that are continuous year after year until operation of the use ceases. Because of this difference, SCAQMD recommends in its draft threshold to amortize construction emissions over a 30-year operational lifetime. This normalizes construction emissions so that they can be grouped with operational emissions in order to generate a precise project GHG inventory. Amortized construction emissions are included in Table 12.

Table 12
Construction Greenhouse Gas Emissions

Construction Year	GHG Emissions (MT/YR)			
	CO_2	CH_4	N_2O	TOTAL*
2017	1,054.73	0.12	0.00	1,057.29
2018	464.14	0.05	0.00	465.10
*AMORTIZED TOTAL^*	*50.63*	*0.01*	*0.00*	*50.75*

* MTCO2E
Note: Slight variations may occur due to rounding and variations in modeling software
^ Amortized over 30-years

7.2.2 Long-Term Emissions

Warehousing and distribution activities will result in continuous greenhouse gas emissions from mobile and operational sources. Mobile sources including vehicle trips to and from the project site will result primarily in emissions of CO_2 with minor emissions of CH_4 and N_2O. The most significant GHG emission from natural gas usage will be methane. Electricity usage by the project and indirect usage of electricity for water and wastewater conveyance will result primarily in emissions of carbon dioxide. Disposal of solid waste will result in emissions of methane from the decomposition of waste at landfills coupled with CO_2 emission from the handling and transport of solid waste. These sources combine to define the long-term greenhouse gas emissions for the build-out of the proposed project.

To determine long-term emissions, CalEEMod was used. The methodology utilized for each emissions source is based on the CAPCOA *Quantifying Greenhouse Gas Mitigation Measures* handbook.[25] A summary of the project's net long-term greenhouse gas emissions is included in Table 13 (Operational Greenhouse Gas Emissions). Emissions are presented as metric tons of carbon dioxide equivalent (MTCO2E) meaning that all emissions have been weighted based on their Global Warming Potential (GWP) (a metric ton is equal to 1.102 US short tons).

Table 13
Operational Greenhouse Gas Emissions

Source	GHG Emissions (MT/YR)			
	CO_2	CH_4	N_2O	TOTAL*
Area	0.02	0.00	0.00	0.02
Energy	708.03	0.03	0.01	710.87
Mobile	2,680.85	0.04	0.00	2,681.78
Solid Waste	80.10	4.73	0.00	179.51
Water/Wastewater	392.44	3.14	0.07	482.37
TOTAL	*3,861.44*	*7.95*	*0.08*	*4,054.55*

* MTCO2E/YR
Note: Slight variations may occur due to rounding

Mobile sources are based on annual vehicle miles traveled (VMT) based on daily trip generation identified in the project traffic impact report.[26] Trip lengths have been adjusted based on a study of metropolitan commercial and freight travel conducted by the National Cooperative Highway Research Program. According to observed data collected in the field for the Southern California Association of Governments (SCAG) region, trip lengths for similar uses are estimated at 5.92 miles for light-duty trucks, 13.06 for medium-duty trucks, and 22.40 for heavy-duty trucks. Total vehicle miles were calculated using the average daily trips for each vehicle class and divided by total daily truck trips to get to an average truck distance of 17.41 miles. Natural gas usage and electricity usage are based on default demand figures utilized in CalEEMod. Solid waste generation is also based on CalEEMod defaults.

CalEEMod does not include outdoor landscape irrigation demand defaults for this type of project. Estimated irrigation needs for landscaping was calculated at 1,371,963 gallons per year. Landscape irrigation requirements were calculated using the California Department of Water Resources (DWR) *Water Budget* Workbook that calculates the Maximum Applied Water Allowance (MAWA) for landscaping based on the requirements of the state water conservation in landscaping act.[27] This reflects the maximum allowable amount of water that is permitted to be used annually after consideration of effective precipitation (25 percent of annual rainfall). MAWA is calculated using the following equation:

```
MAWA = (ETO – Eppt) * 0.62 * [(0.70 * LA) + (0.30 * SLA)]

Where:

MAWA  = Maximum Applied Water Allowance (gallons per year)
ETO   = Reference Evapotranspiration for Locale (inches per year)
Eppt  = Effective Precipitation (inches per year)
LA    = Landscape Area (square feet)
SLA   = Special Landscape Area (square feet)
```

Indoor water demand and wastewater discharges are based on CalEEMod defaults.

7.2.3 Greenhouse Gas Emissions Inventory

Table 14 (Greenhouse Gas Emissions Inventory) summarizes the yearly estimated greenhouse gas emissions from construction and operational sources. The total yearly carbon dioxide equivalent emissions for the proposed project are estimated at 4,105 MTCO2E. This does not exceed the SCAQMD threshold of 10,000 MTCO2E per year.

Table 14
Greenhouse Gas Emissions Inventory

Source	GHG Emissions (MT/YR)			
	CO_2	CH_4	N_2O	TOTAL*
Construction	*50.63*	*0.01*	*0.00*	*50.75*
Operation	*3,861.44*	*7.95*	*0.08*	*4,054.55*
			Total	4,105.30

* MTCO2E/YR
Note: Slight variations may occur due to rounding
^ Construction impacts amortized over 30-years

7.3 Greenhouse Gas Emissions Reduction Planning

ARB's *Scoping Plan* identifies strategies to reduce California's greenhouse gas emissions in support of AB32. Many of the strategies identified in the Scoping Plan are not applicable at the project level, such as long-term technological improvements to reduce emissions from vehicles. Some measures are applicable and supported by the project, such as energy efficiency. Finally, while some measures are not directly applicable, the project would not conflict with their implementation. Reduction measures are grouped into 18 action categories, as follows:

1. **California Cap-and-Trade Program Linked to Western Climate Initiative Partner Jurisdictions.** Implement a broad-based California cap-and-trade program to provide a firm limit on emissions. Link the California cap–and-trade program with other Western Climate Initiative Partner programs to create a regional market system to achieve greater environmental and economic benefits for California.[28] Ensure California's program meets all applicable AB 32 requirements for market-based mechanisms.
2. **California Light-Duty Vehicle Greenhouse Gas Standards.** Implement adopted Pavley standards and planned second phase of the program. Align zero-emission vehicle, alternative and renewable fuel and vehicle technology programs with long-term climate change goals.
3. **Energy Efficiency.** Maximize energy efficiency building and appliance standards, and pursue additional efficiency efforts including new technologies, and new policy and implementation mechanisms. Pursue comparable investment in energy efficiency from all retail providers of electricity in California (including both investor-owned and publicly owned utilities).
4. **Renewables Portfolio Standards.** Achieve 33 percent renewable energy mix statewide.
5. **Low Carbon Fuel Standard.** Develop and adopt the Low Carbon Fuel Standard.

6. Regional Transportation-Related Greenhouse Gas Targets. Develop regional greenhouse gas emissions reduction targets for passenger vehicles.
7. Vehicle Efficiency Measures. Implement light-duty vehicle efficiency measures.
8. Goods Movement. Implement adopted regulations for the use of shore power for ships at berth. Improve efficiency in goods movement activities.
9. Million Solar Roofs Program. Install 3,000 megawatts of solar-electric capacity under California's existing solar programs.
10. Medium- and Heavy-Duty Vehicles. Adopt medium- (MD) and heavy-duty (HD) vehicle efficiencies. Aerodynamic efficiency measures for HD trucks pulling trailers 53-feet or longer that include improvements in trailer aerodynamics and use of rolling resistance tires were adopted in 2008 and went into effect in 2010.[29] Future, yet to be determined improvements, includes hybridization of MD and HD trucks.
11. Industrial Emissions. Require assessment of large industrial sources to determine whether individual sources within a facility can cost-effectively reduce greenhouse gas emissions and provide other pollution reduction co-benefits. Reduce greenhouse gas emissions from fugitive emissions from oil and gas extraction and gas transmission. Adopt and implement regulations to control fugitive methane emissions and reduce flaring at refineries.
12. High Speed Rail. Support implementation of a high speed rail system.
13. Green Building Strategy. Expand the use of green building practices to reduce the carbon footprint of California's new and existing inventory of buildings.
14. High Global Warming Potential Gases. Adopt measures to reduce high warming global potential gases.
15. Recycling and Waste. Reduce methane emissions at landfills. Increase waste diversion, composting and other beneficial uses of organic materials, and mandate commercial recycling. Move toward zero-waste.
16. Sustainable Forests. Preserve forest sequestration and encourage the use of forest biomass for sustainable energy generation. The 2020 target for carbon sequestration is 5 million MTCO2E/YR.
17. Water. Continue efficiency programs and use cleaner energy sources to move and treat water.
18. Agriculture. In the near-term, encourage investment in manure digesters and at the five-year Scoping Plan update determine if the program should be made mandatory by 2020.

Table 15 (Scoping Plan Consistency Summary) summarizes the project's consistency with the State Scoping Plan. As summarized, the project will not conflict with any of the provisions of the Scoping Plan and in fact supports seven of the action categories through water conservation and recycling.

Table 15
Scoping Plan Consistency Summary

Action	Supporting Measures	Consistency
Cap-and-Trade Program	--	**Not Applicable.** These programs involve capping emissions from electricity generation, industrial facilities, and broad scoped fuels. Caps do not directly affect this type of project.
Light-Duty Vehicle Standards	T-1	**Not Applicable.** This is a statewide measure establishing vehicle emissions standards.
Energy Efficiency	E-1 E-2 CR-1 CR-2	**Consistent.** The project will not conflict with any State mandated energy efficiency requirements.
Renewables Portfolio Standard	E-3	**Not Applicable.** Establishes the minimum statewide renewable energy mix.
Low Carbon Fuel Standard	T-2	**Not Applicable.** Establishes reduced carbon intensity of transportation fuels.
Regional Transportation-Related Greenhouse Gas Targets	T-3	**Consistent.** The project includes features that reduce greenhouse gas emissions, assisting the region in meeting emissions targets.
Vehicle Efficiency Measures	T-4	**Not Applicable.** Identifies measures such as minimum tire-fuel efficiency, lower friction oil, and reduction in air conditioning use.
Goods Movement	T-5 T-6	**Not applicable.** Identifies measures to improve goods movement efficiencies such as advanced combustion strategies, friction reduction, waste heat recovery, and electrification of accessories. While these measures are yet to be implemented and will be voluntary, the proposed project would not interfere with their implementation.
Million Solar Roofs Program	E-4	**Not Applicable.** Sets goal for use of solar systems throughout the state. While the project currently does not include solar energy generation, the buildings could support solar panels in the future.
Medium- & Heavy-Duty Vehicles	T-7 T-8	**Consistent.** MD and HD trucks and trailers working from the proposed project will be subject to aerodynamic and hybridization requirements as established by ARB; no feature of the project would interfere with implementation of these requirements and programs.
Industrial Emissions	I-1 I-2 I-3	**Not Applicable.** These measures are applicable to large industrial facilities (> 500,000 MTCOE2/YR) and other intensive uses such as refineries.

Action	Supporting Measures	Consistency
	I-4 I-5	
High Speed Rail	T-9	**Not Applicable.** Supports increased mobility choice.
Green Building Strategy	GB-1	**Consistent.** The project includes water and solid waste efficiencies consistent with 2011 CALGREEN requirements.
High Global Warming Potential Gases	H-1 H-2 H-3 H-4 H-5 H-6 H-7	**Not Applicable.** The proposed project is not a substantial source of high GWP emissions and will comply with any future changes in air conditioning, fire protection suppressant, and other requirements.
Recycling and Waste	RW-1 RW-2 RW-3	**Consistent.** The project is subject to a minimum 50 percent recycling standard and will recycle a minimum of 50 percent of construction debris per State and City requirements.
Sustainable Forests	F-1	**Consistent.** The project will increase carbon sequestration by maintaining on-site trees in project landscaping.
Water	W-1 W-2 W-3 W-4 W-5 W-6	**Consistent.** The project includes use of recycled water and low-flow fixtures.
Agriculture	A-1	**Not Applicable.** The project is not an agricultural use.

8 Mitigation Measures

N/A

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14 California Climate Action Team. Biennial Report. April 2010.
15 Southern California Association of Governments. Senate Bill 375 Fact Sheet. http://scag.ca.gov/Documents/SCAG_SB375_Factsheet.pdf [April 2016].
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19 California Building Standards Commission. California Code of Regulations Title 24. California Green Building Standards Code. 2010.
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21 Institute of Transportation Engineers. Trip Generation Manual. 9th ed. September 2012.
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23 South Coast Air Quality Management District. Fact Sheet for Applying CalEEMod to Localized Significance Thresholds.
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25 California Air Pollution Control Officers Association. Quantifying Greenhouse Gas Emissions. August 2010
26 Urban Crossroads. Carson Warehouse Traffic Impact Analysis. April 22, 2016.
27 California Department of Water Resources. Water Budget Workbook. www.water.ca.gov/wateruseefficiency/docs/WaterBudget.xls [April 2016].
28 California Air Resources Board. California GHG Emissions – Forecast (2002-2020). October 2010.
29 California Air Resources Board. Scoping Plan Measures Implementation Timeline. October 2010.

10 Appendix Materials

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AL2 Carson 420K Warehouse

South Coast Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	21.45	1000sqft	0.00	21,450.00	0
Unrefrigerated Warehouse-No Rail	398.55	1000sqft	9.15	398,550.00	0
Other Non-Asphalt Surfaces	109.80	1000sqft	2.52	109,800.00	0
Parking Lot	356.23	1000sqft	8.18	356,225.00	0

1.2 Other Project Characteristics

Urbanization Urban **Wind Speed (m/s)** 2.2 **Precipitation Freq (Days)** 31

Climate Zone 11 **Operational Year** 2019

Utility Company Southern California Edison

CO2 Intensity (lb/MWhr) 630.89 **CH4 Intensity (lb/MWhr)** 0.029 **N2O Intensity (lb/MWhr)** 0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Mezzanine

Construction Phase -

Demolition -

Grading - Net export

Architectural Coating - Use of Low-VOC Paints

Vehicle Trips - Warehouse Trip Rate per SCAQMD Recomendation
No office trip generation per traffic study.

Vechicle Emission Factors - SCAQMD Recomendation

Vechicle Emission Factors - Fleet Mix Per Traffic Study

Vechicle Emission Factors - Fleet Mix Per SCAQMD Recommendation

Water And Wastewater - Include Landscape Water Demand using State Water Budget Worksheet

Solid Waste -

Construction Off-road Equipment Mitigation - Water 3 times daily

Table Name	Column Name	Default Value	New Value
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tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	0.00
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tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
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tblLandUse	LotAcreage	0.49	0.00
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tblVehicleEF	HHD	0.03	0.23
tblVehicleEF	HHD	0.03	0.23
tblVehicleEF	LDA	0.51	0.62
tblVehicleEF	LDA	0.51	0.62
tblVehicleEF	LDA	0.51	0.62

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tblVehicleEF	LDT1	0.06	0.00
tblVehicleEF	LDT1	0.06	0.00
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tblVehicleTrips	CNW_TL	6.90	17.41
tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
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tblWater	OutdoorWaterUseRate	2,336,625.45	0.00
tblWater	OutdoorWaterUseRate	0.00	1,371,963.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2017	0.7249	5.8570	6.7974	0.0127	0.7676	0.2859	1.0535	0.2461	0.2667	0.5128	0.0000	1,054.7258	1,054.7258	0.1222	0.0000	1,057.2923
2018	0.2810	1.9980	2.7777	5.7700e-003	0.2574	0.0959	0.3533	0.0692	0.0899	0.1591	0.0000	464.1411	464.1411	0.0458	0.0000	465.1018
Total	**1.0059**	**7.8550**	**9.5752**	**0.0184**	**1.0249**	**0.3819**	**1.4068**	**0.3154**	**0.3566**	**0.6720**	**0.0000**	**1,518.8669**	**1,518.8669**	**0.1680**	**0.0000**	**1,522.3941**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2017	0.3096	1.7897	6.3537	0.0127	0.6085	0.0295	0.6380	0.1792	0.0277	0.2069	0.0000	1,054.7253	1,054.7253	0.1222	0.0000	1,057.2918
2018	0.1478	0.7679	2.7958	5.7700e-003	0.2574	0.0128	0.2701	0.0692	0.0120	0.0812	0.0000	464.1409	464.1409	0.0458	0.0000	465.1016
Total	**0.4574**	**2.5576**	**9.1495**	**0.0184**	**0.8659**	**0.0423**	**0.9082**	**0.2484**	**0.0396**	**0.2881**	**0.0000**	**1,518.8663**	**1,518.8663**	**0.1680**	**0.0000**	**1,522.3934**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**54.52**	**67.44**	**4.45**	**0.00**	**15.52**	**88.92**	**35.44**	**21.22**	**88.88**	**57.13**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	3.8290	1.1000e-004	0.0114	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	0.0220	0.0220	6.0000e-005	0.0000	0.0232
Energy	3.2200e-003	0.0293	0.0246	1.8000e-004		2.2200e-003	2.2200e-003		2.2200e-003	2.2200e-003	0.0000	708.0272	708.0272	0.0317	7.0100e-003	710.8673
Mobile	0.6580	7.1127	9.0303	0.0334	1.6257	0.1226	1.7483	0.4405	0.1128	0.5533	0.0000	2,680.8495	2,680.8495	0.0443	0.0000	2,681.7787
Waste						0.0000	0.0000		0.0000	0.0000	80.0982	0.0000	80.0982	4.7337	0.0000	179.5052
Water						0.0000	0.0000		0.0000	0.0000	30.4491	361.9897	392.4388	3.1441	0.0773	482.4231
Total	**4.4903**	**7.1421**	**9.0663**	**0.0336**	**1.6257**	**0.1249**	**1.7505**	**0.4405**	**0.1151**	**0.5556**	**110.5473**	**3,750.8884**	**3,861.4357**	**7.9537**	**0.0843**	**4,054.5976**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	3.8290	1.1000e-004	0.0114	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	0.0220	0.0220	6.0000e-005	0.0000	0.0232
Energy	3.2200e-003	0.0293	0.0246	1.8000e-004		2.2200e-003	2.2200e-003		2.2200e-003	2.2200e-003	0.0000	708.0272	708.0272	0.0317	7.0100e-003	710.8673
Mobile	0.6580	7.1127	9.0303	0.0334	1.6257	0.1226	1.7483	0.4405	0.1128	0.5533	0.0000	2,680.8495	2,680.8495	0.0443	0.0000	2,681.7787
Waste						0.0000	0.0000		0.0000	0.0000	80.0982	0.0000	80.0982	4.7337	0.0000	179.5052
Water						0.0000	0.0000		0.0000	0.0000	30.4491	361.9897	392.4388	3.1435	0.0772	482.3745
Total	**4.4903**	**7.1421**	**9.0663**	**0.0336**	**1.6257**	**0.1249**	**1.7505**	**0.4405**	**0.1151**	**0.5556**	**110.5473**	**3,750.8884**	**3,861.4357**	**7.9532**	**0.0842**	**4,054.5490**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.01**	**0.14**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2017	1/27/2017	5	20	
2	Site Preparation	Site Preparation	1/28/2017	2/10/2017	5	10	
3	Grading	Grading	2/11/2017	3/24/2017	5	30	
4	Building Construction	Building Construction	3/25/2017	5/18/2018	5	300	
5	Paving	Paving	5/19/2018	6/15/2018	5	20	
6	Architectural Coating	Architectural Coating	6/16/2018	7/13/2018	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 75

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 810,730; Non-Residential Outdoor: 270,243 (Architectural Coating – sqft)

<u>OffRoad Equipment</u>

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	162	0.38
Demolition	Rubber Tired Dozers	2	8.00	255	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	255	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	162	0.38
Grading	Graders	1	8.00	174	0.41
Grading	Rubber Tired Dozers	1	8.00	255	0.40
Grading	Scrapers	2	8.00	361	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	226	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	125	0.42
Paving	Paving Equipment	2	8.00	130	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	4.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	663.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	370.00	145.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	74.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Demolition - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0400	0.0000	0.0400	6.0600e-003	0.0000	6.0600e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0405	0.4270	0.3389	4.0000e-004		0.0213	0.0213		0.0198	0.0198	0.0000	36.6182	36.6182	0.0101	0.0000	36.8292
Total	**0.0405**	**0.4270**	**0.3389**	**4.0000e-004**	**0.0400**	**0.0213**	**0.0613**	**6.0600e-003**	**0.0198**	**0.0259**	**0.0000**	**36.6182**	**36.6182**	**0.0101**	**0.0000**	**36.8292**

3.2 Demolition - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.0000e-005	5.4000e-004	4.2000e-004	0.0000	3.0000e-005	1.0000e-005	4.0000e-005	1.0000e-005	1.0000e-005	2.0000e-005	0.0000	0.1327	0.1327	0.0000	0.0000	0.1327
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.4000e-004	8.0000e-004	8.2900e-003	2.0000e-005	1.6500e-003	1.0000e-005	1.6600e-003	4.4000e-004	1.0000e-005	4.5000e-004	0.0000	1.4827	1.4827	8.0000e-005	0.0000	1.4843
Total	**5.7000e-004**	**1.3400e-003**	**8.7100e-003**	**2.0000e-005**	**1.6800e-003**	**2.0000e-005**	**1.7000e-003**	**4.5000e-004**	**2.0000e-005**	**4.7000e-004**	**0.0000**	**1.6153**	**1.6153**	**8.0000e-005**	**0.0000**	**1.6169**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0156	0.0000	0.0156	2.3600e-003	0.0000	2.3600e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.7400e-003	0.0205	0.2383	4.0000e-004		6.3000e-004	6.3000e-004		6.3000e-004	6.3000e-004	0.0000	36.6182	36.6182	0.0101	0.0000	36.8291
Total	**4.7400e-003**	**0.0205**	**0.2383**	**4.0000e-004**	**0.0156**	**6.3000e-004**	**0.0162**	**2.3600e-003**	**6.3000e-004**	**2.9900e-003**	**0.0000**	**36.6182**	**36.6182**	**0.0101**	**0.0000**	**36.8291**

3.2 Demolition - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.0000e-005	5.4000e-004	4.2000e-004	0.0000	3.0000e-005	1.0000e-005	4.0000e-005	1.0000e-005	1.0000e-005	2.0000e-005	0.0000	0.1327	0.1327	0.0000	0.0000	0.1327
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.4000e-004	8.0000e-004	8.2900e-003	2.0000e-005	1.6500e-003	1.0000e-005	1.6600e-003	4.4000e-004	1.0000e-005	4.5000e-004	0.0000	1.4827	1.4827	8.0000e-005	0.0000	1.4843
Total	**5.7000e-004**	**1.3400e-003**	**8.7100e-003**	**2.0000e-005**	**1.6800e-003**	**2.0000e-005**	**1.7000e-003**	**4.5000e-004**	**2.0000e-005**	**4.7000e-004**	**0.0000**	**1.6153**	**1.6153**	**8.0000e-005**	**0.0000**	**1.6169**

3.3 Site Preparation - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0242	0.2588	0.1970	2.0000e-004		0.0138	0.0138		0.0127	0.0127	0.0000	18.1577	18.1577	5.5600e-003	0.0000	18.2745
Total	**0.0242**	**0.2588**	**0.1970**	**2.0000e-004**	**0.0903**	**0.0138**	**0.1041**	**0.0497**	**0.0127**	**0.0623**	**0.0000**	**18.1577**	**18.1577**	**5.5600e-003**	**0.0000**	**18.2745**

3.3 Site Preparation - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.2000e-004	4.8000e-004	4.9700e-003	1.0000e-005	9.9000e-004	1.0000e-005	1.0000e-003	2.6000e-004	1.0000e-005	2.7000e-004	0.0000	0.8896	0.8896	5.0000e-005	0.0000	0.8906
Total	**3.2000e-004**	**4.8000e-004**	**4.9700e-003**	**1.0000e-005**	**9.9000e-004**	**1.0000e-005**	**1.0000e-003**	**2.6000e-004**	**1.0000e-005**	**2.7000e-004**	**0.0000**	**0.8896**	**0.8896**	**5.0000e-005**	**0.0000**	**0.8906**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0352	0.0000	0.0352	0.0194	0.0000	0.0194	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.3800e-003	0.0103	0.1062	2.0000e-004		3.2000e-004	3.2000e-004		3.2000e-004	3.2000e-004	0.0000	18.1577	18.1577	5.5600e-003	0.0000	18.2745
Total	**2.3800e-003**	**0.0103**	**0.1062**	**2.0000e-004**	**0.0352**	**3.2000e-004**	**0.0356**	**0.0194**	**3.2000e-004**	**0.0197**	**0.0000**	**18.1577**	**18.1577**	**5.5600e-003**	**0.0000**	**18.2745**

3.3 Site Preparation - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.2000e-004	4.8000e-004	4.9700e-003	1.0000e-005	9.9000e-004	1.0000e-005	1.0000e-003	2.6000e-004	1.0000e-005	2.7000e-004	0.0000	0.8896	0.8896	5.0000e-005	0.0000	0.8906
Total	**3.2000e-004**	**4.8000e-004**	**4.9700e-003**	**1.0000e-005**	**9.9000e-004**	**1.0000e-005**	**1.0000e-003**	**2.6000e-004**	**1.0000e-005**	**2.7000e-004**	**0.0000**	**0.8896**	**0.8896**	**5.0000e-005**	**0.0000**	**0.8906**

3.4 Grading - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1304	0.0000	0.1304	0.0540	0.0000	0.0540	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0915	1.0439	0.7021	9.3000e-004		0.0498	0.0498		0.0458	0.0458	0.0000	85.9109	85.9109	0.0263	0.0000	86.4637
Total	**0.0915**	**1.0439**	**0.7021**	**9.3000e-004**	**0.1304**	**0.0498**	**0.1802**	**0.0540**	**0.0458**	**0.0998**	**0.0000**	**85.9109**	**85.9109**	**0.0263**	**0.0000**	**86.4637**

3.4 Grading - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.6000e-003	0.0887	0.0700	2.4000e-004	5.6800e-003	1.3000e-003	6.9800e-003	1.5600e-003	1.2000e-003	2.7500e-003	0.0000	21.9873	21.9873	1.6000e-004	0.0000	21.9906
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0800e-003	1.5900e-003	0.0166	4.0000e-005	3.2900e-003	3.0000e-005	3.3200e-003	8.7000e-004	2.0000e-005	9.0000e-004	0.0000	2.9653	2.9653	1.5000e-004	0.0000	2.9685
Total	**6.6800e-003**	**0.0903**	**0.0866**	**2.8000e-004**	**8.9700e-003**	**1.3300e-003**	**0.0103**	**2.4300e-003**	**1.2200e-003**	**3.6500e-003**	**0.0000**	**24.9526**	**24.9526**	**3.1000e-004**	**0.0000**	**24.9591**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0509	0.0000	0.0509	0.0211	0.0000	0.0211	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0114	0.0492	0.5217	9.3000e-004		1.5100e-003	1.5100e-003		1.5100e-003	1.5100e-003	0.0000	85.9108	85.9108	0.0263	0.0000	86.4636
Total	**0.0114**	**0.0492**	**0.5217**	**9.3000e-004**	**0.0509**	**1.5100e-003**	**0.0524**	**0.0211**	**1.5100e-003**	**0.0226**	**0.0000**	**85.9108**	**85.9108**	**0.0263**	**0.0000**	**86.4636**

3.4 Grading - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.6000e-003	0.0887	0.0700	2.4000e-004	5.6800e-003	1.3000e-003	6.9800e-003	1.5600e-003	1.2000e-003	2.7500e-003	0.0000	21.9873	21.9873	1.6000e-004	0.0000	21.9906
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0800e-003	1.5900e-003	0.0166	4.0000e-005	3.2900e-003	3.0000e-005	3.3200e-003	8.7000e-004	2.0000e-005	9.0000e-004	0.0000	2.9653	2.9653	1.5000e-004	0.0000	2.9685
Total	**6.6800e-003**	**0.0903**	**0.0866**	**2.8000e-004**	**8.9700e-003**	**1.3300e-003**	**0.0103**	**2.4300e-003**	**1.2200e-003**	**3.6500e-003**	**0.0000**	**24.9526**	**24.9526**	**3.1000e-004**	**0.0000**	**24.9591**

3.5 Building Construction - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.3102	2.6406	1.8129	2.6800e-003		0.1781	0.1781		0.1673	0.1673	0.0000	239.4791	239.4791	0.0589	0.0000	240.7169
Total	**0.3102**	**2.6406**	**1.8129**	**2.6800e-003**		**0.1781**	**0.1781**		**0.1673**	**0.1673**	**0.0000**	**239.4791**	**239.4791**	**0.0589**	**0.0000**	**240.7169**

3.5 Building Construction - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1180	1.1980	1.6014	3.1400e-003	0.0892	0.0183	0.1076	0.0255	0.0169	0.0423	0.0000	281.3807	281.3807	2.0200e-003	0.0000	281.4231
Worker	0.1329	0.1967	2.0448	4.9900e-003	0.4059	3.3300e-003	0.4093	0.1078	3.0700e-003	0.1109	0.0000	365.7216	365.7216	0.0189	0.0000	366.1183
Total	**0.2509**	**1.3947**	**3.6462**	**8.1300e-003**	**0.4952**	**0.0217**	**0.5168**	**0.1333**	**0.0199**	**0.1532**	**0.0000**	**647.1024**	**647.1024**	**0.0209**	**0.0000**	**647.5414**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0327	0.2229	1.7411	2.6800e-003		4.0600e-003	4.0600e-003		4.0600e-003	4.0600e-003	0.0000	239.4788	239.4788	0.0589	0.0000	240.7166
Total	**0.0327**	**0.2229**	**1.7411**	**2.6800e-003**		**4.0600e-003**	**4.0600e-003**		**4.0600e-003**	**4.0600e-003**	**0.0000**	**239.4788**	**239.4788**	**0.0589**	**0.0000**	**240.7166**

3.5 Building Construction - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.1180	1.1980	1.6014	3.1400e-003	0.0892	0.0183	0.1076	0.0255	0.0169	0.0423	0.0000	281.3807	281.3807	2.0200e-003	0.0000	281.4231
Worker	0.1329	0.1967	2.0448	4.9900e-003	0.4059	3.3300e-003	0.4093	0.1078	3.0700e-003	0.1109	0.0000	365.7216	365.7216	0.0189	0.0000	366.1183
Total	**0.2509**	**1.3947**	**3.6462**	**8.1300e-003**	**0.4952**	**0.0217**	**0.5168**	**0.1333**	**0.0199**	**0.1532**	**0.0000**	**647.1024**	**647.1024**	**0.0209**	**0.0000**	**647.5414**

3.5 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1334	1.1630	0.8766	1.3400e-003		0.0747	0.0747		0.0702	0.0702	0.0000	118.3848	118.3848	0.0290	0.0000	118.9932
Total	**0.1334**	**1.1630**	**0.8766**	**1.3400e-003**		**0.0747**	**0.0747**		**0.0702**	**0.0702**	**0.0000**	**118.3848**	**118.3848**	**0.0290**	**0.0000**	**118.9932**

3.5 Building Construction - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0552	0.5498	0.7671	1.5700e-003	0.0446	8.6300e-003	0.0533	0.0127	7.9400e-003	0.0207	0.0000	138.3301	138.3301	1.0000e-003	0.0000	138.3512
Worker	0.0597	0.0892	0.9260	2.4900e-003	0.2030	1.6200e-003	0.2046	0.0539	1.5000e-003	0.0554	0.0000	176.0355	176.0355	8.7700e-003	0.0000	176.2196
Total	**0.1149**	**0.6390**	**1.6931**	**4.0600e-003**	**0.2476**	**0.0103**	**0.2579**	**0.0666**	**9.4400e-003**	**0.0761**	**0.0000**	**314.3655**	**314.3655**	**9.7700e-003**	**0.0000**	**314.5707**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0163	0.1114	0.8706	1.3400e-003		2.0300e-003	2.0300e-003		2.0300e-003	2.0300e-003	0.0000	118.3847	118.3847	0.0290	0.0000	118.9931
Total	**0.0163**	**0.1114**	**0.8706**	**1.3400e-003**		**2.0300e-003**	**2.0300e-003**		**2.0300e-003**	**2.0300e-003**	**0.0000**	**118.3847**	**118.3847**	**0.0290**	**0.0000**	**118.9931**

3.5 Building Construction - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0552	0.5498	0.7671	1.5700e-003	0.0446	8.6300e-003	0.0533	0.0127	7.9400e-003	0.0207	0.0000	138.3301	138.3301	1.0000e-003	0.0000	138.3512
Worker	0.0597	0.0892	0.9260	2.4900e-003	0.2030	1.6200e-003	0.2046	0.0539	1.5000e-003	0.0554	0.0000	176.0355	176.0355	8.7700e-003	0.0000	176.2196
Total	**0.1149**	**0.6390**	**1.6931**	**4.0600e-003**	**0.2476**	**0.0103**	**0.2579**	**0.0666**	**9.4400e-003**	**0.0761**	**0.0000**	**314.3655**	**314.3655**	**9.7700e-003**	**0.0000**	**314.5707**

3.6 Paving - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0161	0.1716	0.1449	2.2000e-004		9.3900e-003	9.3900e-003		8.6400e-003	8.6400e-003	0.0000	20.3687	20.3687	6.3400e-003	0.0000	20.5019
Paving	0.0107					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0268**	**0.1716**	**0.1449**	**2.2000e-004**		**9.3900e-003**	**9.3900e-003**		**8.6400e-003**	**8.6400e-003**	**0.0000**	**20.3687**	**20.3687**	**6.3400e-003**	**0.0000**	**20.5019**

3.6 Paving - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.8000e-004	7.2000e-004	7.5100e-003	2.0000e-005	1.6500e-003	1.0000e-005	1.6600e-003	4.4000e-004	1.0000e-005	4.5000e-004	0.0000	1.4273	1.4273	7.0000e-005	0.0000	1.4288
Total	**4.8000e-004**	**7.2000e-004**	**7.5100e-003**	**2.0000e-005**	**1.6500e-003**	**1.0000e-005**	**1.6600e-003**	**4.4000e-004**	**1.0000e-005**	**4.5000e-004**	**0.0000**	**1.4273**	**1.4273**	**7.0000e-005**	**0.0000**	**1.4288**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.7500e-003	0.0119	0.1693	2.2000e-004		3.7000e-004	3.7000e-004		3.7000e-004	3.7000e-004	0.0000	20.3687	20.3687	6.3400e-003	0.0000	20.5019
Paving	0.0107					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0135**	**0.0119**	**0.1693**	**2.2000e-004**		**3.7000e-004**	**3.7000e-004**		**3.7000e-004**	**3.7000e-004**	**0.0000**	**20.3687**	**20.3687**	**6.3400e-003**	**0.0000**	**20.5019**

3.6 Paving - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.8000e-004	7.2000e-004	7.5100e-003	2.0000e-005	1.6500e-003	1.0000e-005	1.6600e-003	4.4000e-004	1.0000e-005	4.5000e-004	0.0000	1.4273	1.4273	7.0000e-005	0.0000	1.4288
Total	**4.8000e-004**	**7.2000e-004**	**7.5100e-003**	**2.0000e-005**	**1.6500e-003**	**1.0000e-005**	**1.6600e-003**	**4.4000e-004**	**1.0000e-005**	**4.5000e-004**	**0.0000**	**1.4273**	**1.4273**	**7.0000e-005**	**0.0000**	**1.4288**

3.7 Architectural Coating - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.9900e-003	0.0201	0.0185	3.0000e-005		1.5100e-003	1.5100e-003		1.5100e-003	1.5100e-003	0.0000	2.5533	2.5533	2.4000e-004	0.0000	2.5584
Total	**2.9900e-003**	**0.0201**	**0.0185**	**3.0000e-005**		**1.5100e-003**	**1.5100e-003**		**1.5100e-003**	**1.5100e-003**	**0.0000**	**2.5533**	**2.5533**	**2.4000e-004**	**0.0000**	**2.5584**

3.7 Architectural Coating - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.3900e-003	3.5700e-003	0.0370	1.0000e-004	8.1200e-003	6.0000e-005	8.1800e-003	2.1600e-003	6.0000e-005	2.2200e-003	0.0000	7.0414	7.0414	3.5000e-004	0.0000	7.0488
Total	**2.3900e-003**	**3.5700e-003**	**0.0370**	**1.0000e-004**	**8.1200e-003**	**6.0000e-005**	**8.1800e-003**	**2.1600e-003**	**6.0000e-005**	**2.2200e-003**	**0.0000**	**7.0414**	**7.0414**	**3.5000e-004**	**0.0000**	**7.0488**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.0000e-004	1.2900e-003	0.0183	3.0000e-005		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	2.5533	2.5533	2.4000e-004	0.0000	2.5584
Total	**3.0000e-004**	**1.2900e-003**	**0.0183**	**3.0000e-005**		**4.0000e-005**	**4.0000e-005**		**4.0000e-005**	**4.0000e-005**	**0.0000**	**2.5533**	**2.5533**	**2.4000e-004**	**0.0000**	**2.5584**

3.7 Architectural Coating - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.3900e-003	3.5700e-003	0.0370	1.0000e-004	8.1200e-003	6.0000e-005	8.1800e-003	2.1600e-003	6.0000e-005	2.2200e-003	0.0000	7.0414	7.0414	3.5000e-004	0.0000	7.0488
Total	**2.3900e-003**	**3.5700e-003**	**0.0370**	**1.0000e-004**	**8.1200e-003**	**6.0000e-005**	**8.1800e-003**	**2.1600e-003**	**6.0000e-005**	**2.2200e-003**	**0.0000**	**7.0414**	**7.0414**	**3.5000e-004**	**0.0000**	**7.0488**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.6580	7.1127	9.0303	0.0334	1.6257	0.1226	1.7483	0.4405	0.1128	0.5533	0.0000	2,680.8495	2,680.8495	0.0443	0.0000	2,681.7787
Unmitigated	0.6580	7.1127	9.0303	0.0334	1.6257	0.1226	1.7483	0.4405	0.1128	0.5533	0.0000	2,680.8495	2,680.8495	0.0443	0.0000	2,681.7787

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Office Building	0.00	0.00	0.00		
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Unrefrigerated Warehouse-No Rail	669.56	669.56	669.56	4,126,713	4,126,713
Total	669.56	669.56	669.56	4,126,713	4,126,713

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Office Building	16.60	8.40	6.90	33.00	48.00	19.00	77	19	4
Other Non-Asphalt Surfaces	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Unrefrigerated Warehouse-No Rail	16.60	0.00	17.41	59.00	0.00	41.00	100	0	0

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.618000	0.000000	0.000000	0.000000	0.064600	0.000000	0.087000	0.230400	0.000000	0.000000	0.000000	0.000000	0.000000

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	676.1621	676.1621	0.0311	6.4300e-003	678.8083
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	676.1621	676.1621	0.0311	6.4300e-003	678.8083
NaturalGas Mitigated	3.2200e-003	0.0293	0.0246	1.8000e-004		2.2200e-003	2.2200e-003		2.2200e-003	2.2200e-003	0.0000	31.8651	31.8651	6.1000e-004	5.8000e-004	32.0590
NaturalGas Unmitigated	3.2200e-003	0.0293	0.0246	1.8000e-004		2.2200e-003	2.2200e-003		2.2200e-003	2.2200e-003	0.0000	31.8651	31.8651	6.1000e-004	5.8000e-004	32.0590

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	362681	1.9600e-003	0.0178	0.0149	1.1000e-004		1.3500e-003	1.3500e-003		1.3500e-003	1.3500e-003	0.0000	19.3540	19.3540	3.7000e-004	3.5000e-004	19.4718
General Office Building	234449	1.2600e-003	0.0115	9.6500e-003	7.0000e-005		8.7000e-004	8.7000e-004		8.7000e-004	8.7000e-004	0.0000	12.5111	12.5111	2.4000e-004	2.3000e-004	12.5872
Total		**3.2200e-003**	**0.0293**	**0.0246**	**1.8000e-004**		**2.2200e-003**	**2.2200e-003**		**2.2200e-003**	**2.2200e-003**	**0.0000**	**31.8651**	**31.8651**	**6.1000e-004**	**5.8000e-004**	**32.0590**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	362681	1.9600e-003	0.0178	0.0149	1.1000e-004		1.3500e-003	1.3500e-003		1.3500e-003	1.3500e-003	0.0000	19.3540	19.3540	3.7000e-004	3.5000e-004	19.4718
General Office Building	234449	1.2600e-003	0.0115	9.6500e-003	7.0000e-005		8.7000e-004	8.7000e-004		8.7000e-004	8.7000e-004	0.0000	12.5111	12.5111	2.4000e-004	2.3000e-004	12.5872
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**3.2200e-003**	**0.0293**	**0.0246**	**1.8000e-004**		**2.2200e-003**	**2.2200e-003**		**2.2200e-003**	**2.2200e-003**	**0.0000**	**31.8651**	**31.8651**	**6.1000e-004**	**5.8000e-004**	**32.0590**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Office Building	311669	89.1892	4.1000e-003	8.5000e-004	89.5383
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	313478	89.7070	4.1200e-003	8.5000e-004	90.0581
Unrefrigerated Warehouse-No Rail	1.73768e +006	497.2659	0.0229	4.7300e-003	499.2120
Total		**676.1621**	**0.0311**	**6.4300e-003**	**678.8083**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Office Building	311669	89.1892	4.1000e-003	8.5000e-004	89.5383
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	313478	89.7070	4.1200e-003	8.5000e-004	90.0581
Unrefrigerated Warehouse-No Rail	1.73768e+006	497.2659	0.0229	4.7300e-003	499.2120
Total		**676.1621**	**0.0311**	**6.4300e-003**	**678.8083**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	3.8290	1.1000e-004	0.0114	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	0.0220	0.0220	6.0000e-005	0.0000	0.0232
Unmitigated	3.8290	1.1000e-004	0.0114	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	0.0220	0.0220	6.0000e-005	0.0000	0.0232

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.6263					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	3.2017					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0800e-003	1.1000e-004	0.0114	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	0.0220	0.0220	6.0000e-005	0.0000	0.0232
Total	**3.8290**	**1.1000e-004**	**0.0114**	**0.0000**		**4.0000e-005**	**4.0000e-005**		**4.0000e-005**	**4.0000e-005**	**0.0000**	**0.0220**	**0.0220**	**6.0000e-005**	**0.0000**	**0.0232**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.6263					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	3.2017					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0800e-003	1.1000e-004	0.0114	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	0.0220	0.0220	6.0000e-005	0.0000	0.0232
Total	**3.8290**	**1.1000e-004**	**0.0114**	**0.0000**		**4.0000e-005**	**4.0000e-005**		**4.0000e-005**	**4.0000e-005**	**0.0000**	**0.0220**	**0.0220**	**6.0000e-005**	**0.0000**	**0.0232**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	392.4388	3.1435	0.0772	482.3745
Unmitigated	392.4388	3.1441	0.0773	482.4231

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Office Building	3.81239 / 0	15.4151	0.1249	3.0700e-003	18.9888
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	92.1647 / 1.37196	377.0236	3.0192	0.0742	463.4343
Total		**392.4388**	**3.1441**	**0.0773**	**482.4231**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Office Building	3.81239 / 0	15.4151	0.1249	3.0600e-003	18.9869
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	92.1647 / 1.37196	377.0236	3.0186	0.0741	463.3876
Total		**392.4388**	**3.1435**	**0.0772**	**482.3745**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	80.0982	4.7337	0.0000	179.5052
Unmitigated	80.0982	4.7337	0.0000	179.5052

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Office Building	19.95	4.0497	0.2393	0.0000	9.0756
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	374.64	76.0485	4.4943	0.0000	170.4297
Total		**80.0982**	**4.7337**	**0.0000**	**179.5052**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Office Building	19.95	4.0497	0.2393	0.0000	9.0756
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	374.64	76.0485	4.4943	0.0000	170.4297
Total		**80.0982**	**4.7337**	**0.0000**	**179.5052**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Vegetation

AL2 Carson 420K Warehouse

South Coast Air Basin, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	21.45	1000sqft	0.00	21,450.00	0
Unrefrigerated Warehouse-No Rail	398.55	1000sqft	9.15	398,550.00	0
Other Non-Asphalt Surfaces	109.80	1000sqft	2.52	109,800.00	0
Parking Lot	356.23	1000sqft	8.18	356,225.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	11			**Operational Year**	2019
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	630.89	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Mezzanine

Construction Phase -

Demolition -

Grading - Net export

Architectural Coating - Use of Low-VOC Paints

Vehicle Trips - Warehouse Trip Rate per SCAQMD Recomendation
No office trip generation per traffic study.

Vechicle Emission Factors - SCAQMD Recomendation

Vechicle Emission Factors - Fleet Mix Per Traffic Study

Vechicle Emission Factors - Fleet Mix Per SCAQMD Recommendation

Water And Wastewater - Include Landscape Water Demand using State Water Budget Worksheet

Solid Waste -

Construction Off-road Equipment Mitigation - Water 3 times daily

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	0.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	0.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	9.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblGrading	MaterialExported	0.00	5,300.00
tblLandUse	LandUseSquareFeet	356,230.00	356,225.00
tblLandUse	LotAcreage	0.49	0.00
tblProjectCharacteristics	OperationalYear	2014	2019
tblTripsAndVMT	HaulingTripNumber	370.00	4.00
tblVehicleEF	HHD	0.03	0.23
tblVehicleEF	HHD	0.03	0.23
tblVehicleEF	HHD	0.03	0.23
tblVehicleEF	LDA	0.51	0.62
tblVehicleEF	LDA	0.51	0.62
tblVehicleEF	LDA	0.51	0.62

tblVehicleEF	LDT1	0.06	0.00
tblVehicleEF	LDT1	0.06	0.00
tblVehicleEF	LDT1	0.06	0.00
tblVehicleEF	LDT2	0.18	0.00
tblVehicleEF	LDT2	0.18	0.00
tblVehicleEF	LDT2	0.18	0.00
tblVehicleEF	LHD1	0.04	0.06
tblVehicleEF	LHD1	0.04	0.06
tblVehicleEF	LHD1	0.04	0.06
tblVehicleEF	LHD2	6.6660e-003	0.00
tblVehicleEF	LHD2	6.6660e-003	0.00
tblVehicleEF	LHD2	6.6660e-003	0.00
tblVehicleEF	MCY	4.3770e-003	0.00
tblVehicleEF	MCY	4.3770e-003	0.00
tblVehicleEF	MCY	4.3770e-003	0.00
tblVehicleEF	MDV	0.14	0.00
tblVehicleEF	MDV	0.14	0.00
tblVehicleEF	MDV	0.14	0.00
tblVehicleEF	MH	2.1280e-003	0.00
tblVehicleEF	MH	2.1280e-003	0.00
tblVehicleEF	MH	2.1280e-003	0.00
tblVehicleEF	MHD	0.02	0.09
tblVehicleEF	MHD	0.02	0.09
tblVehicleEF	MHD	0.02	0.09
tblVehicleEF	OBUS	1.9400e-003	0.00
tblVehicleEF	OBUS	1.9400e-003	0.00
tblVehicleEF	OBUS	1.9400e-003	0.00
tblVehicleEF	SBUS	5.8200e-004	0.00

tblVehicleEF	SBUS	5.8200e-004	0.00
tblVehicleEF	SBUS	5.8200e-004	0.00
tblVehicleEF	UBUS	2.4960e-003	0.00
tblVehicleEF	UBUS	2.4960e-003	0.00
tblVehicleEF	UBUS	2.4960e-003	0.00
tblVehicleTrips	CC_TL	8.40	0.00
tblVehicleTrips	CNW_TL	6.90	17.41
tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	92.00	100.00
tblVehicleTrips	ST_TR	2.37	0.00
tblVehicleTrips	ST_TR	2.59	1.68
tblVehicleTrips	SU_TR	0.98	0.00
tblVehicleTrips	SU_TR	2.59	1.68
tblVehicleTrips	WD_TR	11.01	0.00
tblVehicleTrips	WD_TR	2.59	1.68
tblWater	OutdoorWaterUseRate	2,336,625.45	0.00
tblWater	OutdoorWaterUseRate	0.00	1,371,963.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	6.5341	75.2991	53.4518	0.1107	18.2675	3.4056	21.0233	9.9840	3.1331	12.5194	0.0000	9,985.4920	9,985.4920	1.9572	0.0000	10,026.5934
2018	4.9586	35.3684	50.2273	0.1106	5.0422	1.6986	6.7409	1.3550	1.5929	2.9479	0.0000	9,745.9200	9,745.9200	0.8538	0.0000	9,763.8497
Total	**11.4927**	**110.6675**	**103.6791**	**0.2214**	**23.3097**	**5.1042**	**27.7642**	**11.3390**	**4.7261**	**15.4674**	**0.0000**	**19,731.4120**	**19,731.4120**	**2.8110**	**0.0000**	**19,790.4432**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	2.8215	15.4346	52.7337	0.1107	7.2470	0.2563	7.3121	3.9263	0.2391	3.9913	0.0000	9,985.4920	9,985.4920	1.9572	0.0000	10,026.5934
2018	2.6164	14.3364	50.1056	0.1106	5.0422	0.2450	5.2872	1.3550	0.2288	1.5838	0.0000	9,745.9200	9,745.9200	0.8538	0.0000	9,763.8497
Total	**5.4379**	**29.7710**	**102.8393**	**0.2214**	**12.2893**	**0.5013**	**12.5993**	**5.2813**	**0.4679**	**5.5750**	**0.0000**	**19,731.4120**	**19,731.4120**	**2.8110**	**0.0000**	**19,790.4432**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**52.68**	**73.10**	**0.81**	**0.00**	**47.28**	**90.18**	**54.62**	**53.42**	**90.10**	**63.96**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	20.9837	8.5000e-004	0.0914	1.0000e-005		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004		0.1939	0.1939	5.3000e-004		0.2050
Energy	0.0176	0.1604	0.1347	9.6000e-004		0.0122	0.0122		0.0122	0.0122		192.4670	192.4670	3.6900e-003	3.5300e-003	193.6384
Mobile	3.5545	37.0625	46.5174	0.1866	9.0914	0.6736	9.7650	2.4591	0.6199	3.0791		16,479.8936	16,479.8936	0.2678		16,485.5167
Total	**24.5558**	**37.2238**	**46.7435**	**0.1875**	**9.0914**	**0.6861**	**9.7775**	**2.4591**	**0.6325**	**3.0916**		**16,672.5545**	**16,672.5545**	**0.2720**	**3.5300e-003**	**16,679.3600**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	20.9837	8.5000e-004	0.0914	1.0000e-005		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004		0.1939	0.1939	5.3000e-004		0.2050
Energy	0.0176	0.1604	0.1347	9.6000e-004		0.0122	0.0122		0.0122	0.0122		192.4670	192.4670	3.6900e-003	3.5300e-003	193.6384
Mobile	3.5545	37.0625	46.5174	0.1866	9.0914	0.6736	9.7650	2.4591	0.6199	3.0791		16,479.8936	16,479.8936	0.2678		16,485.5167
Total	**24.5558**	**37.2238**	**46.7435**	**0.1875**	**9.0914**	**0.6861**	**9.7775**	**2.4591**	**0.6325**	**3.0916**		**16,672.5545**	**16,672.5545**	**0.2720**	**3.5300e-003**	**16,679.3600**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2017	1/27/2017	5	20	
2	Site Preparation	Site Preparation	1/28/2017	2/10/2017	5	10	
3	Grading	Grading	2/11/2017	3/24/2017	5	30	
4	Building Construction	Building Construction	3/25/2017	5/18/2018	5	300	
5	Paving	Paving	5/19/2018	6/15/2018	5	20	
6	Architectural Coating	Architectural Coating	6/16/2018	7/13/2018	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 75

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 810,730; Non-Residential Outdoor: 270,243 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	162	0.38
Demolition	Rubber Tired Dozers	2	8.00	255	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	255	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	162	0.38
Grading	Graders	1	8.00	174	0.41
Grading	Rubber Tired Dozers	1	8.00	255	0.40
Grading	Scrapers	2	8.00	361	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	226	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	125	0.42
Paving	Paving Equipment	2	8.00	130	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	4.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	663.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	370.00	145.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	74.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Demolition - 2017

<u>Unmitigated Construction On-Site</u>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.0016	0.0000	4.0016	0.6059	0.0000	0.6059			0.0000			0.0000
Off-Road	4.0482	42.6971	33.8934	0.0399		2.1252	2.1252		1.9797	1.9797		4,036.467 4	4,036.467 4	1.1073		4,059.721 1
Total	**4.0482**	**42.6971**	**33.8934**	**0.0399**	**4.0016**	**2.1252**	**6.1268**	**0.6059**	**1.9797**	**2.5856**		**4,036.467 4**	**4,036.467 4**	**1.1073**		**4,059.721 1**

3.2 Demolition - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.2600e-003	0.0508	0.0373	1.5000e-004	3.4800e-003	7.8000e-004	4.2700e-003	9.5000e-004	7.2000e-004	1.6800e-003		14.6371	14.6371	1.0000e-004		14.6393
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0561	0.0705	0.8806	2.1200e-003	0.1677	1.3500e-003	0.1690	0.0445	1.2400e-003	0.0457		171.6086	171.6086	8.4400e-003		171.7859
Total	**0.0594**	**0.1213**	**0.9179**	**2.2700e-003**	**0.1711**	**2.1300e-003**	**0.1733**	**0.0454**	**1.9600e-003**	**0.0474**		**186.2458**	**186.2458**	**8.5400e-003**		**186.4252**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.5606	0.0000	1.5606	0.2363	0.0000	0.2363			0.0000			0.0000
Off-Road	0.4739	2.0535	23.8257	0.0399		0.0632	0.0632		0.0632	0.0632	0.0000	4,036.4674	4,036.4674	1.1073		4,059.7211
Total	**0.4739**	**2.0535**	**23.8257**	**0.0399**	**1.5606**	**0.0632**	**1.6238**	**0.2363**	**0.0632**	**0.2995**	**0.0000**	**4,036.4674**	**4,036.4674**	**1.1073**		**4,059.7211**

3.2 Demolition - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.2600e-003	0.0508	0.0373	1.5000e-004	3.4800e-003	7.8000e-004	4.2700e-003	9.5000e-004	7.2000e-004	1.6800e-003		14.6371	14.6371	1.0000e-004		14.6393
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0561	0.0705	0.8806	2.1200e-003	0.1677	1.3500e-003	0.1690	0.0445	1.2400e-003	0.0457		171.6086	171.6086	8.4400e-003		171.7859
Total	**0.0594**	**0.1213**	**0.9179**	**2.2700e-003**	**0.1711**	**2.1300e-003**	**0.1733**	**0.0454**	**1.9600e-003**	**0.0474**		**186.2458**	**186.2458**	**8.5400e-003**		**186.4252**

3.3 Site Preparation - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.8382	51.7535	39.3970	0.0391		2.7542	2.7542		2.5339	2.5339		4,003.0859	4,003.0859	1.2265		4,028.8432
Total	**4.8382**	**51.7535**	**39.3970**	**0.0391**	**18.0663**	**2.7542**	**20.8205**	**9.9307**	**2.5339**	**12.4646**		**4,003.0859**	**4,003.0859**	**1.2265**		**4,028.8432**

3.3 Site Preparation - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0674	0.0846	1.0567	2.5500e-003	0.2012	1.6200e-003	0.2028	0.0534	1.4900e-003	0.0549		205.9304	205.9304	0.0101		206.1431
Total	**0.0674**	**0.0846**	**1.0567**	**2.5500e-003**	**0.2012**	**1.6200e-003**	**0.2028**	**0.0534**	**1.4900e-003**	**0.0549**		**205.9304**	**205.9304**	**0.0101**		**206.1431**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.0458	0.0000	7.0458	3.8730	0.0000	3.8730			0.0000			0.0000
Off-Road	0.4757	2.0615	21.2415	0.0391		0.0634	0.0634		0.0634	0.0634	0.0000	4,003.0859	4,003.0859	1.2265		4,028.8432
Total	**0.4757**	**2.0615**	**21.2415**	**0.0391**	**7.0458**	**0.0634**	**7.1093**	**3.8730**	**0.0634**	**3.9364**	**0.0000**	**4,003.0859**	**4,003.0859**	**1.2265**		**4,028.8432**

3.3 Site Preparation - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0674	0.0846	1.0567	2.5500e-003	0.2012	1.6200e-003	0.2028	0.0534	1.4900e-003	0.0549		205.9304	205.9304	0.0101		206.1431
Total	**0.0674**	**0.0846**	**1.0567**	**2.5500e-003**	**0.2012**	**1.6200e-003**	**0.2028**	**0.0534**	**1.4900e-003**	**0.0549**		**205.9304**	**205.9304**	**0.0101**		**206.1431**

3.4 Grading - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.6933	0.0000	8.6933	3.5995	0.0000	3.5995			0.0000			0.0000
Off-Road	6.0991	69.5920	46.8050	0.0617		3.3172	3.3172		3.0518	3.0518		6,313.3690	6,313.3690	1.9344		6,353.9915
Total	**6.0991**	**69.5920**	**46.8050**	**0.0617**	**8.6933**	**3.3172**	**12.0105**	**3.5995**	**3.0518**	**6.6513**		**6,313.3690**	**6,313.3690**	**1.9344**		**6,353.9915**

3.4 Grading - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.3602	5.6131	4.1248	0.0163	0.3851	0.0866	0.4717	0.1054	0.0797	0.1851		1,617.4038	1,617.4038	0.0116		1,617.6464
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0749	0.0940	1.1741	2.8300e-003	0.2236	1.8000e-003	0.2254	0.0593	1.6600e-003	0.0610		228.8115	228.8115	0.0113		229.0479
Total	**0.4350**	**5.7071**	**5.2989**	**0.0191**	**0.6086**	**0.0884**	**0.6970**	**0.1647**	**0.0813**	**0.2461**		**1,846.2154**	**1,846.2154**	**0.0228**		**1,846.6943**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.3904	0.0000	3.3904	1.4038	0.0000	1.4038			0.0000			0.0000
Off-Road	0.7564	3.2778	34.7787	0.0617		0.1009	0.1009		0.1009	0.1009	0.0000	6,313.3690	6,313.3690	1.9344		6,353.9915
Total	**0.7564**	**3.2778**	**34.7787**	**0.0617**	**3.3904**	**0.1009**	**3.4913**	**1.4038**	**0.1009**	**1.5047**	**0.0000**	**6,313.3690**	**6,313.3690**	**1.9344**		**6,353.9915**

3.4 Grading - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.3602	5.6131	4.1248	0.0163	0.3851	0.0866	0.4717	0.1054	0.0797	0.1851		1,617.4038	1,617.4038	0.0116		1,617.6464
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0749	0.0940	1.1741	2.8300e-003	0.2236	1.8000e-003	0.2254	0.0593	1.6600e-003	0.0610		228.8115	228.8115	0.0113		229.0479
Total	**0.4350**	**5.7071**	**5.2989**	**0.0191**	**0.6086**	**0.0884**	**0.6970**	**0.1647**	**0.0813**	**0.2461**		**1,846.2154**	**1,846.2154**	**0.0228**		**1,846.6943**

3.5 Building Construction - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.1024	26.4057	18.1291	0.0268		1.7812	1.7812		1.6730	1.6730		2,639.8053	2,639.8053	0.6497		2,653.4490
Total	**3.1024**	**26.4057**	**18.1291**	**0.0268**		**1.7812**	**1.7812**		**1.6730**	**1.6730**		**2,639.8053**	**2,639.8053**	**0.6497**		**2,653.4490**

3.5 Building Construction - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.1103	11.4661	13.6024	0.0315	0.9065	0.1825	1.0889	0.2582	0.1678	0.4260		3,112.673 8	3,112.673 8	0.0220		3,113.134 8
Worker	1.3847	1.7396	21.7203	0.0524	4.1357	0.0333	4.1690	1.0968	0.0307	1.1275		4,233.012 9	4,233.012 9	0.2082		4,237.385 9
Total	**2.4950**	**13.2057**	**35.3227**	**0.0839**	**5.0422**	**0.2157**	**5.2579**	**1.3550**	**0.1985**	**1.5535**		**7,345.686 7**	**7,345.686 7**	**0.2302**		**7,350.520 7**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3265	2.2289	17.4110	0.0268		0.0406	0.0406		0.0406	0.0406	0.0000	2,639.805 3	2,639.805 3	0.6497		2,653.449 0
Total	**0.3265**	**2.2289**	**17.4110**	**0.0268**		**0.0406**	**0.0406**		**0.0406**	**0.0406**	**0.0000**	**2,639.805 3**	**2,639.805 3**	**0.6497**		**2,653.449 0**

3.5 Building Construction - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.1103	11.4661	13.6024	0.0315	0.9065	0.1825	1.0889	0.2582	0.1678	0.4260		3,112.673 8	3,112.673 8	0.0220		3,113.134 8
Worker	1.3847	1.7396	21.7203	0.0524	4.1357	0.0333	4.1690	1.0968	0.0307	1.1275		4,233.012 9	4,233.012 9	0.2082		4,237.385 9
Total	**2.4950**	**13.2057**	**35.3227**	**0.0839**	**5.0422**	**0.2157**	**5.2579**	**1.3550**	**0.1985**	**1.5535**		**7,345.686 7**	**7,345.686 7**	**0.2302**		**7,350.520 7**

3.5 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6687	23.2608	17.5327	0.0268		1.4943	1.4943		1.4048	1.4048		2,609.939 0	2,609.939 0	0.6387		2,623.351 7
Total	**2.6687**	**23.2608**	**17.5327**	**0.0268**		**1.4943**	**1.4943**		**1.4048**	**1.4048**		**2,609.939 0**	**2,609.939 0**	**0.6387**		**2,623.351 7**

3.5 Building Construction - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.0415	10.5293	12.9596	0.0315	0.9065	0.1720	1.0785	0.2582	0.1582	0.4164		3,060.477 0	3,060.477 0	0.0218		3,060.935 2
Worker	1.2484	1.5782	19.7350	0.0524	4.1357	0.0324	4.1681	1.0968	0.0300	1.1268		4,075.504 0	4,075.504 0	0.1933		4,079.562 8
Total	**2.2899**	**12.1075**	**32.6946**	**0.0838**	**5.0422**	**0.2044**	**5.2466**	**1.3550**	**0.1882**	**1.5432**		**7,135.981 0**	**7,135.981 0**	**0.2151**		**7,140.498 0**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3265	2.2289	17.4110	0.0268		0.0406	0.0406		0.0406	0.0406	0.0000	2,609.938 9	2,609.938 9	0.6387		2,623.351 7
Total	**0.3265**	**2.2289**	**17.4110**	**0.0268**		**0.0406**	**0.0406**		**0.0406**	**0.0406**	**0.0000**	**2,609.938 9**	**2,609.938 9**	**0.6387**		**2,623.351 7**

3.5 Building Construction - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.0415	10.5293	12.9596	0.0315	0.9065	0.1720	1.0785	0.2582	0.1582	0.4164		3,060.4770	3,060.4770	0.0218		3,060.9352
Worker	1.2484	1.5782	19.7350	0.0524	4.1357	0.0324	4.1681	1.0968	0.0300	1.1268		4,075.5040	4,075.5040	0.1933		4,079.5628
Total	**2.2899**	**12.1075**	**32.6946**	**0.0838**	**5.0422**	**0.2044**	**5.2466**	**1.3550**	**0.1882**	**1.5432**		**7,135.9810**	**7,135.9810**	**0.2151**		**7,140.4980**

3.6 Paving - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.6114	17.1628	14.4944	0.0223		0.9386	0.9386		0.8635	0.8635		2,245.2695	2,245.2695	0.6990		2,259.9481
Paving	1.0716					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**2.6830**	**17.1628**	**14.4944**	**0.0223**		**0.9386**	**0.9386**		**0.8635**	**0.8635**		**2,245.2695**	**2,245.2695**	**0.6990**		**2,259.9481**

3.6 Paving - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0506	0.0640	0.8001	2.1200e-003	0.1677	1.3100e-003	0.1690	0.0445	1.2100e-003	0.0457		165.2231	165.2231	7.8400e-003		165.3877
Total	**0.0506**	**0.0640**	**0.8001**	**2.1200e-003**	**0.1677**	**1.3100e-003**	**0.1690**	**0.0445**	**1.2100e-003**	**0.0457**		**165.2231**	**165.2231**	**7.8400e-003**		**165.3877**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2745	1.1895	16.9276	0.0223		0.0366	0.0366		0.0366	0.0366	0.0000	2,245.2695	2,245.2695	0.6990		2,259.9481
Paving	1.0716					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.3461**	**1.1895**	**16.9276**	**0.0223**		**0.0366**	**0.0366**		**0.0366**	**0.0366**	**0.0000**	**2,245.2695**	**2,245.2695**	**0.6990**		**2,259.9481**

3.6 Paving - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0506	0.0640	0.8001	2.1200e-003	0.1677	1.3100e-003	0.1690	0.0445	1.2100e-003	0.0457		165.2231	165.2231	7.8400e-003		165.3877
Total	**0.0506**	**0.0640**	**0.8001**	**2.1200e-003**	**0.1677**	**1.3100e-003**	**0.1690**	**0.0445**	**1.2100e-003**	**0.0457**		**165.2231**	**165.2231**	**7.8400e-003**		**165.3877**

3.7 Architectural Coating - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2986	2.0058	1.8542	2.9700e-003		0.1506	0.1506		0.1506	0.1506		281.4485	281.4485	0.0267		282.0102
Total	**0.2986**	**2.0058**	**1.8542**	**2.9700e-003**		**0.1506**	**0.1506**		**0.1506**	**0.1506**		**281.4485**	**281.4485**	**0.0267**		**282.0102**

3.7 Architectural Coating - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2497	0.3156	3.9470	0.0105	0.8272	6.4800e-003	0.8336	0.2194	5.9900e-003	0.2254		815.1008	815.1008	0.0387		815.9126
Total	**0.2497**	**0.3156**	**3.9470**	**0.0105**	**0.8272**	**6.4800e-003**	**0.8336**	**0.2194**	**5.9900e-003**	**0.2254**		**815.1008**	**815.1008**	**0.0387**		**815.9126**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0297	0.1288	1.8324	2.9700e-003		3.9600e-003	3.9600e-003		3.9600e-003	3.9600e-003	0.0000	281.4485	281.4485	0.0267		282.0102
Total	**0.0297**	**0.1288**	**1.8324**	**2.9700e-003**		**3.9600e-003**	**3.9600e-003**		**3.9600e-003**	**3.9600e-003**	**0.0000**	**281.4485**	**281.4485**	**0.0267**		**282.0102**

3.7 Architectural Coating - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2497	0.3156	3.9470	0.0105	0.8272	6.4800e-003	0.8336	0.2194	5.9900e-003	0.2254		815.1008	815.1008	0.0387		815.9126
Total	**0.2497**	**0.3156**	**3.9470**	**0.0105**	**0.8272**	**6.4800e-003**	**0.8336**	**0.2194**	**5.9900e-003**	**0.2254**		**815.1008**	**815.1008**	**0.0387**		**815.9126**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	3.5545	37.0625	46.5174	0.1866	9.0914	0.6736	9.7650	2.4591	0.6199	3.0791		16,479.8936	16,479.8936	0.2678		16,485.5167
Unmitigated	3.5545	37.0625	46.5174	0.1866	9.0914	0.6736	9.7650	2.4591	0.6199	3.0791		16,479.8936	16,479.8936	0.2678		16,485.5167

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Office Building	0.00	0.00	0.00		
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Unrefrigerated Warehouse-No Rail	669.56	669.56	669.56	4,126,713	4,126,713
Total	669.56	669.56	669.56	4,126,713	4,126,713

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Office Building	16.60	8.40	6.90	33.00	48.00	19.00	77	19	4
Other Non-Asphalt Surfaces	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Unrefrigerated Warehouse-No Rail	16.60	0.00	17.41	59.00	0.00	41.00	100	0	0

4.4 Fleet Mix

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.618000	0.000000	0.000000	0.000000	0.064600	0.000000	0.087000	0.230400	0.000000	0.000000	0.000000	0.000000	0.000000

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
NaturalGas Mitigated	0.0176	0.1604	0.1347	9.6000e-004		0.0122	0.0122		0.0122	0.0122		192.4670	192.4670	3.6900e-003	3.5300e-003	193.6384
NaturalGas Unmitigated	0.0176	0.1604	0.1347	9.6000e-004		0.0122	0.0122		0.0122	0.0122		192.4670	192.4670	3.6900e-003	3.5300e-003	193.6384

5.2 Energy by Land Use - NaturalGas

Unmitigated

Land Use	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	kBTU/yr	lb/day										lb/day					
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	993.645	0.0107	0.0974	0.0818	5.8000e-004		7.4000e-003	7.4000e-003		7.4000e-003	7.4000e-003		116.8994	116.8994	2.2400e-003	2.1400e-003	117.6109
General Office Building	642.325	6.9300e-003	0.0630	0.0529	3.8000e-004		4.7900e-003	4.7900e-003		4.7900e-003	4.7900e-003		75.5676	75.5676	1.4500e-003	1.3900e-003	76.0275
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0177**	**0.1604**	**0.1347**	**9.6000e-004**		**0.0122**	**0.0122**		**0.0122**	**0.0122**		**192.4671**	**192.4671**	**3.6900e-003**	**3.5300e-003**	**193.6384**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	0.993645	0.0107	0.0974	0.0818	5.8000e-004		7.4000e-003	7.4000e-003		7.4000e-003	7.4000e-003		116.8994	116.8994	2.2400e-003	2.1400e-003	117.6109
General Office Building	0.642325	6.9300e-003	0.0630	0.0529	3.8000e-004		4.7900e-003	4.7900e-003		4.7900e-003	4.7900e-003		75.5676	75.5676	1.4500e-003	1.3900e-003	76.0275
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0177**	**0.1604**	**0.1347**	**9.6000e-004**		**0.0122**	**0.0122**		**0.0122**	**0.0122**		**192.4671**	**192.4671**	**3.6900e-003**	**3.5300e-003**	**193.6384**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	20.9837	8.5000e-004	0.0914	1.0000e-005		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004		0.1939	0.1939	5.3000e-004		0.2050
Unmitigated	20.9837	8.5000e-004	0.0914	1.0000e-005		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004		0.1939	0.1939	5.3000e-004		0.2050

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	3.4317					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	17.5433					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	8.6600e-003	8.5000e-004	0.0914	1.0000e-005		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004		0.1939	0.1939	5.3000e-004		0.2050
Total	**20.9837**	**8.5000e-004**	**0.0914**	**1.0000e-005**		**3.3000e-004**	**3.3000e-004**		**3.3000e-004**	**3.3000e-004**		**0.1939**	**0.1939**	**5.3000e-004**		**0.2050**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	3.4317					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	17.5433					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	8.6600e-003	8.5000e-004	0.0914	1.0000e-005		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004		0.1939	0.1939	5.3000e-004		0.2050
Total	**20.9837**	**8.5000e-004**	**0.0914**	**1.0000e-005**		**3.3000e-004**	**3.3000e-004**		**3.3000e-004**	**3.3000e-004**		**0.1939**	**0.1939**	**5.3000e-004**		**0.2050**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Vegetation

AL2 Carson 420K Warehouse

South Coast Air Basin, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	21.45	1000sqft	0.00	21,450.00	0
Unrefrigerated Warehouse-No Rail	398.55	1000sqft	9.15	398,550.00	0
Other Non-Asphalt Surfaces	109.80	1000sqft	2.52	109,800.00	0
Parking Lot	356.23	1000sqft	8.18	356,225.00	0

1.2 Other Project Characteristics

Urbanization Urban **Wind Speed (m/s)** 2.2 **Precipitation Freq (Days)** 31

Climate Zone 11 **Operational Year** 2019

Utility Company Southern California Edison

CO2 Intensity (lb/MWhr) 630.89 **CH4 Intensity (lb/MWhr)** 0.029 **N2O Intensity (lb/MWhr)** 0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Mezzanine

Construction Phase -

Demolition -

Grading - Net export

Architectural Coating - Use of Low-VOC Paints

Vehicle Trips - Warehouse Trip Rate per SCAQMD Recomendation
No office trip generation per traffic study.

Vechicle Emission Factors - SCAQMD Recomendation

Vechicle Emission Factors - Fleet Mix Per Traffic Study

Vechicle Emission Factors - Fleet Mix Per SCAQMD Recommendation

Water And Wastewater - Include Landscape Water Demand using State Water Budget Worksheet

Solid Waste -

Construction Off-road Equipment Mitigation - Water 3 times daily

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	0.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	0.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	9.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
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tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblGrading	MaterialExported	0.00	5,300.00
tblLandUse	LandUseSquareFeet	356,230.00	356,225.00
tblLandUse	LotAcreage	0.49	0.00
tblProjectCharacteristics	OperationalYear	2014	2019
tblTripsAndVMT	HaulingTripNumber	370.00	4.00
tblVehicleEF	HHD	0.03	0.23
tblVehicleEF	HHD	0.03	0.23
tblVehicleEF	HHD	0.03	0.23
tblVehicleEF	LDA	0.51	0.62
tblVehicleEF	LDA	0.51	0.62
tblVehicleEF	LDA	0.51	0.62

tblVehicleEF	LDT1	0.06	0.00
tblVehicleEF	LDT1	0.06	0.00
tblVehicleEF	LDT1	0.06	0.00
tblVehicleEF	LDT2	0.18	0.00
tblVehicleEF	LDT2	0.18	0.00
tblVehicleEF	LDT2	0.18	0.00
tblVehicleEF	LHD1	0.04	0.06
tblVehicleEF	LHD1	0.04	0.06
tblVehicleEF	LHD1	0.04	0.06
tblVehicleEF	LHD2	6.6660e-003	0.00
tblVehicleEF	LHD2	6.6660e-003	0.00
tblVehicleEF	LHD2	6.6660e-003	0.00
tblVehicleEF	MCY	4.3770e-003	0.00
tblVehicleEF	MCY	4.3770e-003	0.00
tblVehicleEF	MCY	4.3770e-003	0.00
tblVehicleEF	MDV	0.14	0.00
tblVehicleEF	MDV	0.14	0.00
tblVehicleEF	MDV	0.14	0.00
tblVehicleEF	MH	2.1280e-003	0.00
tblVehicleEF	MH	2.1280e-003	0.00
tblVehicleEF	MH	2.1280e-003	0.00
tblVehicleEF	MHD	0.02	0.09
tblVehicleEF	MHD	0.02	0.09
tblVehicleEF	MHD	0.02	0.09
tblVehicleEF	OBUS	1.9400e-003	0.00
tblVehicleEF	OBUS	1.9400e-003	0.00
tblVehicleEF	OBUS	1.9400e-003	0.00
tblVehicleEF	SBUS	5.8200e-004	0.00

tblVehicleEF	SBUS	5.8200e-004	0.00
tblVehicleEF	SBUS	5.8200e-004	0.00
tblVehicleEF	UBUS	2.4960e-003	0.00
tblVehicleEF	UBUS	2.4960e-003	0.00
tblVehicleEF	UBUS	2.4960e-003	0.00
tblVehicleTrips	CC_TL	8.40	0.00
tblVehicleTrips	CNW_TL	6.90	17.41
tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	92.00	100.00
tblVehicleTrips	ST_TR	2.37	0.00
tblVehicleTrips	ST_TR	2.59	1.68
tblVehicleTrips	SU_TR	0.98	0.00
tblVehicleTrips	SU_TR	2.59	1.68
tblVehicleTrips	WD_TR	11.01	0.00
tblVehicleTrips	WD_TR	2.59	1.68
tblWater	OutdoorWaterUseRate	2,336,625.45	0.00
tblWater	OutdoorWaterUseRate	0.00	1,371,963.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	6.5543	75.5112	54.5606	0.1072	18.2675	3.4058	21.0233	9.9840	3.1333	12.5194	0.0000	9,695.861 1	9,695.861 1	1.9574	0.0000	9,736.965 9
2018	5.0728	35.7771	51.4032	0.1071	5.0422	1.7003	6.7425	1.3550	1.5944	2.9494	0.0000	9,465.957 3	9,465.957 3	0.8545	0.0000	9,483.901 8
Total	**11.6271**	**111.2883**	**105.9637**	**0.2143**	**23.3097**	**5.1061**	**27.7658**	**11.3390**	**4.7278**	**15.4689**	**0.0000**	**19,161.81 84**	**19,161.81 84**	**2.8119**	**0.0000**	**19,220.86 77**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	2.9516	15.8883	53.8424	0.1072	7.2470	0.2581	7.3121	3.9263	0.2408	3.9913	0.0000	9,695.861 1	9,695.861 1	1.9574	0.0000	9,736.965 9
2018	2.7306	14.7452	51.2815	0.1071	5.0422	0.2466	5.2888	1.3550	0.2303	1.5853	0.0000	9,465.957 3	9,465.957 3	0.8545	0.0000	9,483.901 8
Total	**5.6822**	**30.6334**	**105.1239**	**0.2143**	**12.2893**	**0.5047**	**12.6009**	**5.2813**	**0.4710**	**5.5765**	**0.0000**	**19,161.81 84**	**19,161.81 84**	**2.8119**	**0.0000**	**19,220.86 77**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**51.13**	**72.47**	**0.79**	**0.00**	**47.28**	**90.11**	**54.62**	**53.42**	**90.04**	**63.95**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	20.9837	8.5000e-004	0.0914	1.0000e-005		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004		0.1939	0.1939	5.3000e-004		0.2050
Energy	0.0176	0.1604	0.1347	9.6000e-004		0.0122	0.0122		0.0122	0.0122		192.4670	192.4670	3.6900e-003	3.5300e-003	193.6384
Mobile	3.6895	38.4283	50.0480	0.1824	9.0914	0.6756	9.7670	2.4591	0.6218	3.0809		16,170.6135	16,170.6135	0.2691		16,176.2641
Total	**24.6908**	**38.5895**	**50.2741**	**0.1834**	**9.0914**	**0.6881**	**9.7795**	**2.4591**	**0.6343**	**3.0934**		**16,363.2744**	**16,363.2744**	**0.2733**	**3.5300e-003**	**16,370.1074**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	20.9837	8.5000e-004	0.0914	1.0000e-005		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004		0.1939	0.1939	5.3000e-004		0.2050
Energy	0.0176	0.1604	0.1347	9.6000e-004		0.0122	0.0122		0.0122	0.0122		192.4670	192.4670	3.6900e-003	3.5300e-003	193.6384
Mobile	3.6895	38.4283	50.0480	0.1824	9.0914	0.6756	9.7670	2.4591	0.6218	3.0809		16,170.6135	16,170.6135	0.2691		16,176.2641
Total	**24.6908**	**38.5895**	**50.2741**	**0.1834**	**9.0914**	**0.6881**	**9.7795**	**2.4591**	**0.6343**	**3.0934**		**16,363.2744**	**16,363.2744**	**0.2733**	**3.5300e-003**	**16,370.1074**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2017	1/27/2017	5	20	
2	Site Preparation	Site Preparation	1/28/2017	2/10/2017	5	10	
3	Grading	Grading	2/11/2017	3/24/2017	5	30	
4	Building Construction	Building Construction	3/25/2017	5/18/2018	5	300	
5	Paving	Paving	5/19/2018	6/15/2018	5	20	
6	Architectural Coating	Architectural Coating	6/16/2018	7/13/2018	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 75

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 810,730; Non-Residential Outdoor: 270,243 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	162	0.38
Demolition	Rubber Tired Dozers	2	8.00	255	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	255	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	162	0.38
Grading	Graders	1	8.00	174	0.41
Grading	Rubber Tired Dozers	1	8.00	255	0.40
Grading	Scrapers	2	8.00	361	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	226	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	125	0.42
Paving	Paving Equipment	2	8.00	130	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	4.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	663.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	370.00	145.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	74.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Demolition - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.0016	0.0000	4.0016	0.6059	0.0000	0.6059			0.0000			0.0000
Off-Road	4.0482	42.6971	33.8934	0.0399		2.1252	2.1252		1.9797	1.9797		4,036.467 4	4,036.467 4	1.1073		4,059.721 1
Total	**4.0482**	**42.6971**	**33.8934**	**0.0399**	**4.0016**	**2.1252**	**6.1268**	**0.6059**	**1.9797**	**2.5856**		**4,036.467 4**	**4,036.467 4**	**1.1073**		**4,059.721 1**

3.2 Demolition - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.4300e-003	0.0526	0.0430	1.5000e-004	3.4800e-003	7.9000e-004	4.2700e-003	9.5000e-004	7.2000e-004	1.6800e-003		14.6024	14.6024	1.1000e-004		14.6046
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0573	0.0775	0.8088	1.9900e-003	0.1677	1.3500e-003	0.1690	0.0445	1.2400e-003	0.0457		160.9269	160.9269	8.4400e-003		161.1042
Total	**0.0607**	**0.1301**	**0.8519**	**2.1400e-003**	**0.1711**	**2.1400e-003**	**0.1733**	**0.0454**	**1.9600e-003**	**0.0474**		**175.5292**	**175.5292**	**8.5500e-003**		**175.7087**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.5606	0.0000	1.5606	0.2363	0.0000	0.2363			0.0000			0.0000
Off-Road	0.4739	2.0535	23.8257	0.0399		0.0632	0.0632		0.0632	0.0632	0.0000	4,036.4674	4,036.4674	1.1073		4,059.7211
Total	**0.4739**	**2.0535**	**23.8257**	**0.0399**	**1.5606**	**0.0632**	**1.6238**	**0.2363**	**0.0632**	**0.2995**	**0.0000**	**4,036.4674**	**4,036.4674**	**1.1073**		**4,059.7211**

3.2 Demolition - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.4300e-003	0.0526	0.0430	1.5000e-004	3.4800e-003	7.9000e-004	4.2700e-003	9.5000e-004	7.2000e-004	1.6800e-003		14.6024	14.6024	1.1000e-004		14.6046
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0573	0.0775	0.8088	1.9900e-003	0.1677	1.3500e-003	0.1690	0.0445	1.2400e-003	0.0457		160.9269	160.9269	8.4400e-003		161.1042
Total	**0.0607**	**0.1301**	**0.8519**	**2.1400e-003**	**0.1711**	**2.1400e-003**	**0.1733**	**0.0454**	**1.9600e-003**	**0.0474**		**175.5292**	**175.5292**	**8.5500e-003**		**175.7087**

3.3 Site Preparation - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.8382	51.7535	39.3970	0.0391		2.7542	2.7542		2.5339	2.5339		4,003.0859	4,003.0859	1.2265		4,028.8432
Total	**4.8382**	**51.7535**	**39.3970**	**0.0391**	**18.0663**	**2.7542**	**20.8205**	**9.9307**	**2.5339**	**12.4646**		**4,003.0859**	**4,003.0859**	**1.2265**		**4,028.8432**

3.3 Site Preparation - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/day									lb/day		
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0687	0.0929	0.9706	2.3900e-003	0.2012	1.6200e-003	0.2028	0.0534	1.4900e-003	0.0549		193.1123	193.1123	0.0101		193.3250
Total	**0.0687**	**0.0929**	**0.9706**	**2.3900e-003**	**0.2012**	**1.6200e-003**	**0.2028**	**0.0534**	**1.4900e-003**	**0.0549**		**193.1123**	**193.1123**	**0.0101**		**193.3250**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/day									lb/day		
Fugitive Dust					7.0458	0.0000	7.0458	3.8730	0.0000	3.8730			0.0000			0.0000
Off-Road	0.4757	2.0615	21.2415	0.0391		0.0634	0.0634		0.0634	0.0634	0.0000	4,003.0859	4,003.0859	1.2265		4,028.8432
Total	**0.4757**	**2.0615**	**21.2415**	**0.0391**	**7.0458**	**0.0634**	**7.1093**	**3.8730**	**0.0634**	**3.9364**	**0.0000**	**4,003.0859**	**4,003.0859**	**1.2265**		**4,028.8432**

3.3 Site Preparation - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0687	0.0929	0.9706	2.3900e-003	0.2012	1.6200e-003	0.2028	0.0534	1.4900e-003	0.0549		193.1123	193.1123	0.0101		193.3250
Total	**0.0687**	**0.0929**	**0.9706**	**2.3900e-003**	**0.2012**	**1.6200e-003**	**0.2028**	**0.0534**	**1.4900e-003**	**0.0549**		**193.1123**	**193.1123**	**0.0101**		**193.3250**

3.4 Grading - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.6933	0.0000	8.6933	3.5995	0.0000	3.5995			0.0000			0.0000
Off-Road	6.0991	69.5920	46.8050	0.0617		3.3172	3.3172		3.0518	3.0518		6,313.3690	6,313.3690	1.9344		6,353.9915
Total	**6.0991**	**69.5920**	**46.8050**	**0.0617**	**8.6933**	**3.3172**	**12.0105**	**3.5995**	**3.0518**	**6.6513**		**6,313.3690**	**6,313.3690**	**1.9344**		**6,353.9915**

3.4 Grading - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.3789	5.8159	4.7563	0.0163	0.3851	0.0868	0.4718	0.1054	0.0798	0.1853		1,613.5596	1,613.5596	0.0117		1,613.8055
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0764	0.1033	1.0784	2.6500e-003	0.2236	1.8000e-003	0.2254	0.0593	1.6600e-003	0.0610		214.5692	214.5692	0.0113		214.8056
Total	**0.4552**	**5.9192**	**5.8347**	**0.0189**	**0.6086**	**0.0886**	**0.6972**	**0.1647**	**0.0815**	**0.2462**		**1,828.1288**	**1,828.1288**	**0.0230**		**1,828.6111**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.3904	0.0000	3.3904	1.4038	0.0000	1.4038			0.0000			0.0000
Off-Road	0.7564	3.2778	34.7787	0.0617		0.1009	0.1009		0.1009	0.1009	0.0000	6,313.3690	6,313.3690	1.9344		6,353.9915
Total	**0.7564**	**3.2778**	**34.7787**	**0.0617**	**3.3904**	**0.1009**	**3.4913**	**1.4038**	**0.1009**	**1.5047**	**0.0000**	**6,313.3690**	**6,313.3690**	**1.9344**		**6,353.9915**

3.4 Grading - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.3789	5.8159	4.7563	0.0163	0.3851	0.0868	0.4718	0.1054	0.0798	0.1853		1,613.5596	1,613.5596	0.0117		1,613.8055
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0764	0.1033	1.0784	2.6500e-003	0.2236	1.8000e-003	0.2254	0.0593	1.6600e-003	0.0610		214.5692	214.5692	0.0113		214.8056
Total	**0.4552**	**5.9192**	**5.8347**	**0.0189**	**0.6086**	**0.0886**	**0.6972**	**0.1647**	**0.0815**	**0.2462**		**1,828.1288**	**1,828.1288**	**0.0230**		**1,828.6111**

3.5 Building Construction - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.1024	26.4057	18.1291	0.0268		1.7812	1.7812		1.6730	1.6730		2,639.8053	2,639.8053	0.6497		2,653.4490
Total	**3.1024**	**26.4057**	**18.1291**	**0.0268**		**1.7812**	**1.7812**		**1.6730**	**1.6730**		**2,639.8053**	**2,639.8053**	**0.6497**		**2,653.4490**

3.5 Building Construction - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.2127	11.7490	16.4803	0.0313	0.9065	0.1843	1.0907	0.2582	0.1695	0.4277		3,086.5261	3,086.5261	0.0226		3,087.0014
Worker	1.4125	1.9104	19.9511	0.0491	4.1357	0.0333	4.1690	1.0968	0.0307	1.1275		3,969.5297	3,969.5297	0.2082		3,973.9027
Total	**2.6252**	**13.6594**	**36.4314**	**0.0804**	**5.0422**	**0.2175**	**5.2597**	**1.3550**	**0.2002**	**1.5552**		**7,056.0558**	**7,056.0558**	**0.2309**		**7,060.9042**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3265	2.2289	17.4110	0.0268		0.0406	0.0406		0.0406	0.0406	0.0000	2,639.8053	2,639.8053	0.6497		2,653.4490
Total	**0.3265**	**2.2289**	**17.4110**	**0.0268**		**0.0406**	**0.0406**		**0.0406**	**0.0406**	**0.0000**	**2,639.8053**	**2,639.8053**	**0.6497**		**2,653.4490**

3.5 Building Construction - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.2127	11.7490	16.4803	0.0313	0.9065	0.1843	1.0907	0.2582	0.1695	0.4277		3,086.526 1	3,086.526 1	0.0226		3,087.001 4
Worker	1.4125	1.9104	19.9511	0.0491	4.1357	0.0333	4.1690	1.0968	0.0307	1.1275		3,969.529 7	3,969.529 7	0.2082		3,973.902 7
Total	**2.6252**	**13.6594**	**36.4314**	**0.0804**	**5.0422**	**0.2175**	**5.2597**	**1.3550**	**0.2002**	**1.5552**		**7,056.055 8**	**7,056.055 8**	**0.2309**		**7,060.904 2**

3.5 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6687	23.2608	17.5327	0.0268		1.4943	1.4943		1.4048	1.4048		2,609.939 0	2,609.939 0	0.6387		2,623.351 7
Total	**2.6687**	**23.2608**	**17.5327**	**0.0268**		**1.4943**	**1.4943**		**1.4048**	**1.4048**		**2,609.939 0**	**2,609.939 0**	**0.6387**		**2,623.351 7**

3.5 Building Construction - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.1337	10.7836	15.8145	0.0313	0.9065	0.1736	1.0801	0.2582	0.1597	0.4179		3,034.713 3	3,034.713 3	0.0225		3,035.186 2
Worker	1.2704	1.7327	18.0560	0.0491	4.1357	0.0324	4.1681	1.0968	0.0300	1.1268		3,821.305 0	3,821.305 0	0.1933		3,825.363 8
Total	**2.4041**	**12.5163**	**33.8705**	**0.0803**	**5.0422**	**0.2060**	**5.2482**	**1.3550**	**0.1897**	**1.5447**		**6,856.018 3**	**6,856.018 3**	**0.2158**		**6,860.550 0**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.3265	2.2289	17.4110	0.0268		0.0406	0.0406		0.0406	0.0406	0.0000	2,609.938 9	2,609.938 9	0.6387		2,623.351 7
Total	**0.3265**	**2.2289**	**17.4110**	**0.0268**		**0.0406**	**0.0406**		**0.0406**	**0.0406**	**0.0000**	**2,609.938 9**	**2,609.938 9**	**0.6387**		**2,623.351 7**

3.5 Building Construction - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.1337	10.7836	15.8145	0.0313	0.9065	0.1736	1.0801	0.2582	0.1597	0.4179		3,034.713 3	3,034.713 3	0.0225		3,035.186 2
Worker	1.2704	1.7327	18.0560	0.0491	4.1357	0.0324	4.1681	1.0968	0.0300	1.1268		3,821.305 0	3,821.305 0	0.1933		3,825.363 8
Total	**2.4041**	**12.5163**	**33.8705**	**0.0803**	**5.0422**	**0.2060**	**5.2482**	**1.3550**	**0.1897**	**1.5447**		**6,856.018 3**	**6,856.018 3**	**0.2158**		**6,860.550 0**

3.6 Paving - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.6114	17.1628	14.4944	0.0223		0.9386	0.9386		0.8635	0.8635		2,245.269 5	2,245.269 5	0.6990		2,259.948 1
Paving	1.0716					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**2.6830**	**17.1628**	**14.4944**	**0.0223**		**0.9386**	**0.9386**		**0.8635**	**0.8635**		**2,245.269 5**	**2,245.269 5**	**0.6990**		**2,259.948 1**

3.6 Paving - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0515	0.0702	0.7320	1.9900e-003	0.1677	1.3100e-003	0.1690	0.0445	1.2100e-003	0.0457		154.9178	154.9178	7.8400e-003		155.0823
Total	**0.0515**	**0.0702**	**0.7320**	**1.9900e-003**	**0.1677**	**1.3100e-003**	**0.1690**	**0.0445**	**1.2100e-003**	**0.0457**		**154.9178**	**154.9178**	**7.8400e-003**		**155.0823**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2745	1.1895	16.9276	0.0223		0.0366	0.0366		0.0366	0.0366	0.0000	2,245.2695	2,245.2695	0.6990		2,259.9481
Paving	1.0716					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.3461**	**1.1895**	**16.9276**	**0.0223**		**0.0366**	**0.0366**		**0.0366**	**0.0366**	**0.0000**	**2,245.2695**	**2,245.2695**	**0.6990**		**2,259.9481**

3.6 Paving - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0515	0.0702	0.7320	1.9900e-003	0.1677	1.3100e-003	0.1690	0.0445	1.2100e-003	0.0457		154.9178	154.9178	7.8400e-003		155.0823
Total	**0.0515**	**0.0702**	**0.7320**	**1.9900e-003**	**0.1677**	**1.3100e-003**	**0.1690**	**0.0445**	**1.2100e-003**	**0.0457**		**154.9178**	**154.9178**	**7.8400e-003**		**155.0823**

3.7 Architectural Coating - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2986	2.0058	1.8542	2.9700e-003		0.1506	0.1506		0.1506	0.1506		281.4485	281.4485	0.0267		282.0102
Total	**0.2986**	**2.0058**	**1.8542**	**2.9700e-003**		**0.1506**	**0.1506**		**0.1506**	**0.1506**		**281.4485**	**281.4485**	**0.0267**		**282.0102**

3.7 Architectural Coating - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2541	0.3465	3.6112	9.8100e-003	0.8272	6.4800e-003	0.8336	0.2194	5.9900e-003	0.2254		764.2610	764.2610	0.0387		765.0728
Total	**0.2541**	**0.3465**	**3.6112**	**9.8100e-003**	**0.8272**	**6.4800e-003**	**0.8336**	**0.2194**	**5.9900e-003**	**0.2254**		**764.2610**	**764.2610**	**0.0387**		**765.0728**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0297	0.1288	1.8324	2.9700e-003		3.9600e-003	3.9600e-003		3.9600e-003	3.9600e-003	0.0000	281.4485	281.4485	0.0267		282.0102
Total	**0.0297**	**0.1288**	**1.8324**	**2.9700e-003**		**3.9600e-003**	**3.9600e-003**		**3.9600e-003**	**3.9600e-003**	**0.0000**	**281.4485**	**281.4485**	**0.0267**		**282.0102**

3.7 Architectural Coating - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2541	0.3465	3.6112	9.8100e-003	0.8272	6.4800e-003	0.8336	0.2194	5.9900e-003	0.2254		764.2610	764.2610	0.0387		765.0728
Total	**0.2541**	**0.3465**	**3.6112**	**9.8100e-003**	**0.8272**	**6.4800e-003**	**0.8336**	**0.2194**	**5.9900e-003**	**0.2254**		**764.2610**	**764.2610**	**0.0387**		**765.0728**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	3.6895	38.4283	50.0480	0.1824	9.0914	0.6756	9.7670	2.4591	0.6218	3.0809		16,170.6135	16,170.6135	0.2691		16,176.2641
Unmitigated	3.6895	38.4283	50.0480	0.1824	9.0914	0.6756	9.7670	2.4591	0.6218	3.0809		16,170.6135	16,170.6135	0.2691		16,176.2641

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Office Building	0.00	0.00	0.00		
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Unrefrigerated Warehouse-No Rail	669.56	669.56	669.56	4,126,713	4,126,713
Total	669.56	669.56	669.56	4,126,713	4,126,713

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Office Building	16.60	8.40	6.90	33.00	48.00	19.00	77	19	4
Other Non-Asphalt Surfaces	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Unrefrigerated Warehouse-No	16.60	0.00	17.41	59.00	0.00	41.00	100	0	0

4.4 Fleet Mix

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.618000	0.000000	0.000000	0.000000	0.064600	0.000000	0.087000	0.230400	0.000000	0.000000	0.000000	0.000000	0.000000

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0176	0.1604	0.1347	9.6000e-004		0.0122	0.0122		0.0122	0.0122		192.4670	192.4670	3.6900e-003	3.5300e-003	193.6384
NaturalGas Unmitigated	0.0176	0.1604	0.1347	9.6000e-004		0.0122	0.0122		0.0122	0.0122		192.4670	192.4670	3.6900e-003	3.5300e-003	193.6384

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	993.645	0.0107	0.0974	0.0818	5.8000e-004		7.4000e-003	7.4000e-003		7.4000e-003	7.4000e-003		116.8994	116.8994	2.2400e-003	2.1400e-003	117.6109
General Office Building	642.325	6.9300e-003	0.0630	0.0529	3.8000e-004		4.7900e-003	4.7900e-003		4.7900e-003	4.7900e-003		75.5676	75.5676	1.4500e-003	1.3900e-003	76.0275
Total		**0.0177**	**0.1604**	**0.1347**	**9.6000e-004**		**0.0122**	**0.0122**		**0.0122**	**0.0122**		**192.4671**	**192.4671**	**3.6900e-003**	**3.5300e-003**	**193.6384**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	0.993645	0.0107	0.0974	0.0818	5.8000e-004		7.4000e-003	7.4000e-003		7.4000e-003	7.4000e-003		116.8994	116.8994	2.2400e-003	2.1400e-003	117.6109
General Office Building	0.642325	6.9300e-003	0.0630	0.0529	3.8000e-004		4.7900e-003	4.7900e-003		4.7900e-003	4.7900e-003		75.5676	75.5676	1.4500e-003	1.3900e-003	76.0275
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0177**	**0.1604**	**0.1347**	**9.6000e-004**		**0.0122**	**0.0122**		**0.0122**	**0.0122**		**192.4671**	**192.4671**	**3.6900e-003**	**3.5300e-003**	**193.6384**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	20.9837	8.5000e-004	0.0914	1.0000e-005		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004		0.1939	0.1939	5.3000e-004		0.2050
Unmitigated	20.9837	8.5000e-004	0.0914	1.0000e-005		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004		0.1939	0.1939	5.3000e-004		0.2050

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	3.4317					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	17.5433					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	8.6600e-003	8.5000e-004	0.0914	1.0000e-005		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004		0.1939	0.1939	5.3000e-004		0.2050
Total	**20.9837**	**8.5000e-004**	**0.0914**	**1.0000e-005**		**3.3000e-004**	**3.3000e-004**		**3.3000e-004**	**3.3000e-004**		**0.1939**	**0.1939**	**5.3000e-004**		**0.2050**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	3.4317					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	17.5433					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	8.6600e-003	8.5000e-004	0.0914	1.0000e-005		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004		0.1939	0.1939	5.3000e-004		0.2050
Total	**20.9837**	**8.5000e-004**	**0.0914**	**1.0000e-005**		**3.3000e-004**	**3.3000e-004**		**3.3000e-004**	**3.3000e-004**		**0.1939**	**0.1939**	**5.3000e-004**		**0.2050**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Vegetation

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AL2 Carson 420K Warehouse Building Health Risk Assessment

July 2016 (13509)

Prepared for:

AL2 LLC
1815 South Soto Street
Los Angeles, California 90023

Prepared by:

MIG
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AL2 Carson 420k Industrial Building Project

Health Risk Assessment

June 2016

City of Carson

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1 Executive Summary

1.1 Project Description

The building includes a 404,925-square foot footprint, with 15,075-square feet of mezzanine floor space, for a total of 420,000-gross-square-feet on 19.85 acres. The project includes 101,600 square feet of landscaping, 300 passenger vehicle parking stalls, 100 truck trailer parking stalls, and 65 loading docks. Access to the site is provided via three driveways on East 220th Street and one driveway on Wilmington Avenue. Two of the three driveways on East 220th Street are 30-feet wide and the third is 40-feet wide. The driveway on Wilmington Avenue is 50-feet wide. The 40-foot wide driveway on East 220th Street and the 500-foot wide driveway on Wilmington Avenue will provide truck trailer access to the rear of the building along the north side of the site where the truck trailer parking stalls and loading docks are located. All four driveways provide passenger vehicle access to passenger vehicle parking along the south and west sides of the site. The project is located at the northeast corner of the intersection of Wilmington Avenue and East 220th Street in the City of Carson, California, Universal Transverse Mercator (UTM) coordinates Zone 11 N, 385167 Easting, 3745766 Northing, World Geodetic System (WGS) 1984.

1.2 Risk Assessment

The MEIR is located at three residential dwelling units southwest of the project site: 1532 E Abri Street, 1533 E. Abri Street, and 21945 Martin Street. The incremental increase in cancer risk at these properties is 0.000001 in one. The MEIW is Tri Modal Distribution Services, located north of the project site at 1939 E. Carson Street. The incremental increase in cancer risk at this business is 0.000000104 in one million. The PMI of 0.0000105 cases per one million is located at the existing site driveway on Wilmington Avenue. This point on the receptor grid is identified and there are no receptors at this location. The non-cancer hazard index at all properties will be less than the threshold of 1.0 established by SCAQMD.

2 Introduction

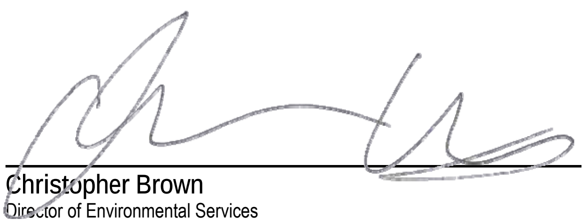
This health risk assessment includes models and analysis of operation-related emissions of diesel particulate matter from the proposed AL2 Carson Warehouse Building. The project includes the construction of a 420,000-gross-square-foot warehouse on 19.85 acres located at the northwest corner of the intersection of Wilmington Avenue and East 220th Street in the City of Carson, California. The project includes 101,600 square feet of landscaping, 300 passenger vehicle parking stalls, 100 truck trailer parking stalls, and 65 loading docks.

The health risk assessment provided herein utilizes guidance provided in the South Coast Air Quality Management District (SCAQMD) *Health Risk Assessment Guidance for Analyzing Cancer Risks from Mobile Source Diesel Idling Emissions for CEQA Air Quality Analysis* (http://www.aqmd.gov/docs/default-source/ceqa/handbook/mobile-source-toxics-analysis.doc?sfvrsn=2). Modeling of diesel particulate matter emissions utilizes the following software:

- EMFAC2014
- BPIPPRM (DATED 04274)
- AERMOD v 14134

This report has been prepared for use by the Lead Agency to assess potential project-related toxic emissions impacts in compliance with the State CEQA Statutes and Guidelines, particularly with respect to the sensitive receptors issues identified in Appendix G of the State CEQA Guidelines. This report does not make determinations of significance pursuant to CEQA because such determinations are required to be made solely in the purview of the Lead Agency.

This report was prepared under the direction of Christopher Brown (Director of Environmental Services) of MIG under contract to AL2, LLC.

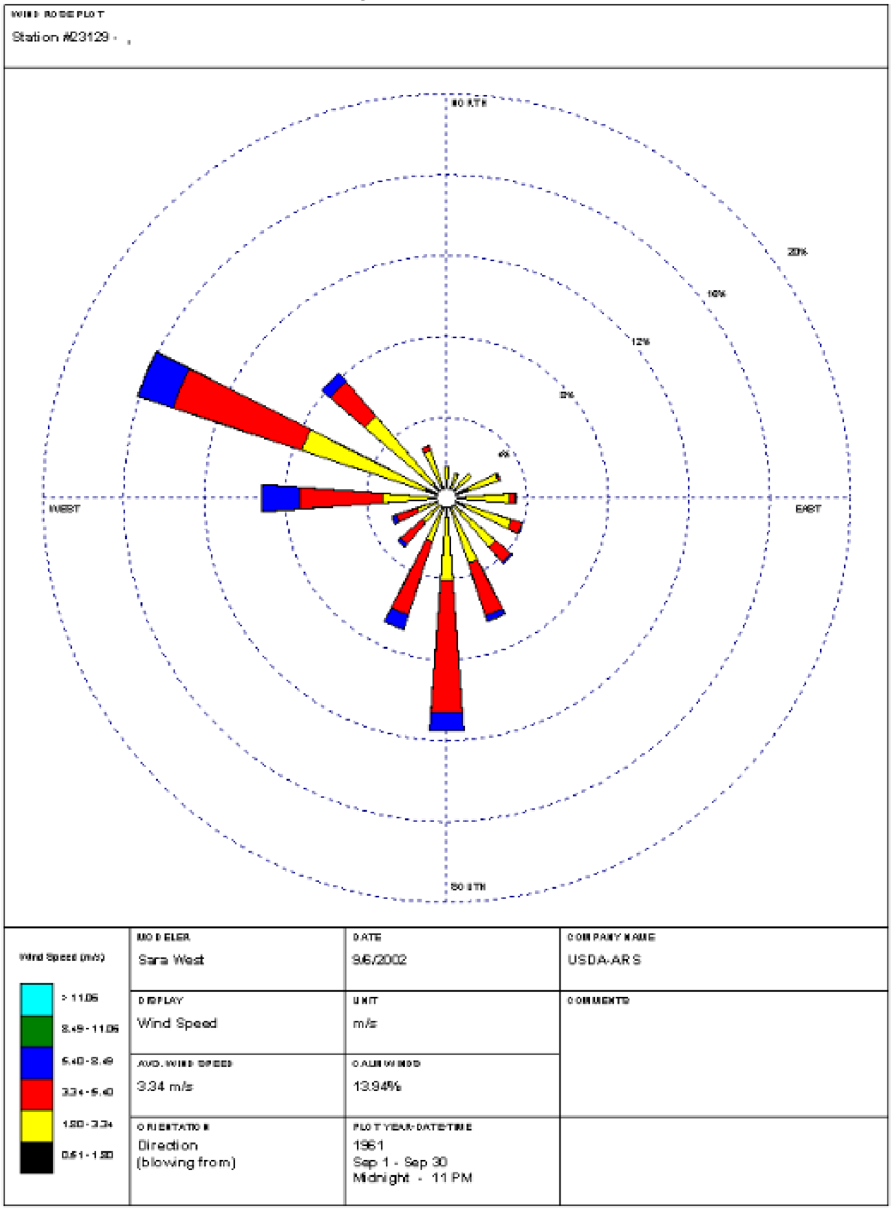


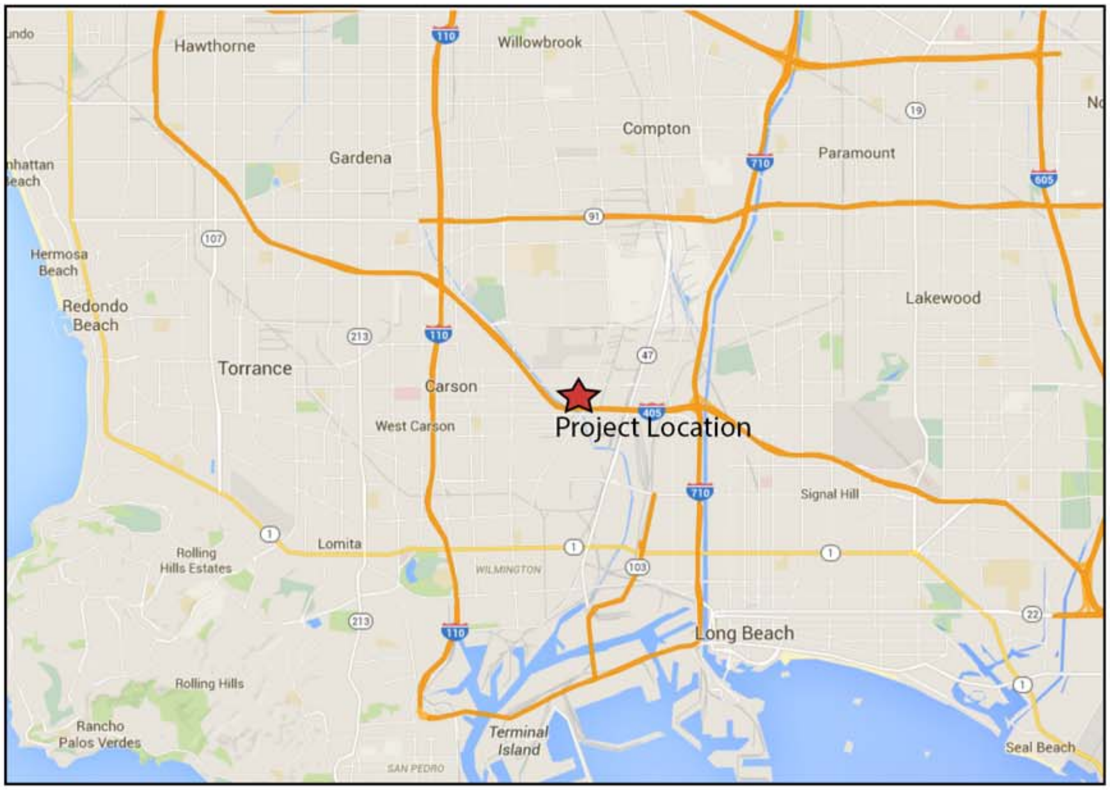
Christopher Brown
Director of Environmental Services

3 Environmental Setting

The project is located in the City of Carson, in the southwestern portion of Los Angeles County, which is part of the South Coast Air Basin (SCAB) that includes all of Orange County as well as non-desert portions of Los Angeles, Riverside, and San Bernardino Counties. The City of Carson and the broader Inland Empire are defined by a moderate, Mediterranean climate with mild winters and warm summers. The annual average temperature varies little throughout much of the basin, ranging from the low to middle 60s, measured in degrees Fahrenheit (°F). The majority of the annual rainfall in the basin occurs between November and April. Summer rainfall is minimal and is generally limited to scattered thunderstorms in the coastal regions and slightly heavier showers in the eastern portion of the basin along the coastal side of the mountains. Annual rainfall averages 11.29 inches with the rainy season occurring between the months of December and March.[1] The coolest month of the year is December with an average monthly low of 56.2° Fahrenheit (F). The warmest month is August with an average monthly high of 74.3° F. Carson is located at an elevation of approximately 20 feet to 50 feet above mean sea level (AMSL).[2] The project site is located at an approximate elevation of 25 feet AMSL. Wind generally blows from the west and south.[3]

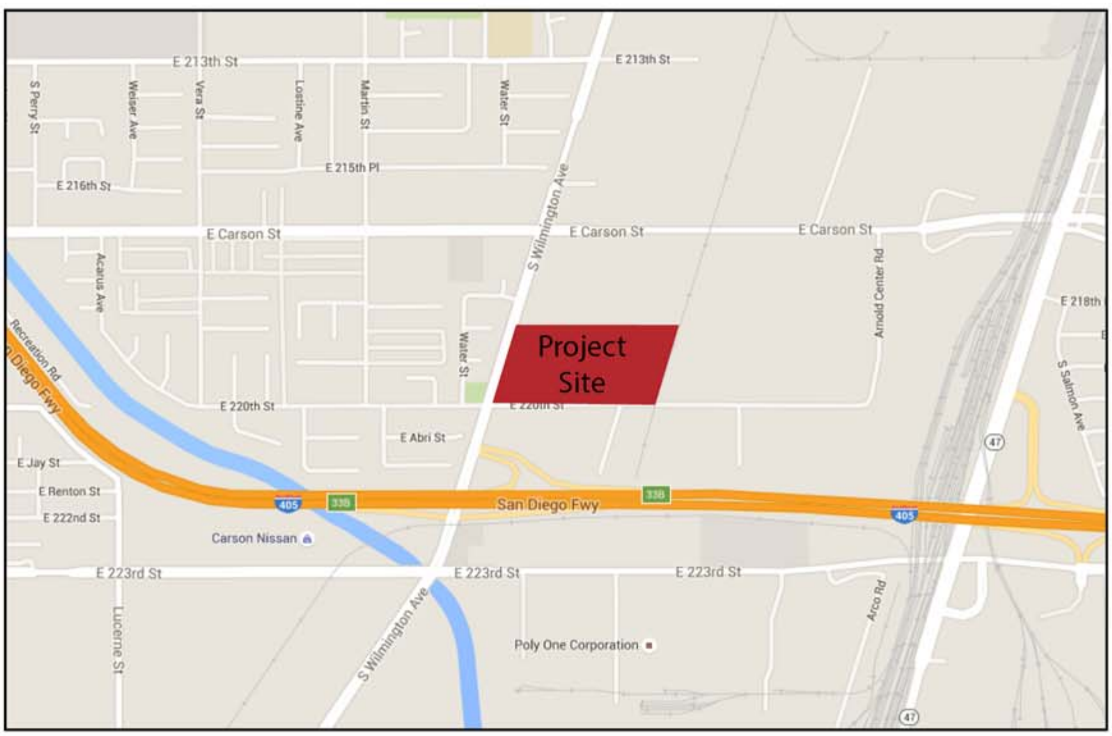
Figure 1
Long Beach Wind Rose





Source: Google Maps

Regional



Source: Google Maps

Vicinity

Not to Scale

Exhibit 1 Regional and Vicinity Map

AL2 Carson 420K Warehouse

Carson, California

4.1 Air Toxics

State requirements specifically address air toxics issues through Assembly Bill (AB) 1807 (known as the Tanner Bill) that established the State air toxics program and the Air Toxics Hot Spots Information and Assessment Act (AB 2588). The air quality regulations developed from these bills have been modified recently to incorporate the Federal regulations associated with the Federal Clean Air Act Amendments of 1990. The Air Toxics Hot Spots Information and Assessment Act (Hot Spots Act) was enacted in September 1987. Under this bill, stationary sources of emissions are required to report the types and quantities of certain substances that their facilities routinely release into the air.

The SCAQMD is required to prepare an annual report on the status and forecast of air toxic *hotspots* pursuant to Section 44363 of the California Health and Safety Code. SCAQMD monitors facilities that are not exempt from the fee and reporting requirements of AB 2588.

Some facilities are covered under *umbrella* permits that address industry-wide categories. SCAQMD has issued general permits for the following seven activities:

- Retail gasoline dispensing
- Perchloroethylene dry cleaning
- Auto body shops
- Fiberglass molding
- Printing
- Metal plating
- Wood stripping and finishing

Emissions inventories and risk assessment guidelines have been prepared for the seven industry-wide categories. Approximately 1,400 auto body shops, 3,200 gasoline stations, and 1,400 perchloroethylene dry cleaners within the District are covered under these umbrella permits.

Depending on the severity of the facilities' toxic air contaminant (TAC) releases, SCAQMD requires either public notification of toxic hot spots or preparation of a risk reduction plan, as follows:

	Cancer Risk (per million)	Acute Risk	Chronic Risk
Action Risk Level	>= 25	>= 3.0	>= 3.0
Public Notification Level	>= 10	>= 1.0	>= 1.0
Exempt	<1	<0.1	<0.1

The proposed use does not include use of stationary emergency or prime compression ignition internal combustion engines, portable diesel engines, or other equipment subject to AB 2588.

4.2 Truck and Bus Regulation

In December 2008, the California Air Resources Board (ARB) approved the *Truck and Bus Regulations* as part of their rulemaking authority and adopted in Title 13 (Motor Vehicles) of the California Code of Regulations (CCR).[4] These regulations are applicable to all diesel-fueled trucks and buses with a gross vehicle weight rating (GVWR) of 14,000 pounds or more (Class 4 or greater) that are privately or federally owned and for privately and publically owned school buses.[5] These regulations are designed to reduce emissions of particulate matter and oxides of nitrogen from existing diesel vehicles operating in California. Compliance scheduling is phased for light and heavy vehicles depending on the age of the vehicle engine. Full compliance across vehicle ratings is set in 2023. Regulations affect the following areas:

- Auxiliary Power Units
- Port and Rail Yard Trucks
- Emissions Control Label Inspection
- Greenhouse Gas Emissions Reductions
- Heavy-Duty Diesel Vehicle Inspection
- Idling Reduction
- Periodic Smoke Inspection
- Public and Utility Agencies
- Public Transit Agencies
- School Bus Fleets
- Solid Waste Collection Vehicles
- Transport Refrigeration Units

Starting in 2015, lighter trucks (between 14,000 and 26,000 GVWR) will be required to replace the vehicle and/or engine if the engine manufacture date is from 1995 or earlier. Newer engines will be required to be replaced on a graduated scale until 2023 when all engines will be required to meet model year 2010 emissions or equivalent. Heavier truck operators (greater than 26,000 GVWR) have options for meeting the regulation requirements through 2023. Vehicles with engine years earlier than 1994 and 1995 will be required to be replaced in 2015 and 2016, respectively. Operators with engine years between 1996 and 2006 have the option to install a particulate filter before being required to replace the engine towards the compliance deadline. Later engines are considered compliant in 2023 when they demonstrate 2010 emissions levels or equivalent.

Idling restrictions were established in 2008 and apply to vehicles greater than 10,000 GVWR (Class 3 or greater). These restrictions limit idling to five minutes or less before manual or automatic shutdown must be initiated at a location (facility). Engine models manufactured in 2008 and thereafter are required to be equipped with a non-programmable engine shutdown mechanism that automatically shuts off the engine after five minutes of idling.

5 Exposure Assessment

The following discussion summarizes the *Required Source Information* identified in Table 1 of the SCAQMD health risk assessment guidance.

5.1 Facility and Surroundings

5.1.1 Location

The project is located at the northeast corner of the intersection of South Wilmington Avenue and East 220th Street in the City of Carson, California, Universal Transverse Mercator (UTM) coordinates Zone 11 S, 385419 Easting, 3743874 Northing, World Geodetic System (WGS) 1984 (see Exhibit 1, Regional Context and Vicinity Map).

5.1.2 Local Land Use

Some populations are more susceptible to the effects of air pollution than the population at large; these populations are defined as sensitive receptors. Sensitive receptors include children, the elderly, the sick, and the athletic. Land uses associated with sensitive receptors include residences, schools, playgrounds, childcare centers, athletic facilities, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes. Sensitive receptors are located north, east, and south of the project. Residential uses are located directly west of the project site on the opposite side of Wilmington Avenue. Exhibit 2 (Radius Map) identifies existing development in the project vicinity based on recent assessor's parcel data.

5.1.3 Facility Plot Plan

The project includes the construction of a 420,000-gross-square-foot building on 19.85 acres. Diesel particulate matter emissions will occur from truck movement along proposed drive aisles, truck movement along local roadways, and from truck idling at loading/unloading docks.

5.1.4 Operating Schedule

The tenant for the proposed building is unknown at this time, thus, the operating schedule is assumed at 24 hours a day, 365 days a year, as a worst-case scenario. Note that this means there will be no opening or start of day delay that could result in vehicle queuing at this location.

5.2 Mobile Emissions Sources

5.2.1 Hazard Identification

The proposed project will result in the generation of heavy diesel truck traffic and have been linked with high emissions of diesel particulate matter (DPM) that was established as an air toxic contaminant by ARB in 1998.[6] DPM was identified as a toxic air contaminant (TAC) because of its potential to cause cancer, premature deaths, and other health problems. Health hazards associated with DPM are especially hazardous for children because their lungs are still developing, and the elderly who may have other serious health problems. Health risks from DPM occur exclusively through the inhalation pathway.

5.2.2 Hourly Emissions Rate

Table 1 (Trip Generation) summarizes the estimated average daily traffic (ADT) volumes of truck trips generated by the project based on a SCAQMD trip study presented to the Mobile Source Committee on July 25, 2014.[7] The proposed project was modeled with an estimated daily trip rate of 1.68 per 1,000 square feet. Based on SCAQMD recommendations, an average rate of 0.64 trucks per 1,000 square feet has been applied. Passenger vehicles will consist of 62 percent of the fleet mix, light-duty trucks will consist of eight percent of the fleet mix, medium-heavy duty trucks will consist of seven percent of the truck trips, and heavy-heavy duty truck trips consist of 23 percent of the fleet mix. For this analysis, it is assumed that the building will operate 24 hours a day.

Table 1
Trip Generation

Vehicle Type	ADT	AHT
Medium-Heavy Duty Trucks	47.56	1.98
Heavy-Heavy Duty Trucks	162.15	6.76
Source: Urban Crossroads, 2016		

Running and idling emissions rates for diesel particulate matter were modeled using EMFAC2014 (see Appendix A). EMFAC2014 was run for calendar year 2017 based on a 2017 opening year. As a worst case scenario, the 2017 EMFAC2014 results were used in the assessment for the third-trimester to nine-year age group, the nine-year to thirty-year age group, and the thirty-year to seventy-year age group. The EMFAC emissions database combines aggregate emissions for multiple model years as a repository for emission rates estimated through the year 2050. In actuality, emissions will decrease in the future due to the regular vehicle turn over and improvements in emissions technologies. If the construction and operation of the proposed project were to be delayed, the emissions factors included in this report would provide a worst case scenario as emissions rates improve as newer model years become available. EMFAC2014 was run at 10 miles per hour (MPH) for diesel powered medium-heavy duty (MHD) and heavy-heavy duty (HHD) trucks using an aggregate of model years to generate the emissions factors for on-site truck movement. The inclusive "Truck 2" class of vehicle was selected, representing all types of medium-heavy duty and heavy-heavy duty trucks. Idling emissions for "Truck 2" were also modeled for each averaging year. Note that State law limits idling to five minutes *per location* without exception for entry and exits; therefore, idling emissions were modeled using EMFAC2014 and adjusted to account for the five minute idling limitation.

EMFAC2014 was used for on-road emissions factors at 25 MPH on Wilmington Avenue and East 220th Street. Emissions factors were converted into units of grams per second per square meter of area for drive aisle movement and on-road movement in order to be input into AERMOD using the following conversion method:

Equation 1
Emissions Factors

$$= ([\{_{//} \times \times \} + 60] + 60) +$$

Where:

E = Emissions (grams per second per square meter)
R = Running
EMFAC = EMFAC2014 Output (grams per hour)
g = Grams
mi = Mile
hr = Hour
T = Trucks
D = Travel Distance (miles)
A = Area (square meters)

Idling emissions are presented in grams per second. Trucks will idle for a maximum of five total minutes. Trip distribution is based on the traffic impact analysis prepared by Urban Crossroads (see Appendix B, Traffic Impact Analysis). Table 2 (Emissions Factors) summarizes the emissions factors for each area of the on- and off-site area.

Table 2
Emissions Factors

Source	Emissions Factor*
Building	
Truck Bay (DOCK1)	5.67E-05
Truck Bay (DOCK2)	8.49E-05
Drive Aisle (AIS1)	1.00E-09
Drive Aisle (AIS2)	2.00E-09
Roadways	
Wilmington Ave (ROAD1)	4.32E-10
Wilmington Ave (ROAD2)	8.17E-10
Wilmington Ave (ROAD3)	4.33E-09
E. 220th Street (ROAD4)	3.22E-09
Wilmington Ave (ROAD5)	4.82E-10
* grams per second per square meters (g/s/m^2) for vehicle movement and grams per second (g/s) for idling emissions	

5.2.3 Source Location

On-site emissions sources are identified in Exhibit 3 (On-Site Emissions) and Exhibit 4 (Off-Site Emissions). Table 3 (Source Locations) provides the Universal Transverse Mercator (UTM) coordinates for the southwest corner of each area source. Although SCAQMD recommends emissions be modeled as area or volume sources, the idling sources were input a point source from the center of the docking bay to account for building downwash.

Table 3
Source Locations

Source	UTM (Zone 11N)	
	Easting	Northing
Building		
Truck Bay (DOCK1)	385353	3743930
Truck Bay (DOCK2)	385508	3743930
Drive Aisle (AIS1)	385245	3743951
Drive Aisle (AIS2)	385428	3743918
Roadways		
Wilmington Ave (ROAD1)	385299	3744209
Wilmington Ave (ROAD2)	385215	3743948
Wilmington Ave (ROAD3)	385159	3743776
E. 220th Street (ROAD4)	385126	3743672
Wilmington Ave (ROAD5)	385180	3743762

5.2.4 Source Treatment

The source height for all emissions sources is 14 feet (4.2 meters), the approximate height of a truck exhaust. On- and off-site vehicle movement was modeled as area sources and idling emissions were modeled as point sources. Idling exhaust release characteristics were assumed with an exit temperature of 366.48° Kelvin, exit velocity of 50 meters per second (m/s), and an exhaust diameter of 0.1016 meters.

5.2.5 Area Dimensions

All off-site vehicle movement emissions sources are modeled as a polygon area source in AERMOD. On-site vehicle movement was modeled as an irregular polygon area source to account for truck movement into trailer parking, on drive aisles, and into docking bays. Table 4 (Area Dimensions) identifies the dimensions used in the model.

Table 4
Area Dimensions

Source	Length (m)	Width (m)	Travel Distance (miles)*
Building			
Drive Aisle (AIS1)	180.72	58.08	0.08
Drive Aisle (AIS2)	339.05	35.59	0.21
Roadways			
Wilmington Ave (ROAD1)	277.32	25.20	0.13
Wilmington Ave (ROAD2)	177.50	24.50	0.13
Wilmington Ave (ROAD3)	112.08	24.32	0.25
E. 220th Street (ROAD4)	397.89	14.45	0.13
Wilmington Ave (ROAD5)	109.53	23.79	0.07

* Length of area source doubled to account for total trip length
-- Irregular Area Source

5.3 Air Dispersion Modeling

Cancer risk and non-cancer health risks to sensitive receptors within one-quarter mile of the project site were characterized using the United States Environmental Protection Agency (EPA) EPA AERMOD model and guidance provided by SCAQMD in the *Health Risk Assessment Guidance for Analyzing Cancer Risks from Mobile Source Diesel Emissions* white paper, the *Guidance Manual for Preparation of Health Risk Assessments* developed by OEHHA, and the SCAQMD *Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics Hot Spots Information and Assessment Act* prepared by SCAQMD. AERMOD is the EPA regulatory dispersion model that provides multiple source Gaussian plume models with maximum ground-level concentrations for point, area, flare, and volume sources. AERMOD replaced the Industrial Source Complex (ISC3) model in 2005 as the EPA regulatory model. The composite emissions factor for idling trucks and on-site truck movement was estimated using Mobile Emissions Sources Inventory 2014 (EMFAC2014). EMFAC2014 was developed by ARB to calculate emissions inventories for mobile vehicles operating in California based on raw vehicle data. The dimensions of the proposed buildings were modeled using Building Profile Input Program Prime (BPIPPRM) (see Appendix C).

5.3.1 Meteorological Data

Meteorological data was prepared by SCAQMD for the Long Beach (LGBH) station using AERMET version 12345 (available at http://www.aqmd.gov/home/library/air-quality-data-studies/meteorological-data/aermod-table-2). Surface characteristics for the Long Beach station include a surface albedo of 0.18, surface roughness of 0.504 meters, and a Bowen ratio of 1.0. The station is located at UTM Zone 11 South, 393.41 kilometers (km) easting and 3,742.55 km northing at an elevation of 41 meters above sea level.

5.3.2 Discrete Receptors

There are 338 discrete receptors within one-quarter mile of the project site, of which 271 are residential parcels and 67 are non-residential parcels. These receptors were input into the model. Sensitive receptors are located less than 100-feet from the western edge of the project site.

5.3.3 Receptor Grid

Emissions were modeled in a 1,100 x 800-meter receptor grid network at 50 meter transects around the project site. This resulted in a 352-point concentration grid around the project site.

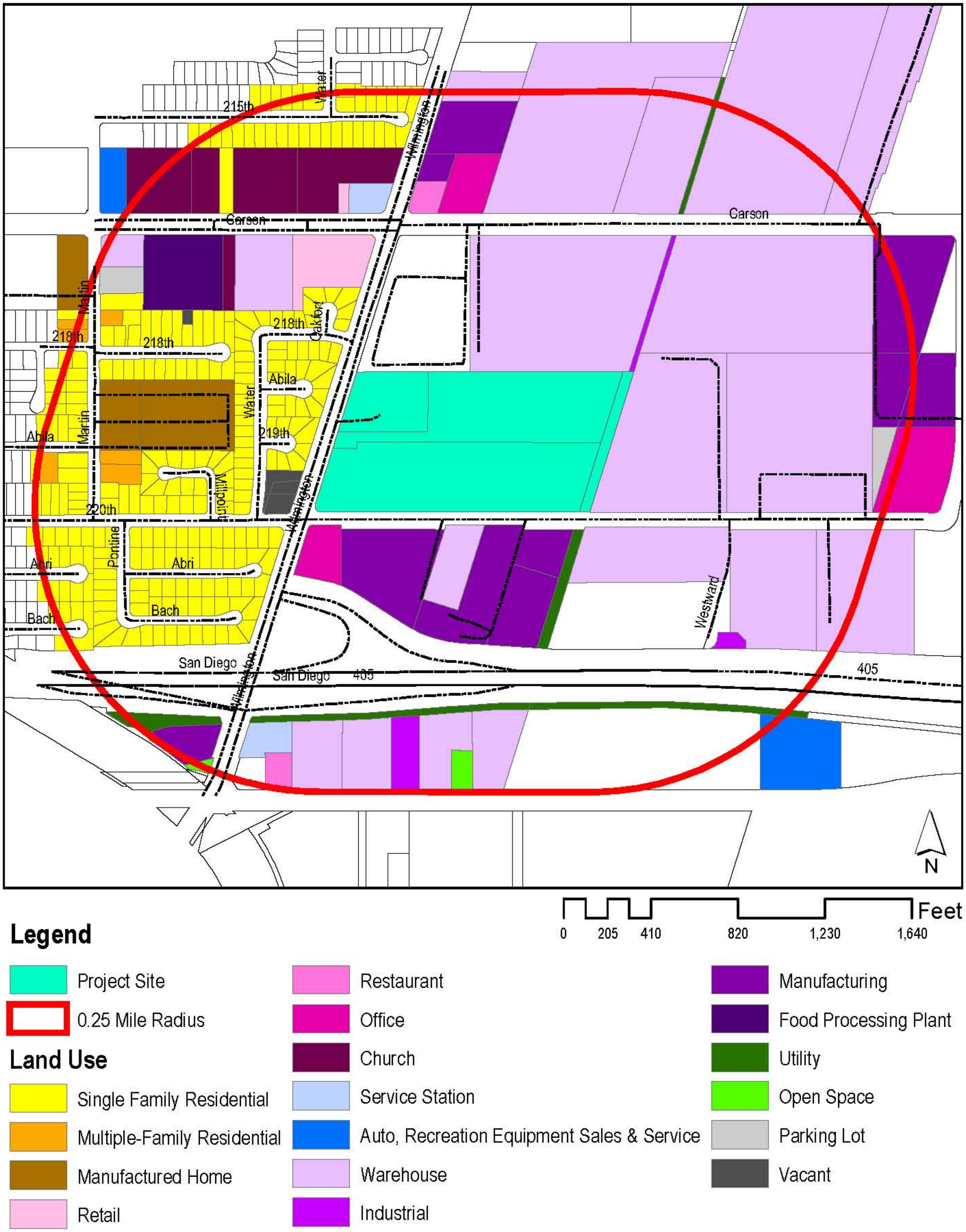
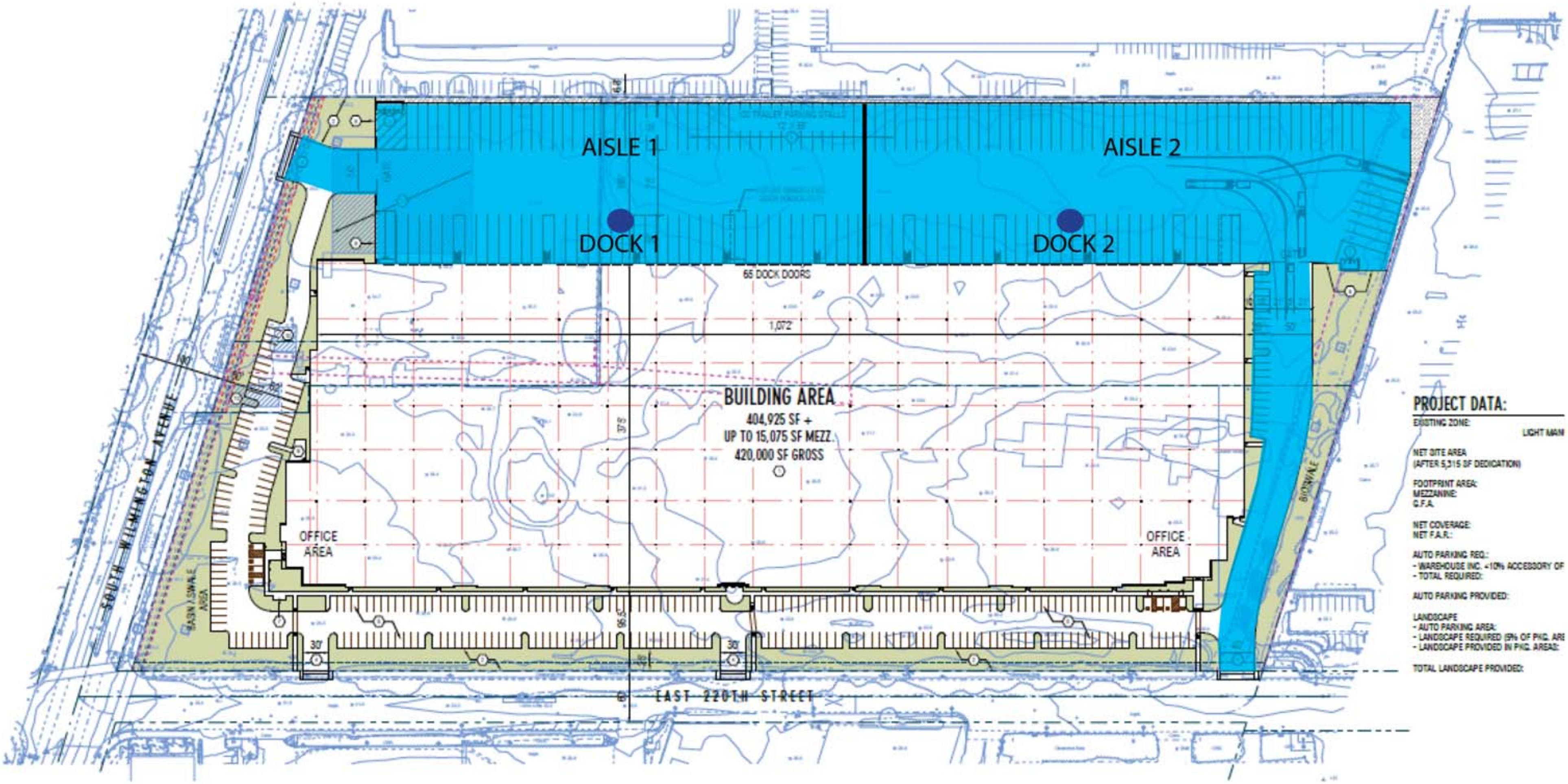


Exhibit 2 Radius Map

AL2 Carson 420K Warehouse

Carson, California



- Idling Point Sources

- Drive Aisle Area

Not to Scale

Exhibit 3 On-Site Emissions

AL2 Carson 420K Warehouse

Carson, California

http://www.migcom.com • 951-787-9222

MIG

- Project Site

- Off-Site Emissions Sources

Not to Scale

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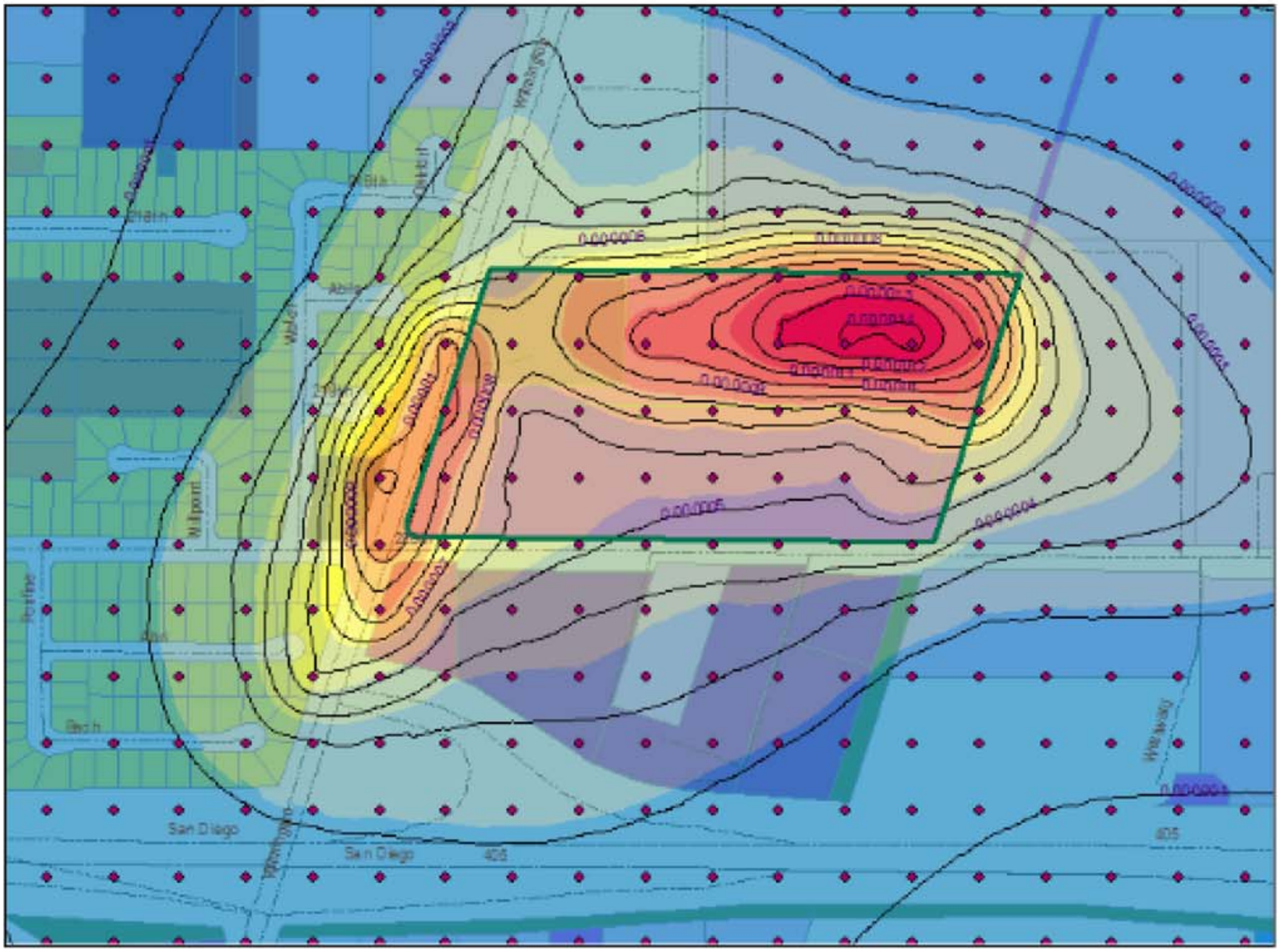
Exhibit 4 Off-Site Emissions

AL2 Carson 420K Warehouse

Carson, California



N

0 130 260 520 780 1,040 Feet

Legend

Project Site

Cancer Risk (Contours)

<VALUE>

- 0.000000554 - 0.00000208
- 0.00000208 - 0.00000366
- 0.00000366 - 0.000005186
- 0.000005186 - 0.000006711
- 0.000006711 - 0.000008292
- 0.000008292 - 0.000009817
- 0.000009817 - 0.000011343
- 0.000011343 - 0.000012923
- 0.000012923 - 0.000014449

Not to Scale

Exhibit 5 Cancer Burden

AL2 Carson 420K Warehouse

Carson, California

6 Risk Assessment

Cancer risk and non-cancer health risks to sensitive receptors within one-quarter mile of on-site sources were estimated using the EPA AERMOD model and guidance provided by SCAQMD in the *Health Risk Assessment Guidance for Analyzing Cancer Risks from Mobile Source Diesel Emissions* white paper and the *2015 Guidance Manual for the Preparation of Health Risk Assessment*. The discussion herein is further

6.1 Cancer Risk

SCAQMD has established thresholds for emissions of toxic air contaminants. Toxic air emissions from a project are considered potentially significant if maximum incremental cancer risk is greater than ten persons in 1,000,000 (1E-05). Cancer risk is determined by calculating the combinatory effects of the cancer potency factor (CPF) when inhaling the toxic, the daily inhalation dose, the age group the receptor is cohort to, the duration of exposure over a lifetime (70 years), and the amount of time spent at the location of exposure (see Appendix C). Cancer risk was assessed for three specific locations within one-quarter mile of the proposed project, as recommended by OEHHA: the maximum exposed individual resident (MEIR) over a 30-year exposure duration that characterizes the maximum residency tendency in California, the maximum exposed individual worker (MEIW) over a 25-year exposure duration characterizing the maximum job tenure tendency in California, and the point of maximum impact (PMI) irrespective of receptor type. Additionally, residential receptors were assessed under 9-year and 70-year exposure durations to further detail potential risk to those under average residency tendency and lifetime exposure scenarios, respectively. Cancer risk for exposed residential and worker receptors was calculated using Equation 1 (Residential Cancer Risk) and

Equation 2 (Worker Cancer Risk). Residential risk calculations account for presumed sensitivity to carcinogens and differences in intake rates for the third-trimester to birth, birth to two-years, two-years to nine-years, two-years to nine-years, two-years to 16-years, 16-year to 30-years, and 16-years to 70 years age bins.

Equation 1
Residential Cancer Risk

$$RISK_{INH.RES} = DOSE_{AIR.RES} \times CPF \times ASF \times \frac{ED}{AT} \times FAH$$

Equation 2
Worker Cancer Risk

$$RISK_{INH.WORK} = DOSE_{AIR.WORK} \times CPF \times ASF \times \frac{ED}{AT}$$

Where:

$DOSE_{AIR}$	=	Daily Inhalation Dose (mg/kg-day)
CPF	=	Cancer Potency Factor for Inhalants (mg/kg-day). CPF is expressed as the 95th percent upper confidence limit of the slope of the dose response curve under continuous lifetime exposure conditions. The CPF for diesel exhaust is 1.1 mg/kg-day.
ASF	=	Age Sensitivity Factor (ASF. ASF is a coefficient that inflates overall cancer risk for younger receptors based on data that suggests younger animals may be more susceptible when exposed to carcinogens. The recommended coefficients are 10 for the third-trimester to birth and two-year age bins, three for the two-year to nine-year and 16-year age bins, and one for receptors over 16 years of age.
ED	=	Exposure Duration (years). Exposure duration characterizes the length of residency or employment of the receptor. As discussed above, MEIR over a 30-year exposure duration is used to characterize the upper limit of residency in California while residential 9-year and 70-year exposure durations and included to characterize average residency tendency and lifetime exposure scenarios, respectively. MEIW over a 25-year exposure is used to characterize the upper limit of job tenure in California.

AT = Averaging Time (years). A 70-year (lifetime) averaging time is used to characterize to total risk as a factor of average risk over a typical lifespan.

FAH = Fraction at Home. FAH is the percentage of time the receptor is physically at the receptor location. The recommended percentages are 85 percent for the third-trimester to birth and two-year age bins, 72 percent for the two-year to nine-year and 16-year age bins, and 73 for receptors over 16 years of age.

Equation 3
Residential Dose

$$DOSE_{AIR,RES} = C_{Air} \times \frac{BR}{BW} \times A \times EF \times 10^{-6}$$

Equation 4
Worker Dose

$$DOSE_{AIR,WORK} = C_{Air} \times WAF \times \frac{BR}{BW} \times A \times EF \times 10^{-6}$$

Where:

C_{AIR} = Concentration of TAC in air (μg/m³). Concentration of toxic in micrograms per one cubic meter of air. The AERMOD program is used in the study to determine concentrations of diesel particulate matter at surrounding discrete and grid receptor points.

WAF = Worker Air Concentration Adjustment Factor. The WAF is a coefficient designed to characterize the overlap of offsite worker schedules with the operations of a land use under study.

$\frac{BR}{BW}$ = *Breathing Rate ÷ Body Weight (L*/kg/day). Daily breathing rate normalized to body weight. The 95th percentile breathing rate to body weight ratios are used in this study with a recommended 361 L/kg/day for the third-trimester to birth age bin, 1,090 L/kg/day for the birth to two-years age bin, 861 L/kg/day for the two-years to nine-years age bin, 745 for the two-years to 16-years age bin, 335 L/kg/day for the 16-years to 30-years age bin, and 290 L/kg/day for the 16-years to 70-years age bin.

A = *Inhalation Absorption Factor.* Is a coefficient that reflects the fraction of chemical absorbed in studies used in the development of CPF and Reference Exposure Levels (RELs). An absorption factor of one is recommended for all chemicals.

EF = *Exposure* Frequency. EF is the ratio of days in a year that a receptor is receiving the dose. The recommended EF is 0.96 characterizing an assumed 350 days a year that a residential receptor is home for some portion of the day.

Equation 5
Worker Adjustment Factor

$$WAF = \frac{H_{RES}}{H_{SOURCE}} \times \frac{D_{RES}}{D_{SOURCE}} \times DF$$

Where:

H_{RES} = *Residential Hours.* Daily Hours by that the Annual Average Residential Air Concentration is Calculated.

H_{SOURCE} = *Source Operational Hours.* For this study it was assumed that the facilities will operate 24 hours a day.

D_{RES} = *Residential Days.* Weekly Days by that the Annual Average Residential Air Concentration is Calculated.

D_{SOURCE} = *Weekly Operational Days of the Source.* For this study it was assumed that the facilities will operate seven days a week.

DF = *Discount Factor.* Coefficient for Partial Overlap of Work Schedule and Source Operations. No discount factor was applied in this study

Concentrations were modeled using AERMOD and then input into the Hot Spots and Reporting Program (HARP) Health Risk Assessment Standalone Tool (RAST) computer software to calculate cancer risk based on the methods and recommendations found in the HRA Guidelines. The results of the HARP evaluation of cancer risk for residential 9-years, 30 years, and 70 years, and worker 25-years exposure scenarios for grid receptors and discrete receptors are summarized in the following tables and detailed program results are included as Appendix D.

- Table 5 (30 Years (Maximum) Residential Cancer Risk (Discrete Receptors))
- Table 6 (70 Years (Lifetime) Population-Wide Cancer Burden (Grid Receptors))
- Table 7 (25 Years (High-End) Worker Cancer Risk)

Table 5
30 Years (Maximum) Residential Cancer Risk (Discrete Receptors)

Res. Disc. Index	UTM		Concentration	Cancer Risk
	N	E		
Discrete Receptors				
1	384791	3743746	0.00098	8.48E-07
2	384793	3743846	0.00084	7.27E-07
3	384795	3743800	0.00092	7.96E-07
4	384803	3743668	0.00106	9.17E-07
5	384803	3743716	0.00105	9.08E-07
6	384803	3743901	0.00077	6.66E-07
7	384808	3743800	0.00096	8.31E-07
8	384812	3743746	0.00105	9.08E-07
9	384815	3743846	0.00089	7.70E-07
10	384818	3743637	0.0011	9.52E-07
11	384818	3743668	0.00111	9.60E-07
12	384818	3743901	0.0008	6.92E-07
13	384819	3743716	0.0011	9.52E-07
14	384821	3743799	0.001	8.65E-07
15	384821	3743928	0.00077	6.66E-07
16	384823	3743945	0.00075	6.49E-07
17	384823	3743962	0.00074	6.40E-07
18	384823	3743978	0.00072	6.23E-07
19	384830	3743745	0.00112	9.69E-07
20	384831	3743592	0.00111	9.60E-07
21	384833	3743901	0.00083	7.18E-07
22	384834	3743637	0.00115	9.95E-07
23	384834	3743667	0.00116	1.00E-06
24	384834	3743716	0.00116	1.00E-06
25	384834	3743799	0.00105	9.08E-07
26	384838	3743999	0.00074	6.40E-07
27	384847	3743833	0.00102	8.82E-07
28	384847	3743854	0.00097	8.39E-07
29	384849	3743745	0.00119	1.03E-06
30	384849	3744034	0.00074	6.40E-07
31	384849	3744050	0.00073	6.32E-07
32	384849	3744064	0.00072	6.23E-07
33	384849	3744125	0.00067	5.80E-07
34	384851	3743639	0.00122	1.06E-06
35	384851	3743666	0.00123	1.06E-06
36	384852	3743718	0.00123	1.06E-06
37	384853	3743928	0.00084	7.27E-07
38	384853	3743945	0.00082	7.09E-07
39	384853	3743961	0.0008	6.92E-07
40	384854	3743780	0.00116	1.00E-06
41	384854	3743791	0.00114	9.86E-07
42	384854	3743803	0.00111	9.60E-07
43	384854	3743816	0.00108	9.34E-07

Res. Disc. Index	UTM N	UTM E	Concentration	Cancer Risk
44	384854	3743891	0.00091	7.87E-07
45	384854	3743978	0.00079	6.83E-07
46	384855	3743910	0.00087	7.53E-07
47	384858	3743999	0.00078	6.75E-07
48	384861	3743593	0.00121	1.05E-06
49	384867	3743745	0.00127	1.10E-06
50	384868	3743634	0.00128	1.11E-06
51	384868	3743670	0.0013	1.12E-06
52	384869	3743713	0.00131	1.13E-06
53	384884	3743744	0.00135	1.17E-06
54	384890	3743629	0.00137	1.19E-06
55	384891	3743609	0.00135	1.17E-06
56	384892	3743645	0.0014	1.21E-06
57	384892	3743660	0.00141	1.22E-06
58	384892	3743675	0.00142	1.23E-06
59	384892	3743691	0.00142	1.23E-06
60	384892	3743706	0.00142	1.23E-06
61	384892	3743721	0.00141	1.22E-06
62	384896	3743985	0.00088	7.61E-07
63	384898	3744033	0.00085	7.35E-07
64	384899	3743789	0.00134	1.16E-06
65	384899	3743811	0.00128	1.11E-06
66	384901	3743744	0.00144	1.25E-06
67	384904	3743598	0.00139	1.20E-06
68	384905	3744059	0.00084	7.27E-07
70	384913	3743984	0.00092	7.96E-07
71	384916	3743835	0.00129	1.12E-06
72	384916	3743858	0.00121	1.05E-06
73	384916	3743919	0.00103	8.91E-07
74	384916	3744033	0.00089	7.70E-07
76	384920	3743798	0.00143	1.24E-06
77	384920	3744082	0.00086	7.44E-07
79	384928	3743985	0.00097	8.39E-07
80	384931	3743599	0.00152	1.32E-06
81	384932	3744054	0.00091	7.87E-07
82	384935	3743798	0.00153	1.32E-06
83	384936	3743713	0.00168	1.45E-06
84	384936	3743743	0.00165	1.43E-06
85	384937	3744033	0.00095	8.22E-07
86	384941	3743640	0.00165	1.43E-06
87	384941	3743658	0.00167	1.44E-06
88	384941	3743676	0.0017	1.47E-06
89	384944	3743984	0.00102	8.82E-07
90	384951	3743602	0.00162	1.40E-06
91	384952	3743713	0.00179	1.55E-06
92	384953	3743743	0.00178	1.54E-06

Res. Disc. Index	UTM		Concentration	Cancer Risk
	N	E		
93	384953	3743790	0.00168	1.45E-06
94	384954	3744044	0.00099	8.57E-07
95	384955	3743824	0.00156	1.35E-06
96	384955	3743847	0.00147	1.27E-06
97	384959	3743984	0.00107	9.26E-07
98	384964	3743644	0.00181	1.57E-06
99	384964	3743671	0.00185	1.60E-06
100	384967	3743813	0.0017	1.47E-06
101	384968	3743602	0.00172	1.49E-06
102	384969	3743713	0.00193	1.67E-06
103	384969	3743858	0.00151	1.31E-06
104	384969	3744044	0.00103	8.91E-07
106	384970	3743743	0.00192	1.66E-06
107	384972	3743790	0.00183	1.58E-06
108	384974	3743984	0.00112	9.69E-07
110	384983	3743644	0.00195	1.69E-06
111	384983	3743671	0.00201	1.74E-06
112	384984	3744043	0.00109	9.43E-07
113	384986	3743602	0.00183	1.58E-06
114	384986	3743713	0.00209	1.81E-06
115	384986	3743743	0.00208	1.80E-06
116	384989	3743984	0.00118	1.02E-06
117	384991	3743789	0.00201	1.74E-06
118	384991	3743814	0.00191	1.65E-06
119	384993	3743855	0.00171	1.48E-06
120	384999	3744043	0.00114	9.86E-07
121	385002	3743643	0.00211	1.83E-06
122	385002	3743670	0.00219	1.89E-06
123	385003	3743712	0.00227	1.96E-06
124	385003	3743743	0.00226	1.96E-06
125	385004	3743602	0.00195	1.69E-06
126	385004	3743984	0.00125	1.08E-06
129	385010	3743789	0.00222	1.92E-06
130	385011	3743816	0.00211	1.83E-06
131	385013	3743854	0.0019	1.64E-06
132	385013	3743918	0.00152	1.32E-06
133	385013	3744033	0.00121	1.05E-06
135	385019	3743984	0.00133	1.15E-06
136	385020	3743712	0.00249	2.15E-06
137	385020	3743743	0.00249	2.15E-06
138	385021	3743643	0.00229	1.98E-06
139	385021	3743670	0.0024	2.08E-06
140	385022	3743602	0.00208	1.80E-06
141	385025	3744320	0.00078	6.75E-07
143	385029	3744043	0.00127	1.10E-06
144	385030	3743789	0.0025	2.16E-06

Res. Disc. Index	UTM		Concentration	Cancer Risk
	N	E		
145	385030	3743815	0.00236	2.04E-06
146	385033	3743856	0.00211	1.83E-06
147	385035	3743984	0.00142	1.23E-06
148	385036	3743712	0.00274	2.37E-06
149	385037	3743742	0.00276	2.39E-06
150	385039	3743643	0.0025	2.16E-06
151	385040	3743602	0.00222	1.92E-06
152	385040	3743670	0.00267	2.31E-06
154	385041	3744320	0.00081	7.01E-07
155	385044	3744043	0.00134	1.16E-06
156	385053	3743712	0.00307	2.66E-06
157	385053	3743742	0.00308	2.66E-06
158	385053	3743982	0.00154	1.33E-06
159	385054	3743855	0.00242	2.09E-06
160	385057	3744319	0.00084	7.27E-07
161	385058	3743602	0.00237	2.05E-06
162	385059	3743644	0.00279	2.41E-06
163	385059	3743670	0.00302	2.61E-06
164	385059	3744045	0.00142	1.23E-06
165	385064	3743785	0.00319	2.76E-06
166	385064	3743804	0.00305	2.64E-06
167	385066	3743824	0.00293	2.54E-06
168	385066	3743846	0.00272	2.35E-06
169	385070	3743712	0.00349	3.02E-06
170	385070	3743742	0.00352	3.05E-06
171	385071	3744255	0.001	8.65E-07
172	385072	3743985	0.00167	1.44E-06
173	385073	3744319	0.00087	7.53E-07
174	385074	3744032	0.00154	1.33E-06
175	385074	3744060	0.00147	1.27E-06
177	385078	3743670	0.0035	3.03E-06
178	385079	3743600	0.00251	2.17E-06
179	385084	3743647	0.00331	2.86E-06
180	385087	3743712	0.0041	3.55E-06
181	385087	3743742	0.0041	3.55E-06
182	385089	3743784	0.00397	3.43E-06
183	385089	3744319	0.0009	7.79E-07
184	385091	3743801	0.00389	3.37E-06
185	385092	3743818	0.00373	3.23E-06
186	385092	3743833	0.00352	3.05E-06
187	385093	3743848	0.00334	2.89E-06
188	385093	3743864	0.00313	2.71E-06
189	385093	3743879	0.00292	2.53E-06
190	385093	3744018	0.00172	1.49E-06
191	385093	3744037	0.00166	1.44E-06
192	385094	3743894	0.00274	2.37E-06

Res. Disc. Index	UTM N	UTM E	Concentration	Cancer Risk
193	385094	3743909	0.00254	2.20E-06
194	385094	3743925	0.00235	2.03E-06
195	385094	3743940	0.00219	1.89E-06
196	385094	3743955	0.00206	1.78E-06
197	385095	3743611	0.00279	2.41E-06
198	385095	3743970	0.00197	1.70E-06
199	385095	3743986	0.00188	1.63E-06
200	385095	3744001	0.00181	1.57E-06
201	385097	3743670	0.00425	3.68E-06
202	385098	3743402	0.00137	1.19E-06
203	385100	3744055	0.00165	1.43E-06
204	385103	3743638	0.00348	3.01E-06
205	385104	3743742	0.0049	4.24E-06
206	385105	3744319	0.00093	8.05E-07
207	385109	3743716	0.00537	4.65E-06
208	385114	3744373	0.00082	7.09E-07
209	385116	3743673	0.00584	5.05E-06
210	385120	3743741	0.00617	5.34E-06
211	385121	3744319	0.00096	8.31E-07
213	385122	3744058	0.00181	1.57E-06
217	385128	3743707	0.00803	6.95E-06
218	385129	3744373	0.00084	7.27E-07
219	385133	3743853	0.00499	4.32E-06
220	385133	3743900	0.00373	3.23E-06
221	385136	3744319	0.00099	8.57E-07
222	385137	3743742	0.00846	7.32E-06
224	385140	3743923	0.00344	2.98E-06
225	385140	3743939	0.0031	2.68E-06
226	385140	3743971	0.00261	2.26E-06
227	385141	3743987	0.00246	2.13E-06
228	385141	3744056	0.00199	1.72E-06
229	385142	3744003	0.00234	2.02E-06
230	385143	3744017	0.00225	1.95E-06
232	385144	3744373	0.00086	7.44E-07
234	385148	3743850	0.00634	5.49E-06
235	385149	3743902	0.00444	3.84E-06
237	385152	3744319	0.00102	8.82E-07
238	385159	3744055	0.0022	1.90E-06
239	385159	3744373	0.00088	7.61E-07
240	385160	3743930	0.00415	3.59E-06
241	385161	3743980	0.00294	2.54E-06
242	385164	3744009	0.00263	2.28E-06
243	385167	3743850	0.00944	8.17E-06
244	385168	3744319	0.00105	9.08E-07
245	385172	3743903	0.00647	5.60E-06
246	385175	3744054	0.00241	2.09E-06

Res. Disc. Index	UTM		Concentration	Cancer Risk
	N	E		
247	385175	3744373	0.0009	7.79E-07
248	385176	3743926	0.00546	4.72E-06
249	385177	3743982	0.00332	2.87E-06
250	385178	3743866	0.01068	9.24E-06
251	385179	3744009	0.00291	2.52E-06
252	385184	3744318	0.00108	9.34E-07
253	385185	3743891	0.00988	8.55E-06
254	385191	3744072	0.00249	2.15E-06
256	385194	3743928	0.00768	6.64E-06
257	385194	3744051	0.00273	2.36E-06
258	385195	3744009	0.00327	2.83E-06
259	385197	3744364	0.00096	8.31E-07
260	385197	3744384	0.0009	7.79E-07
261	385198	3744089	0.00245	2.12E-06
262	385199	3744318	0.00111	9.60E-07
263	385200	3743982	0.00408	3.53E-06
265	385204	3743944	0.00718	6.21E-06
266	385210	3743967	0.00539	4.66E-06
267	385210	3744009	0.00376	3.25E-06
268	385215	3744318	0.00115	9.95E-07
270	385222	3744090	0.00287	2.48E-06
271	385225	3744006	0.00458	3.96E-06
272	385231	3744319	0.00118	1.02E-06
273	385235	3744046	0.00407	3.52E-06
276	385243	3744064	0.00405	3.50E-06
277	385243	3744085	0.00359	3.11E-06
278	385244	3744362	0.00104	9.00E-07
279	385244	3744383	0.00097	8.39E-07
280	385246	3744319	0.00122	1.06E-06
281	385261	3744319	0.00126	1.09E-06
283	385265	3744371	0.00106	9.17E-07
285	385277	3744319	0.00133	1.15E-06
286	385280	3744370	0.00111	9.60E-07
287	385292	3744319	0.00142	1.23E-06
288	385296	3744369	0.00119	1.03E-06
292	385307	3744317	0.00158	1.37E-06
293	385311	3744369	0.0013	1.12E-06
295	385325	3744317	0.0019	1.64E-06
296	385326	3744371	0.00144	1.25E-06
297	385342	3744365	0.00178	1.54E-06
298	385352	3744068	0.0036	3.11E-06
317	385654	3743430	0.00078	6.75E-07
318	385654	3743624	0.00137	1.19E-06
325	385776	3743624	0.00132	1.14E-06

Table 6
70 Years (Lifetime) Population-Wide Cancer Burden (Grid Receptors)

Res. Disc. Index	UTM N	UTM E	Concentration	Cancer Risk
Grid Receptors				
1	3744221	384874	0.00062	5.54E-07
2	3744171	384874	0.00067	5.99E-07
3	3744121	384874	0.00072	6.43E-07
4	3744071	384874	0.00076	6.79E-07
5	3744021	384874	0.0008	7.15E-07
6	3743971	384874	0.00084	7.51E-07
7	3743921	384874	0.0009	8.04E-07
8	3743871	384874	0.00101	9.03E-07
9	3743821	384874	0.00115	1.03E-06
10	3743771	384874	0.00126	1.13E-06
11	3743721	384874	0.00132	1.18E-06
12	3743671	384874	0.00133	1.19E-06
13	3743621	384874	0.00129	1.15E-06
14	3743571	384874	0.00123	1.10E-06
15	3743521	384874	0.00115	1.03E-06
16	3743471	384874	0.00106	9.47E-07
17	3744221	384924	0.00071	6.35E-07
18	3744171	384924	0.00077	6.88E-07
19	3744121	384924	0.00083	7.42E-07
20	3744071	384924	0.00088	7.86E-07
21	3744021	384924	0.00092	8.22E-07
22	3743971	384924	0.00097	8.67E-07
23	3743921	384924	0.00106	9.47E-07
24	3743871	384924	0.00121	1.08E-06
25	3743821	384924	0.00138	1.23E-06
26	3743771	384924	0.00153	1.37E-06
27	3743721	384924	0.0016	1.43E-06
28	3743671	384924	0.00159	1.42E-06
29	3743621	384924	0.00152	1.36E-06
30	3743571	384924	0.00142	1.27E-06
31	3743521	384924	0.0013	1.16E-06
32	3743471	384924	0.00119	1.06E-06
33	3744221	384974	0.00081	7.24E-07
34	3744171	384974	0.00088	7.86E-07
35	3744121	384974	0.00096	8.58E-07
36	3744071	384974	0.00102	9.12E-07
37	3744021	384974	0.00108	9.65E-07
38	3743971	384974	0.00114	1.02E-06
39	3743921	384974	0.00127	1.14E-06
40	3743871	384974	0.00148	1.32E-06
41	3743821	384974	0.00172	1.54E-06
42	3743771	384974	0.0019	1.70E-06
43	3743721	384974	0.00197	1.76E-06

Res. Disc. Index	UTM		Concentration	Cancer Risk
	N	E		
44	3743671	384974	0.00194	1.73E-06
45	3743621	384974	0.00182	1.63E-06
46	3743571	384974	0.00165	1.47E-06
47	3743521	384974	0.00149	1.33E-06
48	3743471	384974	0.00133	1.19E-06
49	3744221	385024	0.00094	8.40E-07
50	3744171	385024	0.00102	9.12E-07
51	3744121	385024	0.00112	1.00E-06
52	3744071	385024	0.0012	1.07E-06
53	3744021	385024	0.00128	1.14E-06
54	3743971	385024	0.00139	1.24E-06
55	3743921	385024	0.00159	1.42E-06
56	3743871	385024	0.0019	1.70E-06
57	3743821	385024	0.00224	2.00E-06
58	3743771	385024	0.00249	2.23E-06
59	3743721	385024	0.00256	2.29E-06
60	3743671	385024	0.00245	2.19E-06
61	3743621	385024	0.00221	1.98E-06
62	3743571	385024	0.00192	1.72E-06
63	3743521	385024	0.00167	1.49E-06
64	3743471	385024	0.00147	1.31E-06
65	3744221	385074	0.00109	9.74E-07
66	3744171	385074	0.0012	1.07E-06
67	3744121	385074	0.00133	1.19E-06
68	3744071	385074	0.00145	1.30E-06
69	3744021	385074	0.00157	1.40E-06
70	3743971	385074	0.00175	1.56E-06
71	3743921	385074	0.00209	1.87E-06
72	3743871	385074	0.00261	2.33E-06
73	3743821	385074	0.00315	2.82E-06
74	3743771	385074	0.00354	3.16E-06
75	3743721	385074	0.00363	3.24E-06
76	3743671	385074	0.00339	3.03E-06
77	3743621	385074	0.00273	2.44E-06
78	3743571	385074	0.00219	1.96E-06
79	3743521	385074	0.00185	1.65E-06
80	3743471	385074	0.0016	1.43E-06
81	3744221	385124	0.00126	1.13E-06
82	3744171	385124	0.00143	1.28E-06
83	3744121	385124	0.0016	1.43E-06
84	3744071	385124	0.00178	1.59E-06
85	3744021	385124	0.002	1.79E-06
86	3743971	385124	0.00234	2.09E-06
87	3743921	385124	0.00301	2.69E-06
88	3743871	385124	0.00404	3.61E-06
89	3743821	385124	0.00522	4.67E-06

Res. Disc. Index	UTM		Concentration	Cancer Risk
	N	E		
90	3743771	385124	0.0062	5.54E-06
91	3743721	385124	0.00704	6.29E-06
92	3743671	385124	0.00663	5.93E-06
93	3743621	385124	0.00315	2.82E-06
94	3743571	385124	0.00236	2.11E-06
95	3743521	385124	0.00196	1.75E-06
96	3743471	385124	0.00169	1.51E-06
97	3744221	385174	0.00145	1.30E-06
98	3744171	385174	0.00169	1.51E-06
99	3744121	385174	0.00196	1.75E-06
100	3744071	385174	0.00227	2.03E-06
101	3744021	385174	0.00268	2.40E-06
102	3743971	385174	0.00349	3.12E-06
103	3743921	385174	0.00556	4.97E-06
104	3743871	385174	0.00928	8.29E-06
105	3743821	385174	0.01278	1.14E-05
106	3743771	385174	0.01224	1.09E-05
107	3743721	385174	0.0098	8.76E-06
108	3743671	385174	0.0057	5.09E-06
109	3743621	385174	0.00312	2.79E-06
110	3743571	385174	0.0024	2.14E-06
111	3743521	385174	0.00202	1.81E-06
112	3743471	385174	0.00174	1.56E-06
113	3744221	385224	0.00166	1.48E-06
114	3744171	385224	0.00203	1.81E-06
115	3744121	385224	0.00254	2.27E-06
116	3744071	385224	0.00318	2.84E-06
117	3744021	385224	0.00409	3.66E-06
118	3743971	385224	0.0059	5.27E-06
119	3743921	385224	0.01174	1.05E-05
120	3743871	385224	0.01199	1.07E-05
121	3743821	385224	0.00962	8.60E-06
122	3743771	385224	0.0084	7.51E-06
123	3743721	385224	0.00588	5.25E-06
124	3743671	385224	0.00426	3.81E-06
125	3743621	385224	0.0031	2.77E-06
126	3743571	385224	0.00244	2.18E-06
127	3743521	385224	0.00204	1.82E-06
128	3743471	385224	0.00175	1.56E-06
129	3744221	385274	0.00206	1.84E-06
130	3744171	385274	0.00294	2.63E-06
131	3744121	385274	0.00387	3.46E-06
132	3744071	385274	0.00458	4.09E-06
133	3744021	385274	0.00542	4.84E-06
134	3743971	385274	0.00677	6.05E-06
135	3743921	385274	0.00815	7.28E-06

Res. Disc. Index	UTM		Concentration	Cancer Risk
	N	E		
136	3743871	385274	0.00678	6.06E-06
137	3743821	385274	0.00635	5.67E-06
138	3743771	385274	0.00645	5.76E-06
139	3743721	385274	0.00503	4.50E-06
140	3743671	385274	0.00399	3.57E-06
141	3743621	385274	0.00307	2.74E-06
142	3743571	385274	0.00246	2.20E-06
143	3743521	385274	0.00205	1.83E-06
144	3743471	385274	0.00173	1.55E-06
145	3744221	385324	0.00266	2.38E-06
146	3744171	385324	0.00322	2.88E-06
147	3744121	385324	0.00318	2.84E-06
148	3744071	385324	0.00354	3.16E-06
149	3744021	385324	0.00456	4.08E-06
150	3743971	385324	0.00918	8.20E-06
151	3743921	385324	0.00987	8.82E-06
152	3743871	385324	0.00703	6.28E-06
153	3743821	385324	0.00618	5.52E-06
154	3743771	385324	0.0058	5.18E-06
155	3743721	385324	0.00455	4.07E-06
156	3743671	385324	0.004	3.57E-06
157	3743621	385324	0.00301	2.69E-06
158	3743571	385324	0.00242	2.16E-06
159	3743521	385324	0.00199	1.78E-06
160	3743471	385324	0.00167	1.49E-06
161	3744221	385374	0.00204	1.82E-06
162	3744171	385374	0.00239	2.14E-06
163	3744121	385374	0.00279	2.49E-06
164	3744071	385374	0.00367	3.28E-06
165	3744021	385374	0.00475	4.25E-06
166	3743971	385374	0.00949	8.48E-06
167	3743921	385374	0.01173	1.05E-05
168	3743871	385374	0.0081	7.24E-06
169	3743821	385374	0.00599	5.35E-06
170	3743771	385374	0.00544	4.86E-06
171	3743721	385374	0.00421	3.76E-06
172	3743671	385374	0.00383	3.42E-06
173	3743621	385374	0.00285	2.55E-06
174	3743571	385374	0.00228	2.04E-06
175	3743521	385374	0.00187	1.67E-06
176	3743471	385374	0.00156	1.39E-06
177	3744221	385424	0.00183	1.64E-06
178	3744171	385424	0.00224	2.00E-06
179	3744121	385424	0.00287	2.56E-06
180	3744071	385424	0.0041	3.66E-06
181	3744021	385424	0.00493	4.41E-06

Res. Disc. Index	UTM N	UTM E	Concentration	Cancer Risk
182	3743971	385424	0.01054	9.42E-06
183	3743921	385424	0.01229	1.10E-05
184	3743871	385424	0.0082	7.33E-06
185	3743821	385424	0.00607	5.42E-06
186	3743771	385424	0.00524	4.68E-06
187	3743721	385424	0.00393	3.51E-06
188	3743671	385424	0.00341	3.05E-06
189	3743621	385424	0.00259	2.31E-06
190	3743571	385424	0.00207	1.85E-06
191	3743521	385424	0.0017	1.52E-06
192	3743471	385424	0.00142	1.27E-06
193	3744221	385474	0.00161	1.44E-06
194	3744171	385474	0.00201	1.80E-06
195	3744121	385474	0.00264	2.36E-06
196	3744071	385474	0.00389	3.48E-06
197	3744021	385474	0.00567	5.07E-06
198	3743971	385474	0.01257	1.12E-05
199	3743921	385474	0.01462	1.31E-05
200	3743871	385474	0.00857	7.66E-06
201	3743821	385474	0.00597	5.34E-06
202	3743771	385474	0.0051	4.56E-06
203	3743721	385474	0.00396	3.54E-06
204	3743671	385474	0.00308	2.75E-06
205	3743621	385474	0.00227	2.03E-06
206	3743571	385474	0.00182	1.63E-06
207	3743521	385474	0.00151	1.35E-06
208	3743471	385474	0.00127	1.14E-06
209	3744221	385524	0.00136	1.22E-06
210	3744171	385524	0.00166	1.48E-06
211	3744121	385524	0.00217	1.94E-06
212	3744071	385524	0.00314	2.81E-06
213	3744021	385524	0.0052	4.65E-06
214	3743971	385524	0.01344	1.20E-05
215	3743921	385524	0.01574	1.41E-05
216	3743871	385524	0.00807	7.21E-06
217	3743821	385524	0.00577	5.16E-06
218	3743771	385524	0.00504	4.50E-06
219	3743721	385524	0.00336	3.00E-06
220	3743671	385524	0.00246	2.20E-06
221	3743621	385524	0.00191	1.71E-06
222	3743571	385524	0.00156	1.39E-06
223	3743521	385524	0.00132	1.18E-06
224	3743471	385524	0.00113	1.01E-06
225	3744221	385574	0.00122	1.09E-06
226	3744171	385574	0.00152	1.36E-06
227	3744121	385574	0.002	1.79E-06

Res. Disc. Index	UTM N	UTM E	Concentration	Cancer Risk
228	3744071	385574	0.00287	2.56E-06
229	3744021	385574	0.00495	4.42E-06
230	3743971	385574	0.01293	1.16E-05
231	3743921	385574	0.01624	1.45E-05
232	3743871	385574	0.00876	7.83E-06
233	3743821	385574	0.00695	6.21E-06
234	3743771	385574	0.00511	4.57E-06
235	3743721	385574	0.00287	2.56E-06
236	3743671	385574	0.00199	1.78E-06
237	3743621	385574	0.0016	1.43E-06
238	3743571	385574	0.00134	1.20E-06
239	3743521	385574	0.00115	1.03E-06
240	3743471	385574	0.001	8.94E-07
241	3744221	385624	0.00118	1.05E-06
242	3744171	385624	0.00147	1.31E-06
243	3744121	385624	0.00192	1.72E-06
244	3744071	385624	0.00267	2.39E-06
245	3744021	385624	0.00426	3.81E-06
246	3743971	385624	0.01045	9.34E-06
247	3743921	385624	0.01319	1.18E-05
248	3743871	385624	0.0098	8.76E-06
249	3743821	385624	0.00622	5.56E-06
250	3743771	385624	0.00385	3.44E-06
251	3743721	385624	0.0024	2.14E-06
252	3743671	385624	0.00175	1.56E-06
253	3743621	385624	0.00141	1.26E-06
254	3743571	385624	0.0012	1.07E-06
255	3743521	385624	0.00104	9.29E-07
256	3743471	385624	0.00091	8.13E-07
257	3744221	385674	0.00113	1.01E-06
258	3744171	385674	0.0014	1.25E-06
259	3744121	385674	0.0018	1.61E-06
260	3744071	385674	0.00243	2.17E-06
261	3744021	385674	0.00349	3.12E-06
262	3743971	385674	0.00577	5.16E-06
263	3743921	385674	0.00712	6.36E-06
264	3743871	385674	0.00661	5.91E-06
265	3743821	385674	0.00503	4.50E-06
266	3743771	385674	0.00342	3.06E-06
267	3743721	385674	0.0023	2.06E-06
268	3743671	385674	0.00166	1.48E-06
269	3743621	385674	0.00133	1.19E-06
270	3743571	385674	0.00112	1.00E-06
271	3743521	385674	0.00097	8.67E-07
272	3743471	385674	0.00085	7.60E-07
273	3744221	385724	0.00107	9.56E-07

Res. Disc. Index	UTM N	UTM E	Concentration	Cancer Risk
274	3744171	385724	0.00132	1.18E-06
275	3744121	385724	0.00168	1.50E-06
276	3744071	385724	0.0022	1.97E-06
277	3744021	385724	0.00293	2.62E-06
278	3743971	385724	0.00392	3.50E-06
279	3743921	385724	0.00485	4.33E-06
280	3743871	385724	0.00515	4.60E-06
281	3743821	385724	0.00443	3.96E-06
282	3743771	385724	0.00327	2.92E-06
283	3743721	385724	0.0023	2.06E-06
284	3743671	385724	0.00166	1.48E-06
285	3743621	385724	0.0013	1.16E-06
286	3743571	385724	0.00108	9.65E-07
287	3743521	385724	0.00093	8.31E-07
288	3743471	385724	0.00081	7.24E-07
289	3744221	385774	0.001	8.94E-07
290	3744171	385774	0.00123	1.10E-06
291	3744121	385774	0.00155	1.39E-06
292	3744071	385774	0.00195	1.74E-06
293	3744021	385774	0.00243	2.17E-06
294	3743971	385774	0.00301	2.69E-06
295	3743921	385774	0.00366	3.27E-06
296	3743871	385774	0.00412	3.68E-06
297	3743821	385774	0.00387	3.46E-06
298	3743771	385774	0.0031	2.77E-06
299	3743721	385774	0.00228	2.04E-06
300	3743671	385774	0.00168	1.50E-06
301	3743621	385774	0.0013	1.16E-06
302	3743571	385774	0.00107	9.56E-07
303	3743521	385774	0.00091	8.13E-07
304	3743471	385774	0.00079	7.06E-07
305	3744221	385824	0.00095	8.49E-07
306	3744171	385824	0.00115	1.03E-06
307	3744121	385824	0.00142	1.27E-06
308	3744071	385824	0.00173	1.55E-06
309	3744021	385824	0.00207	1.85E-06
310	3743971	385824	0.00244	2.18E-06
311	3743921	385824	0.00291	2.60E-06
312	3743871	385824	0.00335	2.99E-06
313	3743821	385824	0.00335	2.99E-06
314	3743771	385824	0.00287	2.56E-06
315	3743721	385824	0.00223	1.99E-06
316	3743671	385824	0.00168	1.50E-06
317	3743621	385824	0.00131	1.17E-06
318	3743571	385824	0.00106	9.47E-07
319	3743521	385824	0.0009	8.04E-07

Res. Disc. Index	UTM N	UTM E	Concentration	Cancer Risk
320	3743471	385824	0.00077	6.88E-07
321	3744221	385874	0.00089	7.95E-07
322	3744171	385874	0.00107	9.56E-07
323	3744121	385874	0.0013	1.16E-06
324	3744071	385874	0.00154	1.38E-06
325	3744021	385874	0.00178	1.59E-06
326	3743971	385874	0.00205	1.83E-06
327	3743921	385874	0.00239	2.14E-06
328	3743871	385874	0.00276	2.47E-06
329	3743821	385874	0.00287	2.56E-06
330	3743771	385874	0.0026	2.32E-06
331	3743721	385874	0.00213	1.90E-06
332	3743671	385874	0.00166	1.48E-06
333	3743621	385874	0.0013	1.16E-06
334	3743571	385874	0.00106	9.47E-07
335	3743521	385874	0.00089	7.95E-07
336	3743471	385874	0.00076	6.79E-07
337	3744221	385924	0.00083	7.42E-07
338	3744171	385924	0.00099	8.85E-07
339	3744121	385924	0.00118	1.05E-06
340	3744071	385924	0.00137	1.22E-06
341	3744021	385924	0.00156	1.39E-06
342	3743971	385924	0.00175	1.56E-06
343	3743921	385924	0.002	1.79E-06
344	3743871	385924	0.0023	2.06E-06
345	3743821	385924	0.00245	2.19E-06
346	3743771	385924	0.00232	2.07E-06
347	3743721	385924	0.00199	1.78E-06
348	3743671	385924	0.0016	1.43E-06
349	3743621	385924	0.00128	1.14E-06
350	3743571	385924	0.00104	9.29E-07
351	3743521	385924	0.00087	7.78E-07
352	3743471	385924	0.00075	6.70E-07

Table 7
25 Years (High-End) Worker Cancer Risk

Worker Index	UTM E	UTM N	Concentration	Cancer Risk
69	384909	3744256	0.00065	4.02E-08
75	384919	3744113	0.00082	5.07E-08
78	384921	3744155	0.00078	4.83E-08
105	384970	3743479	0.00134	8.29E-08
109	384975	3744255	0.00077	4.77E-08
127	385008	3743449	0.00136	8.42E-08
128	385008	3744123	0.00106	6.56E-08
134	385014	3744058	0.00118	7.30E-08

Worker Index	UTM		Concentration	Cancer Risk
	E	N		
142	385027	3743414	0.00129	7.98E-08
153	385041	3744255	0.00092	5.69E-08
176	385074	3744123	0.00132	8.17E-08
212	385122	3743451	0.00159	9.84E-08
214	385123	3743793	0.00577	3.57E-07
215	385124	3744122	0.00159	9.84E-08
216	385127	3744254	0.00117	7.24E-08
223	385138	3743407	0.00143	8.85E-08
231	385144	3743789	0.00838	5.19E-07
233	385146	3743827	0.007	4.33E-07
236	385152	3743812	0.00872	5.40E-07
255	385194	3743428	0.00155	9.59E-08
264	385203	3743716	0.0064	3.96E-07
269	385218	3744136	0.00229	1.42E-07
274	385236	3744263	0.00146	9.04E-08
275	385240	3744228	0.0017	1.05E-07
282	385265	3743428	0.00153	9.47E-08
284	385276	3744228	0.00199	1.23E-07
289	385300	3743933	0.00974	6.03E-07
290	385301	3743696	0.00444	2.75E-07
291	385302	3743487	0.0018	1.11E-07
294	385321	3743430	0.00147	9.10E-08
299	385360	3744228	0.00215	1.33E-07
300	385373	3744270	0.00188	1.16E-07
301	385374	3743438	0.0014	8.66E-08
302	385392	3743699	0.00383	2.37E-07
303	385400	3743825	0.00625	3.87E-07
304	385402	3743404	0.0012	7.43E-08
305	385421	3744246	0.00168	1.04E-07
306	385423	3743660	0.00326	2.02E-07
307	385425	3744327	0.00133	8.23E-08
308	385444	3744386	0.00112	6.93E-08
309	385449	3743438	0.00121	7.49E-08
310	385474	3743923	0.01485	9.19E-07
311	385491	3743636	0.00231	1.43E-07
312	385521	3743719	0.00334	2.07E-07
313	385546	3743663	0.00212	1.31E-07
314	385550	3744077	0.00277	1.71E-07
315	385589	3744334	0.00085	5.26E-08
316	385614	3743874	0.01064	6.58E-07
319	385678	3743711	0.00214	1.32E-07
320	385682	3744072	0.00238	1.47E-07
321	385700	3743492	0.00087	5.38E-08
322	385705	3743877	0.0057	3.53E-07
323	385705	3744299	0.00083	5.14E-08
324	385755	3744298	0.00078	4.83E-08

Worker Index	UTM		Concentration	Cancer Risk
	E	N		
326	385788	3743585	0.00112	6.93E-08
327	385844	3744081	0.00159	9.84E-08
328	385853	3743661	0.00159	9.84E-08
329	385887	3743423	0.00066	4.08E-08
330	385891	3743884	0.00251	1.55E-07
331	385893	3744416	0.00047	2.91E-08
332	385984	3743656	0.00141	8.73E-08
333	386008	3743850	0.00182	1.13E-07
334	386024	3743950	0.00138	8.54E-08
335	386035	3744406	0.00041	2.54E-08
336	386047	3744089	0.001	6.19E-08
337	386060	3743828	0.0016	9.90E-08
338	386082	3743939	0.00121	7.49E-08

6.2 Cancer Risk and Cancer Burden

The breadth of averaging options was included in this study to provide the broadest depth of information regarding cancer risk to the public and local decision makers. In regards to the health risk assessment and CEQA, identifying the Maximum Increase in Cancer Risk (MICR) is based on the greater of the PMI, MEIW, and MEIR using the appropriate scenario for those receptors categories. The lifetime exposure scenario is appropriate for determining cancer burden in those areas that may be exposed to cancer risk greater than one in one million cases. Evaluation of these scenarios will identify any receptors that exceed the MICR of 10 in one million or the 0.5 increased cancer burden thresholds promulgated by SCAQMD.

The MEIR is located at the residential dwelling unit immediately west of the project, located at 1814 East 219th Street. The incremental increase in cancer risk at these properties is 0.00000924 in one million as identified as Index 250 of Table 5. The MEIW is Watson Land Company, located across the street to the south of the project site at 22010 Wilmington Avenue. The incremental increase in cancer risk at this business is 0.000000396 in one million as identified as Index 264 of Table 7. The PMI of 0.0000145 cases per one million is located at the eastern half of the project site. This point on the receptor grid is identified as Index 231 of Table 6 and there are no receptors at this location.

Cancer burden is the product of public cancer risk and the population exposed to the carcinogen. There are 271 residential properties located within ¼-mile of the project site. Census data indicates that the average owner-occupied household size in the city is 3.46 persons per dwelling unit, thus, an estimated population of 938 persons lives within one-quarter mile of the project site. The average cancer risk based on the lifetime exposure scenario is 2.81E-06 (approximately 2.81 cases per million people). The product of cancer risk and the estimated population is 0.00263 and does not exceed the SCAQMD threshold of 0.5 excess cancer cases.

6.3 Non-Cancer Risk

Chronic non-cancer risks are considered significant if the project toxic air contaminant emissions result in a hazard index greater than or equal to one. The hazard index is determined by calculating the average annual toxic concentration (μg/m^3) divided by the reference exposure level (REL) for a particular toxic. The REL is the concentration at which no adverse health impacts are anticipated and is established by OEHHA. The chronic REL for DPM was established by OEHHA as 5 μg/m^3. Non-cancer risk is estimated using Equation 6. Chronic non-cancer risk was evaluated using HARP and identified the highest hazard index or 0.01485, identified as Index 310 on the lifetime receptor grid. This does not exceed the hazard index threshold of one promulgated by SCAQMD.

Equation 6
Chronic Hazard Quotient

$$HI_{DPM} = \frac{C_{DPM}}{REL_{AAC}}$$

Where:

HI_{DPM} Hazard Index; an expression of the potential for non-cancer health effects.
C_{DPM} Annual average DPM concentration (µg/m^3)
REL_{DPM} Reference exposure level (REL) for DPM; the DPM concentration at which no adverse health effects are anticipated.

6.4 Conclusion

Discrete and grid receptor cancer risks are detailed in the AERMOD and HARP-RAST output files included in the appendix of this report. No thresholds for cancer or non-cancer risk will be exceeded by the project.

7 Mitigation

7.1 Required Measures

None required.

7.2 Other Measures

SCAQMD typically provides a menu of mitigation options when commenting on environmental documents associated with warehousing and other industrial uses related to DPM emissions. The following lists common mitigation recommended by SCAQMD for inclusion in the project environmental document at the discretion of the Leady Agency in consultation with the Project Proponent. Many of these measures are dependent on the type and operational characteristics of individual tenants.

- Design the site such that any check-in point for trucks is well inside the facility to ensure that there are no trucks queuing outside of the facility.
- Prohibit all vehicles from idling in excess of five minutes, both on- and off-site.
- Post signs informing truck drivers about the California Air Resources Board diesel idling regulations and the health effects of diesel particulate matter.
- Post signs on the interior and exterior of the project site near the gates, requiring the following:
- Truck drivers shall turn off engines when not in use;
- Trucks shall not idle for more than five minutes;
- Telephone numbers of the California Air Resources Board to report violations.
- Improve traffic flow by signal synchronization.
- Have truck routes clearly marked with trailblazer signs, so that trucks will not enter residential areas.
- The Lead Agency should require mitigation that requires accelerated phase-in for non-diesel powered trucks. For example, natural gas trucks, including Class 8 HHD trucks, are commercially available today. Natural gas trucks can provide a substantial reduction in health risks, and may be more financially feasible today due to reduced fuel costs compared to diesel.
- On-site equipment should be alternative fueled.

1 Western Regional Climate Center. Period of Record Monthly Climate Summary: Long Beach-Daugherty Field Airport, California. http://www.wrcc.dri.edu/summary/lgb.ca.html [Accessed June 2016].
2 United States Geological Survey. Long Beach Quadrangle 15 Minute Series. 1999.
3 Western Regional Climate Center. Prevailing Wind Directions 1992-2002. http://www.wrcc.dri.edu/htmlfiles/westwinddir.html [Accessed June 2016].
4 California Air Resources Board. Statewide Truck and Bus Regulations. www.arb.ca.gov/regact/2008/truckbus08/truckbus08.htm [Accessed May 2016].
5 California Air Resources Board. Facts About Truck and Bus Regulation Compliance Requirements Summary. January 2011.
6 California Air Resources Board. California's Plan to Reduce Diesel Particulate Matter Emissions Fact Sheet. http://www.arb.ca.gov/diesel/factsheets/rrpfactsheet.pdf Accessed May 2016].
7 South Coast Air Quality Management District. *Warehouse Truck Trip Study Data Results and Usage.* July 25, 2014.

9 Appendix Materials

Appendix A

EMFAC2014 Outputs

calendar_year	season_month	sub_area	vehicle_class	fuel	temperature	relative_humidity	process	speed_time	pollutant	emission_rate
2019	Annual	Los Angeles (SC)	Truck2	Dsl			IDLEX		PM	0.048656891
2019	Annual	Los Angeles (SC)	Truck2	Dsl			PMBW		PM	0.089191305
2019	Annual	Los Angeles (SC)	Truck2	Dsl			PMTW		PM	0.027020124
2019	Annual	Los Angeles (SC)	Truck2	Dsl	78	53	RUNEX	10	PM	0.085467329
2019	Annual	Los Angeles (SC)	Truck2	Dsl	78	53	RUNEX	25	PM	0.045458508
2019	Annual	Los Angeles (SC)	Truck2	Dsl	78	53	RUNEX	35	PM	0.039696133
2019	Annual	Los Angeles (SC)	Truck2	Dsl	78	53	RUNEX	45	PM	0.03980481

Appendix B

Traffic Impact Analysis

Appendix C

HARP Outputs

HARP2 - HRACalc (dated 16088) 6/23/2016 3:37:58 PM - Output Log

GLCs loaded successfully
Pollutants loaded successfully
****
RISK SCENARIO SETTINGS

Receptor Type: Worker
Scenario: Cancer
Calculation Method: Derived

****
EXPOSURE DURATION PARAMETERS FOR CANCER

Start Age: 16
Total Exposure Duration: 25

Exposure Duration Bin Distribution
3rd Trimester Bin: 0
0<2 Years Bin: 0
2<9 Years Bin: 0
2<16 Years Bin: 0
16<30 Years Bin: 0
16 to 70 Years Bin: 25

****
PATHWAYS ENABLED

NOTE: Inhalation is always enabled and used for all assessments. The remaining pathways are only used for cancer and noncancer chronic assessments.

Inhalation: True
Soil: True
Dermal: True
Mother's milk: False
Water: False
Fish: False
Homegrown crops: False
Beef: False
Dairy: False
Pig: False
Chicken: False
Egg: False

****
INHALATION

Daily breathing rate: Moderate8HR

Worker Adjustment Factors
Worker adjustment factors enabled: NO

Fraction at time at home

3rd Trimester to 16 years: OFF
16 years to 70 years: OFF

****
SOIL & DERMAL PATHWAY SETTINGS

Deposition rate (m/s): 0.05
Soil mixing depth (m): 0.01
Dermal climate: Mixed

****
TIER 2 SETTINGS
Tier2 not used.

****

Calculating cancer risk
Cancer risk saved to: C:\Users\cbrown\Google Drive\10000 Projects (Sync)\13509 AL2 Carson\10 Other Modeling\13509_25YR_WORKCancerRisk.csv
HRA ran successfully

HARP2 - HRACalc (dated 16088) 6/23/2016 3:37:17 PM - Output Log

GLCs loaded successfully
Pollutants loaded successfully
****
RISK SCENARIO SETTINGS

Receptor Type: Resident
Scenario: Cancer
Calculation Method: Derived

****
EXPOSURE DURATION PARAMETERS FOR CANCER

Start Age: -0.25
Total Exposure Duration: 30

Exposure Duration Bin Distribution
3rd Trimester Bin: 0.25
0<2 Years Bin: 2
2<9 Years Bin: 0
2<16 Years Bin: 14
16<30 Years Bin: 14
16 to 70 Years Bin: 0

****
PATHWAYS ENABLED

NOTE: Inhalation is always enabled and used for all assessments. The remaining pathways are only used for cancer and noncancer chronic assessments.

Inhalation: True
Soil: False
Dermal: False
Mother's milk: False
Water: False
Fish: False
Homegrown crops: False
Beef: False
Dairy: False
Pig: False
Chicken: False
Egg: False

****
INHALATION

Daily breathing rate: LongTerm24HR

Worker Adjustment Factors
Worker adjustment factors enabled: NO

Fraction at time at home

3rd Trimester to 16 years: OFF
16 years to 70 years: ON

****
TIER 2 SETTINGS
Tier2 not used.

****

Calculating cancer risk
Cancer risk saved to: C:\Users\cbrown\Google Drive\10000 Projects (Sync)\13509 AL2 Carson\10 Other Modeling\13509_30YR_RESCancerRisk.csv
HRA ran successfully

HARP2 - HRACalc (dated 16088) 6/27/2016 2:27:00 PM - Output Log

GLCs loaded successfully
Pollutants loaded successfully
****
RISK SCENARIO SETTINGS

Receptor Type: Population
Scenario: Cancer
Calculation Method: Derived

****
EXPOSURE DURATION PARAMETERS FOR CANCER

Start Age: -0.25
Total Exposure Duration: 70

Exposure Duration Bin Distribution
3rd Trimester Bin: 0.25
0<2 Years Bin: 2
2<9 Years Bin: 0
2<16 Years Bin: 14
16<30 Years Bin: 0
16 to 70 Years Bin: 54

****
PATHWAYS ENABLED

NOTE: Inhalation is always enabled and used for all assessments. The remaining pathways are only used for cancer and noncancer chronic assessments.

Inhalation: True
Soil: False
Dermal: False
Mother's milk: False
Water: False
Fish: False
Homegrown crops: False
Beef: False
Dairy: False
Pig: False
Chicken: False
Egg: False

****
INHALATION

Daily breathing rate: RMP

Worker Adjustment Factors
Worker adjustment factors enabled: NO

Fraction at time at home

3rd Trimester to 16 years: OFF
16 years to 70 years: OFF

****
TIER 2 SETTINGS
Tier2 not used.

****

Calculating cancer risk
Cancer risk saved to: P:\Projects\AL2\13509 Carson Warehouse\02-02 Health Risk Assessment\04 HARP\13509_70YR_BURDEN_CancerRisk.csv
HRA ran successfully

HARP2 - HRACalc (dated 16088) 6/23/2016 3:38:46 PM - Output Log

GLCs loaded successfully
Pollutants loaded successfully
****
RISK SCENARIO SETTINGS

Receptor Type: Population
Scenario: Cancer
Calculation Method: Derived

****
EXPOSURE DURATION PARAMETERS FOR CANCER

Start Age: -0.25
Total Exposure Duration: 70

Exposure Duration Bin Distribution
3rd Trimester Bin: 0.25
0<2 Years Bin: 2
2<9 Years Bin: 0
2<16 Years Bin: 14
16<30 Years Bin: 0
16 to 70 Years Bin: 54

****
PATHWAYS ENABLED

NOTE: Inhalation is always enabled and used for all assessments. The remaining pathways are only used for cancer and noncancer chronic assessments.

Inhalation: True
Soil: True
Dermal: True
Mother's milk: False
Water: False
Fish: False
Homegrown crops: False
Beef: False
Dairy: False
Pig: False
Chicken: False
Egg: False

****
INHALATION

Daily breathing rate: RMP

Worker Adjustment Factors
Worker adjustment factors enabled: NO

Fraction at time at home

3rd Trimester to 16 years: OFF
16 years to 70 years: OFF

****

SOIL & DERMAL PATHWAY SETTINGS

Deposition rate (m/s): 0.05
Soil mixing depth (m): 0.01
Dermal climate: Mixed

****

TIER 2 SETTINGS
Tier2 not used.

****

Calculating cancer risk
Cancer risk saved to: C:\Users\cbrown\Google Drive\10000 Projects (Sync)\13509 AL2 Carson\10 Other Modeling\13509_70YR_CANBURCancerRisk.csv
HRA ran successfully

HARP2 - HRACalc (dated 16088) 6/23/2016 3:40:43 PM - Output Log

GLCs loaded successfully
Pollutants loaded successfully
****
RISK SCENARIO SETTINGS

Receptor Type: Population
Scenario: NCChronic
Calculation Method: Derived

****
EXPOSURE DURATION PARAMETERS FOR CANCER
Exposure duration are only adjusted for cancer assessments

****
PATHWAYS ENABLED

NOTE: Inhalation is always enabled and used for all assessments. The remaining pathways are only used for cancer and noncancer chronic assessments.

Inhalation: True
Soil: False
Dermal: False
Mother's milk: False
Water: False
Fish: False
Homegrown crops: False
Beef: False
Dairy: False
Pig: False
Chicken: False
Egg: False

****
INHALATION

Daily breathing rate: RMP

Worker Adjustment Factors
Worker adjustment factors enabled: NO

Fraction at time at home
NOTE: Exposure duration (i.e., start age, end age, ED, & FAH) are only adjusted for cancer assessments.

****
TIER 2 SETTINGS
Tier2 not used.

****

Calculating chronic risk
Chronic risk saved to: C:\Users\cbrown\Google Drive\10000 Projects (Sync)\13509 AL2 Carson\10 Other

Modeling\13509_CHRONIC_COMMNCChronicRisk.csv
HRA ran successfully

HARP2 - HRACalc (dated 16088) 6/23/2016 3:40:15 PM - Output Log

GLCs loaded successfully
Pollutants loaded successfully
****
RISK SCENARIO SETTINGS

Receptor Type: Resident
Scenario: NCChronic
Calculation Method: Derived

****
EXPOSURE DURATION PARAMETERS FOR CANCER
Exposure duration are only adjusted for cancer assessments

****
PATHWAYS ENABLED

NOTE: Inhalation is always enabled and used for all assessments. The remaining pathways are only used for cancer and noncancer chronic assessments.

Inhalation: True
Soil: False
Dermal: False
Mother's milk: False
Water: False
Fish: False
Homegrown crops: False
Beef: False
Dairy: False
Pig: False
Chicken: False
Egg: False

****
INHALATION

Daily breathing rate: LongTerm24HR

Worker Adjustment Factors
Worker adjustment factors enabled: NO

Fraction at time at home
NOTE: Exposure duration (i.e., start age, end age, ED, & FAH) are only adjusted for cancer assessments.

****
TIER 2 SETTINGS
Tier2 not used.

****

Calculating chronic risk
Chronic risk saved to: C:\Users\cbrown\Google Drive\10000 Projects (Sync)\13509 AL2 Carson\10 Other

Modeling\13509_CHRONIC_RESNCChronicRisk.csv
HRA ran successfully

HARP2 - HRACalc (dated 16088) 6/23/2016 3:39:28 PM - Output Log

GLCs loaded successfully
Pollutants loaded successfully
****
RISK SCENARIO SETTINGS

Receptor Type: Worker
Scenario: NCChronic
Calculation Method: Derived

****
EXPOSURE DURATION PARAMETERS FOR CANCER
Exposure duration are only adjusted for cancer assessments

****
PATHWAYS ENABLED

NOTE: Inhalation is always enabled and used for all assessments. The remaining pathways are only used for cancer and noncancer chronic assessments.

Inhalation: True
Soil: True
Dermal: True
Mother's milk: False
Water: False
Fish: False
Homegrown crops: False
Beef: False
Dairy: False
Pig: False
Chicken: False
Egg: False

****
INHALATION

Daily breathing rate: Moderate8HR

Worker Adjustment Factors
Worker adjustment factors enabled: NO

Fraction at time at home
NOTE: Exposure duration (i.e., start age, end age, ED, & FAH) are only adjusted for cancer assessments.

****
SOIL & DERMAL PATHWAY SETTINGS

Deposition rate (m/s): 0.05
Soil mixing depth (m): 0.01
Dermal climate: Mixed

****

TIER 2 SETTINGS
Tier2 not used.

****

Calculating chronic risk
Chronic risk saved to: C:\Users\cbrown\Google Drive\10000 Projects (Sync)\13509 AL2 Carson\10 Other Modeling\13509_CHRONIC_WORKNCChronicRisk.csv
HRA ran successfully

Appendix D

AERMOD Outputs

```
CO STARTING
   TITLEONE  13509 AL2 Carson
   MODELOPT  CONC FLAT FASTALL
   AVERTIME  PERIOD
   URBANOPT  9862049 LA
   POLLUTID  PM
   RUNORNOT  RUN
CO FINISHED

SO STARTING
   ELEVUNIT  METERS

**                           E      N       Z
**                           ------ ------- -
   LOCATION  AISL1 AREAPOLY 385245 3743951 0
   URBANSRC  AISL1

   LOCATION  AISL2 AREAPOLY 385428 3743918 0
   URBANSRC  AISL2

   LOCATION  ROAD1 AREAPOLY 385299 3744209 0
   URBANSRC  ROAD1

   LOCATION  ROAD2 AREAPOLY 385215 3743948 0
   URBANSRC  ROAD2

   LOCATION  ROAD3 AREAPOLY 385159 3743776 0
   URBANSRC  ROAD3

   LOCATION  ROAD4 AREAPOLY 385126 3743672 0
   URBANSRC  ROAD4

   LOCATION  ROAD5 AREAPOLY 385180 3743762 0
   URBANSRC  ROAD5

   LOCATION  DOCK1 POINT    385353 3743930 0
   URBANSRC  DOCK1

   LOCATION  DOCK2 POINT    385508 3743930 0
   URBANSRC  DOCK2

** Poly Source    EF             HT   V
** Parameters:    -------------- ---- --
   SRCPARAM AISL1 0.000000001000 4.12 10
   AREAVERT AISL1 385245 3743951
   AREAVERT AISL1 385250 3743965
   AREAVERT AISL1 385263 3743961
   AREAVERT AISL1 385276 3743961
   AREAVERT AISL1 385276 3743977
   AREAVERT AISL1 385428 3743977
   AREAVERT AISL1 385428 3743918
   AREAVERT AISL1 385276 3743920
   AREAVERT AISL1 385276 3743945
   AREAVERT AISL1 385262 3743945
```

```
   SRCPARAM AISL2 0.000000002000 4.12 15
   AREAVERT AISL2 385428 3743918
   AREAVERT AISL2 385428 3743977
   AREAVERT AISL2 385640 3743977
   AREAVERT AISL2 385640 3743961
   AREAVERT AISL2 385624 3743911
   AREAVERT AISL2 385611 3743916
   AREAVERT AISL2 385602 3743916
   AREAVERT AISL2 385601 3743874
   AREAVERT AISL2 385600 3743860
   AREAVERT AISL2 385580 3743789
   AREAVERT AISL2 385580 3743776
   AREAVERT AISL2 385568 3743776
   AREAVERT AISL2 385569 3743798
   AREAVERT AISL2 385585 3743861
   AREAVERT AISL2 385587 3743918

   SRCPARAM ROAD1 0.000000000432 4.12 4
   AREAVERT ROAD1 385299 3744209
   AREAVERT ROAD1 385422 3744588
   AREAVERT ROAD1 385448 3744589
   AREAVERT ROAD1 385326 3744210

   SRCPARAM ROAD2 0.000000000817 4.12 4
   AREAVERT ROAD2 385215 3743948
   AREAVERT ROAD2 385299 3744209
   AREAVERT ROAD2 385326 3744210
   AREAVERT ROAD2 385238 3743940

   SRCPARAM ROAD3 0.000000004331 4.12 4
   AREAVERT ROAD3 385159 3743776
   AREAVERT ROAD3 385215 3743948
   AREAVERT ROAD3 385238 3743940
   AREAVERT ROAD3 385185 3743776

   SRCPARAM ROAD4 0.000000003217 4.12 4
   AREAVERT ROAD4 385126 3743672
   AREAVERT ROAD4 385159 3743776
   AREAVERT ROAD4 385185 3743776
   AREAVERT ROAD4 385148 3743666

   SRCPARAM ROAD5 0.000000000482 4.12 4
   AREAVERT ROAD5 385180 3743762
   AREAVERT ROAD5 385185 3743776
   AREAVERT ROAD5 385583 3743776
   AREAVERT ROAD5 385578 3743762

** Point Source   EF             HT   TMP     V  D
** Parameters:    -------------- ---- ------- -- ------
   SRCPARAM DOCK1 0.000056766000 4.12 366.483 50 0.1016
   SRCPARAM DOCK2 0.000084987000 4.12 366.483 50 0.1016

** Building Downwash
```

```
SO BUILDHGT DOCk1      12.80   12.80   12.80   12.80   12.80   12.80
SO BUILDHGT DOCk1      12.80   12.80    0.00   12.80   12.80   12.80
SO BUILDHGT DOCk1      12.80   12.80   12.80   12.80   12.80   12.80
SO BUILDHGT DOCk1      12.80   12.80   12.80   12.80   12.80   12.80
SO BUILDHGT DOCk1      12.80   12.80    0.00   12.80   12.80   12.80
SO BUILDHGT DOCk1      12.80   12.80   12.80   12.80   12.80   12.80
SO BUILDWID DOCk1     332.92  333.70  325.80  309.99  285.95  253.23
SO BUILDWID DOCk1     212.81  165.93    0.00  169.22  219.31  262.73
SO BUILDWID DOCk1     298.16  324.54  341.75  349.77  347.16  334.00
SO BUILDWID DOCk1     332.92  333.70  325.80  309.99  285.95  253.23
SO BUILDWID DOCk1     212.81  165.93    0.00  169.22  219.31  262.73
SO BUILDWID DOCk1     298.16  324.54  341.75  349.77  347.16  334.00
SO BUILDLEN DOCk1     169.22  219.31  262.73  298.16  324.54  341.75
SO BUILDLEN DOCk1     349.77  347.16    0.00  332.92  333.70  325.80
SO BUILDLEN DOCk1     309.99  285.95  253.23  212.81  165.93  114.00
SO BUILDLEN DOCk1     169.22  219.31  262.73  298.16  324.54  341.75
SO BUILDLEN DOCk1     349.77  347.16    0.00  332.92  333.70  325.80
SO BUILDLEN DOCk1     309.99  285.95  253.23  212.81  165.93  114.00
SO XBADJ    DOCk1    -140.18 -152.09 -159.39 -161.84 -159.37 -152.76
SO XBADJ    DOCk1    -142.70 -128.30    0.00  -94.78  -88.67  -79.87
SO XBADJ    DOCk1     -68.64  -55.33  -40.34  -24.12   -7.17   10.00
SO XBADJ    DOCk1     -29.05  -67.22 -103.34 -136.32 -165.17 -188.99
SO XBADJ    DOCk1    -207.07 -218.86    0.00 -238.14 -245.04 -245.93
SO XBADJ    DOCk1    -241.34 -230.62 -212.89 -188.69 -158.76 -124.00
SO YBADJ    DOCk1     -71.68  -78.18  -83.03  -86.35  -87.64  -86.27
SO YBADJ    DOCk1     -82.28  -75.79    0.00  -55.56  -42.44  -28.02
SO YBADJ    DOCk1     -12.76    2.90   18.11   32.19   45.28   57.00
SO YBADJ    DOCk1      71.68   78.18   83.03   86.35   87.64   86.27
SO YBADJ    DOCk1      82.28   75.79    0.00   55.56   42.44   28.02
SO YBADJ    DOCk1      12.76   -2.90  -18.11  -32.19  -45.28  -57.00


SO BUILDHGT DOCk2      12.80   12.80   12.80   12.80   12.80   12.80
SO BUILDHGT DOCk2      12.80   12.80    0.00   12.80   12.80   12.80
SO BUILDHGT DOCk2      12.80   12.80   12.80   12.80   12.80   12.80
SO BUILDHGT DOCk2      12.80   12.80   12.80   12.80   12.80   12.80
SO BUILDHGT DOCk2      12.80   12.80    0.00   12.80   12.80   12.80
SO BUILDHGT DOCk2      12.80   12.80   12.80   12.80   12.80   12.80
SO BUILDWID DOCk2     332.92  333.70  325.80  309.99  285.95  253.23
SO BUILDWID DOCk2     212.81  165.93    0.00  169.22  219.31  262.73
SO BUILDWID DOCk2     298.16  324.54  341.75  349.77  347.16  334.00
SO BUILDWID DOCk2     332.92  333.70  325.80  309.99  285.95  253.23
SO BUILDWID DOCk2     212.81  165.93    0.00  169.22  219.31  262.73
SO BUILDWID DOCk2     298.16  324.54  341.75  349.77  347.16  334.00
SO BUILDLEN DOCk2     169.22  219.31  262.73  298.16  324.54  341.75
SO BUILDLEN DOCk2     349.77  347.16    0.00  332.92  333.70  325.80
SO BUILDLEN DOCk2     309.99  285.95  253.23  212.81  165.93  114.00
SO BUILDLEN DOCk2     169.22  219.31  262.73  298.16  324.54  341.75
SO BUILDLEN DOCk2     349.77  347.16    0.00  332.92  333.70  325.80
SO BUILDLEN DOCk2     309.99  285.95  253.23  212.81  165.93  114.00
SO XBADJ    DOCk2    -167.09 -205.11 -236.89 -261.47 -278.11 -287.00
SO XBADJ    DOCk2    -288.35 -280.94    0.00 -247.43 -234.32 -214.10
SO XBADJ    DOCk2    -187.38 -154.96 -117.84  -77.13  -34.08   10.00
SO XBADJ    DOCk2      -2.13  -14.20  -25.84  -36.69  -46.43  -54.76
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SO XBADJ    DOCk2     -61.42  -66.22    0.00  -85.49  -99.38 -111.69
SO XBADJ    DOCk2    -122.60 -130.99 -135.39 -135.68 -131.84 -124.00
SO YBADJ    DOCk2      80.97   67.47   51.21   32.39   11.99   -8.77
SO YBADJ    DOCk2     -29.27  -48.88    0.00  -82.48  -95.45 -105.52
SO YBADJ    DOCk2    -112.39 -115.84 -116.12 -113.47 -107.36  -98.00
SO YBADJ    DOCk2     -80.97  -67.47  -51.21  -32.39  -11.99    8.77
SO YBADJ    DOCk2      29.27   48.88    0.00   82.48   95.45  105.52
SO YBADJ    DOCk2     112.39  115.84  116.12  113.47  107.36   98.00


   SRCGROUP  ALL
SO FINISHED

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                 XYINC 384874 22 50 3743471 16 50
RE GRIDCART GRID END

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RE DISCCART 385123 3743793

RE FINISHED

ME STARTING
   SURFFILE  lgbh8.sfc
   PROFFILE  lgbh8.pfl
   SURFDATA  0     2008 LONG BEACH
   UAIRDATA  3190  2008 LONG BEACH
   PROFBASE  0.0  METERS
ME FINISHED

OU STARTING
   RECTABLE  ALLAVE  FIRST-THIRD
   MAXTABLE  ALLAVE  50
   SUMMFILE  13432_3.SUM
   PLOTFILE  PERIOD ALL 13432_3.PLT
OU FINISHED

 ***********************************
 *** SETUP Finishes Successfully ***
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****

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 *** AERMOD - VERSION  15181 ***   ***  13509 AL2 Carson
***        06/20/16
 *** AERMET - VERSION  14134 ***   ***
***        15:55:16

PAGE   1
 **MODELOPTs:   NonDFAULT CONC      FLAT      FASTALL   URBAN

                                                       ***     MODEL SETUP OPTIONS
SUMMARY       ***
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - -

 **Model Is Setup For Calculation of Average CONCentration Values.

   --  DEPOSITION LOGIC  --
 **NO GAS DEPOSITION Data Provided.
 **NO PARTICLE DEPOSITION Data Provided.
 **Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
 **Model Uses NO WET DEPLETION.  WETDPLT  =  F

 **Model Uses URBAN Dispersion Algorithm for the SBL for     9 Source(s),
   for Total of    1 Urban Area(s):
   Urban Population =   9862049.0 ;  Urban Roughness Length =  1.000 m

 **Model Allows User-Specified Options:
         1. Stack-tip Downwash.
         2. Model Assumes Receptors on FLAT Terrain.
         3. Use Calms Processing Routine.
         4. Use Missing Data Processing Routine.
         5. No Exponential Decay.
         6. Urban Roughness Length of 1.0 Meter Used.

 **Other Options Specified:
         FASTALL  - Use effective sigma-y to optimize meander for
                    POINT and VOLUME sources, and hybrid approach
                    to optimize AREA sources (formerly TOXICS option)
         TEMP_Sub - Meteorological data includes TEMP substitutions

 **Model Assumes No FLAGPOLE Receptor Heights.

 **The User Specified a Pollutant Type of:  PM

 **Model Calculates PERIOD Averages Only

 **This Run Includes:      9 Source(s);       1 Source Group(s); and
690 Receptor(s)

                with:      2 POINT(s), including
                           0 POINTCAP(s) and      0 POINTHOR(s)
                 and:      0 VOLUME source(s)
                 and:      7 AREA type source(s)
                 and:      0 LINE source(s)
                 and:      0 OPENPIT source(s)
```

```
 **Model Set To Continue RUNning After the Setup Testing.

 **The AERMET Input Meteorological Data Version Date:  14134

 **Output Options Selected:
          Model Outputs Tables of PERIOD Averages by Receptor
          Model Outputs Tables of Highest Short Term Values by Receptor
(RECTABLE Keyword)
          Model Outputs Tables of Overall Maximum Short Term Values
(MAXTABLE Keyword)
          Model Outputs External File(s) of High Values for Plotting
(PLOTFILE Keyword)
          Model Outputs Separate Summary File of High Ranked Values
(SUMMFILE Keyword)

 **NOTE:  The Following Flags May Appear Following CONC Values:  c for
Calm Hours
                                                                 m for
Missing Hours
                                                                 b for
Both Calm and Missing Hours

 **Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =     0.00 ;
Decay Coef. =    0.000     ;  Rot. Angle =     0.0
                  Emission Units = GRAMS/SEC
;  Emission Rate Unit Factor =   0.10000E+07
                  Output Units   = MICROGRAMS/M**3

 **Approximate Storage Requirements of Model =      3.6 MB of RAM.

 **File for Summary of Results:   13432_3.SUM
```

**MODELOPTs: NonDFAULT CONC FLAT FASTALL URBAN

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BLDG EXISTS	URBAN SOURCE	CAP/ HOR	EMIS RATE SCALAR VARY BY
DOCK1	0	0.56766E-04	385353.0	3743930.0	0.0	4.12	366.48	50.00	0.10	YES	YES	NO	
DOCK2	0	0.84987E-04	385508.0	3743930.0	0.0	4.12	366.48	50.00	0.10	YES	YES	NO	

*** AERMOD - VERSION 15181 *** *** 13509 AL2 Carson *** 06/20/16
*** AERMET - VERSION 14134 *** *** *** 15:55:16

PAGE 3
**MODELOPTs: NonDFAULT CONC FLAT FASTALL URBAN

*** AREAPOLY SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC /METER**2)	LOCATION OF AREA X (METERS)	LOCATION OF AREA Y (METERS)	BASE ELEV. (METERS)	RELEASE HEIGHT (METERS)	NUMBER OF VERTS.	INIT. SZ (METERS)	URBAN SOURCE	EMISSION RATE SCALAR VARY BY
AISL1	0	0.10000E-08	385245.0	3743951.0	0.0	4.12	10	0.00	YES	
AISL2	0	0.20000E-08	385428.0	3743918.0	0.0	4.12	15	0.00	YES	
ROAD1	0	0.43200E-09	385299.0	3744209.0	0.0	4.12	4	0.00	YES	
ROAD2	0	0.81700E-09	385215.0	3743948.0	0.0	4.12	4	0.00	YES	
ROAD3	0	0.43310E-08	385159.0	3743776.0	0.0	4.12	4	0.00	YES	
ROAD4	0	0.32170E-08	385126.0	3743672.0	0.0	4.12	4	0.00	YES	
ROAD5	0	0.48200E-09	385180.0	3743762.0	0.0	4.12	4	0.00	YES	

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 *** AERMOD - VERSION  15181 ***   ***  13509 AL2 Carson
***        06/20/16
 *** AERMET - VERSION  14134 ***   ***
***        15:55:16

PAGE   4
 **MODELOPTs:   NonDFAULT CONC      FLAT      FASTALL   URBAN


                                          *** SOURCE IDs DEFINING SOURCE
GROUPS ***

 SRCGROUP ID                                                       SOURCE IDs
 -----------                                                       ----------


  ALL        AISL1       , AISL2       , ROAD1       , ROAD2       ,
ROAD3       , ROAD4       , ROAD5       , DOCK1       ,

             DOCK2       ,
```

**MODELOPTs: NonDFAULT CONC FLAT FASTALL URBAN

*** SOURCE IDs DEFINED AS URBAN SOURCES ***

URBAN ID	URBAN POP	SOURCE IDs
	9862049.	AISL1 , AISL2 , ROAD1 , ROAD2 , ROAD3 , ROAD4 , ROAD5 , DOCK1 , DOCK2 ,

**MODELOPTs: NonDFAULT CONC FLAT FASTALL URBAN

*** DIRECTION SPECIFIC BUILDING DIMENSIONS ***

SOURCE ID: DOCK1

IFV	BH	BW	BL	XADJ	YADJ	IFV	BH	BW	BL	XADJ	YADJ
1	12.8,	332.9,	169.2,	-140.2,	-71.7,	2	12.8,	333.7,	219.3,	-152.1,	-78.2,
3	12.8,	325.8,	262.7,	-159.4,	-83.0,	4	12.8,	310.0,	298.2,	-161.8,	-86.3,
5	12.8,	285.9,	324.5,	-159.4,	-87.6,	6	12.8,	253.2,	341.8,	-152.8,	-86.3,
7	12.8,	212.8,	349.8,	-142.7,	-82.3,	8	12.8,	165.9,	347.2,	-128.3,	-75.8,
9	0.0,	0.0,	0.0,	0.0,	0.0,	10	12.8,	169.2,	332.9,	-94.8,	-55.6,
11	12.8,	219.3,	333.7,	-88.7,	-42.4,	12	12.8,	262.7,	325.8,	-79.9,	-28.0,
13	12.8,	298.2,	310.0,	-68.6,	-12.8,	14	12.8,	324.5,	285.9,	-55.3,	2.9,
15	12.8,	341.8,	253.2,	-40.3,	18.1,	16	12.8,	349.8,	212.8,	-24.1,	32.2,
17	12.8,	347.2,	165.9,	-7.2,	45.3,	18	12.8,	334.0,	114.0,	10.0,	57.0,
19	12.8,	332.9,	169.2,	-29.1,	71.7,	20	12.8,	333.7,	219.3,	-67.2,	78.2,
21	12.8,	325.8,	262.7,	-103.3,	83.0,	22	12.8,	310.0,	298.2,	-136.3,	86.3,
23	12.8,	285.9,	324.5,	-165.2,	87.6,	24	12.8,	253.2,	341.8,	-189.0,	86.3,
25	12.8,	212.8,	349.8,	-207.1,	82.3,	26	12.8,	165.9,	347.2,	-218.9,	75.8,
27	0.0,	0.0,	0.0,	0.0,	0.0,	28	12.8,	169.2,	332.9,	-238.1,	55.6,
29	12.8,	219.3,	333.7,	-245.0,	42.4,	30	12.8,	262.7,	325.8,	-245.9,	28.0,
31	12.8,	298.2,	310.0,	-241.3,	12.8,	32	12.8,	324.5,	285.9,	-230.6,	-2.9,
33	12.8,	341.8,	253.2,	-212.9,	-18.1,	34	12.8,	349.8,	212.8,	-188.7,	-32.2,
35	12.8,	347.2,	165.9,	-158.8,	-45.3,	36	12.8,	334.0,	114.0,	-124.0,	-57.0,

SOURCE ID: DOCK2

IFV	BH	BW	BL	XADJ	YADJ	IFV	BH	BW	BL	XADJ	YADJ
1	12.8,	332.9,	169.2,	-167.1,	81.0,	2	12.8,	333.7,	219.3,	-205.1,	67.5,
3	12.8,	325.8,	262.7,	-236.9,	51.2,	4	12.8,	310.0,	298.2,	-261.5,	32.4,
5	12.8,	285.9,	324.5,	-278.1,	12.0,	6	12.8,	253.2,	341.8,	-287.0,	-8.8,
7	12.8,	212.8,	349.8,	-288.4,	-29.3,	8	12.8,	165.9,	347.2,	-280.9,	-48.9,
9	0.0,	0.0,	0.0,	0.0,	0.0,	10	12.8,	169.2,	332.9,	-247.4,	-82.5,
11	12.8,	219.3,	333.7,	-234.3,	-95.5,	12	12.8,	262.7,	325.8,	-214.1,	-105.5,
13	12.8,	298.2,	310.0,	-187.4,	-112.4,	14	12.8,	324.5,	285.9,	-155.0,	-115.8,
15	12.8,	341.8,	253.2,	-117.8,	-116.1,	16	12.8,	349.8,	212.8,	-77.1,	-113.5,
17	12.8,	347.2,	165.9,	-34.1,	-107.4,	18	12.8,	334.0,	114.0,	10.0,	-98.0,
19	12.8,	332.9,	169.2,	-2.1,	-81.0,	20	12.8,	333.7,	219.3,	-14.2,	-67.5,
21	12.8,	325.8,	262.7,	-25.8,	-51.2,	22	12.8,	310.0,	298.2,	-36.7,	-32.4,
23	12.8,	285.9,	324.5,	-46.4,	-12.0,	24	12.8,	253.2,	341.8,	-54.8,	8.8,
25	12.8,	212.8,	349.8,	-61.4,	29.3,	26	12.8,	165.9,	347.2,	-66.2,	48.9,
27	0.0,	0.0,	0.0,	0.0,	0.0,	28	12.8,	169.2,	332.9,	-85.5,	82.5,
29	12.8,	219.3,	333.7,	-99.4,	95.5,	30	12.8,	262.7,	325.8,	-111.7,	105.5,
31	12.8,	298.2,	310.0,	-122.6,	112.4,	32	12.8,	324.5,	285.9,	-131.0,	115.8,
33	12.8,	341.8,	253.2,	-135.4,	116.1,	34	12.8,	349.8,	212.8,	-135.7,	113.5,
35	12.8,	347.2,	165.9,	-131.8,	107.4,	36	12.8,	334.0,	114.0,	-124.0,	98.0,

**MODELOPTs: NonDFAULT CONC   FLAT   FASTALL   URBAN

*** GRIDDED RECEPTOR NETWORK SUMMARY ***

*** NETWORK ID: GRID   ; NETWORK TYPE: GRIDCART ***

*** X-COORDINATES OF GRID ***
(METERS)

384874.0, 384924.0, 384974.0, 385024.0, 385074.0, 385124.0,
385174.0, 385224.0, 385274.0, 385324.0,
385374.0, 385424.0, 385474.0, 385524.0, 385574.0, 385624.0,
385674.0, 385724.0, 385774.0, 385824.0,
385874.0, 385924.0,

*** Y-COORDINATES OF GRID ***
(METERS)

3743471.0, 3743521.0, 3743571.0, 3743621.0, 3743671.0, 3743721.0,
3743771.0, 3743821.0, 3743871.0, 3743921.0,
3743971.0, 3744021.0, 3744071.0, 3744121.0, 3744171.0, 3744221.0,

**MODELOPTs: NonDFAULT CONC FLAT FASTALL URBAN

*** DISCRETE CARTESIAN RECEPTORS ***
(X-COORD, Y-COORD, ZELEV, ZHILL, ZFLAG)
(METERS)

(385654.0, 3743430.0, 0.0, 0.0, 0.0); (385654.0, 3743624.0, 0.0, 0.0, 0.0);
(385776.0, 3743624.0, 0.0, 0.0, 0.0); (385352.0, 3744068.0, 0.0, 0.0, 0.0);
(385098.0, 3743402.0, 0.0, 0.0, 0.0); (385280.0, 3744370.0, 0.0, 0.0, 0.0);
(385265.0, 3744371.0, 0.0, 0.0, 0.0); (385105.0, 3744319.0, 0.0, 0.0, 0.0);
(385244.0, 3744362.0, 0.0, 0.0, 0.0); (385168.0, 3744319.0, 0.0, 0.0, 0.0);
(385261.0, 3744319.0, 0.0, 0.0, 0.0); (385231.0, 3744319.0, 0.0, 0.0, 0.0);
(385114.0, 3744373.0, 0.0, 0.0, 0.0); (385197.0, 3744364.0, 0.0, 0.0, 0.0);
(385071.0, 3744255.0, 0.0, 0.0, 0.0); (385129.0, 3744373.0, 0.0, 0.0, 0.0);
(385311.0, 3744369.0, 0.0, 0.0, 0.0); (385136.0, 3744319.0, 0.0, 0.0, 0.0);
(385246.0, 3744319.0, 0.0, 0.0, 0.0); (385199.0, 3744318.0, 0.0, 0.0, 0.0);
(385025.0, 3744320.0, 0.0, 0.0, 0.0); (385292.0, 3744319.0, 0.0, 0.0, 0.0);
(385307.0, 3744317.0, 0.0, 0.0, 0.0); (385244.0, 3744383.0, 0.0, 0.0, 0.0);
(385184.0, 3744318.0, 0.0, 0.0, 0.0); (385342.0, 3744365.0, 0.0, 0.0, 0.0);
(385325.0, 3744317.0, 0.0, 0.0, 0.0); (385159.0, 3744373.0, 0.0, 0.0, 0.0);
(385144.0, 3744373.0, 0.0, 0.0, 0.0); (385152.0, 3744319.0, 0.0, 0.0, 0.0);
(385326.0, 3744371.0, 0.0, 0.0, 0.0); (385121.0, 3744319.0, 0.0, 0.0, 0.0);
(385041.0, 3744320.0, 0.0, 0.0, 0.0); (385073.0, 3744319.0, 0.0, 0.0, 0.0);
(385175.0, 3744373.0, 0.0, 0.0, 0.0); (385215.0, 3744318.0, 0.0, 0.0, 0.0);
(385197.0, 3744384.0, 0.0, 0.0, 0.0); (385057.0, 3744319.0, 0.0, 0.0, 0.0);
(384854.0, 3743791.0, 0.0, 0.0, 0.0); (384793.0, 3743846.0, 0.0, 0.0, 0.0);

(384855.0, 3743910.0, 0.0, 0.0, 0.0); (
384854.0, 3743816.0, 0.0, 0.0, 0.0);
(384823.0, 3743962.0, 0.0, 0.0, 0.0); (
384821.0, 3743928.0, 0.0, 0.0, 0.0);
(384854.0, 3743803.0, 0.0, 0.0, 0.0); (
384854.0, 3743891.0, 0.0, 0.0, 0.0);
(384954.0, 3744044.0, 0.0, 0.0, 0.0); (
384854.0, 3743780.0, 0.0, 0.0, 0.0);
(384932.0, 3744054.0, 0.0, 0.0, 0.0); (
385010.0, 3743789.0, 0.0, 0.0, 0.0);
(384858.0, 3743999.0, 0.0, 0.0, 0.0); (
384838.0, 3743999.0, 0.0, 0.0, 0.0);
(384818.0, 3743901.0, 0.0, 0.0, 0.0); (
384984.0, 3744043.0, 0.0, 0.0, 0.0);
(384953.0, 3743790.0, 0.0, 0.0, 0.0); (
384935.0, 3743798.0, 0.0, 0.0, 0.0);
(384899.0, 3743811.0, 0.0, 0.0, 0.0); (
384808.0, 3743800.0, 0.0, 0.0, 0.0);
(384853.0, 3743928.0, 0.0, 0.0, 0.0); (
384849.0, 3744064.0, 0.0, 0.0, 0.0);
(384898.0, 3744033.0, 0.0, 0.0, 0.0); (
385059.0, 3744045.0, 0.0, 0.0, 0.0);
(384991.0, 3743814.0, 0.0, 0.0, 0.0); (
384959.0, 3743984.0, 0.0, 0.0, 0.0);
(384952.0, 3743713.0, 0.0, 0.0, 0.0); (
385120.0, 3743741.0, 0.0, 0.0, 0.0);
(384854.0, 3743978.0, 0.0, 0.0, 0.0); (
384803.0, 3743901.0, 0.0, 0.0, 0.0);
(385029.0, 3744043.0, 0.0, 0.0, 0.0); (
385066.0, 3743846.0, 0.0, 0.0, 0.0);
(385054.0, 3743855.0, 0.0, 0.0, 0.0); (
384920.0, 3743798.0, 0.0, 0.0, 0.0);
(385037.0, 3743742.0, 0.0, 0.0, 0.0); (
384892.0, 3743645.0, 0.0, 0.0, 0.0);
(384904.0, 3743598.0, 0.0, 0.0, 0.0); (
385039.0, 3743643.0, 0.0, 0.0, 0.0);
(385133.0, 3743900.0, 0.0, 0.0, 0.0); (
385093.0, 3744018.0, 0.0, 0.0, 0.0);
(385064.0, 3743804.0, 0.0, 0.0, 0.0); (
385066.0, 3743824.0, 0.0, 0.0, 0.0);
(385109.0, 3743716.0, 0.0, 0.0, 0.0); (
385003.0, 3743743.0, 0.0, 0.0, 0.0);
(385002.0, 3743643.0, 0.0, 0.0, 0.0); (
385116.0, 3743673.0, 0.0, 0.0, 0.0);
(385100.0, 3744055.0, 0.0, 0.0, 0.0); (
384795.0, 3743800.0, 0.0, 0.0, 0.0);
(384853.0, 3743945.0, 0.0, 0.0, 0.0); (
384916.0, 3744033.0, 0.0, 0.0, 0.0);
(384955.0, 3743847.0, 0.0, 0.0, 0.0); (
385003.0, 3743712.0, 0.0, 0.0, 0.0);

**MODELOPTs: NonDFAULT CONC FLAT FASTALL URBAN

*** DISCRETE CARTESIAN RECEPTORS ***
(X-COORD, Y-COORD, ZELEV, ZHILL, ZFLAG)
(METERS)

(385058.0, 3743602.0, 0.0, 0.0, 0.0); (384983.0, 3743671.0, 0.0, 0.0, 0.0);
(385021.0, 3743670.0, 0.0, 0.0, 0.0); (385094.0, 3743925.0, 0.0, 0.0, 0.0);
(385191.0, 3744072.0, 0.0, 0.0, 0.0); (385222.0, 3744090.0, 0.0, 0.0, 0.0);
(384847.0, 3743854.0, 0.0, 0.0, 0.0); (384823.0, 3743945.0, 0.0, 0.0, 0.0);
(385013.0, 3744033.0, 0.0, 0.0, 0.0); (385033.0, 3743856.0, 0.0, 0.0, 0.0);
(385036.0, 3743712.0, 0.0, 0.0, 0.0); (384936.0, 3743743.0, 0.0, 0.0, 0.0);
(385053.0, 3743742.0, 0.0, 0.0, 0.0); (384941.0, 3743658.0, 0.0, 0.0, 0.0);
(385059.0, 3743670.0, 0.0, 0.0, 0.0); (385093.0, 3743864.0, 0.0, 0.0, 0.0);
(385175.0, 3744054.0, 0.0, 0.0, 0.0); (385142.0, 3744003.0, 0.0, 0.0, 0.0);
(384834.0, 3743799.0, 0.0, 0.0, 0.0); (384955.0, 3743824.0, 0.0, 0.0, 0.0);
(384989.0, 3743984.0, 0.0, 0.0, 0.0); (384986.0, 3743713.0, 0.0, 0.0, 0.0);
(384884.0, 3743744.0, 0.0, 0.0, 0.0); (385040.0, 3743602.0, 0.0, 0.0, 0.0);
(385002.0, 3743670.0, 0.0, 0.0, 0.0); (385204.0, 3743944.0, 0.0, 0.0, 0.0);
(385091.0, 3743801.0, 0.0, 0.0, 0.0); (384819.0, 3743716.0, 0.0, 0.0, 0.0);
(384821.0, 3743799.0, 0.0, 0.0, 0.0); (384920.0, 3744082.0, 0.0, 0.0, 0.0);
(384967.0, 3743813.0, 0.0, 0.0, 0.0); (385004.0, 3743984.0, 0.0, 0.0, 0.0);
(384974.0, 3743984.0, 0.0, 0.0, 0.0); (384901.0, 3743744.0, 0.0, 0.0, 0.0);
(385022.0, 3743602.0, 0.0, 0.0, 0.0); (385094.0, 3743955.0, 0.0, 0.0, 0.0);
(385194.0, 3743928.0, 0.0, 0.0, 0.0); (385092.0, 3743833.0, 0.0, 0.0, 0.0);
(384834.0, 3743716.0, 0.0, 0.0, 0.0); (384853.0, 3743961.0, 0.0, 0.0, 0.0);

(385074.0, 3744032.0, 0.0, 0.0, 0.0); (
384913.0, 3743984.0, 0.0, 0.0, 0.0);
(385070.0, 3743712.0, 0.0, 0.0, 0.0); (
385087.0, 3743742.0, 0.0, 0.0, 0.0);
(385103.0, 3743638.0, 0.0, 0.0, 0.0); (
385097.0, 3743670.0, 0.0, 0.0, 0.0);
(385094.0, 3743894.0, 0.0, 0.0, 0.0); (
385133.0, 3743853.0, 0.0, 0.0, 0.0);
(384867.0, 3743745.0, 0.0, 0.0, 0.0); (
384803.0, 3743716.0, 0.0, 0.0, 0.0);
(384969.0, 3744044.0, 0.0, 0.0, 0.0); (
385014.0, 3744058.0, 0.0, 0.0, 0.0);
(385011.0, 3743816.0, 0.0, 0.0, 0.0); (
384936.0, 3743713.0, 0.0, 0.0, 0.0);
(384953.0, 3743743.0, 0.0, 0.0, 0.0); (
385070.0, 3743742.0, 0.0, 0.0, 0.0);
(385084.0, 3743647.0, 0.0, 0.0, 0.0); (
384941.0, 3743640.0, 0.0, 0.0, 0.0);
(384941.0, 3743676.0, 0.0, 0.0, 0.0); (
385243.0, 3744064.0, 0.0, 0.0, 0.0);
(385225.0, 3744006.0, 0.0, 0.0, 0.0); (
385141.0, 3743987.0, 0.0, 0.0, 0.0);
(384818.0, 3743668.0, 0.0, 0.0, 0.0); (
384847.0, 3743833.0, 0.0, 0.0, 0.0);
(384833.0, 3743901.0, 0.0, 0.0, 0.0); (
385013.0, 3743854.0, 0.0, 0.0, 0.0);
(384928.0, 3743985.0, 0.0, 0.0, 0.0); (
385053.0, 3743712.0, 0.0, 0.0, 0.0);
(384892.0, 3743691.0, 0.0, 0.0, 0.0); (
384968.0, 3743602.0, 0.0, 0.0, 0.0);
(385078.0, 3743670.0, 0.0, 0.0, 0.0); (
385094.0, 3743909.0, 0.0, 0.0, 0.0);
(385095.0, 3743986.0, 0.0, 0.0, 0.0); (
384812.0, 3743746.0, 0.0, 0.0, 0.0);
(384868.0, 3743634.0, 0.0, 0.0, 0.0); (
384969.0, 3743858.0, 0.0, 0.0, 0.0);
(384896.0, 3743985.0, 0.0, 0.0, 0.0); (
385087.0, 3743712.0, 0.0, 0.0, 0.0);
(385020.0, 3743712.0, 0.0, 0.0, 0.0); (
384892.0, 3743721.0, 0.0, 0.0, 0.0);
(384892.0, 3743660.0, 0.0, 0.0, 0.0); (
384931.0, 3743599.0, 0.0, 0.0, 0.0);
(385040.0, 3743670.0, 0.0, 0.0, 0.0); (
385093.0, 3743879.0, 0.0, 0.0, 0.0);
(385159.0, 3744055.0, 0.0, 0.0, 0.0); (
384849.0, 3743745.0, 0.0, 0.0, 0.0);
(384861.0, 3743593.0, 0.0, 0.0, 0.0); (
384937.0, 3744033.0, 0.0, 0.0, 0.0);
(385030.0, 3743789.0, 0.0, 0.0, 0.0); (
385072.0, 3743985.0, 0.0, 0.0, 0.0);

**MODELOPTs: NonDFAULT CONC   FLAT   FASTALL   URBAN

*** DISCRETE CARTESIAN RECEPTORS ***
(X-COORD, Y-COORD, ZELEV, ZHILL, ZFLAG)
(METERS)

```
( 385035.0, 3743984.0,       0.0,       0.0,       0.0);         ( 385104.0, 3743742.0,       0.0,       0.0,       0.0);
( 385095.0, 3743611.0,       0.0,       0.0,       0.0);         ( 384983.0, 3743644.0,       0.0,       0.0,       0.0);
( 385160.0, 3743930.0,       0.0,       0.0,       0.0);         ( 385140.0, 3743923.0,       0.0,       0.0,       0.0);
( 385178.0, 3743866.0,       0.0,       0.0,       0.0);         ( 385148.0, 3743850.0,       0.0,       0.0,       0.0);
( 385161.0, 3743980.0,       0.0,       0.0,       0.0);         ( 384851.0, 3743666.0,       0.0,       0.0,       0.0);
( 384999.0, 3744043.0,       0.0,       0.0,       0.0);         ( 384972.0, 3743790.0,       0.0,       0.0,       0.0);
( 384899.0, 3743789.0,       0.0,       0.0,       0.0);         ( 385128.0, 3743707.0,       0.0,       0.0,       0.0);
( 385020.0, 3743743.0,       0.0,       0.0,       0.0);         ( 385021.0, 3743643.0,       0.0,       0.0,       0.0);
( 385092.0, 3743818.0,       0.0,       0.0,       0.0);         ( 385093.0, 3743848.0,       0.0,       0.0,       0.0);
( 385143.0, 3744017.0,       0.0,       0.0,       0.0);         ( 384791.0, 3743746.0,       0.0,       0.0,       0.0);
( 385053.0, 3743982.0,       0.0,       0.0,       0.0);         ( 384944.0, 3743984.0,       0.0,       0.0,       0.0);
( 384892.0, 3743675.0,       0.0,       0.0,       0.0);         ( 384951.0, 3743602.0,       0.0,       0.0,       0.0);
( 385079.0, 3743600.0,       0.0,       0.0,       0.0);         ( 385140.0, 3743939.0,       0.0,       0.0,       0.0);
( 385167.0, 3743850.0,       0.0,       0.0,       0.0);         ( 385177.0, 3743982.0,       0.0,       0.0,       0.0);
( 384830.0, 3743745.0,       0.0,       0.0,       0.0);         ( 384868.0, 3743670.0,       0.0,       0.0,       0.0);
( 385064.0, 3743785.0,       0.0,       0.0,       0.0);         ( 384993.0, 3743855.0,       0.0,       0.0,       0.0);
( 385019.0, 3743984.0,       0.0,       0.0,       0.0);         ( 384970.0, 3743743.0,       0.0,       0.0,       0.0);
( 384892.0, 3743706.0,       0.0,       0.0,       0.0);         ( 384986.0, 3743602.0,       0.0,       0.0,       0.0);
( 384964.0, 3743644.0,       0.0,       0.0,       0.0);         ( 385176.0, 3743926.0,       0.0,       0.0,       0.0);
( 385095.0, 3743970.0,       0.0,       0.0,       0.0);         ( 385141.0, 3744056.0,       0.0,       0.0,       0.0);
```

(385140.0, 3743971.0,   0.0,   0.0,   0.0);   (
384834.0, 3743667.0,   0.0,   0.0,   0.0);
(384831.0, 3743592.0,   0.0,   0.0,   0.0);   (
384890.0, 3743629.0,   0.0,   0.0,   0.0);
(384891.0, 3743609.0,   0.0,   0.0,   0.0);   (
385059.0, 3743644.0,   0.0,   0.0,   0.0);
(385149.0, 3743902.0,   0.0,   0.0,   0.0);   (
385172.0, 3743903.0,   0.0,   0.0,   0.0);
(385095.0, 3744001.0,   0.0,   0.0,   0.0);   (
385004.0, 3743602.0,   0.0,   0.0,   0.0);
(384964.0, 3743671.0,   0.0,   0.0,   0.0);   (
385094.0, 3743940.0,   0.0,   0.0,   0.0);
(385198.0, 3744089.0,   0.0,   0.0,   0.0);   (
385210.0, 3743967.0,   0.0,   0.0,   0.0);
(384852.0, 3743718.0,   0.0,   0.0,   0.0);   (
384834.0, 3743637.0,   0.0,   0.0,   0.0);
(385122.0, 3744058.0,   0.0,   0.0,   0.0);   (
385195.0, 3744009.0,   0.0,   0.0,   0.0);
(385179.0, 3744009.0,   0.0,   0.0,   0.0);   (
385200.0, 3743982.0,   0.0,   0.0,   0.0);
(384869.0, 3743713.0,   0.0,   0.0,   0.0);   (
384818.0, 3743637.0,   0.0,   0.0,   0.0);
(384851.0, 3743639.0,   0.0,   0.0,   0.0);   (
385093.0, 3744037.0,   0.0,   0.0,   0.0);
(385164.0, 3744009.0,   0.0,   0.0,   0.0);   (
384803.0, 3743668.0,   0.0,   0.0,   0.0);
(385235.0, 3744046.0,   0.0,   0.0,   0.0);   (
385194.0, 3744051.0,   0.0,   0.0,   0.0);
(385277.0, 3744319.0,   0.0,   0.0,   0.0);   (
385296.0, 3744369.0,   0.0,   0.0,   0.0);
(385089.0, 3744319.0,   0.0,   0.0,   0.0);   (
384823.0, 3743978.0,   0.0,   0.0,   0.0);
(384991.0, 3743789.0,   0.0,   0.0,   0.0);   (
385044.0, 3744043.0,   0.0,   0.0,   0.0);
(384986.0, 3743743.0,   0.0,   0.0,   0.0);   (
385089.0, 3743784.0,   0.0,   0.0,   0.0);
(384969.0, 3743713.0,   0.0,   0.0,   0.0);   (
385137.0, 3743742.0,   0.0,   0.0,   0.0);
(385243.0, 3744085.0,   0.0,   0.0,   0.0);   (
385030.0, 3743815.0,   0.0,   0.0,   0.0);
(385185.0, 3743891.0,   0.0,   0.0,   0.0);   (
385210.0, 3744009.0,   0.0,   0.0,   0.0);
(385074.0, 3744060.0,   0.0,   0.0,   0.0);   (
384849.0, 3744050.0,   0.0,   0.0,   0.0);
(384905.0, 3744059.0,   0.0,   0.0,   0.0);   (
384916.0, 3743858.0,   0.0,   0.0,   0.0);
(384849.0, 3744034.0,   0.0,   0.0,   0.0);   (
384815.0, 3743846.0,   0.0,   0.0,   0.0);
(384916.0, 3743835.0,   0.0,   0.0,   0.0);   (
385013.0, 3743918.0,   0.0,   0.0,   0.0);

**MODELOPTs: NonDFAULT CONC   FLAT   FASTALL   URBAN

*** DISCRETE CARTESIAN RECEPTORS ***
(X-COORD, Y-COORD, ZELEV, ZHILL, ZFLAG)
(METERS)

(384849.0, 3744125.0,   0.0,   0.0,   0.0);   (384916.0, 3743919.0,   0.0,   0.0,   0.0);
(385152.0, 3743812.0,   0.0,   0.0,   0.0);   (385144.0, 3743789.0,   0.0,   0.0,   0.0);
(385240.0, 3744228.0,   0.0,   0.0,   0.0);   (385218.0, 3744136.0,   0.0,   0.0,   0.0);
(385421.0, 3744246.0,   0.0,   0.0,   0.0);   (386060.0, 3743828.0,   0.0,   0.0,   0.0);
(385203.0, 3743716.0,   0.0,   0.0,   0.0);   (385138.0, 3743407.0,   0.0,   0.0,   0.0);
(385360.0, 3744228.0,   0.0,   0.0,   0.0);   (385276.0, 3744228.0,   0.0,   0.0,   0.0);
(385122.0, 3743451.0,   0.0,   0.0,   0.0);   (384909.0, 3744256.0,   0.0,   0.0,   0.0);
(385887.0, 3743423.0,   0.0,   0.0,   0.0);   (386008.0, 3743850.0,   0.0,   0.0,   0.0);
(385321.0, 3743430.0,   0.0,   0.0,   0.0);   (385400.0, 3743825.0,   0.0,   0.0,   0.0);
(385474.0, 3743923.0,   0.0,   0.0,   0.0);   (385682.0, 3744072.0,   0.0,   0.0,   0.0);
(385788.0, 3743585.0,   0.0,   0.0,   0.0);   (385614.0, 3743874.0,   0.0,   0.0,   0.0);
(385008.0, 3743449.0,   0.0,   0.0,   0.0);   (385425.0, 3744327.0,   0.0,   0.0,   0.0);
(386082.0, 3743939.0,   0.0,   0.0,   0.0);   (385491.0, 3743636.0,   0.0,   0.0,   0.0);
(386024.0, 3743950.0,   0.0,   0.0,   0.0);   (385373.0, 3744270.0,   0.0,   0.0,   0.0);
(385301.0, 3743696.0,   0.0,   0.0,   0.0);   (385521.0, 3743719.0,   0.0,   0.0,   0.0);
(386047.0, 3744089.0,   0.0,   0.0,   0.0);   (385300.0, 3743933.0,   0.0,   0.0,   0.0);
(385423.0, 3743660.0,   0.0,   0.0,   0.0);   (385374.0, 3743438.0,   0.0,   0.0,   0.0);
(385449.0, 3743438.0,   0.0,   0.0,   0.0);   (385705.0, 3744299.0,   0.0,   0.0,   0.0);
(385893.0, 3744416.0,   0.0,   0.0,   0.0);   (385392.0, 3743699.0,   0.0,   0.0,   0.0);
(385194.0, 3743428.0,   0.0,   0.0,   0.0);   (385891.0, 3743884.0,   0.0,   0.0,   0.0);

(384921.0, 3744155.0, 0.0, 0.0, 0.0); (
385265.0, 3743428.0, 0.0, 0.0, 0.0);
(385444.0, 3744386.0, 0.0, 0.0, 0.0); (
385550.0, 3744077.0, 0.0, 0.0, 0.0);
(386035.0, 3744406.0, 0.0, 0.0, 0.0); (
385705.0, 3743877.0, 0.0, 0.0, 0.0);
(385853.0, 3743661.0, 0.0, 0.0, 0.0); (
385589.0, 3744334.0, 0.0, 0.0, 0.0);
(385678.0, 3743711.0, 0.0, 0.0, 0.0); (
385984.0, 3743656.0, 0.0, 0.0, 0.0);
(385844.0, 3744081.0, 0.0, 0.0, 0.0); (
385124.0, 3744122.0, 0.0, 0.0, 0.0);
(385008.0, 3744123.0, 0.0, 0.0, 0.0); (
384919.0, 3744113.0, 0.0, 0.0, 0.0);
(385127.0, 3744254.0, 0.0, 0.0, 0.0); (
385236.0, 3744263.0, 0.0, 0.0, 0.0);
(384975.0, 3744255.0, 0.0, 0.0, 0.0); (
385041.0, 3744255.0, 0.0, 0.0, 0.0);
(385074.0, 3744123.0, 0.0, 0.0, 0.0); (
385302.0, 3743487.0, 0.0, 0.0, 0.0);
(385700.0, 3743492.0, 0.0, 0.0, 0.0); (
384970.0, 3743479.0, 0.0, 0.0, 0.0);
(385546.0, 3743663.0, 0.0, 0.0, 0.0); (
385755.0, 3744298.0, 0.0, 0.0, 0.0);
(385402.0, 3743404.0, 0.0, 0.0, 0.0); (
385027.0, 3743414.0, 0.0, 0.0, 0.0);
(385146.0, 3743827.0, 0.0, 0.0, 0.0); (
385123.0, 3743793.0, 0.0, 0.0, 0.0);

**MODELOPTs: NonDFAULT CONC   FLAT   FASTALL   URBAN

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

```
            1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1
```

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54,   3.09,   5.14,   8.23, 10.80,

```
 *** AERMOD - VERSION  15181 ***   ***  13509 AL2 Carson
***        06/20/16
 *** AERMET - VERSION  14134 ***   ***
***        15:55:16

PAGE  13
 **MODELOPTs:   NonDFAULT CONC      FLAT      FASTALL   URBAN

                                    *** UP TO THE FIRST 24 HOURS OF
METEOROLOGICAL DATA ***

   Surface file:   lgbh8.sfc
Met Version:  14134
   Profile file:   lgbh8.pfl
   Surface format: FREE
   Profile format: FREE
   Surface station no.:        0                 Upper air station no.:
3190
                  Name: LONG                                     Name:
LONG
                  Year:   2008                                   Year:
2008

 First 24 hours of scalar data
 YR MO DY JDY HR     H0     U*     W*  DT/DZ ZICNV ZIMCH  M-O LEN    Z0
BOWEN ALBEDO  REF WS   WD     HT  REF TA     HT
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - -
 06 01 01   1 01   -2.2  0.062 -9.000 -9.000 -999.   37.      9.9  0.50
1.00   1.00    0.90   50.    9.1  285.9    5.5
 06 01 01   1 02   -5.3  0.090 -9.000 -9.000 -999.   65.     12.3  0.50
1.00   1.00    1.30   52.    9.1  285.9    5.5
 06 01 01   1 03   -6.2  0.090 -9.000 -9.000 -999.   65.     10.6  0.50
1.00   1.00    1.30   86.    9.1  285.9    5.5
 06 01 01   1 04   -2.2  0.062 -9.000 -9.000 -999.   37.      9.9  0.50
1.00   1.00    0.90   66.    9.1  285.9    5.5
 06 01 01   1 05  -11.8  0.124 -9.000 -9.000 -999.  105.     14.6  0.50
1.00   1.00    1.80   96.    9.1  285.9    5.5
 06 01 01   1 06   -6.4  0.090 -9.000 -9.000 -999.   65.     10.1  0.50
1.00   1.00    1.30   93.    9.1  285.9    5.5
 06 01 01   1 07  -11.8  0.124 -9.000 -9.000 -999.  105.     14.6  0.50
1.00   1.00    1.80   77.    9.1  285.9    5.5
 06 01 01   1 08   -4.3  0.090 -9.000 -9.000 -999.   65.     15.1  0.50
1.00   0.54    1.30   68.    9.1  285.4    5.5
 06 01 01   1 09   12.5  0.267  0.482  0.005  323.  330.   -137.0  0.50
1.00   0.31    1.80   60.    9.1  285.9    5.5
 06 01 01   1 10    6.2  0.259  0.410  0.005  396.  317.   -251.8  0.50
1.00   0.24    1.80  124.    9.1  287.0    5.5
 06 01 01   1 11   44.8  0.401  0.976  0.005  746.  610.   -129.7  0.50
1.00   0.21    2.70  133.    9.1  287.5    5.5
 06 01 01   1 12   35.0  0.397  0.921  0.007  803.  599.   -160.6  0.50
1.00   0.20    2.70  136.    9.1  288.1    5.5
 06 01 01   1 13   29.1  0.393  0.882  0.013  848.  592.   -188.6  0.50
1.00   0.20    2.70  124.    9.1  288.8    5.5
```

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 06 01 01   1 14   24.5  0.391  0.844  0.015  884.  587.   -219.9  0.50
1.00   0.21    2.70  126.    9.1  288.8    5.5
 06 01 01   1 15   13.2  0.318  0.691  0.015  902.  434.   -220.9  0.50
1.00   0.24    2.20  149.    9.1  288.1    5.5
 06 01 01   1 16    0.1  0.373  0.136  0.015  902.  547.  -8888.0  0.50
1.00   0.33    2.70  143.    9.1  287.5    5.5
 06 01 01   1 17  -11.2  0.200 -9.000 -9.000 -999.  239.     64.7  0.50
1.00   0.59    1.80   93.    9.1  287.5    5.5
 06 01 01   1 18  -25.1  0.334 -9.000 -9.000 -999.  463.    133.3  0.50
1.00   1.00    2.70  109.    9.1  287.0    5.5
 06 01 01   1 19  -29.9  0.395 -9.000 -9.000 -999.  596.    186.0  0.50
1.00   1.00    3.10  118.    9.1  285.9    5.5
 06 01 01   1 20  -29.9  0.395 -9.000 -9.000 -999.  596.    185.5  0.50
1.00   1.00    3.10  106.    9.1  285.4    5.5
 06 01 01   1 21  -22.5  0.405 -9.000 -9.000 -999.  617.    264.5  0.50
1.00   1.00    3.10   84.    9.1  285.4    5.5
 06 01 01   1 22  -14.9  0.268 -9.000 -9.000 -999.  345.    115.7  0.50
1.00   1.00    2.20   71.    9.1  284.9    5.5
 06 01 01   1 23  -19.2  0.345 -9.000 -9.000 -999.  486.    192.5  0.50
1.00   1.00    2.70   83.    9.1  285.4    5.5
 06 01 01   1 24  -14.9  0.268 -9.000 -9.000 -999.  336.    116.3  0.50
1.00   1.00    2.20  105.    9.1  285.9    5.5


 First hour of profile data
 YR MO DY HR HEIGHT F  WDIR    WSPD AMB_TMP sigmaA  sigmaW  sigmaV
 06 01 01 01    5.5 0 -999.  -99.00   286.0   99.0  -99.00  -99.00
 06 01 01 01    9.1 1   50.    0.90  -999.0   99.0  -99.00  -99.00

 F indicates top of profile (=1) or below (=0)
```

**MODELOPTs: NonDFAULT CONC FLAT FASTALL URBAN

*** THE PERIOD (43824 HRS) AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): AISL1 , AISL2 , ROAD1 , ROAD2 , ROAD3 , ROAD4 , ROAD5 , DOCK1 , DOCK2 ,

*** NETWORK ID: GRID ; NETWORK TYPE: GRIDCART ***

** CONC OF PM IN MICROGRAMS/M**3 **

Y-COORD (METERS)	X-COORD (METERS) 384874.00	384924.00	384974.00	385024.00	385074.00	385124.00	385174.00	385224.00	385274.00
3744221.00	0.00062	0.00071	0.00081	0.00094	0.00109	0.00126	0.00145	0.00166	0.00206
3744171.00	0.00067	0.00077	0.00088	0.00102	0.00120	0.00143	0.00169	0.00203	0.00294
3744121.00	0.00072	0.00083	0.00096	0.00112	0.00133	0.00160	0.00196	0.00254	0.00387
3744071.00	0.00076	0.00088	0.00102	0.00120	0.00145	0.00178	0.00227	0.00318	0.00458
3744021.00	0.00080	0.00092	0.00108	0.00128	0.00157	0.00200	0.00268	0.00409	0.00542
3743971.00	0.00084	0.00097	0.00114	0.00139	0.00175	0.00234	0.00349	0.00590	0.00677
3743921.00	0.00090	0.00106	0.00127	0.00159	0.00209	0.00301	0.00556	0.01174	0.00815
3743871.00	0.00101	0.00121	0.00148	0.00190	0.00261	0.00404	0.00928	0.01199	0.00678
3743821.00	0.00115	0.00138	0.00172	0.00224	0.00315	0.00522	0.01278	0.00962	0.00635
3743771.00	0.00126	0.00153	0.00190	0.00249	0.00354	0.00620	0.01224	0.00840	0.00645
3743721.00	0.00132	0.00160	0.00197	0.00256	0.00363	0.00704	0.00980	0.00588	0.00503
3743671.00	0.00133	0.00159	0.00194	0.00245	0.00339	0.00663	0.00570	0.00426	0.00399
3743621.00	0.00129	0.00152	0.00182	0.00221	0.00273	0.00315	0.00312	0.00310	0.00307

3743571.00	0.00123	0.00142	0.00165	0.00192	0.00219	0.00236	0.00240	0.00244	0.00246	
3743521.00	0.00115	0.00130	0.00149	0.00167	0.00185	0.00196	0.00202	0.00204	0.00205	
3743471.00	0.00106	0.00119	0.00133	0.00147	0.00160	0.00169	0.00174	0.00175	0.00173	

**MODELOPTs: NonDFAULT CONC FLAT FASTALL URBAN

*** THE PERIOD (43824 HRS) AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): AISL1 , AISL2 , ROAD1 , ROAD2 , ROAD3 ,
ROAD4 , ROAD5 , DOCK1 , DOCK2 ,

*** NETWORK ID: GRID ; NETWORK TYPE: GRIDCART ***

** CONC OF PM IN MICROGRAMS/M**3 **

Y-COORD (METERS)	X-COORD (METERS) 385324.00	385374.00	385424.00	385474.00	385524.00	385574.00	385624.00	385674.00	385724.00
3744221.00	0.00266	0.00204	0.00183	0.00161	0.00136	0.00122	0.00118	0.00113	0.00107
3744171.00	0.00322	0.00239	0.00224	0.00201	0.00166	0.00152	0.00147	0.00140	0.00132
3744121.00	0.00318	0.00279	0.00287	0.00264	0.00217	0.00200	0.00192	0.00180	0.00168
3744071.00	0.00354	0.00367	0.00410	0.00389	0.00314	0.00287	0.00267	0.00243	0.00220
3744021.00	0.00456	0.00475	0.00493	0.00567	0.00520	0.00495	0.00426	0.00349	0.00293
3743971.00	0.00918	0.00949	0.01054	0.01257	0.01344	0.01293	0.01045	0.00577	0.00392
3743921.00	0.00987	0.01173	0.01229	0.01462	0.01574	0.01624	0.01319	0.00712	0.00485
3743871.00	0.00703	0.00810	0.00820	0.00857	0.00807	0.00876	0.00980	0.00661	0.00515
3743821.00	0.00618	0.00599	0.00607	0.00597	0.00577	0.00695	0.00622	0.00503	0.00443
3743771.00	0.00580	0.00544	0.00524	0.00510	0.00504	0.00511	0.00385	0.00342	0.00327
3743721.00	0.00455	0.00421	0.00393	0.00396	0.00336	0.00287	0.00240	0.00230	0.00230
3743671.00	0.00400	0.00383	0.00341	0.00308	0.00246	0.00199	0.00175	0.00166	0.00166
3743621.00	0.00301	0.00285	0.00259	0.00227	0.00191	0.00160	0.00141	0.00133	0.00130

3743571.00 | 0.00242 0.00228 0.00207 0.00182
0.00156 0.00134 0.00120 0.00112 0.00108
3743521.00 | 0.00199 0.00187 0.00170 0.00151
0.00132 0.00115 0.00104 0.00097 0.00093
3743471.00 | 0.00167 0.00156 0.00142 0.00127
0.00113 0.00100 0.00091 0.00085 0.00081

**MODELOPTs: NonDFAULT CONC FLAT FASTALL URBAN

*** THE PERIOD (43824 HRS) AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): AISL1 , AISL2 , ROAD1 , ROAD2 , ROAD3 ,
ROAD4 , ROAD5 , DOCK1 , DOCK2 ,

*** NETWORK ID: GRID ; NETWORK TYPE: GRIDCART ***

** CONC OF PM IN MICROGRAMS/M**3 **

Y-COORD (METERS)	X-COORD (METERS)			
(METERS)	385774.00	385824.00	385874.00	385924.00
3744221.00	0.00100	0.00095	0.00089	0.00083
3744171.00	0.00123	0.00115	0.00107	0.00099
3744121.00	0.00155	0.00142	0.00130	0.00118
3744071.00	0.00195	0.00173	0.00154	0.00137
3744021.00	0.00243	0.00207	0.00178	0.00156
3743971.00	0.00301	0.00244	0.00205	0.00175
3743921.00	0.00366	0.00291	0.00239	0.00200
3743871.00	0.00412	0.00335	0.00276	0.00230
3743821.00	0.00387	0.00335	0.00287	0.00245
3743771.00	0.00310	0.00287	0.00260	0.00232
3743721.00	0.00228	0.00223	0.00213	0.00199
3743671.00	0.00168	0.00168	0.00166	0.00160
3743621.00	0.00130	0.00131	0.00130	0.00128
3743571.00	0.00107	0.00106	0.00106	0.00104
3743521.00	0.00091	0.00090	0.00089	0.00087
3743471.00	0.00079	0.00077	0.00076	0.00075

*** AERMOD - VERSION 15181 *** *** 13509 AL2 Carson *** 06/20/16
*** AERMET - VERSION 14134 *** *** *** 15:55:16

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**MODELOPTs: NonDFAULT CONC FLAT FASTALL URBAN

*** THE PERIOD (43824 HRS) AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): AISL1 , AISL2 , ROAD1 , ROAD2 , ROAD3 ,
ROAD4 , ROAD5 , DOCK1 , DOCK2 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
385654.00	3743430.00	0.00078	385654.00	3743624.00	0.00137
385776.00	3743624.00	0.00132	385352.00	3744068.00	0.00360
385098.00	3743402.00	0.00137	385280.00	3744370.00	0.00111
385265.00	3744371.00	0.00106	385105.00	3744319.00	0.00093
385244.00	3744362.00	0.00104	385168.00	3744319.00	0.00105
385261.00	3744319.00	0.00126	385231.00	3744319.00	0.00118
385114.00	3744373.00	0.00082	385197.00	3744364.00	0.00096
385071.00	3744255.00	0.00100	385129.00	3744373.00	0.00084
385311.00	3744369.00	0.00130	385136.00	3744319.00	0.00099
385246.00	3744319.00	0.00122	385199.00	3744318.00	0.00111
385025.00	3744320.00	0.00078	385292.00	3744319.00	0.00142
385307.00	3744317.00	0.00158	385244.00	3744383.00	0.00097
385184.00	3744318.00	0.00108	385342.00	3744365.00	0.00178
385325.00	3744317.00	0.00190	385159.00	3744373.00	0.00088
385144.00	3744373.00	0.00086	385152.00	3744319.00	0.00102

385326.00	3744371.00	0.00144
385121.00	3744319.00	0.00096
385041.00	3744320.00	0.00081
385073.00	3744319.00	0.00087
385175.00	3744373.00	0.00090
385215.00	3744318.00	0.00115
385197.00	3744384.00	0.00090
385057.00	3744319.00	0.00084
384854.00	3743791.00	0.00114
384793.00	3743846.00	0.00084
384855.00	3743910.00	0.00087
384854.00	3743816.00	0.00108
384823.00	3743962.00	0.00074
384821.00	3743928.00	0.00077
384854.00	3743803.00	0.00111
384854.00	3743891.00	0.00091
384954.00	3744044.00	0.00099
384854.00	3743780.00	0.00116
384932.00	3744054.00	0.00091
385010.00	3743789.00	0.00222
384858.00	3743999.00	0.00078
384838.00	3743999.00	0.00074
384818.00	3743901.00	0.00080
384984.00	3744043.00	0.00109
384953.00	3743790.00	0.00168
384935.00	3743798.00	0.00153
384899.00	3743811.00	0.00128
384808.00	3743800.00	0.00096
384853.00	3743928.00	0.00084
384849.00	3744064.00	0.00072
384898.00	3744033.00	0.00085
385059.00	3744045.00	0.00142
384991.00	3743814.00	0.00191
384959.00	3743984.00	0.00107
384952.00	3743713.00	0.00179
385120.00	3743741.00	0.00617
384854.00	3743978.00	0.00079
384803.00	3743901.00	0.00077
385029.00	3744043.00	0.00127
385066.00	3743846.00	0.00272
385054.00	3743855.00	0.00242
384920.00	3743798.00	0.00143
385037.00	3743742.00	0.00276
384892.00	3743645.00	0.00140
384904.00	3743598.00	0.00139
385039.00	3743643.00	0.00250
385133.00	3743900.00	0.00373
385093.00	3744018.00	0.00172
385064.00	3743804.00	0.00305
385066.00	3743824.00	0.00293

**MODELOPTs: NonDFAULT CONC FLAT FASTALL URBAN

*** THE PERIOD (43824 HRS) AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): AISL1 , AISL2 , ROAD1 , ROAD2 , ROAD3 , ROAD4 , ROAD5 , DOCK1 , DOCK2 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
385109.00	3743716.00	0.00537	385003.00	3743743.00	0.00226
385002.00	3743643.00	0.00211	385116.00	3743673.00	0.00584
385100.00	3744055.00	0.00165	384795.00	3743800.00	0.00092
384853.00	3743945.00	0.00082	384916.00	3744033.00	0.00089
384955.00	3743847.00	0.00147	385003.00	3743712.00	0.00227
385058.00	3743602.00	0.00237	384983.00	3743671.00	0.00201
385021.00	3743670.00	0.00240	385094.00	3743925.00	0.00235
385191.00	3744072.00	0.00249	385222.00	3744090.00	0.00287
384847.00	3743854.00	0.00097	384823.00	3743945.00	0.00075
385013.00	3744033.00	0.00121	385033.00	3743856.00	0.00211
385036.00	3743712.00	0.00274	384936.00	3743743.00	0.00165
385053.00	3743742.00	0.00308	384941.00	3743658.00	0.00167
385059.00	3743670.00	0.00302	385093.00	3743864.00	0.00313
385175.00	3744054.00	0.00241	385142.00	3744003.00	0.00234
384834.00	3743799.00	0.00105	384955.00	3743824.00	0.00156

384989.00	3743984.00	0.00118
384986.00	3743713.00	0.00209
384884.00	3743744.00	0.00135
385040.00	3743602.00	0.00222
385002.00	3743670.00	0.00219
385204.00	3743944.00	0.00718
385091.00	3743801.00	0.00389
384819.00	3743716.00	0.00110
384821.00	3743799.00	0.00100
384920.00	3744082.00	0.00086
384967.00	3743813.00	0.00170
385004.00	3743984.00	0.00125
384974.00	3743984.00	0.00112
384901.00	3743744.00	0.00144
385022.00	3743602.00	0.00208
385094.00	3743955.00	0.00206
385194.00	3743928.00	0.00768
385092.00	3743833.00	0.00352
384834.00	3743716.00	0.00116
384853.00	3743961.00	0.00080
385074.00	3744032.00	0.00154
384913.00	3743984.00	0.00092
385070.00	3743712.00	0.00349
385087.00	3743742.00	0.00410
385103.00	3743638.00	0.00348
385097.00	3743670.00	0.00425
385094.00	3743894.00	0.00274
385133.00	3743853.00	0.00499
384867.00	3743745.00	0.00127
384803.00	3743716.00	0.00105
384969.00	3744044.00	0.00103
385014.00	3744058.00	0.00118
385011.00	3743816.00	0.00211
384936.00	3743713.00	0.00168
384953.00	3743743.00	0.00178
385070.00	3743742.00	0.00352
385084.00	3743647.00	0.00331
384941.00	3743640.00	0.00165
384941.00	3743676.00	0.00170
385243.00	3744064.00	0.00405
385225.00	3744006.00	0.00458
385141.00	3743987.00	0.00246
384818.00	3743668.00	0.00111
384847.00	3743833.00	0.00102
384833.00	3743901.00	0.00083
385013.00	3743854.00	0.00190
384928.00	3743985.00	0.00097
385053.00	3743712.00	0.00307
384892.00	3743691.00	0.00142
384968.00	3743602.00	0.00172

**MODELOPTs: NonDFAULT CONC FLAT FASTALL URBAN

*** THE PERIOD (43824 HRS) AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): AISL1 , AISL2 , ROAD1 , ROAD2 , ROAD3 , ROAD4 , ROAD5 , DOCK1 , DOCK2 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
385078.00	3743670.00	0.00350	385094.00	3743909.00	0.00254
385095.00	3743986.00	0.00188	384812.00	3743746.00	0.00105
384868.00	3743634.00	0.00128	384969.00	3743858.00	0.00151
384896.00	3743985.00	0.00088	385087.00	3743712.00	0.00410
385020.00	3743712.00	0.00249	384892.00	3743721.00	0.00141
384892.00	3743660.00	0.00141	384931.00	3743599.00	0.00152
385040.00	3743670.00	0.00267	385093.00	3743879.00	0.00292
385159.00	3744055.00	0.00220	384849.00	3743745.00	0.00119
384861.00	3743593.00	0.00121	384937.00	3744033.00	0.00095
385030.00	3743789.00	0.00250	385072.00	3743985.00	0.00167
385035.00	3743984.00	0.00142	385104.00	3743742.00	0.00490
385095.00	3743611.00	0.00279	384983.00	3743644.00	0.00195
385160.00	3743930.00	0.00415	385140.00	3743923.00	0.00344
385178.00	3743866.00	0.01068	385148.00	3743850.00	0.00634
385161.00	3743980.00	0.00294	384851.00	3743666.00	0.00123

384999.00	3744043.00	0.00114
384972.00	3743790.00	0.00183
384899.00	3743789.00	0.00134
385128.00	3743707.00	0.00803
385020.00	3743743.00	0.00249
385021.00	3743643.00	0.00229
385092.00	3743818.00	0.00373
385093.00	3743848.00	0.00334
385143.00	3744017.00	0.00225
384791.00	3743746.00	0.00098
385053.00	3743982.00	0.00154
384944.00	3743984.00	0.00102
384892.00	3743675.00	0.00142
384951.00	3743602.00	0.00162
385079.00	3743600.00	0.00251
385140.00	3743939.00	0.00310
385167.00	3743850.00	0.00944
385177.00	3743982.00	0.00332
384830.00	3743745.00	0.00112
384868.00	3743670.00	0.00130
385064.00	3743785.00	0.00319
384993.00	3743855.00	0.00171
385019.00	3743984.00	0.00133
384970.00	3743743.00	0.00192
384892.00	3743706.00	0.00142
384986.00	3743602.00	0.00183
384964.00	3743644.00	0.00181
385176.00	3743926.00	0.00546
385095.00	3743970.00	0.00197
385141.00	3744056.00	0.00199
385140.00	3743971.00	0.00261
384834.00	3743667.00	0.00116
384831.00	3743592.00	0.00111
384890.00	3743629.00	0.00137
384891.00	3743609.00	0.00135
385059.00	3743644.00	0.00279
385149.00	3743902.00	0.00444
385172.00	3743903.00	0.00647
385095.00	3744001.00	0.00181
385004.00	3743602.00	0.00195
384964.00	3743671.00	0.00185
385094.00	3743940.00	0.00219
385198.00	3744089.00	0.00245
385210.00	3743967.00	0.00539
384852.00	3743718.00	0.00123
384834.00	3743637.00	0.00115
385122.00	3744058.00	0.00181
385195.00	3744009.00	0.00327
385179.00	3744009.00	0.00291
385200.00	3743982.00	0.00408

**MODELOPTs: NonDFAULT CONC FLAT FASTALL URBAN

*** THE PERIOD (43824 HRS) AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): AISL1 , AISL2 , ROAD1 , ROAD2 , ROAD3 ,
ROAD4 , ROAD5 , DOCK1 , DOCK2 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
384869.00	3743713.00	0.00131	384818.00	3743637.00	0.00110
384851.00	3743639.00	0.00122	385093.00	3744037.00	0.00166
385164.00	3744009.00	0.00263	384803.00	3743668.00	0.00106
385235.00	3744046.00	0.00407	385194.00	3744051.00	0.00273
385277.00	3744319.00	0.00133	385296.00	3744369.00	0.00119
385089.00	3744319.00	0.00090	384823.00	3743978.00	0.00072
384991.00	3743789.00	0.00201	385044.00	3744043.00	0.00134
384986.00	3743743.00	0.00208	385089.00	3743784.00	0.00397
384969.00	3743713.00	0.00193	385137.00	3743742.00	0.00846
385243.00	3744085.00	0.00359	385030.00	3743815.00	0.00236
385185.00	3743891.00	0.00988	385210.00	3744009.00	0.00376
385074.00	3744060.00	0.00147	384849.00	3744050.00	0.00073
384905.00	3744059.00	0.00084	384916.00	3743858.00	0.00121
384849.00	3744034.00	0.00074	384815.00	3743846.00	0.00089
384916.00	3743835.00	0.00129	385013.00	3743918.00	0.00152

384849.00	3744125.00	0.00067
384916.00	3743919.00	0.00103
385152.00	3743812.00	0.00872
385144.00	3743789.00	0.00838
385240.00	3744228.00	0.00170
385218.00	3744136.00	0.00229
385421.00	3744246.00	0.00168
386060.00	3743828.00	0.00160
385203.00	3743716.00	0.00640
385138.00	3743407.00	0.00143
385360.00	3744228.00	0.00215
385276.00	3744228.00	0.00199
385122.00	3743451.00	0.00159
384909.00	3744256.00	0.00065
385887.00	3743423.00	0.00066
386008.00	3743850.00	0.00182
385321.00	3743430.00	0.00147
385400.00	3743825.00	0.00625
385474.00	3743923.00	0.01485
385682.00	3744072.00	0.00238
385788.00	3743585.00	0.00112
385614.00	3743874.00	0.01064
385008.00	3743449.00	0.00136
385425.00	3744327.00	0.00133
386082.00	3743939.00	0.00121
385491.00	3743636.00	0.00231
386024.00	3743950.00	0.00138
385373.00	3744270.00	0.00188
385301.00	3743696.00	0.00444
385521.00	3743719.00	0.00334
386047.00	3744089.00	0.00100
385300.00	3743933.00	0.00974
385423.00	3743660.00	0.00326
385374.00	3743438.00	0.00140
385449.00	3743438.00	0.00121
385705.00	3744299.00	0.00083
385893.00	3744416.00	0.00047
385392.00	3743699.00	0.00383
385194.00	3743428.00	0.00155
385891.00	3743884.00	0.00251
384921.00	3744155.00	0.00078
385265.00	3743428.00	0.00153
385444.00	3744386.00	0.00112
385550.00	3744077.00	0.00277
386035.00	3744406.00	0.00041
385705.00	3743877.00	0.00570
385853.00	3743661.00	0.00159
385589.00	3744334.00	0.00085
385678.00	3743711.00	0.00214
385984.00	3743656.00	0.00141

**MODELOPTs: NonDFAULT CONC FLAT FASTALL URBAN

*** THE PERIOD (43824 HRS) AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): AISL1 , AISL2 , ROAD1 , ROAD2 , ROAD3 ,
ROAD4 , ROAD5 , DOCK1 , DOCK2 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
385844.00	3744081.00	0.00159	385124.00	3744122.00	0.00159
385008.00	3744123.00	0.00106	384919.00	3744113.00	0.00082
385127.00	3744254.00	0.00117	385236.00	3744263.00	0.00146
384975.00	3744255.00	0.00077	385041.00	3744255.00	0.00092
385074.00	3744123.00	0.00132	385302.00	3743487.00	0.00180
385700.00	3743492.00	0.00087	384970.00	3743479.00	0.00134
385546.00	3743663.00	0.00212	385755.00	3744298.00	0.00078
385402.00	3743404.00	0.00120	385027.00	3743414.00	0.00129
385146.00	3743827.00	0.00700	385123.00	3743793.00	0.00577

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 **MODELOPTs:   NonDFAULT CONC      FLAT      FASTALL   URBAN

                                        *** THE SUMMARY OF MAXIMUM PERIOD
( 43824 HRS) RESULTS ***


                                    ** CONC OF PM       IN
MICROGRAMS/M**3                          **


NETWORK
GROUP ID                        AVERAGE CONC                RECEPTOR  (XR,
YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - -

ALL       1ST HIGHEST VALUE IS       0.01624 AT (  385574.00,
3743921.00,     0.00,     0.00,    0.00)  GC  GRID
          2ND HIGHEST VALUE IS       0.01574 AT (  385524.00,
3743921.00,     0.00,     0.00,    0.00)  GC  GRID
          3RD HIGHEST VALUE IS       0.01485 AT (  385474.00,
3743923.00,     0.00,     0.00,    0.00)  DC
          4TH HIGHEST VALUE IS       0.01462 AT (  385474.00,
3743921.00,     0.00,     0.00,    0.00)  GC  GRID
          5TH HIGHEST VALUE IS       0.01344 AT (  385524.00,
3743971.00,     0.00,     0.00,    0.00)  GC  GRID
          6TH HIGHEST VALUE IS       0.01319 AT (  385624.00,
3743921.00,     0.00,     0.00,    0.00)  GC  GRID
          7TH HIGHEST VALUE IS       0.01293 AT (  385574.00,
3743971.00,     0.00,     0.00,    0.00)  GC  GRID
          8TH HIGHEST VALUE IS       0.01278 AT (  385174.00,
3743821.00,     0.00,     0.00,    0.00)  GC  GRID
          9TH HIGHEST VALUE IS       0.01257 AT (  385474.00,
3743971.00,     0.00,     0.00,    0.00)  GC  GRID
         10TH HIGHEST VALUE IS       0.01229 AT (  385424.00,
3743921.00,     0.00,     0.00,    0.00)  GC  GRID


 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
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 *** AERMOD - VERSION  15181 ***   ***  13509 AL2 Carson
***        06/20/16
 *** AERMET - VERSION  14134 ***   ***
***        15:55:16

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 **MODELOPTs:   NonDFAULT CONC      FLAT      FASTALL   URBAN

 *** Message Summary : AERMOD Model Execution ***

  --------- Summary of Total Messages --------

 A Total of            0 Fatal Error Message(s)
 A Total of            3 Warning Message(s)
 A Total of          856 Informational Message(s)

 A Total of        43824 Hours Were Processed

 A Total of            1 Calm Hours Identified

 A Total of          855 Missing Hours Identified (  1.95 Percent)


    ******** FATAL ERROR MESSAGES ********
               ***  NONE  ***


    ********   WARNING MESSAGES   ********
 MX W492       1       METEXT: SURFDATA YR .NE. 1st YR of file, adj to
match file StartYR 2106
 MX W450   35065       CHKDAT: Record Out of Sequence in Meteorological
File at:      11010101
 MX W450   35065       CHKDAT: Record Out of Sequence in Meteorological
File at:    1 year gap

    ************************************
    *** AERMOD Finishes Successfully ***
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CITY OF CARSON 701 E. Carson Street 90745

NEW CASE REVIEW TRANSMITTAL

Planning Division, Community Development Department

February 2, 2017

Joseph Ontiveros
Cultural Resource Director
Soboba Band of Luiseno Indians
PO Box 487
San Jacinto, CA 92581
jontiveros@soboba-nsn.gov

Via E-mail

**SUBJECT: INITIAL STUDY AND DOR NO. 1607-16
21900 S. Wilmington Ave., (APN's 7316-025-061, -062, -097, -812, and -814)
New Industrial Building**

Dear Joseph,

The Community Development Department/Planning Division of the City of Carson is currently processing an application for design overlay review (DOR) request. The applicant proposes to construct a new 420,000-square-foot industrial distribution building & related site improvements built over APNs 7316-025-061, -062, -097, -812, and -814. For the purpose of consistency, address 21900 S. Wilmington Ave. (APN 7316-025-061) is used as the project address. The affected parcels are currently located within the ML-D zoning district with a General Plan Land Use designation of Light Industrial.

The abovementioned project is being forwarded to your office for review and recommendations. In addition to your recommendation and, if applicable, conditions of approval, please include with your report, a summary of all pertinent complaints and/or actions taken by your organization on this property. If appropriate, indicate any steps or conditions necessary to resolve the conflicts or mitigate future activity. Attached is a copy of the project's initial study.

The matter will be set for public hearing before the Planning Commission so we would appreciate your report and comments by March 3, 2017. Please contact me at 310-952-1761 extension 1326 or malexand@carson.ca.us if you have any questions.

Thank you for your cooperation in this matter.

Sincerely,

McKina Alexander
Associate Planner

CITY OF CARSON 701 E. Carson Street 90745

NEW CASE REVIEW TRANSMITTAL

Planning Division, Community Development Department

February 2, 2017

Michael Mirelez
Cultural Resource Coordinator
Torres Martinez Desert Cahuilla Indians
PO Box 1160
Thermal, CA 92274
mmirelez@tmdci.org

Via E-mail

SUBJECT: INITIAL STUDY AND DOR NO. 1607-16
21900 S. Wilmington Ave., (APN's 7316-025-061, -062, -097, -812, and -814)
New Industrial Building

Dear Michael,

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Thank you for your cooperation in this matter.

Sincerely,

McKina Alexander
Associate Planner

CITY OF CARSON 701 E. Carson Street 90745

NEW CASE REVIEW TRANSMITTAL

Planning Division, Community Development Department

February 2, 2017

Andrew Salas, Chairperson
Gabrieleno Band of Mission Indians – Kizh Nation
PO Box 393
Covina, CA 91723
gabrielenoindians@yahoo.com

Via E-mail

SUBJECT: Initial Study and DOR NO. 1607-16
21900 S. Wilmington Ave., (APN's 7316-025-061, -062, -097, -812, and -814)
New Industrial Building

Dear Andrew,

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Thank you for your cooperation in this matter.

Sincerely,

McKina Alexander
Associate Planner

Attachment: Initial Study

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COUNTY OF LOS ANGELES

FIRE DEPARTMENT

Refer reply to

Health Hazardous Materials Division
5825 Rickenbacker Rd.
Commerce CA 90040-302

DARYL L. OSBY
FIRE CHIEF
FORESTER & FIRE WARDEN

November 1 2016

Mr. Alan Alpert
Alpert & Alpert Iron & Metal, Inc.
1815 South Soto Street
Los Angeles, CA 90023

Dear Mr. Alpert:

FORMER ALPERT & ALPERT IRON & METAL, INC., 21930 SOUTH. WILMINGTON AVENUE CARSON, CALIFORNIA 90810 (SMU FILE #04-589/RO0000087)

This Department has completed a review of the reports entitled, “Groundwater Monitoring Well Destruction Report, Former Alpert & Alpert Iron & Metal, Inc. Facility, 21930 South Wilmington Avenue, Carson, California,” dated September 27, 2016; “Submittal of 2016 Annual Groundwater Monitoring Report and Request for No Further Action for Groundwater, Former Alpert & Alpert Iron & Metal, Inc. Facility, 21930 South Wilmington Avenue, Carson, California,” dated May 20, 2016; “Annual Groundwater Monitoring Report, July 2015 through June 2016, Former Alpert & Alpert Iron & Metal, Inc. Facility, 21930 South Wilmington Avenue, Carson, California,” dated May 20, 2016; and, “Removal Action Completion Report, Former Alpert & Alpert Iron and Metal, Inc. Facility, 21930 South Wilmington Avenue, Carson, California,” dated March 31, 2011, submitted by your consultant, AMEC Foster Wheeler. Appendix B of the removal action completion report included the previously submitted “Removal Action Summary and Post-Remediation Human Health Risk Assessment, Former Alpert & Alpert Iron and Metal, Inc. Facility, 12930 South Wilmington Avenue, Carson, California,” dated March 8, 2010.

The Cal/EPA Office of Environmental Health Hazard Assessment (OEHHA) previously reviewed the post-remediation human health risk assessment (HHRA). Based OEHHA’s review summarized in their Memorandum dated May 4, 2010, the health risks associated with onsite post-remediation chemicals of potential concern (COPC) were computed correctly by your consultant. In addition, this Department reviewed the “Notice of Environmental Condition and Environmental Restriction, Re: Assessor’s Parcel Number 7316-025-062, Carson, California” (Notice) that was recorded at the Los Angeles County Registrar – Recorder’s Office on January 31, 2012. This Notice restricts the site to commercial/industrial uses, excluding hospitals for humans, schools for persons under 18 years of age, and day care centers or play areas for children. In addition, the Notice references the future implementation your soil management plan (Appendix K of the removal action completion report) and performance of soil vapor surveys beneath proposed building locations associated with future site development activities to ensure that onsite soil impacts are properly managed and that human health concerns associated with potential volatile COPCs are adequately evaluated.

Based on information provided in the reports and with the provision that the information was accurate and representative of existing conditions, we concur with your consultant that the known site contamination to soil, soil vapor, and groundwater has been satisfactorily mitigated for commercial/industrial site use and no further action is required at the subject site, provided that the Notice requirements and restrictions are adhered to at the referenced property. The Site Mitigation Unit of this Department has no further requirement or restriction relating to this site at this time.

This letter, however, does not relieve you of any liability under the California Health and Safety Code, the State Water Code, or other applicable laws and regulations for any unidentified conditions that could pose and environmental concern.

If you have any questions, please feel free to call Richard Clark at (323) 890-4106.

Respectfully submitted,

Richard L Clark

RICHARD CLARK, SUPERVISOR
SITE MITIGATION UNIT
HEALTH HAZARDOUS MATERIALS DIVISION

RC:rc

ec: K. E. Tucker, Esq.
D. G. Paul, AMEC

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PRELIMINARY
LOW IMPACT DEVELOPMENT
(LID)

For:

ALPERT PROPERTIES CARSON

2061 E. 220th Street
Carson, CA 90810

Prepared for:

ALPERT PROPERTIES, LLC

1815 South Soto Street
Los Angeles, CA 90023
(323) 265-4040

Lead Agency:

City of Carson

701 E Carson Street
Carson, CA 90745

Prepared by:

DRC Engineering, Inc.

160 S. Old Springs Rd., Suite 210
Anaheim Hills, CA 92808
(714) 685-6860
Christopher McKee, P.E.

November 3, 2015

DRC Project No. 15-859

City of Carson
LOW IMPACT DEVELOPMENT
(LID)

For:
ALPERT PROPERTIES CARSON
2061 E. 220th Street
Carson, CA 90810

Prepared for:
ALPERT PROPERTIES, LLC
1815 South Soto Street
Los Angeles, CA 90023
(323) 265-4040

Prepared by:
DRC Engineering, Inc.
160 S. Old Springs Road, Suite 210
Anaheim Hills, CA 92808
(714) 685-6860
Christopher McKee, P.E.

November 3, 2015

OWNER'S CERTIFICATION

STANDARD URBAN STORMWATER MITIGATION PLAN (SUSMP) FOR ALPERT PROPERTIES CARSON

This Standard Urban Stormwater Mitigation Plan (SUSMP) has been prepared for Alpert Properties, LLC by DRC Engineering, Inc. for the project site known as Alpert Properties Carson at 2061 E. 220th Street in the City of Carson, County of Los Angeles, State of California. The SUSMP is intended to comply with the requirements of the City of Carson and the County of Los Angeles.

The undersigned, while it owns the subject property, is responsible for the implementation of the provisions of this plan and will ensure that this plan is amended as appropriate to reflect up-to-date conditions on the site consistent with the City's and the County's Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP) and the intent of the non-point source NPDES Permit for Waste Discharge Requirements for the County of Los Angeles, Los Angeles County Flood Control District and the incorporated Cities of Los Angeles County within the Los Angeles Region Stormwater Runoff Management Program. Once the undersigned transfers its interest in the property, its successors-in-interest shall bear the aforementioned responsibility to implement and amend the SUSMP. An appropriate number of approved and signed copies of this document shall be available on the subject site in perpetuity.

Signed: ____

Name:

Title:

Company:

Address:

Telephone #:

Date: ______________

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Section 100 Discretionary Permit(s) and Water Quality Conditions

INTRODUCTION

In accordance with the General Permit issued under the National Pollutant Discharge Elimination System (NPDES) and adopted by the California State Water Resources Control Board (CSWRCB) in December 2012 (CAS004001), this Standard Urban Stormwater Mitigation Plan has been developed to meet the following objectives:

- Identify pollutant sources that could affect the quality of storm water discharges.
- Identify non-storm water discharges.
- Identify, construct, and implement Best Management Practices (BMPs) to reduce pollutants in storm water discharges from the site after construction.
- Develop a maintenance schedule for BMPs designed to reduce or eliminate pollutants after construction is completed (post-construction BMPs).

Preparation of this Standard Urban Stormwater Mitigation Plan (SUSMP) is required by the City of Carson and shall comply with the Los Angeles County Storm Water Program supplementing the Standard Urban Stormwater Mitigation Plan (SUSMP) and the Report of Waste Discharge (ROWD) adopted by the County of Los Angeles. The Program, SUSMP, and ROWD are part of a countywide storm water pollution control effort adopted to comply with the National Pollution Discharge Elimination System (NPDES) General Permit adopted by the California State Water Resources Control Board.

The objective of this SUSMP is to identify pollutant sources associated with business operations that may affect the quality of discharges of storm water from the site and to specify storm water pollution prevention measures to reduce potential pollutant discharges. These prevention measures are referred to as Best Management Practices or BMPs. Non-Structural BMPs include such practices as spill prevention, outdoor loading/unloading, waste handling and disposal, and drainage system maintenance. Structural BMPs may include infiltration trenches/basins, grass swales, proprietary control measures, and similar mechanisms as deemed appropriate.

Section 200 Project Description

PROJECT INFORMATION

Owner:	Alpert Properties, LLC
Site Address:	2061 E. 220th St.
City/State	Carson, CA
Project Area:	19.97± acres
Proposed Use:	Industrial

LOCATION

As shown on the Location Map in Attachment A, the project site is located in the City of Carson, County of Los Angeles, State of California. The site is situated east of Wilmington Avenue and north of E. 220th St. The site is bounded by industrial development to the north, east, and south, and by a residential development to the west.

SITE PLAN

The project site is owned by Alpert Properties, LLC. The property is currently partially developed with an existing industrial building in the northwest corner. The proposed development will consist of the construction of a ±398,300 sf industrial building, loading dock, parking field, trash enclosures and landscaping. The site will be used for industrial purposes. Approximately 19.97 acres will be disturbed as a result of the proposed condition. Refer to the Site Plan in Attachment A for further details.

Activities on the site will be in conformance with this SUSMP and the City of Carson zoning ordinance and standards. Anticipated pollutants for this project include heavy metals, trash and debris, and oil and grease. Potential pollutants include nutrients, pesticides, organic compounds, sediments, and oxygen demanding substances.

All solid and liquid waste will be handled and disposed of with caution, ensuring that no waste generated on the site will pollute storm water. There will be no activities associated with vehicle or equipment fueling, maintenance, or repair on the site. There will be no outdoor storage of materials.

Proposed pervious area will comprise approximately 13.8% (2.76 acres) of the site and will consist of planter areas located along the project edges. Plants with low irrigation requirements will be chosen for efficient irrigation purposes. The site will have approximately 17.21 acres of impervious area, which is 86.2% percent of the site. Impervious areas will include the proposed building, sidewalks and driveways/parking. The location of the parking areas are shown on the Site Plan and the SUSMP Exhibit in Attachment A.

Refer to Section 500 of this SUSMP for entities that will be responsible for implementing each BMP.

Section 300 Site Description

WATERSHED

RWQCB: Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200, Los Angeles, CA 90013

SITE INFORMATION

Site Address:	2061 E. 220th St.
City/State:	Carson, CA 90810
Soil Types:	003, CS-1, Chino Silt Loam (per L.A. County Dept. of Public Works Hydrology/Sedimentation Appendix)
Hydrologic Concerns:	None (Runoff will enter existing storm drain that currently receives runoff from the site)
Receiving Waters:	Dominguez Channel

DRAINAGE PATTERN

Existing Condition

The site is currently partially developed with an existing industrial building. The existing site has 3.43 acres of impervious area, which is 17.2% of the site. In the existing condition, storm water travels by overland sheet flow discharging to S. Wilmington Avenue and E. 220th Street where it is picked up by storm drain lines draining to the Dominguez Channel and continues to the Pacific Ocean.

Proposed Condition

The proposed project consists of the construction of an industrial building, landscaping, curb, gutter, loading dock, and utilities. The proposed site will have approximately 2.76 acres of pervious area (13.8% of the site), which will consist of the landscaping around the perimeter of the site. Runoff from the proposed building and parking lot areas will be directed through curb cuts to infiltration basins located along the west, south, and east perimeter of the site. The infiltration basins will be designed with 18" ponding depth and 6" of freeboard. Additional underground infiltration pipes will be located along the south side of the building. Runoff from the loading dock will be directed to a series of on-site grated inlets. The graded inlets will drain to an underground infiltration system located north of the building before connecting to an existing LA County storm drain line in the public right of way on Wilmington Avenue. The public storm drain continues draining to Dominguez Channel and the Pacific Ocean. The required treatment has been calculated using the LA County LID Volume Calculator for each subarea. The required LID volumes were calculated to be V_A = 14,876 cf, V_B = 1,342 cf, V_C = 23,999 cf, and V_D = 2,260 cf for a total required volume of 42,477 cf. Subarea A is designed with proposed infiltration basin volume of 11,682 cf plus underground infiltration of 3,595 cf. Subarea B is designed with proposed infiltration basin volume of 5,175 cf. Subarea C is designed with proposed underground infiltration of 14,980 cf.

Subarea D is designed with proposed infiltration basin volume of 8,197 cf. The total site provides a total infiltration volume of 43,629 cf. Refer to the SUSMP Exhibit in Attachment A for proposed drainage patterns.

POLLUTANTS OF CONCERN

The project drains into the Dominguez Channel which is listed on the State Water Board's 303(d) list of impaired water bodies. The Dominguez Channel is listed for ammonia, benthic community effects, benzo(a)pyrene (3,4-benzopyrene), benzo[a]anthracene, chlordane (tissue), chromium (total), chrysens (c1-c4), coliform bacteria, copper, ddt (tissue & sediment), dieldrin (tissue), lead (tissue), pcb's, phenanthrene, pyrene, sediment toxicity, zinc (sediment).

Anticipated pollutants associated with industrial developments include suspended solids, total phosphorus, total nitrogen, total Kjeldahl nitrogen, copper, lead, and zinc from the parking areas. Potential pollutants from landscaping include nutrients, pesticides, organic compounds, sediments, and oxygen demanding substances.

The site will be treated through a combination of infiltration basins and an underground infiltration system (Stormtech SC-740). Kristar FloGard Plus filter inserts will be used as pretreatment within proposed grated inlets. To the maximum extent possible stormwater is being directed to the infiltration basins and underground infiltration system. Based on infiltration testing by the geotechnical engineer for a nearby site, infiltration is feasible for the project site. Per infiltration testing conducted on the neighboring site, the tested infiltration rate is 0.7 inches/hour. A Factor of Safety of 2 has been applied for a design infiltration rate of 0.35 in/hr. Prior to final design, percolation testing conducted by a geotechnical engineer will be completed on the project site. Infiltration has been found to have high removal rates for Sediment, Nutrients, Trash, Metals, Bacteria, Oil and Grease, and Organic compounds (CASQA Handbook).

HYDROLOGIC CONDITIONS OF CONCERN

The project will not create any hydrologic conditions of concern, as all storm water runoff from the site will continue to be discharged into improved drainage channels/storm drains at a flow rate less than the existing condition. Hydromodification is not an issue of concern for this site. All storm water flows into county storm drains and outlet to the Dominguez channel which is impervious from our project site until it reaches the ocean.

Section 400 Best Management Practices (BMPs)

SOURCE CONTROL BMPS

The following tables show the source control BMPs (routine non-structural and routine structural) included in this project and those that were not included.

Routine Non-Structural BMPs

BMP	Name	Check One		If not applicable, state brief reason
		Included	Not Applicable	
SC-10	Non-Stormwater Discharges	X		
SC-11	Spill Prevention, Control and Cleanup	X		
SC-20	Vehicle and Equipment Fueling		X	Vehicle and equipment fueling will not be conducted onsite.
SC-21	Vehicle and Equipment Cleaning		X	Vehicle and equipment cleaning will not be conducted onsite.
SC-22	Vehicle and Equipment Repair		X	Vehicle and equipment repair will not be conducted onsite.
SC-30	Outdoor Loading/Unloading	X		
SC-31	Outdoor Liquid Container Storage		X	Liquids will not be stored outdoors on the site.
SC-32	Outdoor Equipment Operations		X	Outdoor storage of equipment is not expected.
SC-33	Outdoor Storage of Raw Materials		X	Outdoor storage of raw materials is not expected.
SC-34	Waste Handling and Disposal	X		
SC-35	Safer Alternative Products	X		
SC-40	Contaminated or Erodible Areas		X	Contaminated areas are not expected.
SC-41	Building & Grounds Maintenance	X		
SC-42	Building Repair and Construction	X		
SC-43	Parking/Storage Area Maintenance	X		
SC-44	Drainage System Maintenance	X		

*Refer CASQA BMP Fact Sheets in Attachment B.

Routine Structural BMPs

BMP	Name	Check One		If not applicable, state brief reason
		Included	Not Applicable	
SD-10	Site Design and Landscape Planning	X		
SD-11	Roof Runoff Controls	X		
SD-12	Efficient Irrigation	X		
SD-13	Storm Drain Signage	X		
SD-20	Pervious Pavements		X	Pervious pavements not being used on the site.
SD-30	Fueling Areas		X	Fueling areas are not proposed for the site.
SD-31	Maintenance Bays and Docks	X		
SD-32	Trash Enclosures	X		
SD-33	Vehicle Washing Areas		X	Vehicle washing will not be conducted onsite.
SD-34	Outdoor Material Storage Areas		X	Outdoor hazardous material storage is not expected.
SD-35	Outdoor Work Areas		X	Outdoor work is not expected.
SD-36	Outdoor Processing Areas		X	Outdoor processing is not expected.

*Refer BMP Fact Sheets in Attachment B.

SC-10 Non-Stormwater Discharges
Non-stormwater discharges are those flows that do not consist entirely of stormwater. For municipalities non-stormwater discharges present themselves in two situations. One is from fixed facilities owned and/or operated by the municipality. The other situation is non-stormwater discharges that are discovered during the normal operation of a field program. Some non-stormwater discharges do not include pollutants and may be discharged to the storm drain. These include uncontaminated groundwater and natural springs. There are also some non-stormwater discharges that typically do not contain pollutants and may be discharged to the storm drain with conditions. These include car washing, and surface cleaning. However, there are certain non-stormwater discharges that pose environmental concern. These discharges may originate from illegal dumping or from internal floor drains, appliances, industrial processes, sinks, and toilets that are connected to the nearby storm drainage system. These discharges (which may include: process waste waters, cooling waters, wash waters, and sanitary wastewater) can carry substances (such as paint, oil, fuel and other automotive fluids, chemicals and other pollutants) into storm drains. The ultimate goal is to effectively eliminate non-stormwater discharges to the stormwater drainage system through implementation of measures to detect, correct, and enforce against illicit connections and illegal discharges.

SC-11 Spill Prevention, Control and Cleanup
Spills and leaks are one of the largest contributors of stormwater pollutants. Develop procedures to prevent/mitigate to storm drain systems and develop a Spill Prevention Control and countermeasure Plan. Report spills to local agencies and establish a system for tracking incidents. Prevention of spills and leaks is inexpensive, but treatment of contaminated soils/water can be very expensive.

SC-30 Outdoor Loading/Unloading
The loading/unloading of materials usually takes place outside on docks or terminals; therefore, materials spilled, leaked, or lost during loading/unloading may collect in the soil or on other surfaces and have the potential to be carried away by stormwater runoff or when the area is cleaned. Additionally, rainfall may wash pollutants from machinery used to unload or move materials. Loading and unloading of material may include package products, barrels, and bulk products. Implementation of the following protocols will prevent or reduce the discharge of pollutants to stormwater from outdoor loading/unloading of materials.

SC-34 Waste Handling and Disposal
Improper storage and handling of solid wastes can allow toxic compounds, oils and greases, heavy metals, nutrients, suspended solids, and other pollutants to enter stormwater runoff. The discharge of pollutants to stormwater from waste handling and disposal can be prevented and reduced by tracking waste generation, storage, and disposal; reducing waste generation and disposal through source reduction, re-use, and recycling; and preventing runon and runoff.

SC-35 Safer Alternative Products
Promote the use of less harmful products and products that contain little or no TMDL pollutants. Alternatives exist for most product classes including chemical fertilizers, pesticides, cleaning, solutions, janitorial chemicals, automotive and paint products, and consumables (batteries, fluorescent lamps).

SC-41 Building and Grounds Maintenance
Stormwater runoff from building and grounds maintenance activities can be contaminated with toxic hydrocarbons in solvents, fertilizers and pesticides, suspended solids, heavy metals, and abnormal pH. Utilizing the following protocols will prevent or reduce the discharge of pollutants to stormwater from building and grounds maintenance activities by washing and cleaning up with as little water as possible, following good landscape management practices, preventing and cleaning up spills immediately, keeping debris from entering the storm drains, and maintaining the stormwater collection system.

SC-42 Building Repair and Construction
Modifications are common particularly at large industrial sites. The activity may vary from minor and normal building repair to major remodeling, or the construction of new facilities. These activities can generate pollutants including solvents, paints, paint and varnish removers, finishing residues, spent thinners, soap cleaners, kerosene, asphalt and concrete materials, adhesive residues, and old asbestos installation. Protocols in this fact sheet are intended to prevent or reduce the discharge of pollutants to stormwater from building repair, remodeling, and construction by using soil erosion controls, enclosing or covering building material storage areas, using good housekeeping practices, using safer alternative products, and training employees.

SC-43 Parking/Storage Area Maintenance
Parking lots and storage areas can contribute a number of substances, such as trash, suspended solids, hydrocarbons, oil and grease, and heavy metals that can enter receiving waters through stormwater runoff or non-stormwater discharges. The following protocols are intended to prevent or reduce the discharge of pollutants from parking/storage areas and include using good housekeeping practices, following appropriate cleaning BMPs, and training employees.

SC-44 Drainage System Maintenance
As a consequence of its function, the stormwater conveyance system collects and transports urban runoff and stormwater that may contain certain pollutants. The protocols in this fact sheet are intended to reduce pollutants reaching receiving waters through proper conveyance system operation and maintenance.

SD-10 Site Design & Landscape Planning
Each project site possesses unique topographic, hydrologic, and vegetative features, some of which are more suitable for development than others. Integrating and incorporating appropriate landscape planning methodologies into the project design is the most effective action that can be done to minimize surface and groundwater contamination from stormwater.

SD-11 Roof Runoff Controls
Various roof runoff controls are available to address stormwater that drains off rooftops. The objective is to reduce the total volume and rate of runoff from individual lots, and retain the pollutants on site that may be picked up from roofing materials and atmospheric deposition. Roof runoff controls consist of directing the roof runoff away from paved areas and mitigating flow to the storm drain system through one of several general approaches: cisterns or rain barrels; dry wells or infiltration trenches; pop-up emitters, and foundation planting. The first three approaches require the roof runoff to be contained in a gutter and downspout system. Foundation planting provides a vegetated strip under the drip line of the roof.

SD-12 Efficient Irrigation
Irrigation water provided to landscaped areas may result in excess irrigation water being conveyed into stormwater drainage systems.

SD-13 Storm Drain Signage
Waste materials dumped into storm drain inlets can have severe impacts on receiving and ground waters. Posting notices regarding discharge prohibitions at storm drain inlets can prevent waste dumping. Storm drain signs and stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets.

SD-31 Maintenance Bays and Docks
Several measures can be taken to prevent operations at maintenance bays and loading docks from contributing a variety of toxic compounds, oil and grease, heavy metals, nutrients, suspended solids, and other pollutants to the stormwater conveyance system.

SD-32 Trash Enclosures
Trash storage areas are areas where a trash receptacle (s) is located for use as a repository for solid wastes. Stormwater runoff from areas where trash is stored or disposed of can be polluted. In addition, loose trash and debris can be easily transported by water or wind into nearby storm drain inlets, channels, and/or creeks. Waste handling operations that may be sources of stormwater pollution include dumpsters, litter control, and waste piles.

SITE DESIGN BMPs

The following table shows site design BMPs that are included in this project. A description of each BMP follows:

Table 3: Site Design BMPs

Technique	Included?		If no, state justification
	Yes	No	
Minimize Directly Connected Impervious Areas (DCIAs) (C-Factor Reduction)	X		
Create Reduced or "Zero Discharge" Areas (Runoff Volume Reduction)[1]	X		
Minimize Impervious Area/Maximize Permeability (C-Factor Reduction)[2]	X		
Conserve Natural Areas (C-Factor Reduction)	X		

1 Detention and retention areas incorporated into landscape design provide areas for retaining and detaining stormwater flows, resulting in lower runoff rates and reductions in volume due to limited infiltration and evaporation. Such Site Design BMPs may reduce the size of Treatment Control BMPs.

2 The "C Factor" is a representation of the ability of a surface to produce runoff. Surfaces that produce higher volumes of runoff are represented by higher C Factors. By incorporating more pervious, lower C Factor surfaces into a development, lower volumes of runoff will be produced. Lower volumes and rates of runoff translate directly to lowering treatment requirements.

Minimize Directly Connected Impervious Areas (DCIAs) (C-Factor Reduction):
Inclusion of landscaped areas in the site design is used to minimize directly connected impervious areas. Infiltration of runoff will also help to remove sediment/turbidity, and oil and grease.

Create Reduced or "Zero Discharge" Areas (Runoff Volume Reduction):
The inclusion of infiltration basins and underground infiltration system will treat the stormwater runoff prior to entering the public storm drain. These infiltration areas will help reduce the pollutants discharging from both small and larger events from the building, roof, and surrounding landscape areas.

Minimize Impervious Area/Maximize Permeability (C-Factor Reduction):
The site has been designed with landscape and pervious areas to the maximum extent practicable. The proposed site percentage pervious areas are approximately 13.8% of the site. The outdoor areas are designed with large planter areas around the proposed building and surface parking.

Conserve Natural Areas (C-Factor Reduction):
Since the existing site is mostly undeveloped, the proposed condition will increase impervious areas. However, the site has been designed with landscape and pervious areas to the maximum extent practicable. The proposed site percentage pervious areas are approximately 13.8% of the site.

TREATMENT BMPS

The following table shows the Treatment BMPs that are included in this project.

Treatment BMPs

Identifier	Name	Included?		If not applicable, state brief reason
		Yes	No	
MP-51	Vortex Separator		X	Infiltration will be used instead and will provide higher level of removals.
MP-52	Drain Inserts	X		
TC-10	Infiltration Trench		X	Extensive land and maintenance requirements. Insufficient space for effective treatment.
TC-11	Infiltration Basin	X		
TC-12	Retention/Irrigation		X	Relative frequent inspection and maintenance requirements. Insufficient space for effective treatment.
TC-20	Wet Pond		X	Safety concerns and extensive land and maintenance requirements. Insufficient space for effective treatment.
TC-21	Constructed Wetland		X	Safety concerns and extensive land and maintenance requirements. Insufficient space for effective treatment.
TC-22	Extended Detention Basin		X	Extensive land and maintenance requirements. Insufficient space for effective treatment.
TC-30	Vegetated Swale		X	Not practical at this site. Insufficient space for effective treatment.
TC-31	Vegetated Buffer Strip		X	Not practical at this site. Insufficient space for effective treatment.
TC-32	Bio-filtration		X	Infiltration will be used instead and will provide higher level of removals.
TC-40	Media Filter		X	Infiltration will be used instead and will provide higher level of removals.
TC-50	Water Quality Inlet		X	Infiltration will be used instead and will provide higher level of removals.

MP-52 Drain Inserts
Drain inserts are manufactured filters or fabric placed in a drop inlet to remove sediment and debris. There are a multitude of inserts of various shapes and configurations, typically falling into one of three different groups: socks, boxes, and trays. The sock consists of a fabric, usually constructed of polypropylene. The fabric may be attached to a frame of the grate of the inlet holds the sock. Socks are meant for vertically (drop) inlets. Boxes are constructed of plastic or wire mesh. Typically a polypropylene "bag" is placed in the wire mesh box. The bag takes the form of the box. Most box products are one box; that is, the setting area and filtration through media occur in the same box. Some products consist of one of more trays or mesh grates. The trays may hold different types of media. Filtration media vary by manufacturer. Types include polypropylene, porous polymer, treated cellulose, and activated carbon.

TC-11 Infiltration Basin
An infiltration basin is a shallow impoundment designed to infiltrate stormwater. Infiltration basins use the natural filtering ability of the soil to remove pollutants in stormwater runoff. Infiltration facilities store runoff until it gradually exfiltrates through the soil and eventually info the water table. This practice has high pollutant removal efficiency and can also help recharge groundwater, thus helping to maintain low flows in stream systems. Care must be taking however, because infiltration basins can be challenging to apply on many sites. The locations of the proposed infiltration basins/underground infiltration systems and drainage areas are shown on the SUSMP Plot Plan.

The proposed treatment control BMPs for the project were selected based on their pollutant removal efficiencies and feasibility of implementation. Anticipated pollutants associated with industrial developments include suspended solids, total phosphorus, total nitrogen, total Kjeldahl nitrogen, copper, lead, and zinc from the parking areas. Potential pollutants from landscaping include nutrients, pesticides, organic compounds, sediments, and oxygen demanding substances. Infiltration basins were chosen for the project site because they offer high removal of pollutants that would be associated with industrial developments. Detention systems such as wet ponds require frequent inspection and maintenance and extensive areas for effective treatment. Flow through separation systems such as vortex separators offer only a low level of removal efficiency for the pollutants of concern. Bioretention/biotreatment does not offer the consistently high removal efficiencies as infiltration. It is anticipated that the proposed BMPs will be effective in reducing the anticipated pollutants of concern on the project site and preventing any impairment to downstream storm drainage facilities and receiving waters.

Section 500 Inspection/Maintenance Responsibility for BMPs

RESPONSIBLE PARTIES

The following entity is responsible for the implementation of this SUSMP for the onsite areas, including the long-term inspection and maintenance of all structural Source Control BMPs and all Treatment Control BMPs:

Owner:	Alpert Properties, LLC
Contact:	
Address:	1815 South Soto Street, Los Angeles, CA 90023
Tel:	(323) 265-4040

The Owner of the property (listed above) and its successors and assigns, is responsible for implementation of this SUSMP for the onsite areas (paved lots, landscaping, drainage devices, etc.). The owner may employ construction managers, general contractors, subcontractors, and property managers to assist in implementing, monitoring and reporting the BMPs outlined in this SUSMP for operating facilities to ensure compliance with the provisions of SUSMP including storm water control permitting requirements for new developments.

REPORTING

Alpert Properties, LLC shall be responsible for completing and maintaining inspection reports that include the date of the inspection, the name of the person who performed the inspection, the observations made, and any actions taken. Records shall be maintained for three years. The records shall be available for inspection upon request of the City Engineer, Regional Water Control Board, or the designated City Representative.

See the BMP Maintenance Responsibility/Frequency Matrix in this section for details on the party responsible for each BMP and the frequency of action with respect to that BMP.

MAINTENANCE REQUIREMENTS

Inspection and maintenance of the proprietary treatment control BMPs shall be in accordance with the manufacturer's recommendations included below. All BMPs shall be inspected and maintained according to the Maintenance Responsibility/Frequency Matrix below.

REVISION TO THE SUSMP

Revisions to the SUSMP in the event of a substantial change to the project due to construction modifications or uses at the site will be the responsibility of Alpert Properties, LLC. Modifications to the SUSMP may be necessary if project changes result in a potential increase in pollutant discharge to storm water or if inspection and monitoring indicates that existing BMPs are ineffective. Alpert Properties, LLC shall secure the services of the firm that prepared the original SUSMP or other qualified persons to make any appropriate changes, additions or deletions. Any revisions shall require approval by the local government that has jurisdiction over the subject property.

<table>
<tr><th colspan="3">POST CONSTRUCTION BMPS
MAINTENANCE RESPONSIBILITY/FREQUENCY MATRIX
2061 E. 220th Street, Carson, CA – COUNTY OF LOS ANGELES</th></tr>
<tr><th>BEST MANAGEMENT PRACTICES (BMPs)</th><th>INSPECTION FREQUENCY (all controls)</th><th>MAINTENANCE/REPAIR PROGRAM</th></tr>
<tr><td>SC-10

Non-Storm Water Discharges</td><td>Ongoing. Orientation shall be given to applicable employees within 30 days of start up and to each new applicable onsite employee thereafter within 30 days of hire. Refreshing training shall be provided annually.</td><td>■ Responsible Party:
<u>Alpert Properties, LLC</u>
See BMP SC-10 for additional information.</td></tr>
<tr><td>SC-11

Spill Prevention, Control, and Cleanup</td><td>Ongoing</td><td>■ Responsible Party:
<u>Alpert Properties, LLC</u>
■ The owner shall develop a spill response plan and maintain a spill response kit on site, which shall contain absorbent materials to adequately contain any spills that may be anticipated. Applicable employees shall be trained to use the spill response kit. The kit shall be checked regularly to ensure there are sufficient materials.</td></tr>
<tr><td>SC-30

Outdoor Loading/Unloading</td><td>Ongoing. Daily management of operation. Inspect the loading docks on a daily basis for spills, broken containers, and trash/debris.</td><td>■ Responsible Party:
<u>Alpert Properties, LLC</u>
■ Make repairs to loading/unloading equipment as necessary.
■ Check loading and unloading equipment for leaks and perform regular brook dry-sweeping of area.
■ Spills and broken containers shall be cleaned immediately upon occurrence.</td></tr>
<tr><td>SC-34

Waste Handling and Disposal</td><td>Inspect the trash enclosure area on a weekly basis for trash/debris, spills, broken containers, etc.</td><td>■ Responsible Party:
<u>Alpert Properties, LLC</u>
■ Pick up any trash off the ground and place in appropriate containers.
■ Trash storage pickup will be once per week.</td></tr>
</table>

POST CONSTRUCTION BMPS MAINTENANCE RESPONSIBILITY/FREQUENCY MATRIX 2061 E. 220th Street, Carson, CA – COUNTY OF LOS ANGELES		
BEST MANAGEMENT PRACTICES (BMPs)	**INSPECTION FREQUENCY (all controls)**	**MAINTENANCE/REPAIR PROGRAM**
SC-35 Safer Alternative Products	Ongoing. Daily management of operation.	■ Responsible Party: Alpert Properties, LLC ■ Use safer alternative products when possible and practicable
SC-41 Building & Grounds Maintenance	Landscape and grounds maintenance will be performed on a weekly basis.	■ Responsible Party: Alpert Properties, LLC (through grounds and maintenance personnel) ■ Perform regular landscape maintenance that includes trimming and mowing, repair/replacement of damage or diseased vegetation, replanting of bare areas, etc. ■ Perform regular grounds maintenance that includes trash and litter removal, etc. ■ Additional repair activities will be performed as necessary. ■ See BMP SC-41 for additional information
SC-42 Building Repair and Construction	When buildings are being repaired/maintained.	■ Responsible Party: Alpert Properties, LLC (through grounds and maintenance personnel) ■ See BMP SC-42 for additional information
SC-43 Parking/Storage Area Maintenance	The paved parking lot shall be swept on a regular basis to removed trash and debris.	■ Responsible Party: Alpert Properties, LLC (through grounds and maintenance personnel) ■ See BMP SC-43 for additional information
SC-44 Drainage System Maintenance	The drainage system and inlets shall be inspected a minimum of three times per year, including once per year, prior to, during, and after the rainy season (Oct. 1st through April 30th).	■ Responsible Party: Alpert Properties, LLC ■ Remove any trash, debris, or other obstructions. Make structural repairs as necessary.

POST CONSTRUCTION BMPS
MAINTENANCE RESPONSIBILITY/FREQUENCY MATRIX
2061 E. 220th Street, Carson, CA – COUNTY OF LOS ANGELES

BEST MANAGEMENT PRACTICES (BMPs)	INSPECTION FREQUENCY (all controls)	MAINTENANCE/REPAIR PROGRAM
SD-10 Site Design & Landscape Planning	At regular intervals with landscape/grounds maintenance. Inspect irrigation equipment on a monthly basis for proper operation (Check water sensors, irrigation heads, and timers).	■ Responsible Party: Alpert Properties, LLC ■ Remove any trash, debris, or other obstructions in and around landscape areas. ■ Repair leaks and adjust sensors, timers, and irrigation heads as necessary to prevent over or under watering of vegetation. ■ Repair/replace diseased or damaged vegetation.
SD-11 Roof Runoff Controls	At regular intervals with landscape/grounds maintenance. Minimum of once a month.	■ Responsible Party: Alpert Properties, LLC ■ Remove any trash, debris, or other obstructions in and around the roof drain outlets. Make structural repairs as necessary
SD-12 Efficient Irrigation	Inspect irrigation equipment on a monthly basis for proper operation. Check water sensors, irrigation heads, and timing.	■ Responsible Party: Alpert Properties, LLC ■ Adjust irrigation heads and timers as necessary. ■ Repair leaks and adjust sensors, timers, and irrigation heads as necessary to prevent over or under watering of vegetation. ■ Repair or replace damaged irrigation equipment and make other repairs or adjustments as necessary. ■ Landscape maintenance will be conducted on a weekly basis.
SD-13 Storm Drain Signage	Inspect storm drain signage for legibility a minimum of once per year.	■ Responsible Party: Alpert Properties, LLC ■ Re-apply storm drain signage as necessary to maintain legibility.

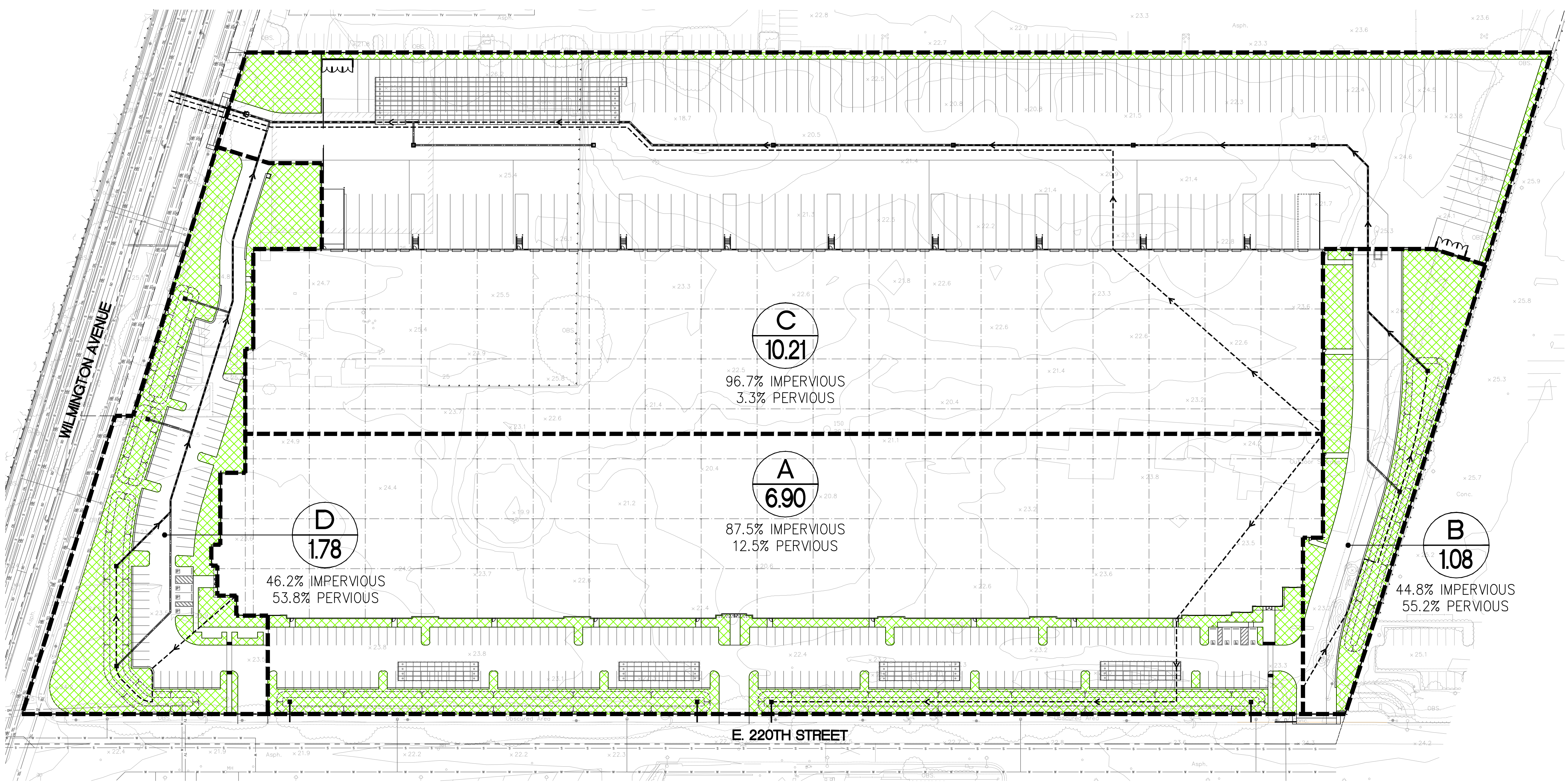
POST CONSTRUCTION BMPS MAINTENANCE RESPONSIBILITY/FREQUENCY MATRIX 2061 E. 220th Street, Carson, CA – COUNTY OF LOS ANGELES		
BEST MANAGEMENT PRACTICES (BMPs)	**INSPECTION FREQUENCY (all controls)**	**MAINTENANCE/REPAIR PROGRAM**
SD-31 Maintenance Bays and Docks	Inspect loading docks for spills, broken containers, and trash/debris. Clean spills immediately upon occurrence. Inspect the dock areas daily for spills and trash/debris. Clean as necessary.	■ Responsible Party: Alpert Properties, LLC ■ Perform regular dry-broom sweeping of the loading docks. ■ Pick up any trash/debris and broken containers immediately upon occurrence. ■ See SC-11 and SC-30 above.
SD-32 Trash Enclosures	Inspect trash dumpster areas daily to ensure the lids are closed and trash is not overflowing. Pick up trash and place in dumpsters. Inspect the structural elements of the dumpsters and enclosures (lids, roofs, screens, etc.) on a monthly basis and repair as necessary.	■ Responsible Party: Alpert Properties, LLC ■ Pick up trash on ground and place in receptacles. Close any lids that are left open. ■ Repair damage to structure as necessary. ■ Remove accumulations of trash.
MP-52 Drain Inserts	Inspect drain inserts a minimum of three times a year per manufacturer's recommendations.	■ Responsible Party: Alpert Properties, LLC ■ Remove accumulated trash and sediment. ■ Replace hydrocarbon removal pouches a minimum of once per year.
TC-11 Infiltration Basin	Inspect to ensure that water infiltrates into the subsurface completely and that vegetation is carefully managed to prevent vector habitats. Inspect for standing water at the end of the wet season.	■ Responsible Party: Alpert Properties, LLC ■ Schedule semiannual inspections for beginning and end of the wet season. ■ Remove accumulated trash/debris in the basin at the start and end of wet season. ■ Trim vegetation at the beginning and end of the wet season. ■ Remove accumulated sediment and regrade when the accumulated sediment volume exceeds 10% of the basin. ■ If erosion is occurring within the basin, revegetate immediately and stabilize with erosion control mulch or mat.

POST CONSTRUCTION BMPS MAINTENANCE RESPONSIBILITY/FREQUENCY MATRIX 2061 E. 220th Street, Carson, CA – COUNTY OF LOS ANGELES		
BEST MANAGEMENT PRACTICES (BMPs)	**INSPECTION FREQUENCY (all controls)**	**MAINTENANCE/REPAIR PROGRAM**
TC-11 Underground Infiltration System (Stormtech SC-740)	Inspect Stormtech per manufacturer's recommendations, but not less than once a year.	■ Responsible Party: Alpert Properties, LLC ■ Remove accumulated sediment per manufacturer's recommendations. ■ Make structural repairs to Stormtech unit as necessary.

Attachment A

Location Map, Site Plan, and SUSMP Exhibit

FIGURE 1: LOCATION MAP



LEGEND

DRAINAGE AREA BOUNDARY

FLOW PATH

DRAINAGE SUBAREA DESIGNATION (I)

DRAINAGE SUBAREA IN ACRES (0.07)

LANDSCAPE AREA

TOTAL SITE SUMMARY

TOTAL SITE AREA = 19.97 ACRES

PRE-DEVELOPMENT:
- % EXISTING IMPERVIOUS = 17.2%
- EXISTING IMPERVIOUS AREA = 3.43 AC
- % EXISTING PERVIOUS = 82.8%
- EXISTING PERVIOUS AREA = 16.54 AC

POST-DEVELOPMENT:
- % PROPOSED IMPERVIOUS = 86.2%
- PROPOSED IMPERVIOUS AREA = 17.21 AC
- % PROPOSED PERVIOUS = 13.8%
- PROPOSED PERVIOUS AREA = 2.76 AC

GRAPHIC SCALE

100 0 50 100 200

(IN FEET)

1 inch = 100 ft.

N

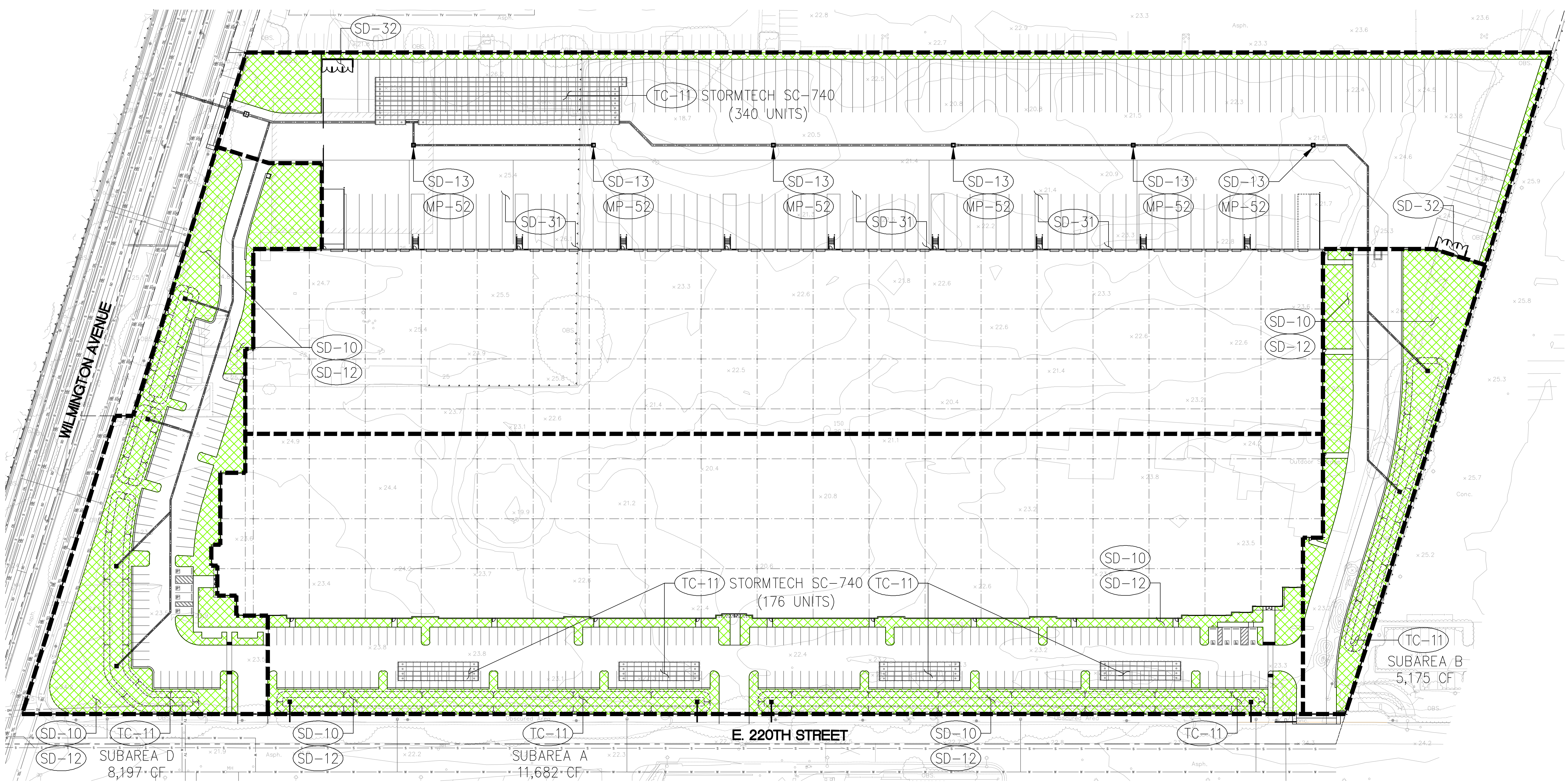
ALPERT PROPERTIES CARSON

SUSMP EXHIBIT

CARSON, CA

DRC Engineering, Inc.
Civil Engineering/Land Surveying/Land Planning
160 S. Old Springs Rd., Ste. 210
Anaheim Hills, California 92808
(714) 685-6860

FILENAME: M:\2015\15-859 AL2 LLC Carson\SUSMP\15-859 SUSMP EXH.dwg, Nov 04 2015 12:31pm



STRUCTURAL BMPs

SD-10	SITE DESIGN & LANDSCAPE PLANNING
SD-12	EFFICIENT IRRIGATION
SD-13	STORM DRAIN SIGNAGE
SD-31	MAINTENANCE BAYS AND DOCKS
SD-32	TRASH ENCLOSURES
MP-52	DRAIN INSERTS
TC-11	INFILTRATION BASINS/ UNDERGROUND INFILTRATION SYSTEM (STORMTECH SC-740)

GRAPHIC SCALE

100 0 50 100 200

(IN FEET)
1 inch = 100 ft.

N

SHEET 1 OF 2

ALPERT PROPERTIES CARSON

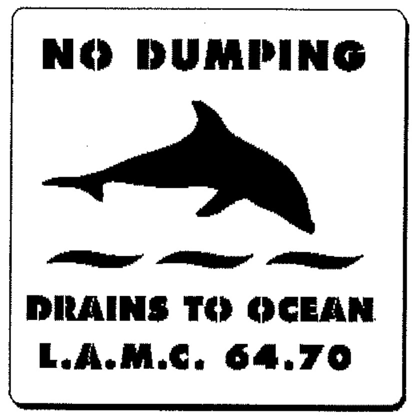
BMP EXHIBIT

CARSON, CA

DRC Engineering, Inc.
Civil Engineering/Land Surveying/Land Planning
160 S. Old Springs Rd., Ste. 210
Anaheim Hills, California 92808
(714) 685-6860

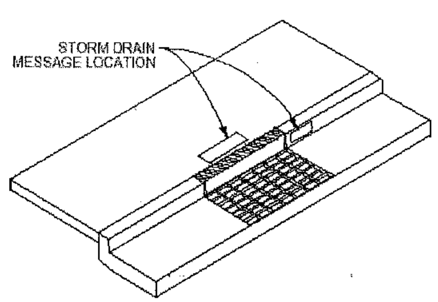
FILENAME: M:\2015\15-859 AL2 LLC Carson\SUSMP\15-859 SUSMP EXH.dwg, Nov 04 2015 12:43pm

Storm Drain Signage Sample and Signage location

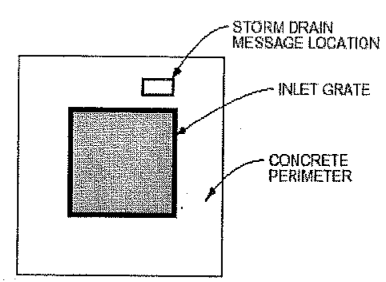


OR

Stencil or signage is required at all drainage inlets



CURB TYPE INLET



AREA TYPE INLET

NOTES:
1. STORM DRAIN MESSAGE SHALL BE APPLIED IN SUCH A WAY AS TO PROVIDE A CLEAR, LEGIBLE IMAGE.
2. STORM DRAIN MESSAGE SHALL BE PERMANENTLY APPLIED DURING THE CONSTRUCTION OF THE CURB AND GUTTER USING A METHOD APPROVED BY THE LOCAL AGENCY.

Storm Drain Message / Stencil Location

		INFILTRATION BASIN SIZING			UNDERGROUND INFILTRATION SIZING (STORMTECH SC-740)	
DRAINAGE AREA	LID VOLUME REQUIRED (CF)	BASIN AREA PROVIDED (SF)	BASIN PONDING DEPTH PROVIDED (FT)	BASIN VOLUME PROVIDED (CF)	UNDERGROUND UNITS PROVIDED (EA)	UNDERGROUND VOLUME PROVIDED (CF)
A	14,876	7,788	1.5	11,682	48	3,595
B	1,342	3,450	1.5	5,175		
C	23,999				200	14,980
D	2,260	5,465	1.5	8,197		

		UNDERGROUND INFILTRATION SIZING (STORMTECH SC-740)	
DRAINAGE AREA	25-YEAR DETENTION VOLUME REQUIRED (CF)	UNDERGROUND UNITS PROVIDED (EA)	UNDERGROUND VOLUME PROVIDED (CF)
A	9,000	128	9,587
C	10,200	140	10,486

ALPERT PROPERTIES CARSON

BMP EXHIBIT

CARSON, CA

DRC
160 S. Old Springs Rd., Ste. 210
Anaheim Hills, California 92808
(714) 685-6860

ATTACHMENT B

Educational Materials Included

The following is a list of the educational materials that pertain to this project.

- After the Storm – A Citizen's Guide to Understanding Stormwater
- Protecting Water Quality from Urban Runoff
- Preventing Pollution through Efficient Water Use
- CASQA BMP Fact Sheets

Education Materials:

AFTER THE STORM– A CITIZEN'S GUIDE TO UNDERSTANDING STORMWATER

After the Storm

A Citizen's Guide to Understanding Stormwater

For more information contact:

or visit

www.epa.gov/npdes/stormwater

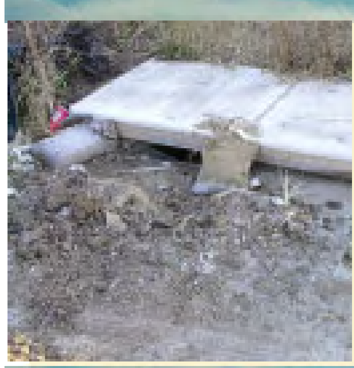
www.epa.gov/nps

United States Environmental Protection Agency

EPA 833-B-03-002

January 2003

What is stormwater runoff?

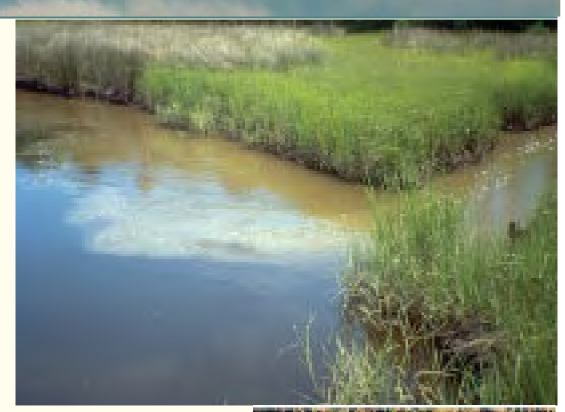


Stormwater runoff occurs when precipitation from rain or snowmelt flows over the ground. Impervious surfaces like driveways, sidewalks, and streets prevent stormwater from naturally soaking into the ground.

Why is stormwater runoff a problem?

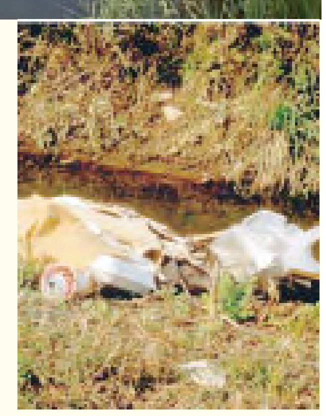
Stormwater can pick up debris, chemicals, dirt, and other pollutants and flow into a storm sewer system or directly to a lake, stream, river, wetland, or coastal water. Anything that enters a storm sewer system is discharged untreated into the waterbodies we use for swimming, fishing, and providing drinking water.

The effects of pollution



Polluted stormwater runoff can have many adverse effects on plants, fish, animals, and people.

- Sediment can cloud the water and make it difficult or impossible for aquatic plants to grow. Sediment also can destroy aquatic habitats.
- Excess nutrients can cause algae blooms. When algae die, they sink to the bottom and decompose in a process that removes oxygen from the water. Fish and other aquatic organisms can't exist in water with low dissolved oxygen levels.



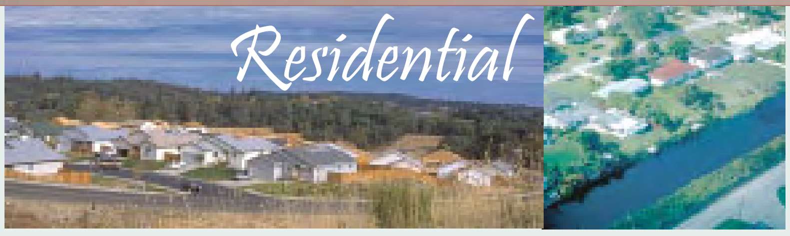
- Bacteria and other pathogens can wash into swimming areas and create health hazards, often making beach closures necessary.
- Debris—plastic bags, six-pack rings, bottles, and cigarette butts—washed into waterbodies can choke, suffocate, or disable aquatic life like ducks, fish, turtles, and birds.
- Household hazardous wastes like insecticides, pesticides, paint, solvents, used motor oil, and other auto fluids can poison aquatic life. Land animals and people can become sick or die from eating diseased fish and shellfish or ingesting polluted water.

- Polluted stormwater often affects drinking water sources. This, in turn, can affect human health and increase drinking water treatment costs.

Stormwater Pollution Solutions

Education is essential to changing people's behavior. Signs and markers near storm drains warn residents that pollutants entering the drains will be carried untreated into a local waterbody.

Residential



Recycle or properly dispose of household products that contain chemicals, such as insecticides, pesticides, paint, solvents, and used motor oil and other auto fluids. Don't pour them onto the ground or into storm drains.

Auto care

Washing your car and degreasing auto parts at home can send detergents and other contaminants through the storm sewer system. Dumping automotive fluids into storm drains has the same result as dumping the materials directly into a waterbody.

- Use a commercial car wash that treats or recycles its wastewater, or wash your car on your yard so the water infiltrates into the ground.
- Repair leaks and dispose of used auto fluids and batteries at designated drop-off or recycling locations.

Lawn care

Excess fertilizers and pesticides applied to lawns and gardens wash off and pollute streams. In addition, yard clippings and leaves can wash into storm drains and contribute nutrients and organic matter to streams.

- Don't overwater your lawn. Consider using a soaker hose instead of a sprinkler.
- Use pesticides and fertilizers sparingly. When use is necessary, use these chemicals in the recommended amounts. Use organic mulch or safer pest control methods whenever possible.
- Compost or mulch yard waste. Don't leave it in the street or sweep it into storm drains or streams.
- Cover piles of dirt or mulch being used in landscaping projects.

Septic systems

Leaking and poorly maintained septic systems release nutrients and pathogens (bacteria and viruses) that can be picked up by stormwater and discharged into nearby waterbodies. Pathogens can cause public health problems and environmental concerns.

- Inspect your system every 3 years and pump your tank as necessary (every 3 to 5 years).
- Don't dispose of household hazardous waste in sinks or toilets.

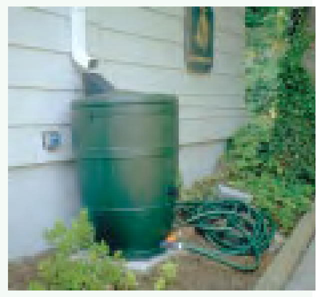
Pet waste

Pet waste can be a major source of bacteria and excess nutrients in local waters.

- When walking your pet, remember to pick up the waste and dispose of it properly. Flushing pet waste is the best disposal method. Leaving pet waste on the ground increases public health risks by allowing harmful bacteria and nutrients to wash into the storm drain and eventually into local waterbodies.

Residential landscaping

Permeable Pavement—Traditional concrete and asphalt don't allow water to soak into the ground. Instead these surfaces rely on storm drains to divert unwanted water. Permeable pavement systems allow rain and snowmelt to soak through, decreasing stormwater runoff.



Rain Barrels—You can collect rainwater from rooftops in mosquito-proof containers. The water can be used later on lawn or garden areas.

Rain Gardens and Grassy Swales—Specially designed areas planted with native plants can provide natural places for rainwater to collect and soak into the ground. Rain from rooftop areas or paved areas can be diverted into these areas rather than into storm drains.

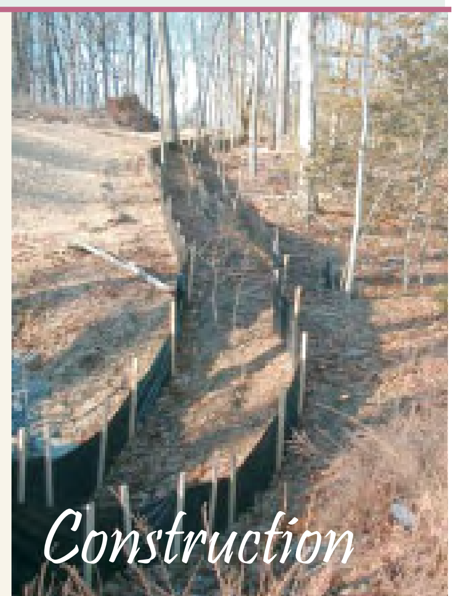
Vegetated Filter Strips—Filter strips are areas of native grass or plants created along roadways or streams. They trap the pollutants stormwater picks up as it flows across driveways and streets.

Commercial

Dirt, oil, and debris that collect in parking lots and paved areas can be washed into the storm sewer system and eventually enter local waterbodies.

- Sweep up litter and debris from sidewalks, driveways and parking lots, especially around storm drains.
- Cover grease storage and dumpsters and keep them clean to avoid leaks.
- Report any chemical spill to the local hazardous waste cleanup team. They'll know the best way to keep spills from harming the environment.

Construction

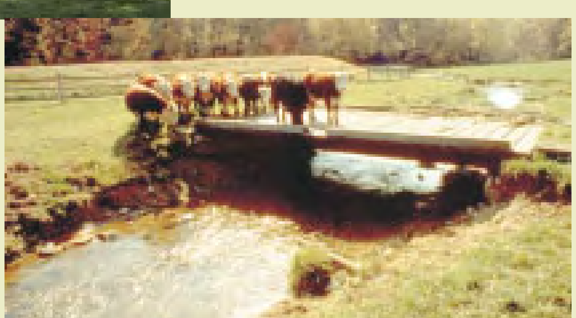


Erosion controls that aren't maintained can cause excessive amounts of sediment and debris to be carried into the stormwater system. Construction vehicles can leak fuel, oil, and other harmful fluids that can be picked up by stormwater and deposited into local waterbodies.

- Divert stormwater away from disturbed or exposed areas of the construction site.
- Install silt fences, vehicle mud removal areas, vegetative cover, and other sediment and erosion controls and properly maintain them, especially after rainstorms.
- Prevent soil erosion by minimizing disturbed areas during construction projects, and seed and mulch bare areas as soon as possible.

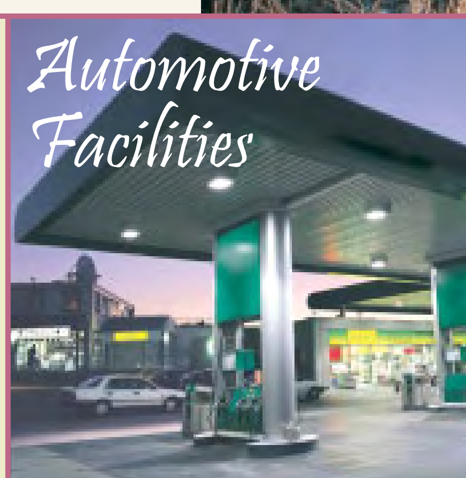
Agriculture

Lack of vegetation on streambanks can lead to erosion. Overgrazed pastures can also contribute excessive amounts of sediment to local waterbodies. Excess fertilizers and pesticides can poison aquatic animals and lead to destructive algae blooms. Livestock in streams can contaminate waterways with bacteria, making them unsafe for human contact.



- Keep livestock away from streambanks and provide them a water source away from waterbodies.
- Store and apply manure away from waterbodies and in accordance with a nutrient management plan.
- Vegetate riparian areas along waterways.
- Rotate animal grazing to prevent soil erosion in fields.
- Apply fertilizers and pesticides according to label instructions to save money and minimize pollution.

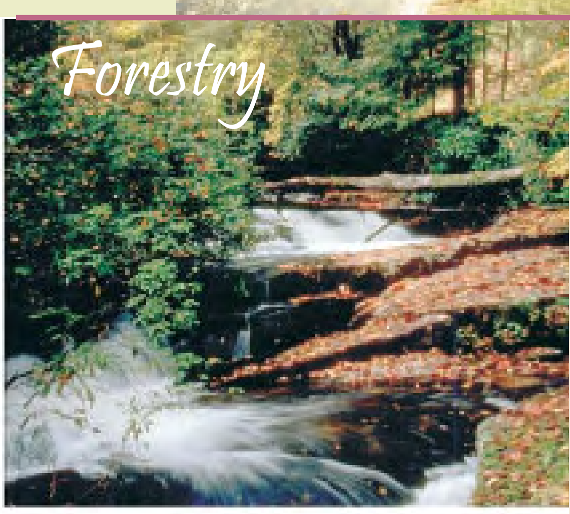
Automotive Facilities



Uncovered fueling stations allow spills to be washed into storm drains. Cars waiting to be repaired can leak fuel, oil, and other harmful fluids that can be picked up by stormwater.

- Clean up spills immediately and properly dispose of cleanup materials.
- Provide cover over fueling stations and design or retrofit facilities for spill containment.
- Properly maintain fleet vehicles to prevent oil, gas, and other discharges from being washed into local waterbodies.
- Install and maintain oil/water separators.

Forestry



Improperly managed logging operations can result in erosion and sedimentation.

- Conduct preharvest planning to prevent erosion and lower costs.
- Use logging methods and equipment that minimize soil disturbance.
- Plan and design skid trails, yard areas, and truck access roads to minimize stream crossings and avoid disturbing the forest floor.
- Construct stream crossings so that they minimize erosion and physical changes to streams.
- Expedite revegetation of cleared areas.

Education Materials:

PROTECTING WATER QUALITY FROM URBAN RUNOFF

United States Environmental Protection Agency

EPA 841-F-03-003

Protecting Water Quality *from* URBAN RUNOFF

Clean Water Is Everybody's Business

In urban and suburban areas, much of the land surface is covered by buildings and pavement, which do not allow rain and snowmelt to soak into the ground. Instead, most developed areas rely on storm drains to carry large amounts of runoff from roofs and paved areas to nearby waterways. The stormwater runoff carries pollutants such as oil, dirt, chemicals, and lawn fertilizers directly to streams and rivers, where they seriously harm water quality. To protect surface water quality and groundwater resources, development should be designed and built to minimize increases in runoff.

The most recent National Water Quality Inventory reports that runoff from urbanized areas is the leading source of water quality impairments to surveyed estuaries and the third-largest source of impairments to surveyed lakes.

Did you know that because of impervious surfaces like pavement and rooftops, a typical city block generates more than 5 times more runoff than a woodland area of the same size?

How Urbanized Areas Affect Water Quality

Increased Runoff

The porous and varied terrain of natural landscapes like forests, wetlands, and grasslands traps rainwater and snowmelt and allows them to filter slowly into the ground. In contrast, impervious (nonporous) surfaces like roads, parking lots, and rooftops prevent rain and snowmelt from infiltrating, or soaking, into the ground. Most of the rainfall and snowmelt remains above the surface, where it runs off rapidly in unnaturally large amounts.

Storm sewer systems concentrate runoff into smooth, straight conduits. This runoff gathers speed and erosional power as it travels underground. When this runoff leaves the storm drains and empties into a stream, its excessive volume and power blast out streambanks, damaging streamside vegetation and wiping out aquatic habitat. These increased storm flows carry sediment loads from construction sites and other denuded surfaces and eroded streambanks. They often carry higher water temperatures from streets, roof tops, and parking lots, which are harmful to the health and reproduction of aquatic life.

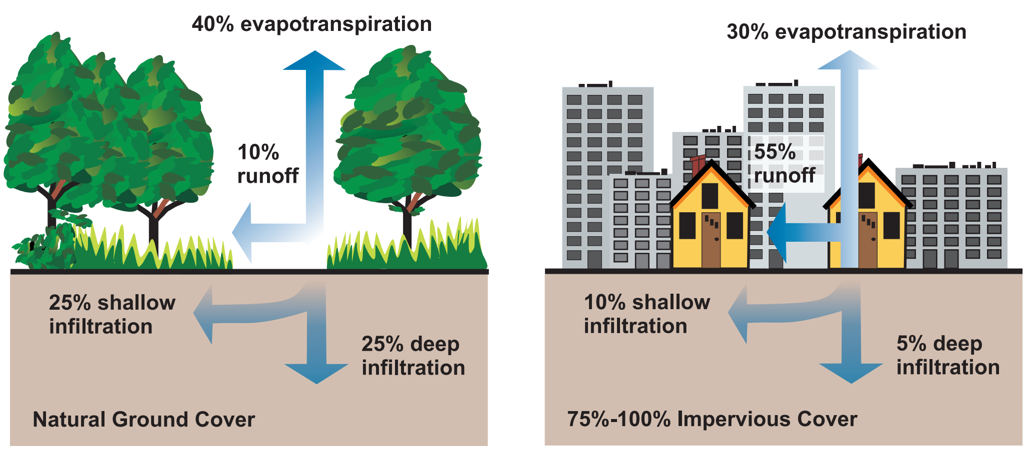
The loss of infiltration from urbanization may also cause profound groundwater changes. Although urbanization leads to great increases in flooding during and immediately after wet weather, in many instances it results in lower stream flows during dry weather. Many native fish and other aquatic life cannot survive when these conditions prevail.

Increased Pollutant Loads

Urbanization increases the variety and amount of pollutants carried into streams, rivers, and lakes. The pollutants include:

- Sediment
- Oil, grease, and toxic chemicals from motor vehicles
- Pesticides and nutrients from lawns and gardens
- Viruses, bacteria, and nutrients from pet waste and failing septic systems
- Road salts
- Heavy metals from roof shingles, motor vehicles, and other sources
- Thermal pollution from dark impervious surfaces such as streets and rooftops

These pollutants can harm fish and wildlife populations, kill native vegetation, foul drinking water supplies, and make recreational areas unsafe and unpleasant.



Relationship between impervious cover and surface runoff. Impervious cover in a watershed results in increased surface ruunoff. As little as 10 percent impervious cover in a watershed can result in stream degradation.

Managing Urban Runoff

What Homeowners Can Do

To decrease polluted runoff from paved surfaces, households can develop alternatives to areas traditionally covered by impervious surfaces. Porous pavement materials are available for driveways and sidewalks, and native vegetation and mulch can replace high maintenance grass lawns. Homeowners can use fertilizers sparingly and sweep driveways, sidewalks, and roads instead of using a hose. Instead of disposing of yard waste, they can use the materials to start a compost pile. And homeowners can learn to use Integrated Pest Management (IPM) to reduce dependence on harmful pesticides.

In addition, households can prevent polluted runoff by picking up after pets and using, storing, and disposing of chemicals properly. Drivers should check their cars for leaks and recycle their motor oil and antifreeze when these fluids are changed. Drivers can also avoid impacts from car wash runoff (e.g., detergents, grime, etc.) by using car wash facilities that do not generate runoff. Households served by septic systems should have them professionally inspected and pumped every 3 to 5 years. They should also practice water conservation measures to extend the life of their septic systems.

Controlling Impacts from New Development

Developers and city planners should attempt to control the volume of runoff from new development by using low impact development, structural controls, and pollution prevention strategies. Low impact development includes measures that conserve natural areas (particularly sensitive hydrologic areas like riparian buffers and infiltrable soils); reduce development impacts; and reduce site runoff rates by maximizing surface roughness, infiltration opportunities, and flow paths.

Controlling Impacts from Existing Development

Controlling runoff from existing urban areas is often more costly than controlling runoff from new developments. Economic efficiencies are often realized through approaches that target "hot spots" of runoff pollution or have multiple benefits, such as high-efficiency street sweeping (which addresses aesthetics, road safety, and water quality). Urban planners and others responsible for managing urban and suburban areas can first identify and implement pollution prevention strategies and examine source control opportunities. They should seek out priority pollutant reduction opportunities, then protect natural areas that help control runoff, and finally begin ecological restoration and retrofit activities to clean up degraded water bodies. Local governments are encouraged to take lead roles in public education efforts through public signage, storm drain marking, pollution prevention outreach campaigns, and partnerships with citizen groups and businesses. Citizens can help prioritize the clean-up strategies, volunteer to become involved in restoration efforts, and mark storm drains with approved "don't dump" messages.

Related Publications

Turn Your Home into a Stormwater Pollution Solution!
www.epa.gov/nps

This web site links to an EPA homeowner's guide to healthy habits for clean water that provides tips for better vehicle and garage care, lawn and garden techniques, home improvement, pet care, and more.

National Management Measures to Control Nonpoint Source Pollution from Urban Areas
www.epa.gov/owow/nps/urbanmm

This technical guidance and reference document is useful to local, state, and tribal managers in implementing management programs for polluted runoff. Contains information on the best available, economically achievable means of reducing pollution of surface waters and groundwater from urban areas.

Onsite Wastewater Treatment System Resources
www.epa.gov/owm/onsite

This web site contains the latest brochures and other resources from EPA for managing onsite wastewater treatment systems (OWTS) such as conventional septic systems and alternative decentralized systems. These resources provide basic information to help individual homeowners, as well as detailed, up-to-date technical guidance of interest to local and state health departments.

Low Impact Development Center
www.lowimpactdevelopment.org

This center provides information on protecting the environment and water resources through integrated site design techniques that are intended to replicate preexisting hydrologic site conditions.

Stormwater Manager's Resource Center (SMRC)
www.stormwatercenter.net

Created and maintained by the Center for Watershed Protection, this resource center is designed specifically for stormwater practitioners, local government officials, and others that need technical assistance on stormwater management issues.

Strategies: Community Responses to Runoff Pollution
www.nrdc.org/water/pollution/storm/stoinx.asp

The Natural Resources Defense Council developed this interactive web document to explore some of the most effective strategies that communities are using around the nation to control urban runoff pollution. The document is also available in print form and as an interactive CD-ROM.

For More Information

U.S. Environmental Protection Agency
Nonpoint Source Control Branch (4503T)
1200 Pennsylvania Avenue, NW
Washington, DC 20460
www.epa.gov/nps

February 2003

Education Materials:

PREVENTING POLLUTION THROUGH EFFICIENT WATER USE

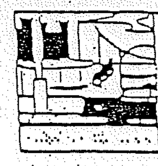
United States
Environmental Protection
Agency

20W-0002
July 1990

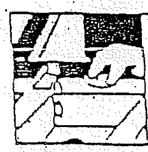
OW (WH 556)
OPPE (PM-222)

EPA

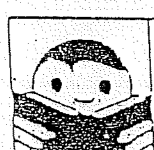
Preventing Pollution Through Efficient Water Use



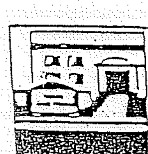
How Efficient Water Use Helps Prevent Pollution



Other Reasons to Use Water Wisely



What Individuals Can Do



What Communities Can Do

How Efficient Water Use Helps Prevent Pollution

Using water more efficiently can help prevent pollution as well as protect and conserve our finite water resources. More efficient water use by you and your community has many other benefits.

Fewer Pollutants

- Using less water reduces the amount of wastewater discharged into our lakes, streams, rivers, and marine waters.
- The amount of pollutants wastewater carries can also be reduced, as treatment efficiency improves.
- Recycled process water can reduce pollutants from industry.
- More efficient irrigation can minimize runoff of agricultural pollutants and reduce the use of fertilizers and pesticides.

Protection of Aquatic Habitats

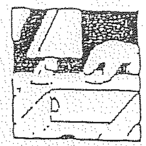
- Building fewer and smaller new water projects can help preserve wetlands, which naturally treat pollutants.
- Diverting less water preserves more streamflow to maintain a healthy aquatic environment.

Protection of Drinking Water Sources

- Less pumping of groundwater lowers the chance that pollutants will be drawn into a water supply well.
- With less water use, septic system performance can improve, reducing the risk of groundwater contamination.
- Highest quality water sources are preserved for drinking water by using treated wastewater for other uses.

Energy Conservation

- Efficient water use means less power needed to pump and treat water and wastewater.
- Less water use reduces the amount of energy required for heating hot water.
- Less energy demand results in fewer harmful by products from power plants.



Other Reasons to Use Water Wisely

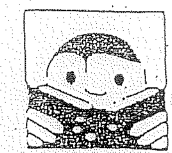
Preventing pollution is only one reason why using water efficiently makes sense. Here are a few more:

Money Saved

- Less water use results in fewer pumping and treatment costs.
- Saving money on water and wastewater operations frees money for meeting water quality, public health and water treatment goals.
- Water saved is also energy, and money, saved for you and your community.

Improved Reliability

- Water conservation provides a hedge against drought impacts.
- Improving water efficiency may be quicker and cheaper than developing a new supply.
- Reduced water use may extend the life of your water or wastewater facility.
- Reduced water use may increase the efficiency of wastewater treatment, and reduce overflows during storms.
- Communities which use water efficiently are better prepared to cope with effects of possible future climate change.



What Individuals Can D

More efficient water use begins with individuals, ir the home and place of work. Taking these and otl steps, and encouraging others to do so, makes gc economic as well as environmental sense.

In The Home

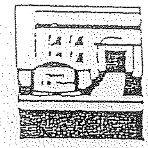
- Install a toilet dam or plastic bottle in your toile tank.
- Install a water-efficient showerhead (2.5 gallon: or less per minute).
- When you buy a new toilet, purchase a low flo model (1.6 gallons or less per flush).

Outdoors

- Water in the morning or evening, to minimize evaporation.
- Install a drip-irrigation watering system for valuable plants.
- Use drought-tolerant plants and grasses for lar scaping, and reduce grass-covered areas.

At Work or School

- Adopt the same water-saving habits that are effective at home.
- Ask about installing water-efficient equipmen and reducing outdoor water use.
- Encourage employers to explore the use of recycled "gray-water" or reclaimed wastewat



What Communities Can Do

water supplier or wastewater system operator (public or private) has cost-effective options to process and deliver water more efficiently. A community can do the same, and can foster ways to use water wisely.

Not all of these steps are expensive. The best choices vary by region and by community; start by asking if these are appropriate where you live and work.

A Water Supplier or Wastewater Processor Can:

- ☞ Identify who uses water, and reduce unaccounted-for water use.
- ☞ Find and repair leaking pipes.
- ☞ Consider a new pricing scheme which encourages conservation.
- ☞ Reduce excess pressure in water lines.
- ☞ Explore the reuse of treated wastewater for uses other than drinking water.
- ☞ Charge hookup fees which encourage more efficient water use in new buildings.
- ☞ Build water efficiency into future demand projections, facility planning, and drought planning.

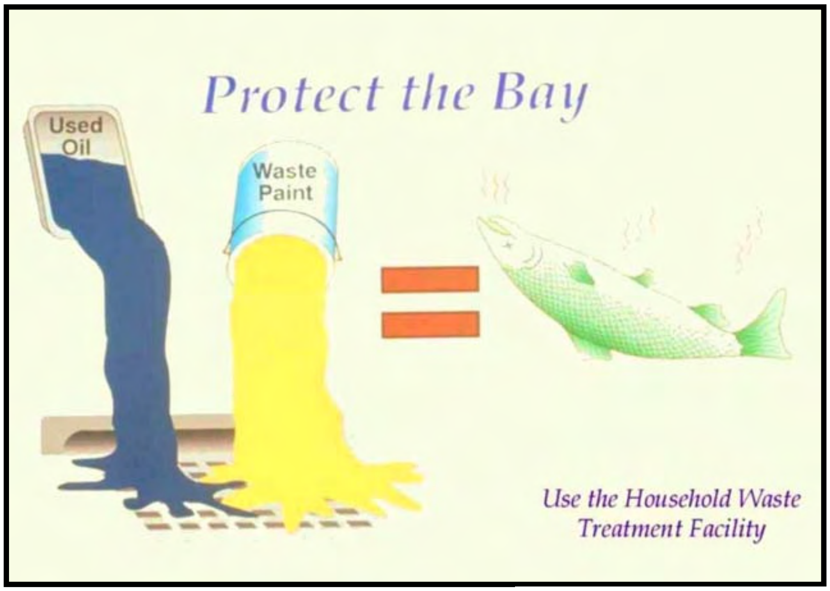
A Community Can:

- ☞ Adopt plumbing and building codes that require water-efficient equipment and practices.
- ☞ Adopt a water-efficient landscaping ordinance to reduce the water used for golf courses and commercial landscapes.
- ☞ Retrofit older buildings with water-efficient equipment, starting with public buildings.
- ☞ Reduce municipal water use for landscaping and other uses.
- ☞ Conduct a public education campaign.
- ☞ Require developers to build in water efficiency measures.

Education Materials:

BMP FACT SHEETS

Non-Stormwater Discharges SC-10



Graphic by: Margie Winter

Objectives

- Contain
- Educate
- Reduce/Minimize

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	☑
Oil and Grease	☑
Organics	☑
Oxygen Demanding	☑

Description

Non-stormwater discharges are those flows that do not consist entirely of stormwater. For municipalities non-stormwater discharges present themselves in two situations. One is from fixed facilities owned and/or operated by the municipality. The other situation is non-stormwater discharges that are discovered during the normal operation of a field program. Some non-stormwater discharges do not include pollutants and may be discharged to the storm drain. These include uncontaminated groundwater and natural springs. There are also some non-stormwater discharges that typically do not contain pollutants and may be discharged to the storm drain with conditions. These include car washing, and surface cleaning. However, there are certain non-stormwater discharges that pose environmental concern. These discharges may originate from illegal dumping or from internal floor drains, appliances, industrial processes, sinks, and toilets that are connected to the nearby storm drainage system. These discharges (which may include: process waste waters, cooling waters, wash waters, and sanitary wastewater) can carry substances (such as paint, oil, fuel and other automotive fluids, chemicals and other pollutants) into storm drains. The ultimate goal is to effectively eliminate non-stormwater discharges to the stormwater drainage system through implementation of measures to detect, correct, and enforce against illicit connections and illegal discharges.

Approach

The municipality must address non-stormwater discharges from its fixed facilities by assessing the types of non-stormwater discharges and implementing BMPs for the discharges determined to pose environmental concern. For field programs

CALIFORNIA STORMWATER QUALITY ASSOCIATION

the field staff must be trained to now what to look for regarding non-stormwater discharges and the procedures to follow in investigating the detected discharges.

Suggested Protocols

Fixed Facility

General

- Post "No Dumping" signs with a phone number for reporting dumping and disposal. Signs should also indicate fines and penalties for illegal dumping.
- Stencil storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages such as "Dump No Waste Drains to Stream" stenciled next to them to warn against ignorant or intentional dumping of pollutants into the storm drainage system.
- Landscaping and beautification efforts of hot spots might also discourage future dumping, as well as provide open space and increase property values.
- Lighting or barriers may also be needed to discourage future dumping.

Illicit Connections

- Locate discharges from the fixed facility drainage system to the municipal storm drain system through review of "as-built" piping schematics.
- Use techniques such as smoke testing, dye testing and television camera inspection (as noted below) to verify physical connections.
- Isolate problem areas and plug illicit discharge points.

Visual Inspection and Inventory

- Inventory and inspect each discharge point during dry weather.
- Keep in mind that drainage from a storm event can continue for several days following the end of a storm and groundwater may infiltrate the underground stormwater collection system. Also, non-stormwater discharges are often intermittent and may require periodic inspections.

Review Infield Piping

- Review the "as-built" piping schematic as a way to determine if there are any connections to the stormwater collection system.
- Inspect the path of floor drains in older buildings.

Smoke Testing

- Smoke testing of wastewater and stormwater collection systems is used to detect connections between the two systems.

- During dry weather the stormwater collection system is filled with smoke and then traced to sources. The appearance of smoke at the base of a toilet indicates that there may be a connection between the sanitary and the stormwater system.

  Dye Testing

- A dye test can be performed by simply releasing a dye into either your sanitary or process wastewater system and examining the discharge points from the stormwater collection system for discoloration.

TV Inspection of Storm Sewer

- TV Cameras can be employed to visually identify illicit connections to the fixed facility storm drain system.

Illegal Dumping

- Regularly inspect and clean up hot spots and other storm drainage areas where illegal dumping and disposal occurs.
- Clean up spills on paved surfaces with as little water as possible. Use a rag for small spills, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be sent to a certified laundry (rags) or disposed of as hazardous waste.
- Never hose down or bury dry material spills. Sweep up the material and dispose of properly.
- Use adsorbent materials on small spills rather than hosing down the spill. Remove the adsorbent materials promptly and dispose of properly.
- For larger spills, a private spill cleanup company or Hazmat team may be necessary.
- See fact sheet SC-11 Spill Prevention, Control, and Clean Up.

Field Program

General

- Develop clear protocols and lines of communication for effectively prohibiting non-stormwater discharges, especially ones that involve more than one jurisdiction and those that are not classified as hazardous, which are often not responded to as effectively as they need to be.
- Stencil storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages such as “Dump No Waste Drains to Stream” stenciled next to them to warn against ignorant or intentional dumping of pollutants into the storm drainage system.
- See SC-74 Stormwater Drainage System Maintenance for additional information.

Field Inspection

- Regularly inspect and clean up hot spots and other storm drainage areas where illegal dumping and disposal occurs.
- During routine field program maintenance field staff should look for evidence of illegal discharges or illicit connection:
  - Is there evidence of spills such as paints, discoloring, etc.
  - Are there any odors associated with the drainage system
  - Record locations of apparent illegal discharges/illicit connections and notify appropriate investigating agency.
- If trained, conduct field investigation of non-stormwater discharges to determine whether they pose a threat to water quality.

Recommended Complaint Investigation Equipment

- Field Screening Analysis
  - pH paper or meter
  - Commercial stormwater pollutant screening kit that can detect for reactive phosphorus, nitrate nitrogen, ammonium nitrogen, specific conductance, and turbidity
  - Sample jars
  - Sample collection pole
  - A tool to remove access hole covers
- Laboratory Analysis
  - Sample cooler
  - Ice
  - Sample jars and labels
  - Chain of custody forms.
- Documentation
  - Camera
  - Notebook
  - Pens
  - Notice of Violation forms

- Educational materials

Reporting

- A database is useful for defining and tracking the magnitude and location of the problem.
- Report prohibited non-stormwater discharges observed during the course of normal daily activities so they can be investigated, contained and cleaned up or eliminated.
- Document that non-stormwater discharges have been eliminated by recording tests performed, methods used, dates of testing, and any onsite drainage points observed.
- Maintain documentation of illicit connection and illegal dumping incidents, including significant conditionally exempt discharges that are not properly managed.

Enforcement

- Educate the responsible party if identified on the impacts of their actions, explain the stormwater requirements, and provide information regarding Best Management Practices (BMP), as appropriate. Initiate follow-up and/or enforcement procedures.
- If an illegal discharge is traced to a commercial, residential or industrial source, conduct the following activities or coordinate the following activities with the appropriate agency:
  - Contact the responsible party to discuss methods of eliminating the non-stormwater discharge, including disposal options, recycling, and possible discharge to the sanitary sewer (if within POTW limits).
  - Provide information regarding BMPs to the responsible party, where appropriate.
  - Begin enforcement procedures, if appropriate.
  - Continue inspection and follow-up activities until the illicit discharge activity has ceased.
- If an illegal discharge is traced to a commercial or industrial activity, coordinate information on the discharge with the jurisdiction's commercial and industrial facility inspection program.

Training

- Train technical staff to identify and document illegal dumping incidents.
- Well-trained employees can reduce human errors that lead to accidental releases or spills. The employee should have the tools and knowledge to immediately begin cleaning up a spill if one should occur. Employees should be familiar with the Spill Prevention Control and Countermeasure Plan.
- Train employees to identify non-stormwater discharges and report them to the appropriate departments.
- Train staff who have the authority to conduct surveillance and inspections, and write citations for those caught illegally dumping.

- Train municipal staff responsible for surveillance and inspection in the following:
  - OSHA-required Health and Safety Training (29 CFR 1910.120) plus annual refresher training (as needed).
  - OSHA Confined Space Entry training (Cal-OSHA Confined Space, Title 8 and federal OSHA 29 CFR 1910.146).
  - Procedural training (field screening, sampling, smoke/dye testing, TV inspection).
- Educate the identified responsible party on the impacts of his or her actions.

Spill Response and Prevention

- See SC-11 Spill Prevention Control and Clean Up

Other Considerations

- The elimination of illegal dumping is dependent on the availability, convenience, and cost of alternative means of disposal. The cost of fees for dumping at a proper waste disposal facility are often more than the fine for an illegal dumping offense, thereby discouraging people from complying with the law. The absence of routine or affordable pickup service for trash and recyclables in some communities also encourages illegal dumping. A lack of understanding regarding applicable laws or the inadequacy of existing laws may also contribute to the problem.
- Municipal codes should include sections prohibiting the discharge of soil, debris, refuse, hazardous wastes, and other pollutants into the storm drain system.
- Many facilities do not have accurate, up-to-date schematic drawings.
- Can be difficult to locate illicit connections especially if there is groundwater infiltration.

Requirements

Costs

- Eliminating illicit connections can be expensive especially if structural modifications are required such re-plumbing cross connections under an existing slab.
- Minor cost to train field crews regarding the identification of non-stormwater discharges. The primary cost is for a fully integrated program to identify and eliminate illicit connections and illegal dumping. However, by combining with other municipal programs (i.e. pretreatment program) cost may be lowered.
- Municipal cost for containment and disposal may be borne by the discharger.

Maintenance

Not applicable

Supplemental Information

Further Detail of the BMP

What constitutes a "non-stormwater" discharge?

- Non-stormwater discharges are discharges not made up entirely of stormwater and include water used directly in the manufacturing process (process wastewater), air conditioning condensate and coolant, non-contact cooling water, cooling equipment condensate, outdoor secondary containment water, vehicle and equipment wash water, landscape irrigation, sink and drinking fountain wastewater, sanitary wastes, or other wastewaters.

Permit Requirements

- Current municipal NPDES permits require municipalities to effectively prohibit non-stormwater discharges unless authorized by a separate NPDES permit or allowed in accordance with the current NPDES permit conditions. Typically the current permits allow certain non-stormwater discharges in the storm drain system as long as the discharges are not significant sources of pollutants. In this context the following non-stormwater discharges are typically allowed:

  - Diverted stream flows;
  - Rising found waters;
  - Uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20));
  - Uncontaminated pumped ground water;
  - Foundation drains;
  - Springs;
  - Water from crawl space pumps;
  - Footing drains;
  - Air conditioning condensation;
  - Flows from riparian habitats and wetlands;
  - Water line and hydrant flushing ;
  - Landscape irrigation;
  - Planned and unplanned discharges from potable water sources;
  - Irrigation water;
  - Individual residential car washing; and
  - Lawn watering.

Municipal facilities subject to industrial general permit requirements must include a certification that the stormwater collection system has been tested or evaluated for the presence of non-stormwater discharges. The state's General Industrial Stormwater Permit requires that non-stormwater discharges be eliminated prior to implementation of the facility's SWPPP.

Illegal Dumping

- Establish a system for tracking incidents. The system should be designed to identify the following:

  - Illegal dumping hot spots
  - Types and quantities (in some cases) of wastes
  - Patterns in time of occurrence (time of day/night, month, or year)
  - Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accidents/spills)
  - Responsible parties

Outreach

One of the keys to success of reducing or eliminating illegal dumping is increasing the number of people on the street who are aware of the problem and who have the tools to at least identify the incident, if not correct it. There we a number of ways of accomplishing this:

- Train municipal staff from all departments (public works, utilities, street cleaning, parks and recreation, industrial waste inspection, hazardous waste inspection, sewer maintenance) to recognize and report the incidents.
- Deputize municipal staff who may come into contact with illegal dumping with the authority to write illegal dumping tickets for offenders caught in the act (see below).
- Educate the public. As many as 3 out of 4 people do not understand that in most communities the storm drain does not go to the wastewater treatment plant. Unfortunately, with the heavy emphasis in recent years on public education about solid waste management, including recycling and household hazardous waste, the sewer system (both storm and sanitary) has been the likely recipient of cross-media transfers of waste.
- Provide the public with a mechanism for reporting incidents such as a hot line and/or door hanger (see below).
- Help areas where incidents occur more frequently set up environmental watch programs (like crime watch programs).
- Train volunteers to notice and report the presence and suspected source of an observed pollutant to the appropriate public agency.

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  - Foundation drains;
  - Springs;
  - Water from crawl space pumps;
  - Footing drains;
  - Air conditioning condensation;
  - Flows from riparian habitats and wetlands;
  - Water line and hydrant flushing ;
  - Landscape irrigation;
  - Planned and unplanned discharges from potable water sources;
  - Irrigation water;
  - Individual residential car washing; and
  - Lawn watering.

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Storm Drain Stenciling

- Stencil storm drain inlets with a message to prohibit illegal dumpings, especially in areas with waste handling facilities.
- Encourage public reporting of improper waste disposal by a HOTLINE number stenciled onto the storm drain inlet.
- See Supplemental Information section of this fact sheet for further detail on stenciling program approach.

Oil Recycling

- Contract collection and hauling of used oil to a private licensed used oil hauler/recycler.
- Comply with all applicable state and federal regulations regarding storage, handling, and transport of petroleum products.
- Create procedures for collection such as; collection locations and schedule, acceptable containers, and maximum amounts accepted.
- The California Integrated Waste Management Board has a Recycling Hotline, (800) 553-2962, that provides information and recycling locations for used oil.

Household Hazardous Waste

- Provide household hazardous waste (HHW) collection facilities. Several types of collection approaches are available including permanent, periodic, or mobile centers, curbside collection, or a combination of these systems.

Training

- Train municipal employees and contractors in proper and consistent methods for waste disposal.
- Train municipal employees to recognize and report illegal dumping.
- Train employees and subcontractors in proper hazardous waste management.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- Federal Regulations (RCRA, SARA, CERCLA) and state regulations exist regarding the disposal of hazardous waste.

- Municipalities are required to have a used oil recycling element and a HHW element within their integrated waste management plan.

- Significant liability issues are involved with the collection, handling, and disposal of HHW.

Examples

The City of Palo Alto has developed a public participation program for reporting dumping violations. When a concerned citizen or public employee encounters evidence of illegal dumping, a door hanger (similar in format to hotel "Do Not Disturb" signs) is placed on the front doors in the neighborhood. The door hanger notes that a violation has occurred in the neighborhood, informs the reader why illegal dumping is a problem, and notes that illegal dumping carries a significant financial penalty. Information is also provided on what citizens can do as well as contact numbers for more information or to report a violation.

The Port of Long Beach has a state of the art database incorporating storm drain infrastructure, potential pollutant sources, facility management practices, and a pollutant tracking system.

The State Department of Fish and Game has a hotline for reporting violations called CalTIP (1-800-952-5400). The phone number may be used to report any violation of a Fish and Game code (illegal dumping, poaching, etc.).

The California Department of Toxic Substances Control's Waste Alert Hotline, 1-800-69TOXIC, can be used to report hazardous waste violations.

References and Resources

http://www.stormwatercenter.net/

California's Nonpoint Source Program Plan http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Stormwater Pollution Control Manual - http://dnr.metrokc.gov/wlr/dss/spcm.htm

Orange County Stormwater Program,
http://www.ocwatersheds.com/stormwater/swp_introduction.asp

San Diego Stormwater Co-permittees Jurisdictional Urban Runoff Management Program
(http://www.projectcleanwater.org)

Santa Clara Valley Urban Runoff Pollution Prevention Program
http://www.scvurppp-w2k.com/pdf%20documents/PS_ICID.PDF

Spill Prevention, Control & Cleanup SC-11

Photo Credit: Geoff Brosseau

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	
Nutrients	
Trash	
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑

Description

Many activities that occur at an industrial or commercial site have the potential to cause accidental or illegal spills. Preparation for accidental or illegal spills, with proper training and reporting systems implemented, can minimize the discharge of pollutants to the environment.

Spills and leaks are one of the largest contributors of stormwater pollutants. Spill prevention and control plans are applicable to any site at which hazardous materials are stored or used. An effective plan should have spill prevention and response procedures that identify potential spill areas, specify material handling procedures, describe spill response procedures, and provide spill clean-up equipment. The plan should take steps to identify and characterize potential spills, eliminate and reduce spill potential, respond to spills when they occur in an effort to prevent pollutants from entering the stormwater drainage system, and train personnel to prevent and control future spills.

Approach

Pollution Prevention

- Develop procedures to prevent/mitigate spills to storm drain systems. Develop and standardize reporting procedures, containment, storage, and disposal activities, documentation, and follow-up procedures.

- Develop a Spill Prevention Control and Countermeasure (SPCC) Plan. The plan should include:

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- Description of the facility, owner and address, activities and chemicals present
- Facility map
- Notification and evacuation procedures
- Cleanup instructions
- Identification of responsible departments
- Identify key spill response personnel

■ Recycle, reclaim, or reuse materials whenever possible. This will reduce the amount of process materials that are brought into the facility.

Suggested Protocols (including equipment needs)

Spill Prevention

■ Develop procedures to prevent/mitigate spills to storm drain systems. Develop and standardize reporting procedures, containment, storage, and disposal activities, documentation, and follow-up procedures.

■ If consistent illegal dumping is observed at the facility:

- Post "No Dumping" signs with a phone number for reporting illegal dumping and disposal. Signs should also indicate fines and penalties applicable for illegal dumping.
- Landscaping and beautification efforts may also discourage illegal dumping.
- Bright lighting and/or entrance barriers may also be needed to discourage illegal dumping.

■ Store and contain liquid materials in such a manner that if the tank is ruptured, the contents will not discharge, flow, or be washed into the storm drainage system, surface waters, or groundwater.

■ If the liquid is oil, gas, or other material that separates from and floats on water, install a spill control device (such as a tee section) in the catch basins that collects runoff from the storage tank area.

■ Routine maintenance:

- Place drip pans or absorbent materials beneath all mounted taps, and at all potential drip and spill locations during filling and unloading of tanks. Any collected liquids or soiled absorbent materials must be reused/recycled or properly disposed.
- Store and maintain appropriate spill cleanup materials in a location known to all near the tank storage area; and ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.
- Sweep and clean the storage area monthly if it is paved, *do not hose down the area to a storm drain.*

- Check tanks (and any containment sumps) daily for leaks and spills. Replace tanks that are leaking, corroded, or otherwise deteriorating with tanks in good condition. Collect all spilled liquids and properly dispose of them.

- Label all containers according to their contents (e.g., solvent, gasoline).
- Label hazardous substances regarding the potential hazard (corrosive, radioactive, flammable, explosive, poisonous).
- Prominently display required labels on transported hazardous and toxic materials (per US DOT regulations).
- Identify key spill response personnel.

Spill Control and Cleanup Activities

- Follow the Spill Prevention Control and Countermeasure Plan.
- Clean up leaks and spills immediately.
- Place a stockpile of spill cleanup materials where it will be readily accessible (e.g., near storage and maintenance areas).
- On paved surfaces, clean up spills with as little water as possible. Use a rag for small spills, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be sent to a certified laundry (rags) or disposed of as hazardous waste. Physical methods for the cleanup of dry chemicals include the use of brooms, shovels, sweepers, or plows.
- Never hose down or bury dry material spills. Sweep up the material and dispose of properly.
- Chemical cleanups of material can be achieved with the use of adsorbents, gels, and foams. Use adsorbent materials on small spills rather than hosing down the spill. Remove the adsorbent materials promptly and dispose of properly.
- For larger spills, a private spill cleanup company or Hazmat team may be necessary.

Reporting

- Report spills that pose an immediate threat to human health or the environment to the Regional Water Quality Control Board.
- Federal regulations require that any oil spill into a water body or onto an adjoining shoreline be reported to the National Response Center (NRC) at 800-424-8802 (24 hour).
- Report spills to local agencies, such as the fire department; they can assist in cleanup.
- Establish a system for tracking incidents. The system should be designed to identify the following:
  - Types and quantities (in some cases) of wastes
  - Patterns in time of occurrence (time of day/night, month, or year)

- Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accidents/spills)

- Responsible parties

Training

- Educate employees about spill prevention and cleanup.

- Well-trained employees can reduce human errors that lead to accidental releases or spills:

  - The employee should have the tools and knowledge to immediately begin cleaning up a spill should one occur.

  - Employees should be familiar with the Spill Prevention Control and Countermeasure Plan.

- Employees should be educated about aboveground storage tank requirements. Employees responsible for aboveground storage tanks and liquid transfers should be thoroughly familiar with the Spill Prevention Control and Countermeasure Plan and the plan should be readily available.

- Train employees to recognize and report illegal dumping incidents.

Other Considerations (Limitations and Regulations)

- A Spill Prevention Control and Countermeasure Plan (SPCC) is required for facilities that are subject to the oil pollution regulations specified in Part 112 of Title 40 of the Code of Federal Regulations or if they have a storage capacity of 10,000 gallons or more of petroleum. (Health and Safety Code 6.67)

- State regulations also exist for storage of hazardous materials (Health & Safety Code Chapter 6.95), including the preparation of area and business plans for emergency response to the releases or threatened releases.

- Consider requiring smaller secondary containment areas (less than 200 sq. ft.) to be connected to the sanitary sewer, prohibiting any hard connections to the storm drain.

Requirements

Costs (including capital and operation & maintenance)

- Will vary depending on the size of the facility and the necessary controls.

- Prevention of leaks and spills is inexpensive. Treatment and/or disposal of contaminated soil or water can be quite expensive.

Maintenance (including administrative and staffing)

- This BMP has no major administrative or staffing requirements. However, extra time is needed to properly handle and dispose of spills, which results in increased labor costs.

Supplemental Information

Further Detail of the BMP

Reporting

Record keeping and internal reporting represent good operating practices because they can increase the efficiency of the facility and the effectiveness of BMPs. A good record keeping system helps the facility minimize incident recurrence, correctly respond with appropriate cleanup activities, and comply with legal requirements. A record keeping and reporting system should be set up for documenting spills, leaks, and other discharges, including discharges of hazardous substances in reportable quantities. Incident records describe the quality and quantity of non-stormwater discharges to the storm sewer. These records should contain the following information:

- Date and time of the incident
- Weather conditions
- Duration of the spill/leak/discharge
- Cause of the spill/leak/discharge
- Response procedures implemented
- Persons notified
- Environmental problems associated with the spill/leak/discharge

Separate record keeping systems should be established to document housekeeping and preventive maintenance inspections, and training activities. All housekeeping and preventive maintenance inspections should be documented. Inspection documentation should contain the following information:

- The date and time the inspection was performed
- Name of the inspector
- Items inspected
- Problems noted
- Corrective action required
- Date corrective action was taken

Other means to document and record inspection results are field notes, timed and dated photographs, videotapes, and drawings and maps.

Aboveground Tank Leak and Spill Control

Accidental releases of materials from aboveground liquid storage tanks present the potential for contaminating stormwater with many different pollutants. Materials spilled, leaked, or lost from tanks may accumulate in soils or on impervious surfaces and be carried away by stormwater runoff.

The most common causes of unintentional releases are:

- Installation problems
- Failure of piping systems (pipes, pumps, flanges, couplings, hoses, and valves)
- External corrosion and structural failure
- Spills and overfills due to operator error
- Leaks during pumping of liquids or gases from truck or rail car to a storage tank or vice versa

Storage of reactive, ignitable, or flammable liquids should comply with the Uniform Fire Code and the National Electric Code. Practices listed below should be employed to enhance the code requirements:

- Tanks should be placed in a designated area.
- Tanks located in areas where firearms are discharged should be encapsulated in concrete or the equivalent.
- Designated areas should be impervious and paved with Portland cement concrete, free of cracks and gaps, in order to contain leaks and spills.
- Liquid materials should be stored in UL approved double walled tanks or surrounded by a curb or dike to provide the volume to contain 10 percent of the volume of all of the containers or 110 percent of the volume of the largest container, whichever is greater. The area inside the curb should slope to a drain.
- For used oil or dangerous waste, a dead-end sump should be installed in the drain.
- All other liquids should be drained to the sanitary sewer if available. The drain must have a positive control such as a lock, valve, or plug to prevent release of contaminated liquids.
- Accumulated stormwater in petroleum storage areas should be passed through an oil/water separator.

Maintenance is critical to preventing leaks and spills. Conduct routine inspections and:

- Check for external corrosion and structural failure.
- Check for spills and overfills due to operator error.
- Check for failure of piping system (pipes, pumps, flanger, coupling, hoses, and valves).
- Check for leaks or spills during pumping of liquids or gases from truck or rail car to a storage facility or vice versa.

- Visually inspect new tank or container installation for loose fittings, poor welding, and improper or poorly fitted gaskets.
- Inspect tank foundations, connections, coatings, and tank walls and piping system. Look for corrosion, leaks, cracks, scratches, and other physical damage that may weaken the tank or container system.
- Frequently relocate accumulated stormwater during the wet season.
- Periodically conduct integrity testing by a qualified professional.

Vehicle Leak and Spill Control

Major spills on roadways and other public areas are generally handled by highly trained Hazmat teams from local fire departments or environmental health departments. The measures listed below pertain to leaks and smaller spills at vehicle maintenance shops.

In addition to implementing the spill prevention, control, and clean up practices above, use the following measures related to specific activities:

Vehicle and Equipment Maintenance

- Perform all vehicle fluid removal or changing inside or under cover to prevent the run-on of stormwater and the runoff of spills.
- Regularly inspect vehicles and equipment for leaks, and repair immediately.
- Check incoming vehicles and equipment (including delivery trucks, and employee and subcontractor vehicles) for leaking oil and fluids. Do not allow leaking vehicles or equipment onsite.
- Always use secondary containment, such as a drain pan or drop cloth, to catch spills or leaks when removing or changing fluids.
- Immediately drain all fluids from wrecked vehicles.
- Store wrecked vehicles or damaged equipment under cover.
- Place drip pans or absorbent materials under heavy equipment when not in use.
- Use adsorbent materials on small spills rather than hosing down the spill.
- Remove the adsorbent materials promptly and dispose of properly.
- Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around.
- Oil filters disposed of in trashcans or dumpsters can leak oil and contaminate stormwater. Place the oil filter in a funnel over a waste oil recycling drum to drain excess oil before disposal. Oil filters can also be recycled. Ask your oil supplier or recycler about recycling oil filters.

- Store cracked batteries in a non-leaking secondary container. Do this with all cracked batteries, even if you think all the acid has drained out. If you drop a battery, treat it as if it is cracked. Put it into the containment area until you are sure it is not leaking.

Vehicle and Equipment Fueling

- Design the fueling area to prevent the run-on of stormwater and the runoff of spills:
    - Cover fueling area if possible.
    - Use a perimeter drain or slope pavement inward with drainage to a sump.
    - Pave fueling area with concrete rather than asphalt.
- If dead-end sump is not used to collect spills, install an oil/water separator.
- Install vapor recovery nozzles to help control drips as well as air pollution.
- Discourage “topping-off” of fuel tanks.
- Use secondary containment when transferring fuel from the tank truck to the fuel tank.
- Use adsorbent materials on small spills and general cleaning rather than hosing down the area. Remove the adsorbent materials promptly.
- Carry out all Federal and State requirements regarding underground storage tanks, or install above ground tanks.
- Do not use mobile fueling of mobile industrial equipment around the facility; rather, transport the equipment to designated fueling areas.
- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Train employees in proper fueling and cleanup procedures.

Industrial Spill Prevention Response

For the purposes of developing a spill prevention and response program to meet the stormwater regulations, facility managers should use information provided in this fact sheet and the spill prevention/response portions of the fact sheets in this handbook, for specific activities. The program should:

- Integrate with existing emergency response/hazardous materials programs (e.g., Fire Department)
- Develop procedures to prevent/mitigate spills to storm drain systems
- Identify responsible departments
- Develop and standardize reporting procedures, containment, storage, and disposal activities, documentation, and follow-up procedures
- Address spills at municipal facilities, as well as public areas

- Provide training concerning spill prevention, response and cleanup to all appropriate personnel

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Stormwater Managers Resource Center http://www.stormwatercenter.net/

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑
Oxygen Demanding	☑

Description

The loading/unloading of materials usually takes place outside on docks or terminals; therefore, materials spilled, leaked, or lost during loading/unloading may collect in the soil or on other surfaces and have the potential to be carried away by stormwater runoff or when the area is cleaned. Additionally, rainfall may wash pollutants from machinery used to unload or move materials. Loading and unloading of material may include package products, barrels, and bulk products. Implementation of the following protocols will prevent or reduce the discharge of pollutants to stormwater from outdoor loading/unloading of materials.

Approach

Pollution Prevention

- Keep accurate maintenance logs to evaluate materials removed and improvements made.
- Park tank trucks or delivery vehicles in designated areas so that spills or leaks can be contained.
- Limit exposure of materials with the potential to contaminate stormwater.
- Prevent stormwater runon.
- Regularly check equipment for leaks.

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Suggested Protocols

Loading and Unloading – General Guidelines

- Develop an operations plan that describes procedures for loading and/or unloading.
- Do not conduct loading and unloading during wet weather, whenever possible.
- Cover designated loading/unloading areas to reduce exposure of materials to rain.
- A seal or door skirt between delivery vehicles and building can reduce or prevent exposure to rain.
- Design loading/unloading area to prevent stormwater runon which would include grading or berming the area, and positioning roof downspouts so they direct stormwater away from the loading/unloading areas.
- If feasible, load and unload all materials and equipment in covered areas such as building overhangs at loading docks.
- Load/unload only at designated loading areas.
- Use drip pans underneath hose and pipe connections and other leak-prone spots during liquid transfer operations, and when making and breaking connections. Several drip pans should be stored in a covered location near the liquid transfer area so that they are always available, yet protected from precipitation when not in use. Drip pans can be made specifically for railroad tracks. Drip pans must be cleaned periodically, and drip collected materials must be disposed of properly.
- Pave loading areas with concrete instead of asphalt.
- Avoid placing storm drains in the area.
- Grade and/or berm he loading/ unloading area to a drain that is connected to a dead-end sump.

Inspection

- Check loading and unloading equipment regularly for leaks, including valves, pumps, flanges and connections.
- Look for dust or fumes during loading or unloading operations.

Training

- Train employees (e.g. fork lift operators) and contractors on proper spill containment and cleanup.
- Employees trained in spill containment and cleanup should be present during the loading/unloading.
- Train employees in proper handling techniques during liquid transfers to avoid spills.

- Make sure forklift operators are properly trained on loading and unloading procedures.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup
- Keep your spill prevention Control and countermeasure (SPCC) Plan up-to-date, and implement accordingly.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- Space, material characteristics and/or time limitations may preclude all transfers from being performed indoors or under cover.

Requirements

Costs

- Should be low except when covering a large loading/unloading area.

Maintenance

- Conduct regular inspections and make repairs as necessary. The frequency of repairs will depend on the age of the facility.
- Check loading and unloading equipment regularly for leaks.
- Regular broom dry-sweeping of area.
- Conduct major clean-out of loading and unloading area and sump prior to October 1 of each year.

Supplemental Information

Further Detail of the BMP

Special Circumstances for Indoor Loading/Unloading of Materials

As appropriate loading or unloading of liquids should occur indoors so that any spills that are not completely retained can be discharged to the sanitary sewer, treatment plant, or treated in a manner consistent with local sewer authorities and permit requirements.

- For loading and unloading tank trucks to above and below ground storage tanks, the following procedures should be used:
  - The area where the transfer takes place should be paved. If the liquid is reactive with the asphalt, Portland cement should be used to pave the area.
  - Transfer area should be designed to prevent runon of stormwater from adjacent areas. Sloping the pad and using a curb, like a speed bump, around the uphill side of the transfer area should reduce run-on.

- Transfer area should be designed to prevent runoff of spilled liquids from the area. Sloping the area to a drain should prevent runoff. The drain should be connected to a dead-end sump or to the sanitary sewer (if allowed). A positive control valve should be installed on the drain.

- For transfer from rail cars to storage tanks that must occur outside, use the following procedures:

  - Drip pans should be placed at locations where spillage may occur, such as hose connections, hose reels, and filler nozzles, Use drip pans when making and breaking connections.

  - Drip pan systems should be installed between the rails to collect spillage from tank cars.

References and Resources

http://www.stormwatercenter.net/

King County - ftp://dnr.metrokc.gov/wlr/dss/spcm/Chapter%203.PDF

Orange County Stormwater Program
http://www.ocwatersheds.com/StormWater/swp_introduction.asp

San Diego Stormwater Co-permittees Jurisdictional Urban Runoff Management Program (URMP) -
http://www.projectcleanwater.org/pdf/Model%20Program%20Municipal%20Facilities.pdf

Waste Handling & Disposal SC-34

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	☑
Oil and Grease	☑
Organics	☑
Oxygen Demanding	☑

Description

Improper storage and handling of solid wastes can allow toxic compounds, oils and greases, heavy metals, nutrients, suspended solids, and other pollutants to enter stormwater runoff. The discharge of pollutants to stormwater from waste handling and disposal can be prevented and reduced by tracking waste generation, storage, and disposal; reducing waste generation and disposal through source reduction, re-use, and recycling; and preventing runon and runoff.

Approach

Pollution Prevention

- Reduction in the amount of waste generated can be accomplished using the following source controls such as:
  - Production planning and sequencing
  - Process or equipment modification
  - Raw material substitution or elimination
  - Loss prevention and housekeeping
  - Waste segregation and separation
  - Close loop recycling
- Establish a material tracking system to increase awareness about material usage. This may reduce spills and minimize contamination, thus reducing the amount of waste produced.
- Recycle materials whenever possible.

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Suggested Protocols

General

- Cover storage containers with leak proof lids or some other means. If waste is not in containers, cover all waste piles (plastic tarps are acceptable coverage) and prevent stormwater runon and runoff with a berm. The waste containers or piles must be covered except when in use.
- Use drip pans or absorbent materials whenever grease containers are emptied by vacuum trucks or other means. Grease cannot be left on the ground. Collected grease must be properly disposed of as garbage.
- Check storage containers weekly for leaks and to ensure that lids are on tightly. Replace any that are leaking, corroded, or otherwise deteriorating.
- Sweep and clean the storage area regularly. If it is paved, do not hose down the area to a storm drain.
- Dispose of rinse and wash water from cleaning waste containers into a sanitary sewer if allowed by the local sewer authority. Do not discharge wash water to the street or storm drain.
- Transfer waste from damaged containers into safe containers.
- Take special care when loading or unloading wastes to minimize losses. Loading systems can be used to minimize spills and fugitive emission losses such as dust or mist. Vacuum transfer systems can minimize waste loss.

Controlling Litter

- Post "No Littering" signs and enforce anti-litter laws.
- Provide a sufficient number of litter receptacles for the facility.
- Clean out and cover litter receptacles frequently to prevent spillage.

Waste Collection

- Keep waste collection areas clean.
- Inspect solid waste containers for structural damage or leaks regularly. Repair or replace damaged containers as necessary.
- Secure solid waste containers; containers must be closed tightly when not in use.
- Place waste containers under cover if possible.
- Do not fill waste containers with washout water or any other liquid.
- Ensure that only appropriate solid wastes are added to the solid waste container. Certain wastes such as hazardous wastes, appliances, fluorescent lamps, pesticides, etc. may not be

disposed of in solid waste containers (see chemical/ hazardous waste collection section below).

- Do not mix wastes; this can cause chemical reactions, make recycling impossible, and complicate disposal.

Good Housekeeping

- Use all of the product before disposing of the container.
- Keep the waste management area clean at all times by sweeping and cleaning up spills immediately.
- Use dry methods when possible (e.g. sweeping, use of absorbents) when cleaning around restaurant/food handling dumpster areas. If water must be used after sweeping/using absorbents, collect water and discharge through grease interceptor to the sewer.
- Stencil storm drains on the facility's property with prohibitive message regarding waste disposal.

Chemical/Hazardous Wastes

- Select designated hazardous waste collection areas on-site.
- Store hazardous materials and wastes in covered containers protected from vandalism, and in compliance with fire and hazardous waste codes.
- Place hazardous waste containers in secondary containment.
- Make sure that hazardous waste is collected, removed, and disposed of only at authorized disposal areas.

Runon/Runoff Prevention

- Prevent stormwater runon from entering the waste management area by enclosing the area or building a berm around the area.
- Prevent the waste materials from directly contacting rain.
- Cover waste piles with temporary covering material such as reinforced tarpaulin, polyethylene, polyurethane, polypropyleneor hypalon.
- Cover the area with a permanent roof if feasible.
- Cover dumpsters to prevent rain from washing waste out of holes or cracks in the bottom of the dumpster.
- Move the activity indoor after ensuring all safety concerns such as fire hazard and ventilation are addressed.

Inspection

- Inspect and replace faulty pumps or hoses regularly to minimize the potential of releases and spills.

- Check waste management areas for leaking containers or spills.

- Repair leaking equipment including valves, lines, seals, or pumps promptly.

Training

- Train staff pollution prevention measures and proper disposal methods.

- Train employees and contractors proper spill containment and cleanup. The employee should have the tools and knowledge to immediately begin cleaning up a spill if one should occur.

- Train employees and subcontractors in proper hazardous waste management.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup.

- Keep your Spill Prevention Control and countermeasure (SPCC) plan up-to-date, and implement accordingly.

- Have spill cleanup materials readily available and in a known location.

- Cleanup spills immediately and use dry methods if possible.

- Properly dispose of spill cleanup material.

- Vehicles transporting waste should have spill prevention equipment that can prevent spills during transport. The spill prevention equipment includes:

  - Vehicles equipped with baffles for liquid waste

  - Trucks with sealed gates and spill guards for solid waste

Other Considerations

- Hazardous waste cannot be re-used or recycled; it must be disposed of by a licensed hazardous waste hauler.

Requirements

Costs

- Capital and operation and maintenance costs will vary substantially depending on the size of the facility and the types of waste handled. Costs should be low if there is an inventory program in place.

Maintenance

- None except for maintaining equipment for material tracking program.

Supplemental Information

Further Detail of the BMP

Land Treatment System

- Minimize the runoff of polluted stormwater from land application of municipal waste on-site by:
  - Choosing a site where slopes are under 6%, the soil is permeable, there is a low water table, it is located away from wetlands or marshes, there is a closed drainage system.
  - Avoiding application of waste to the site when it is raining or when the ground is saturated with water.
  - Growing vegetation on land disposal areas to stabilize soils and reduce the volume of surface water runoff from the site.
  - Maintaining adequate barriers between the land application site and the receiving waters. Planted strips are particularly good.
  - Using erosion control techniques such as mulching and matting, filter fences, straw bales, diversion terracing, and sediment basins.
  - Performing routine maintenance to ensure the erosion control or site stabilization measures are working.

References and Resources

King County Stormwater Pollution Control Manual - http://dnr.metrokc.gov/wlr/dss/spcm.htm

Orange County Stormwater Program
http://www.ocwatersheds.com/StormWater/swp_introduction.asp

Pollution from Surface Cleaning Folder. 1996. Bay Area Stormwater Management Agencies Associations (BASMAA). On-line: http://www.basmaa.org

Safer Alternative Products

Description

Promote the use of less harmful products and products that contain little or no TMDL pollutants. Alternatives exist for most product classes including chemical fertilizers, pesticides, cleaning solutions, janitorial chemicals, automotive and paint products, and consumables (batteries, fluorescent lamps).

Approach

Pattern a new program after the many established programs around the state and country. Integrate this best management practice as much as possible with existing programs at your facility.

Develop a comprehensive program based on:

- The "Precautionary Principle," which is an alternative to the "Risk Assessment" model that says it's acceptable to use a potentially harmful product until physical evidence of its harmful effects are established and deemed too costly from an environmental or public health perspective. For instance, a risk assessment approach might say it's acceptable to use a pesticide until there is direct proof of an environmental impact. The Precautionary Principle approach is used to evaluate whether a given product is safe, whether it is really necessary, and whether alternative products would perform just as well.

- Environmentally Preferable Purchasing Program to minimize the purchase of products containing hazardous ingredients used in the facility's custodial services, fleet maintenance, and facility maintenance in favor of using alternate products that pose less risk to employees and to the environment.

- Integrated Pest Management (IPM) or Less-Toxic Pesticide Program, which uses a pest management approach that minimizes the use of toxic chemicals and gets rid of pests by methods that pose a lower risk to employees, the public, and the environment.

- Energy Efficiency Program including no-cost and low-cost energy conservation and efficiency actions that can reduce both energy consumption and electricity bills, along with long-term energy efficiency investments.

Consider the following mechanisms for developing and implementing a comprehensive program:

- Policies

Objectives

- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	
Nutrients	✓
Trash	
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

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- Procedures
  - Standard operating procedures (SOPs)
  - Purchasing guidelines and procedures
  - Bid packages (services and supplies)
- Materials
  - Preferred or approved product and supplier lists
  - Product and supplier evaluation criteria
  - Training sessions and manuals
  - Fact sheets for employees

Implement this BMP in conjunction with the Vehicle and Equipment Management fact sheets (SC20 – SC22) and SC41, Building and Grounds Maintenance.

Training

- Employees who handle potentially harmful materials in the use of safer alternatives.
- Purchasing departments should be encouraged to procure less hazardous materials and products that contain little or no harmful substances or TMDL pollutants.

Regulations

This BMP has no regulatory requirements. Existing regulations already encourage facilities to reduce the use of hazardous materials through incentives such as reduced:

- Specialized equipment storage and handling requirements,
- Storm water runoff sampling requirements,
- Training and licensing requirements, and
- Record keeping and reporting requirements.

Equipment

- There are no major equipment requirements to this BMP.

Limitations

- Alternative products may not be available, suitable, or effective in every case.

Requirements

Cost Considerations

- The primary cost is for staff time to: 1) develop new policies and procedures and 2) educate purchasing departments and employees who handle potentially harmful materials about the availability, procurement, and use of safer alternatives.

- Some alternative products may be slightly more expensive than conventional products.

Supplemental Information

Employees and contractors / service providers can both be educated about safer alternatives by using information developed by a number of organizations including the references and resources listed below.

The following discussion provides some general information on safer alternatives. More specific information on particular hazardous materials and the available alternatives may be found in the references and resources listed below.

- Automotive products – Less toxic alternatives are not available for many automotive products, especially engine fluids. But there are alternatives to grease lubricants, car polishes, degreasers, and windshield washer solution. Rerefined motor oil is also available.
- Vehicle/Trailer lubrication – Fifth wheel bearings on trucks require routine lubrication. Adhesive lubricants are available to replace typical chassis grease.
- Cleaners – Vegetables-based or citrus-based soaps are available to replace petroleum-based soaps/detergents.
- Paint products – Water-based paints, wood preservatives, stains, and finishes are available.
- Pesticides – Specific alternative products or methods exist to control most insects, fungi, and weeds.
- Chemical Fertilizers – Compost and soil amendments are natural alternatives.
- Consumables – Manufacturers have either reduced or are in the process of reducing the amount of heavy metals in consumables such as batteries and fluorescent lamps. All fluorescent lamps contain mercury, however low-mercury containing lamps are now available from most hardware and lighting stores. Fluorescent lamps are also more energy efficient than the average incandescent lamp.
- Janitorial chemicals – Even biodegradable soap can harm fish and wildlife before it biodegrades. Biodegradable does not mean non-toxic. Safer products and procedures are available for floor stripping and cleaning, as well as carpet, glass, metal, and restroom cleaning and disinfecting.

Examples

There are a number of business and trade associations, and communities with effective programs. Some of the more prominent are listed below in the references and resources section.

References and Resources

Note: Many of these references provide alternative products for materials that typically are used inside and disposed to the sanitary sewer as well as alternatives to products that usually end up in the storm drain.

General Sustainable Practices and Pollution Prevention Including Pollutant-Specific Information

California Department of Toxic Substances Control (www.dtsc.ca.gov)

California Integrated Waste Management Board (www.ciwmb.ca.gov)

City of Santa Monica (www.santa-monica.org/environment)

City of Palo Alto (www.city.palo-alto.ca.us/cleanbay)

City and County of San Francisco, Department of the Environment (www.ci.sf.ca.us/sfenvironment)

Earth 911 (www.earth911.org/master.asp)

Environmental Finance Center Region IX (www.greenstart.org/efc9)

Flex Your Power (www.flexyourpower.ca.gov)

GreenBiz.com (www.greenbiz.com)

Green Business Program (www.abag.org/bayarea/enviro/gbus/gb.html)

Pacific Industrial and Business Association (www.piba.org)

Sacramento Clean Water Business Partners (www.sacstormwater.org)

USEPA BMP fact sheet – Alternative products (http://cfpub.epa.gov/npdes/stormwater/menuofbmps/poll_2.cfm)

USEPA Region IX Pollution Prevention Program (www.epa.gov/region09/p2)

Western Regional Pollution Prevention Network (www.westp2net.org)

Metals (mercury, copper)

National Electrical Manufacturers Association - Environment, Health and Safety (www.nema.org)

Sustainable Conservation (www.suscon.org)

Auto Recycling Project

Brake Pad Partnership

Pesticides and Chemical Fertilizers

Bio-Integral Resource Center (www.birc.org)

California Department of Pesticide Regulation (www.cdpr.ca.gov)

University of California Statewide IPM Program (www.ipm.ucdavis.edu/default.html)

Dioxins

Bay Area Dioxins Project (http://dioxin.abag.ca.gov/)

Building & Grounds Maintenance SC-41

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	☑
Oil and Grease	☑
Organics	☑
Oxygen Demanding	☑

Description

Stormwater runoff from building and grounds maintenance activities can be contaminated with toxic hydrocarbons in solvents, fertilizers and pesticides, suspended solids, heavy metals, and abnormal pH. Utilizing the following protocols will prevent or reduce the discharge of pollutants to stormwater from building and grounds maintenance activities by washing and cleaning up with as little water as possible, following good landscape management practices, preventing and cleaning up spills immediately, keeping debris from entering the storm drains, and maintaining the stormwater collection system.

Approach

Pollution Prevention

- Switch to non-toxic chemicals for maintenance when possible.
- Choose cleaning agents that can be recycled.
- Encourage proper lawn management and landscaping, including use of native vegetation.
- Encourage use of Integrated Pest Management techniques for pest control.
- Encourage proper onsite recycling of yard trimmings.
- Recycle residual paints, solvents, lumber, and other material as much as possible.

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CALIFORNIA STORMWATER QUALITY ASSOCIATION

Suggested Protocols

Pressure Washing of Buildings, Rooftops, and Other Large Objects

- In situations where soaps or detergents are used and the surrounding area is paved, pressure washers must use a waste water collection device that enables collection of wash water and associated solids. A sump pump, wet vacuum or similarly effective device must be used to collect the runoff and loose materials. The collected runoff and solids must be disposed of properly.

- If soaps or detergents are not used, and the surrounding area is paved, wash water runoff does not have to be collected but must be screened. Pressure washers must use filter fabric or some other type of screen on the ground and/or in he catch basin to trap the particles in wash water runoff.

- If you are pressure washing on a grassed area (with or without soap), runoff must be dispersed as sheet flow as much as possible, rather than as a concentrated stream. The wash runoff must remain on the grass and not drain to pavement. Ensure that this practice does not kill grass.

Landscaping Activities

- Do not apply any chemicals (insecticide, herbicide, or fertilizer) directly to surface waters, unless the application is approved and permitted by the state.

- Dispose of grass clippings, leaves, sticks, or other collected vegetation as garbage, or by composting. Do not dispose of collected vegetation into waterways or storm drainage systems.

- Use mulch or other erosion control measures on exposed soils.

- Check irrigation schedules so pesticides will not be washed away and to minimize non-stormwater discharge.

Building Repair, Remodeling, and Construction

- Do not dump any toxic substance or liquid waste on the pavement, the ground, or toward a storm drain.

- Use ground or drop cloths underneath outdoor painting, scraping, and sandblasting work, and properly dispose of collected material daily.

- Use a ground cloth or oversized tub for activities such as paint mixing and tool cleaning.

- Clean paint brushes and tools covered with water-based paints in sinks connected to sanitary sewers or in portable containers that can be dumped into a sanitary sewer drain. Brushes and tools covered with non-water-based paints, finishes, or other materials must be cleaned in a manner that enables collection of used solvents (e.g., paint thinner, turpentine, etc.) for recycling or proper disposal.

- Use a storm drain cover, filter fabric, or similarly effective runoff control mechanism if dust, grit, wash water, or other pollutants may escape the work area and enter a catch basin. The containment device(s) must be in place at the beginning of the work day, and accumulated dirty runoff and solids must be collected and disposed of before removing the containment device(s) at the end of the work day.

- If you need to de-water an excavation site, you may need to filter the water before discharging to a catch basin or off-site. In which case you should direct the water through hay bales and filter fabric or use other sediment filters or traps.

- Store toxic material under cover with secondary containment during precipitation events and when not in use. A cover would include tarps or other temporary cover material.

Mowing, Trimming, and Planting

- Dispose of leaves, sticks, or other collected vegetation as garbage, by composting or at a permitted landfill. Do not dispose of collected vegetation into waterways or storm drainage systems.

- Use mulch or other erosion control measures when soils are exposed.

- Place temporarily stockpiled material away from watercourses and drain inlets, and berm or cover stockpiles to prevent material releases to the storm drain system.

- Consider an alternative approach when bailing out muddy water; do not put it in the storm drain, pour over landscaped areas.

- Use hand or mechanical weeding where practical.

Fertilizer and Pesticide Management

- Follow all federal, state, and local laws and regulations governing the use, storage, and disposal of fertilizers and pesticides and training of applicators and pest control advisors.

- Follow manufacturers' recommendations and label directions. Pesticides must never be applied if precipitation is occuring or predicted. Do not apply insecticides within 100 feet of surface waters such as lakes, ponds, wetlands, and streams.

- Use less toxic pesticides that will do the job, whenever possible. Avoid use of copper-based pesticides if possible.

- Do not use pesticides if rain is expected.

- Do not mix or prepare pesticides for application near storm drains.

- Use the minimum amount needed for the job.

- Calibrate fertilizer distributors to avoid excessive application.

- Employ techniques to minimize off-target application (e.g. spray drift) of pesticides, including consideration of alternative application techniques.

- Apply pesticides only when wind speeds are low.
- Work fertilizers into the soil rather than dumping or broadcasting them onto the surface.
- Irrigate slowly to prevent runoff and then only as much as is needed.
- Clean pavement and sidewalk if fertilizer is spilled on these surfaces before applying irrigation water.
- Dispose of empty pesticide containers according to the instructions on the container label.
- Use up the pesticides. Rinse containers, and use rinse water as product. Dispose of unused pesticide as hazardous waste.
- Implement storage requirements for pesticide products with guidance from the local fire department and County Agricultural Commissioner. Provide secondary containment for pesticides.

Inspection

- Inspect irrigation system periodically to ensure that the right amount of water is being applied and that excessive runoff is not occurring. Minimize excess watering, and repair leaks in the irrigation system as soon as they are observed.

Training

- Educate and train employees on use of pesticides and in pesticide application techniques to prevent pollution.
- Train employees and contractors in proper techniques for spill containment and cleanup.
- Be sure the frequency of training takes into account the complexity of the operations and the nature of the staff.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup
- Keep your Spill Prevention Control and countermeasure (SPCC) plan up-to-date, and implement accordingly.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- Alternative pest/weed controls may not be available, suitable, or effective in many cases.

Requirements

Costs

- Overall costs should be low in comparison to other BMPs.

Maintenance

- Sweep paved areas regularly to collect loose particles, and wipe up spills with rags and other absorbent material immediately, do not hose down the area to a storm drain.

Supplemental Information

Further Detail of the BMP

Fire Sprinkler Line Flushing

Building fire sprinkler line flushing may be a source of non-stormwater runoff pollution. The water entering the system is usually potable water though in some areas it may be non-potable reclaimed wastewater. There are subsequent factors that may drastically reduce the quality of the water in such systems. Black iron pipe is usually used since it is cheaper than potable piping but it is subject to rusting and results in lower quality water. Initially the black iron pipe has an oil coating to protect it from rusting between manufacture and installation; this will contaminate the water from the first flush but not from subsequent flushes. Nitrates, poly-phosphates and other corrosion inhibitors, as well as fire suppressants and antifreeze may be added to the sprinkler water system. Water generally remains in the sprinkler system a long time, typically a year, between flushes and may accumulate iron, manganese, lead, copper, nickel and zinc. The water generally becomes anoxic and contains living and dead bacteria and breakdown products from chlorination. This may result in a significant BOD problem and the water often smells. Consequently dispose fire sprinkler line flush water into the sanitary sewer. Do not allow discharge to storm drain or infiltration due to potential high levels of pollutants in fire sprinkler line water.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

King County - ftp://dnr.metrokc.gov/wlr/dss/spcm/Chapter%203.PDF

Orange County Stormwater Program
http://www.ocwatersheds.com/StormWater/swp_introduction.asp

Mobile Cleaners Pilot Program: Final Report. 1997. Bay Area Stormwater Management Agencies Association (BASSMA) http://www.basmaa.org/

Pollution from Surface Cleaning Folder. 1996. Bay Area Stormwater Management Agencies Association (BASMAA) http://www.basmaa.org/

San Diego Stormwater Co-permittees Jurisdictional Urban Runoff Management Program (URMP) -
http://www.projectcleanwater.org/pdf/Model%20Program%20Municipal%20Facilities.pdf

Building Repair and Construction SC-42

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Recycle

Targeted Constituents

Sediment	✓
Nutrients	
Trash	✓
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

CASQA
California Stormwater Quality Association

Description

Modifications are common particularly at large industrial sites. The activity may vary from minor and normal building repair to major remodeling, or the construction of new facilities. These activities can generate pollutants including solvents, paints, paint and varnish removers, finishing residues, spent thinners, soap cleaners, kerosene, asphalt and concrete materials, adhesive residues, and old asbestos installation. Protocols in this fact sheet are intended to prevent or reduce the discharge of pollutants to stormwater from building repair, remodeling, and construction by using soil erosion controls, enclosing or covering building material storage areas, using good housekeeping practices, using safer alternative products, and training employees.

Approach

Pollution Prevention

- Recycle residual paints, solvents, lumber, and other materials to the maximum extent practical.

- Buy recycled products to the maximum extent practical.

- Inform on-site contractors of company policy on these matters and include appropriate provisions in their contract to ensure certain proper housekeeping and disposal practices are implemented.

- Make sure that nearby storm drains are well marked to minimize the chance of inadvertent disposal of residual paints and other liquids.

Suggested Protocols

Repair & Remodeling

- Follow BMPs identified in Construction BMP Handbook.
- Maintain good housekeeping practices while work is underway.
- Keep the work site clean and orderly. Remove debris in a timely fashion. Sweep the area.
- Cover materials of particular concern that must be left outside, particularly during the rainy season.
- Do not dump waste liquids down the storm drain.
- Dispose of wash water, sweepings, and sediments properly.
- Store materials properly that are normally used in repair and remodeling such as paints and solvents.
- Sweep out the gutter or wash the gutter and trap the particles at the outlet of the downspout if when repairing roofs, small particles have accumulated in the gutter. A sock or geofabric placed over the outlet may effectively trap the materials. If the downspout is tight lined, place a temporary plug at the first convenient point in the storm drain and pump out the water with a vactor truck, and clean the catch basin sump where you placed the plug.
- Properly store and dispose waste materials generated from construction activities. See Construction BMP Handbook.
- Clean the storm drain system in the immediate vicinity of the construction activity after it is completed.

Painting

- Enclose painting operations consistent with local air quality regulations and OSHA.
- Local air pollution regulations may, in many areas of the state, specify painting procedures which if properly carried out are usually sufficient to protect water quality.
- Develop paint handling procedures for proper use, storage, and disposal of paints.
- Transport paint and materials to and from job sites in containers with secure lids and tied down to the transport vehicle.
- Test and inspect spray equipment prior to starting to paint. Tighten all hoses and connections and do not overfill paint containers.
- Mix paint indoors before using so that any spill will not be exposed to rain. Do so even during dry weather because cleanup of a spill will never be 100% effective.
- Transfer and load paint and hot thermoplastic away from storm drain inlets.

- Do not transfer or load paint near storm drain inlets.
- Plug nearby storm drain inlets prior to starting painting and remove plugs when job is complete when there is significant risk of a spill reaching storm drains.
- Cover nearby storm drain inlets prior to starting work if sand blasting is used to remove paint.
- Use a ground cloth to collect the chips if painting requires scraping or sand blasting of the existing surface. Dispose the residue properly.
- Cover or enclose painting operations properly to avoid drift.
- Clean the application equipment in a sink that is connected to the sanitary sewer if using water based paints.
- Capture all cleanup-water and dispose of properly.
- Dispose of paints containing lead or tributyl tin and considered a hazardous waste properly.
- Store leftover paints if they are to be kept for the next job properly, or dispose properly.
- Recycle paint when possible. Dispose of paint at an appropriate household hazardous waste facility.

Training
Proper education of off-site contractors is often overlooked. The conscientious efforts of well trained employees can be lost by unknowing off-site contractors, so make sure they are well informed about what they are expected to do.

Spill Response and Prevention
- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- Clean up spills immediately.
- Excavate and remove the contaminated (stained) soil if a spill occurs on dirt.

Limitations
- This BMP is for minor construction only. The State's General Construction Activity Stormwater Permit has more requirements for larger projects. The companion "Construction Best Management Practice Handbook" contains specific guidance and best management practices for larger-scale projects.
- Hazardous waste that cannot be reused or recycled must be disposed of by a licensed hazardous waste hauler.
- Be certain that actions to help stormwater quality are consistent with Cal- and Fed-OSHA and air quality regulations.

Requirements

Costs

These BMPs are generally low to modest in cost.

Maintenance

N/A

Supplemental Information

Further Detail of the BMP

Soil/Erosion Control

If the work involves exposing large areas of soil, employ the appropriate soil erosion and control techniques. See the Construction Best Management Practice Handbook. If old buildings are being torn down and not replaced in the near future, stabilize the site using measures described in SC-40 Contaminated or Erodible Areas.

If a building is to be placed over an open area with a storm drainage system, make sure the storm inlets within the building are covered or removed, or the storm line is connected to the sanitary sewer. If because of the remodeling a new drainage system is to be installed or the existing system is to be modified, consider installing catch basins as they serve as effective "in-line" treatment devices. See Treatment Control Fact Sheet TC-20 Wet Pond/Basin in Section 5 of the New Development and Redevelopment Handbook regarding design criteria. Include in the catch basin a "turn-down" elbow or similar device to trap floatables.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net/

Parking/Storage Area Maintenance SC-43

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	☑
Oil and Grease	☑
Organics	☑
Oxygen Demanding	☑

Description

Parking lots and storage areas can contribute a number of substances, such as trash, suspended solids, hydrocarbons, oil and grease, and heavy metals that can enter receiving waters through stormwater runoff or non-stormwater discharges. The following protocols are intended to prevent or reduce the discharge of pollutants from parking/storage areas and include using good housekeeping practices, following appropriate cleaning BMPs, and training employees.

Approach

Pollution Prevention

- Encourage alternative designs and maintenance strategies for impervious parking lots. (See New Development and Redevelopment BMP Handbook).

- Keep accurate maintenance logs to evaluate BMP implementation.

Suggested Protocols

General

- Keep the parking and storage areas clean and orderly. Remove debris in a timely fashion.

- Allow sheet runoff to flow into biofilters (vegetated strip and swale) and/or infiltration devices.

- Utilize sand filters or oleophilic collectors for oily waste in low concentrations.

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- Arrange rooftop drains to prevent drainage directly onto paved surfaces.
- Design lot to include semi-permeable hardscape.

Controlling Litter

- Post "No Littering" signs and enforce anti-litter laws.
- Provide an adequate number of litter receptacles.
- Clean out and cover litter receptacles frequently to prevent spillage.
- Provide trash receptacles in parking lots to discourage litter.
- Routinely sweep, shovel and dispose of litter in the trash.

Surface cleaning

- Use dry cleaning methods (e.g. sweeping or vacuuming) to prevent the discharge of pollutants into the stormwater conveyance system.
- Establish frequency of public parking lot sweeping based on usage and field observations of waste accumulation.
- Sweep all parking lots at least once before the onset of the wet season.
- If water is used follow the procedures below:
  - Block the storm drain or contain runoff.
  - Wash water should be collected and pumped to the sanitary sewer or discharged to a pervious surface, do not allow wash water to enter storm drains.
  - Dispose of parking lot sweeping debris and dirt at a landfill.
- When cleaning heavy oily deposits:
  - Use absorbent materials on oily spots prior to sweeping or washing.
  - Dispose of used absorbents appropriately.

Surface Repair

- Pre-heat, transfer or load hot bituminous material away from storm drain inlets.
- Apply concrete, asphalt, and seal coat during dry weather to prevent contamination form contacting stormwater runoff.
- Cover and seal nearby storm drain inlets (with waterproof material or mesh) and manholes before applying seal coat, slurry seal, etc., where applicable. Leave covers in place until job is complete and until all water from emulsified oil sealants has drained or evaporated. Clean any debris from these covered manholes and drains for proper disposal.

- Use only as much water as necessary for dust control, to avoid runoff.
- Catch drips from paving equipment that is not in use with pans or absorbent material placed under the machines. Dispose of collected material and absorbents properly.

Inspection

- Have designated personnel conduct inspections of the parking facilities and stormwater conveyance systems associated with them on a regular basis.
- Inspect cleaning equipment/sweepers for leaks on a regular basis.

Training

- Provide regular training to field employees and/or contractors regarding cleaning of paved areas and proper operation of equipment.
- Train employees and contractors in proper techniques for spill containment and cleanup.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup.
- Keep your Spill Prevention Control and countermeasure (SPCC) plan up-to-date, nad implement accordingly.
- Have spill cleanup materials readily available and in a known location.
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- Limitations related to sweeping activities at large parking facilities may include high equipment costs, the need for sweeper operator training, and the inability of current sweeper technology to remove oil and grease.

Requirements

Costs

Cleaning/sweeping costs can be quite large, construction and maintenance of stormwater structural controls can be quite expensive as well.

Maintenance

- Sweep parking lot to minimize cleaning with water.
- Clean out oil/water/sand separators regularly, especially after heavy storms.
- Clean parking facilities on a regular basis to prevent accumulated wastes and pollutants from being discharged into conveyance systems during rainy conditions.

Supplemental Information

Further Detail of the BMP

Surface Repair

Apply concrete, asphalt, and seal coat during dry weather to prevent contamination form contacting stormwater runoff. Where applicable, cover and seal nearby storm drain inlets (with waterproof material or mesh) and manholes before applying seal coat, slurry seal, etc. Leave covers in place until job is complete and until all water from emulsified oil sealants has drained or evaporated. Clean any debris from these covered manholes and drains for proper disposal. Use only as much water as necessary for dust control, to avoid runoff.

References and Resources

http://www.stormwatercenter.net/

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Model Urban Runoff Program: A How-To Guide for Developing Urban Runoff Programs for Small Municipalities. Prepared by City of Monterey, City of Santa Cruz, California Coastal Commission, Monterey Bay National Marine Sanctuary, Association of Monterey Bay Area Governments, Woodward-Clyde, Central Coast Regional Water Quality control Board. July 1998 (Revised February 2002 by the California Coastal Commission).

Orange County Stormwater Program
http://www.ocwatersheds.com/StormWater/swp_introduction.asp

Oregon Association of Clean Water Agencies. Oregon Municipal Stormwater Toolbox for Maintenance Practices. June 1998.

Pollution from Surface Cleaning Folder. 1996. Bay Area Stormwater Management Agencies Association (BASMAA) http://www.basma.org

San Diego Stormwater Co-permittees Jurisdictional Urban Runoff Management Program (URMP)
http://www.projectcleanwater.org/pdf/Model%20Program%20Municipal%20Facilities.pdf

Drainage System Maintenance SC-44

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize

Targeted Constituents

Sediment	✓
Nutrients	
Trash	✓
Metals	
Bacteria	✓
Oil and Grease	
Organics	

California Stormwater Quality Association

Description

As a consequence of its function, the stormwater conveyance system collects and transports urban runoff and stormwater that may contain certain pollutants. The protocols in this fact sheet are intended to reduce pollutants reaching receiving waters through proper conveyance system operation and maintenance.

Approach

Pollution Prevention

Maintain catch basins, stormwater inlets, and other stormwater conveyance structures on a regular basis to remove pollutants, reduce high pollutant concentrations during the first flush of storms, prevent clogging of the downstream conveyance system, restore catch basins' sediment trapping capacity, and ensure the system functions properly hydraulically to avoid flooding.

Suggested Protocols

Catch Basins/Inlet Structures

- Staff should regularly inspect facilities to ensure compliance with the following:
  - Immediate repair of any deterioration threatening structural integrity.
  - Cleaning before the sump is 40% full. Catch basins should be cleaned as frequently as needed to meet this standard.
  - Stenciling of catch basins and inlets (see SC34 Waste Handling and Disposal).

- Clean catch basins, storm drain inlets, and other conveyance structures before the wet season to remove sediments and debris accumulated during the summer.

- Conduct inspections more frequently during the wet season for problem areas where sediment or trash accumulates more often. Clean and repair as needed.

- Keep accurate logs of the number of catch basins cleaned.

- Store wastes collected from cleaning activities of the drainage system in appropriate containers or temporary storage sites in a manner that prevents discharge to the storm drain.

- Dewater the wastes if necessary with outflow into the sanitary sewer if permitted. Water should be treated with an appropriate filtering device prior to discharge to the sanitary sewer. If discharge to the sanitary sewer is not allowed, water should be pumped or vacuumed to a tank and properly disposed. Do not dewater near a storm drain or stream.

Storm Drain Conveyance System

- Locate reaches of storm drain with deposit problems and develop a flushing schedule that keeps the pipe clear of excessive buildup.

- Collect and pump flushed effluent to the sanitary sewer for treatment whenever possible.

Pump Stations

- Clean all storm drain pump stations prior to the wet season to remove silt and trash.

- Do not allow discharge to reach the storm drain system when cleaning a storm drain pump station or other facility.

- Conduct routine maintenance at each pump station.

- Inspect, clean, and repair as necessary all outlet structures prior to the wet season.

Open Channel

- Modify storm channel characteristics to improve channel hydraulics, increase pollutant removals, and enhance channel/creek aesthetic and habitat value.

- Conduct channel modification/improvement in accordance with existing laws. Any person, government agency, or public utility proposing an activity that will change the natural (emphasis added) state of any river, stream, or lake in California, must enter into a Steam or Lake Alteration Agreement with the Department of Fish and Game. The developer-applicant should also contact local governments (city, county, special districts), other state agencies (SWRCB, RWQCB, Department of Forestry, Department of Water Resources), and Federal Corps of Engineers and USFWS.

Illicit Connections and Discharges

- Look for evidence of illegal discharges or illicit connections during routine maintenance of conveyance system and drainage structures:

  - Is there evidence of spills such as paints, discoloring, etc?

- Are there any odors associated with the drainage system?
- Record locations of apparent illegal discharges/illicit connections?
- Track flows back to potential dischargers and conduct aboveground inspections. This can be done through visual inspection of upgradient manholes or alternate techniques including zinc chloride smoke testing, fluorometric dye testing, physical inspection testing, or television camera inspection.
- Eliminate the discharge once the origin of flow is established.

■ Stencil or demarcate storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages such as "Dump No Waste Drains to Stream" stenciled next to them to warn against ignorant or intentional dumping of pollutants into the storm drainage system.

■ Refer to fact sheet SC-10 Non-Stormwater Discharges.

Illegal Dumping

■ Inspect and clean up hot spots and other storm drainage areas regularly where illegal dumping and disposal occurs.

■ Establish a system for tracking incidents. The system should be designed to identify the following:

- Illegal dumping hot spots
- Types and quantities (in some cases) of wastes
- Patterns in time of occurrence (time of day/night, month, or year)
- Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accidents/spills)
- Responsible parties

■ Post "No Dumping" signs in problem areas with a phone number for reporting dumping and disposal. Signs should also indicate fines and penalties for illegal dumping.

■ Refer to fact sheet SC-10 Non-Stormwater Discharges.

Training

■ Train crews in proper maintenance activities, including record keeping and disposal.

■ Allow only properly trained individuals to handle hazardous materials/wastes.

■ Have staff involved in detection and removal of illicit connections trained in the following:

- OSHA-required Health and Safety Training (29 CFR 1910.120) plus annual refresher training (as needed).

- OSHA Confined Space Entry training (Cal-OSHA Confined Space, Title 8 and Federal OSHA 29 CFR 1910.146).

- Procedural training (field screening, sampling, smoke/dye testing, TV inspection).

Spill Response and Prevention

- Investigate all reports of spills, leaks, and/or illegal dumping promptly.

- Clean up all spills and leaks using "dry" methods (with absorbent materials and/or rags) or dig up, remove, and properly dispose of contaminated soil.

- Refer to fact sheet SC-11 Spill Prevention, Control, and Cleanup.

Other Considerations (Limitations and Regulations)

- Clean-up activities may create a slight disturbance for local aquatic species. Access to items and material on private property may be limited. Trade-offs may exist between channel hydraulics and water quality/riparian habitat. If storm channels or basins are recognized as wetlands, many activities, including maintenance, may be subject to regulation and permitting.

- Storm drain flushing is most effective in small diameter pipes (36-inch diameter pipe or less, depending on water supply and sediment collection capacity). Other considerations associated with storm drain flushing may include the availability of a water source, finding a downstream area to collect sediments, liquid/sediment disposal, and prohibition against disposal of flushed effluent to sanitary sewer in some areas.

- Regulations may include adoption of substantial penalties for illegal dumping and disposal.

- Local municipal codes may include sections prohibiting discharge of soil, debris, refuse, hazardous wastes, and other pollutants into the storm drain system.

Requirements

Costs

- An aggressive catch basin cleaning program could require a significant capital and O&M budget.

- The elimination of illegal dumping is dependent on the availability, convenience, and cost of alternative means of disposal. The primary cost is for staff time. Cost depends on how aggressively a program is implemented. Other cost considerations for an illegal dumping program include:

  - Purchase and installation of signs.

  - Rental of vehicle(s) to haul illegally-disposed items and material to landfills.

  - Rental of heavy equipment to remove larger items (e.g., car bodies) from channels.

  - Purchase of landfill space to dispose of illegally-dumped items and material.

- Methods used for illicit connection detection (smoke testing, dye testing, visual inspection, and flow monitoring) can be costly and time-consuming. Site-specific factors, such as the level of impervious area, the density and ages of buildings, and type of land use will determine the level of investigation necessary.

Maintenance

- Two-person teams may be required to clean catch basins with vactor trucks.
- Teams of at least two people plus administrative personnel are required to identify illicit discharges, depending on the complexity of the storm sewer system.
- Arrangements must be made for proper disposal of collected wastes.
- Technical staff are required to detect and investigate illegal dumping violations.

Supplemental Information

Further Detail of the BMP

Storm Drain Flushing

Flushing is a common maintenance activity used to improve pipe hydraulics and to remove pollutants in storm drainage systems. Flushing may be designed to hydraulically convey accumulated material to strategic locations, such as an open channel, another point where flushing will be initiated, or the sanitary sewer and the treatment facilities, thus preventing resuspension and overflow of a portion of the solids during storm events. Flushing prevents “plug flow” discharges of concentrated pollutant loadings and sediments. Deposits can hinder the designed conveyance capacity of the storm drain system and potentially cause backwater conditions in severe cases of clogging.

Storm drain flushing usually takes place along segments of pipe with grades that are too flat to maintain adequate velocity to keep particles in suspension. An upstream manhole is selected to place an inflatable device that temporarily plugs the pipe. Further upstream, water is pumped into the line to create a flushing wave. When the upstream reach of pipe is sufficiently full to cause a flushing wave, the inflated device is rapidly deflated with the assistance of a vacuum pump, thereby releasing the backed up water and resulting in the cleaning of the storm drain segment.

To further reduce impacts of stormwater pollution, a second inflatable device placed well downstream may be used to recollect the water after the force of the flushing wave has dissipated. A pump may then be used to transfer the water and accumulated material to the sanitary sewer for treatment. In some cases, an interceptor structure may be more practical or required to recollect the flushed waters.

It has been found that cleansing efficiency of periodic flush waves is dependent upon flush volume, flush discharge rate, sewer slope, sewer length, sewer flow rate, sewer diameter, and population density. As a rule of thumb, the length of line to be flushed should not exceed 700 feet. At this maximum recommended length, the percent removal efficiency ranges between 65-75% for organics and 55-65% for dry weather grit/inorganic material. The percent removal efficiency drops rapidly beyond that. Water is commonly supplied by a water truck, but fire hydrants can also supply water. To make the best use of water, it is recommended that reclaimed water be used or that fire hydrant line flushing coincide with storm sewer flushing.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

Ferguson, B.K. 1991. Urban Stream Reclamation, p. 324-322, Journal of Soil and Water Conservation.

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Oregon Association of Clean Water Agencies. Oregon Municipal Stormwater Toolbox for Maintenance Practices. June 1998.

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net

United States Environmental Protection Agency (USEPA). 2002. Pollution Prevention/Good Housekeeping for Municipal Operations Storm Drain System Cleaning. On line:
http://www.epa.gov/npdes/menuofbmps/poll_16.htm

Design Objectives

- ☑ Maximize Infiltration
- ☑ Provide Retention
- ☑ Slow Runoff
- ☑ Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Each project site possesses unique topographic, hydrologic, and vegetative features, some of which are more suitable for development than others. Integrating and incorporating appropriate landscape planning methodologies into the project design is the most effective action that can be done to minimize surface and groundwater contamination from stormwater.

Approach

Landscape planning should couple consideration of land suitability for urban uses with consideration of community goals and projected growth. Project plan designs should conserve natural areas to the extent possible, maximize natural water storage and infiltration opportunities, and protect slopes and channels.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment.

Design Considerations

Design requirements for site design and landscapes planning should conform to applicable standards and specifications of agencies with jurisdiction and be consistent with applicable General Plan and Local Area Plan policies.

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Designing New Installations

Begin the development of a plan for the landscape unit with attention to the following general principles:

- Formulate the plan on the basis of clearly articulated community goals. Carefully identify conflicts and choices between retaining and protecting desired resources and community growth.

- Map and assess land suitability for urban uses. Include the following landscape features in the assessment: wooded land, open unwooded land, steep slopes, erosion-prone soils, foundation suitability, soil suitability for waste disposal, aquifers, aquifer recharge areas, wetlands, floodplains, surface waters, agricultural lands, and various categories of urban land use. When appropriate, the assessment can highlight outstanding local or regional resources that the community determines should be protected (e.g., a scenic area, recreational area, threatened species habitat, farmland, fish run). Mapping and assessment should recognize not only these resources but also additional areas needed for their sustenance.

Project plan designs should conserve natural areas to the extent possible, maximize natural water storage and infiltration opportunities, and protect slopes and channels.

Conserve Natural Areas during Landscape Planning

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Cluster development on least-sensitive portions of a site while leaving the remaining land in a natural undisturbed condition.

- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.

- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants.

- Promote natural vegetation by using parking lot islands and other landscaped areas.

- Preserve riparian areas and wetlands.

Maximize Natural Water Storage and Infiltration Opportunities Within the Landscape Unit

- Promote the conservation of forest cover. Building on land that is already deforested affects basin hydrology to a lesser extent than converting forested land. Loss of forest cover reduces interception storage, detention in the organic forest floor layer, and water losses by evapotranspiration, resulting in large peak runoff increases and either their negative effects or the expense of countering them with structural solutions.

- Maintain natural storage reservoirs and drainage corridors, including depressions, areas of permeable soils, swales, and intermittent streams. Develop and implement policies and regulations to discourage the clearing, filling, and channelization of these features. Utilize them in drainage networks in preference to pipes, culverts, and engineered ditches.

- Evaluating infiltration opportunities by referring to the stormwater management manual for the jurisdiction and pay particular attention to the selection criteria for avoiding groundwater contamination, poor soils, and hydrogeological conditions that cause these facilities to fail. If necessary, locate developments with large amounts of impervious surfaces or a potential to produce relatively contaminated runoff away from groundwater recharge areas.

Protection of Slopes and Channels during Landscape Design

- Convey runoff safely from the tops of slopes.
- Avoid disturbing steep or unstable slopes.
- Avoid disturbing natural channels.
- Stabilize disturbed slopes as quickly as possible.
- Vegetate slopes with native or drought tolerant vegetation.
- Control and treat flows in landscaping and/or other controls prior to reaching existing natural drainage systems.
- Stabilize temporary and permanent channel crossings as quickly as possible, and ensure that increases in run-off velocity and frequency caused by the project do not erode the channel.
- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion. Energy dissipaters shall be installed in such a way as to minimize impacts to receiving waters.
- Line on-site conveyance channels where appropriate, to reduce erosion caused by increased flow velocity due to increases in tributary impervious area. The first choice for linings should be grass or some other vegetative surface, since these materials not only reduce runoff velocities, but also provide water quality benefits from filtration and infiltration. If velocities in the channel are high enough to erode grass or other vegetative linings, riprap, concrete, soil cement, or geo-grid stabilization are other alternatives.
- Consider other design principles that are comparable and equally effective.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define “redevelopment” in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of “ redevelopment” must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under “designing new installations” above should be followed.

Redevelopment may present significant opportunity to add features which had not previously been implemented. Examples include incorporation of depressions, areas of permeable soils, and swales in newly redeveloped areas. While some site constraints may exist due to the status of already existing infrastructure, opportunities should not be missed to maximize infiltration, slow runoff, reduce impervious areas, disconnect directly connected impervious areas.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Stormwater Management Manual for Western Washington, Washington State Department of Ecology, August 2001.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Roof Runoff Controls SD-11

Rain Garden

Design Objectives

☑ Maximize Infiltration

☑ Provide Retention

☑ Slow Runoff

Minimize Impervious Land Coverage

Prohibit Dumping of Improper Materials

☑ Contain Pollutants

Collect and Convey

Description

Various roof runoff controls are available to address stormwater that drains off rooftops. The objective is to reduce the total volume and rate of runoff from individual lots, and retain the pollutants on site that may be picked up from roofing materials and atmospheric deposition. Roof runoff controls consist of directing the roof runoff away from paved areas and mitigating flow to the storm drain system through one of several general approaches: cisterns or rain barrels; dry wells or infiltration trenches; pop-up emitters, and foundation planting. The first three approaches require the roof runoff to be contained in a gutter and downspout system. Foundation planting provides a vegetated strip under the drip line of the roof.

Approach

Design of individual lots for single-family homes as well as lots for higher density residential and commercial structures should consider site design provisions for containing and infiltrating roof runoff or directing roof runoff to vegetative swales or buffer areas. Retained water can be reused for watering gardens, lawns, and trees. Benefits to the environment include reduced demand for potable water used for irrigation, improved stormwater quality, increased groundwater recharge, decreased runoff volume and peak flows, and decreased flooding potential.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment.

Design Considerations

Designing New Installations

Cisterns or Rain Barrels

One method of addressing roof runoff is to direct roof downspouts to cisterns or rain barrels. A cistern is an above ground storage vessel with either a manually operated valve or a permanently open outlet. Roof runoff is temporarily stored and then released for irrigation or infiltration between storms. The number of rain

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barrels needed is a function of the rooftop area. Some low impact developers recommend that every house have at least 2 rain barrels, with a minimum storage capacity of 1000 liters. Roof barrels serve several purposes including mitigating the first flush from the roof which has a high volume, amount of contaminants, and thermal load. Several types of rain barrels are commercially available. Consideration must be given to selecting rain barrels that are vector proof and childproof. In addition, some barrels are designed with a bypass valve that filters out grit and other contaminants and routes overflow to a soak-away pit or rain garden.

If the cistern has an operable valve, the valve can be closed to store stormwater for irrigation or infiltration between storms. This system requires continual monitoring by the resident or grounds crews, but provides greater flexibility in water storage and metering. If a cistern is provided with an operable valve and water is stored inside for long periods, the cistern must be covered to prevent mosquitoes from breeding.

A cistern system with a permanently open outlet can also provide for metering stormwater runoff. If the cistern outlet is significantly smaller than the size of the downspout inlet (say ¼ to ½ inch diameter), runoff will build up inside the cistern during storms, and will empty out slowly after peak intensities subside. This is a feasible way to mitigate the peak flow increases caused by rooftop impervious land coverage, especially for the frequent, small storms.

Dry wells and Infiltration Trenches

Roof downspouts can be directed to dry wells or infiltration trenches. A dry well is constructed by excavating a hole in the ground and filling it with an open graded aggregate, and allowing the water to fill the dry well and infiltrate after the storm event. An underground connection from the downspout conveys water into the dry well, allowing it to be stored in the voids. To minimize sedimentation from lateral soil movement, the sides and top of the stone storage matrix can be wrapped in a permeable filter fabric, though the bottom may remain open. A perforated observation pipe can be inserted vertically into the dry well to allow for inspection and maintenance.

In practice, dry wells receiving runoff from single roof downspouts have been successful over long periods because they contain very little sediment. They must be sized according to the amount of rooftop runoff received, but are typically 4 to 5 feet square, and 2 to 3 feet deep, with a minimum of 1-foot soil cover over the top (maximum depth of 10 feet).

To protect the foundation, dry wells must be set away from the building at least 10 feet. They must be installed in solids that accommodate infiltration. In poorly drained soils, dry wells have very limited feasibility.

Infiltration trenches function in a similar manner and would be particularly effective for larger roof areas. An infiltration trench is a long, narrow, rock-filled trench with no outlet that receives stormwater runoff. These are described under Treatment Controls.

Pop-up Drainage Emitter

Roof downspouts can be directed to an underground pipe that daylights some distance from the building foundation, releasing the roof runoff through a pop-up emitter. Similar to a pop-up irrigation head, the emitter only opens when there is flow from the roof. The emitter remains flush to the ground during dry periods, for ease of lawn or landscape maintenance.

Foundation Planting

Landscape planting can be provided around the base to allow increased opportunities for stormwater infiltration and protect the soil from erosion caused by concentrated sheet flow coming off the roof. Foundation plantings can reduce the physical impact of water on the soil and provide a subsurface matrix of roots that encourage infiltration. These plantings must be sturdy enough to tolerate the heavy runoff sheet flows, and periodic soil saturation.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Supplemental Information

Examples

- City of Ottawa's Water Links Surface –Water Quality Protection Program
- City of Toronto Downspout Disconnection Program
- City of Boston, MA, Rain Barrel Demonstration Program

Other Resources

Hager, Marty Catherine, Stormwater, "Low-Impact Development", January/February 2003. www.stormh2o.com

Low Impact Urban Design Tools, Low Impact Development Design Center, Beltsville, MD. www.lid-stormwater.net

Start at the Source, Bay Area Stormwater Management Agencies Association, 1999 Edition

Design Objectives

- ☑ Maximize Infiltration
- ☑ Provide Retention
- ☑ Slow Runoff
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description
Irrigation water provided to landscaped areas may result in excess irrigation water being conveyed into stormwater drainage systems.

Approach
Project plan designs for development and redevelopment should include application methods of irrigation water that minimize runoff of excess irrigation water into the stormwater conveyance system.

Suitable Applications
Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment. (Detached residential single-family homes are typically excluded from this requirement.)

Design Considerations
Designing New Installations
The following methods to reduce excessive irrigation runoff should be considered, and incorporated and implemented where determined applicable and feasible by the Permittee:

- Employ rain-triggered shutoff devices to prevent irrigation after precipitation.
- Design irrigation systems to each landscape area's specific water requirements.
- Include design featuring flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines.
- Implement landscape plans consistent with County or City water conservation resolutions, which may include provision of water sensors, programmable irrigation times (for short cycles), etc.

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- Design timing and application methods of irrigation water to minimize the runoff of excess irrigation water into the storm water drainage system.

- Group plants with similar water requirements in order to reduce excess irrigation runoff and promote surface filtration. Choose plants with low irrigation requirements (for example, native or drought tolerant species). Consider design features such as:

  - Using mulches (such as wood chips or bar) in planter areas without ground cover to minimize sediment in runoff

  - Installing appropriate plant materials for the location, in accordance with amount of sunlight and climate, and use native plant materials where possible and/or as recommended by the landscape architect

  - Leaving a vegetative barrier along the property boundary and interior watercourses, to act as a pollutant filter, where appropriate and feasible

  - Choosing plants that minimize or eliminate the use of fertilizer or pesticides to sustain growth

- Employ other comparable, equally effective methods to reduce irrigation water runoff.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Storm Drain Signage SD-13

Design Objectives

- Maximize Infiltration
- Provide Retention
- Slow Runoff
- Minimize Impervious Land Coverage
- ☑ Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Waste materials dumped into storm drain inlets can have severe impacts on receiving and ground waters. Posting notices regarding discharge prohibitions at storm drain inlets can prevent waste dumping. Storm drain signs and stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets.

Approach

The stencil or affixed sign contains a brief statement that prohibits dumping of improper materials into the urban runoff conveyance system. Storm drain messages have become a popular method of alerting the public about the effects of and the prohibitions against waste disposal.

Suitable Applications

Stencils and signs alert the public to the destination of pollutants discharged to the storm drain. Signs are appropriate in residential, commercial, and industrial areas, as well as any other area where contributions or dumping to storm drains is likely.

Design Considerations

Storm drain message markers or placards are recommended at all storm drain inlets within the boundary of a development project. The marker should be placed in clear sight facing toward anyone approaching the inlet from either side. All storm drain inlet locations should be identified on the development site map.

Designing New Installations

The following methods should be considered for inclusion in the project design and show on project plans:

- Provide stenciling or labeling of all storm drain inlets and catch basins, constructed or modified, within the project area with prohibitive language. Examples include "NO DUMPING

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– DRAINS TO OCEAN" and/or other graphical icons to discourage illegal dumping.

- Post signs with prohibitive language and/or graphical icons, which prohibit illegal dumping at public access points along channels and creeks within the project area.

Note - Some local agencies have approved specific signage and/or storm drain message placards for use. Consult local agency stormwater staff to determine specific requirements for placard types and methods of application.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. If the project meets the definition of "redevelopment", then the requirements stated under " designing new installations" above should be included in all project design plans.

Additional Information

Maintenance Considerations

- Legibility of markers and signs should be maintained. If required by the agency with jurisdiction over the project, the owner/operator or homeowner's association should enter into a maintenance agreement with the agency or record a deed restriction upon the property title to maintain the legibility of placards or signs.

Placement

- Signage on top of curbs tends to weather and fade.

- Signage on face of curbs tends to be worn by contact with vehicle tires and sweeper brooms.

Supplemental Information

Examples

- Most MS4 programs have storm drain signage programs. Some MS4 programs will provide stencils, or arrange for volunteers to stencil storm drains as part of their outreach program.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Maintenance Bays & Docks SD-31

Design Objectives

- Maximize Infiltration
- Provide Retention
- Slow Runoff
- Minimize Impervious Land Coverage
- ☑ Prohibit Dumping of Improper Materials
- ☑ Contain Pollutants
- Collect and Convey

Description

Several measures can be taken to prevent operations at maintenance bays and loading docks from contributing a variety of toxic compounds, oil and grease, heavy metals, nutrients, suspended solids, and other pollutants to the stormwater conveyance system.

Approach

In designs for maintenance bays and loading docks, containment is encouraged. Preventative measures include overflow containment structures and dead-end sumps. However, in the case of loading docks from grocery stores and warehouse/distribution centers, engineered infiltration systems may be considered.

Suitable Applications

Appropriate applications include commercial and industrial areas planned for development or redevelopment.

Design Considerations

Design requirements for vehicle maintenance and repair are governed by Building and Fire Codes, and by current local agency ordinances, and zoning requirements. The design criteria described in this fact sheet are meant to enhance and be consistent with these code requirements.

Designing New Installations

Designs of maintenance bays should consider the following:

- Repair/maintenance bays and vehicle parts with fluids should be indoors; or designed to preclude urban run-on and runoff.
- Repair/maintenance floor areas should be paved with Portland cement concrete (or equivalent smooth impervious surface).

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- Repair/maintenance bays should be designed to capture all wash water leaks and spills. Provide impermeable berms, drop inlets, trench catch basins, or overflow containment structures around repair bays to prevent spilled materials and wash-down waters form entering the storm drain system. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

- Other features may be comparable and equally effective.

The following designs of loading/unloading dock areas should be considered:

- Loading dock areas should be covered, or drainage should be designed to preclude urban run-on and runoff.

- Direct connections into storm drains from depressed loading docks (truck wells) are prohibited.

- Below-grade loading docks from grocery stores and warehouse/distribution centers of fresh food items should drain through water quality inlets, or to an engineered infiltration system, or an equally effective alternative. Pre-treatment may also be required.

- Other features may be comparable and equally effective.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Additional Information

Stormwater and non-stormwater will accumulate in containment areas and sumps with impervious surfaces. Contaminated accumulated water must be disposed of in accordance with applicable laws and cannot be discharged directly to the storm drain or sanitary sewer system without the appropriate permit.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Trash Storage Areas SD-32

Design Objectives

- Maximize Infiltration
- Provide Retention
- Slow Runoff
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- ☑ Contain Pollutants
- Collect and Convey

Description

Trash storage areas are areas where a trash receptacle (s) are located for use as a repository for solid wastes. Stormwater runoff from areas where trash is stored or disposed of can be polluted. In addition, loose trash and debris can be easily transported by water or wind into nearby storm drain inlets, channels, and/or creeks. Waste handling operations that may be sources of stormwater pollution include dumpsters, litter control, and waste piles.

Approach

This fact sheet contains details on the specific measures required to prevent or reduce pollutants in stormwater runoff associated with trash storage and handling. Preventative measures including enclosures, containment structures, and impervious pavements to mitigate spills, should be used to reduce the likelihood of contamination.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment. (Detached residential single-family homes are typically excluded from this requirement.)

Design Considerations

Design requirements for waste handling areas are governed by Building and Fire Codes, and by current local agency ordinances and zoning requirements. The design criteria described in this fact sheet are meant to enhance and be consistent with these code and ordinance requirements. Hazardous waste should be handled in accordance with legal requirements established in Title 22, California Code of Regulation.

Wastes from commercial and industrial sites are typically hauled by either public or commercial carriers that may have design or access requirements for waste storage areas. The design criteria in this fact sheet are recommendations and are not intended to be in conflict with requirements established by the waste hauler. The waste hauler should be contacted prior to the design of your site trash collection areas. Conflicts or issues should be discussed with the local agency.

Designing New Installations

Trash storage areas should be designed to consider the following structural or treatment control BMPs:

- Design trash container areas so that drainage from adjoining roofs and pavement is diverted around the area(s) to avoid run-on. This might include berming or grading the waste handling area to prevent run-on of stormwater.

- Make sure trash container areas are screened or walled to prevent off-site transport of trash.

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- Use lined bins or dumpsters to reduce leaking of liquid waste.
- Provide roofs, awnings, or attached lids on all trash containers to minimize direct precipitation and prevent rainfall from entering containers.
- Pave trash storage areas with an impervious surface to mitigate spills.
- Do not locate storm drains in immediate vicinity of the trash storage area.
- Post signs on all dumpsters informing users that hazardous materials are not to be disposed of therein.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Additional Information

Maintenance Considerations

The integrity of structural elements that are subject to damage (i.e., screens, covers, and signs) must be maintained by the owner/operator. Maintenance agreements between the local agency and the owner/operator may be required. Some agencies will require maintenance deed restrictions to be recorded of the property title. If required by the local agency, maintenance agreements or deed restrictions must be executed by the owner/operator before improvement plans are approved.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

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Drain Inserts MP-52

Description

Drain inserts are manufactured filters or fabric placed in a drop inlet to remove sediment and debris. There are a multitude of inserts of various shapes and configurations, typically falling into one of three different groups: socks, boxes, and trays. The sock consists of a fabric, usually constructed of polypropylene. The fabric may be attached to a frame or the grate of the inlet holds the sock. Socks are meant for vertical (drop) inlets. Boxes are constructed of plastic or wire mesh. Typically a polypropylene "bag" is placed in the wire mesh box. The bag takes the form of the box. Most box products are one box; that is, the setting area and filtration through media occur in the same box. Some products consist of one or more trays or mesh grates. The trays may hold different types of media. Filtration media vary by manufacturer. Types include polypropylene, porous polymer, treated cellulose, and activated carbon.

California Experience

The number of installations is unknown but likely exceeds a thousand. Some users have reported that these systems require considerable maintenance to prevent plugging and bypass.

Advantages

- Does not require additional space as inserts as the drain inlets are already a component of the standard drainage systems.
- Easy access for inspection and maintenance.
- As there is no standing water, there is little concern for mosquito breeding.
- A relatively inexpensive retrofit option.

Limitations

Performance is likely significantly less than treatment systems that are located at the end of the drainage system such as ponds and vaults. Usually not suitable for large areas or areas with trash or leaves than can plug the insert.

Design and Sizing Guidelines

Refer to manufacturer's guidelines. Drain inserts come any many configurations but can be placed into three general groups: socks, boxes, and trays. The sock consists of a fabric, usually constructed of polypropylene. The fabric may be attached to a frame or the grate of the inlet holds the sock. Socks are meant for vertical (drop) inlets. Boxes are constructed of plastic or wire mesh. Typically a polypropylene "bag" is placed in the wire mesh box. The bag takes the form of the box. Most box products are

Design Considerations

- Use with other BMPs
- Fit and Seal Capacity within Inlet

Targeted Constituents

- ☑ Sediment
- ☑ Nutrients
- ☑ Trash
- ☑ Metals
- Bacteria
- ☑ Oil and Grease
- ☑ Organics

Removal Effectiveness

See New Development and Redevelopment Handbook-Section 5.

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one box; that is, the setting area and filtration through media occurs in the same box. One manufacturer has a double-box. Stormwater enters the first box where setting occurs. The stormwater flows into the second box where the filter media is located. Some products consist of one or more trays or mesh grates. The trays can hold different types of media. Filtration media vary with the manufacturer: types include polypropylene, porous polymer, treated cellulose, and activated carbon.

Construction/Inspection Considerations

Be certain that installation is done in a manner that makes certain that the stormwater enters the unit and does not leak around the perimeter. Leakage between the frame of the insert and the frame of the drain inlet can easily occur with vertical (drop) inlets.

Performance

Few products have performance data collected under field conditions.

Siting Criteria

It is recommended that inserts be used only for retrofit situations or as pretreatment where other treatment BMPs presented in this section area used.

Additional Design Guidelines

Follow guidelines provided by individual manufacturers.

Maintenance

Likely require frequent maintenance, on the order of several times per year.

Cost

- The initial cost of individual inserts ranges from less than $100 to about $2,000. The cost of using multiple units in curb inlet drains varies with the size of the inlet.

- The low cost of inserts may tend to favor the use of these systems over other, more effective treatment BMPs. However, the low cost of each unit may be offset by the number of units that are required, more frequent maintenance, and the shorter structural life (and therefore replacement).

References and Sources of Additional Information

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Interagency Catch Basin Insert Committee, Evaluation of Commercially-Available Catch Basin Inserts for the Treatment of Stormwater Runoff from Developed Sites, 1995

Larry Walker Associates, June 1998, NDMP Inlet/In-Line Control Measure Study Report

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Santa Monica (City), Santa Monica Bay Municipal Stormwater/Urban Runoff Project - Evaluation of Potential Catch basin Retrofits, Woodward Clyde, September 24, 1998

Woodward Clyde, June 11, 1996, Parking Lot Monitoring Report, Santa Clara Valley Nonpoint Source Pollution Control Program.

Design Considerations

- Soil for Infiltration
- Slope
- Aesthetics

Targeted Constituents

☑	Sediment	■
☑	Nutrients	■
☑	Trash	■
☑	Metals	■
☑	Bacteria	■
☑	Oil and Grease	■
☑	Organics	■

Legend *(Removal Effectiveness)*

● Low ■ High

▲ Medium

Description

An infiltration basin is a shallow impoundment that is designed to infiltrate stormwater. Infiltration basins use the natural filtering ability of the soil to remove pollutants in stormwater runoff. Infiltration facilities store runoff until it gradually exfiltrates through the soil and eventually into the water table. This practice has high pollutant removal efficiency and can also help recharge groundwater, thus helping to maintain low flows in stream systems. Infiltration basins can be challenging to apply on many sites, however, because of soils requirements. In addition, some studies have shown relatively high failure rates compared with other management practices.

California Experience

Infiltration basins have a long history of use in California, especially in the Central Valley. Basins located in Fresno were among those initially evaluated in the National Urban Runoff Program and were found to be effective at reducing the volume of runoff, while posing little long-term threat to groundwater quality (EPA, 1983; Schroeder, 1995). Proper siting of these devices is crucial as underscored by the experience of Caltrans in siting two basins in Southern California. The basin with marginal separation from groundwater and soil permeability failed immediately and could never be rehabilitated.

Advantages

- Provides 100% reduction in the load discharged to surface waters.

- The principal benefit of infiltration basins is the approximation of pre-development hydrology during which a

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significant portion of the average annual rainfall runoff is infiltrated and evaporated rather than flushed directly to creeks.

- If the water quality volume is adequately sized, infiltration basins can be useful for providing control of channel forming (erosion) and high frequency (generally less than the 2-year) flood events.

Limitations

- May not be appropriate for industrial sites or locations where spills may occur.
- Infiltration basins require a minimum soil infiltration rate of 0.5 inches/hour, not appropriate at sites with Hydrologic Soil Types C and D.
- If infiltration rates exceed 2.4 inches/hour, then the runoff should be fully treated prior to infiltration to protect groundwater quality.
- Not suitable on fill sites or steep slopes.
- Risk of groundwater contamination in very coarse soils.
- Upstream drainage area must be completely stabilized before construction.
- Difficult to restore functioning of infiltration basins once clogged.

Design and Sizing Guidelines

- Water quality volume determined by local requirements or sized so that 85% of the annual runoff volume is captured.
- Basin sized so that the entire water quality volume is infiltrated within 48 hours.
- Vegetation establishment on the basin floor may help reduce the clogging rate.

Construction/Inspection Considerations

- Before construction begins, stabilize the entire area draining to the facility. If impossible, place a diversion berm around the perimeter of the infiltration site to prevent sediment entrance during construction or remove the top 2 inches of soil after the site is stabililized. Stabilize the entire contributing drainage area, including the side slopes, before allowing any runoff to enter once construction is complete.
- Place excavated material such that it can not be washed back into the basin if a storm occurs during construction of the facility.
- Build the basin without driving heavy equipment over the infiltration surface. Any equipment driven on the surface should have extra-wide ("low pressure") tires. Prior to any construction, rope off the infiltration area to stop entrance by unwanted equipment.
- After final grading, till the infiltration surface deeply.
- Use appropriate erosion control seed mix for the specific project and location.

Performance

As water migrates through porous soil and rock, pollutant attenuation mechanisms include precipitation, sorption, physical filtration, and bacterial degradation. If functioning properly, this approach is presumed to have high removal efficiencies for particulate pollutants and moderate removal of soluble pollutants. Actual pollutant removal in the subsurface would be expected to vary depending upon site-specific soil types. This technology eliminates discharge to surface waters except for the very largest storms; consequently, complete removal of all stormwater constituents can be assumed.

There remain some concerns about the potential for groundwater contamination despite the findings of the NURP and Nightingale (1975; 1987a,b,c; 1989). For instance, a report by Pitt et al. (1994) highlighted the potential for groundwater contamination from intentional and unintentional stormwater infiltration. That report recommends that infiltration facilities not be sited in areas where high concentrations are present or where there is a potential for spills of toxic material. Conversely, Schroeder (1995) reported that there was no evidence of groundwater impacts from an infiltration basin serving a large industrial catchment in Fresno, CA.

Siting Criteria

The key element in siting infiltration basins is identifying sites with appropriate soil and hydrogeologic properties, which is critical for long term performance. In one study conducted in Prince George's County, Maryland (Galli, 1992), all of the infiltration basins investigated clogged within 2 years. It is believed that these failures were for the most part due to allowing infiltration at sites with rates of less than 0.5 in/hr, basing siting on soil type rather than field infiltration tests, and poor construction practices that resulted in soil compaction of the basin invert.

A study of 23 infiltration basins in the Pacific Northwest showed better long-term performance in an area with highly permeable soils (Hilding, 1996). In this study, few of the infiltration basins had failed after 10 years. Consequently, the following guidelines for identifying appropriate soil and subsurface conditions should be rigorously adhered to.

- Determine soil type (consider RCS soil type 'A, B or C' only) from mapping and consult USDA soil survey tables to review other parameters such as the amount of silt and clay, presence of a restrictive layer or seasonal high water table, and estimated permeability. The soil should not have more than 30% clay or more than 40% of clay and silt combined. Eliminate sites that are clearly unsuitable for infiltration.

- Groundwater separation should be at least 3 m from the basin invert to the measured ground water elevation. There is concern at the state and regional levels of the impact on groundwater quality from infiltrated runoff, especially when the separation between groundwater and the surface is small.

- Location away from buildings, slopes and highway pavement (greater than 6 m) and wells and bridge structures (greater than 30 m). Sites constructed of fill, having a base flow or with a slope greater than 15% should not be considered.

- Ensure that adequate head is available to operate flow splitter structures (to allow the basin to be offline) without ponding in the splitter structure or creating backwater upstream of the splitter.

- Base flow should not be present in the tributary watershed.

Secondary Screening Based on Site Geotechnical Investigation

- At least three in-hole conductivity tests shall be performed using USBR 7300-89 or Bouwer-Rice procedures (the latter if groundwater is encountered within the boring), two tests at different locations within the proposed basin and the third down gradient by no more than approximately 10 m. The tests shall measure permeability in the side slopes and the bed within a depth of 3 m of the invert.

- The minimum acceptable hydraulic conductivity as measured in any of the three required test holes is 13 mm/hr. If any test hole shows less than the minimum value, the site should be disqualified from further consideration.

- Exclude from consideration sites constructed in fill or partially in fill unless no silts or clays are present in the soil boring. Fill tends to be compacted, with clays in a dispersed rather than flocculated state, greatly reducing permeability.

- The geotechnical investigation should be such that a good understanding is gained as to how the stormwater runoff will move in the soil (horizontally or vertically) and if there are any geological conditions that could inhibit the movement of water.

Additional Design Guidelines

(1) Basin Sizing - The required water quality volume is determined by local regulations or sufficient to capture 85% of the annual runoff.

(2) Provide pretreatment if sediment loading is a maintenance concern for the basin.

(3) Include energy dissipation in the inlet design for the basins. Avoid designs that include a permanent pool to reduce opportunity for standing water and associated vector problems.

(4) Basin invert area should be determined by the equation:

$$A = \frac{WQV}{kt}$$

where A = Basin invert area (m^2)

WQV = water quality volume (m^3)

k = 0.5 times the lowest field-measured hydraulic conductivity (m/hr)

t = drawdown time (48 hr)

(5) The use of vertical piping, either for distribution or infiltration enhancement shall not be allowed to avoid device classification as a Class V injection well per 40 CFR146.5(e)(4).

Maintenance

Regular maintenance is critical to the successful operation of infiltration basins. Recommended operation and maintenance guidelines include:

- Inspections and maintenance to ensure that water infiltrates into the subsurface completely (recommended infiltration rate of 72 hours or less) and that vegetation is carefully managed to prevent creating mosquito and other vector habitats.
- Observe drain time for the design storm after completion or modification of the facility to confirm that the desired drain time has been obtained.
- Schedule semiannual inspections for beginning and end of the wet season to identify potential problems such as erosion of the basin side slopes and invert, standing water, trash and debris, and sediment accumulation.
- Remove accumulated trash and debris in the basin at the start and end of the wet season.
- Inspect for standing water at the end of the wet season.
- Trim vegetation at the beginning and end of the wet season to prevent establishment of woody vegetation and for aesthetic and vector reasons.
- Remove accumulated sediment and regrade when the accumulated sediment volume exceeds 10% of the basin.
- If erosion is occurring within the basin, revegetate immediately and stabilize with an erosion control mulch or mat until vegetation cover is established.
- To avoid reversing soil development, scarification or other disturbance should only be performed when there are actual signs of clogging, rather than on a routine basis. Always remove deposited sediments before scarification, and use a hand-guided rotary tiller, if possible, or a disc harrow pulled by a very light tractor.

Cost

Infiltration basins are relatively cost-effective practices because little infrastructure is needed when constructing them. One study estimated the total construction cost at about $2 per ft (adjusted for inflation) of storage for a 0.25-acre basin (SWRPC, 1991). As with other BMPs, these published cost estimates may deviate greatly from what might be incurred at a specific site. For instance, Caltrans spent about $18/ft^3 for the two infiltration basins constructed in southern California, each of which had a water quality volume of about 0.34 ac.-ft. Much of the higher cost can be attributed to changes in the storm drain system necessary to route the runoff to the basin locations.

Infiltration basins typically consume about 2 to 3% of the site draining to them, which is relatively small. Additional space may be required for buffer, landscaping, access road, and fencing. Maintenance costs are estimated at 5 to 10% of construction costs.

One cost concern associated with infiltration practices is the maintenance burden and longevity. If improperly maintained, infiltration basins have a high failure rate. Thus, it may be necessary to replace the basin with a different technology after a relatively short period of time.

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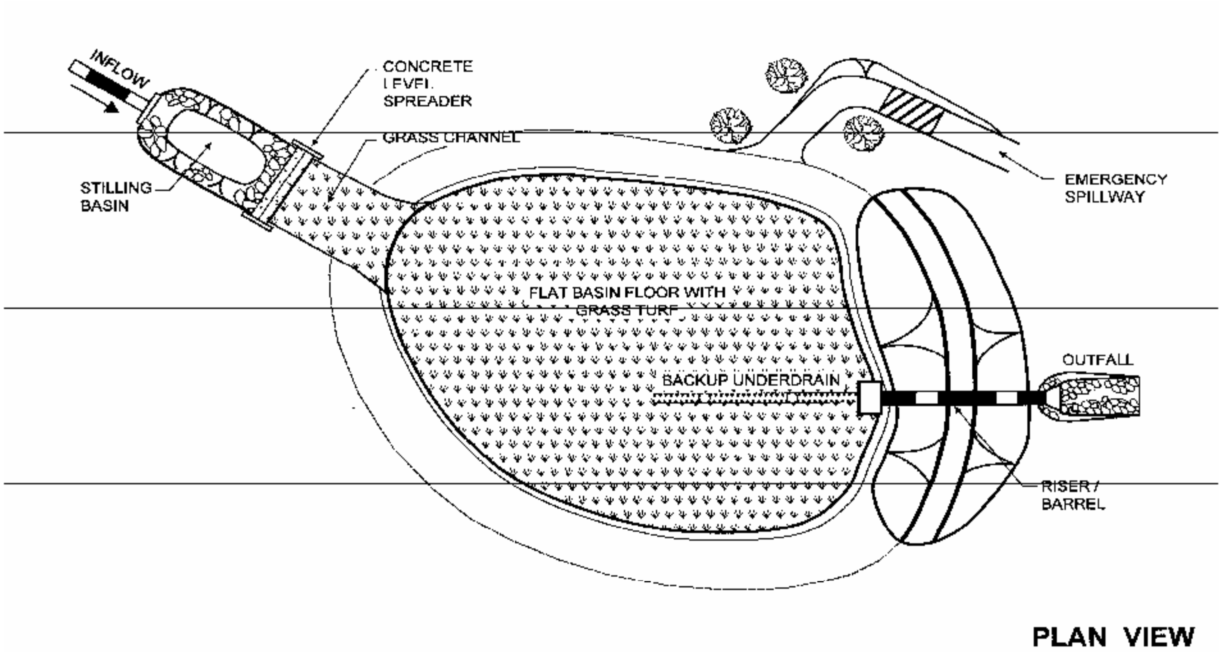
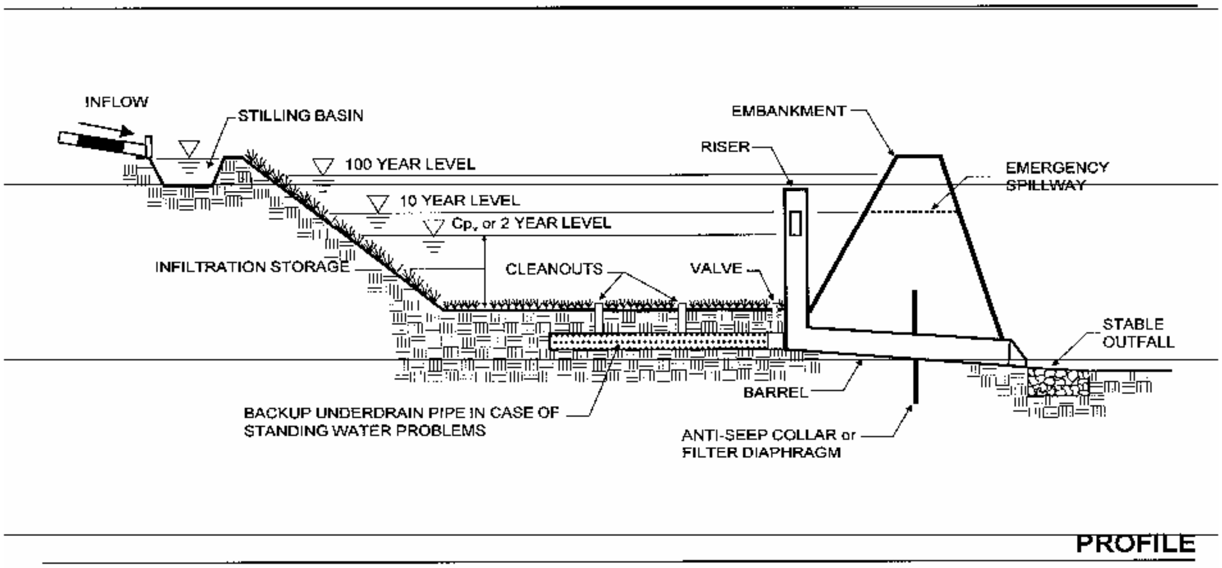
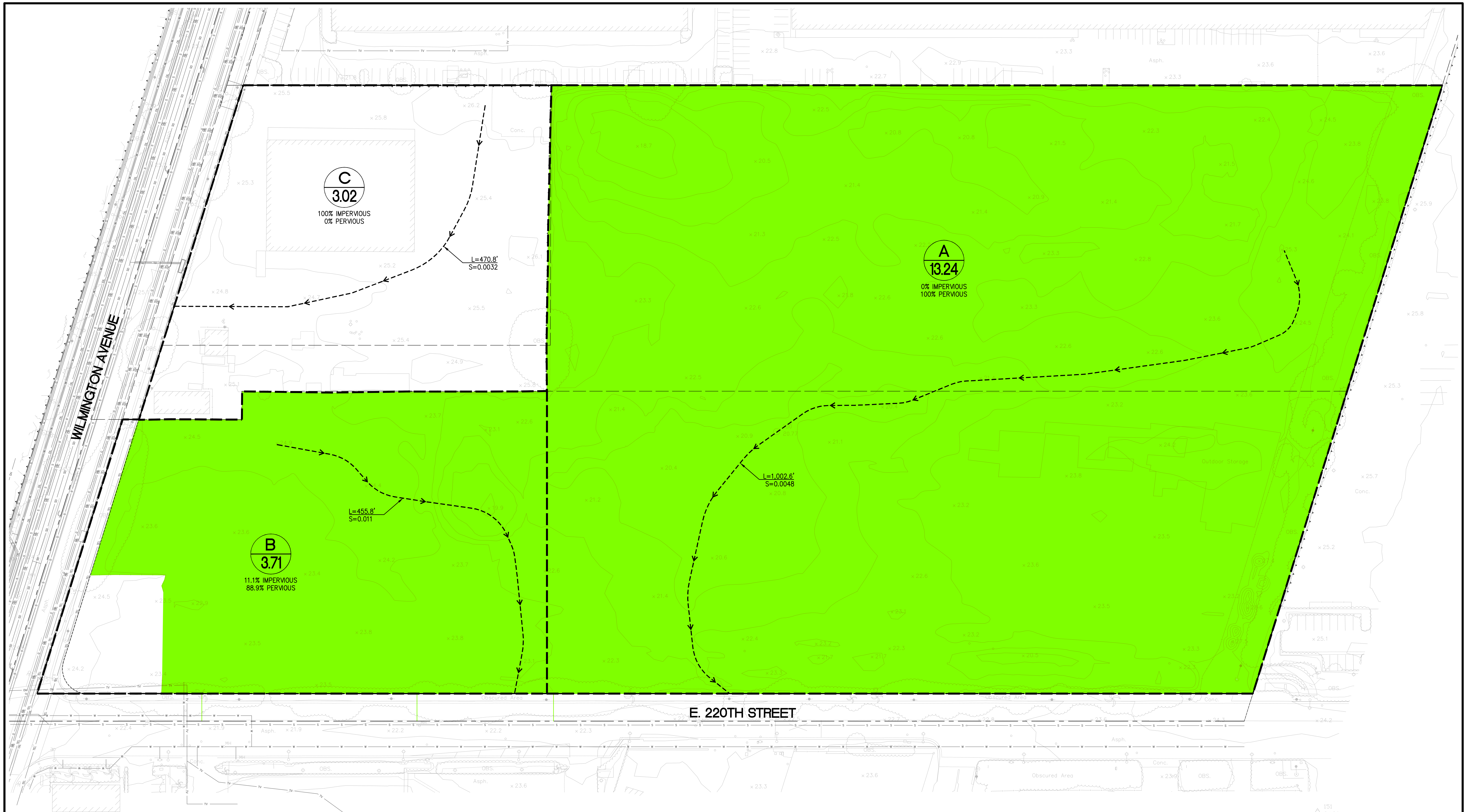

INFLOW
CONCRETE LEVEL SPREADER
GRASS CHANNEL
STILLING BASIN
EMERGENCY SPILLWAY
FLAT BASIN FLOOR WITH GRASS TURF
OUTFALL
BACKUP UNDERDRAIN
RISER / BARREL
PLAN VIEW


INFLOW
STILLING BASIN
EMBANKMENT
RISER
100 YEAR LEVEL
EMERGENCY SPILLWAY
10 YEAR LEVEL
Cp$_v$ or 2 YEAR LEVEL
INFILTRATION STORAGE
CLEANOUTS
VALVE
STABLE OUTFALL
BARREL
BACKUP UNDERDRAIN PIPE IN CASE OF STANDING WATER PROBLEMS
ANTI-SEEP COLLAR or FILTER DIAPHRAGM
PROFILE

ATTACHMENT C

SUSMP Calculations and BMP Details

- Proposed Hydrology Map
- Existing Hydrology Map
- LA County 25-year storm calculations
- Detention Summary
- Infiltration Sizing Summary
- Infiltration Basin Details
- Kristar Plus FloGard Filter Insert Details
- Stormtech SC-740 Arch Pipe System Details
- Infiltration Test Results



LEGEND

DRAINAGE SUBAREA BOUNDARY

I / 0.07 — DRAINAGE SUBAREA DESIGNATION / DRAINAGE SUBAREA IN ACRES

FLOW PATH

LANDSCAPE AREA

PROJECT:
DISTURBED AREA = 19.97 AC
PERCENTAGE PERVIOUS = 82.8%
(IN DISTURBED AREA)

FLOWRATE & TIME OF CONCENTRATION CALCULATIONS		
DRAINAGE AREA	Q_{25} (CFS)	Tc (MIN)
A	3.87	30
B	3.07	12
C	6.48	9
TOTALS:	13.42	

N

50' 0' 50' 100' 150'
GRAPHIC SCALE: 1"=50'

PREPARED BY:
DRC Engineering, Inc.
Civil Engineering/Land Surveying/Land Planning
160 S. Old Springs Road
Suite 210
Anaheim Hills, CA 92808
714-685-6860

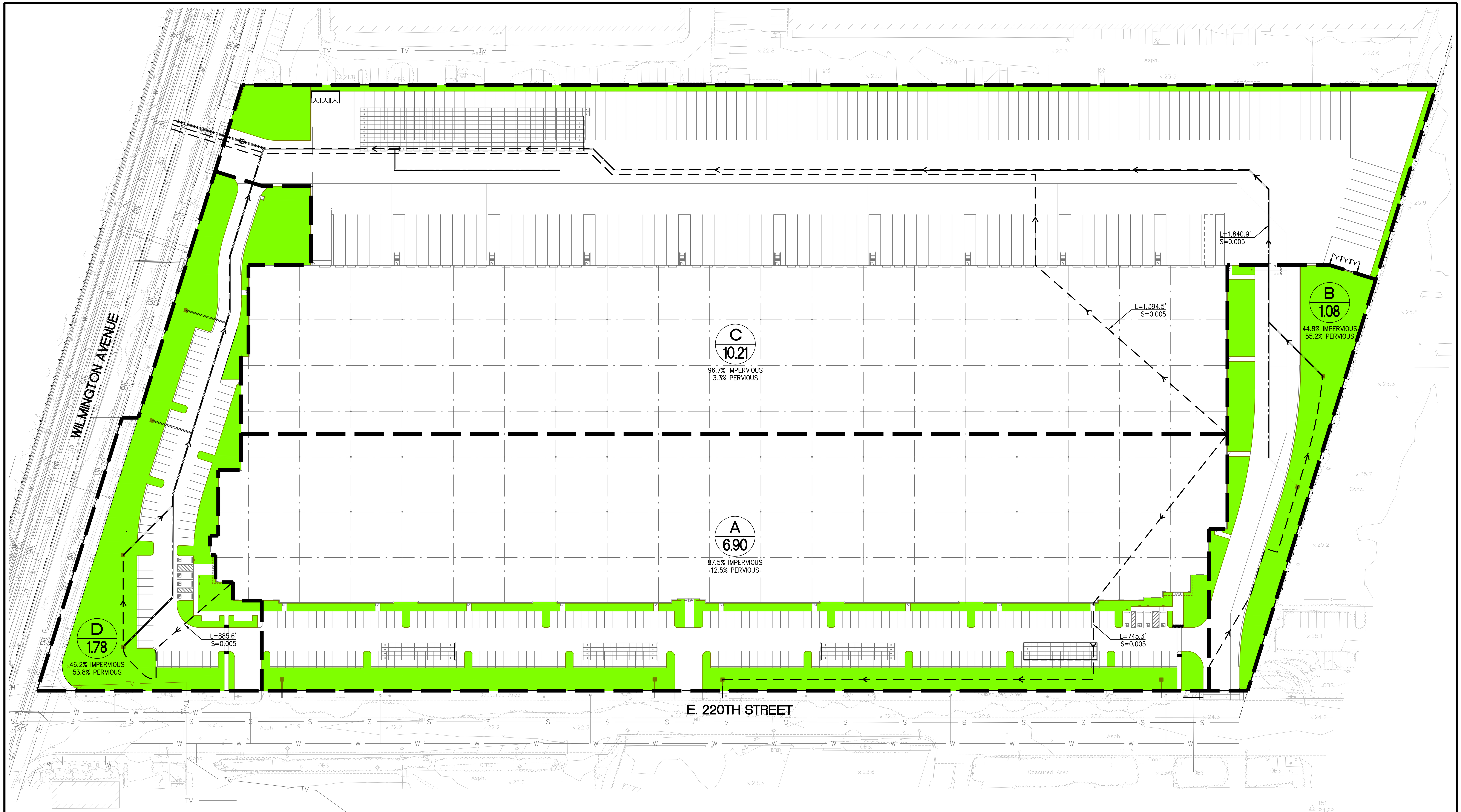
DATE:

NO.: REVISION:

PROJECT:
ALPERT METAL CARSON
2061 E. 220TH ST.
CARSON, CALIFORNIA

DRAWING NAME:
EXISTING HYDROLOGY MAP

ISSUE: HYDROLOGY
DATE: 11/02/15
CHECKED: CM DRAWN: LS
DRAWING FILE: 15859HMEX
PROJECT NO.: 15-859
SHEET NUMBER: 1
OF 1 SHEETS
SCALE: AS SHOWN



LEGEND

DRAINAGE SUBAREA BOUNDARY

I / 0.07 — DRAINAGE SUBAREA DESIGNATION / DRAINAGE SUBAREA IN ACRES

FLOW PATH

LANDSCAPE AREA

PROJECT:
DISTURBED AREA = 19.97 AC
PERCENTAGE PERVIOUS = 13.8%
(IN DISTURBED AREA)

FLOWRATE & TIME OF CONCENTRATION CALCULATIONS		
DRAINAGE AREA	Q_{25} (CFS)	T_c (MIN)
A	11.92	12
B	0.79	28
C	15.88	17
D	1.79	17
TOTALS:	30.38	

50' 0' 50' 100' 150'
GRAPHIC SCALE: 1"=50'

PREPARED BY:
DRC Engineering, Inc.
Civil Engineering/Land Surveying/Land Planning
160 S. Old Springs Road
Suite 210
Anaheim Hills, CA 92808
714-685-6860

DATE:

NO.: REVISION:

PROJECT:
ALPERT METAL CARSON
2061 E. 220TH ST.
CARSON, CALIFORNIA

DRAWING NAME:
PROPOSED HYDROLOGY MAP

ISSUE:	HYDROLOGY
DATE:	11/02/15
CHECKED: CM	DRAWN: TN
DRAWING FILE:	15859HMPR
PROJECT NO.:	15-859
SHEET NUMBER: 1 OF 1 SHEETS	
SCALE:	AS SHOWN

EXTERNAL REFERENCES: 15-859recbndy01 15-859 CT 15-859
FILENAME: M:\2015\15-859 AL2 LLC Carson\HM\15859 HMPR

Peak Flow Hydrologic Analysis

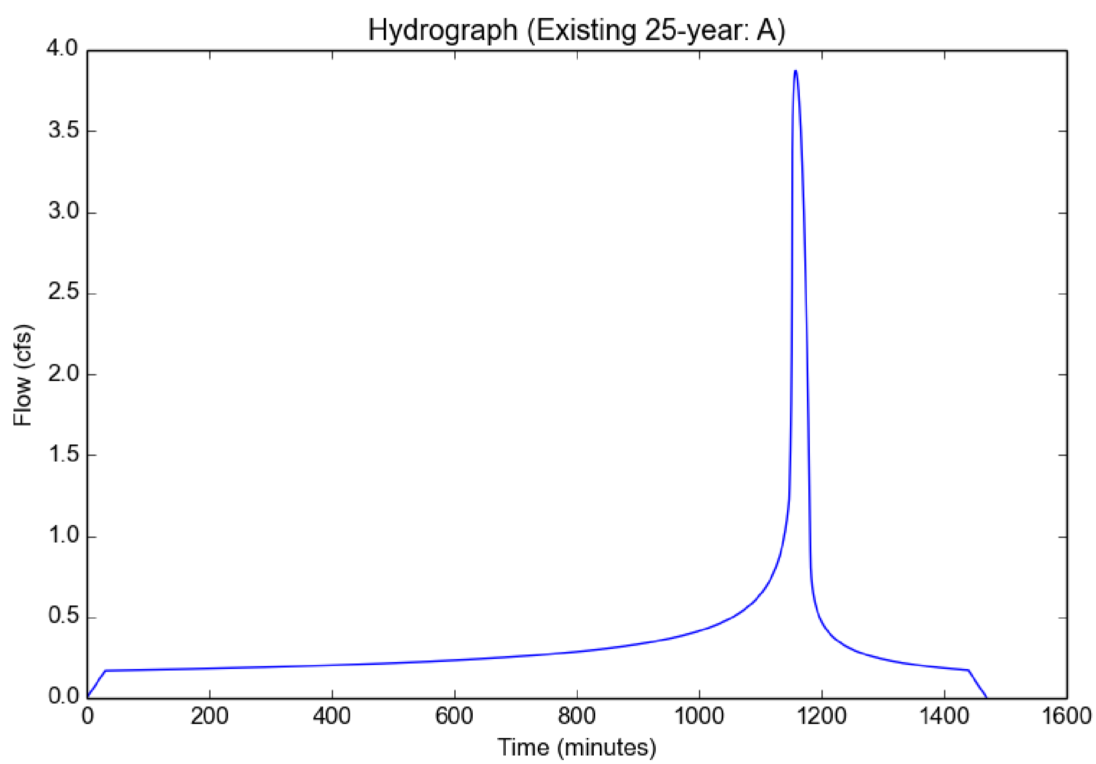
File location: U:/Lianne/15859 Existing 25-year - A.pdf
Version: HydroCalc 0.3.0-beta

Input Parameters

Project Name	Existing 25-year
Subarea ID	A
Area (ac)	13.24
Flow Path Length (ft)	1002.6
Flow Path Slope (vft/hft)	0.0048
50-yr Rainfall Depth (in)	6.0
Percent Impervious	0.01
Soil Type	3
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	5.268
Peak Intensity (in/hr)	1.354
Undeveloped Runoff Coefficient (Cu)	0.2091
Developed Runoff Coefficient (Cd)	0.216
Time of Concentration (min)	30.0
Clear Peak Flow Rate (cfs)	3.872
Burned Peak Flow Rate (cfs)	3.872
24-Hr Clear Runoff Volume (ac-ft)	0.6796
24-Hr Clear Runoff Volume (cu-ft)	29602.4405



Peak Flow Hydrologic Analysis

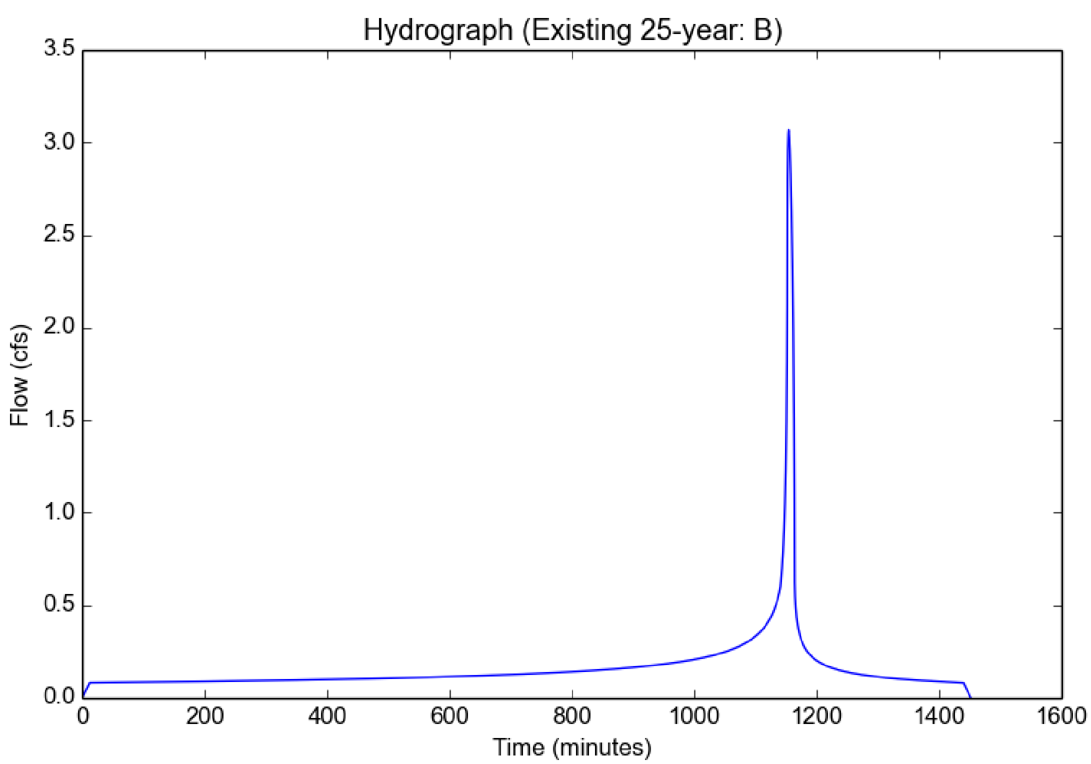
File location: U:/Lianne/15859 Existing 25-year - B.pdf
Version: HydroCalc 0.3.0-beta

Input Parameters

Project Name	Existing 25-year
Subarea ID	B
Area (ac)	3.71
Flow Path Length (ft)	455.8
Flow Path Slope (vft/hft)	0.011
50-yr Rainfall Depth (in)	6.0
Percent Impervious	0.111
Soil Type	3
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	5.268
Peak Intensity (in/hr)	2.0828
Undeveloped Runoff Coefficient (Cu)	0.3343
Developed Runoff Coefficient (Cd)	0.3971
Time of Concentration (min)	12.0
Clear Peak Flow Rate (cfs)	3.0687
Burned Peak Flow Rate (cfs)	3.0687
24-Hr Clear Runoff Volume (ac-ft)	0.3293
24-Hr Clear Runoff Volume (cu-ft)	14344.6702



Peak Flow Hydrologic Analysis

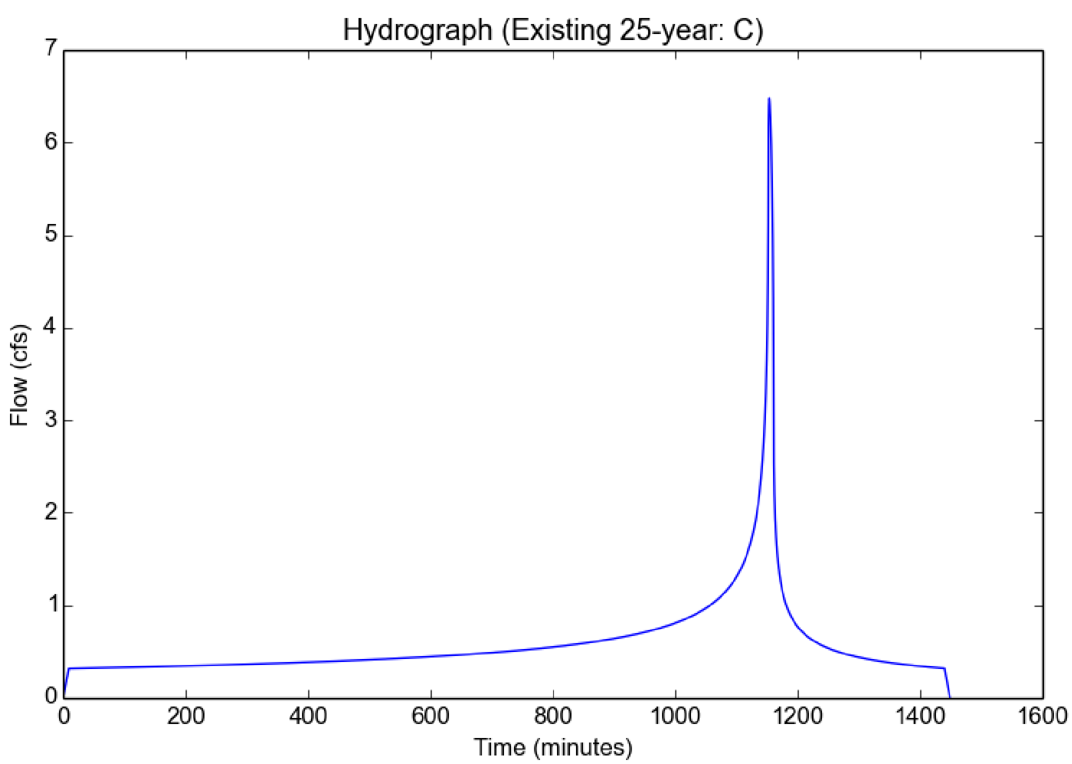
File location: U:/Lianne/15859 Existing 25-year - C.pdf
Version: HydroCalc 0.3.0-beta

Input Parameters

Project Name	Existing 25-year
Subarea ID	C
Area (ac)	3.02
Flow Path Length (ft)	470.8
Flow Path Slope (vft/hft)	0.0032
50-yr Rainfall Depth (in)	6.0
Percent Impervious	1.0
Soil Type	3
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	5.268
Peak Intensity (in/hr)	2.3844
Undeveloped Runoff Coefficient (Cu)	0.38
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	9.0
Clear Peak Flow Rate (cfs)	6.4807
Burned Peak Flow Rate (cfs)	6.4807
24-Hr Clear Runoff Volume (ac-ft)	1.1833
24-Hr Clear Runoff Volume (cu-ft)	51546.3789



Peak Flow Hydrologic Analysis

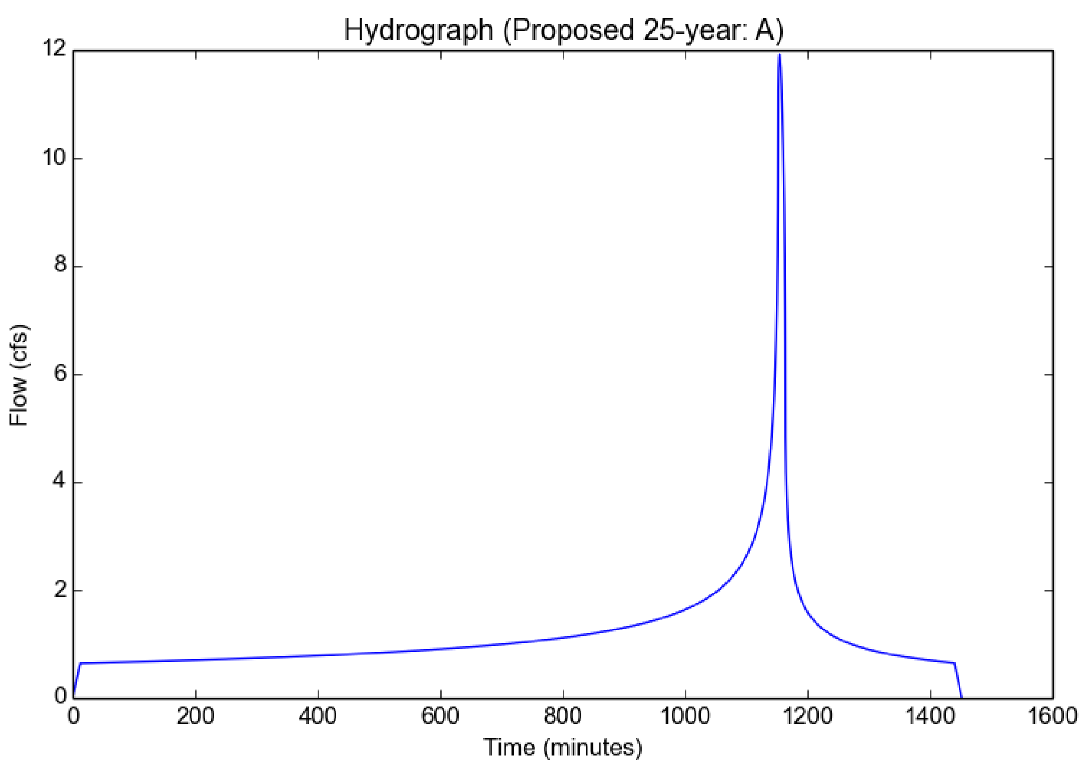
File location: U:/Lianne/15859 Proposed 25-year - A.pdf
Version: HydroCalc 0.3.0-beta

Input Parameters

Project Name	Proposed 25-year
Subarea ID	A
Area (ac)	6.9
Flow Path Length (ft)	745.3
Flow Path Slope (vft/hft)	0.005
50-yr Rainfall Depth (in)	6.0
Percent Impervious	0.875
Soil Type	3
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	5.268
Peak Intensity (in/hr)	2.0828
Undeveloped Runoff Coefficient (Cu)	0.3343
Developed Runoff Coefficient (Cd)	0.8293
Time of Concentration (min)	12.0
Clear Peak Flow Rate (cfs)	11.9181
Burned Peak Flow Rate (cfs)	11.9181
24-Hr Clear Runoff Volume (ac-ft)	2.4096
24-Hr Clear Runoff Volume (cu-ft)	104963.2901



Peak Flow Hydrologic Analysis

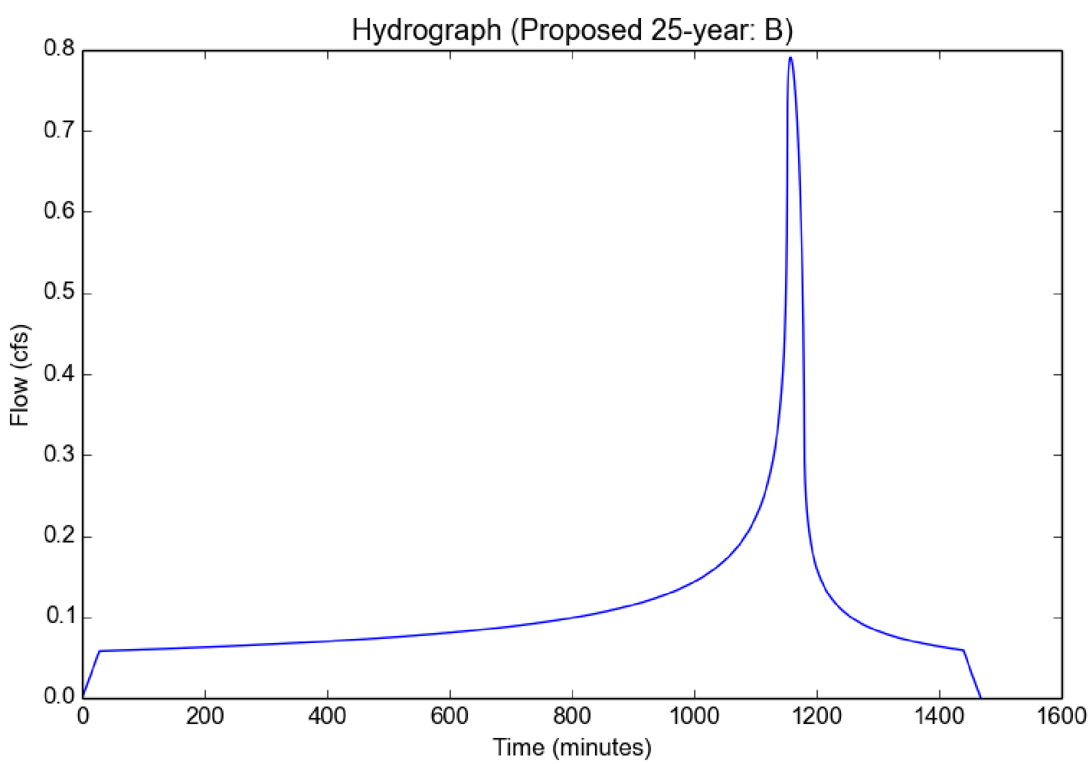
File location: U:/Lianne/15859 Proposed 25-year - B.pdf
Version: HydroCalc 0.3.0-beta

Input Parameters

Project Name	Proposed 25-year
Subarea ID	B
Area (ac)	1.08
Flow Path Length (ft)	1840.0
Flow Path Slope (vft/hft)	0.005
50-yr Rainfall Depth (in)	6.0
Percent Impervious	0.448
Soil Type	3
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	5.268
Peak Intensity (in/hr)	1.3986
Undeveloped Runoff Coefficient (Cu)	0.2178
Developed Runoff Coefficient (Cd)	0.5234
Time of Concentration (min)	28.0
Clear Peak Flow Rate (cfs)	0.7906
Burned Peak Flow Rate (cfs)	0.7906
24-Hr Clear Runoff Volume (ac-ft)	0.2183
24-Hr Clear Runoff Volume (cu-ft)	9509.5232



Peak Flow Hydrologic Analysis

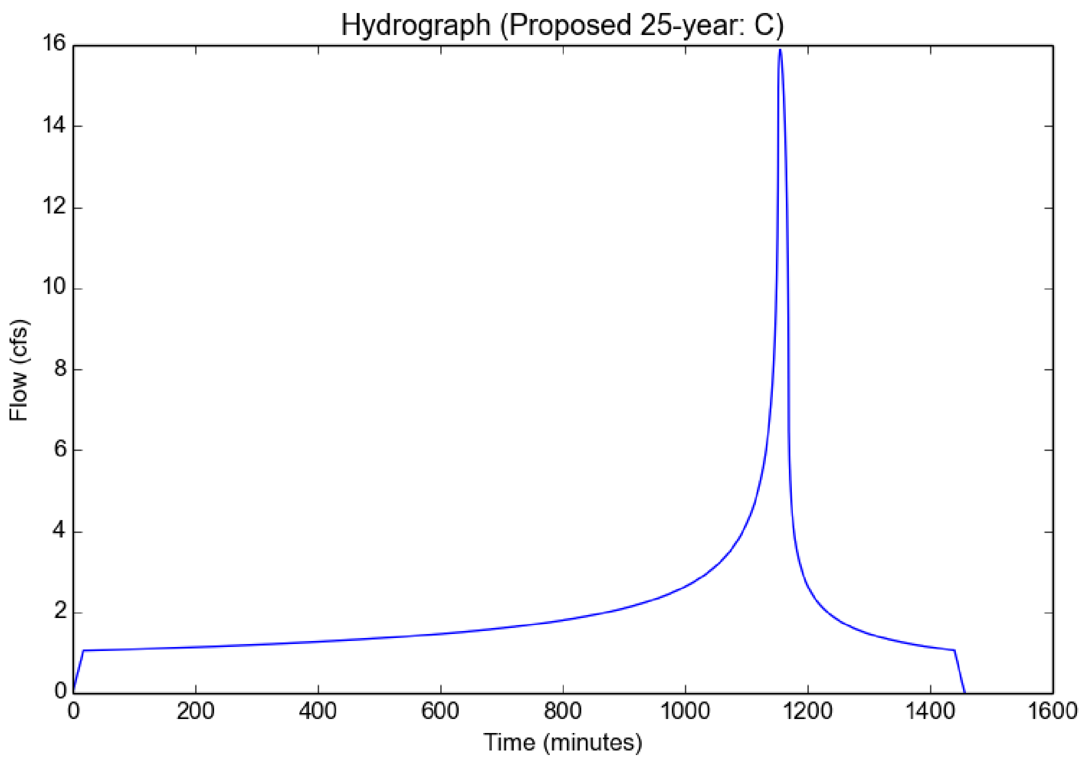
File location: U:/Lianne/15859 Proposed 25-year - C.pdf
Version: HydroCalc 0.3.0-beta

Input Parameters

Project Name	Proposed 25-year
Subarea ID	C
Area (ac)	10.21
Flow Path Length (ft)	1394.5
Flow Path Slope (vft/hft)	0.005
50-yr Rainfall Depth (in)	6.0
Percent Impervious	0.967
Soil Type	3
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	5.268
Peak Intensity (in/hr)	1.7683
Undeveloped Runoff Coefficient (Cu)	0.2867
Developed Runoff Coefficient (Cd)	0.8798
Time of Concentration (min)	17.0
Clear Peak Flow Rate (cfs)	15.8834
Burned Peak Flow Rate (cfs)	15.8834
24-Hr Clear Runoff Volume (ac-ft)	3.8855
24-Hr Clear Runoff Volume (cu-ft)	169251.5377



Peak Flow Hydrologic Analysis

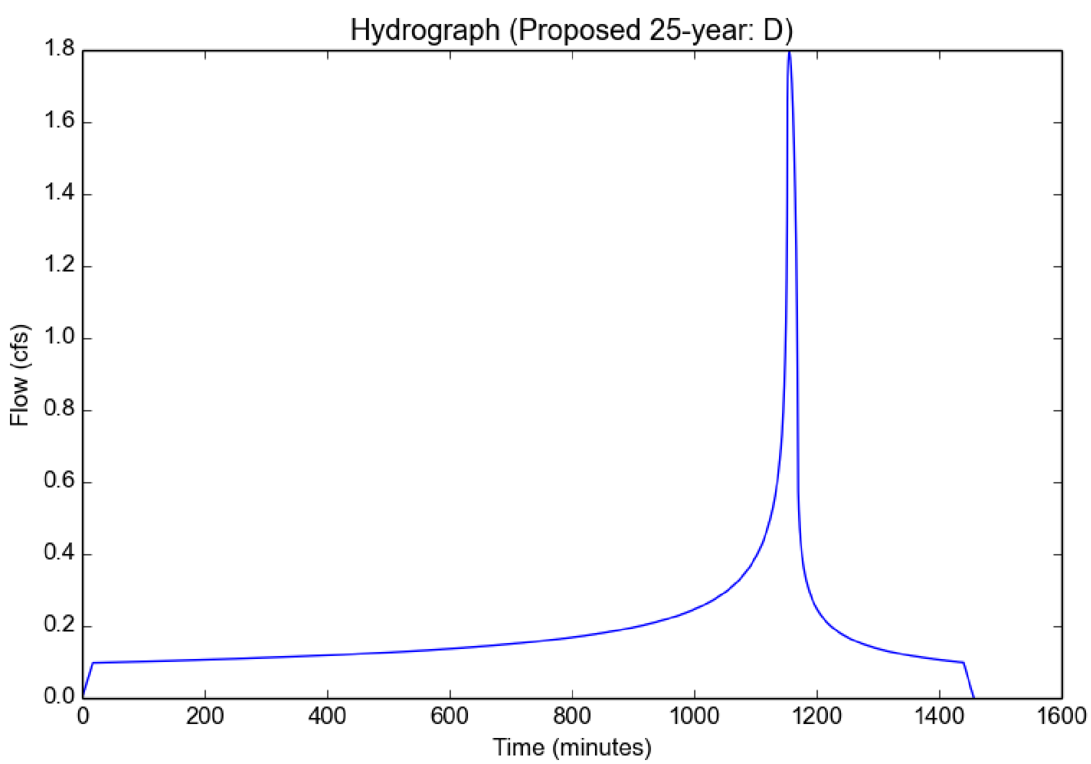
File location: U:/Lianne/15859 Proposed 25-year - D.pdf
Version: HydroCalc 0.3.0-beta

Input Parameters

Project Name	Proposed 25-year
Subarea ID	D
Area (ac)	1.78
Flow Path Length (ft)	885.6
Flow Path Slope (vft/hft)	0.005
50-yr Rainfall Depth (in)	6.0
Percent Impervious	0.462
Soil Type	3
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	5.268
Peak Intensity (in/hr)	1.7683
Undeveloped Runoff Coefficient (Cu)	0.2867
Developed Runoff Coefficient (Cd)	0.57
Time of Concentration (min)	17.0
Clear Peak Flow Rate (cfs)	1.7942
Burned Peak Flow Rate (cfs)	1.7942
24-Hr Clear Runoff Volume (ac-ft)	0.3701
24-Hr Clear Runoff Volume (cu-ft)	16123.1464



Peak Flow Hydrologic Analysis

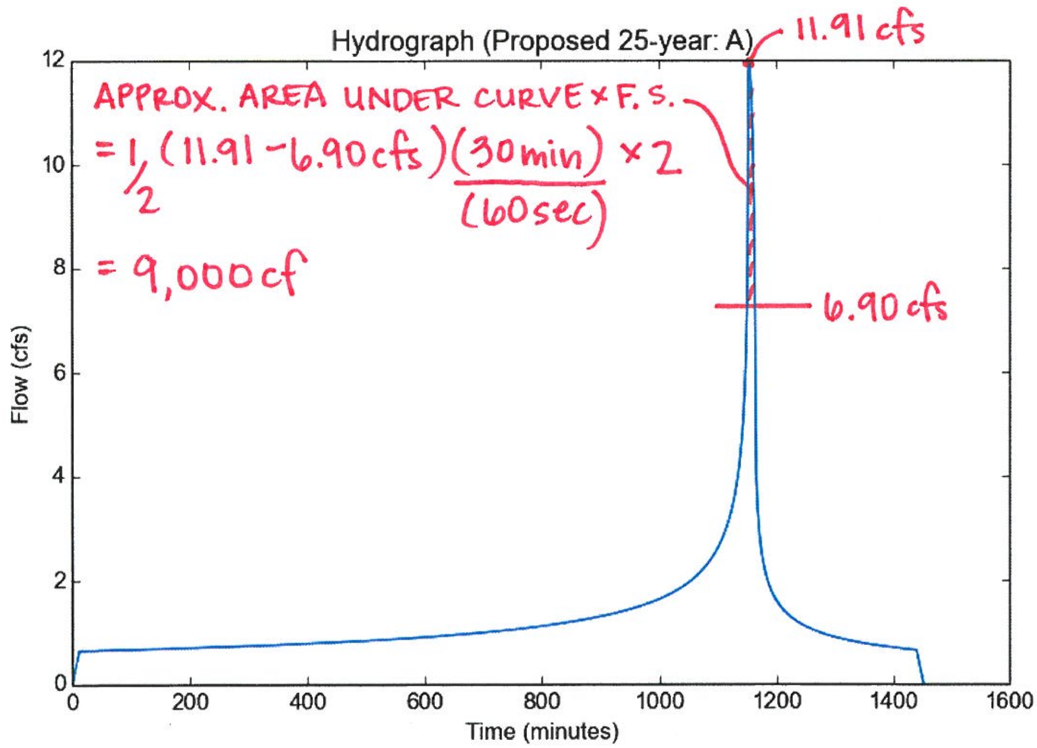
File location: U:/Lianne/15859 Proposed 25-year - A.pdf
Version: HydroCalc 0.3.0-beta

Input Parameters

Project Name	Proposed 25-year
Subarea ID	A
Area (ac)	6.9
Flow Path Length (ft)	745.3
Flow Path Slope (vft/hft)	0.005
50-yr Rainfall Depth (in)	6.0
Percent Impervious	0.875
Soil Type	3
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	5.268
Peak Intensity (in/hr)	2.0828
Undeveloped Runoff Coefficient (Cu)	0.3343
Developed Runoff Coefficient (Cd)	0.8293
Time of Concentration (min)	12.0
Clear Peak Flow Rate (cfs)	11.9181
Burned Peak Flow Rate (cfs)	11.9181
24-Hr Clear Runoff Volume (ac-ft)	2.4096
24-Hr Clear Runoff Volume (cu-ft)	104963.2901



Peak Flow Hydrologic Analysis

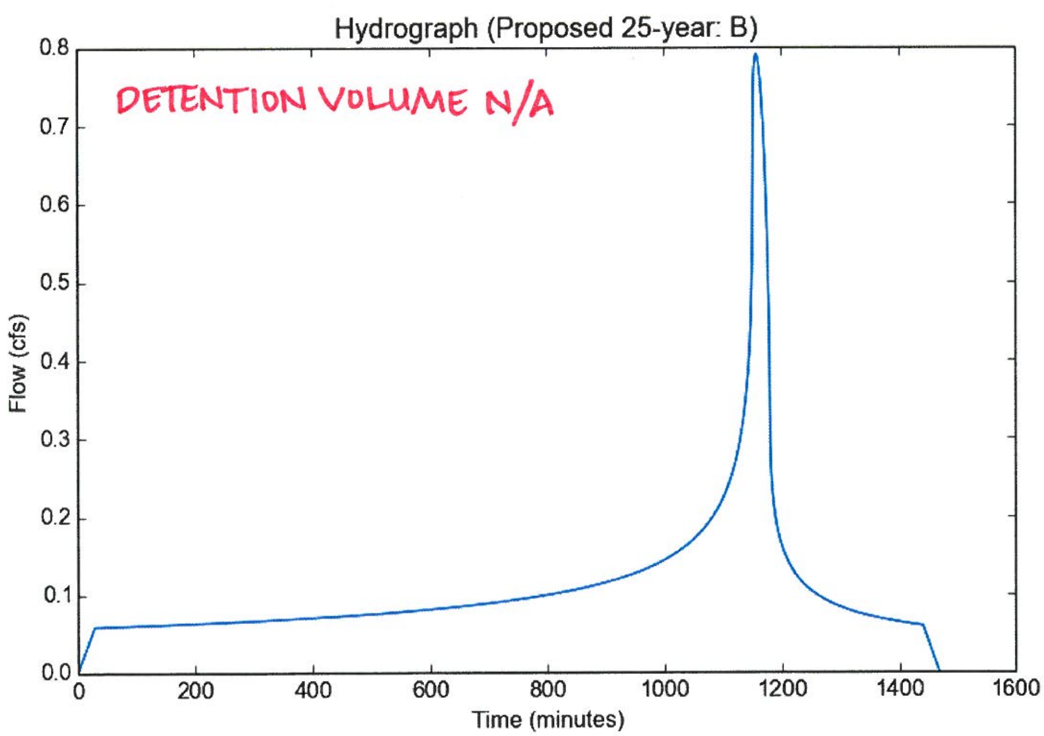
File location: U:/Lianne/15859 Proposed 25-year - B.pdf
Version: HydroCalc 0.3.0-beta

Input Parameters

Project Name	Proposed 25-year
Subarea ID	B
Area (ac)	1.08
Flow Path Length (ft)	1840.0
Flow Path Slope (vft/hft)	0.005
50-yr Rainfall Depth (in)	6.0
Percent Impervious	0.448
Soil Type	3
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	5.268
Peak Intensity (in/hr)	1.3986
Undeveloped Runoff Coefficient (Cu)	0.2178
Developed Runoff Coefficient (Cd)	0.5234
Time of Concentration (min)	28.0
Clear Peak Flow Rate (cfs)	0.7906
Burned Peak Flow Rate (cfs)	0.7906
24-Hr Clear Runoff Volume (ac-ft)	0.2183
24-Hr Clear Runoff Volume (cu-ft)	9509.5232



Peak Flow Hydrologic Analysis

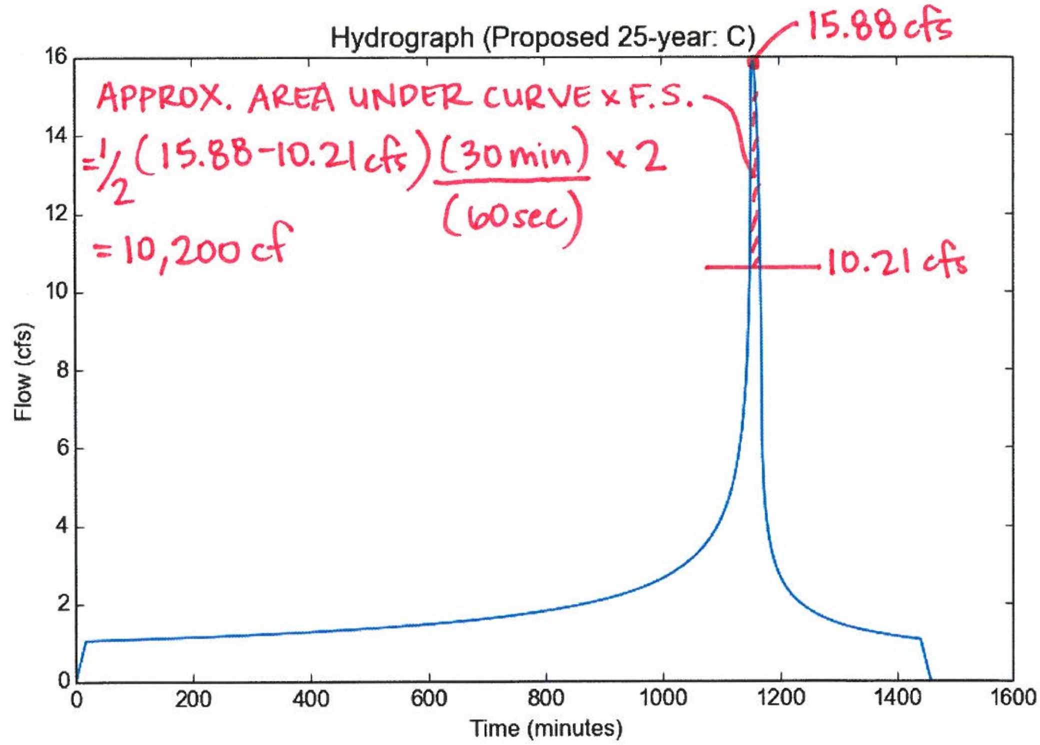
File location: U:/Lianne/15859 Proposed 25-year - C.pdf
Version: HydroCalc 0.3.0-beta

Input Parameters

Project Name	Proposed 25-year
Subarea ID	C
Area (ac)	10.21
Flow Path Length (ft)	1394.5
Flow Path Slope (vft/hft)	0.005
50-yr Rainfall Depth (in)	6.0
Percent Impervious	0.967
Soil Type	3
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	5.268
Peak Intensity (in/hr)	1.7683
Undeveloped Runoff Coefficient (Cu)	0.2867
Developed Runoff Coefficient (Cd)	0.8798
Time of Concentration (min)	17.0
Clear Peak Flow Rate (cfs)	15.8834
Burned Peak Flow Rate (cfs)	15.8834
24-Hr Clear Runoff Volume (ac-ft)	3.8855
24-Hr Clear Runoff Volume (cu-ft)	169251.5377



Peak Flow Hydrologic Analysis

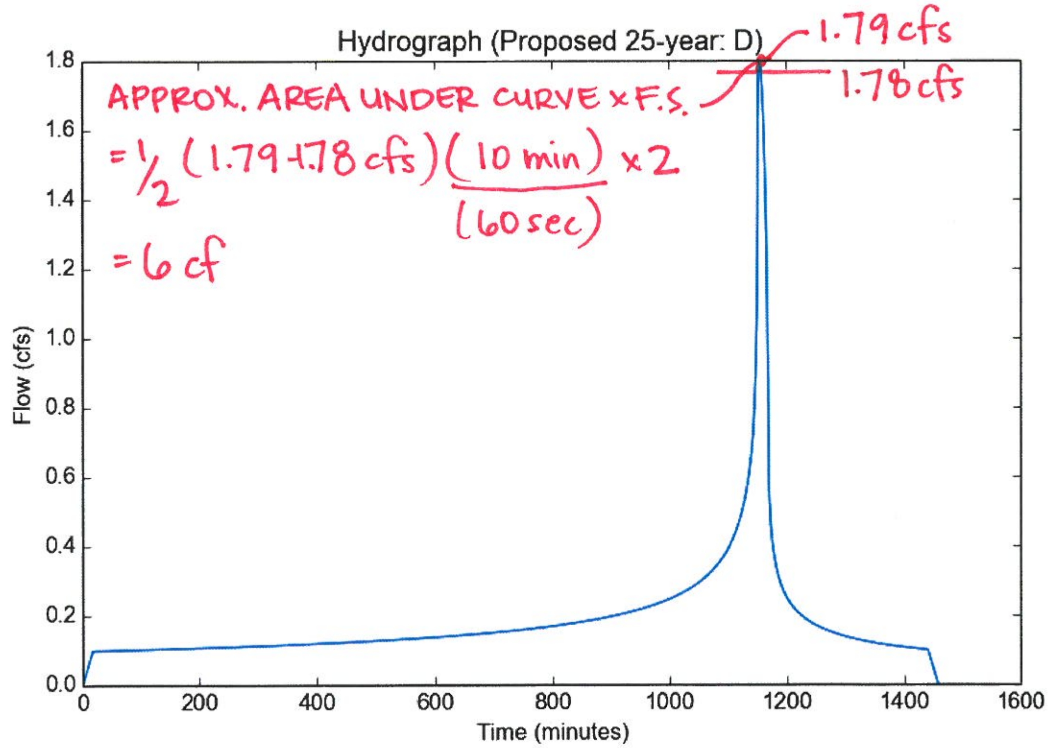
File location: U:/Lianne/15859 Proposed 25-year - D.pdf
Version: HydroCalc 0.3.0-beta

Input Parameters

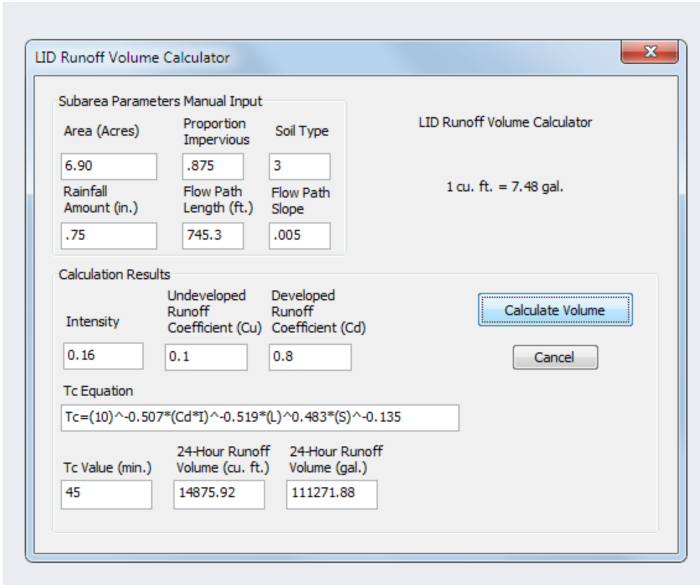
Project Name	Proposed 25-year
Subarea ID	D
Area (ac)	1.78
Flow Path Length (ft)	885.6
Flow Path Slope (vft/hft)	0.005
50-yr Rainfall Depth (in)	6.0
Percent Impervious	0.462
Soil Type	3
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

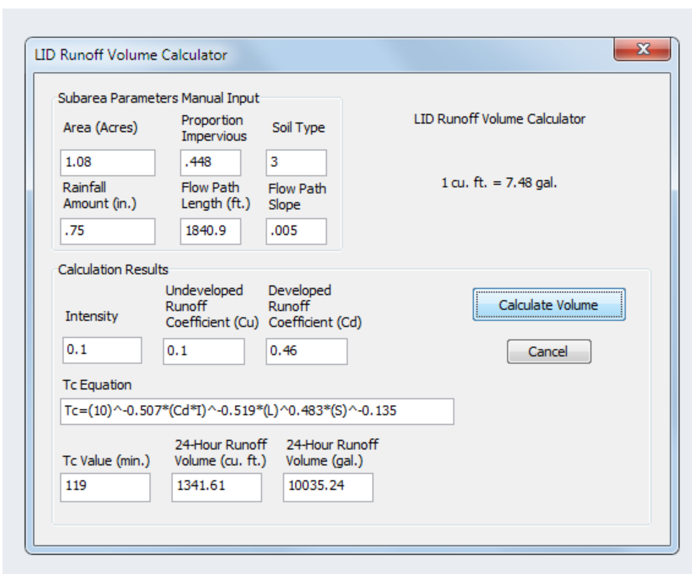
Modeled (25-yr) Rainfall Depth (in)	5.268
Peak Intensity (in/hr)	1.7683
Undeveloped Runoff Coefficient (Cu)	0.2867
Developed Runoff Coefficient (Cd)	0.57
Time of Concentration (min)	17.0
Clear Peak Flow Rate (cfs)	1.7942
Burned Peak Flow Rate (cfs)	1.7942
24-Hr Clear Runoff Volume (ac-ft)	0.3701
24-Hr Clear Runoff Volume (cu-ft)	16123.1464



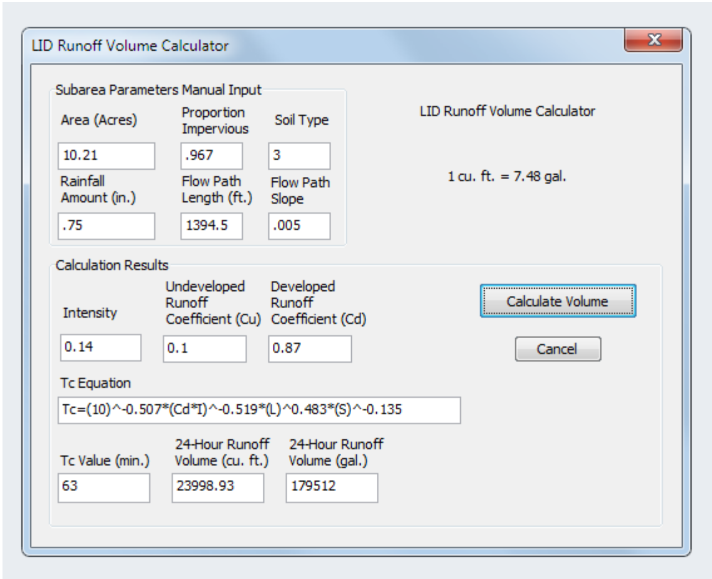
LID Volume Calculator - Proposed Area A



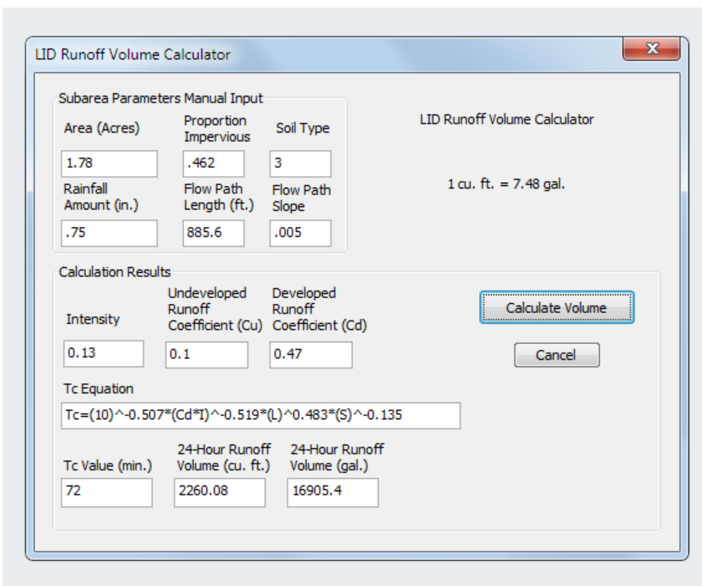
LID Volume Calculator - Proposed Area B



LID Volume Calculator - Proposed Area C



LID Volume Calculator - Proposed Area D



Detention Summary

Areas Tributary to 220th Street

Proposed Subarea A

Total Area = 6.90 acres

Q25allowable = 6.90 cfs

Q25actual (with detention) = 6.90 cfs

Detention storage volume required = 9,000 cf

Detention storage volume provided (Stormtech SC-740 units):

Proposed 128 Units @ 74.9 CF/Unit = $\boxed{\text{9,587 cf}}$ O.K.

Areas Tributary to Wilmington Avenue

Proposed Subareas B-D

Total Area = 13.07 acres

Q25allowable = 13.07 cfs

Q25actual (with detention) = 13.07 cfs

Detention storage volume required = 10,200 cf

Detention storage volume provided (Stormtech SC-740 units):

Proposed 140 Units @ 74.9 CF/Unit = $\boxed{\text{10,486 cf}}$ O.K.

Total storage volume provided:

9,587 cf + 10,486 cf = $\boxed{\text{20,073 cf}}$

Infiltration Summary

Areas Tributary to 220th Street
Proposed Subarea A
Total Area = 6.90 acres
LID Volume Required = 14,876 cf
Infiltration Basin Volume Provided = 11,682 cf
Underground Infiltration Volume Provided = 3,595 cf
Total Volume Provided = 11,682 cf + 3,595 cf = 15,277 cf
Vol. provided = 15,277 cf > Vol. required = 14,876 cf ✓ O.K.

Areas Tributary to Wilmington Avenue
Proposed Subarea B
Total Area = 1.08 acres
LID Volume Required = 1,342 cf
Infiltration Basin Volume Provided = 5,175 cf

Proposed Subarea C
Total Area = 10.21 acres
LID Volume Required = 23,999 cf
Underground Infiltration Volume Provided = 14,980 cf

Proposed Subarea D
Total Area = 1.78 acres
LID Volume Required = 2,260 cf
Infiltration Basin Volume Provided = 8,197 cf cf

Total Volume Required = 1,342 cf + 23,999 cf + 2,260 cf = 27,601 cf
Total Volume Provided = 5,175 cf + 14,980 cf + 8,197 cf = 28,352 cf
Vol. provided = 28,352 cf > Vol. required = 27,601 cf ✓ O.K.

RET-2: Infiltration Basin

Description

An infiltration basin is a shallow earthen basin constructed in naturally permeable soil designed for retaining and infiltrating stormwater runoff into the underlying native soils and the groundwater table. The bottoms of the basins are typically vegetated with dry-land grasses or irrigated turf grass. Infiltration basins can provide stormwater runoff treatment through a variety of natural mechanisms (i.e., filtration, adsorption, biological degradation) as water flows through the soil profile.

A schematic of a typical infiltration basin is presented in Figure E-2.

LID Ordinance Requirements

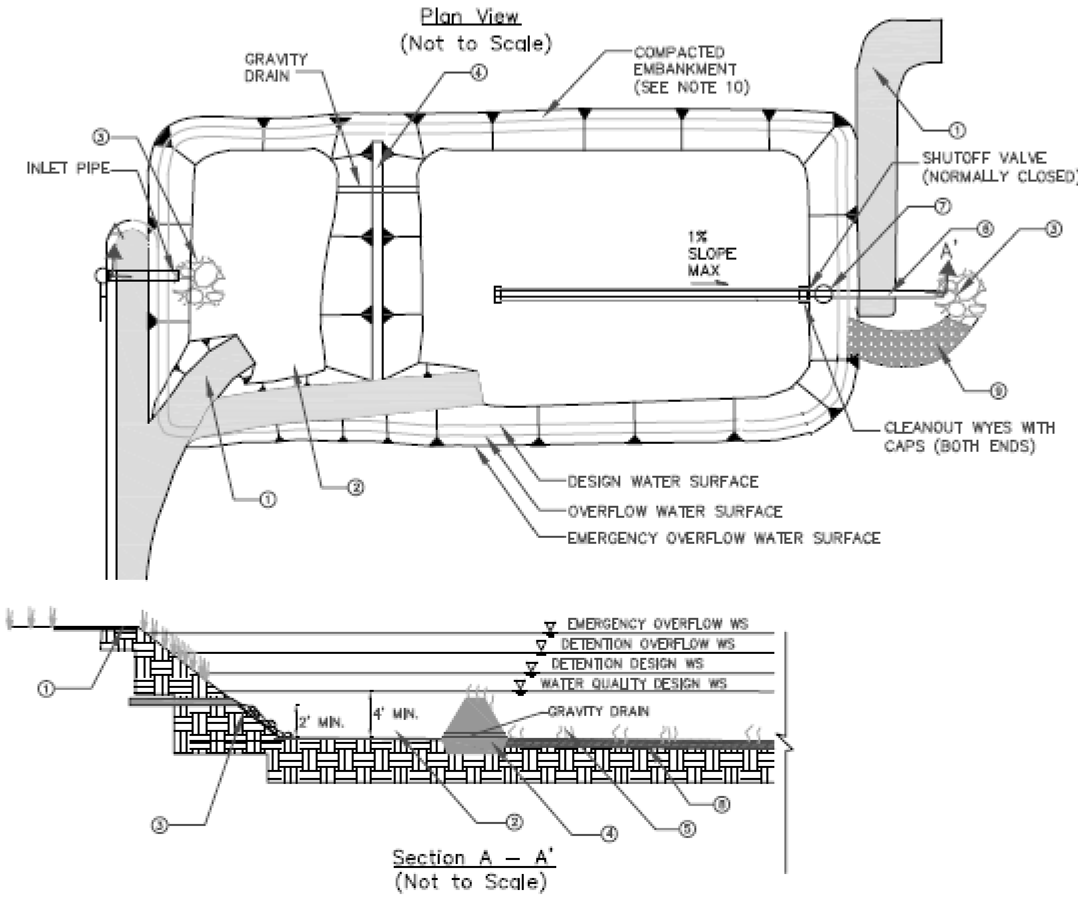
Infiltration basins can be used to meet the on-site retention requirements of the LID Ordinance. Infiltration basins will prevent pollutants in the SWQDv from being discharged off-site.

Advantages

- Retains stormwater runoff and eliminates pollutant discharge
- Reduces peak stormwater runoff flows, which provides erosion control
- Provides groundwater recharge

Disadvantages

- May not be appropriate for areas with too low or too high permeability soils
- May not be appropriate for industrial sites or locations with contaminated soils or where spills may occur because of the potential threat to groundwater contamination
- Must be protected from high sediment loads
- May result in standing water, which may allow vector breeding
- Has a large footprint
- Is not appropriate on fill or sites with steep slopes



NOTES:

1. MAINTENANCE RAMP SHOULD BE PAVED. SLOPE SHOULD NOT EXCEED 12%. MAINTENANCE RAMP SHOULD PROVIDE ACCESS TO BOTH THE FIRST CELL AND MAIN BASIN.
2. UPSTREAM PRETREATMENT SHALL BE PROVIDED. SEDIMENT FOREBAY WITH VOLUME EQUAL TO 25% OF TOTAL INFILTRATION BASIN VOLUME MAY BE USED IN LIEU OF UPSTREAM PRETREATMENT. DEPTH SHALL BE 4' MIN TO 8' MAX PLUS AN ADDITIONAL 1 FOOT MIN SEDIMENT STORAGE DEPTH.
3. RIP RAP APRON OR OTHER ENERGY DISSIPATION.
4. EXTEND EARTHEN BERM ACROSS ENTIRE WIDTH OF THE INFILTRATION BASIN.
5. INFILTRATION BASIN BOTTOM AND SIDE SLOPES SHALL BE PLANTED WITH DROUGHT TOLERANT VEGETATION. DEEP ROOTED VEGETATION PREFERRED FOR BASIN BOTTOM. NO TOPSOIL SHALL BE ADDED TO INFILTRATION BASIN BED.
6. SIZE OUTLET PIPE TO PASS CAPITAL DESIGN PEAK FLOW FOR ON–LINE INFILTRATION BASINS AND WATER QUALITY PEAK FLOW FOR OFF–LINE INFILTRATION BASINS.
7. WATER QUALITY OUTLET STRUCTURE. SEE FIGURE 7–2 AND FIGURE 7–3 FOR DETAILS.
8. OVER EXCAVATE BASIN BOTTOM 1 FOOT. RE–PLACE EXCAVATED MATERIAL UNIFORMLY WITHOUT COMPACTION. AMENDING EXCAVATED MATERIAL WITH 2" – 4" OF COARSE SAND IS RECOMMENDED FOR SOILS WITH BORDER LINE INFILTRATION CAPACITY.
9. INSTALL EMERGENCY OVERFLOW SPILLWAY AS NEEDED. SEE FIGURE 2–4 FOR DETAILS
10. EMBANKMENT SIDE SLOPES SHALL BE NO STEEPER THAN 3H:1V BOTH OUTSIDE AND INSIDE.

Figure E-2. Infiltration Basin Schematic

General Constraints and Implementation Considerations

- Infiltration basins can be applied to a variety of situations, including, but not limited to:
    - Mixed use and commercial development;
    - Roads and parking lots;
    - Parks and open space; and
    - Single- and multi-family residential
- Infiltration basins can be integrated into open space buffers and other landscape areas.
- The potential for groundwater contamination must be carefully considered,. Infiltration basins are not suitable for sites that:
    - Use or store chemicals or hazardous materials, unless they are prevented from entering the basin; or
    - Un-remediated "brownfield sites" where there is known groundwater or soil contamination.
- If the corrected in-situ infiltration rate exceeds 2.4 in/hr, then stormwater runoff may need to be fully-treated with an upstream stormwater quality control measure prior to infiltration to protect groundwater quality.
- Infiltration basins cannot be located on sites with a slope greater than 20 percent (5:1).
- Pretreatment to remove sediment is required to protect infiltration basin from high sediment loads. If upstream pretreatment devices are not provided, a sediment forebay, which takes up at least 25 percent of the basin area, is required.
- If possible, the entire tributary area of the infiltration basin should be stabilized before construction begins. If this is not possible, all flows should be diverted around the infiltration basin to protect it from sediment loads during construction or the top two inches of soil from the infiltration basin floor should be removed after the site has been stabilized. Excavated material should be stored such that it cannot be washed back into the infiltration basin if a storm occurs during construction.
- The equipment used to construct the infiltration basin should have extra wide, low-pressure tires. Construction traffic should not enter the infiltration basin because it can compact soil, which reduces infiltration capacity. If heavy equipment is used on the base of the infiltration basin, the infiltrative capacity may be restored by tilling or aerating prior to placing the infiltrative bed.
- Final grading must produce a level basin bottom without low spots or depressions. After final grading, the infiltration basin bottom should be deep-tilled to improve infiltration.

- After construction is completed, the entire tributary area to the infiltration basin should be stabilized before allowing stormwater runoff to enter it.

Design Specifications

The following sections provide design specifications for infiltration basins.

Geotechnical

Due to the potential to contaminate groundwater, cause slope instability, impact surrounding structures, and potential for insufficient infiltration capacity, an extensive geotechnical site investigation must be conducted during the site planning process to verify site suitability for an infiltration basin. All geotechnical investigations must be performed according to the most recent GMED Policy GS 200.1. Soil infiltration rates and the groundwater table depth must be evaluated to ensure that conditions are satisfactory for proper operation of an infiltration basin. The project applicant must demonstrate through infiltration testing, soil logs, and the written opinion of a licensed civil engineer that sufficiently permeable soils exist on-site to allow the construction of a properly functioning infiltration basin.

Infiltration basins are appropriate for soils with a minimum corrected in-situ infiltration rate of 0.3 in/hr. The geotechnical report must determine if the proposed project site is suitable for an infiltration basin and must recommend a design infiltration rate (see “Design Infiltration Rate” under the “Sizing” section). The geotechnical investigation should be such that a good understanding is gained as to how the stormwater runoff will move through the soil (horizontally or vertically) and if there are any geological conditions that could inhibit the movement of water.

Pretreatment

Pretreatment is important for all structural stormwater quality control measures, but it is particularly important for retention facilities. Pretreatment refers to design features that provide settling of large particles before stormwater runoff enters a stormwater quality control measure in order to reduce the long-term maintenance burden. Pretreatment should be provided to reduce the sediment load entering an infiltration basin in order to maintain the infiltration rate of the infiltration basin. To ensure that infiltration basins are effective, the project applicant must incorporate pretreatment devices that provide sediment reduction (e.g., vegetated swales, vegetated filter strips, sedimentation basins or forebays, sedimentation manholes, and proprietary devices). The use of at least two pretreatment devices is highly recommended for infiltration basins.

Setbacks

Infiltration basins must be sited following the setbacks from the most recent GMED Policy GS 200.1.

Geometry

- Infiltration basins must be designed and constructed with the flattest bottom slope possible to promote uniform ponding and infiltration.
- The side slopes must be no steeper than 3:1 (H:V).
- If upstream pretreatment is not provided to reduce sediment loads or if the tributary catchment area is mostly impervious, a sediment forebay is required. The sediment forebay should be separated from the infiltration basin by a berm or similar feature, and must be equal to 25 percent of the total infiltration basin volume. The sediment forebay must be designed with a minimum length-to-width ratio of 2:1 and must completely drain to the main infiltration basin through an 8-inch (minimum) low-flow outlet. All inlets must enter the sediment forebay. If there are multiple inlets into the sediment forebay, the length-to-width ratio is based on the average flow path length for all inlets.

Embankments

Embankments are earthen slopes or berms used to detain or redirect the flow of water. For infiltration basins, the embankments must be design with the following specifications:

- All earthworks must be conducted in accordance with the Standard Specifications for Public Works Construction.
- The minimum top width of all berm embankments must be 20 feet, unless otherwise approved by GMED.
- Berm embankments must be constructed on native consolidated soil or adequately compacted and stable fill soils approved by a licensed geotechnical engineer. Soils must be free of loose surface soil materials, roots, and other organic debris.
- Berm embankments must be constructed of compacted soil (95 percent minimum dry density, Modified Proctor method per ASTM D1557) and placed in 6-inch lifts.
- Berm embankments greater than 4 feet in height must be constructed by excavating a key equal to 50 percent of the berm embankment cross-sectional height and width. This requirement may be waived if specifically recommended by a licensed geotechnical engineer.
- Low growing native or non-invasive perennial grasses must be planted on downstream embankment slopes. See Attachment B of the Vegetation Management on Embankment Dams of Public Works' Debris Control Facilities for a recommended plant list.

Sizing

Infiltration basins are sized using a simple sizing method where the SWQDv must be completely infiltrated within 96 hours. Infiltration basins provide stormwater runoff storage above ground.

<u>Step 1: Determine the SWQDv</u>

Infiltration basins must be designed to capture and retain the SWQDv (see Section 6 for SWQDv calculation procedures).

<u>Step 2: Determine the design infiltration rate</u>

Determine the corrected in-situ infiltration rate (f_{design}) of the native soil using the procedures described in the most recent GMED Policy GS 200.1.

<u>Step 3: Calculate the surface area</u>

Determine the required size of the infiltration surface by assuming the SWQDv will fill the available ponding depth. The maximum depth of stormwater runoff that can be infiltrated within the maximum retention time (96 hrs) is calculated using the following equation:

$$d_{max} = \frac{f_{design}}{12} \times t$$

Where:

d_{max} = Maximum depth of water that can be infiltrated within the required drawdown time [ft];
f_{design} = Design infiltration rate [in/hr]; and
t = Maximum detention time (max 96 hrs) [hr].

Select the ponding depth (d_p) such that:

$$d_{max} \geq d_p$$

Where:

d_{max} = Maximum depth of water that can be infiltrated within the maximum retention time [ft]; and
d_p = Ponding depth (max 1.5 ft) [ft].

Calculate the infiltrating surface area (bottom of the infiltration basin) required:

$$A = \frac{SWQDv}{d_p}$$

Where:

A = Surface area of the bottom of the infiltration basin [ft^2];
SWQDv = Stormwater quality design volume [ft^3]; and
d_p = Ponding depth [ft].

Flow Entrance and Energy Dissipation

Energy dissipation controls, constructed of sound materials such as stones, concrete, or proprietary devices that are rated to withstand the energy of the influent flow, must be installed at the inlet to the infiltration basin or its forebay. Flow velocity at the inlet must be 4 ft/s or less. Consult with LACDPW for the type and design of energy dissipation structure.

Drainage

The specifications for designing drainage systems for infiltration basins are presented below:

- The bottom of infiltration basin must be native soil that is over-excavated at least one foot in depth with the soil replaced uniformly without compaction. Amending excavated soil with two to four inches (~15 to 30 percent) of coarse sand is recommended.
- The use of vertical piping, either for distribution or infiltration enhancement, is prohibited. This application may be classified as a Class V Injection Well per 40 CFR Part 146.5(e)(4).
- The infiltration capacity of the subsurface layers should be sufficient to ensure a maximum retention time of 96 hours.

Hydraulic Restriction Layer

Lateral infiltration pathways may need to be restricted due to the close proximity of roads, foundations, or other infrastructure. A geomembrane liner, or other equivalent waterproofing, may be placed along the vertical walls to reduce lateral flows. The geomembrane liner must have a minimum thickness of 30 mils and meet the requirements of Table E-13. Generally, waterproof barriers must not be placed at the bottom of the bioretention area as it would prevent incidental infiltration which is important to meeting the required on-site retention requirement.

Table E-3. Geomembrane Liner Specifications for Bioretention Areas

Parameter	Test Method	Specifications
Material		Non-woven geomembrane liner
Unit weight		8 oz/yd^3 (minimum)
Filtration rate		0.08 in/sec (minimum)
Puncture strength	ASTM D-751 (Modified)	125 lbs (minimum)
Mullen burst strength	ASTM D-751	400 lb/in^2 (minimum)
Tensile strength	AST D-1682	300 lbs (minimum)
Equiv. opening size	US Standard Sieve	No. 80 (minimum)

Vegetation

- A thick mat of drought-tolerant grass should be established on the infiltration basin floor and side-slopes following construction. Grasses can help prevent erosion and increase evapotranspiration, and their rhizomes discourage compaction within the root zone to help maintain infiltration rates. Additionally, active growing vegetation can help break up surface crusts that accumulate from sedimentation of fine particulates.
- Grass may need to be irrigated during establishment.
- The infiltration basin will not be accepted by LACDPW until vegetation is well-established and functioning.

Exterior Landscaping

Landscaping outside of the infiltration basin, but within the easement/right-of-way, is required and must adhere to the following specifications such that it will not hinder maintenance operations:

- Trees or shrubs may not be planted within ten feet of inlet or outlet pipes or manmade drainage structures such as spillways, flow spreaders, or earthen embankments. Species with roots that seek water, such as willow or poplar, may not be planted within 50 feet of pipes or manmade structures. Weeping willow (*Salix babylonica*) may not be planted in or near infiltration basins.
- Non-native plant species are not permitted.
- Other resources for identifying suitable plant types can be found by consulting a nursery, arborist, landscape architect, or referring to online resources such as:
    - Calflora (http://calflora.org), which is a database of wild California plants that include plant characteristics and photos.
    - Los Angeles River Master Plan Landscaping Guidelines and Plant Palettes (http://ladpw.org/wmd/watershed/LA/LAR_planting_guidelines_webversion

.pdf), which is a guidance document providing a listing of native plant communities in the Los Angeles area.

- The Jepson Online Interchange California Floristics (http://ucjeps.berkeley.edu/interchange.html), which is a database that provides information on identification, taxonomy, distribution, ecology, relationships, and diversity of California vascular plants.
- VegSpec (http://catalog.data.gov/dataset/vegspec), which is a web-based decision support system that assists land managers in the planning and design with vegetative establishment practices.
- United States Department of Agriculture (http://plants.usda.gov/java), which is an extensive database of native and non-native plants of the United States with over 100 plant characteristics.

Restricted Construction Materials

Use of pressure-treated wood or galvanized metal at or around an infiltration basin is prohibited.

Overflow Device

An overflow device must be provided in the event that stormwater runoff overtops the infiltration basin or if the infiltration basin becomes clogged. The overflow device must be able to convey stormwater runoff to a downstream conveyance system or other acceptable discharge point.

Maintenance Access

Maintenance access must be provided to the drainage structures associated with the infiltration basin (e.g., inlet, overflow or bypass devices) if it is publicly-maintained. Manhole and catch basin lids must be in or at the edge of the access road. An access ramp to the infiltration basin bottom is required to facilitate the entry of sediment removal and vegetation maintenance equipment without compacting the bottom and side slopes of the infiltration basin.

Access roads must meet the following design specification:

- All access ramps and roads must be paved with a minimum of six inches of concrete over three inches of crushed aggregate base material. This requirement may be modified depending on the soil conditions and intended use of the road at the discretion of LACDPW.
- The maximum grade is 12 percent unless otherwise approved by LACDPW.
- Centerline turning radius must be a minimum of 40 feet.
- Access roads less than 500 feet long must have a 12-foot wide pavement within a minimum 15-foot wide bench. Access roads greater than 500 feet long must have a 16-foot wide pavement within a minimum 20-foot wide bench.

- All access roads must terminate with turnaround areas of 40-feet by 40-feet. A hammer type turnaround area or a circle drive around the top of the infiltration basin is also acceptable.
- Adequate double-drive gates and commercial driveways are required at street crossings. Gates must be located a minimum of 25 feet from the street curb except in residential areas where the gates may be located along the property line provided there is adequate sight distance to see oncoming vehicles at the posted speed limit.

Maintenance Requirements

Maintenance and regular inspections are important for proper function of infiltration basins. The following are general maintenance requirements:

- Conduct regular inspection and routine maintenance for pretreatment devices.
- Inspect infiltration basin frequently to ensure that water infiltrates into the subsurface completely within maximum detention time of 96 hours. If water is present in the infiltration basin more than 96 hours after a major storm, the infiltration basin may be clogged. Maintenance activities triggered by a potentially clogged facility include:
    - Check for debris/sediment accumulation, rake surface and remove sediment (if any), and evaluate potential sources of sediment and vegetative or other debris (i.e., embankment erosion, channel scour, overhanging trees). If suspected upstream sources are outside of the County's jurisdiction, additional pretreatment (i.e., trash racks, vegetated swales) may be necessary.
    - Determine if it is necessary to remove the top layer of native soil to restore infiltrative capacity.
- Remove and dispose of trash and debris, as needed, but at least prior to the beginning of the wet season.
- Eliminate standing water to prevent vector breeding.
- Maintain vegetation as needed to sustain the aesthetic appearance of the site, and as follows:
    - Prune and/or remove vegetation, large shrubs, or trees that limit access or interfere with operation of the infiltration basin.
    - Mow grass to four to nine inches high and remove grass clippings.
    - Rake and remove fallen leaves and debris from deciduous plant foliage.
    - Remove and replace invasive vegetation with native vegetation. Invasive species should never contribute more than 25 percent of the vegetated area. For more information on invasive weeds, including biology and control of listed weeds, look at the “encycloweedia” located at the California Department of Food and Agriculture website

(http://www.cdfa.ca.gov/plant/ipc/encycloweedia/encycloweedia_hp.htm) or the California Invasive Plant Council website (www.cal-ipc.org).

  - Remove dead vegetation if it exceeds 10 percent of area coverage. Replace vegetation immediately to maintain cover density and control erosion where soils are exposed.
  - Do not use herbicides or other chemicals to control vegetation

- If a sediment forebay is used, remove sediment buildup exceeding 50 percent of the sediment storage capacity, as indicated by the steel markers. Remove sediment from the rest of the infiltration basin when it accumulates six inches. Test removed sediments for toxic substance accumulation in compliance with current disposal requirements if visual or olfactory indications of pollution are noticed. If toxic substances are detected at concentrations exceeding thresholds of Title 22, Section 66261 of the California Code of Regulations, dispose of the sediment in a hazardous waste landfill and investigate and mitigate the source of the contaminated sediments to the maximum extent possible.
- Re-establish vegetation, which may require replanting and/or reseeding, following sediment removal activities.
- Inspect overflow devices for obstructions or debris, which should be removed immediately. Repair or replace damaged pipes upon discovery.

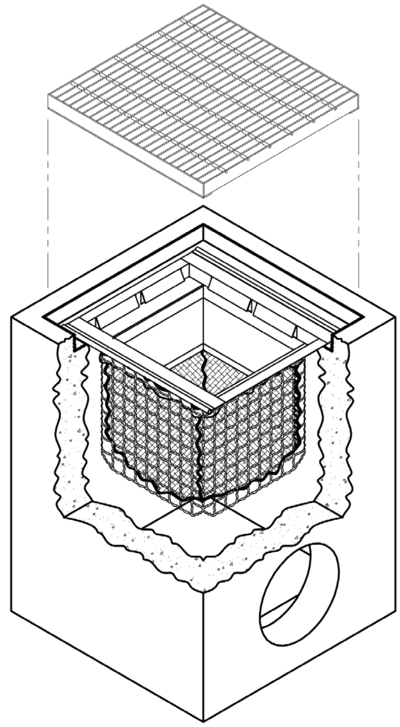
A summary of potential problems that need to be addressed by maintenance activities is presented in Table E-4.

The County requires execution of a maintenance agreement to be recorded by the property owner for the on-going maintenance of any privately-maintained stormwater quality control measures. The property owner is responsible for compliance with the maintenance agreement. A sample maintenance agreement is presented in Appendix H.

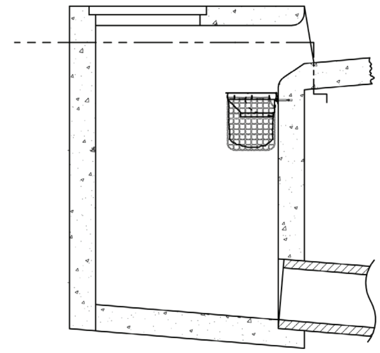
Table E-4. Infiltration Basin Troubleshooting Summary

Problem	Conditions When Maintenance Is Needed	Maintenance Required
Vegetation	Overgrown vegetation	Mow and trim vegetation to prevent establishment of woody vegetation, and for aesthetics and vector control reasons.
	Presence of invasive, poisonous, nuisance, or noxious vegetation or weeds	Remove this vegetation.
	Excessive loss of turf or ground cover	Replant and/or reseed as needed.
Trash and Debris	Trash and debris > 5 ft^3/1,000 ft^2	Remove and dispose of trash and debris.
Contaminants and Pollution	Any evidence of oil, gasoline, contaminants, or other pollutants	Remove any evidence of visual contamination.
Erosion	Undercut or eroded areas at inlet structures	Repair eroded areas and re-grade if necessary.
Sediment Accumulation	Accumulation of sediment, debris, and oil/grease in forebay, pretreatment devices, surface, inlet, or overflow structures	Remove sediment, debris, and/or oil/grease.
Water Drainage Rate	Standing water	Remove the top layer of the infiltration basin bottom if necessary.

Flat grated inlet



Curb inlet



FloGard+PLUS® / Product Specifications

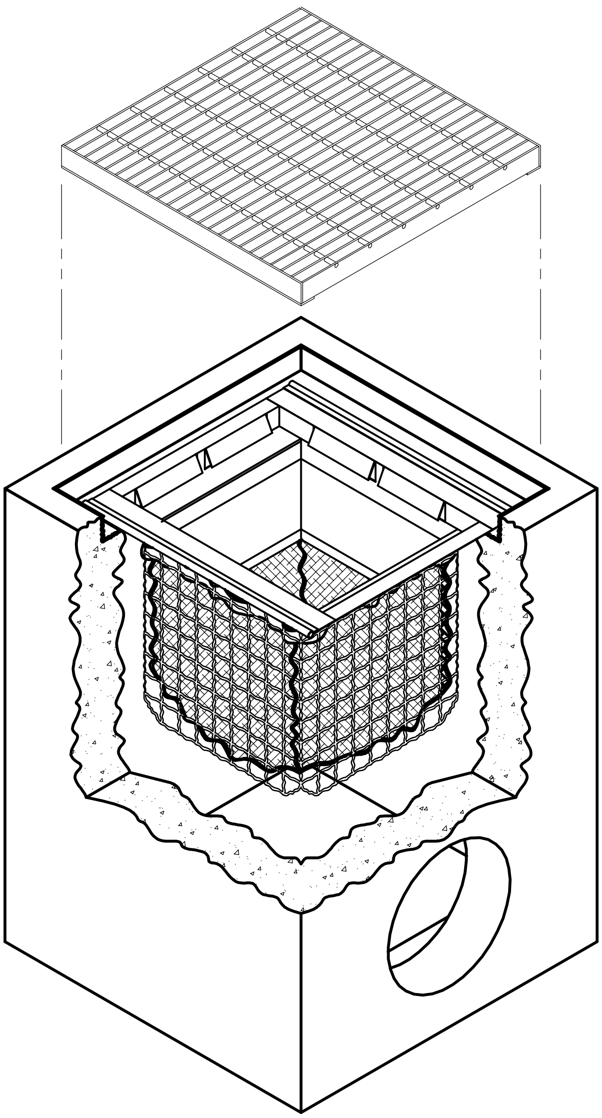
The FloGard+PLUS® is a multipurpose catch basin insert designed to capture sediment, debris, trash & oils/grease from low (first flush) flows.

A (dual) high-flow bypass allows flows to bypass the device while retaining sediment and larger floatables (debris & trash) AND allows sustained maximum design flows under extreme weather conditions.

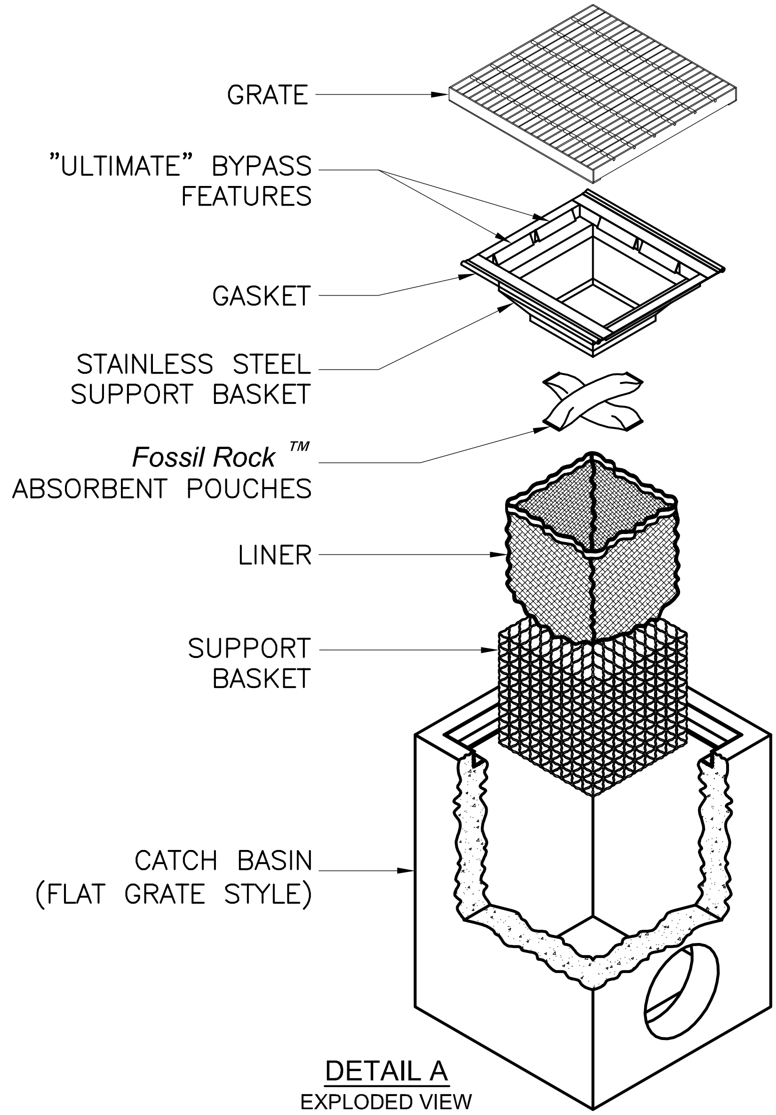
FloGard+PLUS® inserts are available in sizes to fit most industry-standard drainage inlets (...flat grated, combination, curb and round inlets).

FloGard+PLUS® catch basin inserts are recommended for areas subject to silt and debris as well as low-to-moderate levels of petroleum hydrocarbon (oils and grease). Examples of such areas are vehicle parking lots, aircraft ramps, truck and bus storage yards, corporation yards, subdivision streets and public streets.

FGP-0001



FLOGARD+PLUS® FILTER
-INSTALLED INTO CATCH BASIN-



DETAIL A
EXPLODED VIEW

NOTES:

1. FloGard®+Plus (frame mount) high capacity catch basin inserts are available in most sizes and styles (see specifier chart, sheet 2 of 2). Refer to the FloGard®+Plus (wall mount) insert for devices to fit non-standard, or combination style catch basins.

2. Filter insert shall have both an "initial" filtering bypass and "ultimate" high flow bypass feature.

3. Filter support frame shall be constructed from stainless steel Type 304.

4. Allow a minimum of 2.0 feet, of clearance between the bottom of the grate and top of outlet pipe(s), or refer to the FloGard® insert for "shallow" installations.

5. Filter medium shall be *Fossil Rock* ™, installed and maintained in accordance with manufacturer specifications.

6. Storage capacity reflects 80% of maximum solids collection prior to impeding filtering bypass.

7. Filtered flow r/rate includes a safety factor of two.

U.S. PATENT # 6,00,023 & 6,877,029

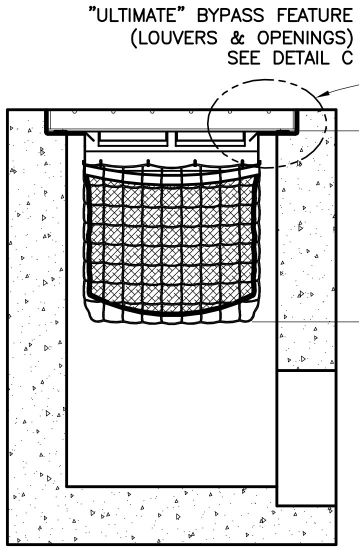
TITLE

FloGard® +PLUS
CATCH BASIN FILTER INSERT
(Flat Grated Inlet Style)

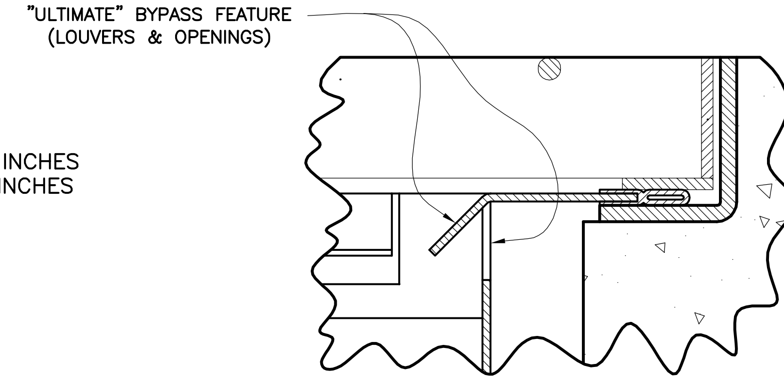
KRISTAR
KriStar Enterprises, Inc.
360 Sutton Place, Santa Rosa, CA 95407
Ph: 800.579.8819, Fax: 707.524.8186, www.kristar.com

DRAWING NO.	REV	ECO	DATE	
FGP-0001	D	0059 JPR 12/30/08	JPR 11/3/06	SHEET 1 OF 2

U.S. PATENT # 6,00,023 & 6,877,029



DETAIL B
SECTION VIEW
FLO-GARD® +FILTER
-INSTALLED-



DETAIL C
"ULTIMATE"
BYPASS FEATURES

* MANY OTHER STANDARD & CUSTOM SIZES & DEPTHS AVAILABLE UPON REQUEST.

SPECIFIER CHART

MODEL NO. STANDARD DEPTH	STANDARD & SHALLOW DEPTH (Data in these columes is the same for both STANDARD & SHALLOW versions)			STANDARD DEPTH -20 Inches-		MODEL NO. SHALLOW DEPTH	SHALLOW DEPTH -12 Inches-	
	INLET ID Inside Dimension (inch x inch)	GRATE OD Outside Dimension (inch x inch)	TOTAL BYPASS CAPACITY (cu. ft. / sec.)	SOLIDS STORAGE CAPACITY (cu. ft.)	FILTERED FLOW (cu. ft. / sec.)		SOLIDS STORAGE CAPACITY (cu. ft.)	FILTERED FLOW (cu. ft. / sec.)
FGP-12F	12 X 12	12 X 14	2.8	0.3	0.4	FGP-12F8	.15	.25
FGP-1530F	15 X 30	15 X 35	6.9	2.3	1.6	FGP-1530F8	1.3	.9
FGP-16F	16 X 16	16 X 19	4.7	0.8	0.7	FGP-16F8	.45	.4
FGP-1624F	16 X 24	16 X 26	5.0	1.5	1.2	FGP-1624F8	.85	.7
FGP-18F	18 X 18	18 X 20	4.7	0.8	0.7	FGP-18F8	.45	.4
FGP-1820F	16 X 19	18 X 21	5.9	2.1	1.4	FGP-1820F8	1.2	.8
FGP-1824F	16 X 22	18 X 24	5.0	1.5	1.2	FGP-1824F8	.85	.7
FGP-1836F	18 X 36	18 X 40	6.9	2.3	1.6	FGP-1836F8	1.3	.9
FGP-2024F	18 X 22	20 X 24	5.9	1.2	1.0	FGP-2024F8	.7	.55
FGP-21F	22 X 22	22 X 24	6.1	2.2	1.5	FGP-21F8	1.25	.85
FGP-2142F	21 X 40	24 X 40	9.1	4.3	2.4	FGP-2142F8	2.45	1.35
FGP-2148F	19 X 46	22 X 48	9.8	4.7	2.6	FGP-2148F8	2.7	1.5
FGP-24F	24 X 24	24 X 27	6.1	2.2	1.5	FGP-24F8	1.25	.85
FGP-2430F	24 X 30	26 X 30	7.0	2.8	1.8	FGP-2430F8	1.6	1.05
FGP-2436F	24 X 36	24 X 40	8.0	3.4	2.0	FGP-2436F8	1.95	1.15
FGP-2448F	24 X 48	26 X 48	9.3	4.4	2.4	FGP-2448F8	2.5	1.35
FGP-28F	28 X 28	32 X 32	6.3	2.2	1.5	FGP-28F8	1.25	.85
FGP-2440F	24 X 36	28 X 40	8.3	4.2	2.3	FGP-2440F8	2.4	1.3
FGP-30F	30 X 30	30 X 34	8.1	3.6	2.0	FGP-30F8	2.05	1.15
FGP-36F	36 X 36	36 X 40	9.1	4.6	2.4	FGP-36F8	2.65	1.35
FGP-3648F	36 X 48	40 X 48	11.5	6.8	3.2	FGP-3648F8	3.9	1.85
FGP-48F	48 X 48	48 X 54	13.2	9.5	3.9	FGP-48F8	5.45	2.25
FGP-SD24F	24 X 24	28 X 28	6.1	2.2	1.5	FGP-SD24F8	1.25	.85
FGP-1836FGO	18 X 36	20 X 40	6.9	2.3	1.6	FGP-1836F8GO	1.3	.9
FGP-2436FGO	20 X 36	24 X 40	8.0	3.4	2.0	FGP-2436F8GO	1.95	1.15
FGP-48FGO	18 X 48	20 X 54	6.3	2.2	1.5	FGP-48F8GO	1.25	.85

TITLE

FloGard® +PLUS
CATCH BASIN FILTER INSERT
(Flat Grated Inlet Style)

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DRAWING NO.	REV	ECO	DATE	
FGP-0001	D	0059 JPR 12/30/08	JPR 11/3/06	SHEET 2 OF 2

StormTech SC-740 Chamber

StormTech®
Detention • Retention • Recharge
Subsurface Stormwater Management℠

Designed to meet the most stringent industry performance standards for superior structural integrity while providing designers with a cost-effective method to save valuable land and protect water resources. The StormTech system is designed primarily to be used under parking lots thus maximizing land usage for commercial and municipal applications.

StormTech SC-740 Chamber
(not to scale)

Nominal Chamber Specifications

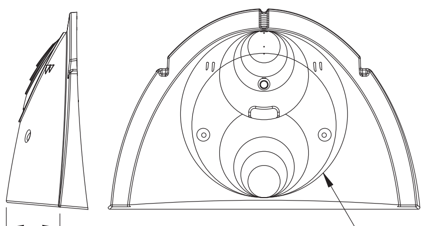
Size (L x W x H)
85.4" x 51.0" x 30.0"
(2170 x 1295 x 762 mm)

Chamber Storage
45.9 ft³ (1.30 m³)

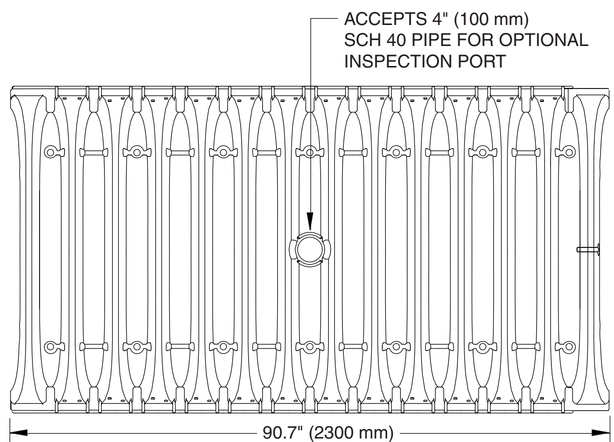
Minimum Installed Storage*
74.9 ft³ (2.12 m³)

Weight
74.0 lbs (33.6 kg)

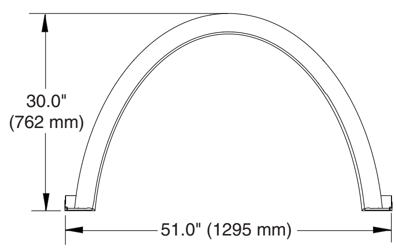
Shipping
30 chambers/pallet
60 end caps/pallet
12 pallets/truck

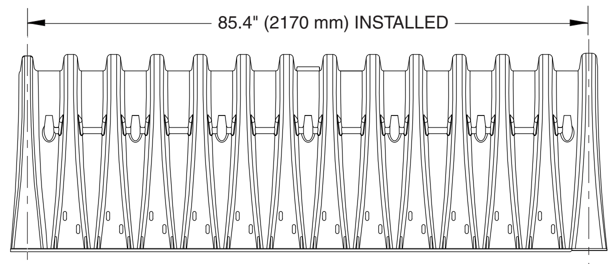


SC-740 End Cap

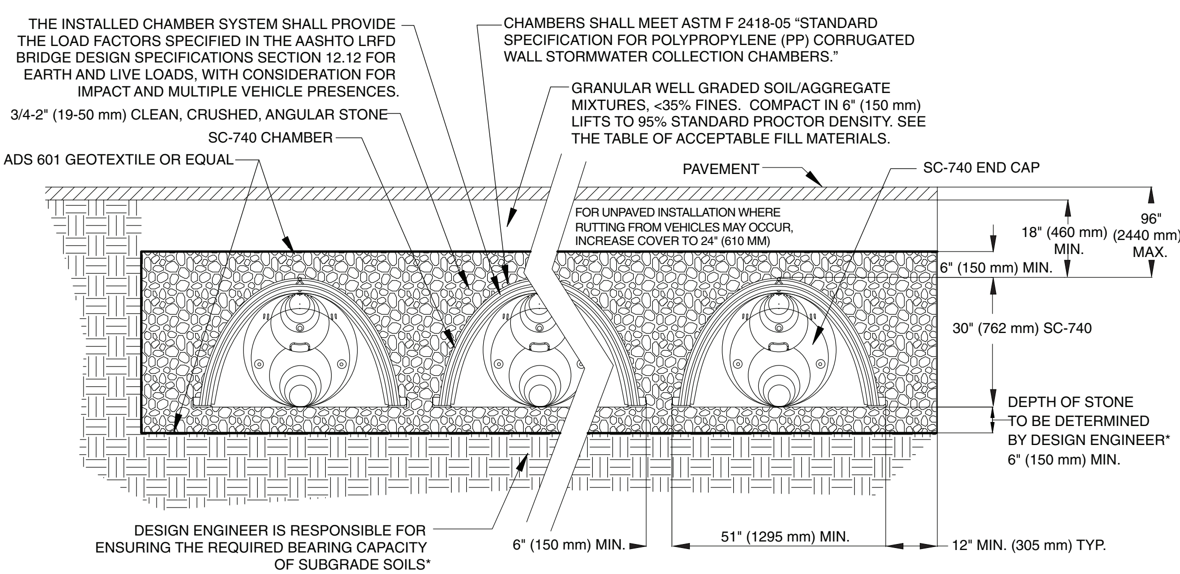


SC-740 Chamber





Typical Cross Section Detail
(not to scale)



THIS CROSS SECTION DETAILS THE REQUIREMENTS NECESSARY TO SATISFY THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS SECTION 12.12 FOR EARTH AND LIVE LOADS USING STORMTECH CHAMBERS

MADE IN THE U.S.A.

SC-740 Cumulative Storage Volumes Per Chamber

Assumes 40% Stone Porosity. Calculations are Based Upon a 6" (152 mm) Stone Base Under the Chambers.

Depth of Water in System Inches (mm)	Cumulative Chamber Storage Ft³ (m³)	Total System Cumulative Storage Ft³ (m³)
42 (1067)	45.90 (1.300)	74.90 (2.121)
41 (1041)	45.90 (1.300)	73.77 (2.089)
40 (1016)	Stone 45.90 (1.300)	72.64 (2.057)
39 (991)	Cover 45.90 (1.300)	71.52 (2.025)
38 (965)	45.90 (1.300)	70.39 (1.993)
37 (948)	45.90 (1.300)	69.26 (1.961)
36 (914)	45.90 (1.300)	68.14 (1.929)
35 (889)	45.85 (1.298)	66.98 (1.897)
34 (864)	45.69 (1.294)	65.75 (1.862)
33 (838)	45.41 (1.286)	64.46 (1.825)
32 (813)	44.81 (1.269)	62.97 (1.783)
31 (787)	44.01 (1.246)	61.36 (1.737)
30 (762)	43.06 (1.219)	59.66 (1.689)
29 (737)	41.98 (1.189)	57.89 (1.639)
28 (711)	40.80 (1.155)	56.05 (1.587)
27 (686)	39.54 (1.120)	54.17 (1.534)
26 (660)	38.18 (1.081)	52.23 (1.479)
25 (635)	36.74 (1.040)	50.23 (1.422)
24 (610)	35.22 (0.977)	48.19 (1.365)
23 (584)	33.64 (0.953)	46.11 (1.306)
22 (559)	31.99 (0.906)	44.00 (1.246)
21 (533)	30.29 (0.858)	41.85 (1.185)
20 (508)	28.54 (0.808)	39.67 (1.123)
19 (483)	26.74 (0.757)	37.47 (1.061)
18 (457)	24.89 (0.705)	35.23 (0.997)
17 (432)	23.00 (0.651)	32.96 (0.939)
16 (406)	21.06 (0.596)	30.68 (0.869)
15 (381)	19.09 (0.541)	28.36 (0.803)
14 (356)	17.08 (0.484)	26.03 (0.737)
13 (330)	15.04 (0.426)	23.68 (0.670)
12 (305)	12.97 (0.367)	21.31 (0.608)
11 (279)	10.87 (0.309)	18.92 (0.535)
10 (254)	8.74 (0.247)	16.51 (0.468)
9 (229)	6.58 (0.186)	14.09 (0.399)
8 (203)	4.41 (0.125)	11.66 (0.330)
7 (178)	2.21 (0.063)	9.21 (0.264)
6 (152)	0	6.76 (0.191)
5 (127)	0	5.63 (0.160)
4 (102)	Stone Foundation 0	4.51 (0.125)
3 (76)	0	3.38 (0.095)
2 (51)	0	2.25 (0.064)
1 (25)	0	1.13 (0.032)

Note: Add 1.13 cu. ft. (0.032 m³) of storage for each additional inch (25 mm) of stone foundation.

Storage Volume Per Chamber

	Bare Chamber Storage	Chamber and Stone Stone Foundation Depth in. (mm)		
	ft³ (m³)	6 (150)	12 (305)	18 (460)
StormTech SC-740	45.9 (1.3)	74.9 (2.1)	81.7 (2.3)	88.4 (2.5)

Note: Storage volumes are in cubic feet per chamber. Assumes 40% porosity for the stone plus the chamber volume.

Amount of Stone Per Chamber

	Stone Foundation Depth		
ENGLISH TONS (CUBIC YARDS)	6"	12"	18"
StormTech SC-740	3.8 (2.8 yd³)	4.6 (3.3 yd³)	5.5 (3.9 yd³)
METRIC KILOGRAMS (METER³)	**150 mm**	**305 mm**	**460 mm**
StormTech SC-740	3450 (2.1 m³)	4170 (2.5 m³)	4490 (3.0 m³)

Note: Assumes 6" (150 mm) of stone above, and between chambers.

Volume of Excavation Per Chamber

	Stone Foundation Depth		
	6" (150 mm)	12" (305 mm)	18" (460 mm)
StormTech SC-740	5.5 (4.2)	6.2 (4.7)	6.8 (5.2)

Note: Volumes are in cubic yards (cubic meters) per chamber. Assumes 6" (150 mm) of separation between chamber rows and 18" (460 mm) of cover. The volume of excavation will vary as the depth of the cover increases.

STANDARD LIMITED WARRANTY OF STORMTECH LLC ("STORMTECH"): PRODUCTS

(A) This Limited Warranty applies solely to the StormTech chambers and endplates manufactured by StormTech and sold to the original purchaser (the "Purchaser"). The chambers and endplates are collectively referred to as the "Products."

(B) The structural integrity of the Products, when installed strictly in accordance with StormTech's written installation instructions at the time of installation, are warranted to the Purchaser against defective materials and workmanship for one (1) year from the date of purchase. Should a defect appear in the Limited Warranty period, the Purchaser shall provide StormTech with written notice of the alleged defect at StormTech's corporate headquarters within ten (10) days of the discovery of the defect. The notice shall describe the alleged defect in reasonable detail. StormTech agrees to supply replacements for those Products determined by StormTech to be defective and covered by this Limited Warranty. The supply of replacement products is the sole remedy of the Purchaser for breaches of this Limited Warranty. StormTech's liability specifically excludes the cost of removal and/or installation of the Products.

(C) **THIS LIMITED WARRANTY IS EXCLUSIVE. THERE ARE NO OTHER WARRANTIES WITH RESPECT TO THE PRODUCTS, INCLUDING NO IMPLIED WARRANTIES OF MERCHANT-ABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE.**

(D) This Limited Warranty only applies to the Products when the Products are installed in a single layer. **UNDER NO CIRCUMSTANCES, SHALL THE PRODUCTS BE INSTALLED IN A MULTI-LAYER CONFIGURATION.**

(E) No representative of StormTech has the authority to change this Limited Warranty in any manner or to extend this Limited Warranty. This Limited Warranty does not apply to any person other than to the Purchaser.

(F) Under no circumstances shall StormTech be liable to the Purchaser or to any third party for product liability claims; claims arising from the design, shipment, or installation of the Products, or the cost of other goods or services related to the purchase and installation of the Products. For this Limited Warranty to apply, the Products must be installed in accordance with all site conditions required by state and local codes; all other applicable laws; and StormTech's written installation instructions.

(G) **THE LIMITED WARRANTY DOES NOT EXTEND TO INCIDENTAL, CONSEQUENTIAL, SPECIAL OR INDIRECT DAMAGES. STORMTECH SHALL NOT BE LIABLE FOR PENALTIES OR LIQUIDATED DAMAGES, INCLUDING LOSS OF PRODUCTION AND PROFITS; LABOR AND MATERIALS; OVERHEAD COSTS; OR OTHER LOSS OR EXPENSE INCURRED BY THE PURCHASER OR ANY THIRD PARTY. SPECIFICALLY EXCLUDED FROM LIMITED WARRANTY COVERAGE ARE DAMAGE TO THE PRODUCTS ARISING FROM ORDINARY WEAR AND TEAR; ALTERATION, ACCIDENT, MISUSE, ABUSE OR NEGLECT; THE PRODUCTS BEING SUBJECTED TO VEHICLE TRAFFIC OR OTHER CONDITIONS WHICH ARE NOT PERMITTED BY STORMTECH'S WRITTEN SPECIFICATIONS OR INSTALLATION INSTRUCTIONS; FAILURE TO MAINTAIN THE MINIMUM GROUND COVERS SET FORTH IN THE INSTALLATION INSTRUCTIONS; THE PLACEMENT OF IMPROPER MATERIALS INTO THE PRODUCTS; FAILURE OF THE PRODUCTS DUE TO IMPROPER SITING OR IMPROPER SIZING; OR ANY OTHER EVENT NOT CAUSED BY STORMTECH. THIS LIMITED WARRANTY REPRESENTS STORMTECH'S SOLE LIABILITY TO THE PURCHASER FOR CLAIMS RELATED TO THE PRODUCTS, WHETHER THE CLAIM IS BASED UPON CONTRACT, TORT, OR OTHER LEGAL THEORY.**

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860.529.8188 | 888.892.2694 | fax 866.328.8401 | fax 860-529-8040 | www.stormtech.com

Subsequent to our testing, we received information that Mr. Vik Bapna of California Watershed Engineering (CWE), the consultant for the city of Carson, requested that the infiltration test be performed in accordance with ASTM Test Method D-3385-03, Standard Test Method for Infiltration Rate of Soils in Field Using Double Ring Infiltrometer. An SCG representative contacted Mr. Bapna and discussed the results of the infiltration testing. Mr. Bapna then agreed to accept the test results using the test methods discussed in this report.

Presaturation

Both of the infiltration test holes were pre-saturated the day prior to testing. The presaturation process consisted of filling the test hole with clean potable water to 12± inches above the bottom of each test hole.

Infiltration Testing

The infiltration testing consisted of refilling each test boring to approximately 10 to 12 inches above the base of the excavation and then allowing the water to infiltrate into the soils beneath the test excavation. Readings were taken at 30 minute intervals for a total of six hours. After several readings were taken, each test excavation was refilled with water to approximately 10 to 12 inches above the base of the excavation. These water level readings are presented on the spreadsheets enclosed with this report. The infiltration rates for each of the timed intervals are also tabulated on the spreadsheets.

The infiltration rates for all of the tests are tabulated in inches per hour. In accordance with typically accepted practice, it is recommended that the most conservative reading from the latter part of the infiltration test be used for design. These rates are summarized below:

Infiltration Test No.	**Infiltration Rate (inch/hour)**
P-1	0.7
P-2	0.7

Design Recommendations

Based on these results, we recommend that a infiltration rate of at 0.7 inches per hour be utilized for the proposed underground storm water disposal system.

It is recommended that the systems be constructed so as to facilitate removal of silt and clay, or other deleterious materials from any water that may enter the storm water retention/disposal system. The presence of such materials would decrease the effective percolation rate. **The infiltration rate recommended above is based on the assumption that only clean water will be introduced to the subsurface profile. Any fines, debris, or organic materials could significantly impact the infiltration rate.** It should be noted that the recommended percolation rates are based on infiltration testing at two discrete locations and the overall infiltration rate of the storm water retention/disposal system could vary considerably.

It is recommended that a representative of the geotechnical engineer be present during excavation for the proposed underground storm water disposal systems. The soil conditions at

ATTACHMENT D

Operations and Maintenance

GENERAL SPECIFICATIONS FOR MAINTENANCE OF
***FLO-GARD+PLUS®* CATCH BASIN INSERT FILTERS**

SCOPE:

Federal, State and Local Clean Water Act regulations and those of insurance carriers require that stormwater filtration systems be maintained and serviced on a recurring basis. The intent of the regulations is to ensure that the systems, on a continuing basis, efficiently remove pollutants from stormwater runoff thereby preventing pollution of the nation's water resources. These specifications apply to the FloGard+Plus® Catch Basin Insert Filter.

RECOMMENDED FREQUENCY OF SERVICE:

Drainage Protection Systems (DPS) recommends that installed Flo-Gard+Plus® Catch Basin Insert Filters be serviced on a recurring basis. Ultimately, the frequency depends on the amount of runoff, pollutant loading and interference from debris (leaves, vegetation, cans, paper, etc.); however, it is recommended that each installation be serviced a minimum of three times per year, with a change of filter medium once per year. DPS technicians are available to do an on-site evaluation, upon request.

RECOMMENDED TIMING OF SERVICE:

DPS guidelines for the timing of service are as follows:

1. For areas with a definite rainy season: Prior to, during and following the rainy season.
2. For areas subject to year-round rainfall: On a recurring basis (at least three times per year).
3. For areas with winter snow and summer rain: Prior to and just after the snow season and during the summer rain season.
4. For installed devices not subject to the elements (washracks, parking garages, etc.): On a recurring basis (no less than three times per years).

SERVICE PROCEDURES:

1. The catch basin grate shall be removed and set to one side. The catch basin shall be visually inspected for defects and possible illegal dumping. If illegal dumping has occurred, the proper authorities and property owner representative shall be notified as soon as practicable.
2. Using an industrial vacuum, the collected materials shall be removed from the liner. (Note: DPS uses a truck-mounted vacuum for servicing Flo-Gard+Plus® catch basin inserts.)
3. When all of the collected materials have been removed, the filter medium pouches shall be removed by unsnapping the tether from the D-ring and set to one side. The filter liner, gaskets, stainless steel frame and mounting brackets, etc. shall be inspected for continued serviceability. Minor damage or defects found shall be corrected on-the-spot and a notation made on the Maintenance Record. More extensive deficiencies that affect the efficiency of the filter (torn liner, etc.), if approved by the customer representative, will be corrected and an invoice submitted to the representative along with the Maintenance Record.
4. The filter medium pouches shall be inspected for defects and continued serviceability and replaced as necessary and the pouch tethers re-attached to the liner's D-ring. See below.
5. The grate shall be replaced.

REPLACEMENT AND DISPOSAL OF EXPOSED FILTER MEDIUM AND COLLECTED DEBRIS

The frequency of filter medium pouch exchange will be in accordance with the existing DPS-Customer Maintenance Contract. DPS recommends that the medium be changed at least once per year. During the appropriate service, or if so determined by the service technician during a non-scheduled service, the filter medium pouches will be replaced with new pouches. Once the exposed pouches and debris have been removed, DPS has possession and must dispose of it in accordance with local, state and federal agency requirements.

DPS also has the capability of servicing all manner of catch basin inserts and catch basins without inserts, underground oil/water separators, stormwater interceptors and other such devices. All DPS personnel are highly qualified technicians and are confined space trained and certified. Call us at (888) 950-8826 for further information and assistance.

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Isolator™ Row O&M Manual

StormTech® Chamber System for Stormwater Management

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1.0 The Isolator™ Row

1.1 INTRODUCTION

An important component of any Stormwater Pollution Prevention Plan is inspection and maintenance. The StormTech Isolator Row is a patent pending technique to inexpensively enhance Total Suspended Solids (TSS) removal and provide easy access for inspection and maintenance.

Looking down the Isolator Row from the manhole opening, woven geotextile is shown between the chamber and stone base.

1.2 THE ISOLATOR™ ROW

The Isolator Row is a row of StormTech chambers, either SC-310, SC-740 or MC-3500 models, that is surrounded with filter fabric and connected to a closely located manhole for easy access. The fabric-wrapped chambers provide for settling and filtration of sediment as storm water rises in the Isolator Row and ultimately passes through the filter fabric. The open bottom chambers and perforated sidewalls allow storm water to flow both vertically and horizontally out of the chambers. Sediments are captured in the Isolator Row protecting the storage areas of the adjacent stone and chambers from sediment accumulation.

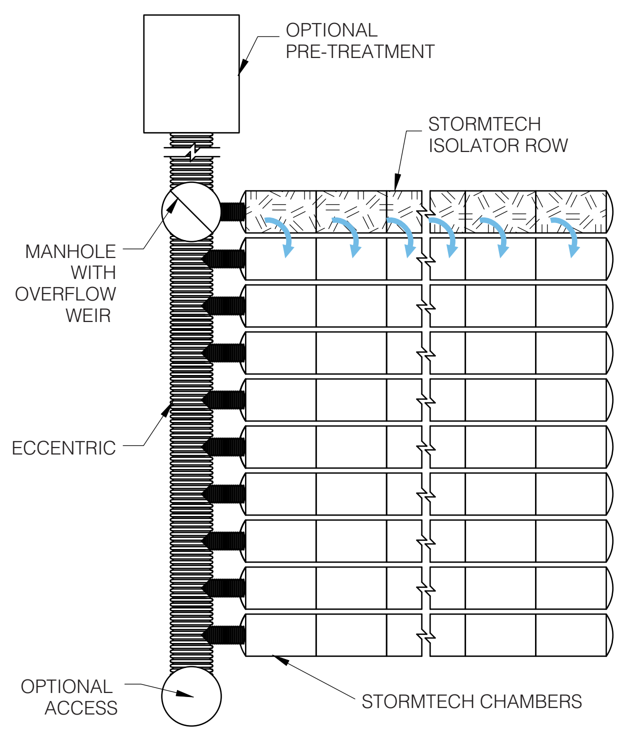
Two different fabrics are used for the Isolator Row. A woven geotextile fabric is placed between the stone and the Isolator Row chambers. The tough geotextile provides a media for storm water filtration and provides a durable surface for maintenance operations. It is also designed to prevent scour of the underlying stone and remain intact during high pressure jetting. A non-woven fabric is placed over the chambers to provide a filter media for flows passing through the perforations in the sidewall of the chamber.

The Isolator Row is typically designed to capture the "first flush" and offers the versatility to be sized on a volume basis or flow rate basis. An upstream manhole not only provides access to the Isolator Row but typically includes a high flow weir such that storm water flowrates or volumes that exceed the capacity of the Isolator Row overtop the over flow weir and discharge through a manifold to the other chambers.

The Isolator Row may also be part of a treatment train. By treating storm water prior to entry into the chamber system, the service life can be extended and pollutants such as hydrocarbons can be captured. Pre-treatment best management practices can be as simple as deep sump catch basins, oil-water separators or can be innovative storm water treatment devices. The design of the treatment train and selection of pretreatment devices by the design engineer is often driven by regulatory requirements. Whether pretreatment is used or not, the Isolator Row is recommended by StormTech as an effective means to minimize maintenance requirements and maintenance costs.

Note: See the StormTech Design Manual for detailed information on designing inlets for a StormTech system, including the Isolator Row.

StormTech Isolator Row with Overflow Spillway
(not to scale)



2.0 Isolator Row Inspection/Maintenance

2.1 INSPECTION

The frequency of Inspection and Maintenance varies by location. A routine inspection schedule needs to be established for each individual location based upon site specific variables. The type of land use (i.e. industrial, commercial residential), anticipated pollutant load, percent imperviousness, climate, etc. all play a critical role in determining the actual frequency of inspection and maintenance practices.

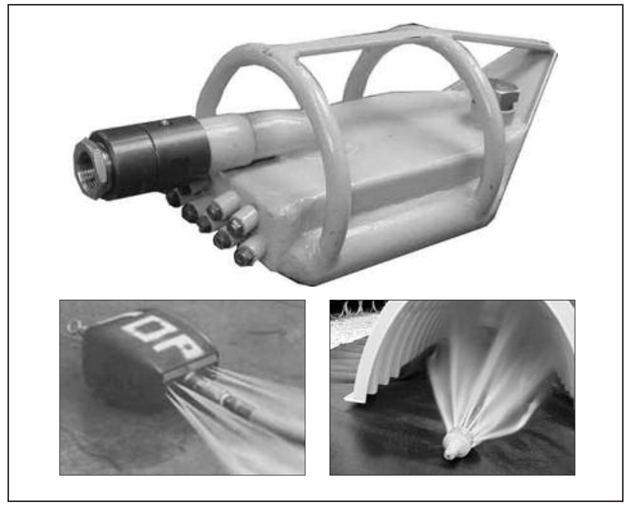
At a minimum, StormTech recommends annual inspections. Initially, the Isolator Row should be inspected every 6 months for the first year of operation. For subsequent years, the inspection should be adjusted based upon previous observation of sediment deposition.

The Isolator Row incorporates a combination of standard manhole(s) and strategically located inspection ports (as needed). The inspection ports allow for easy access to the system from the surface, eliminating the need to perform a confined space entry for inspection purposes.

If upon visual inspection it is found that sediment has accumulated, a stadia rod should be inserted to determine the depth of sediment. When the average depth of sediment exceeds 3 inches throughout the length of the Isolator Row, clean-out should be performed.

2.2 MAINTENANCE

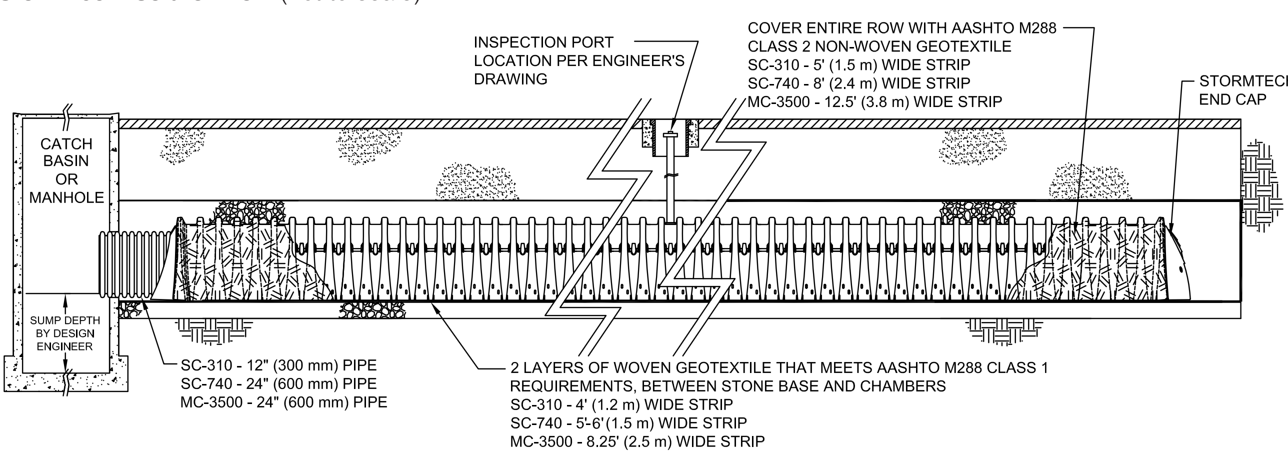
The Isolator Row was designed to reduce the cost of periodic maintenance. By “isolating” sediments to just one row, costs are dramatically reduced by eliminating the need to clean out each row of the entire storage bed. If inspection indicates the potential need for maintenance, access is provided via a manhole(s) located on the end(s) of the row for cleanout. If entry into the manhole is required, please follow local and OSHA rules for a confined space entries.



Examples of culvert cleaning nozzles appropriate for Isolator Row maintenance. (These are not StormTech products.)

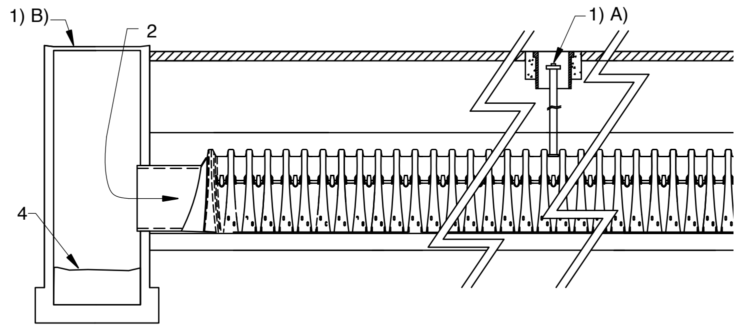
Maintenance is accomplished with the JetVac process. The JetVac process utilizes a high pressure water nozzle to propel itself down the Isolator Row while scouring and suspending sediments. As the nozzle is retrieved, the captured pollutants are flushed back into the manhole for vacuuming. Most sewer and pipe maintenance companies have vacuum/JetVac combination vehicles. Selection of an appropriate JetVac nozzle will improve maintenance efficiency. Fixed nozzles designed for culverts or large diameter pipe cleaning are preferable. Rear facing jets with an effective spread of at least 45” are best. Most JetVac reels have 400 feet of hose allowing maintenance of an Isolator Row up to 50 chambers long. **The JetVac process shall only be performed on StormTech Isolator Rows that have AASHTO class 1 woven geotextile (as specified by StormTech) over their angular base stone.**

StormTech Isolator Row (not to scale)



3.0 Isolator Row Step By Step Maintenance Procedures

StormTech Isolator Row (not to scale)



Step 1) Inspect Isolator Row for sediment

A) Inspection ports (if present)
  i. Remove lid from floor box frame
  ii. Remove cap from inspection riser
  iii. Using a flashlight and stadia rod, measure depth of sediment and record results on maintenance log.
  iv. If sediment is at, or above, 3 inch depth proceed to Step 2. If not proceed to step 3.

B) All Isolator Rows
  i. Remove cover from manhole at upstream end of Isolator Row
  ii. Using a flashlight, inspect down Isolator Row through outlet pipe
    1. Mirrors on poles or cameras may be used to avoid a confined space entry
    2. Follow OSHA regulations for confined space entry if entering manhole
  iii. If sediment is at or above the lower row of sidewall holes (approximately 3 inches) proceed to Step 2. If not proceed to Step 3.

Step 2) Clean out Isolator Row using the JetVac process

A) A fixed culvert cleaning nozzle with rear facing nozzle spread of 45 inches or more is preferable
B) Apply multiple passes of JetVac until backflush water is clean
C) Vacuum manhole sump as required

Step 3) Replace all caps, lids and covers, record observations and actions

Step 4) Inspect & clean catch basins and manholes upstream of the StormTech system

Sample Maintenance Log

Date	Stadia Rod Readings		Sediment Depth (1) - (2)	Observations/Actions	Inspector
	Fixed point to chamber bottom (1)	Fixed point to top of sediment (2)			
3/15/01	6.3 ft.	none		New installation. Fixed point is CI frame at grade	djm
9/24/01		6.2	0.1 ft.	Some grit felt	sm
6/20/03		5.8	0.5 ft.	Mucky feel, debris visible in manhole and in Isolator row, maintenance due	rv
7/7/03	6.3 ft.		0	System jetted and vacuumed	djm

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AL2 Carson 420K Industrial Building

Noise Study

March 2017 (13509)

Prepared for:

AL2 LLC
1815 South Soto Street
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AL2 Carson 420K Industrial Building

Noise Study

March 2017

City of Carson, California

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Appendix A Noise Measurement Data
Appendix B Construction Noise Output Data
Appendix C Traffic Volumes
Appendix D TNM Output Data

Daytime construction-related and daytime/nighttime operational noise impacts were modeled and analyzed for the proposed building located at the northeast corner of Wilmington Avenue and East 220th Street in the City of Carson, California. This noise impact analysis contains documentation of existing noise levels as well as analysis of the impacts generated by project traffic and analysis of vibration impacts. This report analyzes the project's consistency with applicable federal, State, and local regulations. The results of this report find construction-related and operational noise levels are consistent with applicable regulations.

1.1 Project Description

The project includes the demolition and removal of existing on-site structures, asphalt, and concrete and the construction of a 420,000-square foot high-cube industrial building on 19.85 acres located at the northeast corner of Wilmington Avenue and East 220th Street. The project will provide 300 vehicle spaces, 100 truck trailer parking stalls, and 65 dock doors. Approximately 101,600 square feet of landscaping will be provided.

1.2 Construction-Related Noise

Temporary noise increases will be greatest during the demolition phase. The model indicates that the use of construction equipment such as excavators, dozers, and concrete saws could expose the industrial uses located to the north and south and the residential uses to the west of the project site to noise levels in excess of City standards. Therefore, Mitigation Measure NOI-1 has been incorporated to reduce the impact to neighboring uses during demolition. With implementation of Mitigation Measure NOI-1, impacts will be reduced to unsubstantial levels.

1.3 Operational Noise

The proposed project will not cause exterior noise levels under the *Opening Year 2018 Without* and *With Project* scenarios to exceed the allowable 70 dBA exterior noise standard at the industrial uses to the north, east, and south of the project site or the 50 dBA exterior noise standard at the residential uses to the west of the project site during either the daytime or nighttime hours because those uses are already exposed to ambient noise levels in excess of those standards. Furthermore, traffic and outdoor operational noise levels will not increase by more than 3 dBA as a result of the proposed project at any of the studied receptors. Therefore, no substantial impacts will occur.

1.4 Vibration

Based on the threshold criteria established by the Federal Transit Administration (FTA) and the California Department of Transportation (Caltrans), vibration from use of heavy construction equipment to construct the proposed project would be below the thresholds to cause damage to nearby structures and result in less than *barely perceptible* vibration at the receptors analyzed in the report. Moreover, vibration from operation of the proposed development, mainly from heavy truck traffic along Wilmington Avenue, will be below thresholds to cause damage to nearby structures and will result in less than *barely perceptible* vibration at nearby receptors. Therefore, no substantial impacts will occur.

1.5 Airport Noise

The project site is located approximately 4.2 miles south of Compton Airport. According to the Carson General Plan, the 60 dBA and 65 dBA noise contours from Compton Airport do not extend into the City of Carson. Therefore, no substantial impacts will occur.

1.6 Mitigation Measures

The following mitigation measures are required to ensure that project-related short-term noise levels are consistent with applicable federal, State, and local regulations.

NOI-1 The following measures shall be implemented during the demolition phase of construction to ensure that construction noise levels do not exceed allowable exterior noise levels at neighboring industrial and residential uses:

- Stationary construction noise sources such as generators or pumps must be located at least 100 feet from sensitive land uses, as feasible, or at maximum distance when necessary to complete work near sensitive land uses. This mitigation measure must be implemented throughout construction and may be periodically monitored by the Planning Director, or designee during routine inspections.

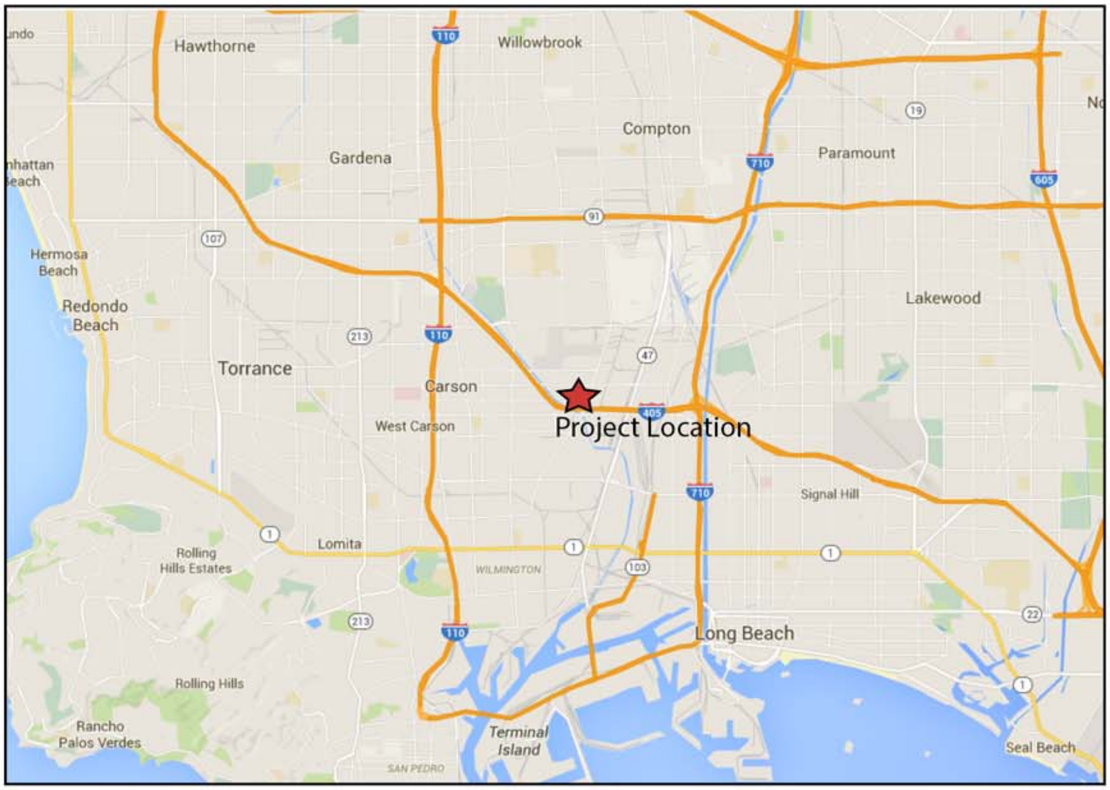
- Construction staging areas must be located as far from noise sensitive land uses as feasible. This mitigation measure must be implemented throughout construction and may be periodically monitored by the Planning Director or designee during routine inspections.

- Throughout construction, the contractor shall ensure all construction equipment is equipped with included noise attenuating devices and are properly maintained. This mitigation measure shall be periodically monitored by the Planning Director, or designee during routine inspections.

- Idling equipment must be turned off when not in use. This mitigation measure may be periodically monitored by the Planning Director, or designee during routine inspections.

- Equipment must be maintained so that vehicles and their loads are secured from rattling and banging. This mitigation measure may be periodically monitored by the Planning Director, or designee during routine inspections.

- Nighttime construction activities will not be permitted (10:00 PM to 7:00 AM).



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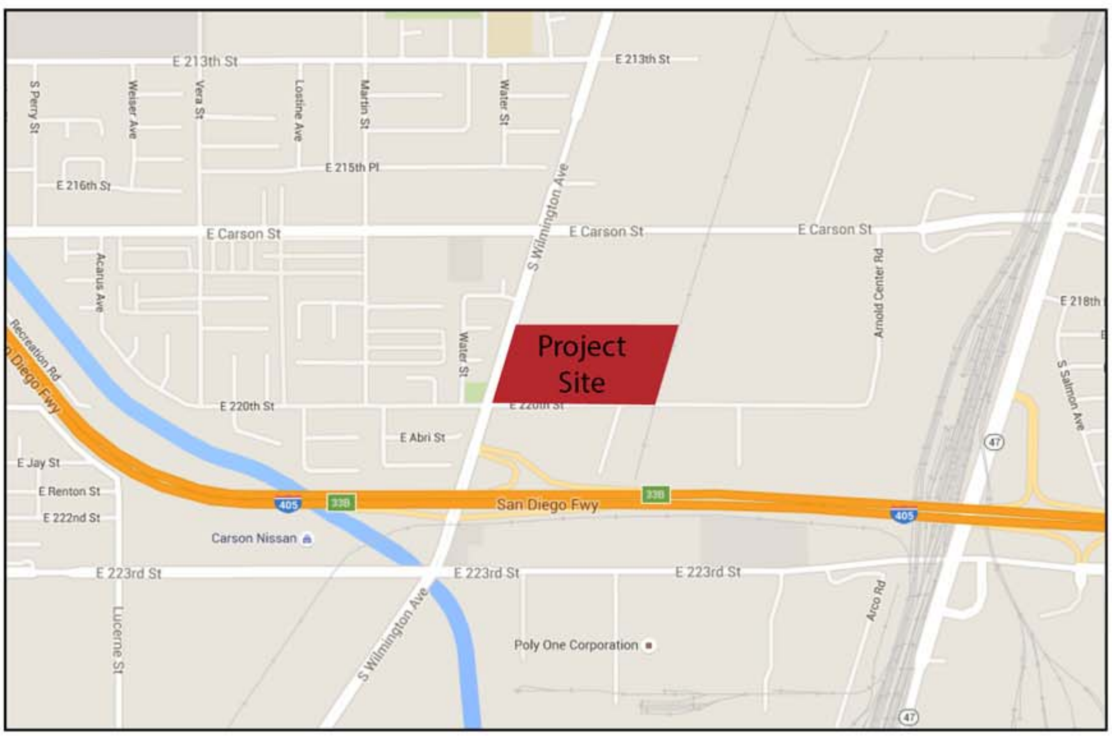
Regional



Source: Google Maps

Vicinity

Not to Scale

Exhibit 1 Regional and Vicinity Map

AL2 Carson 420K Industrial Building

Carson, California

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2 INTRODUCTION

This report includes modeling and analysis of construction- and operation-related noise generated from the proposed project on surrounding land uses. Vibration effects and airport noise are also discussed herein. The project includes construction of a 420,000 square foot building on 19.85 acres in the City of Carson, California.

This report has been prepared utilizing project-specific characteristics where available. In those instances where project-specific data is not available, the analysis has been supplemented by model defaults or other standardized sources of comparable data. In any case where non-project defaults or other data have been used, a "worst-case" scenario was developed to ensure a conservative estimate of noise impacts.

This report has been prepared for use by the Lead Agency to assess potential project-related noise impacts to the environment in compliance with federal, State, or local guidelines, particularly with respect to the noise issues identified in Appendix G of the State CEQA Guidelines. This report does not make determinations of significance pursuant to CEQA because such determinations are required to be made solely in the purview of the Lead Agency.

This report has been prepared by Christopher Brown (Director of Environmental Services) and Olivia Chan (Senior Analyst) of MIG, Inc. under contract to AL2, LLC.

Christopher Brown
Director of Environmental Services

Olivia Chan
Senior Analyst

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3.1 Defining Noise

"Sound" is a vibratory disturbance created by a moving or vibrating source and is capable of being detected. "Noise" is defined as sound that is loud, unpleasant, unexpected, or undesired and may therefore be classified as a more specific group of sounds. The effects of noise on people can include general annoyance, interference with speech communication, sleep disturbance and, in the extreme, hearing impairment.

THE PRODUCTION OF SOUND

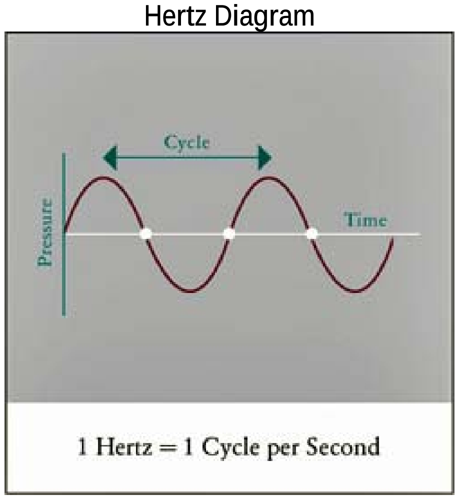
Sound has three properties: amplitude and amplitude variation of the acoustical wave (loudness), frequency (pitch), and duration of the noise. Despite the ability to measure sound, human perceptibility is subjective, and the physical response to sound complicates the analysis of its impact on people. People judge the relative magnitude of sound sensation in subjective terms such as "noisiness" or "loudness."

MEASURING SOUND

Sound pressure levels are described in logarithmic units of ratios of sound pressures to a reference pressure, squared. These units are called bels. To provide a finer description of sound, a bel is subdivided into 10 decibels, abbreviated dB. Since decibels are logarithmic units, sound pressure levels cannot be added or subtracted by ordinary arithmetic means. For example, if one automobile produces a sound pressure level of 70 dB when it passes an observer, two cars passing simultaneously would not produce 140 dB. In fact, they would combine to produce 73 dB. This same principle can be applied to other traffic quantities as well. In other words, doubling the traffic volume on a street or the speed of the traffic will increase the traffic noise level by three dB. Conversely, halving the traffic volume or speed will reduce the traffic noise level by three dB. A three dB change in sound is the beginning at which humans generally notice a *barely perceptible* change in sound and a five dB change is generally *readily perceptible.*[1]

Sound pressure level alone is not a reliable indicator of loudness. The frequency or pitch of a sound also has a substantial effect on how humans will respond. While the intensity of the sound is a purely physical quantity, the loudness or human response depends on the characteristics of the human ear. Human hearing is limited not only to the range of audible frequencies but also in the way it perceives the sound pressure level in that range. In general, the healthy human ear is most sensitive to sounds between 1,000 Hertz (Hz) and 5,000 Hz, and perceives both higher and lower frequency sounds of the same magnitude with less intensity. Hertz is a unit of frequency that defines any periodic event. In the case of sound pressure, a Hertz defines one cycle of a sound wave per second (see Figure 1, Hertz Diagram). To approximate the frequency response of the human ear, a series of sound pressure level adjustments is usually applied to the sound measured by a sound level meter.

Figure 1
Hertz Diagram



Standards for Noise Equivalent

Noise consists of pitch, loudness, and duration; therefore, a variety of methods for measuring noise have been developed. According to the California General Plan Guidelines for Noise Elements, the following are common metrics for measuring noise:[2]

L_{eq} (Equivalent Energy Noise Level): The sound level corresponding to a steady-state sound level containing the same total energy as a time-varying signal over given sample periods. L_{eq} is typically computed over 1-, 8-, and 24-hour sample periods.

CNEL (Community Noise Equivalent Level): The average equivalent A-weighted sound level during a 24-hour day, obtained after addition of five decibels to sound levels in the evening from 7:00 PM to 10:00 PM and after addition of ten decibels to sound levels in the night from 10:00 PM to 7:00 AM.

L_{dn} (Day-Night Average Level): The average equivalent A-weighted sound level during a 24-hour day, obtained after the addition of ten decibels to sound levels in the night after 10:00 PM and before 7:00 AM.

CNEL and L_{dn} are utilized for describing ambient noise levels because they account for all noise sources over an extended period of time and account for the heightened sensitivity of people to noise during the night. L_{eq} is better utilized for describing specific and consistent sources because of the shorter reference period.

Federal and State agencies have established noise and land use compatibility guidelines that use averaging approaches to noise measurement. The State Department of Aeronautics and the California Commission on Housing and Community Development have adopted the community noise equivalent level (CNEL).

3.2 Vibration and Groundborne Noise

Vibration is the movement of mass over time. It is described in terms of frequency and amplitude and unlike sound; there is no standard way of measuring and reporting amplitude. Vibration can be described in units of velocity (inches per second) or discussed in decibel (dB) units in order to compress the range of numbers required to describe vibration. Vibration impacts to buildings are generally discussed in terms of peak particle velocity (PPV) that describes particle movement over time (in terms of physical displacement of mass). For purposes of this analysis, PPV will be used to describe all vibration for ease of reading and comparison. Vibration can impact people, structures, and sensitive equipment.[3] The primary concern related to vibration and people is the potential to annoy those working and residing in the area. Vibration with high enough amplitudes can damage structures (such as crack plaster or destroy windows). Groundborne vibration can also disrupt the use of sensitive medical and scientific instruments such as electron microscopes. Common sources of vibration within communities include construction activities and railroads.

Groundborne vibration generated by construction projects is usually highest during pile driving, rock blasting, soil compacting, jack hammering, and demolition-related activities. Next to pile driving, grading activity has the greatest potential for vibration impacts if large bulldozers, large trucks, or other heavy equipment are used.

4.1 Sensitive Receptors

Some populations are more susceptible to the effects of noise pollution than the population at large; these populations are defined as sensitive receptors. Sensitive receptors include children, the elderly, the sick, and the athletic. Land uses associated with sensitive receptors include residences, schools, playgrounds, childcare centers, athletic facilities, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes. Sensitive receptors are located west and south of the project site. Single-family homes are located on the west side of Wilmington Avenue immediately adjacent to the project site. Del Amo Elementary School is located approximately 0.40 miles north of the project site. Exhibit 2 (Radius Map) identifies existing development in the project vicinity based on recent assessor's parcel data.

4.2 Existing Noise Levels

Short-term noise measurements at the project site and nearby receptors were conducted to identify the ambient noise in the project vicinity both in the daytime and at night. An American National Standards Institute (ANSI Section SI4 1979, Type 1) Larson Davis model LxT sound level meter was used to monitor existing ambient noise levels in the project area. The noise meter was programmed in "slow" mode to record noise levels in A-weighted form. The microphone height was set at five feet. Two 15-minute daytime noise measurements were taken on Wednesday, May 25, 2016 at the existing driveway on South Wilmington and at the commercial use located immediately adjacent to the project to the south. Two additional 15-minute daytime noise measurements were taken Wednesday, February 8, 2017 at the residential neighborhood to the west of the site. These two additional measurement locations were the cul-de-sacs of East 219th Street and East Abila Street. Nighttime noise measurements were conducted at all four locations on the night of Thursday, February 9, 2017/ Friday, February 10, 2017. Vehicular traffic along Wilmington Avenue and East 220th Street and operational noise from neighboring industrial uses were the dominant noise sources observed during the measurements. Measurement locations are shown in Exhibit 3 (Noise Measurement Locations).

Ambient noise levels are a composite of noise from all sources, near and far. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location. Ambient noise levels are presented in Table 1 (Ambient Noise Levels) and measurement output data is included as Appendix A. As shown in Table 1, ambient noise levels at the existing project driveway on Wilmington Avenue (Measurement Location #1) ranged from 68.0 CNEL during the nighttime to 72.4 dBA CNEL during the daytime. This is the location of the project site that will most likely have the highest noise levels during operation as this will be the busiest ingress/egress point on the project. As also shown in Table 1, ambient noise levels at the commercial use to the south (Measurement Location #2) ranged from 57.7 CNEL during the nighttime and 65.4 CNEL during the daytime. Finally, as shown in Table 1, ambient noise levels at the residential uses to the west of the project site on East 219th Street (Measurement Location #3) and East Abila Street (Measurement Location #4) ranged from 48.7 CNEL during the nighttime and 52.2 CNEL during the daytime.

Table 1
Ambient Noise Levels

Location	Date	Time Period	Measurement Period	Description	Existing Ambient Noise Levels (dBA Leq)
001	05/25/16	12:48 PM – 1:03 PM	15 Minutes	South side of E 220th Street	65.4
002	05/25/16	1:05 PM – 1:20 PM	15 Minutes	Existing Driveway/Wilmington Ave.	72.4
003	02/08/17	11:36 AM – 11:51 AM	15 Minutes	East 219th Street Cul-de-Sac	50.5
004	02/08/17	11:54 AM – 12:09 PM	15 Minutes	East Abila Street Cul-de-Sac	48.7
001	02/09/17	11:21 PM – 11:36 PM	15 Minutes	South side of E 220th Street	57.7
002	02/09/17	11:41 PM – 11:56 PM	15 Minutes	Existing Driveway/Wilmington Ave.	68.0
003	02/10/17	12:01 AM – 12:16 AM	15 Minutes	East 219th Street Cul-de-Sac	52.2
004	02/10/17	12:19 AM – 12:34 AM	15 Minutes	East Abila Street Cul-de-Sac	51.7

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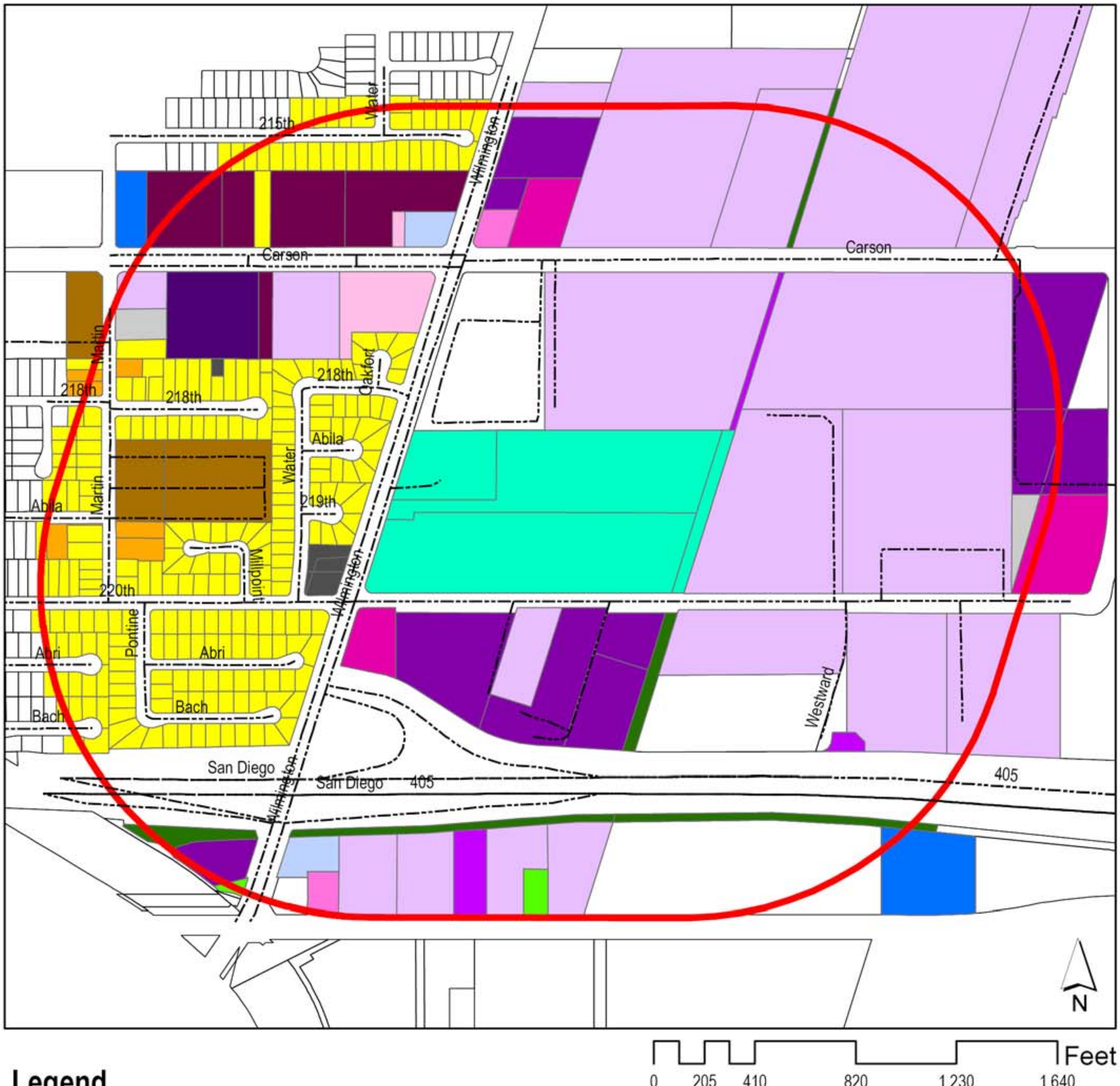

Legend

- Project Site
- 0.25 Mile Radius

Land Use

- Single Family Residential
- Multiple-Family Residential
- Manufactured Home
- Retail
- Restaurant
- Office
- Church
- Service Station
- Auto, Recreation Equipment Sales & Service
- Warehouse
- Industrial
- Manufacturing
- Food Processing Plant
- Utility
- Open Space
- Parking Lot
- Vacant

Exhibit 2 Radius Map

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Carson, California

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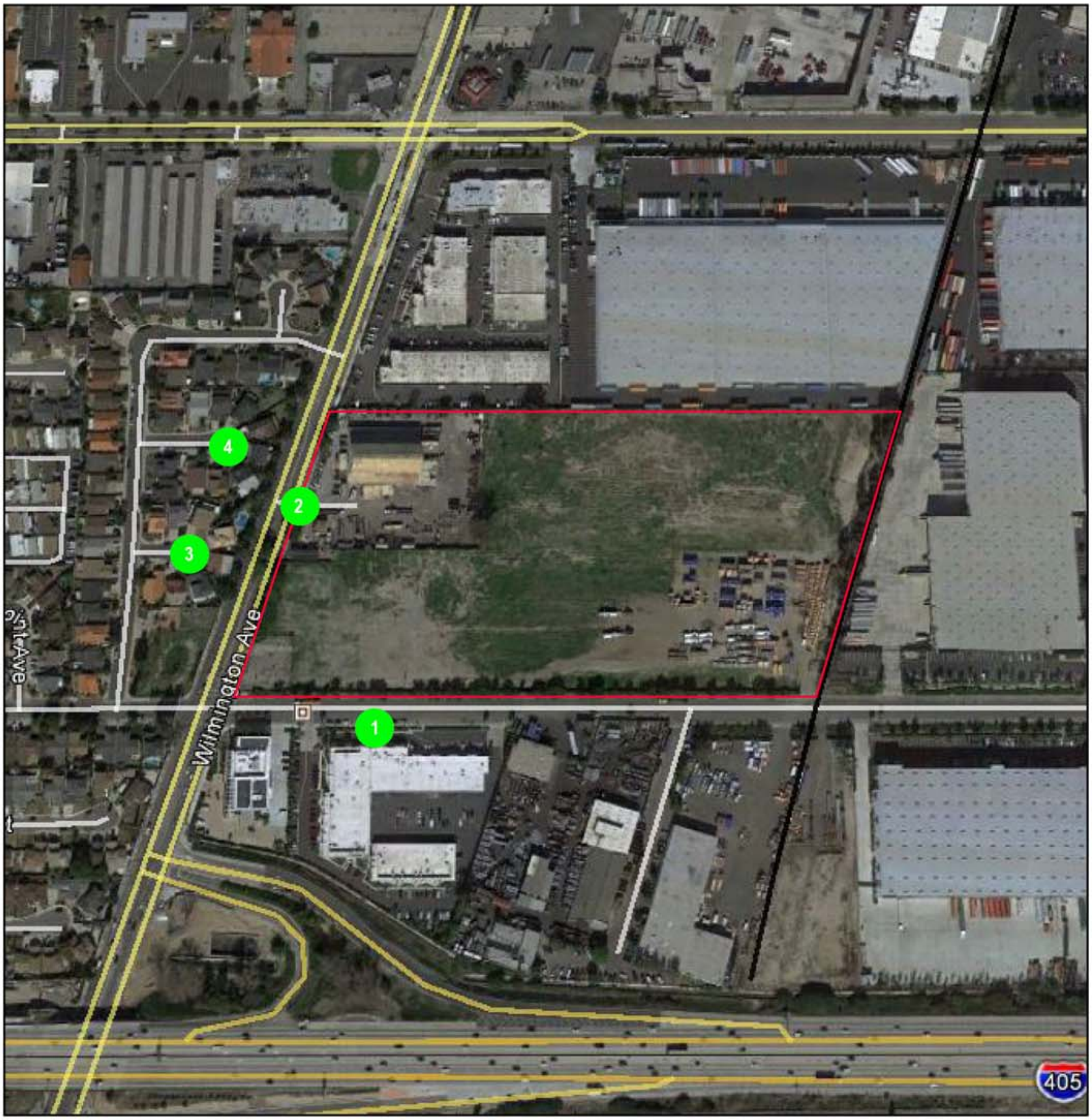

Project Site

XX Measurement Location

Exhibit 3 Noise Measurement Locations

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Carson, California

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5.1 Federal Regulations

Federal Noise Control Act of 1972

The U.S. Environmental Protection Agency (EPA) Office of Noise Abatement and Control was originally established to coordinate federal noise control activities. After its inception, EPA's Office of Noise Abatement and Control issued the Federal Noise Control Act of 1972, establishing programs and guidelines to identify and address the effects of noise on public health, welfare, and the environment. In response, the EPA published information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety (Levels of Environmental Noise). The Levels of Environmental Noise recommended that the L_{dn} should not exceed 55 dBA outdoors or 45 dBA indoors to prevent significant activity interference and annoyance in noise-sensitive areas.

In addition, the Levels of Environmental Noise identified five dBA as an "adequate margin of safety" for a noise level increase relative to a baseline noise exposure level of 55 dBA L_{dn} (i.e., there would not be a noticeable increase in adverse community reaction with an increase of five dBA or less from this baseline level). The EPA did not promote these findings as universal standards or regulatory goals with mandatory applicability to all communities, but rather as advisory exposure levels below which there would be no risk to a community from any health or welfare effect of noise.

In 1981, EPA administrators determined that subjective issues such as noise would be better addressed at more localized levels of government. Consequently, in 1982 responsibilities for regulating noise control policies were transferred to State and local governments. However, noise control guidelines and regulations contained in EPA rulings in prior years remain in place by designated federal agencies, allowing more individualized control for specific issues by designated federal, State, and local government agencies.

Federal Transit Administration

The Federal Transit Administration (FTA) has developed methodology and significance criteria to evaluate incremental noise impacts from surface transportation modes (i.e., on road motor vehicles and trains) as presented in Transit Noise Impact and Vibration Assessment (FTA Guidelines). These incremental noise impact criteria are based on EPA findings and subsequent studies of annoyance in communities affected by transportation noise. The FTA extended the EPA's five dBA incremental impact criterion to higher ambient levels. As baseline ambient levels increase, smaller and smaller increments are allowed to limit expected increases in community annoyance. For example, in residential areas with a baseline ambient noise level of 50 dBA CNEL, a less-than-five dBA increase in noise levels would produce a minimal increase in community annoyance levels, while at 70 dBA CNEL, only one dBA increase could be accommodated before a significant annoyance increase would occur.

Vibration Standards

The FTA provides guidelines for maximum-acceptable vibration criteria for different types of land uses. Groundborne vibration and noise levels associated with various types of construction equipment and activities are summarized in Table 2 (Reference Vibration Source Amplitudes for Construction Equipment). Table 3 (Groundborne Vibration and Noise Impact Criteria) shows the Federal Transit Administration's maximum acceptable vibration standard for human annoyance in residences where people normally sleep is 80 VdB (less than 70 vibration events per day).

Table 2
Reference Vibration Source Amplitudes for Construction Equipment

Equipment	Reference PPV at 25 ft (in/sec) at 25 Feet	Approximate Vibration Level (VL) at 25 Feet
Pile driver (impact)	1.518 (upper range)	112
	0.644 (typical)	104
Pile driver (sonic)	0.734 (upper range)	105
	0.170 (typical)	93
Clam shovel drop (slurry wall)	0.202	94
Hydromill	0.008 in soil	66
Slurry wall	0.017 in rock	75
Vibratory roller	0.210	94
Hoe Ram	0.089	87
Large bulldozer	0.089	87
Caisson drill	0.089	87
Loaded trucks	0.076	86
Jackhammer	0.035	79
Small bulldozer	0.003	58

Notes: PPV is the peak particle velocity. Pile driver amplitude varies greatly based on equipment type and size.
Source: Federal Transit Administration. Transit Noise and Vibration Impact Assessment. 2006.

Table 3
Groundborne Vibration and Noise Impact Criteria

Land Use Category	Groundborne Vibration Impact Levels (VdB)		Groundborne Noise Impact Levels (dBA)	
	Frequent Events[1]	Infrequent Events[2]	Frequent Events[1]	Infrequent Events[2]
Category 1: Buildings where low ambient vibration is essential for interior vibrations	65 VdB[3]	65 VdB[3]	N/A	N/A
Category 2: Residences and buildings where people normally sleep	72 VdB	80 VdB	35 dBA	43 dBA
Category 3: Institutional land uses with primarily daytime use	75 VdB	83 VdB	40 dBA	48 dBA

1 *Frequent Events – more than 70 vibration events per day*
2 *Infrequent Events – fewer than 70 vibration events per day*
3 *This criterion limit is based on levels that are acceptable for more moderately sensitive equipment such as optical microscopes.*
Source: United States Department of Transportation, Federal Transit Administration, Transit Noise and Vibration Assessment, 1995

The FTA and Caltrans have compiled the data from numerous studies related to vibration and have developed standards for human perception and building damage. The FTA's maximum acceptable vibration standard for human annoyance is 78 VdB at nearby vibration-sensitive land uses.[4] The Caltrans maximum vibration level standard is 0.2 in/sec PPV for the prevention of structural damage to typical residential buildings.[5]

5.2 State Regulations

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

CEQA requires lead agencies to consider noise impacts. Under CEQA, lead agencies are directed to assess conformance to locally established noise standards or other agencies' noise standards; measure and identify the potentially significant exposure of people to or generation of excessive noise levels; measure and identify potentially significant permanent or temporary increase in ambient noise levels; and measure and identify potentially significant impacts associated with air traffic.

CALIFORNIA NOISE CONTROL ACT OF 1973

Sections 46000-46080 of the California Health and Safety Code, known as the California Noise Control Act of 1973, find that excessive noise is a serious hazard to public health and welfare and that exposure to certain levels of noise can result in physiological, psychological, and economic damage. It also finds that there is a continuous and increasing bombardment of noise in the urban, suburban, and rural areas. The California Noise Control Act declares that the State of California has a responsibility to protect the health and welfare of its citizens by the control, prevention, and abatement of noise. It is the policy of the State to provide an environment for all Californians free from noise that jeopardizes their health or welfare.

CALIFORNIA NOISE INSULATION STANDARDS (CCR TITLE 24)

In 1974, the California Commission on Housing and Community Development adopted noise insulation standards for multi-family residential buildings (Title 24, Part 2, California Code of Regulations). Title 24 establishes standards for interior room noise (attributable to outside noise sources). The regulations also specify that acoustical studies must be prepared whenever a residential building or structure is proposed to be located near an existing or adopted freeway route, expressway, parkway, major street, thoroughfare, rail line, rapid transit line, or industrial noise source, and where such noise source or sources create an exterior CNEL (or L_{dn}) of 60 dBA or greater. Such acoustical analysis must demonstrate that the residence has been designed to limit intruding noise to an interior CNEL (or L_{dn}) of 45 dBA or below [California's Title 24 Noise Standards, Chap. 2-35].

STATE OF CALIFORNIA GENERAL PLAN GUIDELINES 2003

Though not adopted by law, the State of California General Plan Guidelines 2003, published by the California Governor's Office of Planning and Research (OPR) (OPR Guidelines), provides guidance for the compatibility of projects within areas of specific noise exposure. The OPR Guidelines identify the suitability of various types of development relative to a range of outdoor noise levels and provide each local community some flexibility in setting local noise standards that allow for the variability in community preferences. Findings presented in the Levels of Environmental Noise Document (EPA 1974) influenced the recommendations of the OPR Guidelines, most importantly in the choice of noise exposure metrics (i.e., L_{dn} or CNEL) and in the upper limits for the normally acceptable outdoor exposure of noise-sensitive uses.

The OPR Guidelines include a Noise and Land Use Compatibility Matrix which identifies acceptable and unacceptable community noise exposure limits for various land use categories. Where the "normally acceptable" range is used, it is defined as the highest noise level that should be considered for the construction of the buildings which do not incorporate any special acoustical treatment or noise mitigation. The "conditionally acceptable" or "normally acceptable" ranges include conditions calling for detailed acoustical study or construction mitigation to reduce interior exposure levels prior to the construction or operation of the building under the listed exposure levels.

CALIFORNIA DEPARTMENT OF TRANSPORTATION

According to the Caltrans vibration manual, large bulldozers, vibratory rollers (used to compact earth), and loaded trucks utilized during grading activities can produce vibration, and depending on the level of vibration, could cause annoyance at uses within the project vicinity or damage structures. Caltrans has developed a screening tool to determine of vibration from construction equipment is substantial enough to impact surrounding uses.

The Caltrans vibration manual establishes thresholds for vibration impacts on buildings and humans. These thresholds are summarized in Tables 4 (Vibration Damage Potential Threshold Criteria) and 5 (Vibration Annoyance Potential Threshold Criteria).

Table 4
Vibration Damage Potential Threshold Criteria

Structural Integrity	Maximum PPV (in/sec)	
	Transient	Continuous
Historic and some older buildings	0.50	0.25
Older residential structures	0.50	0.30
New residential structures	1.00	0.50
Modern industrial and commercial structures	2.00	0.50
Source: Caltrans 2013		

Table 5
Vibration Annoyance Potential Threshold Criteria

Human Response	PPV Threshold (in/sec)	
	Transient	Continuous
Barely perceptible	0.035	0.012
Distinctly perceptible	0.24	0.035
Strongly perceptible	0.90	0.10
Severely perceptible	2.00	0.40
Source: Caltrans 2013		

5.3 Local Regulations

CITY OF CARSON MUNICIPAL CODE
The City of Carson Municipal Code, under Chapter 5 (Noise Control Ordinance) Section 5500, adopts the Los Angeles County Noise Control Ordinance.

<u>Exterior Noise Standards</u>
Pursuant to Los Angeles County Municipal Code Section 12.08.390 (Exterior Noise Standards), exterior noise levels should not exceed 50 dBA between the hours of 7:00 AM and 10:00 PM at residential uses during the daytime, 45 dBA between the hours of 10:00 PM and 7:00 AM at residential uses during the nighttime, 65 dBA at commercial uses, and 70 dBA at industrial uses. The County's exterior noise standards are summarized in Table 6 (Los Angeles County Exterior Noise Standards).

Table 6
Los Angeles County Exterior Noise Standards

Noise Zone	Designated Noise Zone Land Use (Receptor Property)	Time Interval	Exterior Noise Level (dB)
I	Noise-sensitive area	Anytime	45
II	Residential Properties	10:00 PM – 7:00 AM (nighttime)	45
		7:00 AM – 10:00 PM	50
III	Commercial Properties	10:00 PM – 7:00 AM (nighttime)	55
		7:00 AM – 10:00 PM	65
IV	Industrial Properties	Anytime	70
Source: Los Angeles County Municipal Code Section 12.08.390 (Exterior Noise Standards)			

Construction Noise Standards

Pursuant to Section 12.08.440 of the Los Angeles County Code, noise sources created by construction are prohibited between the hours of 7:00 PM and 7:00 AM Monday through Saturday or any time on Sundays or holidays. The City of Carson Municipal Code Section 5502(c) amends Los Angeles County Code Section 12.8.440 to require that for affected residential receptors between the hours of 7:00 AM and 8:00 PM, maximum noise levels for nonscheduled, intermittent, short-term operation (less than 20 days) of mobile equipment shall not exceed 75 dBA at single-family residences, 80 dBA at multi-family residences, or 85 dBA for semi-residential/commercial use. The maximum noise level for repetitively scheduled and relatively long-term (periods of 21 days or more) of construction equipment shall not exceed 65 dBA at single-family residences, 70 dBA at multi-family residences, or 70 dBA at semi-residential/commercial uses between the hours of 7:00 AM and 8:00 PM. For commercial receptors, the maximum noise level generated by mobile or stationary equipment shall not exceed 85 dBA.

Vibration Standards

Pursuant to Section 12.08.560 (Vibration) of the Los Angeles County Municipal Code, operating or permitting the operation of any device that creates vibration which is above the vibration perception threshold of any individual at or beyond the property boundary of the source if on private property, or at 150 feet from the source if on a public right-of-way is prohibited.

CITY OF CARSON GENERAL PLAN

The City of Carson General Plan Noise Element includes the following noise and land use compatibility matrix.

Figure 2
Noise and Land Use Compatibility Matrix

Land Use Category	Community Noise Exposure Ldn or CNEL, dB			
	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable
Residential-Low Density	50-60	60-65	65-75	75-85
Residential-Multiple Family	50-60	60-65	65-75	75-85
Transient Lodging-Motel, Hotels	50-65	65-70	70-80	80-85
Schools, Libraries, Churches, Hospitals, Nursing Homes	50-60	60-65	65-80	80-85
Auditoriums, Concert Halls, Amphitheaters	NA	50-65	NA	65-85
Sports Arenas, Outdoor Spectator Sports	NA	50-70	NA	70-85
Playgrounds, Neighborhood Parks	50-70	NA	70-75	75-85
Golf Courses, Riding Stables, Water Recreation, Cemeteries	50-70	NA	70-80	80-85
Office Buildings, Business Commercial and Professional	50-67.5	67.5-75	75-85	NA
Industrial, Manufacturing, Utilities, Agriculture	50-70	70-75	75-85	NA

Source: Modified from U.S. Department of Housing and Urban Development Guidelines and State of California Standards.

NOTES: NORMALLY ACCEPTABLE

Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

CONDITIONALLY ACCEPTABLE

New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

NORMALLY UNACCEPTABLE

New Construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

CLEARLY UNACCEPTABLE

New construction or development should generally not be undertaken.

NA: Not Applicable

The thresholds identified in Appendix G of the State CEQA Guidelines, as implemented by the City of Carson, have been utilized to assess the significance of the potential environmental effects of the project.

6.1 Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the proposed project could result in potentially significant impacts related to noise if it results in:

A. Exposure of persons or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
B. Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.
C. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.
D. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.
E. For a project located within an airport land use plan, or where such a plan has not been adopted, within two miles of a public airport or public use airport, exposure of people residing or working in the project area to excessive noise levels.
F. For a project within a vicinity of a private airstrip, expose people residing or working in the project area to excessive noise levels.

To assess construction impacts, a worst-case construction scenario was modeled using the Federal Highway Administration's Roadway Construction Noise Model (RCNM). Modeling parameters and output are provided in Appendix B. RCNM utilizes standard noise emission levels for different types of equipment and includes utilization percentage, impact, and shielding parameters.

To assess Opening Year 2018 traffic noise levels, vehicle trips associated with surrounding roadways were modeled utilizing the Federal Highway Administration (FHWA) Traffic noise Model (TNM) Version 2.5. Traffic noise levels identified represent conservative potential noise exposure. In reality, noise levels may vary from those represented as the calculations do not assume natural or artificial shielding nor do they assume reflection from existing or proposed structures or topography. Intervening structures or other noise-attenuating obstacles between a roadway and a receptor may reduce roadway noise levels at the receptor.

6.2 Consistency with Applicable Standards

CONSTRUCTION NOISE LEVELS

Construction noise levels were estimated for nearby receptors using the FHWA Roadway Construction Noise Model (RCNM). See Exhibit 4 (Receptors) for receptor locations. The City of Carson Municipal Code adopts the County of Los Angeles County Code Noise Ordinance, which does not include a regulation for industrial uses during construction activities. According to the Carson General Plan Noise Ordinance Table N-2, noise levels at industrial uses, including agriculture, are normally acceptable up to 70 dBA CNEL. Temporary noise increases will be greatest during the demolition phase. The model indicates that use of construction equipment such as excavators, dozers, and concrete saws could expose the industrial uses located approximately 350 feet to the north and 450 feet to the south of the center of the project site to combined noise levels of 72.7 dBA L_{max} and 70.5 dBA $L_{max.}$ Demolition equipment could also expose the residential uses located approximately 700 feet to the west of the center of the project site to a combined noise level of 66.7 dBA $L_{max.}$ Construction activity during all other phases would be within allowable noise levels. Construction activity could result in noise levels in excess of the allowable noise levels at the industrial uses to the north and south and the residential uses to the west during the demolition phase. Therefore, Mitigation Measure NOI-1 has been incorporated to reduce the impact to neighboring uses during demolition.

Because noise levels during demolition activities are anticipated to exceed the City's exterior noise standards, mitigation measures will be necessary to minimize noise levels at neighboring uses during the demolition phase. Mitigation Measure NOI-1 will be incorporated to minimize noise associated with general construction activities. Mitigation Measure NOI-1 requires the use of engineered controls to reduce noise from equipment. Engineered controls include retrofitting equipment with improved exhaust and intake muffling, disengaging equipment fans, and installation of sound panels around equipment engines. These types of controls can achieve noise level reductions of approximately 10 dBA.[6] [7] Mitigation Measure NOI-1 also requires that stationary construction noise sources to be located at least 100 feet from sensitive land uses when feasible, equipment staging areas to be placed at maximum distance from receptors, that all idling equipment be turned off when not in use, and that all equipment be maintained and their loads are secured. Implementation of Mitigation Measure NOI-1 will reduce temporary noise impacts to within allowable levels. Therefore, with implementation of Mitigation Measure NOI-1, construction noise will feasibly be reduced to unsubstantial levels.

OFF-SITE OPERATIONAL NOISE LEVELS

The City of Carson Municipal Code adopts the County of Los Angeles County Code Noise Ordinance, which sets an allowable noise level of 70 dBA at industrial uses and 50 dBA between the hours of 7:00 AM and 10:00 PM for residential uses. Ambient noise at the project site and surrounding uses is generally defined by traffic on Wilmington Avenue and East 220th Street and operational noise from neighboring industrial uses. In particular, ambient noise in the project vicinity is characterized by 24-hour heavy truck traffic associated with nearby industrial uses. Traffic noise from vehicular traffic generated by the proposed project, including project-generated truck traffic, was projected using TNM Version 2.5 software was based on estimated trip generation provided by Urban Crossroads (see Appendix C). A substantial increase in ambient noise is an increase that is *barely perceptible* (3 dBA). Operationally, the proposed project is a speculative use; therefore, the project could include 24-hour activities.

The *Opening Year 2018 Without* Project and With Project noise levels at neighboring uses were calculated using TNM Version 2.5 (see Appendix D for output data). The *Opening Year 2018 Without* Project and With Project traffic noise levels at neighboring uses are summarized in Table 7 (Opening Year 2018 Roadway Noise Levels).

Table 7
Opening Year 2018 Roadway Noise Levels

Receptors	Without Project dBA CNEL (Day)	With Project dBA CNEL (Day)	Without Project dBA CNEL (Night)	With Project dBA CNEL (Night)	Difference	Significant? AM/PM
1 – Industrial (N)	76.4	76.5	--	--	0.1	No
2 – Industrial (E)	66.3	66.9	--	--	0.6	No
3 – Commercial (S)	68.5	69.1	--	--	0.6	No
4 – Residential (W)	78.7	78.7	51.7	51.7	0.0	No

Exterior daytime noise levels during Opening Year 2018 will be within the allowable exterior noise levels at the industrial uses to the north and east of the project site. Exterior daytime noise levels will exceed the allowable 70 dBA for industrial uses and 50 dBA for residential uses at the industrial use to the north and the residential uses to the west, respectively. Exterior nighttime noise levels during Opening Year 2018 will be within the allowable exterior noise levels at the industrial uses to the east and south of the project site. Exterior nighttime noise levels will exceed the allowable 70 dBA for industrial uses and 50 dBA for residential uses at the industrial use to the north and the residential uses to the west, respectively. Because noise levels will exceed allowable levels under Without Project conditions, the proposed project will not cause noise levels to exceed normally acceptable levels. In addition, the proposed project will not result in a perceptible noise increase at any of the studied receptors. Therefore, no substantial impacts will result under Opening Year 2018 conditions.

ON-SITE OPERATIONAL NOISE LEVELS
Residential uses are located to the west of the project site on the west side of South Wilmington Avenue. Noise levels due to the operation of the proposed facility will result from truck activity at docking bays and drive aisles, HVAC units and passenger vehicle operation along the drive aisles and parking areas. Equipment activity at the loading/unloading docks includes loading and unloading activity and engine start-up, acceleration, idling, and back-up alarms from trucks have been included in the calculation. These activities are periodic and common for industrial uses. The Federal Occupational Health and Safety Administration (OSHA) *Technical Manual* was referenced to identify typical noise level exposure for workers in a variety of industrial occupations.[8] Per worker exposure records of approximately 1,200 samples collected by OSHA, the median noise level for transportation-related facilities is 80.89 dBA. Using the inverse squares law for distance attenuation of noise, at a distance of 775 feet from the central dock area, residents west of the project site on the opposing side of Wilmington Avenue would be exposed to noise levels of approximately 23 dBA. Assuming a +10 dBA sensitivity factor for noise occurring during the night, exposure to an operational noise level of 33 dBA will not exceed the City's noise standard of 50 dBA. These calculations do not account for the existing CMU wall or landscaping existing between the project site and the residential units on the opposing side of Wilmington Avenue.

6.3 Vibration Impacts

CONSTRUCTION VIBRATION
Construction activities that use vibratory rollers and bulldozers are repetitive sources of vibration; therefore, the *continuous* threshold is used. Industrial structures are located to the east and south of the project site. As a worst case scenario, the *historic and some older buildings* threshold is used. Based on the threshold criteria summarized in Tables 4 and 5, vibration from use of heavy construction equipment for the proposed project would be below the thresholds to cause damage to nearby structures shown in Table 8 (Construction Vibration Impacts).

Construction of the project does not require rock blasting, pile driving, or the use of a jack hammer, but will use a vibratory roller, and large bulldozer, and loaded trucks. All of the receptors will experience less than *barely perceptible* vibration from construction of the proposed project. Furthermore, these construction activities will be limited to the allowable hours as discussed in Section 5.3 above. With regard to long-term operational impacts, activities associated with the project will not result in any vibration-related impacts to adjacent or on-site properties.

Table 8
Construction Vibration Impacts

Receptors	Equipment	PPVref	Distance (feet)	PPV
1 – Industrial (N)	Vibratory Roller	0.21	350	0.0068
2 – Industrial (E)	Vibratory Roller	0.21	815	0.0023
3 – Industrial (S)	Vibratory Roller	0.21	450	0.0049
4 – Residential (W)	Vibratory Roller	0.21	700	0.0028
1 – Industrial (N)	Large Bulldozer	0.089	350	0.0029
2 – Industrial (E)	Large Bulldozer	0.089	815	0.0010
3 – Industrial (S)	Large Bulldozer	0.089	450	0.0021
4 – Residential (W)	Large Bulldozer	0.089	700	0.0012
1 – Industrial (N)	Loaded Truck	0.076	350	0.0025
2 – Industrial (E)	Loaded Truck	0.076	815	0.0008
3 – Industrial (S)	Loaded Truck	0.076	450	0.0018
4 – Residential (W)	Loaded Truck	0.076	700	0.0010

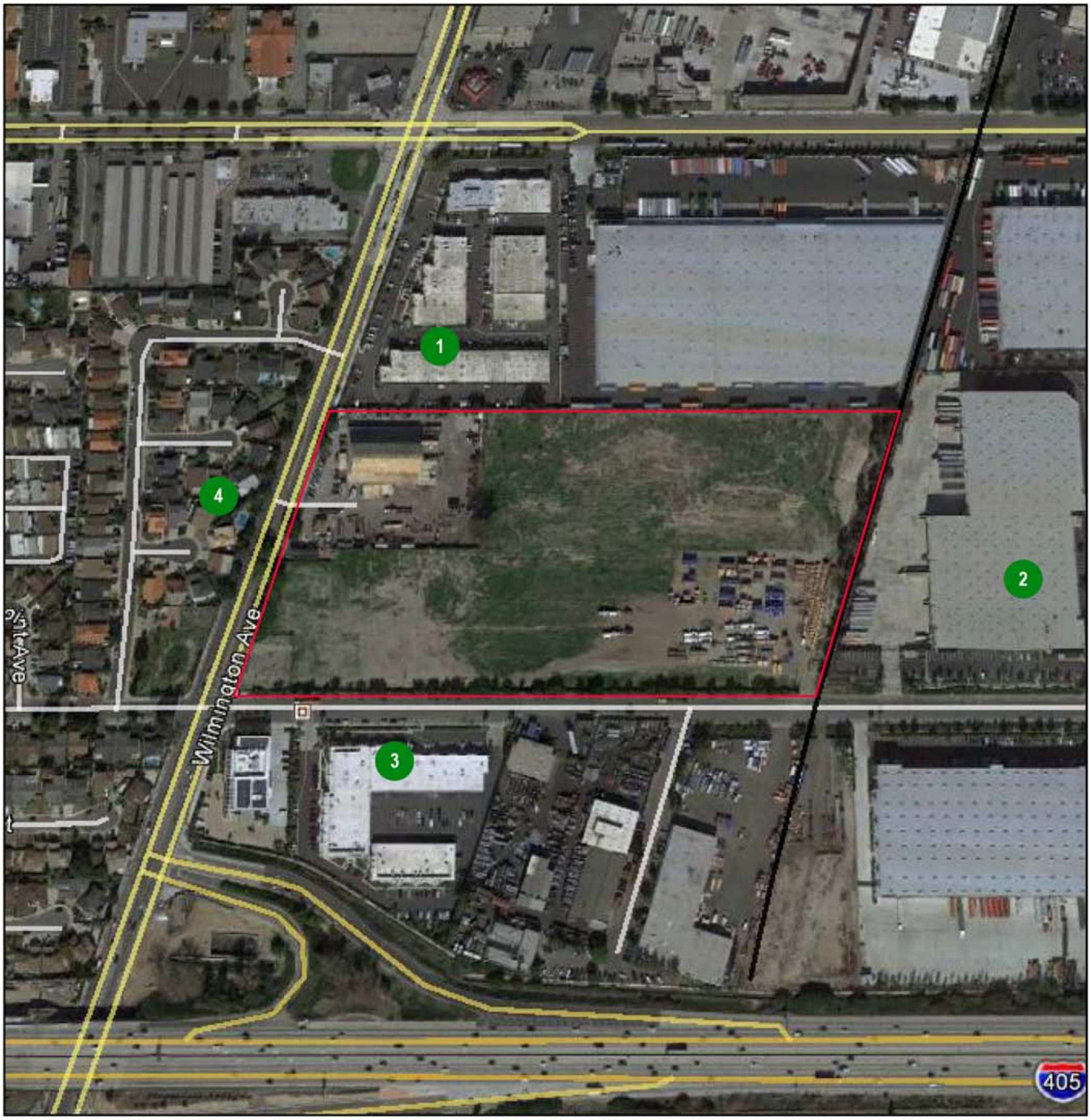
OPERATIONAL VIBRATION

Operation of the proposed project will include heavy-duty truck traffic along South Wilmington Avenue. According to the Federal Transit Administration, it is unusual for vibration from sources such as trucks to be perceptible.[9] However, according to Caltrans, heavy trucks can impart groundborne vibration when the pavement is not smooth.[10] Therefore, to provide a worst case analysis, potential building damage due to project operation has been analyzed for the residences located to the west of the project site on the opposite side of Wilmington Avenue.

The residences are located approximately 60 feet from the centerline of Wilmington Avenue. According to Caltrans, the highest truck traffic vibrations generated on freeway shoulders (at average speeds of 55 mph) is 2.0 PPV mm/sec (0.079 PPV in/sec). At 60 feet, the vibration level reaching the residences is 0.015 PPV. According to project trip generation as estimated by Urban Crossroads, the proposed project is anticipated to generate 486 heavy-duty trucks per day, with a maximum of 23 heavy-duty trucks during the AM peak hour and 30 heavy-duty truck trips during the PM peak hour. Although truck trips will occur periodically, the continuous threshold has been utilized to provide a worst case analysis. Based on the Caltrans threshold for older residential structures as summarized in Table 4 above, and the vibration annoyance potential threshold criteria summarized in Table 5, heavy truck traffic on Wilmington Avenue will not result in structural damage to residences or perceptible annoyance to inhabitants due to operation-related groundborne vibration.

6.4 Airport Noise

The project site is located approximately 4.2 miles south of Compton Airport. According to the Carson General Plan, the 60 dBA and 65 dBA noise contours from Compton Airport do not extend into the City of Carson. Therefore, no substantial impacts will occur.



Project Site

Receptor

Exhibit 4 Receptors

AL2 Carson 420K Industrial Building

Carson, California

7 MITIGATION MEASURES

The following mitigation measures are required to ensure that project-related short-term noise levels are consistent with applicable federal, State, and local regulations.

NOI-1 The following measures shall be implemented during the demolition phase of construction to ensure that construction noise levels do not exceed allowable exterior noise levels at neighboring industrial and residential uses:

- Stationary construction noise sources such as generators or pumps must be located at least 100 feet from sensitive land uses, as feasible, or at maximum distance when necessary to complete work near sensitive land uses. This mitigation measure must be implemented throughout construction and may be periodically monitored by the Planning Director, or designee during routine inspections.

- Construction staging areas must be located as far from noise sensitive land uses as feasible. This mitigation measure must be implemented throughout construction and may be periodically monitored by the Planning Director or designee during routine inspections.

- Throughout construction, the contractor shall ensure all construction equipment is equipped with included noise attenuating devices and are properly maintained. This mitigation measure shall be periodically monitored by the Planning Director, or designee during routine inspections.

- Idling equipment must be turned off when not in use. This mitigation measure may be periodically monitored by the Planning Director, or designee during routine inspections.

- Equipment must be maintained so that vehicles and their loads are secured from rattling and banging. This mitigation measure may be periodically monitored by the Planning Director, or designee during routine inspections.

- Nighttime construction activities will not be permitted (10:00 PM to 7:00 AM).

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1 California Department of Transportation. Basics of Highway Noise: Technical Noise Supplement. November 2009.
2 California Governor's Office of Planning and Research. General Plan Guidelines. 2003
3 California Department of Transportation. Transportation- and Construction-Induced Vibration Guidance Manual. June 2004
4 Federal Transit Administration. *Transit Noise and Vibration Impact Assessment.* 2006
5 California Department of Transportation. *Transportation and Construction Vibration Guidance Manual. Division of Environmental Analysis. September 2013*
6 United States Bureau of Mines. Mining Machinery Noise Control Guidelines. 1983
7 United States Bureau of Mines. Noise Abatement Techniques for Construction Equipment. August 1979
8 Federal Occupational Health and Safety Administration. Technical Manual. Section III, Chapter 5, Noise. August 15, 2013
9 Federal Transit Administration. Transit Noise and Vibration Impact Assessment. May 2006
10 California Department of Transportation, Transportation and Construction Vibration Guidance Manual, September 2013

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General Information

Serial Number	03790
Model	SoundExpert™ LxT
Firmware Version	2.206
Filename	LxT_Data.051
User	Olivia Chan
Job Description	AL2 420K Warehouse
Location	Carson, CA
Measurement Description	
Start Time	Wednesday, 25 May 2016 12:48:34
Stop Time	Wednesday, 25 May 2016 13:03:34
Duration	00:15:00.0
Run Time	00:15:00.0
Pause	00:00:00.0
Pre Calibration	Wednesday, 27 January 2016 10:21:19
Post Calibration	None
Calibration Deviation	---

Note

Overall Data

LASeq		65.4	dB
LASmax	25 May 2016 12:49:06	78.1	dB
LApeak (max)	25 May 2016 12:55:30	92.0	dB
LASmin	25 May 2016 12:56:56	54.8	dB
LCSeq		75.9	dB
LASeq		65.4	dB
LCSeq - LASeq		10.5	dB
LAIeq		66.8	dB
LAeq		65.4	dB
LAIeq - LAeq		1.4	dB
Ldn		65.4	dB
LDay 07:00-22:00		65.4	dB
LNight 22:00-07:00		---	dB
Lden		65.4	dB
LDay 07:00-19:00		65.4	dB
LEvening 19:00-22:00		---	dB
LNight 22:00-07:00		---	dB
LASE		94.9	dB
# Overloads		0	
Overload Duration		0.0	s
# OBA Overloads		56	
OBA Overload Duration		233.4	s

Statistics

LAS5.00	72.0	dBA
LAS10.00	69.0	dBA
LAS25.00	64.2	dBA
LAS50.00	61.1	dBA
LAS66.60	59.3	dBA
LAS90.00	57.2	dBA
LAS > 70.0 dB (Exceedence Counts / Duration)	15 / 92.7	s
LAS > 100.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 135.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 137.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 140.0 dB (Exceedence Counts / Duration)	0 / 0.0	s

Settings

RMS Weight	A Weighting	
Peak Weight	A Weighting	
Detector	Slow	
Preamp	PRMLxT1L	
Microphone Correction	Off	
Integration Method	Exponential	
OBA Range	Low	
OBA Bandwidth	1/1 and 1/3	
OBA Freq. Weighting	A Weighting	
OBA Max Spectrum	At Lmax	
Under Range Limit	25.4	dB
Under Range Peak	78.9	dB
Noise Floor	15.1	dB
Overload	122.6	dB

1/1 Spectra

Freq. (Hz):	8.0	16.0	31.5	63.0	125	250	500	1k	2k	4k	8k	16k
LASeq	7.2	18.5	32.6	46.1	53.7	53.8	58.2	60.8	57.9	53.2	44.7	31.1
LASmax	7.2	13.1	31.2	48.6	73.5	68.7	70.7	70.6	66.2	55.8	46.8	33.5
LASmin	7.2	7.3	23.3	35.4	37.7	39.5	45.6	51.1	47.3	37.0	25.4	10.1

1/3 Spectra

Freq. (Hz):	6.3	8.0	10.0	12.5	16.0	20.0	25.0	31.5	40.0	50.0	63.0	80.0
LASeq	3.0	2.5	1.8	6.4	12.7	16.9	23.2	26.9	30.6	35.9	40.9	44.0
LASmax	3.0	2.4	1.7	2.2	5.7	12.1	20.2	25.8	30.0	38.1	44.9	46.3
LASmin	3.0	2.4	1.7	1.2	0.3	5.8	11.5	16.5	21.1	25.5	29.8	30.7

Freq. (Hz):	100	125	160	200	250	315	400	500	630	800	1k	1.25k
LASeq	47.5	48.8	50.3	47.9	48.9	49.9	51.7	53.5	54.6	56.0	56.4	55.8
LASmax	51.9	68.5	73.1	62.0	63.8	64.7	65.5	65.7	66.7	67.3	65.4	65.9
LASmin	31.7	33.0	33.4	32.0	34.0	36.5	38.3	40.5	42.0	45.5	47.4	45.9

Freq. (Hz):	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	20k
LASeq	54.4	52.7	51.9	50.7	47.7	45.1	42.2	39.9	35.2	29.9	23.5	14.7
LASmax	64.8	59.8	56.4	53.3	50.4	47.7	44.8	40.7	36.8	32.0	26.6	20.4
LASmin	44.3	42.0	37.9	34.8	29.9	26.3	23.7	18.3	14.5	8.1	3.1	-0.6

Calibration History

Preamp	Date	dB re. 1V/Pa
PRMLxT1L	27 Jan 2016 10:21:19	-28.9
PRMLxT1L	26 Jan 2016 14:23:09	-28.9
PRMLxT1L	26 Jan 2016 14:20:57	-28.1
PRMLxT1L	17 Nov 2015 09:56:46	-28.9
PRMLxT1L	14 Jul 2015 08:29:53	-28.8
PRMLxT1L	30 Jan 2014 00:00:58	-28.0
PRMLxT1L	13 Sep 2014 10:03:02	-27.2
PRMLxT1L	13 Aug 2014 07:59:24	-28.6
PRMLxT1L	21 Jul 2014 14:19:41	-28.1
PRMLxT1L	08 May 2014 10:49:07	-28.1
PRMLxT1L	07 Oct 2013 00:47:30	-28.3

General Information

Serial Number	03790
Model	SoundExpert™ LxT
Firmware Version	2.206
Filename	LxT_Data.052
User	Olivia Chan
Job Description	AL2 420K Warehouse
Location	Carson, CA
Measurement Description	
Start Time	Wednesday, 25 May 2016 13:05:47
Stop Time	Wednesday, 25 May 2016 13:20:47
Duration	00:15:00.0
Run Time	00:15:00.0
Pause	00:00:00.0
Pre Calibration	Wednesday, 27 January 2016 10:21:19
Post Calibration	None
Calibration Deviation	---

Note

Overall Data

LASeq		72.4	dB
LASmax	25 May 2016 13:16:02	88.3	dB
LApeak (max)	25 May 2016 13:16:01	102.4	dB
LASmin	25 May 2016 13:15:15	56.9	dB
LCSeq		80.3	dB
LASeq		72.4	dB
LCSeq - LASeq		7.9	dB
LAIeq		74.3	dB
LAeq		72.5	dB
LAIeq - LAeq		1.8	dB
Ldn		72.4	dB
LDay 07:00-22:00		72.4	dB
LNight 22:00-07:00		---	dB
Lden		72.4	dB
LDay 07:00-19:00		72.4	dB
LEvening 19:00-22:00		---	dB
LNight 22:00-07:00		---	dB
LASE		102.0	dB
# Overloads		0	
Overload Duration		0.0	s
# OBA Overloads		54	
OBA Overload Duration		370.0	s

Statistics

LAS5.00	78.9	dBA
LAS10.00	76.5	dBA
LAS25.00	72.2	dBA
LAS50.00	67.1	dBA
LAS66.60	64.4	dBA
LAS90.00	60.3	dBA
LAS > 70.0 dB (Exceedence Counts / Duration)	30 / 354.9	s
LAS > 100.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 135.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 137.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 140.0 dB (Exceedence Counts / Duration)	0 / 0.0	s

Settings

RMS Weight	A Weighting	
Peak Weight	A Weighting	
Detector	Slow	
Preamp	PRMLxT1L	
Microphone Correction	Off	
Integration Method	Exponential	
OBA Range	Low	
OBA Bandwidth	1/1 and 1/3	
OBA Freq. Weighting	A Weighting	
OBA Max Spectrum	At Lmax	
Under Range Limit	25.4	dB
Under Range Peak	78.9	dB
Noise Floor	15.1	dB
Overload	122.6	dB

1/1 Spectra

Freq. (Hz):	8.0	16.0	31.5	63.0	125	250	500	1k	2k	4k	8k	16k
LASeq	7.3	20.7	35.1	49.4	54.9	58.9	63.8	67.4	64.6	59.7	53.2	42.2
LASmax	11.8	30.0	42.5	50.1	60.9	68.6	77.1	79.7	77.3	74.2	67.8	58.9
LASmin	7.2	6.8	23.9	37.8	43.5	44.2	48.7	52.8	50.0	42.1	32.1	17.0

1/3 Spectra

Freq. (Hz):	6.3	8.0	10.0	12.5	16.0	20.0	25.0	31.5	40.0	50.0	63.0	80.0
LASeq	3.0	2.5	2.3	5.6	13.8	19.5	25.6	28.7	33.2	41.5	44.3	46.6
LASmax	3.0	2.4	9.3	14.9	22.4	29.4	34.2	36.1	39.9	46.0	43.4	47.8
LASmin	3.0	2.4	1.7	1.2	0.3	4.4	15.9	16.4	18.4	32.0	27.8	34.5

Freq. (Hz):	100	125	160	200	250	315	400	500	630	800	1k	1.25k
LASeq	47.8	50.2	51.6	53.2	53.3	55.4	56.8	58.9	60.7	62.2	63.0	62.6
LASmax	57.4	54.0	57.7	62.9	64.3	65.1	66.8	71.5	75.4	75.1	74.2	75.8
LASmin	38.7	39.0	37.2	39.4	37.8	39.6	43.6	43.9	44.5	47.2	48.8	47.3

Freq. (Hz):	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	20k
LASeq	60.9	59.8	58.7	57.0	54.4	52.1	50.7	47.8	44.5	40.7	35.2	28.2
LASmax	72.5	72.6	71.9	70.9	69.4	67.4	65.2	62.5	59.0	57.1	52.5	49.1
LASmin	45.4	45.0	41.7	39.2	37.0	34.1	30.0	25.9	21.5	15.4	9.1	3.4

Calibration History

Preamp	Date	dB re. 1V/Pa
PRMLxT1L	27 Jan 2016 10:21:19	-28.9
PRMLxT1L	26 Jan 2016 14:23:09	-28.9
PRMLxT1L	26 Jan 2016 14:20:57	-28.1
PRMLxT1L	17 Nov 2015 09:56:46	-28.9
PRMLxT1L	14 Jul 2015 08:29:53	-28.8
PRMLxT1L	30 Jan 2014 00:00:58	-28.0
PRMLxT1L	13 Sep 2014 10:03:02	-27.2
PRMLxT1L	13 Aug 2014 07:59:24	-28.6
PRMLxT1L	21 Jul 2014 14:19:41	-28.1
PRMLxT1L	08 May 2014 10:49:07	-28.1
PRMLxT1L	07 Oct 2013 00:47:30	-28.3

General Information

Serial Number	03790
Model	SoundExpert™ LxT
Firmware Version	2.206
Filename	LxT_Data.105
User	Cameron Hile
Job Description	
Location	Carson
Measurement Description	
Start Time	Wednesday, 08 February 2017 11:36:34
Stop Time	Wednesday, 08 February 2017 11:51:34
Duration	00:15:00.0
Run Time	00:15:00.0
Pause	00:00:00.0
Pre Calibration	Wednesday, 21 December 2016 07:07:45
Post Calibration	None
Calibration Deviation	---

Note

Overall Data

LASeq		50.5	dB
LASmax	08 Feb 2017 11:36:39	67.9	dB
LApeak (max)	08 Feb 2017 11:36:38	89.5	dB
LASmin	08 Feb 2017 11:41:30	43.7	dB
LCSeq		67.7	dB
LASeq		50.5	dB
LCSeq - LASeq		17.3	dB
LAIeq		53.8	dB
LAeq		50.4	dB
LAIeq - LAeq		3.4	dB
Ldn		50.5	dB
LDay 07:00-22:00		50.5	dB
LNight 22:00-07:00		---	dB
Lden		50.5	dB
LDay 07:00-19:00		50.5	dB
LEvening 19:00-22:00		---	dB
LNight 22:00-07:00		---	dB
LASE		80.0	dB
# Overloads		0	
Overload Duration		0.0	s
# OBA Overloads		6	
OBA Overload Duration		15.3	s

Statistics

LAS1.00	55.6	dBA
LAS10.00	52.8	dBA
LAS25.00	51.3	dBA
LAS50.00	49.4	dBA
LAS66.60	47.7	dBA
LAS90.00	45.4	dBA
LAS > 70.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LAS > 100.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 135.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 137.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 140.0 dB (Exceedence Counts / Duration)	0 / 0.0	s

Settings

RMS Weight	A Weighting	
Peak Weight	A Weighting	
Detector	Slow	
Preamp	PRMLxT1L	
Microphone Correction	Off	
Integration Method	Exponential	
OBA Range	Low	
OBA Bandwidth	1/1 and 1/3	
OBA Freq. Weighting	A Weighting	
OBA Max Spectrum	At Lmax	
Under Range Limit	25.0	dB
Under Range Peak	78.0	dB
Noise Floor	14.9	dB
Overload	121.8	dB

1/1 Spectra

Freq. (Hz):	8.0	16.0	31.5	63.0	125	250	500	1k	2k	4k	8k	16k
LASeq	6.3	15.6	28.2	37.0	38.9	39.3	43.9	46.3	42.3	35.6	26.9	12.9
LASmax	6.3	16.8	31.6	43.0	41.2	48.5	63.0	66.1	58.4	46.5	43.5	21.5
LASmin	6.3	4.9	19.8	29.1	32.5	32.8	36.0	39.6	35.0	23.3	12.4	5.2

1/3 Spectra

Freq. (Hz):	6.3	8.0	10.0	12.5	16.0	20.0	25.0	31.5	40.0	50.0	63.0	80.0
LASeq	2.1	1.6	0.8	2.5	10.1	14.0	18.6	23.0	25.9	27.6	33.8	33.2
LASmax	2.1	1.6	0.8	3.2	12.4	16.6	21.2	26.2	30.0	30.2	41.5	40.0
LASmin	2.1	1.6	0.8	0.3	-0.6	2.6	7.5	14.3	17.4	19.5	23.5	25.2

Freq. (Hz):	100	125	160	200	250	315	400	500	630	800	1k	1.25k
LASeq	34.0	34.8	33.8	33.6	34.6	35.4	38.4	38.9	40.2	41.4	41.9	41.5
LASmax	36.9	36.2	38.4	36.4	38.9	47.7	60.1	55.4	59.5	60.4	58.9	63.6
LASmin	26.1	27.5	26.8	26.3	27.8	27.6	29.7	30.9	31.9	34.4	35.5	34.3

Freq. (Hz):	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	20k
LASeq	39.1	37.4	35.3	33.2	30.0	27.1	24.5	21.8	17.2	11.1	6.7	-0.9
LASmax	56.1	51.7	46.2	43.3	35.4	42.7	42.5	36.3	27.0	20.3	13.6	4.8
LASmin	32.2	29.6	25.4	21.1	16.6	11.5	9.2	6.7	4.6	2.5	0.2	-3.1

Calibration History

Preamp	Date	dB re. 1V/Pa
PRMLxT1L	21 Dec 2016 07:07:41	-28.0
PRMLxT1L	27 Jan 2016 10:21:19	-28.9
PRMLxT1L	26 Jan 2016 14:23:09	-28.9
PRMLxT1L	26 Jan 2016 14:20:57	-28.1
PRMLxT1L	17 Nov 2015 09:56:46	-28.9
PRMLxT1L	14 Jul 2015 08:29:53	-28.8
PRMLxT1L	30 Jan 2014 00:00:58	-28.0
PRMLxT1L	13 Sep 2014 10:03:02	-27.2
PRMLxT1L	13 Aug 2014 07:59:24	-28.6
PRMLxT1L	21 Jul 2014 14:19:41	-28.1
PRMLxT1L	08 May 2014 10:49:07	-28.1

General Information

Serial Number	03790
Model	SoundExpert™ LxT
Firmware Version	2.206
Filename	LxT_Data.106
User	Cameron Hile
Job Description	
Location	Carson
Measurement Description	
Start Time	Wednesday, 08 February 2017 11:54:35
Stop Time	Wednesday, 08 February 2017 12:09:35
Duration	00:15:00.0
Run Time	00:15:00.0
Pause	00:00:00.0
Pre Calibration	Wednesday, 21 December 2016 07:07:41
Post Calibration	None
Calibration Deviation	---

Note

Overall Data

LASeq		48.7	dB
LASmax	08 Feb 2017 12:02:01	55.7	dB
LApeak (max)	08 Feb 2017 12:06:49	77.2	dB
LASmin	08 Feb 2017 12:09:27	40.7	dB
LCSeq		66.6	dB
LASeq		48.7	dB
LCSeq - LASeq		17.9	dB
LAIeq		49.6	dB
LAeq		48.7	dB
LAIeq - LAeq		0.9	dB
Ldn		48.7	dB
LDay 07:00-22:00		48.7	dB
LNight 22:00-07:00		---	dB
Lden		48.7	dB
LDay 07:00-19:00		48.7	dB
LEvening 19:00-22:00		---	dB
LNight 22:00-07:00		---	dB
LASE		78.3	dB
# Overloads		0	
Overload Duration		0.0	s
# OBA Overloads		8	
OBA Overload Duration		17.7	s

Statistics

LAS1.00	54.3	dBA
LAS10.00	51.3	dBA
LAS25.00	49.8	dBA
LAS50.00	48.0	dBA
LAS66.60	46.8	dBA
LAS90.00	44.6	dBA

LAS > 70.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LAS > 100.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 135.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 137.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 140.0 dB (Exceedence Counts / Duration)	0 / 0.0	s

Settings

RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Slow
Preamp	PRMLxT1L
Microphone Correction	Off
Integration Method	Exponential
OBA Range	Low
OBA Bandwidth	1/1 and 1/3
OBA Freq. Weighting	A Weighting
OBA Max Spectrum	At Lmax

Under Range Limit	25.0	dB
Under Range Peak	78.0	dB
Noise Floor	14.9	dB
Overload	121.8	dB

1/1 Spectra

Freq. (Hz):	8.0	16.0	31.5	63.0	125	250	500	1k	2k	4k	8k	16k
LASeq	6.3	15.3	27.2	33.9	37.2	39.2	42.2	44.7	40.1	32.5	23.9	11.7
LASmax	8.3	23.8	33.6	42.6	48.3	48.4	49.5	49.9	45.2	38.2	26.8	11.9
LASmin	6.3	4.3	12.7	27.1	30.2	30.9	33.5	36.1	31.5	-1.2	0.0	1.4

1/3 Spectra

Freq. (Hz):	6.3	8.0	10.0	12.5	16.0	20.0	25.0	31.5	40.0	50.0	63.0	80.0
LASeq	2.1	1.6	0.9	2.1	9.2	14.0	17.8	22.6	24.6	27.2	28.9	30.6
LASmax	2.1	1.6	8.2	15.0	14.0	23.8	28.2	30.2	30.4	32.1	31.6	41.9
LASmin	2.1	1.6	0.8	0.3	-0.6	-0.4	6.2	10.7	14.3	18.9	21.8	23.9

Freq. (Hz):	100	125	160	200	250	315	400	500	630	800	1k	1.25k
LASeq	31.8	32.7	32.8	33.9	34.2	35.1	35.8	37.3	38.7	40.2	40.4	39.4
LASmax	39.8	39.7	47.1	42.7	45.7	44.9	42.7	45.5	45.6	45.6	45.5	44.7
LASmin	24.9	25.7	26.0	25.0	25.5	26.7	27.5	28.6	20.0	24.4	31.9	30.7

Freq. (Hz):	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	20k
LASeq	37.2	35.0	32.4	29.9	26.9	24.5	22.1	17.6	13.9	9.7	5.7	0.3
LASmax	42.4	40.4	38.1	36.3	32.1	28.7	24.8	21.0	16.4	10.6	3.3	-2.8
LASmin	28.7	25.9	22.6	21.2	16.1	-5.5	-5.1	-4.8	-4.4	-3.7	-3.4	-3.1

Calibration History

Preamp	Date	dB re. 1V/Pa
PRMLxT1L	21 Dec 2016 07:07:41	-28.0
PRMLxT1L	27 Jan 2016 10:21:19	-28.9
PRMLxT1L	26 Jan 2016 14:23:09	-28.9
PRMLxT1L	26 Jan 2016 14:20:57	-28.1
PRMLxT1L	17 Nov 2015 09:56:46	-28.9
PRMLxT1L	14 Jul 2015 08:29:53	-28.8
PRMLxT1L	30 Jan 2014 00:00:58	-28.0
PRMLxT1L	13 Sep 2014 10:03:02	-27.2
PRMLxT1L	13 Aug 2014 07:59:24	-28.6
PRMLxT1L	21 Jul 2014 14:19:41	-28.1
PRMLxT1L	08 May 2014 10:49:07	-28.1

General Information

Serial Number	03790
Model	SoundExpert™ LxT
Firmware Version	2.206
Filename	LxT_Data.107
User	Cameron Hile
Job Description	
Location	Carson
Measurement Description	
Start Time	Thursday, 09 February 2017 23:21:39
Stop Time	Thursday, 09 February 2017 23:36:39
Duration	00:15:00.0
Run Time	00:15:00.0
Pause	00:00:00.0
Pre Calibration	Wednesday, 21 December 2016 07:07:41
Post Calibration	None
Calibration Deviation	---

Note

Overall Data

LASeq		57.7	dB
LASmax	09 Feb 2017 23:29:36	74.4	dB
LApeak (max)	09 Feb 2017 23:29:36	88.9	dB
LASmin	09 Feb 2017 23:28:10	52.0	dB
LCSeq		68.1	dB
LASeq		57.7	dB
LCSeq - LASeq		10.4	dB
LAIeq		58.8	dB
LAeq		57.7	dB
LAIeq - LAeq		1.1	dB
Ldn		67.7	dB
LDay 07:00-22:00		---	dB
LNight 22:00-07:00		57.7	dB
Lden		67.7	dB
LDay 07:00-19:00		---	dB
LEvening 19:00-22:00		---	dB
LNight 22:00-07:00		57.7	dB
LASE		87.2	dB
# Overloads		0	
Overload Duration		0.0	s
# OBA Overloads		3	
OBA Overload Duration		10.0	s

Statistics

LAS1.00	66.7	dBA
LAS10.00	59.0	dBA
LAS25.00	56.6	dBA
LAS50.00	55.3	dBA
LAS66.60	54.8	dBA
LAS90.00	53.9	dBA

LAS > 70.0 dB (Exceedence Counts / Duration)	1 / 5.9	s
LAS > 100.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 135.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 137.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 140.0 dB (Exceedence Counts / Duration)	0 / 0.0	s

Settings

RMS Weight	A Weighting	
Peak Weight	A Weighting	
Detector	Slow	
Preamp	PRMLxT1L	
Microphone Correction	Off	
Integration Method	Exponential	
OBA Range	Low	
OBA Bandwidth	1/1 and 1/3	
OBA Freq. Weighting	A Weighting	
OBA Max Spectrum	At Lmax	
Under Range Limit	25.0	dB
Under Range Peak	78.0	dB
Noise Floor	14.9	dB
Overload	121.8	dB

1/1 Spectra

Freq. (Hz):	8.0	16.0	31.5	63.0	125	250	500	1k	2k	4k	8k	16k
LASeq	6.3	13.0	25.7	40.2	44.7	47.4	48.8	54.3	51.0	42.9	36.1	21.1
LASmax	6.3	32.9	35.6	46.3	58.0	64.1	63.5	71.3	68.3	63.1	57.5	41.3
LASmin	6.3	4.3	19.9	33.5	39.0	40.7	43.5	48.7	45.0	32.5	15.5	5.1

1/3 Spectra

Freq. (Hz):	6.3	8.0	10.0	12.5	16.0	20.0	25.0	31.5	40.0	50.0	63.0	80.0
LASeq	2.1	1.6	0.8	0.4	4.5	12.3	14.8	19.6	24.0	29.4	33.9	38.6
LASmax	2.1	1.6	0.8	4.7	17.9	32.9	28.9	29.4	34.3	43.6	42.5	42.3
LASmin	2.1	1.6	0.8	0.3	-0.6	0.8	6.8	11.9	18.2	22.8	26.6	30.8

Freq. (Hz):	100	125	160	200	250	315	400	500	630	800	1k	1.25k
LASeq	37.7	39.4	41.6	43.0	43.1	41.9	41.1	43.8	45.9	48.0	50.1	50.3
LASmax	51.4	54.1	54.0	60.8	60.9	56.4	56.2	58.6	60.5	63.0	65.8	68.9
LASmin	31.5	32.8	35.0	35.3	35.7	35.4	35.5	37.9	40.5	42.6	44.3	44.0

Freq. (Hz):	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	20k
LASeq	47.9	46.0	43.7	40.1	38.0	34.7	34.3	30.6	24.8	18.6	16.5	5.1
LASmax	62.6	63.8	63.7	59.8	58.5	55.6	56.4	50.7	45.7	40.2	32.2	24.8
LASmin	42.4	39.8	35.9	31.0	25.3	19.5	13.9	8.1	5.2	2.5	0.1	-3.1

Calibration History

Preamp	Date	dB re. 1V/Pa
PRMLxT1L	21 Dec 2016 07:07:41	-28.0
PRMLxT1L	27 Jan 2016 10:21:19	-28.9
PRMLxT1L	26 Jan 2016 14:23:09	-28.9
PRMLxT1L	26 Jan 2016 14:20:57	-28.1
PRMLxT1L	17 Nov 2015 09:56:46	-28.9
PRMLxT1L	14 Jul 2015 08:29:53	-28.8
PRMLxT1L	30 Jan 2014 00:00:58	-28.0
PRMLxT1L	13 Sep 2014 10:03:02	-27.2
PRMLxT1L	13 Aug 2014 07:59:24	-28.6
PRMLxT1L	21 Jul 2014 14:19:41	-28.1
PRMLxT1L	08 May 2014 10:49:07	-28.1

General Information

Serial Number	03790
Model	SoundExpert™ LxT
Firmware Version	2.206
Filename	LxT_Data.108
User	Cameron Hile
Job Description	
Location	Carson
Measurement Description	
Start Time	Thursday, 09 February 2017 23:41:16
Stop Time	Thursday, 09 February 2017 23:56:16
Duration	00:15:00.0
Run Time	00:15:00.0
Pause	00:00:00.0
Pre Calibration	Wednesday, 21 December 2016 07:07:41
Post Calibration	None
Calibration Deviation	---

Note

Overall Data

LASeq		68.0	dB
LASmax	09 Feb 2017 23:54:13	81.5	dB
LApeak (max)	09 Feb 2017 23:54:12	94.6	dB
LASmin	09 Feb 2017 23:47:50	53.2	dB
LCSeq		74.7	dB
LASeq		68.0	dB
LCSeq - LASeq		6.6	dB
LAIeq		69.4	dB
LAeq		68.0	dB
LAIeq - LAeq		1.3	dB
Ldn		78.0	dB
LDay 07:00-22:00		---	dB
LNight 22:00-07:00		68.0	dB
Lden		78.0	dB
LDay 07:00-19:00		---	dB
LEvening 19:00-22:00		---	dB
LNight 22:00-07:00		68.0	dB
LASE		97.6	dB
# Overloads		0	
Overload Duration		0.0	s
# OBA Overloads		17	
OBA Overload Duration		92.0	s

Statistics

LAS1.00	78.3	dBA
LAS10.00	72.6	dBA
LAS25.00	67.2	dBA
LAS50.00	60.7	dBA
LAS66.60	57.4	dBA
LAS90.00	55.2	dBA
LAS > 70.0 dB (Exceedence Counts / Duration)	21 / 168.9	s
LAS > 100.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 135.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 137.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 140.0 dB (Exceedence Counts / Duration)	0 / 0.0	s

Settings

RMS Weight	A Weighting	
Peak Weight	A Weighting	
Detector	Slow	
Preamp	PRMLxT1L	
Microphone Correction	Off	
Integration Method	Exponential	
OBA Range	Low	
OBA Bandwidth	1/1 and 1/3	
OBA Freq. Weighting	A Weighting	
OBA Max Spectrum	At Lmax	
Under Range Limit	25.0	dB
Under Range Peak	78.0	dB
Noise Floor	14.9	dB
Overload	121.8	dB

1/1 Spectra

Freq. (Hz):	8.0	16.0	31.5	63.0	125	250	500	1k	2k	4k	8k	16k
LASeq	6.3	15.1	27.3	42.0	50.6	54.7	59.8	64.4	61.0	54.1	47.6	35.6
LASmax	6.3	27.9	39.2	54.1	58.4	69.1	72.9	76.5	73.5	69.7	61.0	47.1
LASmin	6.3	4.3	17.4	31.2	40.0	43.0	45.2	50.2	44.8	31.6	14.7	4.9

1/3 Spectra

Freq. (Hz):	6.3	8.0	10.0	12.5	16.0	20.0	25.0	31.5	40.0	50.0	63.0	80.0
LASeq	2.1	1.6	1.0	2.3	8.8	13.8	17.5	20.5	25.8	35.4	39.0	36.5
LASmax	2.1	1.6	3.1	14.5	21.2	26.8	30.6	34.2	37.6	39.9	52.5	49.2
LASmin	2.1	1.6	0.8	0.3	-0.6	0.4	3.1	10.2	15.7	21.0	24.8	28.0

Freq. (Hz):	100	125	160	200	250	315	400	500	630	800	1k	1.25k
LASeq	43.7	47.7	45.1	49.4	48.5	51.5	52.3	54.6	57.1	59.1	60.2	59.6
LASmax	49.5	53.3	56.2	67.8	61.4	62.8	65.8	67.6	70.1	70.7	72.5	72.0
LASmin	29.6	35.0	35.4	37.1	36.8	38.4	31.5	40.1	41.8	44.7	46.1	44.2

Freq. (Hz):	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	20k
LASeq	58.0	56.0	53.4	51.1	48.9	47.0	45.3	42.2	39.1	34.5	28.1	19.4
LASmax	70.2	68.6	67.3	66.3	65.9	61.4	59.0	55.6	51.2	45.9	39.5	32.6
LASmin	42.2	40.0	35.3	30.1	24.3	18.0	12.7	7.9	5.1	2.3	-0.2	-3.1

Calibration History

Preamp	Date	dB re. 1V/Pa
PRMLxT1L	21 Dec 2016 07:07:41	-28.0
PRMLxT1L	27 Jan 2016 10:21:19	-28.9
PRMLxT1L	26 Jan 2016 14:23:09	-28.9
PRMLxT1L	26 Jan 2016 14:20:57	-28.1
PRMLxT1L	17 Nov 2015 09:56:46	-28.9
PRMLxT1L	14 Jul 2015 08:29:53	-28.8
PRMLxT1L	30 Jan 2014 00:00:58	-28.0
PRMLxT1L	13 Sep 2014 10:03:02	-27.2
PRMLxT1L	13 Aug 2014 07:59:24	-28.6
PRMLxT1L	21 Jul 2014 14:19:41	-28.1
PRMLxT1L	08 May 2014 10:49:07	-28.1

General Information

Serial Number	03790
Model	SoundExpert™ LxT
Firmware Version	2.206
Filename	LxT_Data.109
User	Cameron Hile
Job Description	
Location	Carson
Measurement Description	
Start Time	Friday, 10 February 2017 00:01:03
Stop Time	Friday, 10 February 2017 00:16:03
Duration	00:15:00.0
Run Time	00:15:00.0
Pause	00:00:00.0
Pre Calibration	Wednesday, 21 December 2016 07:07:41
Post Calibration	None
Calibration Deviation	---

Note

Overall Data

LASeq		52.2	dB
LASmax	10 Feb 2017 00:10:03	57.6	dB
LApeak (max)	10 Feb 2017 00:15:34	72.9	dB
LASmin	10 Feb 2017 00:01:53	49.4	dB
LCSeq		65.4	dB
LASeq		52.2	dB
LCSeq - LASeq		13.2	dB
LAIeq		52.8	dB
LAeq		52.2	dB
LAIeq - LAeq		0.6	dB
Ldn		62.2	dB
LDay 07:00-22:00		---	dB
LNight 22:00-07:00		52.2	dB
Lden		62.2	dB
LDay 07:00-19:00		---	dB
LEvening 19:00-22:00		---	dB
LNight 22:00-07:00		52.2	dB
LASE		81.7	dB
# Overloads		0	
Overload Duration		0.0	s
# OBA Overloads		15	
OBA Overload Duration		37.7	s

Statistics

LAS1.00	55.0	dBA
LAS10.00	53.2	dBA
LAS25.00	52.6	dBA
LAS50.00	52.0	dBA
LAS66.60	51.7	dBA
LAS90.00	51.1	dBA

LAS > 70.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LAS > 100.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 135.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 137.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 140.0 dB (Exceedence Counts / Duration)	0 / 0.0	s

Settings

RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Slow
Preamp	PRMLxT1L
Microphone Correction	Off
Integration Method	Exponential
OBA Range	Low
OBA Bandwidth	1/1 and 1/3
OBA Freq. Weighting	A Weighting
OBA Max Spectrum	At Lmax

Under Range Limit	25.0	dB
Under Range Peak	78.0	dB
Noise Floor	14.9	dB
Overload	121.8	dB

1/1 Spectra

Freq. (Hz):	8.0	16.0	31.5	63.0	125	250	500	1k	2k	4k	8k	16k
LASeq	6.3	14.0	24.2	32.7	37.9	40.1	45.8	49.1	44.3	31.9	19.8	8.1
LASmax	6.3	6.2	21.7	41.5	50.2	50.3	52.8	52.1	46.3	33.9	24.7	7.5
LASmin	6.3	4.3	14.1	27.3	33.8	37.0	42.6	46.2	41.6	28.7	13.0	4.9

1/3 Spectra

Freq. (Hz):	6.3	8.0	10.0	12.5	16.0	20.0	25.0	31.5	40.0	50.0	63.0	80.0
LASeq	2.1	1.6	0.8	1.7	9.0	12.2	15.6	20.0	21.0	24.1	27.7	30.2
LASmax	2.1	1.6	0.8	0.3	-0.0	4.9	9.5	15.0	21.0	23.3	32.7	41.2
LASmin	2.1	1.6	0.8	0.3	-0.6	-1.4	2.0	7.1	6.8	17.4	20.2	23.2

Freq. (Hz):	100	125	160	200	250	315	400	500	630	800	1k	1.25k
LASeq	32.5	33.3	33.5	34.3	34.3	37.0	38.1	41.6	42.3	43.9	45.1	44.1
LASmax	37.2	46.6	50.1	42.2	41.8	49.2	42.2	49.3	49.3	48.5	47.4	45.9
LASmin	25.2	28.7	28.2	29.5	23.9	33.3	33.3	37.7	39.2	40.6	41.7	41.0

Freq. (Hz):	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	20k
LASeq	41.9	39.1	35.0	30.2	25.5	21.1	17.7	14.1	10.3	6.1	2.1	-2.5
LASmax	44.0	41.0	36.9	31.8	28.0	24.9	22.9	19.2	13.1	5.7	0.7	-3.1
LASmin	39.3	36.0	32.1	26.8	21.9	15.8	10.2	7.2	4.6	2.3	-0.1	-3.1

Calibration History

Preamp	Date	dB re. 1V/Pa
PRMLxT1L	21 Dec 2016 07:07:41	-28.0
PRMLxT1L	27 Jan 2016 10:21:19	-28.9
PRMLxT1L	26 Jan 2016 14:23:09	-28.9
PRMLxT1L	26 Jan 2016 14:20:57	-28.1
PRMLxT1L	17 Nov 2015 09:56:46	-28.9
PRMLxT1L	14 Jul 2015 08:29:53	-28.8
PRMLxT1L	30 Jan 2014 00:00:58	-28.0
PRMLxT1L	13 Sep 2014 10:03:02	-27.2
PRMLxT1L	13 Aug 2014 07:59:24	-28.6
PRMLxT1L	21 Jul 2014 14:19:41	-28.1
PRMLxT1L	08 May 2014 10:49:07	-28.1

General Information

Serial Number	03790
Model	SoundExpert™ LxT
Firmware Version	2.206
Filename	LxT_Data.110
User	Cameron Hile
Job Description	
Location	Carson
Measurement Description	
Start Time	Friday, 10 February 2017 00:19:22
Stop Time	Friday, 10 February 2017 00:34:22
Duration	00:15:00.0
Run Time	00:15:00.0
Pause	00:00:00.0
Pre Calibration	Wednesday, 21 December 2016 07:07:41
Post Calibration	None
Calibration Deviation	---

Note

Overall Data

LASeq		51.7	dB
LASmax	10 Feb 2017 00:29:28	58.1	dB
LApeak (max)	10 Feb 2017 00:29:28	75.7	dB
LASmin	10 Feb 2017 00:22:34	48.6	dB
LCSeq		62.4	dB
LASeq		51.7	dB
LCSeq - LASeq		10.7	dB
LAIeq		52.5	dB
LAeq		51.7	dB
LAIeq - LAeq		0.8	dB
Ldn		61.7	dB
LDay 07:00-22:00		---	dB
LNight 22:00-07:00		51.7	dB
Lden		61.7	dB
LDay 07:00-19:00		---	dB
LEvening 19:00-22:00		---	dB
LNight 22:00-07:00		51.7	dB
LASE		81.2	dB
# Overloads		0	
Overload Duration		0.0	s
# OBA Overloads		1	
OBA Overload Duration		2.0	s

Statistics

LAS1.00	54.7	dBA
LAS10.00	53.2	dBA
LAS25.00	52.3	dBA
LAS50.00	51.5	dBA
LAS66.60	50.8	dBA
LAS90.00	50.0	dBA

LAS > 70.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LAS > 100.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 135.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 137.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 140.0 dB (Exceedence Counts / Duration)	0 / 0.0	s

Settings

RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Slow
Preamp	PRMLxT1L
Microphone Correction	Off
Integration Method	Exponential
OBA Range	Low
OBA Bandwidth	1/1 and 1/3
OBA Freq. Weighting	A Weighting
OBA Max Spectrum	At Lmax

Under Range Limit	25.0	dB
Under Range Peak	78.0	dB
Noise Floor	14.9	dB
Overload	121.8	dB

1/1 Spectra

Freq. (Hz):	8.0	16.0	31.5	63.0	125	250	500	1k	2k	4k	8k	16k
LASeq	6.3	8.7	21.9	31.8	35.9	39.9	44.7	49.1	43.4	31.0	21.2	7.3
LASmax	6.3	7.8	22.2	42.5	42.8	50.8	52.6	52.9	49.8	47.4	36.6	16.2
LASmin	6.3	4.3	5.0	26.5	32.4	36.5	41.3	45.7	39.6	25.2	12.5	5.0

1/3 Spectra

Freq. (Hz):	6.3	8.0	10.0	12.5	16.0	20.0	25.0	31.5	40.0	50.0	63.0	80.0
LASeq	2.1	1.6	0.8	0.8	3.5	6.7	11.3	18.0	19.0	23.0	27.2	29.1
LASmax	2.1	1.6	0.8	0.3	-0.5	6.7	5.8	17.1	21.2	25.0	36.3	41.1
LASmin	2.1	1.6	0.8	0.3	-0.6	-1.4	1.4	6.1	10.4	15.8	19.2	23.2

Freq. (Hz):	100	125	160	200	250	315	400	500	630	800	1k	1.25k
LASeq	29.6	31.4	32.3	33.3	34.5	36.9	37.5	39.8	41.6	44.3	45.0	43.7
LASmax	35.4	36.2	40.2	42.3	45.7	48.8	44.8	44.4	49.7	48.3	48.1	47.9
LASmin	24.3	25.0	28.1	28.9	30.8	33.5	33.9	35.4	37.5	38.2	41.3	40.2

Freq. (Hz):	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	20k
LASeq	41.2	38.1	33.6	29.1	24.7	21.2	18.3	17.3	10.5	5.5	1.0	-3.1
LASmax	45.3	45.3	43.8	44.5	42.7	39.5	34.7	31.1	24.7	14.9	4.8	-3.1
LASmin	37.6	33.7	28.6	23.4	18.1	13.5	9.7	7.0	4.8	2.4	-0.2	-3.1

Calibration History

Preamp	Date	dB re. 1V/Pa
PRMLxT1L	21 Dec 2016 07:07:41	-28.0
PRMLxT1L	27 Jan 2016 10:21:19	-28.9
PRMLxT1L	26 Jan 2016 14:23:09	-28.9
PRMLxT1L	26 Jan 2016 14:20:57	-28.1
PRMLxT1L	17 Nov 2015 09:56:46	-28.9
PRMLxT1L	14 Jul 2015 08:29:53	-28.8
PRMLxT1L	30 Jan 2014 00:00:58	-28.0
PRMLxT1L	13 Sep 2014 10:03:02	-27.2
PRMLxT1L	13 Aug 2014 07:59:24	-28.6
PRMLxT1L	21 Jul 2014 14:19:41	-28.1
PRMLxT1L	08 May 2014 10:49:07	-28.1

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Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 5/20/2016
Case Description: 1 - Demolition

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial (N)	Industrial	70	70	70

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Saw	No	20		89.6	350	0
Excavator	No	40		80.7	350	0
Excavator	No	40		80.7	350	0
Excavator	No	40		80.7	350	0
Dozer	No	40		81.7	350	0
Dozer	No	40		81.7	350	0

Results

		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Concrete Saw		72.7	65.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator		63.8	59.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator		63.8	59.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator		63.8	59.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer		64.8	60.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer		64.8	60.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	72.7	69.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial (E)	Industrial	70	70	70

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Saw	No	20		89.6	815	0
Excavator	No	40		80.7	815	0
Excavator	No	40		80.7	815	0
Excavator	No	40		80.7	815	0
Dozer	No	40		81.7	815	0
Dozer	No	40		81.7	815	0

Results

		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Concrete Saw		65.3	58.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator		56.5	52.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator		56.5	52.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator		56.5	52.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer		57.4	53.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer		57.4	53.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	65.3	62.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial (S)	Industrial	70	70	70

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Saw	No	20		89.6	450	0
Excavator	No	40		80.7	450	0
Excavator	No	40		80.7	450	0
Excavator	No	40		80.7	450	0
Dozer	No	40		81.7	450	0
Dozer	No	40		81.7	450	0

Results

		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Concrete Saw		70.5	63.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator		61.6	57.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator		61.6	57.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator		61.6	57.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer		62.6	58.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer		62.6	58.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	70.5	67.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Residential (W)	Residential	65	65	65

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Saw	No	20		89.6	700	0
Excavator	No	40		80.7	700	0
Excavator	No	40		80.7	700	0
Excavator	No	40		80.7	700	0
Dozer	No	40		81.7	700	0
Dozer	No	40		81.7	700	0

Results

		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Concrete Saw		66.7	59.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator		57.8	53.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator		57.8	53.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator		57.8	53.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer		58.7	54.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer		58.7	54.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	66.7	63.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 5/20/2016
Case Description: 2 - Site Preparation

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial (N)	Industrial	70	70	70

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40		81.7	350	0
Dozer	No	40		81.7	350	0
Dozer	No	40		81.7	350	0
Tractor	No	40	84		350	0
Tractor	No	40	84		350	0
Backhoe	No	40		77.6	350	0
Backhoe	No	40		77.6	350	0

Results

		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Dozer		64.8	60.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer		64.8	60.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer		64.8	60.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor		67.1	63.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor		67.1	63.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe		60.7	56.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe		60.7	56.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	67.1	69.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial (E)	Industrial	70	70	70

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40		81.7	815	0
Dozer	No	40		81.7	815	0
Dozer	No	40		81.7	815	0
Tractor	No	40	84		815	0
Tractor	No	40	84		815	0
Backhoe	No	40		77.6	815	0
Backhoe	No	40		77.6	815	0

Results

		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Dozer		57.4	53.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer		57.4	53.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer		57.4	53.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor		59.8	55.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor		59.8	55.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe		53.3	49.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe		53.3	49.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	59.8	62	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Industrial (S)	Industrial	70	70	70

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Dozer	No	40		81.7	450	0
Dozer	No	40		81.7	450	0
Dozer	No	40		81.7	450	0
Tractor	No	40	84		450	0
Tractor	No	40	84		450	0
Backhoe	No	40		77.6	450	0
Backhoe	No	40		77.6	450	0

Results

		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Dozer		62.6	58.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer		62.6	58.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer		62.6	58.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor		64.9	60.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor		64.9	60.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe		58.5	54.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe		58.5	54.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	64.9	67.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Residential (W)	Residential	65	65	65

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Dozer	No	40		81.7	700	0
Dozer	No	40		81.7	700	0
Dozer	No	40		81.7	700	0
Tractor	No	40	84		700	0
Tractor	No	40	84		700	0
Backhoe	No	40		77.6	700	0
Backhoe	No	40		77.6	700	0

Results

		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Dozer		58.7	54.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer		58.7	54.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer		58.7	54.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor		61.1	57.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor		61.1	57.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe		54.6	50.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe		54.6	50.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	61.1	63.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 5/20/2016
Case Description: 3 - Grading

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial (N)	Industrial	70	70	70

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
			Equipment			
Excavator	No	40		80.7	350	0
Excavator	No	40		80.7	350	0
Grader	No	40	85		350	0
Dozer	No	40		81.7	350	0
Scraper	No	40		83.6	350	0
Scraper	No	40		83.6	350	0
Backhoe	No	40		77.6	350	0
Tractor	No	40	84		350	0

Results

		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Excavator		63.8	59.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator		63.8	59.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader		68.1	64.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer		64.8	60.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper		66.7	62.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper		66.7	62.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe		60.7	56.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor		67.1	63.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	68.1	70.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial (E)	Industrial	70	70	70

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
			Equipment			
Excavator	No	40		80.7	815	0
Excavator	No	40		80.7	815	0
Grader	No	40	85		815	0
Dozer	No	40		81.7	815	0
Scraper	No	40		83.6	815	0
Scraper	No	40		83.6	815	0
Backhoe	No	40		77.6	815	0
Tractor	No	40	84		815	0

Results

		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Excavator		56.5	52.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator		56.5	52.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader		60.8	56.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer		57.4	53.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper		59.3	55.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper		59.3	55.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe		53.3	49.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor		59.8	55.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	60.8	63.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial (S)	Industrial	70	70	70

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	450	0
Excavator	No	40		80.7	450	0
Grader	No	40	85		450	0
Dozer	No	40		81.7	450	0
Scraper	No	40		83.6	450	0
Scraper	No	40		83.6	450	0
Backhoe	No	40		77.6	450	0
Tractor	No	40	84		450	0

Results

		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Excavator		61.6	57.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator		61.6	57.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader		65.9	61.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer		62.6	58.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper		64.5	60.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper		64.5	60.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe		58.5	54.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor		64.9	60.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	65.9	68.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Residential (W)	Residential	65	65	65

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	700	0
Excavator	No	40		80.7	700	0
Grader	No	40	85		700	0
Dozer	No	40		81.7	700	0
Scraper	No	40		83.6	700	0
Scraper	No	40		83.6	700	0
Backhoe	No	40		77.6	700	0
Tractor	No	40	84		700	0

Results

		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Excavator		57.8	53.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator		57.8	53.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader		62.1	58.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer		58.7	54.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper		60.7	56.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper		60.7	56.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe		54.6	50.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor		61.1	57.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	62.1	64.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 5/20/2016
Case Description: 4 - Building Construction

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial (N)	Industrial	70	70	70

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	350	0
All Other Equipment > 5 HP	No	50	85		350	0
All Other Equipment > 5 HP	No	50	85		350	0
All Other Equipment > 5 HP	No	50	85		350	0
Generator	No	50		80.6	350	0
Tractor	No	40	84		350	0
Backhoe	No	40		77.6	350	0
Tractor	No	40	84		350	0
Welder / Torch	No	40		74	350	0

Results

		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Crane		63.6	55.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		68.1	65.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		68.1	65.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		68.1	65.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator		63.7	60.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor		67.1	63.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe		60.7	56.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor		67.1	63.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch		57.1	53.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	68.1	72	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial (E)	Industrial	70	70	70

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	815	0
All Other Equipment > 5 HP	No	50	85		815	0
All Other Equipment > 5 HP	No	50	85		815	0
All Other Equipment > 5 HP	No	50	85		815	0
Generator	No	50		80.6	815	0
Tractor	No	40	84		815	0
Backhoe	No	40		77.6	815	0
Tractor	No	40	84		815	0
Welder / Torch	No	40		74	815	0

Results

		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Crane		56.3	48.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		60.8	57.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		60.8	57.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		60.8	57.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator		56.4	53.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor		59.8	55.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe		53.3	49.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor		59.8	55.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch		49.8	45.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	60.8	64.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial (S)	Industrial	70	70	70

Description		Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane		No	16		80.6	450	0
All Other Equipment > 5 HP		No	50	85		450	0
All Other Equipment > 5 HP		No	50	85		450	0
All Other Equipment > 5 HP		No	50	85		450	0
Generator		No	50		80.6	450	0
Tractor		No	40	84		450	0
Backhoe		No	40		77.6	450	0
Tractor		No	40	84		450	0
Welder / Torch		No	40		74	450	0

Results

		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Crane		61.5	53.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		65.9	62.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		65.9	62.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		65.9	62.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator		61.5	58.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor		64.9	60.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe		58.5	54.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor		64.9	60.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch		54.9	50.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	65.9	69.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Residential (W)	Residential	65	65	65

Description		Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane		No	16		80.6	700	0
All Other Equipment > 5 HP		No	50	85		700	0
All Other Equipment > 5 HP		No	50	85		700	0
All Other Equipment > 5 HP		No	50	85		700	0
Generator		No	50		80.6	700	0
Tractor		No	40	84		700	0
Backhoe		No	40		77.6	700	0
Tractor		No	40	84		700	0
Welder / Torch		No	40		74	700	0

Results

		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Crane		57.6	49.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		62.1	59.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		62.1	59.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		62.1	59.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator		57.7	54.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor		61.1	57.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe		54.6	50.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor		61.1	57.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch		51.1	47.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	62.1	66	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 5/20/2016
Case Description: 5 - Paving

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial (N)	Industrial	70	70	70

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	350	0
Paver	No	50		77.2	350	0
All Other Equipment > 5 HP	No	50	85		350	0
All Other Equipment > 5 HP	No	50	85		350	0
Roller	No	20		80	350	0
Roller	No	20		80	350	0

Results

		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Paver		60.3	57.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver		60.3	57.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		68.1	65.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		68.1	65.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller		63.1	56.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller		63.1	56.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	68.1	69.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial (E)	Industrial	70	70	70

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	815	0
Paver	No	50		77.2	815	0
All Other Equipment > 5 HP	No	50	85		815	0
All Other Equipment > 5 HP	No	50	85		815	0
Roller	No	20		80	815	0
Roller	No	20		80	815	0

Results

		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Paver		56.3	48.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver		60.8	57.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		60.8	57.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		60.8	57.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller		56.4	53.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller		59.8	55.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	60.8	64.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial (S)	Industrial	70	70	70

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	450	0
Paver	No	50		77.2	450	0
All Other Equipment > 5 HP	No	50	85		450	0
All Other Equipment > 5 HP	No	50	85		450	0
Roller	No	20		80	450	0
Roller	No	20		80	450	0

Results

		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Paver		61.5	53.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver		65.9	62.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		65.9	62.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		65.9	62.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller		61.5	58.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller		64.9	60.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	65.9	69.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Residential (W)	Residential	65	65	65

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	700	0
Paver	No	50		77.2	700	0
All Other Equipment > 5 HP	No	50	85		700	0
All Other Equipment > 5 HP	No	50	85		700	0
Roller	No	20		80	700	0
Roller	No	20		80	700	0

Results

		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Paver		57.6	49.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver		62.1	59.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		62.1	59.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		62.1	59.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller		57.7	54.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller		61.1	57.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	62.1	66	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 5/20/2016
Case Description: 6 - Architectural Coating

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Industrial (N)	Industrial	70	70	70

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Compressor (air)	No	40		77.7	350	0

Results

		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Compressor (air)		60.8	56.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	60.8	56.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Industrial (E)	Industrial	70	70	70

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Compressor (air)	No	40		77.7	815	0

Results

		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Compressor (air)		56.3	48.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	56.3	48.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Industrial (S)	Industrial	70	70	70

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Compressor (air)	No	40		77.7	450	0

Results

		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Compressor (air)		58.6	54.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	58.6	54.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Residential (W)	Residential	65	65	65

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Compressor (air)	No	40		77.7	700	0

Results

Equipment		Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq	Noise Limit Exceedance (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq
Compressor (air)		57.6	49.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	57.6	49.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

13509 AL2 Carson
Construction Vibration Screening

Receptors	Distance (ft)
1 – Industrial (N)	350
2 – Industrial (E)	815
3 – Industrial (S)	450
4 - Residential (W)	700

Equipment	PPVref	D	n	Eref	Eequip	PPV
Vibratory Roller	0.21	350	1.3			0.0068
Vibratory Roller	0.21	815	1.3			0.0023
Vibratory Roller	0.21	450	1.3			0.0049
Vibratory Roller	0.21	700	1.3			0.0028
Large Bulldozer	0.089	350	1.3			0.0029
Large Bulldozer	0.089	815	1.3			0.0010
Large Bulldozer	0.089	450	1.3			0.0021
Large Bulldozer	0.089	700	1.3			0.0012
Loaded Truck	0.076	350	1.3			0.0025
Loaded Truck	0.076	815	1.3			0.0008
Loaded Truck	0.076	450	1.3			0.0018
Loaded Truck	0.076	700	1.3			0.0010

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Volume Development

AM Peak Hour

1: S. Wilmington Avenue / Driveway 1

PHF: 0.920 Count Date:

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL
Existing 2016:	0	701	0	0	327	0	0	0	0	0	0	0	1,028
2016 ADT:		18,051			18,051			0			0		
Truck %:	0%	15%	0%	0%	30%	0%	0%	0%	0%	0%	0%	0%	
Project:	0	3	5	0	8	0	0	0	0	0	0	1	17
Project ADT:		217			191			0			108		
E+P:	0	704	5	0	335	0	0	0	0	0	0	1	1,045
E+P ADT:		18,268			18,242			0			108		
2018 NP:	0	747	0	0	352	0	0	0	0	0	0	0	1,100
2018 NP ADT:		19,160			19,160			0			0		
2018 WP:	0	750	5	0	360	0	0	0	0	0	0	1	1,117
2018 WP ADT:		19,377			19,351			0			108		

2: S. Wilmington Avenue / E. 220th Street

PHF: 0.899 Count Date: 4/5/2016

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL
Existing 2016:	29	677	117	24	296	7	12	7	58	17	3	12	1,259
2016 ADT:		16,102			18,051			2,298			2,736		
Truck %:	0%	15%	25%	13%	32%	0%	0%	14%	0%	47%	33%	50%	
Project:	0	5	17	8	0	0	0	0	0	9	0	3	42
Project ADT:		473			217			0			556		
E+P:	29	682	134	32	296	7	12	7	58	26	3	15	1,301
E+P ADT:		16,575			18,268			2,298			3,292		
2018 NP:	30	722	122	26	319	7	12	7	60	18	3	12	1,340
2018 NP ADT:		17,123			19,159			2,391			2,855		
2018 WP:	30	727	139	34	319	7	12	7	60	27	3	15	1,382
2018 WP ADT:		17,596			19,376			2,391			3,411		

3: S. Wilmington Avenue / I-405 NB Ramps

PHF: 0.970 Count Date: 4/5/2016

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL
Existing 2016:	0	**297**	**54**	**16**	355	0	0	0	0	634	0	538	1,894
2016 ADT:		24,022			16,211			0			17,442		
Truck %:	0%	22%	37%	75%	25%	0%	0%	0%	0%	16%	0%	12%	
Project:	0	9	0	3	7	0	0	0	0	0	0	13	32
Project ADT:		258			472			0			214		
E+P:	0	306	54	19	362	0	0	0	0	634	0	551	1,926
E+P ADT:		24,280			16,683			0			17,656		
2018 NP:	0	320	57	17	376	4	0	0	0	660	0	567	2,001
2018 NP ADT:		25,234			17,237			638			21,234		
2018 WP:	0	329	57	0	383	7	0	0	0	660	0	580	2,016
2018 WP ADT:		25,492			17,709			638			21,448		

Volume Development

AM Peak Hour

4: S. Wilmington Avenue / I-405 SB Ramps

PHF: 0.956 Count Date: 4/5/2016

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL
Existing 2016:	0	250	446	208	781	0	101	0	154	0	0	0	1,940
2016 ADT:		25,295			24,022			766			12,627		
Truck %:	0%	26%	24%	22%	19%	0%	20%	0%	23%	0%	0%	0%	
Project:	0	2	0	6	1	0	6	0	0	0	0	0	15
Project ADT:		44			258			70			144		
E+P:	0	252	446	214	782	0	107	0	154	0	0	0	1,955
E+P ADT:		25,339			24,280			836			12,771		
2018 NP:	0	264	465	220	816	0	113	0	160	0	0	0	2,038
2018 NP ADT:		26,429			25,235			878			13,214		
2018 WP:	0	266	465	226	817	0	119	0	160	0	0	0	2,053
2018 WP ADT:		26,473			25,493			948			13,358		

5: Driveway 2 / E. 220th Street

PHF: 0.920 Count Date:

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL
Existing 2016:	0	0	0	0	0	0	0	148	0	0	32	0	180
2016 ADT:		0			0			2,736			2,736		
Truck %:	0%	0%	0%	0%	0%	0%	0%	22%	0%	0%	47%	0%	
Project:	0	0	0	1	0	6	13	13	0	0	6	1	40
Project ADT:		0			262			554			336		
E+P:	0	0	0	1	0	6	13	161	0	0	38	1	220
E+P ADT:		0			262			3,290			3,072		
2018 NP:	0	0	0	0	0	0	0	155	0	0	33	0	188
2018 NP ADT:		0			0			2,855			2,855		
2018 WP:	0	0	0	1	0	6	13	168	0	0	39	1	228
2018 WP ADT:		0			262			3,409			3,191		

6: Driveway 3 / E. 220th Street

PHF: 0.920 Count Date:

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL
Existing 2016:	0	0	0	0	0	0	0	148	0	0	32	0	180
2016 ADT:		0			0			2,736			2,736		
Truck %:	0%	0%	0%	0%	0%	0%	0%	22%	0%	0%	47%	0%	
Project:	0	0	0	1	0	4	8	5	0	0	4	1	23
Project ADT:		0			175			116			205		
E+P:	0	0	0	1	0	4	8	153	0	0	36	1	203
E+P ADT:		0			175			2,852			2,941		
2018 NP:	0	0	0	0	0	0	0	155	0	0	33	0	188
2018 NP ADT:		0			0			2,855			2,855		
2018 WP:	0	0	0	1	0	4	8	160	0	0	37	1	211
2018 WP ADT:		0			175			2,971			3,060		

Volume Development

AM Peak Hour

7: Driveway 4 / E. 220th Street

PHF: 0.920 Count Date:

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL
Existing 2016:	0	0	0	0	0	0	0	148	0	0	32	0	180
2016 ADT:		0			0			2,736			2,736		
Truck %:	0%	0%	0%	0%	0%	0%	0%	22%	0%	0%	47%	0%	
Project:	0	0	0	0	0	3	5	1	0	0	2	0	11
Project ADT:		0			162			206			44		
E+P:	0	0	0	0	0	3	5	149	0	0	34	0	191
E+P ADT:		0			162			2,942			2,780		
2018 NP:	0	0	0	0	0	0	0	155	0	0	33	0	188
2018 NP ADT:		0			0			2,855			2,855		
2018 WP:	0	0	0	0	0	3	5	156	0	0	35	0	199
2018 WP ADT:		0			162			3,061			2,899		

Volume Development

PM Peak Hour

1: S. Wilmington Avenue / Driveway 1

PHF: 0.920 Count Date:

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL
Existing 2016:	0	522	0	0	545	0	0	0	0	0	0	0	1,067
2016 ADT:		18,051			18,051			0			0		
Truck %:	0%	26%	0%	0%	13%	0%	0%	0%	0%	0%	0%	0%	
Project:	0	6	3	0	4	0	0	0	0	0	0	4	17
Project ADT:		217			191			0			108		
E+P:	0	528	3	0	549	0	0	0	0	0	0	4	1,084
E+P ADT:		18,268			18,242			0			108		
2018 NP:	0	556	0	0	585	0	0	0	0	0	0	0	1,141
2018 NP ADT:		19,160			19,160			0			0		
2018 WP:	0	562	3	0	589	0	0	0	0	0	0	4	1,158
2018 WP ADT:		19,377			19,351			0			108		

2: S. Wilmington Avenue / E. 220th Street

PHF: 0.914 Count Date: 4/5/2016

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL
Existing 2016:	87	439	26	21	510	14	10	7	46	69	4	73	1,306
2016 ADT:		16,102			18,051			2,298			2,736		
Truck %:	1%	28%	62%	10%	13%	14%	20%	14%	2%	12%	0%	11%	
Project:	0	3	8	4	0	0	0	0	0	23	0	6	44
Project ADT:		473			217			0			556		
E+P:	87	442	34	25	510	14	10	7	46	92	4	79	1,350
E+P ADT:		16,575			18,268			2,298			3,292		
2018 NP:	91	469	27	22	549	15	10	7	48	72	4	77	1,390
2018 NP ADT:		17,123			19,159			2,391			2,855		
2018 WP:	91	472	35	26	549	15	10	7	48	95	4	83	1,434
2018 WP ADT:		17,596			19,376			2,391			3,411		

3: S. Wilmington Avenue / I-405 NB Ramps

PHF: 0.978 Count Date: 4/5/2016

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL
Existing 2016:	0	212	109	4	621	0	0	0	0	814	0	348	2,108
2016 ADT:		24,022			16,211			0			17,442		
Truck %:	0%	38%	11%	25%	12%	0%	0%	0%	0%	12%	0%	20%	
Project:	0	4	0	7	16	0	0	0	0	0	0	6	33
Project ADT:		258			472			0			214		
E+P:	0	216	109	11	637	0	0	0	0	814	0	354	2,141
E+P ADT:		24,280			16,683			0			17,656		
2018 NP:	0	229	113	4	657	7	0	0	0	848	0	367	2,225
2018 NP ADT:		25,234			17,237			74			18,231		
2018 WP:	0	233	113	0	673	14	0	0	0	848	0	373	2,254
2018 WP ADT:		25,492			17,709			74			18,445		

Volume Development

PM Peak Hour

4: S. Wilmington Avenue / I-405 SB Ramps

PHF: 0.961 Count Date: 4/5/2016

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL
Existing 2016:	0	307	494	429	1,006	0	14	0	42	0	0	0	2,292
2016 ADT:		25,295			24,022			766			12,627		
Truck %:	0%	28%	12%	10%	13%	0%	43%	0%	12%	0%	0%	0%	
Project:	0	1	0	14	2	0	3	0	0	0	0	0	20
Project ADT:		44			258			70			144		
E+P:	0	308	494	443	1,008	0	17	0	42	0	0	0	2,312
E+P ADT:		25,339			24,280			836			12,771		
2018 NP:	0	322	514	453	1,052	0	20	0	45	0	0	0	2,406
2018 NP ADT:		26,429			25,235			878			13,214		
2018 WP:	0	323	514	467	1,054	0	23	0	45	0	0	0	2,426
2018 WP ADT:		26,473			25,493			948			13,358		

5: Driveway 2 / E. 220th Street

PHF: 0.920 Count Date:

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL
Existing 2016:	0	0	0	0	0	0	0	54	0	0	146	0	200
2016 ADT:		0			0			2,736			2,736		
Truck %:	0%	0%	0%	0%	0%	0%	0%	35%	0%	0%	11%	0%	
Project:	0	0	0	1	0	13	6	6	0	0	16	1	43
Project ADT:		0			262			554			336		
E+P:	0	0	0	1	0	13	6	60	0	0	162	1	243
E+P ADT:		0			262			3,290			3,072		
2018 NP:	0	0	0	0	0	0	0	56	0	0	153	0	209
2018 NP ADT:		0			0			2,855			2,855		
2018 WP:	0	0	0	1	0	13	6	62	0	0	169	1	252
2018 WP ADT:		0			262			3,409			3,191		

6: Driveway 3 / E. 220th Street

PHF: 0.920 Count Date:

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL
Existing 2016:	0	0	0	0	0	0	0	54	0	0	146	0	200
2016 ADT:		0			0			2,736			2,736		
Truck %:	0%	0%	0%	0%	0%	0%	0%	35%	0%	0%	11%	0%	
Project:	0	0	0	1	0	8	4	4	0	0	9	1	27
Project ADT:		0			175			116			205		
E+P:	0	0	0	1	0	8	4	58	0	0	155	1	227
E+P ADT:		0			175			2,852			2,941		
2018 NP:	0	0	0	0	0	0	0	56	0	0	153	0	209
2018 NP ADT:		0			0			2,855			2,855		
2018 WP:	0	0	0	1	0	8	4	60	0	0	162	1	236
2018 WP ADT:		0			175			2,971			3,060		

Volume Development

PM Peak Hour

7: Driveway 4 / E. 220th Street

PHF: 0.920 Count Date:

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	TOTAL
Existing 2016:	0	0	0	0	0	0	0	54	0	0	146	0	200
2016 ADT:		0			0			2,736			2,736		
Truck %:	0%	0%	0%	0%	0%	0%	0%	35%	0%	0%	11%	0%	
Project:	0	0	0	0	0	8	3	2	0	0	1	0	14
Project ADT:		0			162			206			44		
E+P:	0	0	0	0	0	8	3	56	0	0	147	0	214
E+P ADT:		0			162			2,942			2,780		
2018 NP:	0	0	0	0	0	0	0	56	0	0	153	0	209
2018 NP ADT:		0			0			2,855			2,855		
2018 WP:	0	0	0	0	0	8	3	58	0	0	154	0	223
2018 WP ADT:		0			162			3,061			2,899		

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MIG 25 May 2016
MIG TNM 2.5

INPUT: TRAFFIC FOR Lden
PROJECT/CONTRACT: AL2 Warehouse
RUN: 2018 No Project Wilmington

Roadway	Points																							
Name	Name	No.	Segment																					
			ADT	Autos				MTrucks				HTrucks				Buses				Motorcycles				
				%D	%E	%N	S	%D	%E	%N	S	%D	%E	%N	S	%D	%E	%N	S	%D	%E	%N	S
			veh/24hrs	%	%	%	mph	%	%	%	mph	%	%	%	mph	%	%	%	mph	%	%	%	mph
Wilmington Avenue	point1	1	38320	95	71	98	45	2	11	1	45	3	18	1	45	0	0	0	0	0	0	0	0
	point6	6	38320	95	71	98	45	2	11	1	45	3	18	1	45	0	0	0	0	0	0	0	0
	point2	2																					

MIG							25 May 2016					
MIG							TNM 2.5					
							Calculated with TNM 2.5					
RESULTS: SOUND LEVELS												
PROJECT/CONTRACT:		AL2 Warehouse										
RUN:		2018 No Project Wilmington										
BARRIER DESIGN:		INPUT HEIGHTS						Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.				
ATMOSPHERICS:		68 deg F, 50% RH										

Receiver Name	No.	#DUs	Existing Lden	No Barrier Lden Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated Lden	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
1 Industrial (N)	1	1	0.0	76.4	0	76.4	0	Snd Lvl	76.4	0.0	0	0.0
4 Residential (W)	3	1	0.0	78.7	0	78.7	0	Snd Lvl	78.7	0.0	0	0.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	2	0.0	0.0	0.0
All Impacted	2	0.0	0.0	0.0
All that meet NR Goal	2	0.0	0.0	0.0

MIG **25 May 2016**
MIG **TNM 2.5**

INPUT: TRAFFIC FOR Lden
PROJECT/CONTRACT: **AL2 Warehouse**
RUN: **2018 No Project - E 220th**

Roadway	Points																							
Name	Name	No.	Segment																					
			ADT	Autos				MTrucks				HTrucks				Buses				Motorcycles				
				%D	%E	%N	S	%D	%E	%N	S	%D	%E	%N	S	%D	%E	%N	S	%D	%E	%N	S
			veh/24hrs	%	%	%	mph	%	%	%	mph	%	%	%	mph	%	%	%	mph	%	%	%	mph
E 220th Street	point3	3	5710	95	71	98	45	2	11	1	45	3	18	1	45	0	0	0	0	0	0	0	0
	point4	4																					

MIG
MIG

25 May 2016
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS

PROJECT/CONTRACT: AL2 Warehouse
RUN: 2018 No Project - E 220th
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing Lden	No Barrier Lden Calculated	No Barrier Crit'n	Increase over existing Calculated	Increase over existing Crit'n Sub'l Inc	Type Impact	With Barrier Calculated Lden	Noise Reduction Calculated	Noise Reduction Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
2 Industrial (E)	4	1	0.0	66.3	0	66.3	0	Snd Lvl	66.3	0.0	0	0.0
3 Industrial (S)	5	1	0.0	68.5	0	68.5	0	Snd Lvl	68.5	0.0	0	0.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	2	0.0	0.0	0.0
All Impacted	2	0.0	0.0	0.0
All that meet NR Goal	2	0.0	0.0	0.0

MIG 25 May 2016
MIG TNM 2.5

INPUT: TRAFFIC FOR Lden
PROJECT/CONTRACT: AL2 Warehouse
RUN: 2018 Plus Project Wilmington

Roadway	Points																						
Name	Name	No.	Segment																				
			ADT	Autos				MTrucks				HTrucks				Buses				Motorcycles			
				%D	%E	%N	S	%D	%E	%N	S	%D	%E	%N	S	%D	%E	%N	S	%D	%E	%N	S
			veh/24hrs	%	%	%	mph	%	%	%	mph	%	%	%	mph	%	%	%	mph	%	%	%	mph
Wilmington Avenue	point1	1	38728	95	71	98	45	2	11	1	45	3	18	1	45	0	0	0	0	0	0	0	0
	point6	6	38728	95	71	98	45	2	11	1	45	3	18	1	45	0	0	0	0	0	0	0	0
	point2	2																					

MIG		25 May 2016	
MIG		TNM 2.5	
		Calculated with TNM 2.5	
RESULTS: SOUND LEVELS			
PROJECT/CONTRACT:	AL2 Warehouse		
RUN:	2018 Plus Project Wilmington		
BARRIER DESIGN:	INPUT HEIGHTS		Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.
ATMOSPHERICS:	68 deg F, 50% RH		

Receiver Name	No.	#DUs	Existing Lden	No Barrier Lden Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated Lden	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
1 Industrial (N)	1	1	0.0	76.5	0	76.5	0	Snd Lvl	76.5	0.0	0	0.0
4 Residential (W)	3	1	0.0	78.7	0	78.7	0	Snd Lvl	78.7	0.0	0	0.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	2	0.0	0.0	0.0
All Impacted	2	0.0	0.0	0.0
All that meet NR Goal	2	0.0	0.0	0.0

MIG 25 May 2016
MIG TNM 2.5

INPUT: TRAFFIC FOR Lden
PROJECT/CONTRACT: AL2 Warehouse
RUN: 2018 Plus Project - E 220th

Roadway	Points																						
Name	Name	No.	Segment																				
			ADT	Autos				MTrucks				HTrucks				Buses				Motorcycles			
				%D	%E	%N	S	%D	%E	%N	S	%D	%E	%N	S	%D	%E	%N	S	%D	%E	%N	S
			veh/24hrs	%	%	%	mph	%	%	%	mph	%	%	%	mph	%	%	%	mph	%	%	%	mph
E 220th Street	point3	3	6600	95	71	98	45	2	11	1	45	3	18	1	45	0	0	0	0	0	0	0	0
	point4	4																					

MIG		25 May 2016
MIG		TNM 2.5
		Calculated with TNM 2.5
RESULTS: SOUND LEVELS		
PROJECT/CONTRACT:	AL2 Warehouse	
RUN:	2018 Plus Project - E 220th	
BARRIER DESIGN:	INPUT HEIGHTS	Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.
ATMOSPHERICS:	68 deg F, 50% RH	

Receiver Name	No.	#DUs	Existing Lden	No Barrier Lden Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated Lden	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
2 Industrial (E)	4	1	0.0	66.9	0	66.9	0	Snd Lvl	66.9	0.0	0	0.0
3 Industrial (S)	5	1	0.0	69.1	0	69.1	0	Snd Lvl	69.1	0.0	0	0.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	2	0.0	0.0	0.0
All Impacted	2	0.0	0.0	0.0
All that meet NR Goal	2	0.0	0.0	0.0

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URBAN
CROSSROADS

Carson Warehouse

Traffic Impact Analysis

City of Carson

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July 22, 2016

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LIST OF ABBREVIATED TERMS

(1)	Reference
ADT	Average Daily Traffic
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CMP	Congestion Management Program
DIF	Development Impact Fee
E+P	Existing Plus Project
FHWA	Federal Highway Administration
HCM	Highway Capacity Manual
ICU	Intersection Capacity Utilization
ITE	Institute of Transportation Engineers
LA	Los Angeles
LOS	Level of Service
MTA	Metropolitan Transportation Authority
MUTCD	Manual on Uniform Traffic Control Devices
N/A	Not Applicable
PCE	Passenger Car Equivalents
PHF	Peak Hour Factor
Project	Carson Warehouse
RSA	Regional Statistical Area
RTPA	Regional Transportation Planning Agency
SANBAG	San Bernardino Association of Governments
SCAG	Southern California Association of Governments
SCAQMD	Southern California Air Quality Management District
SHS	State Highway System
TIA	Traffic Impact Analysis
v/c	Volume to Capacity
VMT	Vehicle Miles Traveled

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1 INTRODUCTION

This report presents the results of the traffic impact analysis (TIA) for the proposed Carson Warehouse ("Project"), which is located on the northeast corner of South Wilmington Avenue and East 220th Street in the City of Carson, as shown on Exhibit 1-1.

The purpose of this traffic impact analysis is to evaluate the potential impacts to traffic and circulation associated with the development of the proposed Project, and to recommend improvements to mitigate impacts considered significant in comparison to established regulatory thresholds. The study follows Appendix D of the Los Angeles County Congestion Management Program (CMP) and the California Department of Transportation's (Caltrans) traffic study requirements. [1] [2] The approved Project Traffic Study Scoping Agreement is provided in Appendix 1.1 of this TIA.

1.1 PROJECT OVERVIEW

It is our understanding that the Project is to consist of a single high-cube warehouse/distribution center building of approximately 420,000 square feet. For the purposes of this analysis, it is assumed that the Project will be developed in a single phase with an Opening Year of 2018.

Trips anticipated to be generated by the Project have been estimated based on trip generation rates collected by the Institute of Transportation Engineers (ITE) as presented in ITE's most current edition of Trip Generation (9th Edition, 2012). [3] The Project is anticipated to generate a net total of approximately 1,107 net new passenger car equivalent (PCE) trip-ends per day with 64 net new PCE AM peak hour trips and 75 net new PCE PM peak hour trips. The assumptions and methods used to estimate the Proposed Project's trip generation characteristics are discussed in detail in Section 4.1 *Project Trip Generation* of this report.

1.2 ANALYSIS SCENARIOS

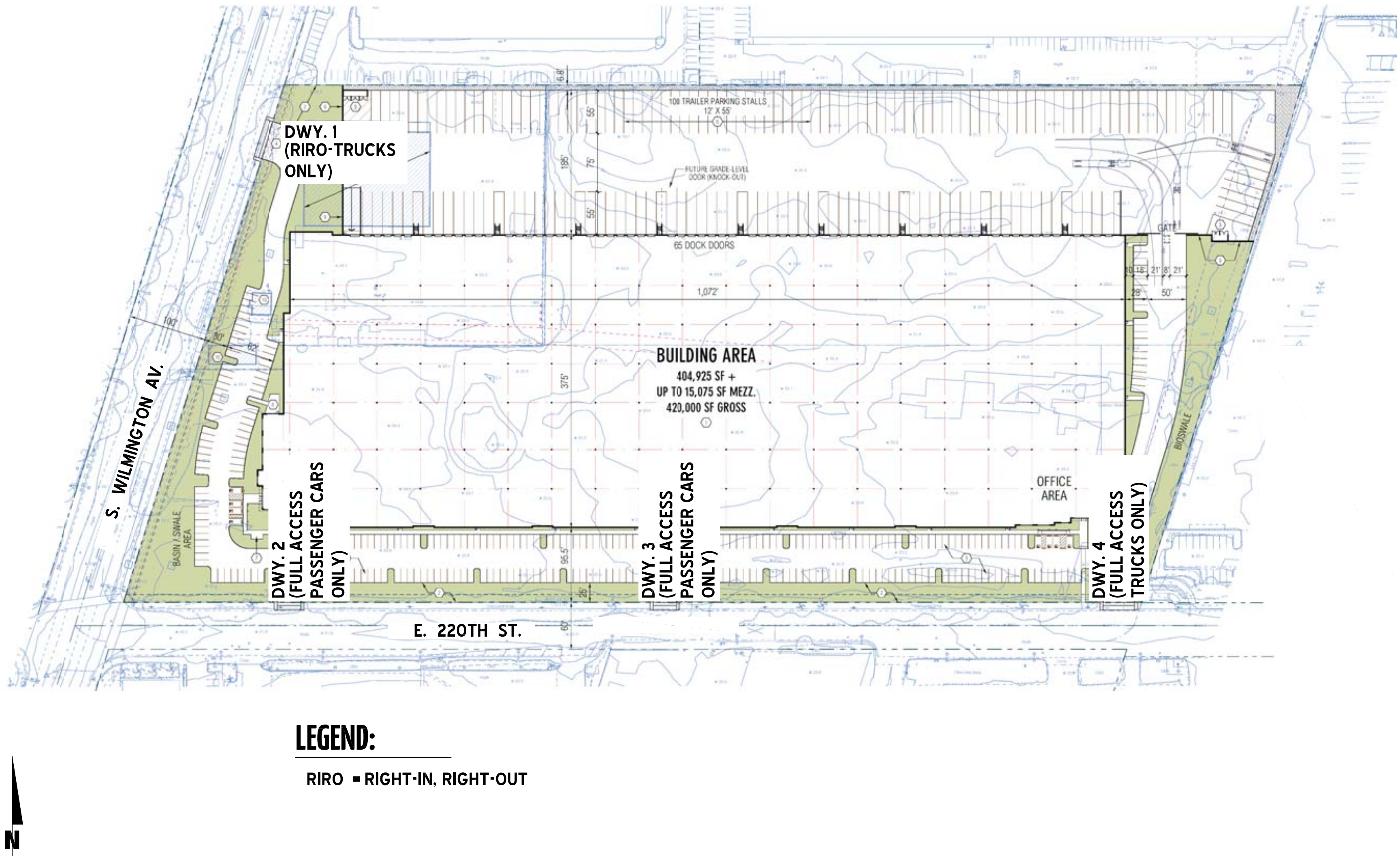
For the purposes of this traffic study, potential impacts to traffic and circulation have been assessed for each of the following scenarios:

- Existing (2016) Conditions
- Existing plus Project Conditions
- Opening Year (2018) Without Project
- Opening Year (2018) With Project

1.2.1 EXISTING (2016) CONDITIONS

Information for Existing conditions is disclosed to represent the baseline traffic conditions as they existed at the time this report was prepared.

EXHIBIT 1-1: PRELIMINARY SITE PLAN



1.2.2 EXISTING PLUS PROJECT CONDITIONS

The Existing plus Project (E+P) analysis determines whether or not significant traffic impacts would occur on the existing roadway system with the addition of Project traffic. The E+P analysis is intended to identify the Project-specific impacts associated solely with the development of the proposed Project based on a comparison of the E+P traffic conditions to Existing conditions.

1.2.3 OPENING YEAR CUMULATIVE (2018) CONDITIONS

The Opening Year Cumulative conditions analysis determines the Project's contribution to near-term cumulative traffic impacts based on a comparison of the "With Project" traffic scenario to the "Without Project" traffic scenario. To account for background traffic growth, traffic associated with other known cumulative development projects in conjunction with an ambient growth from Existing (2016) conditions of 2.0 percent is included for Opening Year Cumulative traffic conditions, as well as traffic generated by the Project.

The generalized growth factors provided in the 2010 Los Angeles (LA) County CMP [1] indicates a growth factor of 1.051 for ten years (2010 to 2020) or a compounded annual growth of 0.51% per year for the Regional Statistical Area (RSA) 19 in which the Project is located. As such, the analysis is consistent with the CMP guidelines.

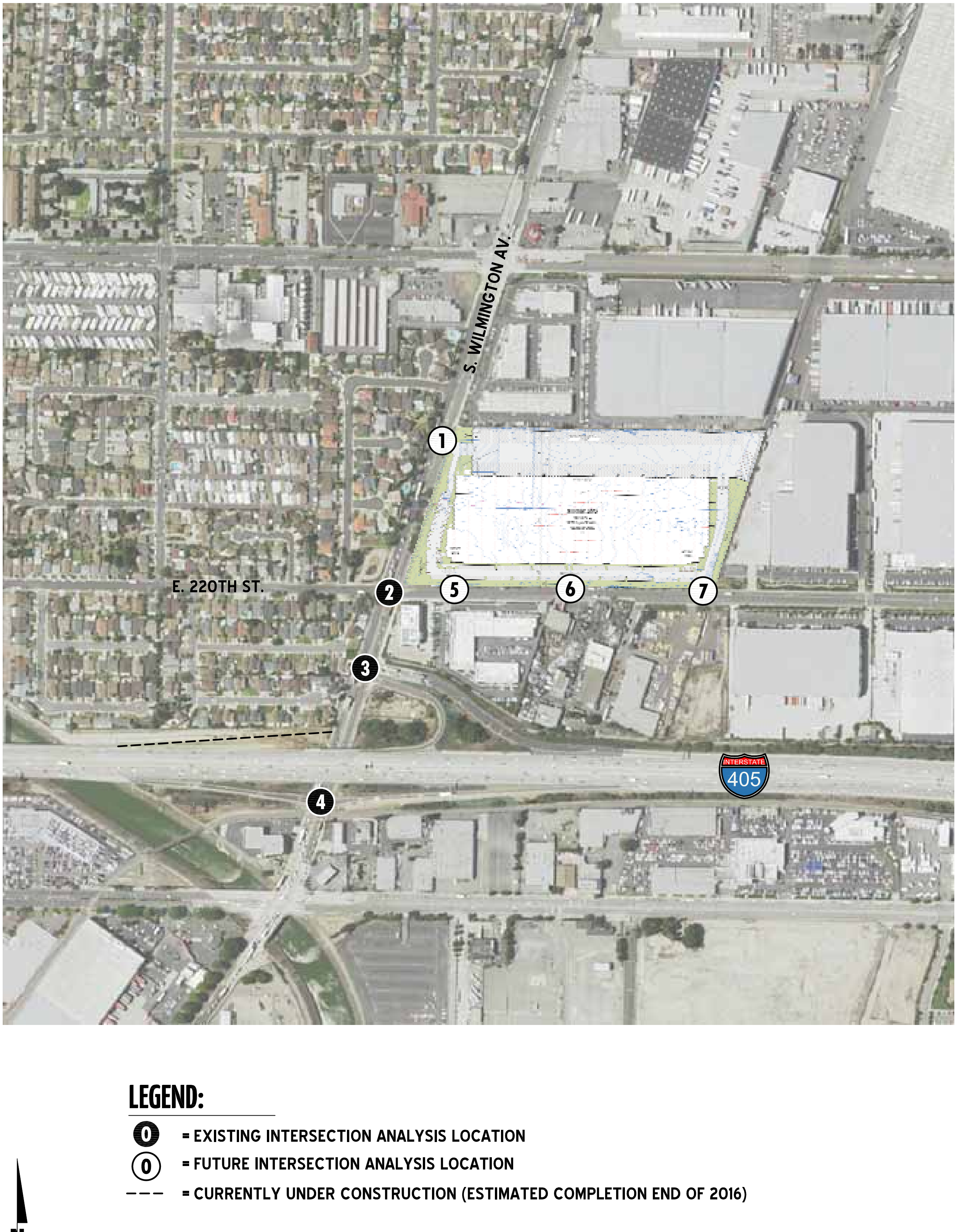
1.3 STUDY AREA

1.3.1 INTERSECTIONS

The potential impact study area was defined in coordination with the City of Carson staff and in conformance with the requirements of the CMP guidelines. Based on these guidelines, the minimum area to be studied shall include any intersections at which the proposed Project will add 50 or more peak hour trips.

To ensure that this TIA complies with the City's TIA preparation requirements, Urban Crossroads, Inc. prepared a Project Traffic Study Scoping Agreement for review and approval by City staff prior to the preparation of this TIA. The Agreement provides an outline of the Project study area, trip generation, trip distribution, and analysis methodology. The City staff reviewed the Agreement and accepted the TIA's proposed study area and methodology as meeting the City's TIA preparation guidelines. The Agreement approved by the City of Carson is included in Appendix 1.1.

EXHIBIT 1-2: LOCATION MAP



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URBAN CROSSROADS

City of CarsonSix study area intersection locations shown on Exhibit 1-2, and listed in Table 1-1 were selected for this TIA based on the City of Carson's traffic study requirements that require analysis of intersection locations in which a proposed Project is anticipated to contribute 50 or more peak-hour trips. It should be noted that none of the study area intersections are CMP locations.

TABLE 1-1: INTERSECTION ANALYSIS LOCATIONS

ID	Intersection Location	Jurisdiction
1	S. Wilmington Avenue / Driveway 1 – Future Intersection	Carson
2	S. Wilmington Avenue / E. 220th Street	Carson
3	S. Wilmington Avenue / I-405 Northbound Ramps	Caltrans, Carson
4	S. Wilmington Avenue / I-405 Southbound Ramps	Caltrans, Carson
5	Driveway 2 / E. 220th Street – Future Intersection	Carson
6	Driveway 3 / E. 220th Street – Future Intersection	Carson
7	Driveway 4 / E. 220th Street – Future Intersection	Carson

1.3.2 Peak Hour Freeway Off-Ramp Queuing Analysis

The study area peak hour freeway off-ramp queuing analysis locations include two Freeway ramp junctions for the northbound and southbound directions of flow as shown on Table 1-2:

TABLE 1-2: PEAK HOUR FREEWAY OFF-RAMP QUEUING ANALYSIS

ID	Peak Hour Freeway Off-Ramp Queuing Locations
1	S. Wilmington Avenue / I-405 Northbound Off-ramp
2	S. Wilmington Avenue / I-405 Southbound Off-ramp

1.4 Analysis Findings

This section provides a summary of the analysis results for Existing, E+P, and Opening Year Cumulative traffic conditions.

1.4.1 Intersections

Existing (2016) Conditions

For Existing traffic conditions, all the study area intersections were found to operate at an acceptable level of service (LOS) based on the applicable jurisdiction's LOS standard.

Existing Plus Project (E+P) Conditions

For E+P traffic conditions, all the study area intersections were found to operate at an acceptable LOS for applicable jurisdictional requirements. As such, the addition of Project traffic does not result in a significant impact on the study area intersections based on the City of Carson's LOS threshold of significance.

Opening Year Cumulative (2018) Conditions

For Opening Year Cumulative (2018) traffic conditions, all the study area intersections were found to operate at an acceptable LOS for applicable jurisdictional requirements. As such, the addition of Project traffic does not result in a significant cumulative impact on the study area intersections based on the City of Carson's threshold of significance.

1.4.2 FREEWAY OFF-RAMP QUEUING

There are no potential queuing issues anticipated on I-405 Freeway Northbound and Southbound off-ramps at S. Wilmington Avenue during the AM and PM peak hour 95th percentile traffic flows for Existing, E+P, and Opening Year Cumulative traffic conditions.

1.5 RECOMMENDED IMPROVEMENTS

The Project's contribution to the study area intersections were found to be less than significant. As such, no improvements have been recommended at the study area intersections.

1.6 LOCAL AND REGIONAL FUNDING MECHANISMS

Transportation improvements throughout LA County are typically funded through a combination of direct Project mitigation and fair share contributions. Based on discussions with City staff, the City of Carson does not have a Development Impact Fee (DIF) program in place and there are no applicable regional fee programs. However, a regional fee program is currently in the process of being developed for Los Angeles County by the Metropolitan Transportation Authority (MTA), the regional transportation planning agency (RTPA). Therefore, regional congestion mitigation fees for projects located within the City of Carson, have not yet been established.

1.7 ON-SITE ROADWAY AND SITE ACCESS IMPROVEMENTS

The Project is proposed to access S. Wilmington Avenue via one stop-controlled driveway: Driveway 1 (westerly driveway) would provide right-in/right-out access to and from the site for trucks only. The Project is proposed to access E. 220th Street via three stop-controlled driveways: Driveway 2 (southwesterly driveway) would provide access to and from the site for passenger cars only and would allow for full vehicle turning movements, Driveway 3 (middle southerly driveway) would provide access to and from the site for passenger cars only and would allow for full vehicle turning movements, and Driveway 4 (southeasterly driveway) would provide right-in/right-out access to and from the site for trucks only. Regional access to the Project site will be primarily provided by the I-405 Freeway via S. Wilmington Avenue.

The site adjacent roadway of S. Wilmington Avenue, as well as E. 220th Street, are currently built to their ultimate number of travel lanes as indicated in the City of Carson General Plan Circulation Element. Additional curb, gutter and parkway improvements are recommended along the Project's frontage consistent with the City of Carson's standards, as specified in the Project's final conditions of approval.

1.7.1 Site Access Improvements

The recommended site access driveway improvements for the Project are described below. Exhibit 1-3 illustrates the on-site and site adjacent recommended roadway lane improvements. Construction of on-site and site adjacent improvements shall occur in conjunction with adjacent Project development activity or as needed for Project access purposes. The following intersection improvements consist of improvements to the Project egress/ingress driveways only, while lanes along S. Wilmington Avenue remain consistent with existing conditions.

S. Wilmington Avenue / Driveway 1 – Install a stop control on the westbound approach and construct the intersection with the following geometrics:

- Northbound Approach: One through lane and one shared through-right turn lane.
- Southbound Approach: Two through lanes.
- Eastbound Approach: Not Applicable (N/A)
- Westbound Approach: One right turn lane.

E. 220th Street / Driveway 2 – Install a stop control on the southbound approach and construct the intersection with the following geometrics:

- Northbound Approach: N/A
- Southbound Approach: One left-right turn lane.
- Eastbound Approach: One shared left-through lane.
- Westbound Approach: One shared through-right turn lane.

E. 220th Street / Driveway 3 – Install a stop control on the southbound approach and construct the intersection with the following geometrics:

- Northbound Approach: N/A
- Southbound Approach: One left-right turn lane.
- Eastbound Approach: One shared left-through lane.
- Westbound Approach: One shared through-right turn lane.

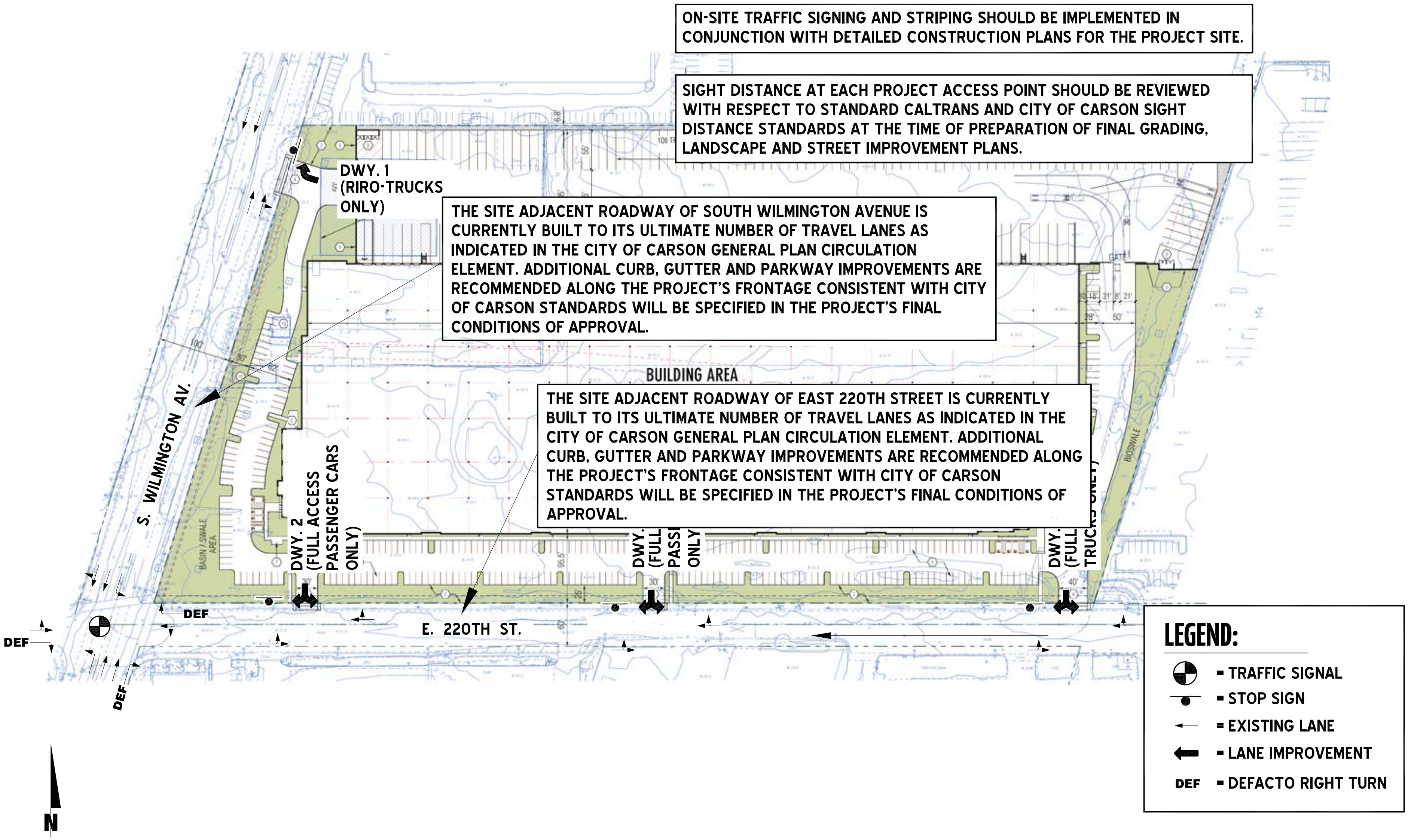
E. 220th Street / Driveway 4 – Install a stop control on the southbound approach and construct the intersection with the following geometrics:

- Northbound Approach: N/A
- Southbound Approach: One left-right turn lane.
- Eastbound Approach: One shared left-through lane.
- Westbound Approach: One shared through-right turn lane.

On-site traffic signing and striping should be implemented in conjunction with detailed construction plans for the Project site.

Sight distance at each project access point shall be designed to comply with standard Caltrans and City of Carson sight distance standards; compliance will be determined at the time of preparation of final grading, landscape and street improvement plans.

EXHIBIT 1-3: SITE ACCESS RECOMMENDATIONS



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1.7.2 QUEUING ANALYSIS AT THE PROJECT DRIVEWAYS

A queuing analysis was conducted along the site adjacent roadways of S. Wilmington Avenue and E. 220th Street for Opening Year Cumulative (2018) traffic conditions to determine the turn pocket lengths necessary to accommodate near term 95th percentile queues. The analysis was conducted for the weekday AM and weekday PM peak hours.

The traffic modeling and signal timing optimization software packages Synchro and SimTraffic (Version 9.1) has been utilized to assess queues at the Project access points. Synchro is a macroscopic traffic software program that is based on the signalized and unsignalized intersection capacity analyses as specified in the HCM. Macroscopic level models represent traffic in terms of aggregate measures for each movement at the study intersections. Equations are used to determine measures of effectiveness such as delay and queue length in Synchro. The LOS and capacity analysis performed by Synchro takes into consideration optimization and coordination of signalized intersections within a network.

SimTraffic is designed to model networks of signalized and unsignalized intersections, with the primary purpose of checking and fine tuning signal operations. SimTraffic uses the input parameters from Synchro to generate random simulations. The average queue is the average of all the two-minute maximum queues observed by SimTraffic. The maximum back of queue observed for every two-minute period is recorded by SimTraffic. SimTraffic has been utilized to assess peak hour queuing at the site access driveways for Opening Year Cumulative With Project traffic conditions. The random simulations generated by SimTraffic have been utilized to determine the 50th and 95th percentile queue lengths observed for each turn lane. A SimTraffic simulation has been recorded five (5) times, during the weekday AM and weekday PM peak hours, and has been seeded for 15-minute periods with 60-minute recording intervals.

The storage length recommendations for the turning movements at the Project were shown previously on Exhibit 1-3 for near term traffic conditions. The Opening Year Cumulative queuing results are provided in Appendix 1.2 of this report.

1.8 PEDESTRIAN AND BICYCLE ACCOMMODATIONS

1.8.1 PEDESTRIAN ACCOMMODATIONS

The Project will construct its curb and gutter and sidewalk improvements along their site frontage on S. Wilmington Avenue and E. 220th Street.

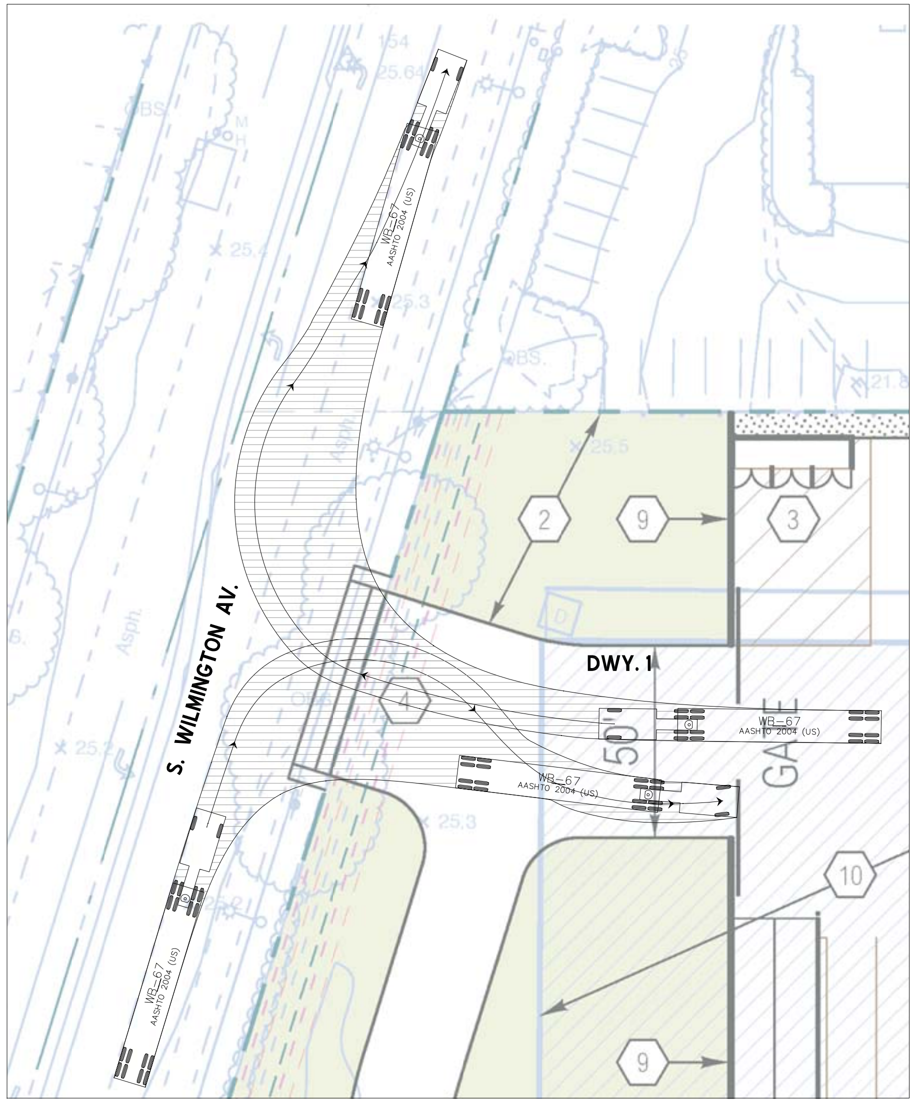
1.8.2 BICYCLE ACCOMMODATIONS

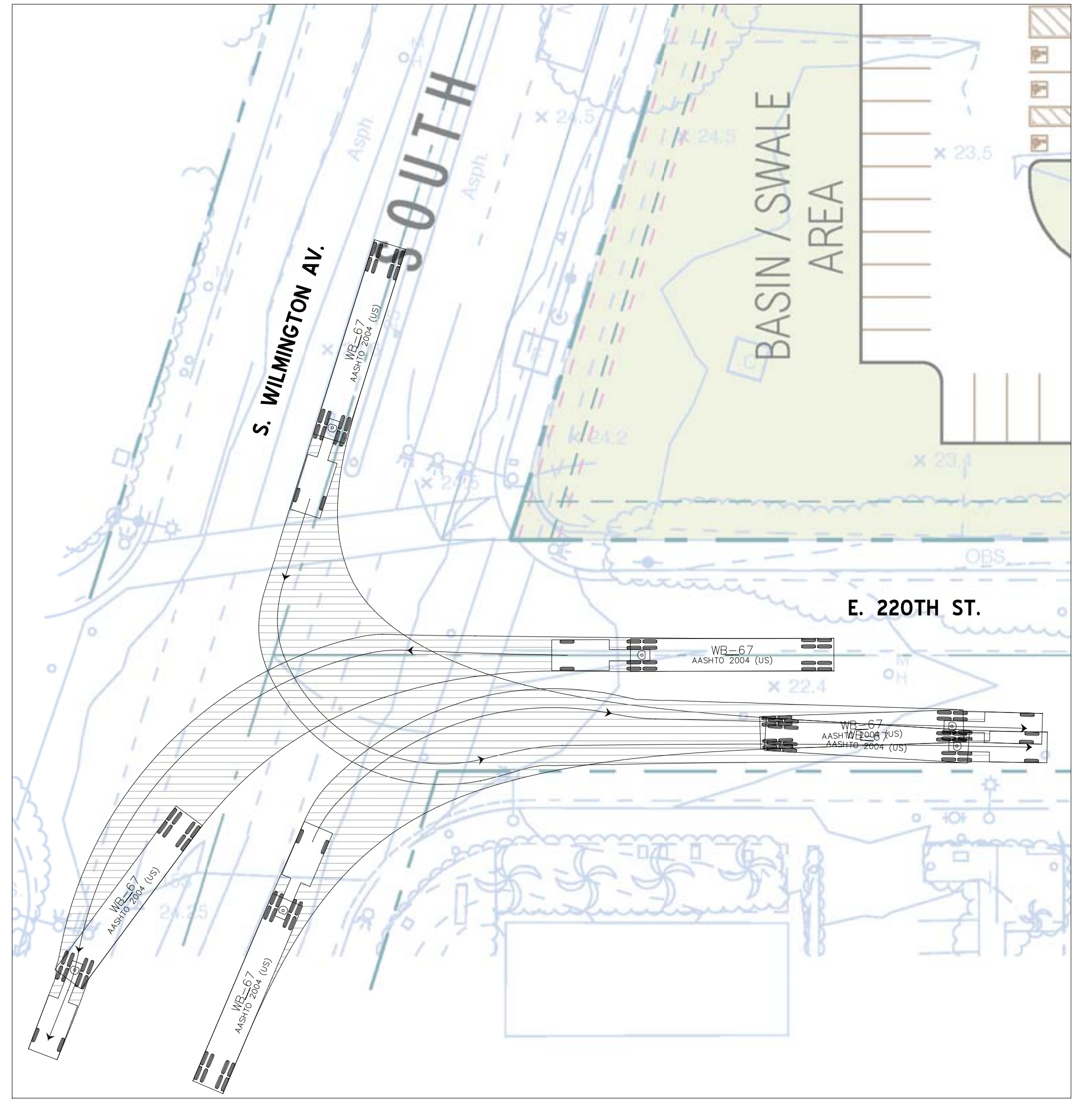
S. Wilmington Avenue is a planned bike route in the vicinity of the Project based on the City of Carson Master Plan of Bikeways.

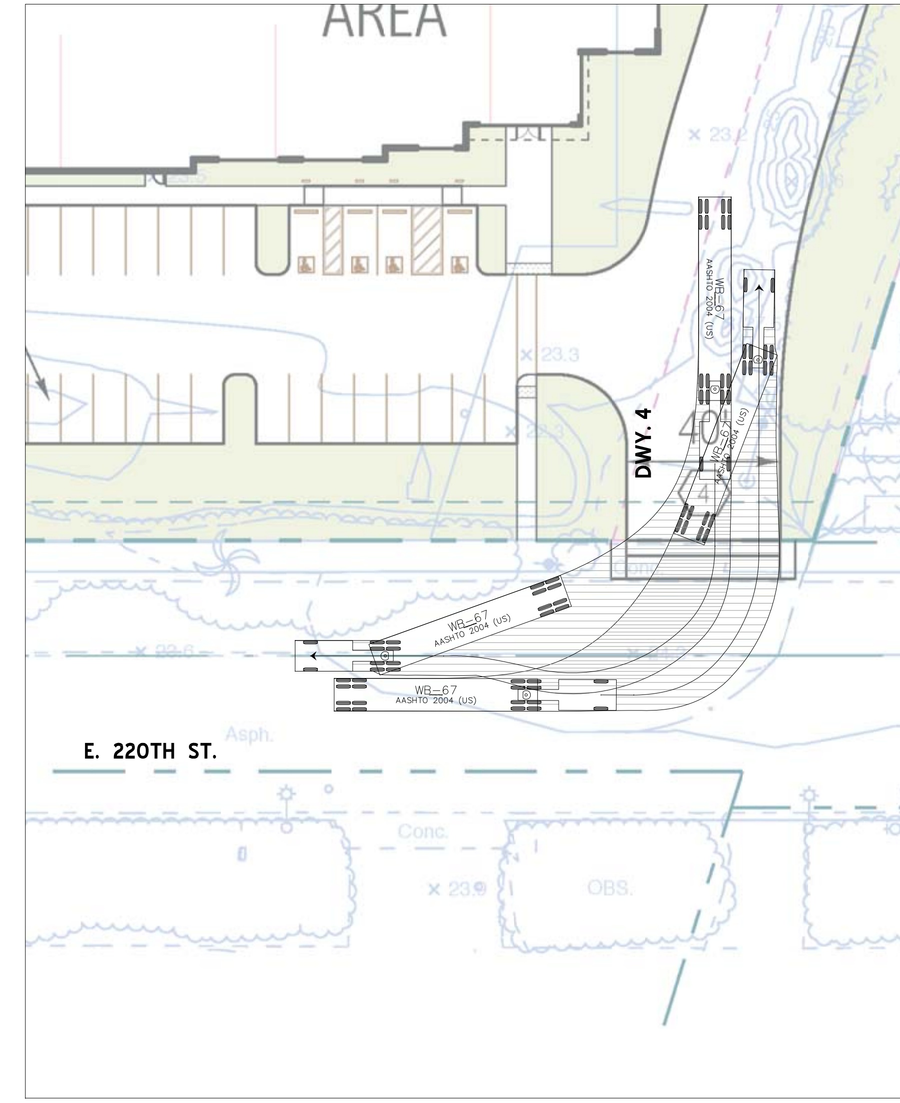
1.9 TRUCK ACCESS AND CIRCULATION

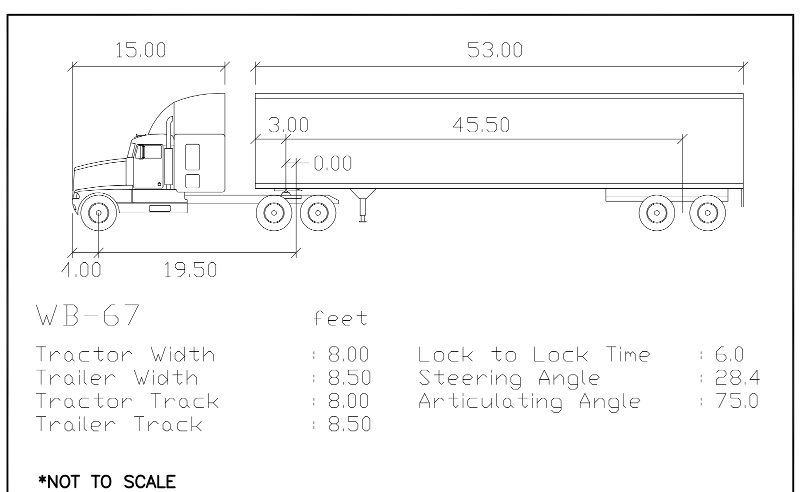
Due to the typical wide turning radius of large trucks, a truck turning template has been overlaid on the site plan at each applicable Project driveway and site adjacent intersection anticipated to be utilized by heavy trucks in order to determine appropriate curb radii and to verify that trucks will have sufficient space to execute turning maneuvers (see Exhibit 1-4). As shown, the Project driveways and site adjacent intersections are anticipated to accommodate the wide turning radius of the heavy trucks with the proposed curb radius at each of the applicable driveways and site adjacent intersections.

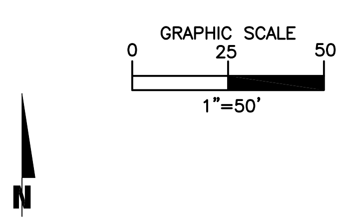
EXHIBIT 1-4: TRUCK ACCESS











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2 METHODOLOGIES

This section of the report presents the methodologies used to perform the traffic analyses summarized in this report. The methodologies described are generally consistent with LA County CMP and Caltrans traffic study guidelines. [1] [2]

2.1 LEVEL OF SERVICE

Traffic operations of roadway facilities are described using the term "Level of Service" (LOS). LOS is a qualitative description of traffic flow based on several factors such as speed, travel time, delay, and freedom to maneuver. Six levels are typically defined ranging from LOS A, representing completely free-flow conditions, to LOS F, representing breakdown in flow resulting in stop-and-go conditions. LOS E represents operations at or near capacity, an unstable level where vehicles are operating with the minimum spacing for maintaining uniform flow.

2.2 INTERSECTION CAPACITY ANALYSIS

The definitions of LOS for interrupted traffic flow (flow restrained by the existence of traffic signals and other traffic control devices) differ slightly depending on the type of traffic control. The LOS is typically dependent on the quality of traffic flow at the intersections along a roadway. LOS analysis was conducted to determine existing traffic conditions using the Intersection Capacity Utilization (ICU) methodology for signalized study intersections in the City of Carson. The 2010 Highway Capacity Manual (HCM) [4] methodology was used to determine LOS's for unsignalized intersections in those cities. In addition, in accordance with Caltrans' guidelines, 2010 HCM methodology was used for all State study intersections.

The HCM 2010 methodology expresses the LOS at an intersection in terms of average control delay time for the various intersection approaches. The HCM uses different procedures depending on the type of intersection control.

2.2.1 SIGNALIZED INTERSECTIONS

The City of Carson requires signalized intersections to be evaluated through ICU analysis which compares the peak hour traffic volumes to intersection capacity. Lane capacities of 1,600 vehicles per hour of green time have been assumed for the ICU calculations. 0.10 of V/C assumed representing 10 seconds of delay for the yellow and all-red signal indication and inherent vehicle delay between cycles with an assumed signal cycle of 100 seconds. The ICU LOS definitions based on V/C ratio are presented in Table 2-1.

TABLE 2-1 INTERSECTION CAPACITY UTILIZATION (ICU) LOS DEFINITIONS

Level of Service	Critical Volume To Capacity Ratio
A	0.00 - 0.60
B	0.61 - 0.70
C	0.71 - 0.80
D	0.81 - 0.90
E	0.91 - 1.00
F	>1.00

Source: 2010 LA County CMP

Caltrans requires signalized intersection operations analysis based on the methodology described in Chapter 18 and Chapter 31 of the HCM 2010. [4] Intersection LOS operations are based on an intersection's average control delay. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. For signalized intersections LOS is directly related to the average control delay per vehicle and is correlated to a LOS designation as described in Table 2-2.

TABLE 2-2: SIGNALIZED INTERSECTION HCM 2010 LOS THRESHOLDS

Description	Average Control Delay (Seconds), V/C ≤ 1.0	Level of Service, V/C ≤ 1.0	Level of Service, V/C > 1.0
Operations with very low delay occurring with favorable progression and/or short cycle length.	0 to 10.00	A	F
Operations with low delay occurring with good progression and/or short cycle lengths.	10.01 to 20.00	B	F
Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	20.01 to 35.00	C	F
Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	35.01 to 55.00	D	F
Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	55.01 to 80.00	E	F
Operation with delays unacceptable to most drivers occurring due to over saturation, poor progression, or very long cycle lengths	80.01 and up	F	F

Source: HCM 2010

The traffic modeling and signal timing optimization software package Synchro (Version 9.1) has been utilized to analyze signalized intersections within the study area. Synchro is a macroscopic traffic software program that is based on the signalized intersection capacity analysis as specified in the Chapters 18 and 31 of the HCM 2010. [4] Macroscopic level models represent traffic in terms of aggregate measures for each movement at the study intersections. Equations are used to determine measures of effectiveness such as delay and queue length. The LOS and capacity analysis performed by Synchro takes into consideration optimization and coordination of signalized intersections within a network.

The LOS analysis for signalized intersections has been performed using existing signal timing for Existing, E+P traffic, Opening Year Cumulative traffic conditions. Appropriate time for pedestrian crossings has also been considered in the signalized intersection analysis.

The peak hour traffic volumes have been adjusted using a peak hour factor (PHF) to reflect peak 15 minute volumes. Common practice for LOS analysis is to use a peak 15-mintue rate of flow. However, flow rates are typically expressed in vehicles per hour. The PHF is the relationship between the peak 15-minute flow rate and the full hourly volume (e.g. PHF = [Hourly Volume] / [4 x Peak 15-minute Flow Rate]). The use of a 15-minute PHF produces a more detailed analysis as compared to analyzing vehicles per hour. Existing PHFs have been used for all analysis scenarios for HCM intersections. ICU intersections have assumed a PHF of 1.00 per the ICU methodology. Per Chapter 4 of the HCM 2010, PHF values over 0.95 often are indicative of high traffic volumes with capacity constraints on peak hour flows while lower PHF values are indicative of greater variability of flow during the peak hour. [4] As such, new intersections have been conservatively evaluated with a PHF of 0.92.

2.2.2 UNSIGNALIZED INTERSECTIONS

The City of Carson requires the operations of unsignalized intersections be evaluated using the methodology described in Chapter 19, Chapter 20, Chapter 32 of the HCM 2010. [4] The LOS rating is based on the weighted average control delay expressed in seconds per vehicle (see Table 2-3).

TABLE 2-3: UNSIGNALIZED INTERSECTION LOS THRESHOLDS

Description	Average Control Delay	Level of Service, V/C	Level of Service, V/C
Little or no delays.	0 to 10.00	A	F
Short traffic delays.	10.01 to 15.00	B	F
Average traffic delays.	15.01 to 25.00	C	F
Long traffic delays.	25.01 to 35.00	D	F
Very long traffic delays.	35.01 to 50.00	E	F
Extreme traffic delays with	> 50.00	F	F

Source: HCM 2010

At two-way or side-street stop-controlled intersections, The LOS criteria apply to each lane on a given approach and to each approach on the minor street. LOS is not calculated for major-street approaches or for the intersection as a whole. For all-way stop controlled intersections, LOS is based solely on control delay for assessment of LOS at the approach and intersection levels.

2.3 TRAFFIC SIGNAL WARRANT ANALYSIS METHODOLOGY

The term "signal warrants" refers to the list of established criteria used by Caltrans and other public agencies to quantitatively justify or ascertain the potential need for installation of a traffic signal at an otherwise unsignalized intersection. This TIA uses the signal warrant criteria presented in the latest edition of the Federal Highway Administration's (FHWA) *Manual on Uniform Traffic Control Devices (MUTCD)*, as amended by *the MUTCD 2014 California Supplement*, for all study area intersections. [5]

The signal warrant criteria for Existing conditions are based upon several factors, including volume of vehicular and pedestrian traffic, frequency of accidents, and location of school areas. Both the FHWA's *MUTCD* and the *MUTCD 2014 California Supplement* indicate that the installation of a traffic signal should be considered if one or more of the signal warrants are met. [5] Specifically, this TIA utilizes the Peak Hour Volume-based Warrant 3 as the appropriate representative traffic signal warrant analysis for Existing traffic conditions. Warrant 3 criteria are basically identical for both the FHWA's *MUTCD* and the *MUTCD 2014 California Supplement*. Warrant 3 is appropriate to use for this TIA because it provides specialized warrant criteria for intersections with rural characteristics (e.g. located in communities with populations of less than 10,000 persons or with adjacent major streets operating above 40 miles per hour). For the purposes of this study, the speed limit was the basis for determining whether Urban or Rural warrants were used for a given intersection.

Future unsignalized intersections have been assessed regarding the potential need for new traffic signals based on future average daily traffic (ADT) volumes, using the Caltrans planning level ADT-based signal warrant analysis worksheets. Traffic signal warrant analyses were performed for the following unsignalized study area intersection (see Table 2-4):

TABLE 2-4: TRAFFIC SIGNAL WARRANT ANALYSIS LOCATIONS

ID	Intersection Location	Jurisdiction
5	Driveway 2 / E. 220th St.	Carson
6	Driveway 3 / E. 220th St.	Carson
7	Driveway 4 / E. 220th St.	Carson

A traffic signal warrant analysis has not been performed for the intersection of S. Wilmington Avenue and Driveway 1 as it is proposed to be a right-in/right-out access only and a traffic signal would not likely be installed with the proposed access restriction. It is important to note that a signal warrant defines the minimum condition under which the installation of a traffic signal might be warranted. Meeting this threshold condition does not require that a traffic control signal be installed at a particular location, but rather, that other traffic factors and conditions be evaluated in order to determine whether the signal is truly justified. It should also be noted that signal warrants do not necessarily correlate with LOS. An intersection may satisfy a signal warrant condition and operate at or above acceptable LOS or operate below acceptable LOS and not meet a signal warrant.

2.4 FREEWAY RAMP QUEUING ANALYSIS

Consistent with Caltrans requirements, the freeway ramp queuing has been assessed to determine potential queuing impacts at the freeway off-ramp intersections on S. Wilmington Avenue at the I-405 Freeway. Specifically, the off-ramp queuing analysis is utilized to identify any potential queuing and "spill back" onto the I-405 Freeway mainline from the off-ramps.

The traffic progression analysis tool and HCM intersection analysis program, Synchro, has been used to assess the potential impacts/needs of the intersections with traffic added from the proposed Project. Storage (turn-pocket) length recommendations at the ramps have been based upon the 95th percentile queue resulting from the Synchro progression analysis. The 95th percentile queue is the maximum back of queue with 95th percentile traffic volumes. The queue length reported is for the lane with the highest queue in the lane group.

There are two footnotes which appear on the Synchro outputs. One footnote indicates if the 95th percentile cycle exceeds capacity. Traffic is simulated for two complete cycles of the 95th percentile traffic in Synchro in order to account for the effects of spillover between cycles. In practice, the 95th percentile queue shown will rarely be exceeded and the queues shown with the footnote are acceptable for the design of storage bays. The other footnote indicates whether or not the volume for the 95th percentile queue is metered by an upstream signal. In many cases, the 95th percentile queue will not be experienced and may potentially be less than the 50th percentile queue due to upstream metering. If the upstream intersection is at or near capacity, the 50th percentile queue represents the maximum queue experienced.

A vehicle is considered queued whenever it is traveling at less than 10 feet/second. A vehicle will only become queued when it is either at the stop bar or behind another queued vehicle. Although only the 95th percentile queue has been reported in the tables, the 50th percentile queue can be found in the appendix alongside the 95th percentile queue for each ramp location. The 50th percentile maximum queue is the maximum back of queue on a typical cycle during the peak hour, while the 95th percentile queue is the maximum back of queue with 95th percentile traffic volumes during the peak hour. In other words, if traffic were observed for 100 cycles, the 95th percentile queue would be the queue experienced with the 95th busiest cycle (or 5% of the time). The 50th percentile or average queue represents the typical queue length for peak hour traffic conditions, while the 95th percentile queue is derived from the average queue plus 1.65 standard deviations. The 95th percentile queue is not necessarily ever observed; it is simply based on statistical calculations.

2.5 LOS CRITERIA

The definition of an intersection deficiency has been obtained from each of the applicable surrounding jurisdictions.

2.5.1 City of Carson

The City of Carson General Plan requires that LOS D or better be maintained on Arterial Streets with certain exceptions. As such, intersections operating at LOS E or F will be considered deficient.

2.5.2 LA County CMP

The CMP definition of deficiency is based on maintaining a level of service standard of LOS E or better. There are no CMP facilities identified by MTA in their 2010 CMP within the study area. [1]

2.5.3 Caltrans

Caltrans endeavors to maintain a target LOS at the transition between LOS C and LOS D on State Highway System (SHS) facilities, however, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. If an existing State highway facility is operating at less than this target LOS, the existing LOS should be maintained. In general, the region-wide goal for an acceptable LOS on all freeways, roadway segments, and intersections is LOS D. Consistent with the City of Carson, LOS threshold of LOS D and in excess of the LA County CMP stated LOS threshold of LOS E, LOS D will be used as the target LOS for freeway ramps.

2.6 Thresholds of Significance

2.6.1 Intersections

To determine whether the addition of Project traffic at a study intersection results in a significant impact, the following thresholds of significance consistent with LA County CMP will be utilized:

- A significant impact occurs at a signalized intersection if the addition of Project trips causes the peak hour LOS to fall from an acceptable LOS to an unacceptable LOS and the proposed Project increases the demand (volume to capacity or V/C) by 0.02.
- A significant impact occurs at a signalized intersection if the addition of Project trips to an intersection that is currently operating at an unacceptable LOS (i.e., LOS E or F) causes the V/C to increase by 0.02 or more.
- A significant impact occurs at an unsignalized intersection if the addition of project trips causes the peak hour LOS to fall from acceptable LOS to an unacceptable LOS.

2.6.2 Caltrans Facilities

To determine whether the addition of project traffic to the SHS freeway segments would result in a deficiency, the following will be utilized:

- The traffic study finds that the LOS of a segment will degrade from LOS D or better to E or F.
- The traffic study finds that the project will exacerbate an already deficient condition by contributing 50 or more peak hour trips. A segment that is operating at or near capacity is deemed to be deficient.

2.7 SB 743 REQUIREMENTS

Impacts associated with vehicle miles traveled (VMT) to address SB 743 requirements have not been evaluated as part of this traffic study. It is anticipated that this Project would be well underway in the environmental process prior to early 2017, and would likely not be affected by SB 743. The Project traffic consultant is aware that the specific requirements and traffic impact analysis guidelines for SB 743 have not yet been prepared. Once those guidelines have been prepared and are finalized, the Project traffic consultant would review them to determine what analysis, if any, needs to be prepared.

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3 AREA CONDITIONS

This section provides a summary of the existing circulation network, the City of Carson General Plan Circulation Network, and a review of existing peak hour intersection operations and traffic signal warrants.

3.1 EXISTING CIRCULATION NETWORK

The study area includes a total of 6 existing and future intersections as shown previously on Exhibit 1-2. Exhibit 3-1 illustrates the study area intersections located near the proposed Project and identifies the number of through traffic lanes for existing roadways and intersection traffic controls.

3.2 CITY OF CARSON GENERAL PLAN TRANSPORTATION AND INFRASTRUCTURE ELEMENT

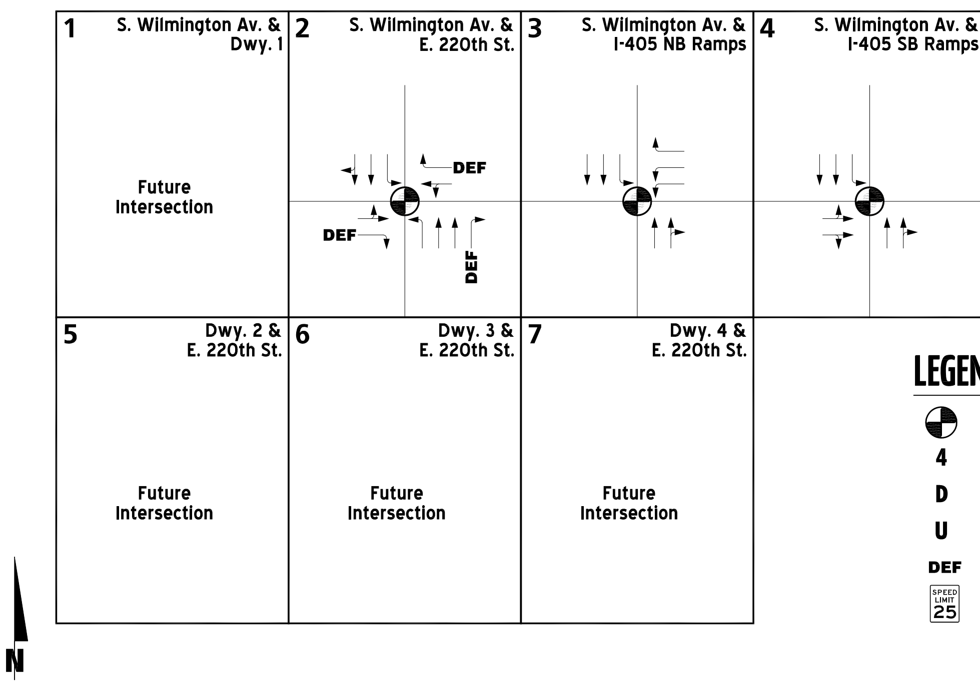
As previously noted, the Project site is located within the City of Carson. Exhibit 3-2 shows the City of Carson General Plan Transportation and Infrastructure Element, and Exhibit 3-3 illustrates the City of Carson General Plan roadway cross-sections. [8]

The roadway classifications and planned (ultimate) roadway cross-sections of the major roadways within the study area, as identified on the City of Carson General Plan Transportation and Infrastructure Element, are described subsequently.

S. Wilmington Avenue: S. Wilmington Avenue is designated as a Major Highway in the City of Carson General Plan. Major highways function to connect traffic from collectors to the major freeway systems as well as to provide access to adjacent land uses. They move large volumes of automobiles, trucks and buses, and link principal elements within the City to other adjacent regions. These facilities typically handle inter-city vehicular trips in the magnitude of 25,000 or more vehicles per day. Typically, curb parking is prohibited during peak periods. Raised medians to separate opposing flows are typical and access control, (i.e., driveways and minor intersecting streets) is often minimized. Separate left-turn lanes at major signalized intersections are required with double left-turn lanes often provided. Separate right-turn lanes, which may also serve as bus loading areas, are provided at locations where warranted by high turn volumes. Major highways in Carson require rights-of-way of 100 feet or more.

E. 220th Street: E. 220th Street is designated as a Local Street in the City of Carson General Plan. Local streets provide vehicular, pedestrian, and bicycle access to property abutting the public right-of-way. In commercial and industrial areas, a minimum pavement width of 40 feet is necessary. In industrial areas, consideration of the predominant type of trucking, and whether or not maneuvering of trailers must be provided, may require a pavement width of 44 feet or more. Local streets can be expected to carry less than 1,500 vehicles per day. All other streets in Carson not otherwise classified are local streets.

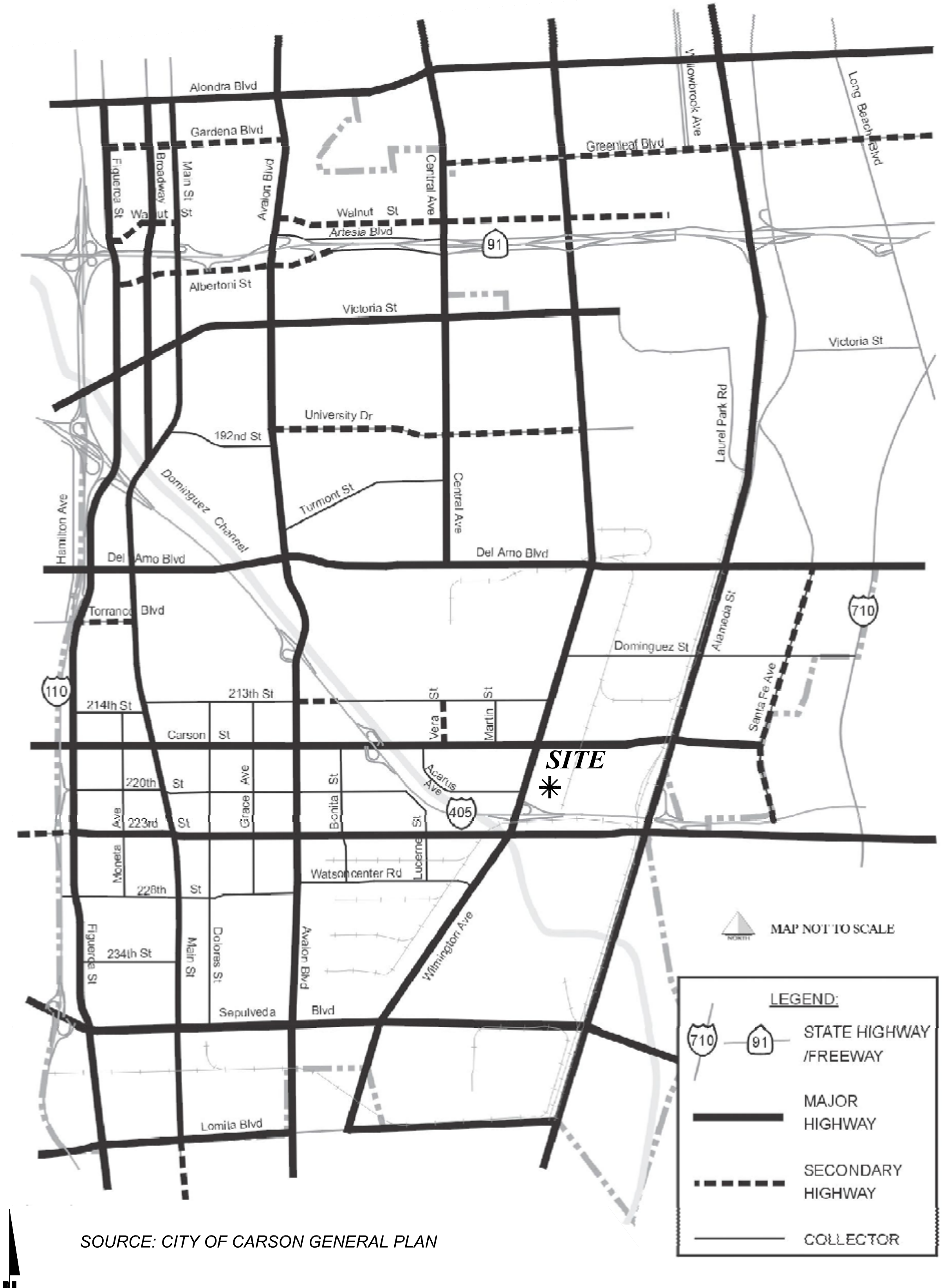
EXHIBIT 3-1: EXISTING NUMBER OF THROUGH LANES AND INTERSECTION CONTROLS



LEGEND:

- = TRAFFIC SIGNAL
- 4 = NUMBER OF LANES
- D = DIVIDED
- U = UNDIVIDED
- DEF = DEFACTO RIGHT TURN
- SPEED LIMIT 25 = SPEED LIMIT (MPH)

EXHIBIT 3-2: CITY OF CARSON PLAN OF STREETS AND HIGHWAYS



SOURCE: CITY OF CARSON GENERAL PLAN

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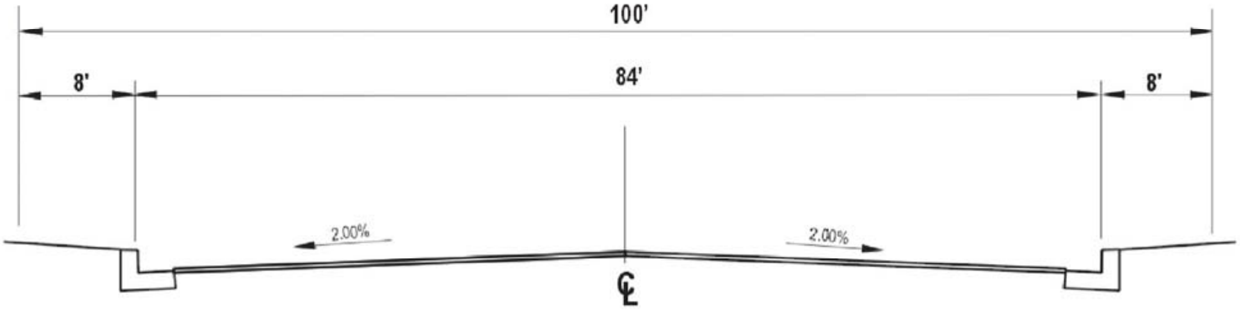
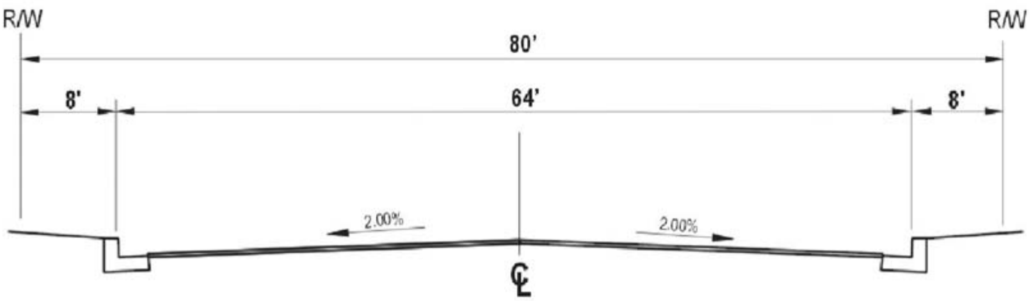
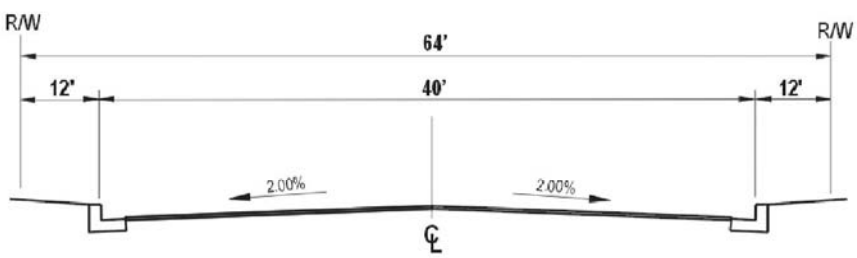
EXHIBIT 3-3: CITY OF CARSON STREET CROSS-SECTIONS



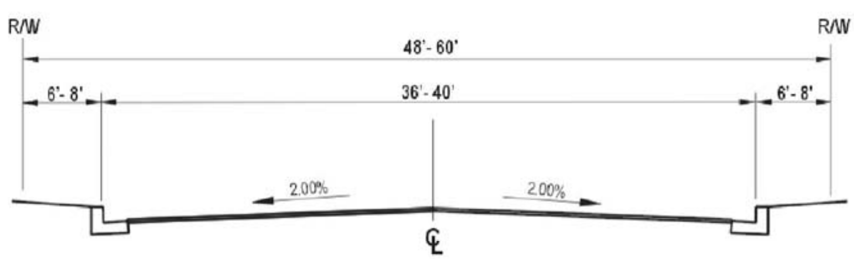
MAJOR HIGHWAY



SECONDARY HIGHWAY



COLLECTOR STREET



LOCAL STREET

SOURCE: CITY OF CARSON GENERAL PLAN

3.3 TRUCK ROUTES

The City of Carson designated truck route map is shown on Exhibit 3-4. S. Wilmington Avenue is identified as a designated City of Carson truck route. The designated truck route map has been utilized to route truck traffic from both the proposed Project and future cumulative development projects throughout the study area.

3.4 TRANSIT SERVICE

The study area is currently served by the Carson Circuit, Torrance Transit, and the Los Angeles County MTA bus lines. The existing transit routes serving the City of Carson is shown on Exhibit 3-5.

3.5 BICYCLE & PEDESTRIAN FACILITIES

Class II bikeways, also referred to as "bike lanes," are intended to delineate the right-of-way assigned to bicyclists and motorists, and to provide for more predictable movements of each. Bike lane signs and pavement marking help define the bikeway. A more important reason for bike lanes is to better accommodate bicyclists through corridors where insufficient room exists for safe bicycling on existing streets. There are no existing bike lanes in the study area. As shown on Exhibit 3-6, there are no existing bikeways within the vicinity of the proposed Project. However, future proposed bikeways indicate planned Class II bikeways along S. Wilmington Avenue within the study area (see Exhibit 3-7).

Field observations conducted in April 2016 and indicate nominal pedestrian and bicycle activity within the study area. Existing pedestrian facilities (sidewalk and crosswalk) and bus stop locations within the study area are shown on Exhibit 3-8.

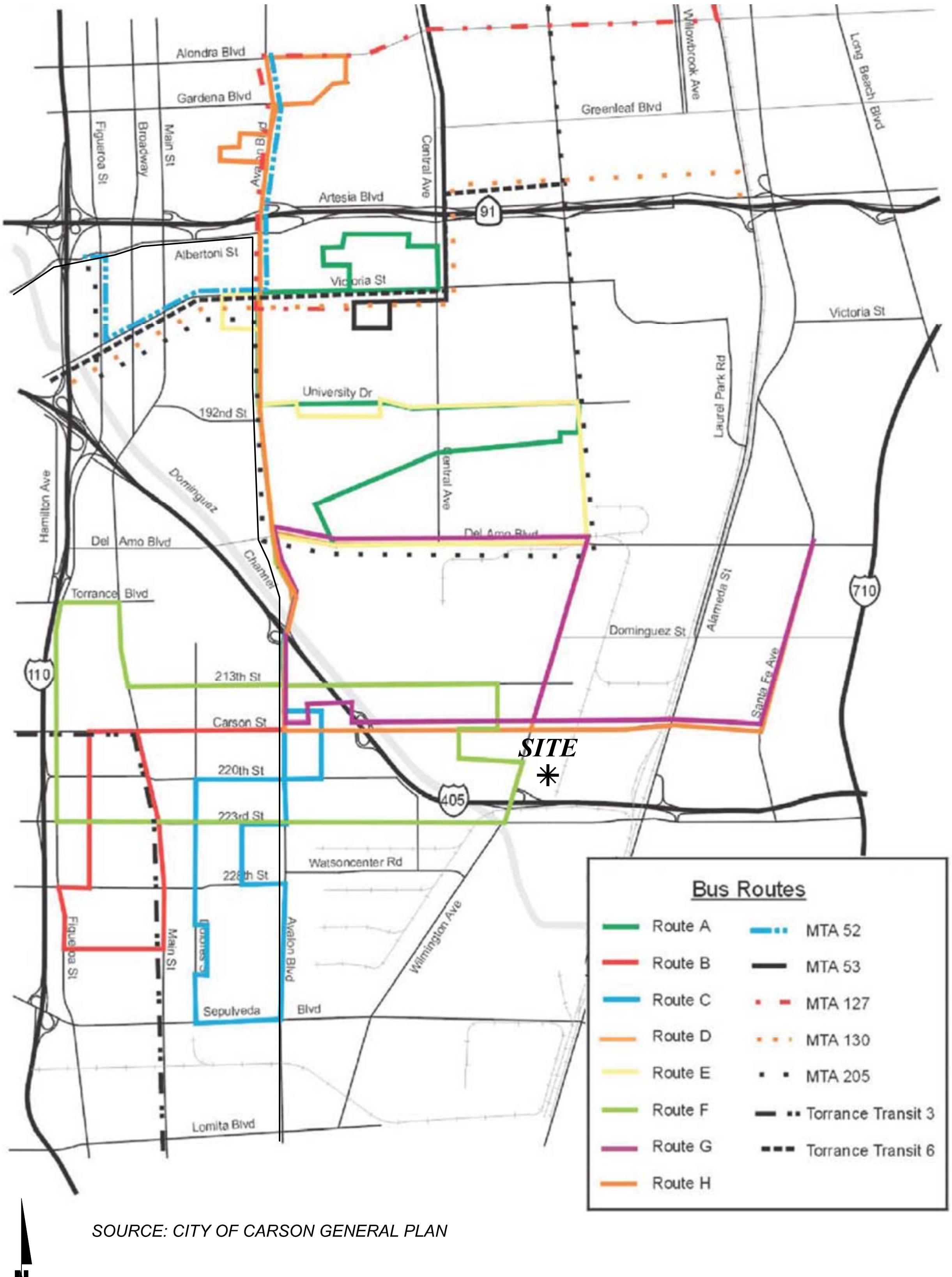
3.6 EXISTING TRAFFIC COUNTS

Manual weekday AM and PM peak hour turning movement counts were conducted in April 2016, while area schools were in session. The raw manual peak hour turning movement traffic count data sheets are included in Appendix 3.1. The traffic counts collected in April 2016 include the vehicle classifications as shown below:

- Passenger Cars
- 2-Axle Trucks
- 3-Axle Trucks
- 4 or More Axle Trucks

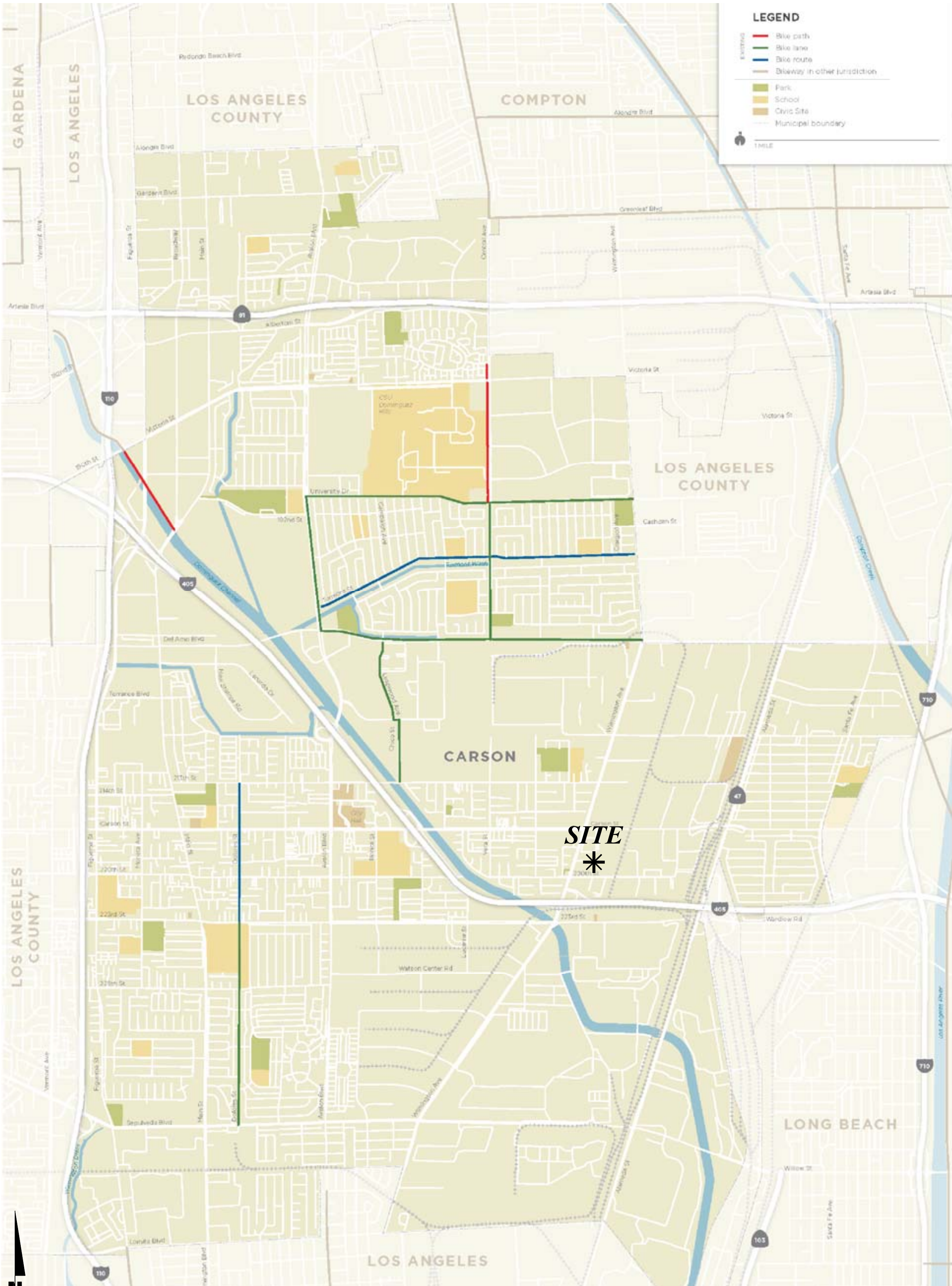
EXHIBIT 3-4: EXISTING TRUCK ROUTES

EXHIBIT 3-5: EXISTING TRANSIT



SOURCE: CITY OF CARSON GENERAL PLAN

EXHIBIT 3-6: EXISTING BIKEWAYS



SOURCE: CITY OF CARSON MASTER PLAN OF BIKEWAYS

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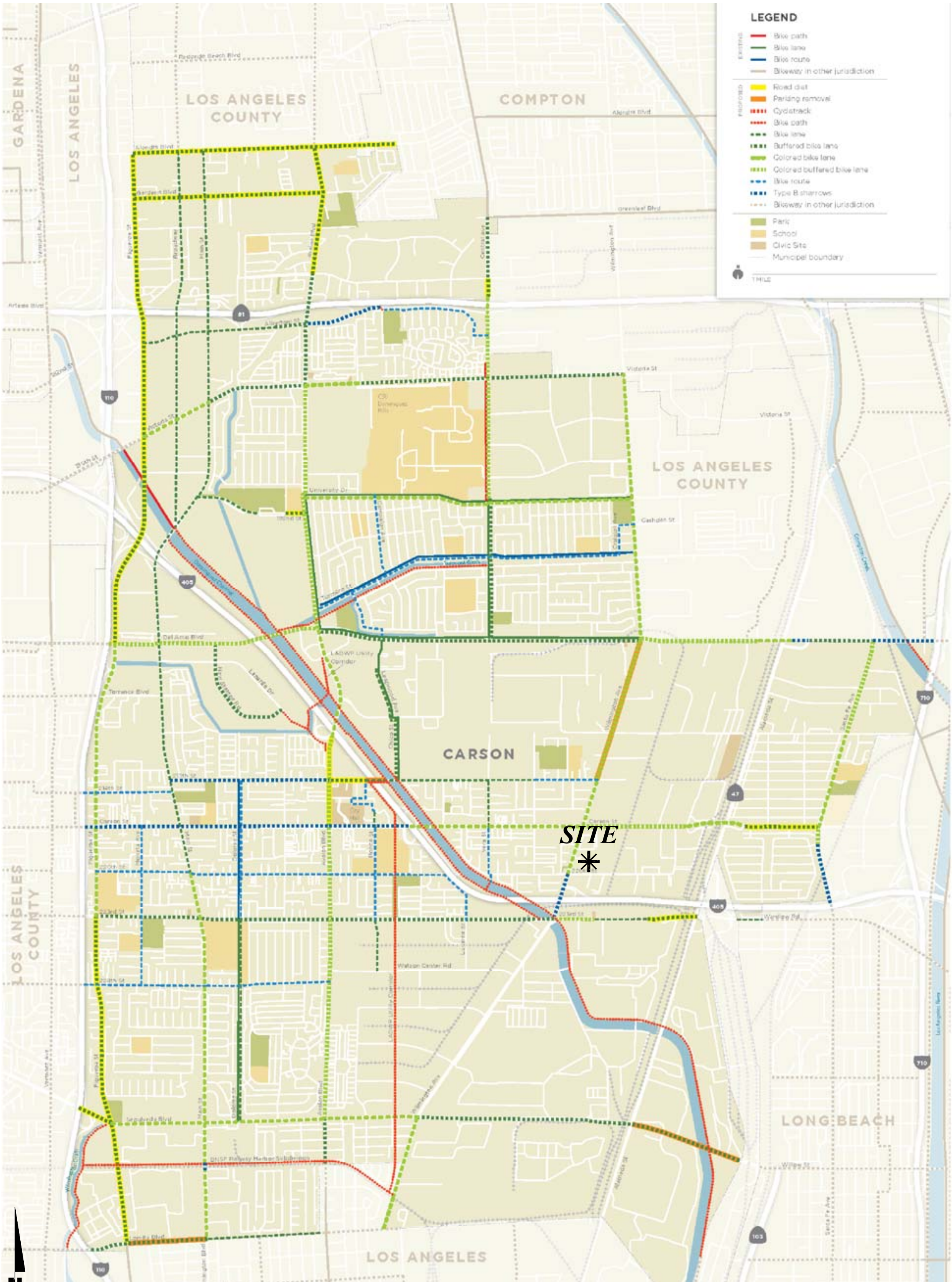
EXHIBIT 3-7: PROPOSED BIKEWAYS



SOURCE: CITY OF CARSON MASTER PLAN OF BIKEWAYS

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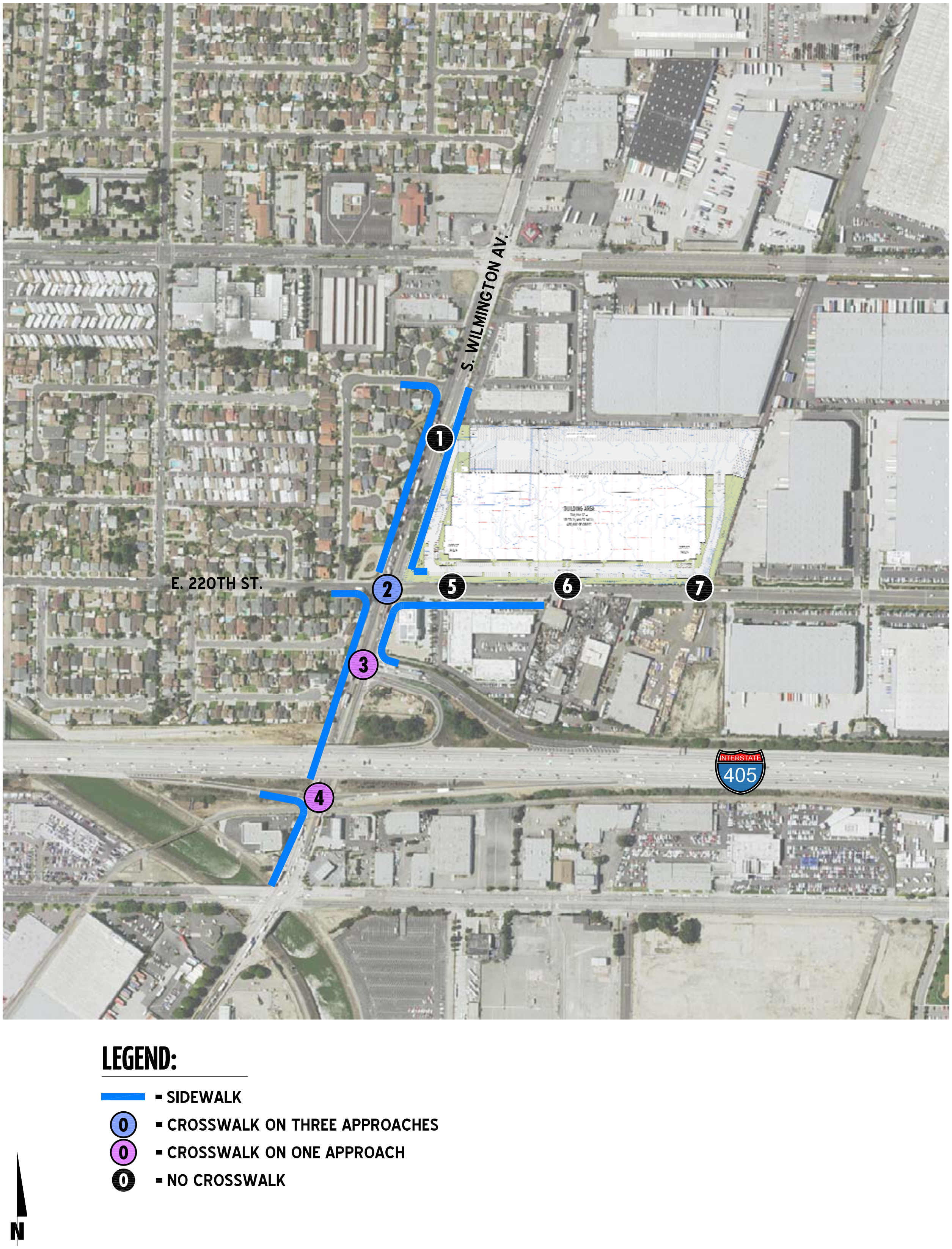
EXHIBIT 3-8: EXISTING PEDESTRIAN FACILITIES



To represent the impact large trucks, buses and recreational vehicles have on traffic flow; all trucks were converted into PCEs. By their size alone, these vehicles occupy the same space as two or more passenger cars. In addition, the time it takes for them to accelerate and slow-down is also much longer than for passenger cars, and varies depending on the type of vehicle and number of axles. For the purpose of this analysis, a PCE factor of 1.5 has been applied to 2-axle trucks, 2.0 for 3-axle trucks and 3.0 for 4+-axle trucks to estimate each turning movement. It should be noted that LA County and the Southern California Association of Governments (SCAG) do not have readily available PCE factor recommendations. As such, the PCE factors used are based on recommendations from San Bernardino Association of Governments (SANBAG) which is consistent with standard engineering practice throughout the Southern California region. Further use of the SANBAG PCE factors was reviewed and approved by the City of Carson staff during the traffic study scoping process and is appropriate based on Urban Crossroads' professional engineering judgment.

Existing ADT volumes on arterial highways throughout the study area are shown on Exhibit 3-9. Existing ADT volumes are based upon factored intersection peak hour counts collected by Urban Crossroads, Inc. using the following formula for each intersection leg:

Weekday PM Peak Hour (Approach Volume + Exit Volume) x 13.6802 = Leg Volume

A comparison of the PM peak hour and daily traffic volumes of various roadway segments within the study area indicated that the peak-to-daily relationship is approximately 7.31 percent. As such, the above equation utilizing a factor of 13.6802 estimates the ADT volumes on the study area roadway segments assuming a peak-to-daily relationship of approximately 7.31 percent (i.e., 1/0.0731 = 13.6802) and was assumed to sufficiently estimate ADT volumes for planning-level analyses.

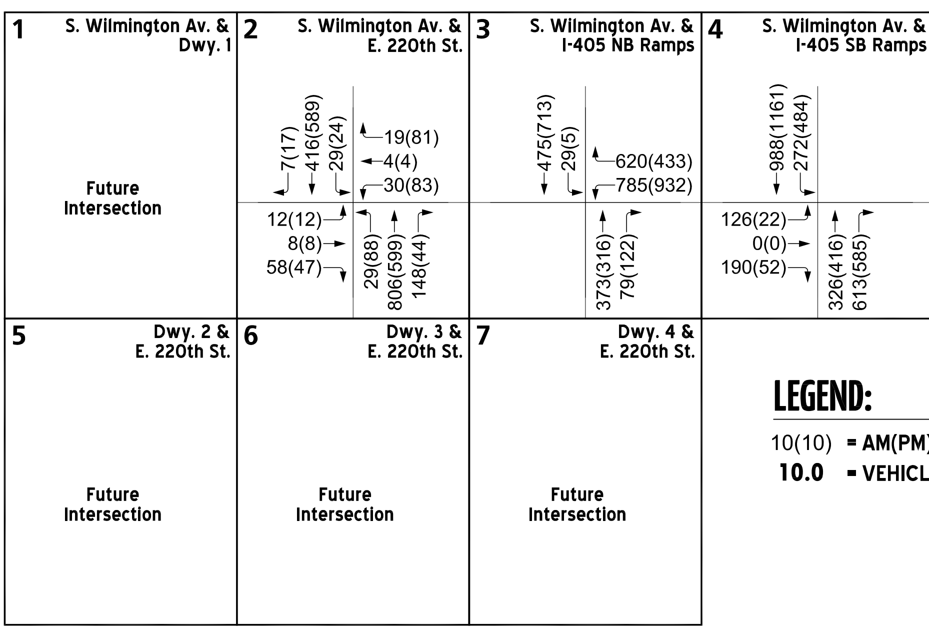
Existing AM and PM peak hour intersection volumes are also shown on Exhibit 3-9. All of the intersections turning movement volumes illustrated on the exhibits and used in the traffic analysis are shown in terms of PCE.

3.7 Existing Conditions Intersection Operations Analysis

Existing peak hour traffic operations have been evaluated for the study area intersections based on the analysis methodologies presented in Section 2.2 *Intersection Capacity Analysis* of this report. The intersection operations analysis results are summarized in Table 3-1 which indicates that all of the existing study area intersections are currently operating at acceptable LOS during the peak hours, based on each applicable jurisdiction's LOS criteria.

Consistent with Table 3-1, a summary of the peak hour intersection LOS for Existing conditions are shown on Exhibit 3-10. The intersection operations analysis worksheets are included in Appendix 3.2 of this TIA.

EXHIBIT 3-9: EXISTING (2016) TRAFFIC VOLUMES (IN PCE)



LEGEND:

10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES

10.0 = VEHICLES PER DAY (1000'S)

N

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URBAN CROSSROADS

EXHIBIT 3-10: EXISTING (2016) SUMMARY OF LOS

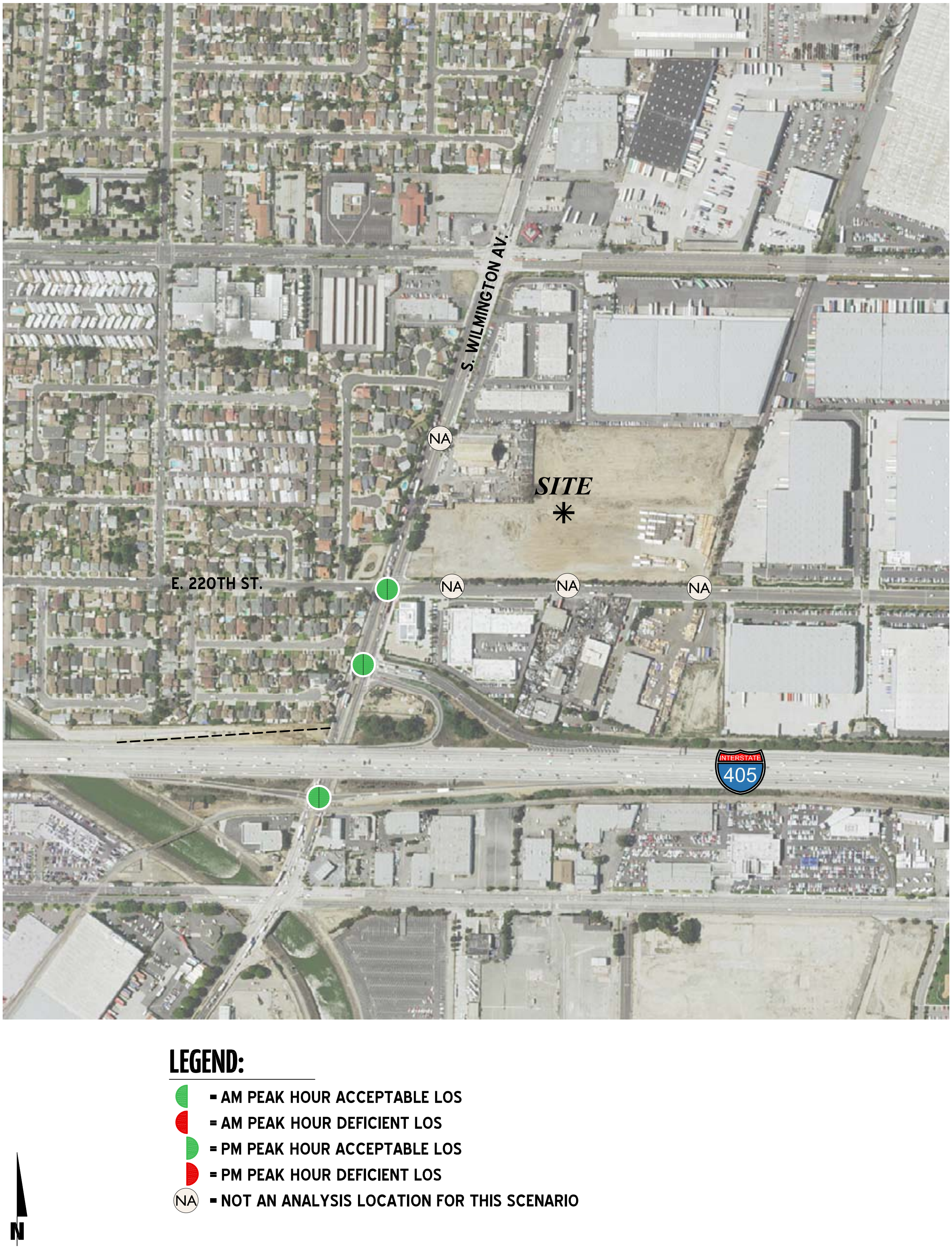


Table 3-1

Intersection Analysis for Existing (2016) Conditions

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1] Northbound L	T	R	Southbound L	T	R	Eastbound L	T	R	Westbound L	T	R	ICU (v/c) or Delay (secs.)[2] AM	PM	Level of Service AM	PM
1	S. Wilmington Av. / Dwy. 1		Future Intersection															
2	S. Wilmington Av. / E. 220th St.	TS	1	2	d	1	2	0	0	1	d	0	1	d	0.576	0.549	B	A
3	S. Wilmington Av. / I-405 NB Ramps[4]	TS	0	2	0	1	2	0	0	0	0	2	0	1	43.7	38.9	D	D
4	S. Wilmington Av. / I-405 SB Ramps[4]	TS	0	2	0	1	2	0	0	2	0	0	0	0	38.6	42.5	D	D
5	Dwy. 2 / E. 220th St.		Future Intersection															
6	Dwy. 3 / E. 220th St.		Future Intersection															
7	Dwy. 4 / E. 220th St.		Future Intersection															

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; d = Defacto Right Turn Lane

[2] ICU reported as a volume-to-capacity ratio and HCM delay reported in seconds. LOS calculated using Synchro (Version 9.0).
Per the 2010 Highway Capacity Manual (HCM), overall average intersection delay and level of service are shown for intersections with a traffic signal.
For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown. LOS calculated using Synchro (Version 9.0).

[3] TS = Traffic Signal

[4] Although the peak hour intersection operations analysis indicates acceptable peak hour operations, field observations indicate significant queuing, particularly in the southbound direction during the PM peak hours. The queuing issues are likely due to the on-going construction and intermittent closures related to the Wilmington/I-405 Interchange Project. It is our understanding that the project is anticipated to be completed by the end of 2016 and would include additional lanes along Wilmington Avenue through the interchange, a new I-405 Northbound on-ramp for the southbound approach, and signal coordination along Wilmington Avenue between E. 220th Street and E. 223rd Street.

It is important to recognize that the intersection operations analysis reflects the existing constrained traffic count conditions. These constraints in the form of vehicle queues at closely spaced intersections significantly limit the number of vehicles that can physically be accommodated during peak hour conditions. While the traffic counts identify all the vehicles using an intersection during peak hours, they may not fully account for the unconstrained demand at a particular location (e.g., vehicles unable to enter an intersection due to queuing). Intersections along S. Wilmington Avenue south of E. 220th Street, through the interchange area, currently are experiencing vehicle delays that are not reflected in the intersection LOS analysis due to the constrained conditions. As such, based on the constrained traffic count data the intersections appear to operate at acceptable LOS or at LOS better than field observations would suggest. Field observations show that the I-405 Freeway ramps on S. Wilmington Avenue are currently experiencing peak hour queues that periodically affect intersection operations, particularly during the PM peak hours in the southbound direction. These queuing issues may potentially be due to on-going construction activity. However, the existing queuing issues are anticipated to be improved once the interchange improvement project is completed and additional capacity is provided along S. Wilmington Avenue.

3.8 EXISTING CONDITIONS FREEWAY OFF-RAMP QUEUING ANALYSIS

An off-ramp queuing analysis was also performed for Northbound and Southbound off-ramps at I-405 Freeway and S. Wilmington Avenue interchanges to assess vehicle queues for the off ramps that may potentially impact peak hour operations at the ramp-to-arterial intersections and may potentially "spill back" onto the I-405 Freeway mainline. Off-ramp queuing analysis findings are presented in Table 3-2. As shown on Table 3-2, there are no queuing issues on the freeway off- ramps during the peak hours.

Worksheets for Existing conditions queuing analysis are provided in Appendix 3.3.

Table 3-2

Peak Hour Freeway Off-Ramp Queuing Summary for Existing (2016) Conditions

Intersection	Movement	Available Stacking Distance (Feet)	95th Percentile Queue (Feet)[2]		Acceptable?[1]	
			AM Peak Hour	PM Peak Hour	AM	PM
S. Wilmington Av. / I-405 NB Ramps	WBL	1,450	350 [2]	453 [2]	Yes	Yes
	WBR	400	182	76	Yes	Yes
S. Wilmington Av. / I-405 SB Ramps	EBL/T	70	0	0	Yes	Yes
	EBT/R	940	100	23	Yes	Yes

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 15 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.

[2] Maximum queue length for the approach reported.

4 PROJECTED FUTURE TRAFFIC

This section presents the traffic volumes estimated to be generated by the Project, as well as the Project's trip assignment onto the study area roadway network.

It is our understanding that the Project is to consist of a single high-cube warehouse/distribution center building of approximately 420,000 square feet. For the purposes of this analysis, it is assumed that the Project will be developed in a single phase with an Opening Year of 2018.

The Project is proposed to access S. Wilmington Avenue via one stop-controlled driveway: Driveway 1 (westerly driveway) would provide right-in/right-out access to and from the site for trucks only. The Project is proposed to access E. 220th St. via three stop-controlled driveways: Driveway 2 (southwesterly driveway) would provide access to and from the site for passenger cars only and would allow for full vehicle turning movements, Driveway 3 (middle southerly driveway) would provide access to and from the site for passenger cars only and would allow for full vehicle turning movements, and Driveway 4 (southeasterly driveway) would provide right-in/right-out access to and from the site for trucks only. Regional access to the Project site will be primarily provided by the I-405 Freeway via S. Wilmington Avenue.

4.1 PROJECT TRIP GENERATION

Trip generation represents the amount of traffic that is attracted and produced by a development, and is based upon the specific land uses planned for a given project. Trip generation rates and summary for the Project are shown in Table 4-1 for PCE and Table 4-2 for actual vehicles. The trip generation rates used for this analysis are based upon information collected by the Institute of Transportation Engineers (ITE) as provided in their *Trip Generation* manual, 9th Edition, 2012. [3]

ITE land use code 152 (High-Cube Warehousing) has been used to derive site specific trip generation estimates for the Proposed Project. Total vehicle mix percentages were also obtained from the ITE *Trip Generation* manual in conjunction with the South Coast Air Quality Management District's (SCAQMD) recommended truck mix, by axle type. The SCAQMD is currently recommending the use of the ITE *Trip Generation* manual in conjunction with their truck mix by axle-type to better quantify trip rates associated with local warehouse and distribution projects, as truck emission represent more than 90 percent of air quality impacts from these projects. This recommended procedure has been utilized for the purposes of this analysis in effort to be consistent with other technical studies being prepared for the Project (e.g., air quality analysis). The percentage of trucks has been determined from the table shown on page 267 of the ITE *Trip Generation* manual. As shown on page 267, the truck trip generation rate for weekday daily traffic is 0.64 or 38.1% of the total traffic. Similarly, the truck trip generation rate for the weekday AM peak hour is 0.03 (27.3% of the total traffic) and 0.04 (or 33.3% of the total traffic) for the weekday PM peak hour. Trip generation for heavy trucks was further broken down by truck type (or axle type). The total truck percentage is comprised of 3 different truck types: 2-axle, 3-axle, and 4+-axle trucks.

Table 4-1

Project Trip Generation Summary (In PCE)

Land Use	Units[2]	ITE LU Code	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Daily
Project Trip Generation Rates[1]									
High-Cube Warehouse[3,4]	TSF	152	0.076	0.034	0.110	0.037	0.083	0.120	1.680
Passenger Cars			0.055	0.025	0.080	0.025	0.055	0.080	1.040
2-Axle Trucks (PCE = 1.5)			0.007	0.003	0.010	0.004	0.009	0.013	0.211
3-Axle Trucks (PCE = 2.0)			0.007	0.003	0.011	0.004	0.010	0.014	0.226
4-Axle+ Trucks (PCE = 3.0)			0.037	0.017	0.054	0.022	0.050	0.072	1.158

Land Use	Quantity	Units[2]	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Daily
Passenger Car Equivalent (PCE) Trip Generation Summary									
High-Cube Warehouse	420.000	TSF							
Passenger Cars:			23	10	33	10	23	33	437
Truck Trips:									
2-axle:			3	1	4	2	4	6	89
3-axle:			3	1	4	2	4	6	95
4+-axle:			16	7	23	9	21	30	486
- Net Truck Trips (PCE)[2]			*22*	*9*	*31*	*13*	*29*	*42*	*670*
TOTAL NET TRIPS (PCE)[5]			***45***	***19***	***64***	***23***	***52***	***75***	***1,107***

[1] Trip Generation Source: Institute of Transportation Engineers (ITE), Trip Generation Manual, Ninth Edition (2012).

[2] TSF = Thousand Square Feet

[3] Vehicle Mix Source: Total truck percentage source from ITE Trip Generation manual. Truck mix (by axle type) source from SCAQMD.
AM peak hour = 72.7% passenger cars, 6.01% 2-Axle trucks, 4.83% 3-Axle trucks, 16.46% 4-Axle trucks
PM peak hour = 66.7% passenger cars, 7.33% 2-Axle trucks, 5.89% 3-Axle trucks, 20.08% 4-Axle trucks
ADT = 61.9% passenger cars, 8.38% 2-Axle trucks, 6.74% 3-Axle trucks, 22.98% 4-Axle trucks

[4] PCE rates are per SANBAG as PCE factors are not readily available. They are 1.5 for 2-axle trucks, 2.0 for 3-axle trucks, and 3.0 for 4+-axle trucks.

[5] TOTAL NET TRIPS (PCE) = Passenger Cars + Net Truck Trips (PCE).

Table 4-2

Project Trip Generation Summary (in Actual Vehicles)

Land Use	Units[2]	ITE LU Code	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Daily
Actual Vehicles Trip Generation Summary[1]									
High-Cube Warehouse[3]	TSF	152	0.076	0.034	0.110	0.037	0.083	0.120	1.680
Passenger Cars			0.055	0.025	0.080	0.025	0.055	0.080	1.040
2-Axle Trucks			0.005	0.002	0.007	0.003	0.006	0.009	0.141
3-Axle Trucks			0.004	0.002	0.005	0.002	0.005	0.007	0.113
4-Axle+ Trucks			0.012	0.006	0.018	0.007	0.017	0.024	0.386

Land Use	Quantity	Units[1]	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Daily
Actual Vehicles Trip Generation Summary									
High-Cube Warehouse	420.000	TSF							
Passenger Cars:			23	10	34	10	23	34	437
Truck Trips:									
2-axle:			2	1	3	1	3	4	59
3-axle:			2	1	2	1	2	3	48
4+-axle:			5	2	8	3	7	10	162
- Net Truck Trips (Actual Trucks)			*9*	*4*	*13*	*5*	*12*	*17*	*269*
TOTAL NET TRIPS (Actual Vehicles) [4]			***32***	***14***	***46***	***16***	***35***	***50***	***706***

[1] Trip Generation Source: Institute of Transportation Engineers (ITE), Trip Generation Manual, Ninth Edition (2012).

[2] TSF = Thousand Square Feet

[3] Vehicle Mix Source: Total truck percentage source from ITE Trip Generation manual. Truck mix (by axle type) source from SCAQMD.
AM peak hour = 72.7% passenger cars, 6.01% 2-Axle trucks, 4.83% 3-Axle trucks, 16.46% 4-Axle trucks
PM peak hour = 66.7% passenger cars, 7.33% 2-Axle trucks, 5.89% 3-Axle trucks, 20.08% 4-Axle trucks
ADT = 61.9% passenger cars, 8.38% 2-Axle trucks, 6.74% 3-Axle trucks, 22.98% 4-Axle trucks

[4] TOTAL NET TRIPS (Actual Vehicles) = Passenger Cars + Net Truck Trips (Actual Trucks).

For the purposes of this analysis, the percentage of trucks, by axle type, were obtained from the SCAQMD interim recommended truck mix. The SCAQMD has recently performed surveys of existing facilities and compiled the data to provide interim guidance on the mix of heavy trucks for these types of high-cube warehousing/distribution facilities. Based on this interim guidance from the SCAQMD, the following truck fleet mix was utilized for the purposes of estimating the truck trip generation for the site: 22.0% of the total trucks as 2-axle trucks, 17.7% of the total trucks as 3-axle trucks, and 60.3% of the total trucks as 4+-axle trucks.

PCE factors were also applied to the proposed Project consistent with the factors applied to the existing site trip generation. The Project is anticipated to generate a net total of approximately 1,107 PCE trip-ends per day with 64 PCE AM peak hour trips and 75 PCE PM peak hour trips.

The Project site is currently occupied by an existing building on S. Wilmington Avenue. However, in an effort to conduct a conservative analysis, no reductions have been taken for the trips being generated by the existing use.

4.2 PROJECT TRIP DISTRIBUTION

Trip distribution is the process of identifying the probable destinations, directions or traffic routes that will be utilized by Project traffic. The potential interaction between the planned land use and surrounding regional access routes are considered, to identify the route where the Project traffic would distribute. The Project trip distribution was developed based on anticipated travel patterns to and from the Project site. The existing roadway network and location of regional destinations such as the Port of Long Beach and the Port of Los Angeles have been reviewed to develop the Project trip distribution pattern.

Exhibit 4-1 illustrates the passenger car trip distribution patterns for the Project. Exhibit 4-2 illustrates the truck trip distribution patterns for the Project.

4.3 MODAL SPLIT

The traffic reducing potential of public transit, walking or bicycling have not been considered in this TIA, because they are likely to be minimal.

4.4 PROJECT TRIP ASSIGNMENT

The assignment of traffic from the Project area to the adjoining roadway system is based upon the Project trip generation, trip distribution, and the arterial highway and local street system improvements that would be in place by the time of initial occupancy of the Project. Based on the identified Project traffic generation and trip distribution patterns, Project ADT, AM and PM peak hour traffic volumes are shown on Exhibit 4-3.

EXHIBIT 4-1: PROJECT (PASSENGER CAR) TRIP DISTRIBUTION

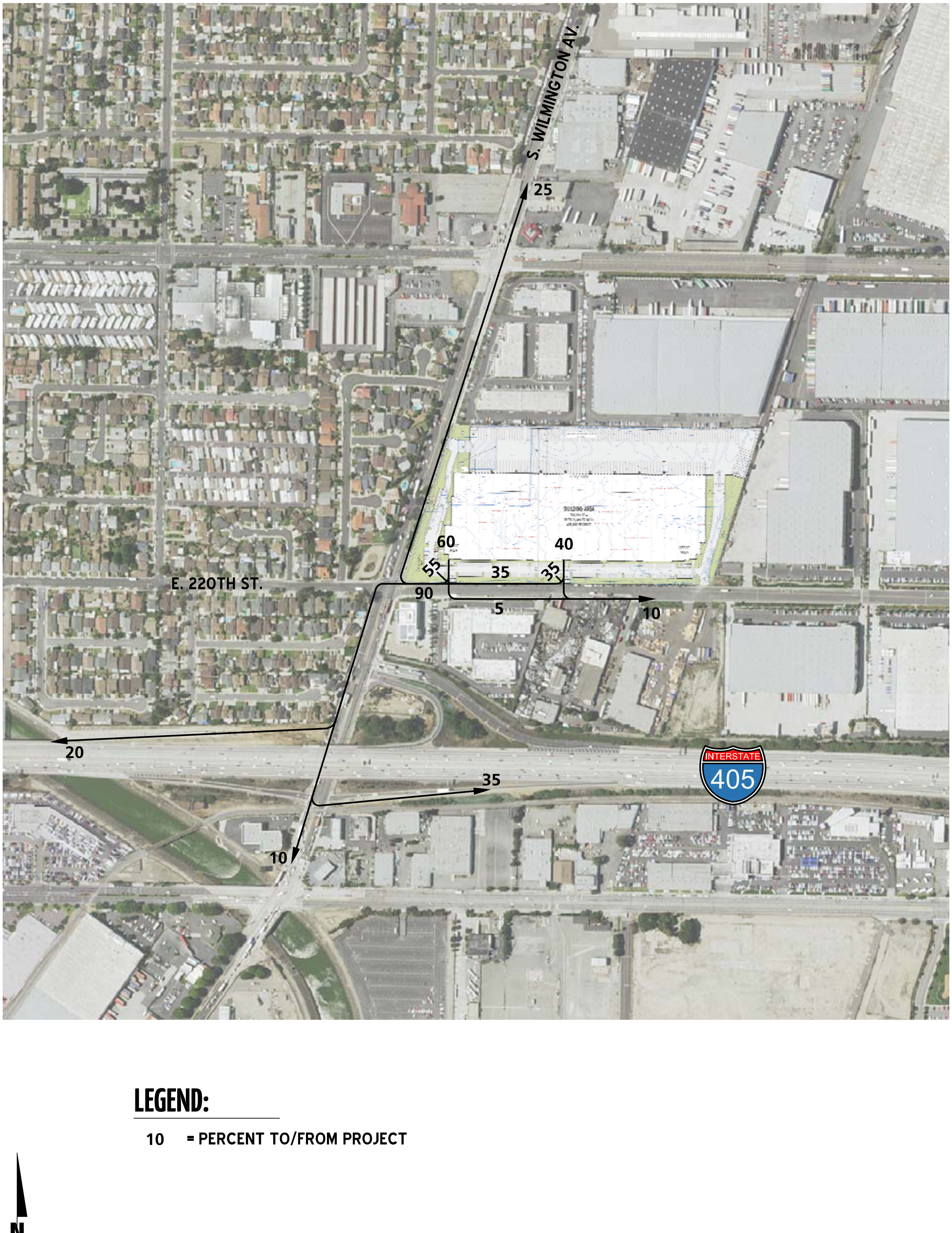
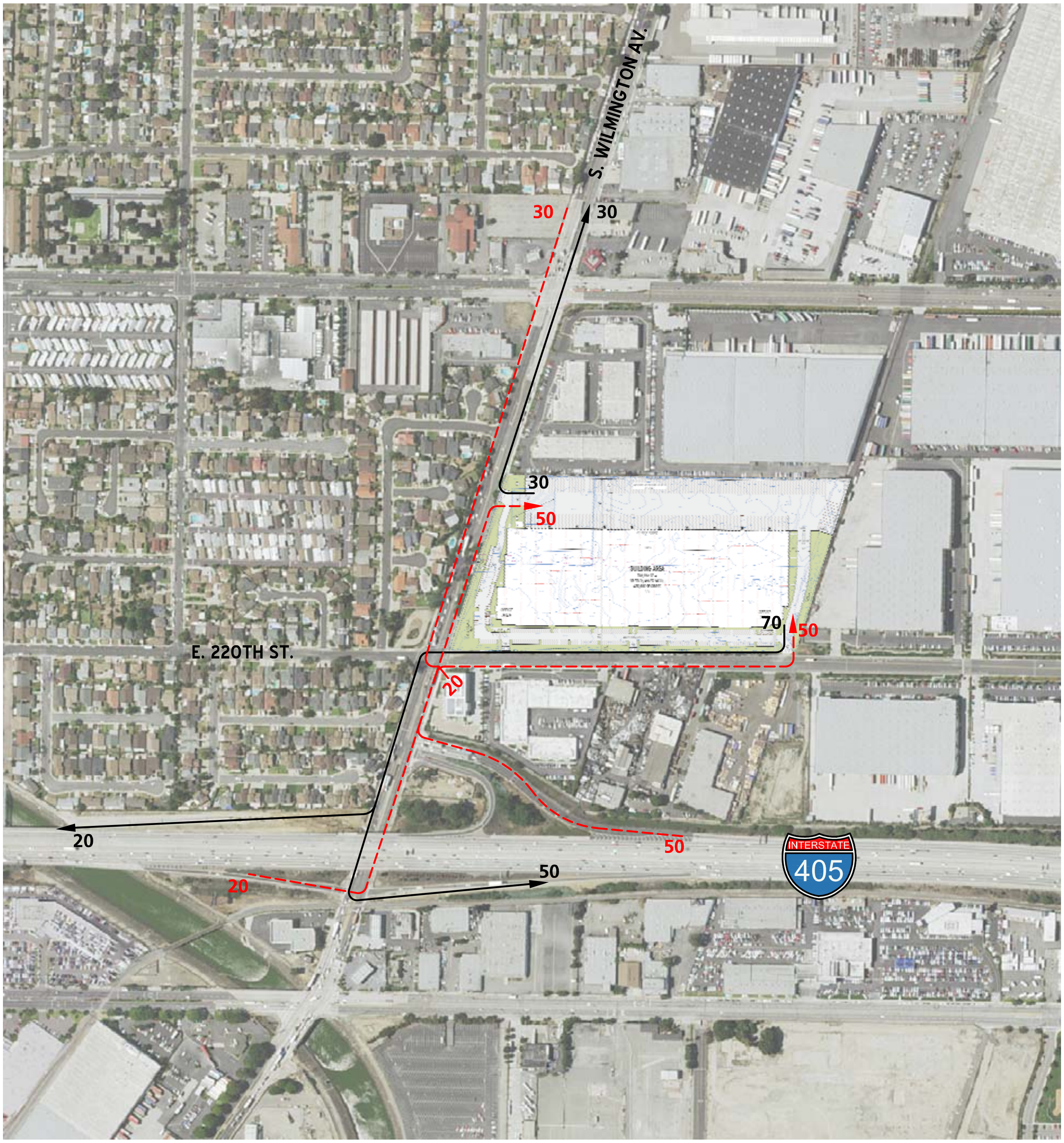


EXHIBIT 4-2: PROJECT (TRUCKS) TRIP DISTRIBUTION



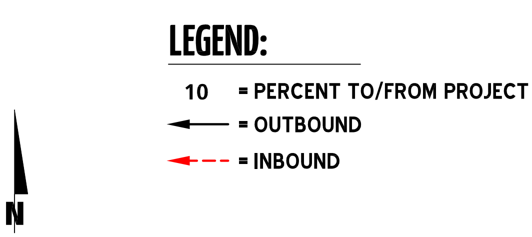
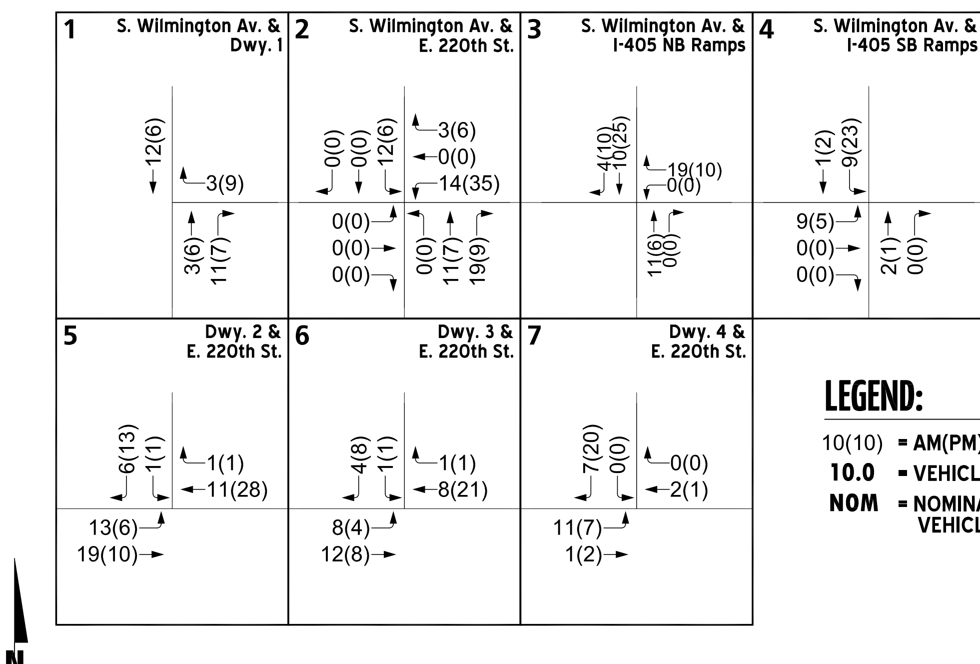


EXHIBIT 4-3: PROJECT ONLY TRAFFIC VOLUMES (IN PCE)



LEGEND:

10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES
10.0 = VEHICLES PER DAY (1000'S)
NOM = NOMINAL, LESS THAN 50 VEHICLES PER DAY

4.5 CONSTRUCTION TRAFFIC

Traffic operations during the proposed construction phase of the project may potentially result in traffic deficiencies related to construction employees, export of materials, and import of construction materials, etc. It is anticipated that the following construction-related activities would generate traffic and may potentially result in construction-related traffic deficiencies:

- Employee trips
- Import of construction materials
- Use of heavy equipment

Each of the traffic generating activities listed above is discussed thoroughly in the subsequent sections. It has been assumed that construction activity will occur during the hours of 7:00 AM and 8:00 PM from Monday to Saturday, consistent with the City's Municipal Code.

The Applicant would be required to develop and implement a City-approved Construction Traffic Management Plan addressing potential construction-related traffic detours and disruptions. The Construction Traffic Management Plan would ensure that to the extent practical, construction traffic would access the Project site during off-peak hours; and that construction traffic would be routed to avoid travel through, or proximate to, sensitive land uses.

4.5.1 EMPLOYEE TRIPS

Employee trips are estimated based on the number of employees anticipated to be on-site throughout the various stages of construction. Each employee is assumed to drive to and from the construction site each day. It has been assumed that employees will arrive up to 30 minutes prior to the workday and will leave up to 30 minutes after the workday ends. Initially, parking for employees and non-employee vehicles can be accommodated on-site near the construction staging area. Once the internal roadway network is constructed, employee parking can be accommodated on-site.

It is anticipated that the majority of employees would arrive and depart from the site outside of the peak commute traffic periods (i.e., 7:00 AM – 9:00 AM and 4:00 PM – 6:00 PM) with a period of overlap. Employee trips are based on the number of employees estimated to be on site during different points throughout the project. The potential impacts resulting from construction-related parking and employee trips are considered less-than-significant.

4.5.2 EXPORT OF DEMOLITION MATERIALS

Construction materials will be moved to and from the site. Import of construction materials is anticipated to consist of the importation of raw building materials, building pad, concrete, parking lot base, asphalt, fill, concrete masonry unit, pipes, landscaping, road base, building equipment, steel, roofing, etc.

In order to minimize the impact of construction truck traffic to the surrounding roadway network, it is recommended that trucks utilize the most direct route between the site and the I-405 Freeway via S. Wilmington Avenue. It is recommended that a construction traffic management plan be implemented for the duration of the construction phase. As these measures will be imposed and the haul trips generated during the construction phase are anticipated to be less than 50 peak hour trips, it can be assumed that truck traffic impacts associated with the export of demolition material could be considered less-than-significant. The City of Carson allows hauling between the hours of 7:00 AM and 8:00 PM. S. Wilmington Avenue. is an existing truck route within the City.

4.5.3 HEAVY EQUIPMENT

Heavy equipment to be utilized on-site during construction includes, but is not limited to: flat beds, dozers, scrapers, graders, track hoes, dump trucks, forklifts, cranes, cement trucks, pavers, rollers, water trucks, rolling container trucks and bobcats. Heavy equipment will be delivered and removed from the site throughout the construction phase. As most heavy equipment is typically not an authorized vehicle to be driven on a public roadway, most of the equipment will be delivered and removed from the site via large flatbed trucks. It is anticipated that delivery of heavy equipment would not occur on a daily basis, but rather periodically throughout the construction phase based on need.

The delivery and removal of heavy equipment is recommended to occur outside of the morning and evening peak hours in order to have nominal impacts to traffic and circulation near the vicinity of the Project. As this measure will be applied, it is anticipated that traffic impacts associated with the delivery and removal of heavy equipment are less-than-significant.

4.6 BACKGROUND TRAFFIC

The Opening Year Cumulative conditions analysis determines the Project's contribution to near-term cumulative traffic impacts based on a comparison of the "With Project" traffic scenario to the "Without Project" traffic scenario. To account for background traffic growth, traffic associated with other known cumulative development projects in conjunction with an ambient growth from Existing (2016) conditions of 4.04% (2% per year, compounded over 2 years) is included for Opening Year Cumulative traffic conditions, as well as traffic generated by cumulative projects that could affect the study area intersections.

The generalized growth factors provided in 2010 LA County CMP [1] indicate a growth factor of 1.051 for ten years (2010 to 2020) or a compounded annual growth of 0.51% per year for the RSA 19, in which the Project is located. As such, the analysis is consistent with the CMP guidelines.

4.7 CUMULATIVE DEVELOPMENT TRAFFIC

California Environmental Quality Act (CEQA) guidelines require that other reasonably foreseeable development projects which are either approved or being processed concurrently in the study area also be included as part of a cumulative analysis scenario. A cumulative project list was developed for the purposes of this analysis through consultation with planning and engineering staff from the City of Carson (from website on 5/27/15), City of Gardena (received on 6/8/15), and City of Compton (from website on 6/3/15) (see Appendix 4.1).

Exhibit 4-4 illustrates the cumulative development location map. A summary of cumulative development projects and their proposed land uses are shown on Table 4-3. If applicable (i.e. if the cumulative projects are anticipated to contribute trips to study area intersections), the traffic generated by individual cumulative projects was manually added to the Opening Year Cumulative forecasts to ensure that traffic generated by the listed cumulative development projects in Table 4-3 are reflected as part of the background traffic. Traffic from other cumulative developments farther away from the study area are not anticipated to add significant traffic and are accounted for by the ambient growth rate applied to forecast the background traffic.

EXHIBIT 4-4: CUMULATIVE DEVELOPMENT LOCATION MAP

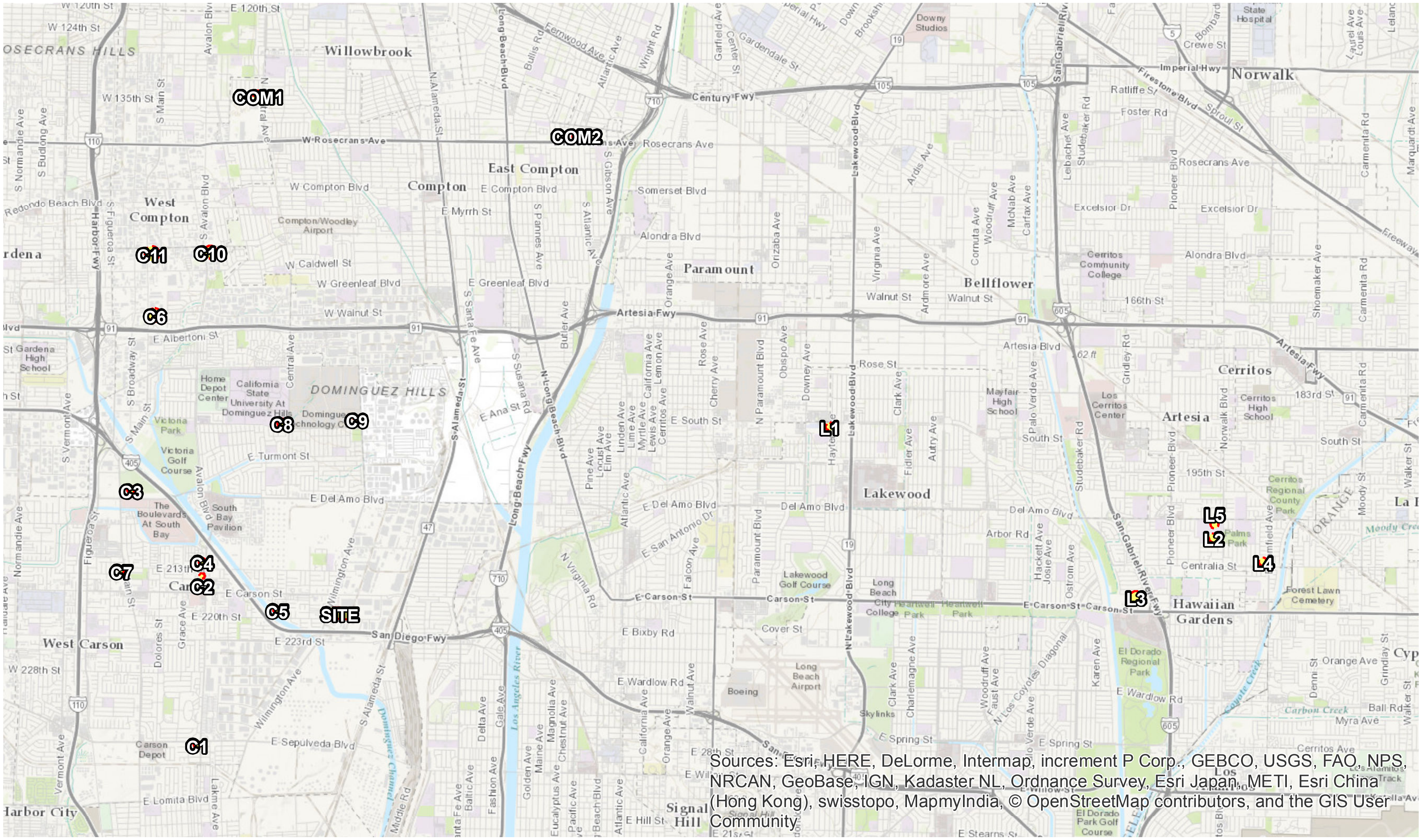


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Table 4-3

Cumulative Development Land Use Summary

TAZ	Project Name	Land Use[1]	Quantity	Units[2]
CITY OF CARSON				
C1	440 Sepulveda Boulevard	Apartment	11	DU
C2	616 E Carson Street	Apartment	152	DU
		Shopping Center	13.000	TSF
C3	19220 S Main Street		53	AC
C4	21521-21601 S Avalon Boulevard	Apartment	357	DU
		Shopping Center	32.000	TSF
C5	21801 Vera Street	SFDR	18	DU
C6	17110, 17118 & 17120 S Main Street	High-Cube Warehouse	210.000	TSF
C7	21791 Moneta Avenue	Apartment	13	DU
C8	1281 E University Drive	Shopping Center	43.000	TSF
C9	18701 S Wilmington Avenue	High-Cube Warehouse	443.000	TSF
C10	16100 S Avalon Boulevard	High-Cube Warehouse	44.000	TSF
C11	200 E Alondra Boulevard	High-Cube Warehouse	147.000	TSF
		General Office	10.000	TSF
CITY OF LAKEWOOD				
L1	3000-3016 South Street	Condominium	72	DU
L2	20721-20741 Elaine Avenue	Condominium	21	DU
L3	11609 216th Street	Condominium	3	DU
L4	20937 Bloomfield Avenue	Apartment	22	DU
L5	20712 Seine Avenue	Apartment	16	DU
CITY OF COMPTON				
COM1	Compton Brickyard Development	High-Cube Warehouse	514.396	TSF
		High-Cube Warehouse	471.930	TSF
COM2	Harridge Development Group	Condominium	67	DU

[1] SFDR = Single Family Detached Residential

[2] DU = Dwelling Unit; RM = Room; TSF = Thousand Square Feet; AC = Acre

5 E+P TRAFFIC CONDITIONS

In an effort to satisfy the CEQA Guidelines section 15125(a), an analysis of existing traffic volumes plus traffic generated by the proposed Project (E+P) has been included in this analysis. This section discusses the traffic forecasts for E+P conditions and the resulting intersection operations and traffic signal warrants.

5.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for E+P conditions are consistent with those shown previously on Exhibit 3-1, with the exception of Project driveways and those facilities assumed to be constructed by the Project to provide site access, which are also assumed to be in place for E+P conditions. In other words, no other off-site improvements are assumed beyond those that currently exist with the exception of the intersections and roadways that would be improved by the Project for access.

The improvement project at the I-405 Freeway at S. Wilmington Avenue is currently underway. The interchange project includes widening S. Wilmington Avenue between E. 220th Street and E. 223rd Street and the addition of a I-405 Northbound on-ramp for southbound vehicles on S. Wilmington Avenue. It is anticipated that the interchange project would be completed by the end of 2016. However, for the purposes of this analysis, the existing lanes and interchange configuration has been assumed for E+P traffic conditions.

5.2 E+P TRAFFIC VOLUME FORECASTS

This scenario includes Existing traffic volumes plus Project traffic. Exhibit 5-1 shows the ADT, AM and PM peak hour traffic volumes which can be expected for E+P traffic conditions.

5.3 INTERSECTION OPERATIONS ANALYSIS

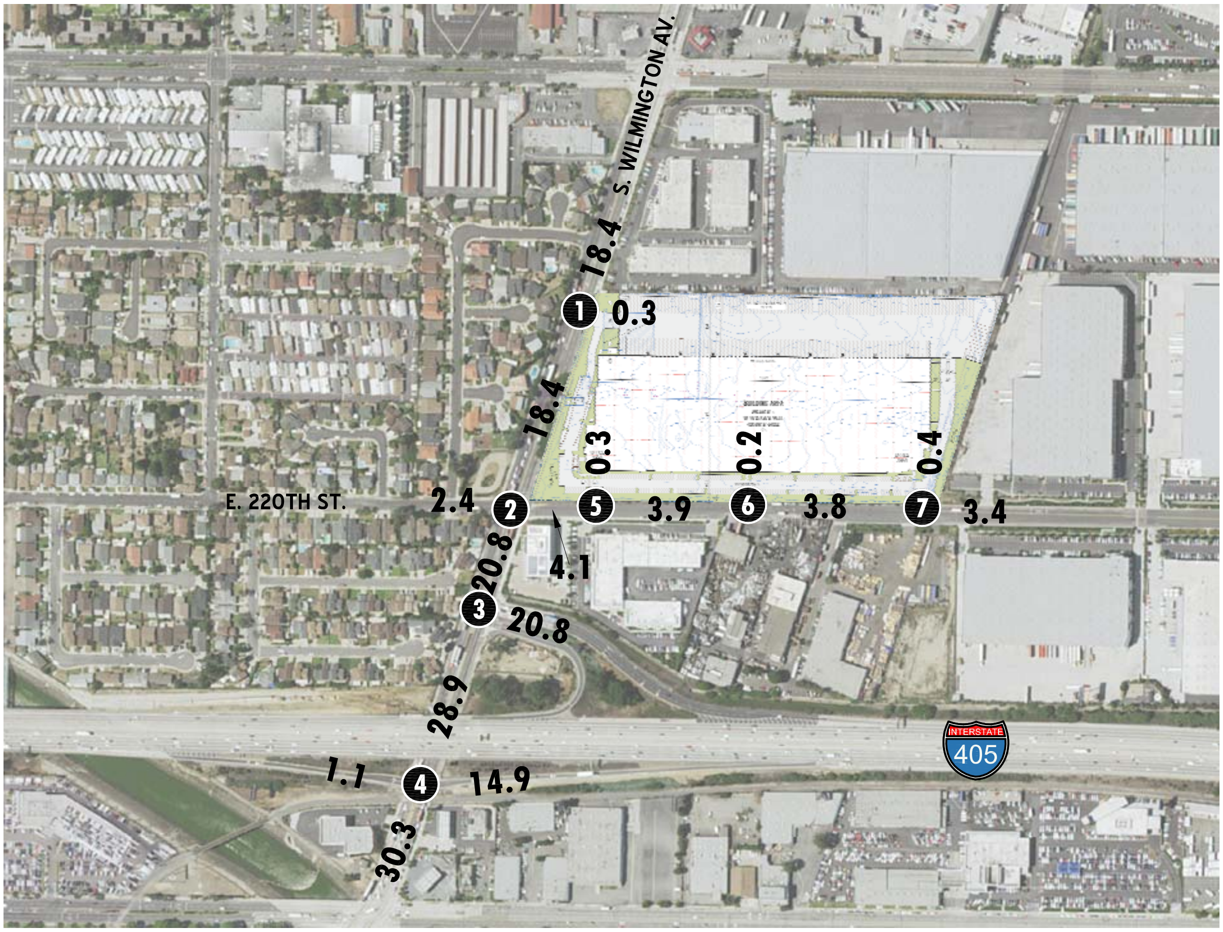
E+P peak hour traffic operations have been evaluated for the study area intersections based on the analysis methodologies presented in Section 2 *Methodologies* of this TIA. The intersection analysis results are summarized in Table 5-1, which indicates the addition of Project traffic is not anticipated to cause an intersection to operate at unacceptable LOS based on the applicable jurisdiction's LOS standards.

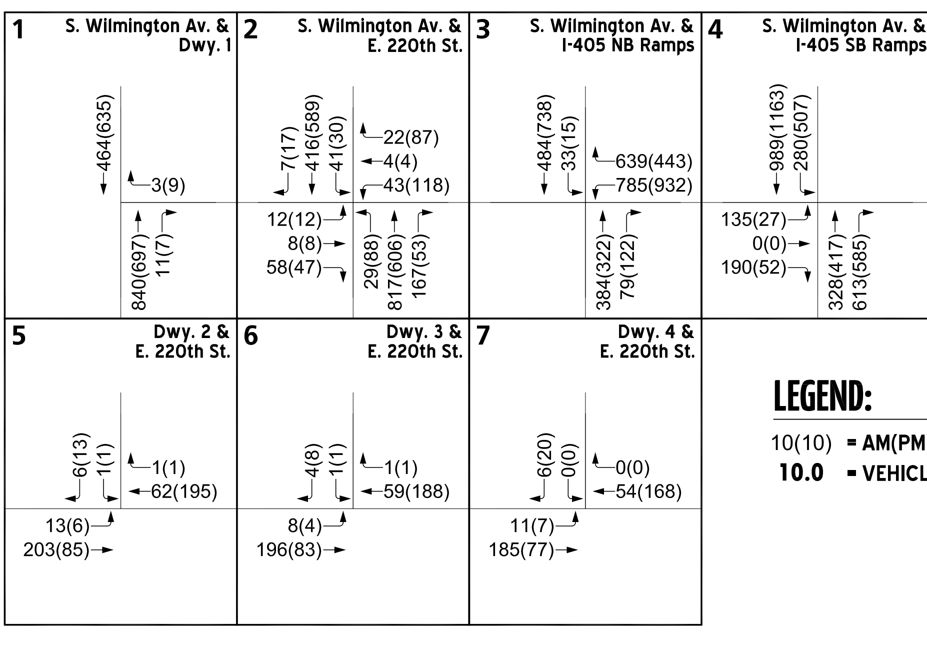
Consistent with Table 5-1, a summary of the peak hour intersection LOS for E+P conditions are shown on Exhibit 5-2. The intersection operations analysis worksheets for E+P traffic conditions are included in Appendix 5.1 of this TIA.

5.4 TRAFFIC SIGNAL WARRANTS ANALYSIS

There are no study area intersections anticipated to meet traffic signal warrants for E+P traffic conditions (see Appendix 5.2).

EXHIBIT 5-1: E+P TRAFFIC VOLUMES (IN PCE)





LEGEND:

10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES

10.0 = VEHICLES PER DAY (1000'S)

EXHIBIT 5-2: E+P SUMMARY OF LOS

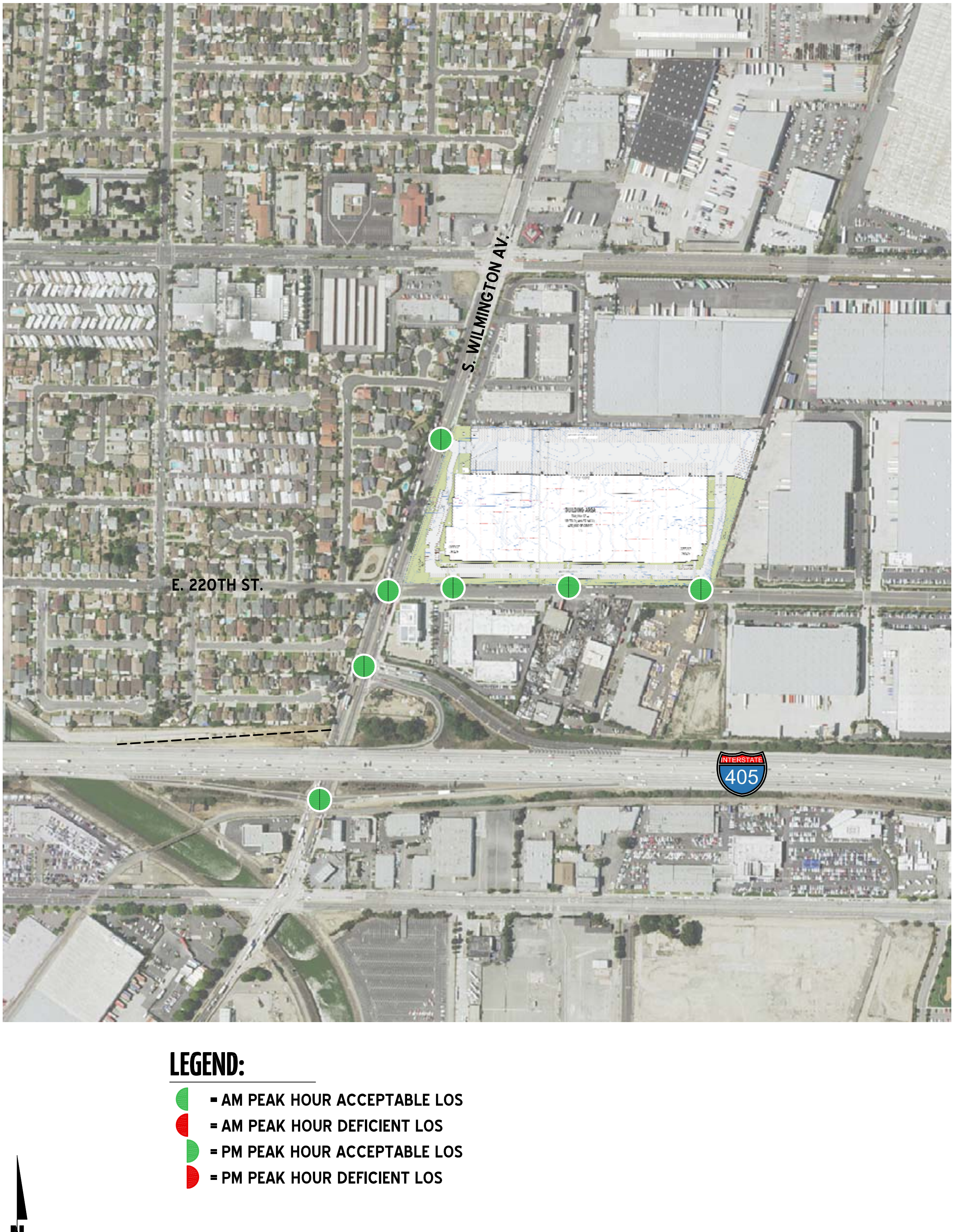


Table 5-1

Intersection Analysis for E+P Conditions

#	Intersection	Traffic Control[2]	Existing (2016) Delay[1] (secs.) AM	Existing (2016) Delay[1] (secs.) PM	Existing (2016) Level of Service AM	Existing (2016) Level of Service PM	E+P Delay[1] (secs.) AM	E+P Delay[1] (secs.) PM	E+P Level of Service AM	E+P Level of Service PM	Significant Impact?[4]
1	S. Wilmington Av. / Dwy. 1	**CSS**	Future Intersection				9.9	9.5	A	A	No
2	S. Wilmington Av. / E. 220th St.	TS	0.576	0.549	B	A	0.580	0.572	B	B	No
3	S. Wilmington Av. / I-405 NB Ramps[3]	TS	43.7	38.9	D	D	46.9	40.4	D	D	No
4	S. Wilmington Av. / I-405 SB Ramps[3]	TS	38.6	42.5	D	D	42.2	47.1	D	D	No
5	Dwy. 2 / E. 220th St.	**CSS**	Future Intersection				8.9	9.5	A	A	No
6	Dwy. 3 / E. 220th St.	**CSS**	Future Intersection				8.9	9.4	A	A	No
7	Dwy. 4 / E. 220th St.	**CSS**	Future Intersection				8.6	9.3	A	A	No

1 ICU reported as a volume-to-capacity ratio and HCM delay reported in seconds. LOS calculated using Synchro (Version 9.0).
Per the 2010 Highway Capacity Manual (HCM), overall average intersection delay and level of service are shown for intersections with a traffic signal.
For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown. LOS calculated using Synchro (Version 9.0).

2 CSS = Cross-street Stop; TS = Traffic Signal; **CSS** = Improvement

3 Although the peak hour intersection operations analysis indicates acceptable peak hour operations, field observations indicate significant queuing, particularly in the southbound direction during the PM peak hours. The queuing issues are likely due to the on-going construction and intermittent closures related to the Wilmington/I-405 Interchange Project. It is our understanding that the project is anticipated to be completed by the end of 2016 and would include additional lanes along Wilmington Avenue through the interchange, a new I-405 Northbound on-ramp for the southbound approach, and signal coordination along Wilmington Avenue between E. 220th Street and E. 223rd Street.

4 To determine whether the addition of Project traffic at a study intersection results in a significant impact, the following thresholds of significance consistent with the Los Angeles County CMP will be utilized:
- A significant impact occurs at a signalized intersection if the addition of Project trips causes the peak hour LOS to fall from an acceptable LOS to an unacceptable LOS and the proposed Project increases the demand (v/c) by 0.02 or more.
- A significant impact occurs at a signalized intersection if the addition of Project trips to an intersection that is currently operating at an acceptable LOS (i.e., LOS E or F) causes the v/c to increase by 0.02 or more.
- A significant impact occur at an unsignalized intersection if the addition of Project rips causes the peak hour LOS to fall from an acceptable LOS to an unacceptable LOS.

5.5 FREEWAY OFF-RAMP QUEUING ANALYSIS

A freeway off-ramp queuing analysis was also performed for northbound and southbound off-ramps at I-405 Freeway and S. Wilmington Avenue interchanges to assess vehicle queues for the off ramps that may potentially impact peak hour operations at the ramp-to-arterial intersections and may potentially “spill back” onto the I-405 Freeway mainline. Ramp queuing analysis findings are presented in Table 5-2 for E+P traffic conditions. As shown on Table 5-2, no queuing issues are anticipated on the freeway off-ramps during the peak hours, consistent with Existing traffic conditions.

Worksheets for E+P conditions queuing analysis are provided in Appendix 5.3.

5.6 EXISTING PLUS PROJECT IMPACTS

Based on the applicable jurisdiction’s significance criteria as discussed in Section 2.6 *Thresholds of Significance*, there were no study area intersections that were found to be significantly impacted by the Project for E+P traffic conditions.

Table 5-2

Peak Hour Freeway Off-Ramp Queuing Summary for E+P Conditions

Intersection	Movement	Available Stacking Distance (Feet)	Existing (2016) 95th Percentile Queue (Feet)[2]		Existing (2016) Acceptable?[1]		E+P 95th Percentile Queue (Feet)[2]		E+P Acceptable?[1]	
			AM Peak	PM Peak	AM	PM	AM Peak	PM Peak	AM	PM
S. Wilmington Av. / I-405 NB Ramps	WBL	1,450	350 [2]	453 [2]	Yes	Yes	350 [2]	453 [2]	Yes	Yes
	WBR	400	182	76	Yes	Yes	216	77	Yes	Yes
S. Wilmington Av. / I-405 SB Ramps	EBL/T	70	0	0	Yes	Yes	0	0	Yes	Yes
	EBT/R	940	100	23	Yes	Yes	104	25	Yes	Yes

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 15 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.

[2] Maximum queue length for the approach reported.

6 OPENING YEAR CUMULATIVE (2018) TRAFFIC CONDITIONS

This section discusses the methods used to develop Opening Year Cumulative Without and With Project traffic forecasts, and the resulting intersection operations and traffic signal warrants.

6.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for Opening Year Cumulative conditions are consistent with those shown previously on Exhibit 3-1, with the exception of Project driveways and those facilities assumed to be constructed by the Project to provide site access, which are anticipated to be in place for Opening Year Cumulative traffic conditions.

The improvement project at the I-405 Freeway at S. Wilmington Avenue is currently underway. The interchange project includes widening S. Wilmington Avenue between E. 220th Street and E. 223rd Street and the addition of a I-405 Northbound on-ramp for southbound vehicles on S. Wilmington Avenue. It is anticipated that the interchange project would be completed by the end of 2016. As such, the analysis has been conducted with both the existing interchange configuration and with the proposed interchange improvements.

6.2 OPENING YEAR CUMULATIVE WITHOUT PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes Existing traffic volumes, an ambient growth factor of 4.04%, and traffic from pending and approved but not yet constructed known development projects in the area. The weekday ADT, AM and PM peak hour volumes which can be expected for Opening Year Cumulative Without Project traffic conditions are shown on Exhibit 6-1.

6.3 OPENING YEAR CUMULATIVE WITH PROJECT TRAFFIC VOLUME FORECASTS

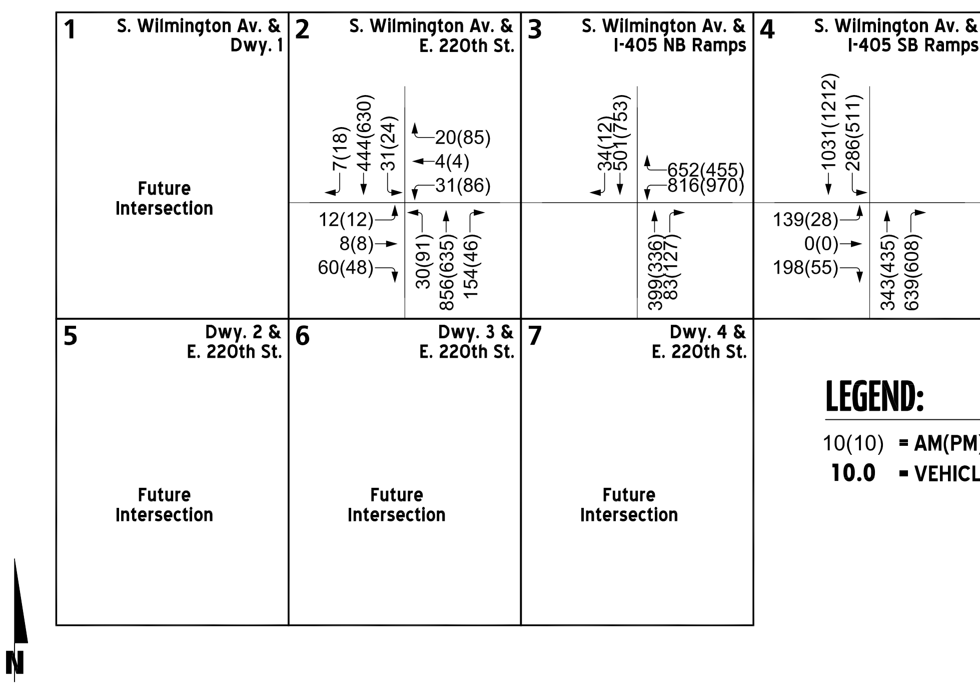
This scenario includes Existing traffic volumes, an ambient growth factor of 4.04%, traffic from pending and approved but not yet constructed known development projects in the area, and the addition of Project traffic. The weekday ADT, AM and PM peak hour volumes which can be expected for Opening Year Cumulative With Project traffic conditions are shown on Exhibit 6-2.

6.4 INTERSECTION OPERATIONS ANALYSIS

LOS calculations were conducted for the study intersections to evaluate their operations under Opening Year Cumulative Without Project conditions, with roadway and intersection geometrics consistent with Section 6.1 *Roadway Improvements*. As shown in Table 6-1, the study area intersections are anticipated to operate at acceptable LOS under Opening Year Cumulative Without and With Project traffic conditions.

A summary of the peak hour intersection LOS for Opening Year Cumulative Without and With Project conditions are shown on Exhibits 6-3 and 6-4, respectively. The intersection operations analysis worksheets for Opening Year Cumulative Without and With Project traffic conditions are included in Appendix 6.1 and Appendix 6.2 of this TIA, respectively.

EXHIBIT 6-1: OPENING YEAR CUMULATIVE (2018) WITHOUT PROJECT TRAFFIC VOLUMES (IN PCE)

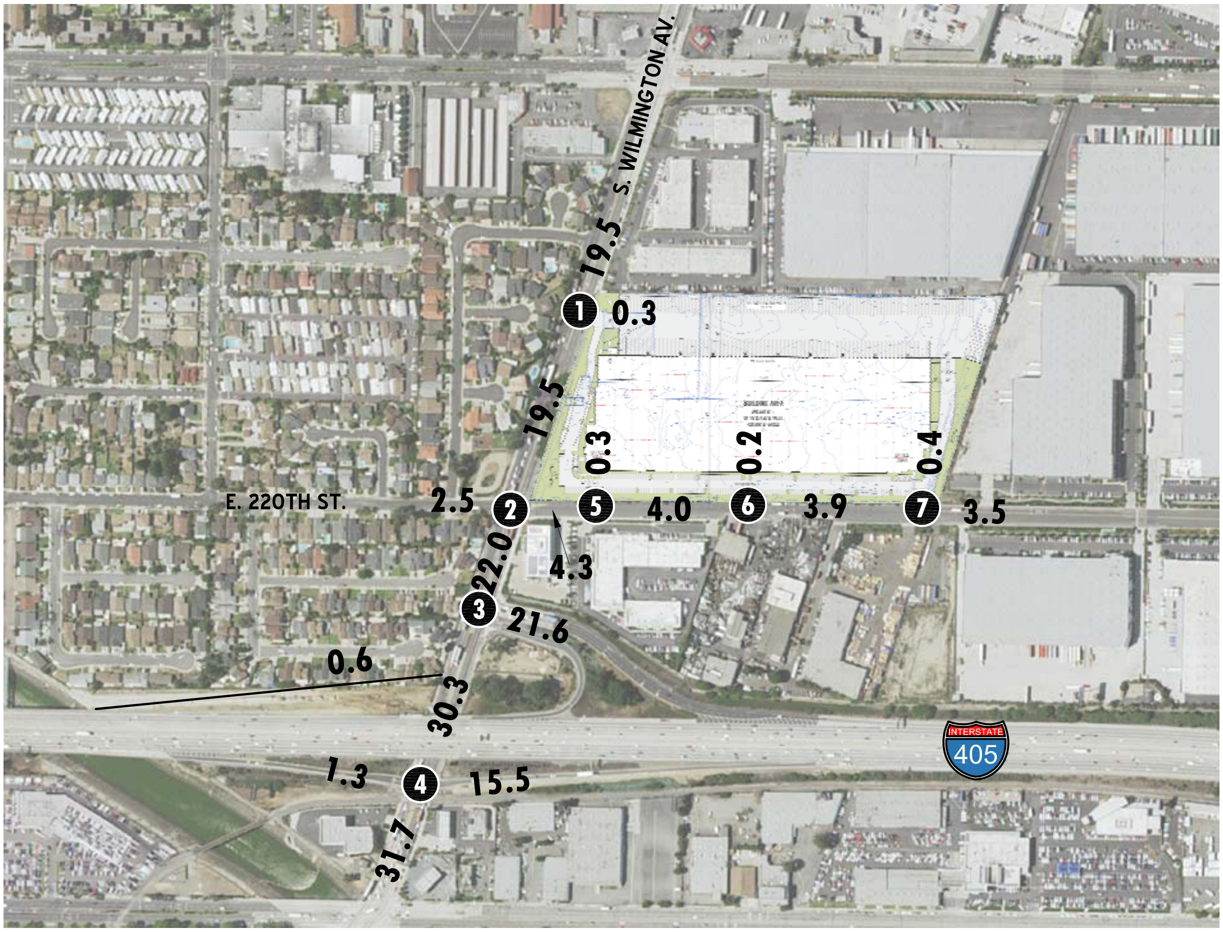


LEGEND:

10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES

10.0 = VEHICLES PER DAY (1000'S)

EXHIBIT 6-2: OPENING YEAR CUMULATIVE (2018) WITH PROJECT TRAFFIC VOLUMES (IN PCE)



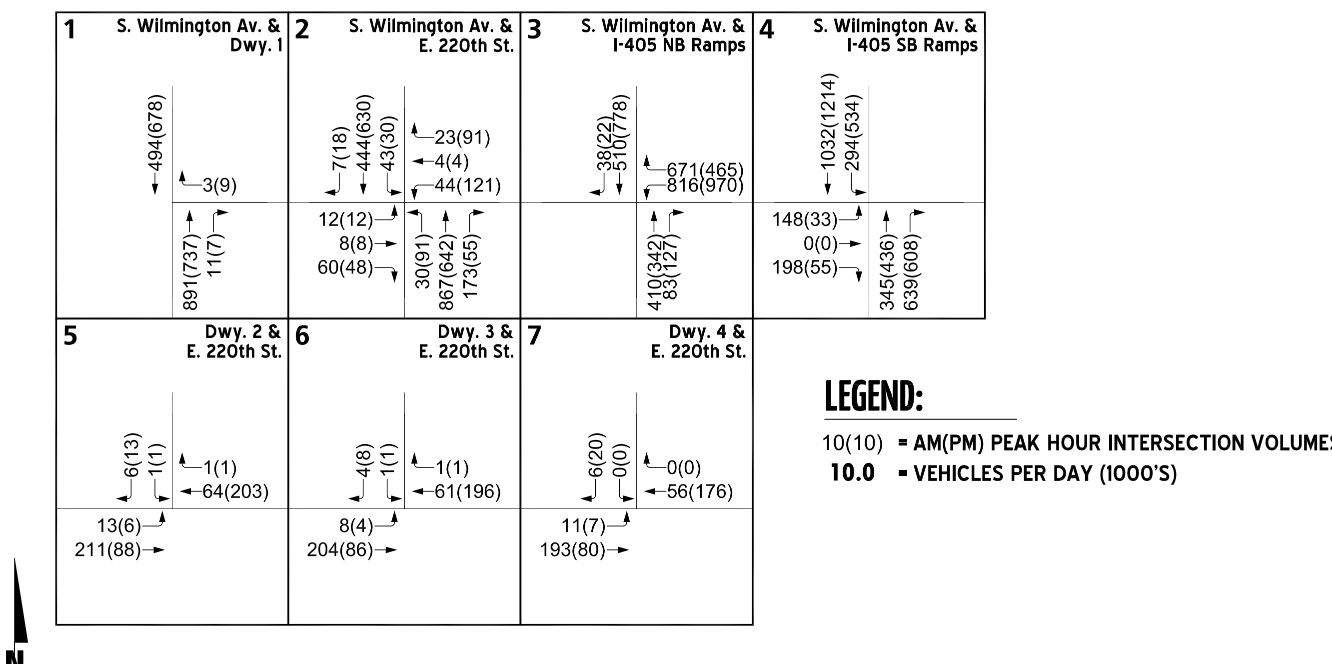
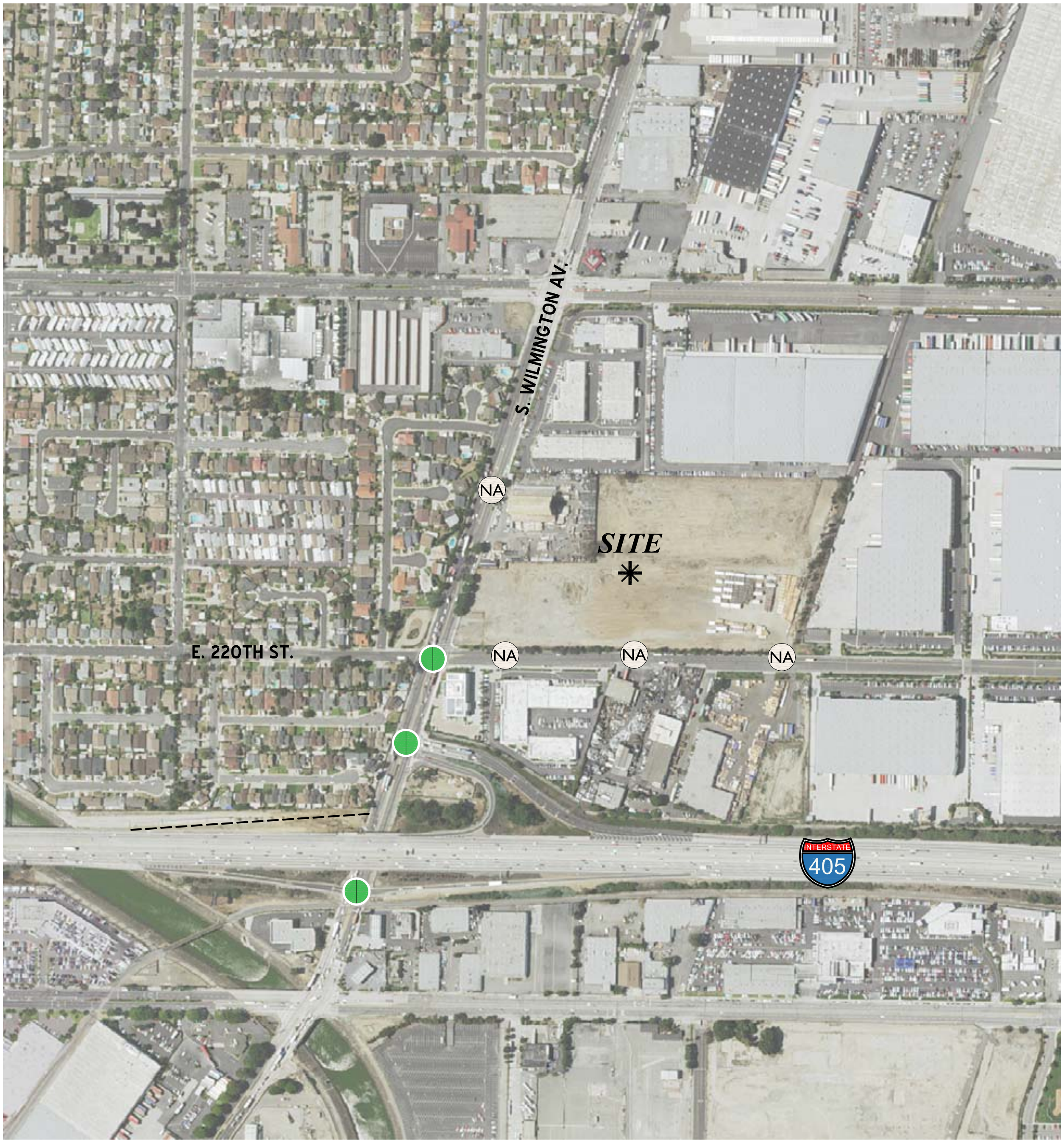


EXHIBIT 6-3: OPENING YEAR CUMULATIVE (2018) WITHOUT PROJECT SUMMARY OF LOS



LEGEND:

- = AM PEAK HOUR ACCEPTABLE LOS
- = AM PEAK HOUR DEFICIENT LOS
- = PM PEAK HOUR ACCEPTABLE LOS
- = PM PEAK HOUR DEFICIENT LOS
- NA = NOT AN ANALYSIS LOCATION FOR THIS SCENARIO

N

EXHIBIT 6-4: OPENING YEAR CUMULATIVE (2018) WITH PROJECT SUMMARY OF LOS

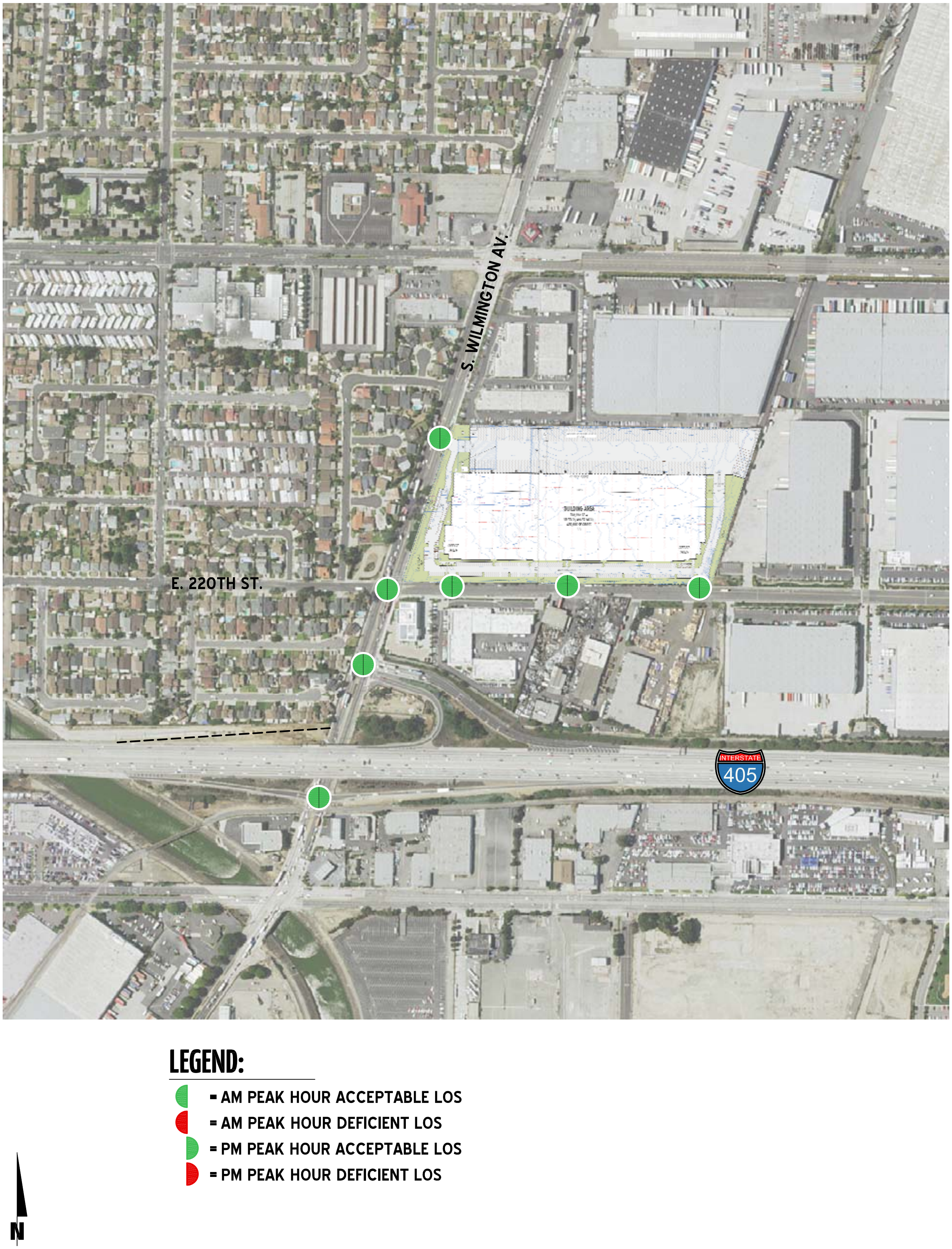


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Table 6-1

Intersection Analysis for Opening Year Cumulative (2018) Conditions

#	Intersection	Traffic Control[2]	2018 Without Project Delay[1] (secs.) AM	PM	Level of Service AM	PM	2018 With Project Delay[1] (secs.) AM	PM	Level of Service AM	PM	Significant Impact?[5]
1	S. Wilmington Av. / Dwy. 1	**CSS**	Future Intersection				9.9	9.5	A	A	No
2	S. Wilmington Av. / E. 220th St.	TS	0.593	0.567	B	B	0.596	0.590	B	B	No
3	S. Wilmington Av. / I-405 NB Ramps[3]	TS	50.0	43.8	D	D	53.8	43.7	D	D	No
	- With Interchange Improvements		25.4	20.1	C	C	28.1	26.3	C	C	
4	S. Wilmington Av. / I-405 SB Ramps[3]	TS	43.6	47.9	D	D	47.5	53.0	D	D	No
	- With Interchange Improvements		14.3	12.3	B	B	14.5	20.1	B	C	
5	Dwy. 2 / E. 220th St.	**CSS**	Future Intersection				8.9	9.5	A	A	No
6	Dwy. 3 / E. 220th St.	**CSS**	Future Intersection				8.9	9.5	A	A	No
7	Dwy. 4 / E. 220th St.	**CSS**	Future Intersection				8.6	9.3	A	A	No

* **BOLD** = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

1 ICU reported as a volume-to-capacity ratio and HCM delay reported in seconds. LOS calculated using Synchro (Version 9.0).
Per the 2010 Highway Capacity Manual (HCM), overall average intersection delay and level of service are shown for intersections with a traffic signal.
For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown. LOS calculated using Synchro (Version 9.0).

2 CSS = Cross-street Stop; TS = Traffic Signal; **CSS** = Improvement

3 Although the peak hour intersection operations analysis indicates acceptable peak hour operations, field observations indicate significant queuing, particularly in the southbound direction during the PM peak hours. The queuing issues are likely due to the on-going construction and intermittent closures related to the Wilmington/I-405 Interchange Project. It is our understanding that the project is anticipated to be completed by the end of 2016 and would include additional lanes along Wilmington Avenue through the interchange, a new I-405 Northbound on-ramp for the southbound approach, and signal coordination along Wilmington Avenue between E. 220th Street and E. 223rd Street.

4 To determine whether the addition of Project traffic at a study intersection results in a significant impact, the following thresholds of significance consistent with the Los Angeles County CMP will be utilized:
- A significant impact occurs at a signalized intersection if the addition of Project trips causes the peak hour LOS to fall from an acceptable LOS to an unacceptable LOS and the proposed Project increases the demand (v/c) by 0.02 or more.
- A significant impact occurs at a signalized intersection if the addition of Project trips to an intersection that is currently operating at an acceptable LOS (i.e., LOS E or F) causes the v/c to increase by 0.02 or more.
- A significant impact occur at an unsignalized intersection if the addition of Project rips causes the peak hour LOS to fall from an acceptable LOS to an unacceptable LOS.

6.5 TRAFFIC SIGNAL WARRANTS ANALYSIS

For Opening Year Cumulative (2018) With Project conditions, there are no intersections anticipated to meet traffic signal warrants (see Appendix 6.3).

6.6 FREEWAY OFF-RAMP QUEUING ANALYSIS

A freeway off-ramp queuing analysis was also performed for Northbound and Southbound off-ramps at I-405 Freeway and S. Wilmington Avenue interchanges to assess vehicle queues for the off ramps that may potentially impact peak hour operations at the ramp-to-arterial intersections and may potentially “spill back” onto the I-405 Freeway mainline. Ramp queuing analysis findings are presented in Table 6-2 for Opening Year Cumulative traffic conditions. As shown on Table 6-2, no queuing issues are anticipated on the freeway off-ramps during the peak hours.

Worksheets for Opening Year Cumulative Without Project conditions queuing analysis are provided in Appendix 6.4 and Appendix 6.5 for Opening Year Cumulative With Project conditions.

6.7 OPENING YEAR CUMULATIVE RECOMMENDED IMPROVEMENTS

The Project’s contribution to the analysis locations were found to be less than significant. As such, no improvements have been recommended to the study area intersections.

Table 6-2

Peak Hour Freeway Off-Ramp Queuing Summary for Opening Year Cumulative (2018) Conditions

Intersection	Movement	Available Stacking Distance (Feet)	2018 Without Project: 95th Percentile Queue (Feet)[2]		2018 Without Project: Acceptable?[1]		2018 With Project: 95th Percentile Queue (Feet)[2]		2018 With Project: Acceptable?[1]	
			AM Peak	PM Peak	AM	PM	AM Peak	PM Peak	AM	PM
S. Wilmington Av. / I-405 NB Ramps	WBL	1,450	373 [2]	481 [2]	Yes	Yes	373 [2]	481 [2]	Yes	Yes
	WBR	400	226 [2]	78	Yes	Yes	331 [2]	79	Yes	Yes
S. Wilmington Av. / I-405 SB Ramps	EBL/T	70	0	0	Yes	Yes	0	0	Yes	Yes
	EBT/R	940	112	27	Yes	Yes	115	30	Yes	Yes

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 15 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.

[2] Maximum queue length for the approach reported.

7 REFERENCES

[1] Los Angeles County Metropolitan Transportation Authority, Congestion Management Program, 2010.

[2] California Department of Transportation, "Guide for the Preparation of Traffic Impact Studies," December 2002.

[3] Institute of Transportation Engineers, Trip Generation, 9th Edition ed., 2012.

[4] Transportation Research Board, Highway Capacity Manual (HCM), Washington, D.C.: National Academy of Sciences, 2010.

[5] Federal Highway Administration, "Manual on Uniform Traffic Control Devices (MUTCD)," in *California Manual on Uniform Traffic Control Devices (CAMUTCD)*, 2014.

[6] City of Carson, City of Carson General Plan Transportation and Infrastructure Element, Carson, Adopted October 11,2004.

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