Draft Environmental Impact Report

VOLUME II - Appendices A - F

BARTON PLACE

City of Cypress, California

SCH No. 2015031004

Prepared by

LSA

LSA ASSOCIATES, INC.

July 2015

DRAFT

ENVIRONMENTAL IMPACT REPORT

BARTON PLACE PROJECT

CITY OF CYPRESS

Submitted to:

City of Cypress
5275 Orange Avenue
Cypress, California 90630
(714) 229-6720

Prepared by:

LSA Associates, Inc.
20 Executive Park, Suite 200
Irvine, California 92614
(949) 553-0666

Project No. CCP1401

LSA

July 2015

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INITIAL STUDY/NOTICE OF PREPARATION

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33 Acre Senior Housing/Retail Commercial Center EIR
Agency Scoping Meeting List
February 2015

City of Los Alamitos Attn: Mr. Steven Mendoza Community Development Department 3191 Katella Avenue Los Alamitos, CA 90720	**City of Stanton** Attn: Mr. Omar Dadabhoy Community Development Department 7800 Katella Avenue Stanton, CA 90680
City of Seal Beach Attn: Mr. Jim Basham Planning Department 211 Eighth Street Seal Beach, CA 90740	**City of Hawaiian Gardens** Community Development Department 21815 Pioneer Boulevard Hawaiian Gardens, CA 90716
City of Garden Grove Community Development Department 11222 Acacia Parkway Garden Grove, CA 92840	**City of Buena Park** Attn: Mr. Joel W. Rosen Community Development Department 6650 Beach Boulevard, First Floor Buena Park, CA 90622
City of Anaheim Attn: Community Development Director Anaheim City Hall 200 S. Anaheim Blvd. Anaheim, CA 92805	**City of Long Beach** Attn: Ms. Amy J. Bodek Department of Development Services 333 W. Ocean Blvd, 5th Floor Long Beach, CA 90802
Los Alamitos Race Course Attn: Dr. Edward Allred 4961 Katella Avenue Los Alamitos, CA 90720	**Southern California Edison** 2800 E. Willow Street Long Beach, CA 90806
Orange County Sanitation District 10844 Ellis Avenue Fountain Valley, CA 92708	**Orange County Water District** 10500 Ellis Avenue Fountain Valley, CA 92708
Cypress School District Attn: Mr. Tim McLellan 9740 Moody Street Cypress, CA 90630	**Anaheim Union School District** 501 N. Crescent Way Anaheim, CA 92801
Cypress Police Department Attn: Commander Rod Cox 5275 Orange Avenue Cypress, CA 90630	**OCFA** Attn: Fire Prevention Department 1 Fire Authority Road Irvine, CA 92602
Cypress Chamber of Commerce 5550 Cerritos Ave, Suite B Cypress, CA 90630	**Southern California Gas Company** 12631 Monarch Avenue Garden Grove, CA 92841
Los Alamitos Unified School District 10293 Bloomfield Street Los Alamitos, CA 90720	

33 Acre Senior Housing/Retail Commercial Center EIR Agency Scoping Meeting List February 2015	
Southern California Association of Governments Attn: Intergovernmental Review 818 W. 7th Street, 12th Floor Los Angeles, CA 90017	**SCAQMD** Attn: CEQA Review 21865 E. Copley Dr. Diamond Bar, CA 91765
OCTA Attn: CEQA Review 550 S. Main St. Orange, CA 92863	**County of Orange** Planning Department Attn: John Buzas 300 North Flower Street Santa Ana, CA 92705
Orange County Health Care Agency Solid Waste Enforcement Agency 1241 East Dyer Road, Suite 120 Santa Ana, CA 92705	**Orange County Integrated Waste Management** 320 North Flower Street Santa Ana, CA 92703
Golden State Water Company 1920 W. Corporate Way Anaheim, CA 92801	**Airport Land Use Commission** 3160 Airway Avenue Costa Mesa, CA 92626
Orange County Flood Control District Attn: Herb Nakassone 300 N. Flower St., 6th Floor Santa Ana, CA 92702-4048	**Caltrans – District 12** Attn: Chris Herre Chief, LD-IGR Branch 3347 Michelson Drive, Suite 100 Irvine, CA 92612
Caltrans – District 7 Attn: Dianna Watson IGR Program Manager 100 S. Main Street Los Angeles, CA 90012	**Warland Investments Company** Attn: Mr. Chip Robertson 1299 Ocean Avenue, Suite 300 Santa Monica, CA 90401
Cypress Land Company Attn: Mr. Matt Doss 10940 Wilshire Blvd. Suite 1900 Los Angeles, CA 90024	**Cottonwood Church** Attn: Mr. Mike Wilson 4505 Katella Avenue Los Alamitos, CA 90720
Armbruster, Goldsmith & Delvac LLP Attn: Mr. Mark Armbruster 11611 San Vicente Blvd., Suite 900 Los Angeles, CA 90049	**AVG Partners, LLC II** 9595 Wilshire Blvd. #710 Beverly Hills, CA 90212-2507
IHP Los Alamitos CA Owner LLC 50 Coconut Row, #211 Palm Beach, FL 33480-4009 C004 C/O CHATHAM LODGING LP	**Marriott Residence Inn** Attn: Onsite Hotel Manager 4931 Katella Avenue Los Alamitos, CA 90720
California Regional Water Quality Control Board – Santa Ana Region Attn: Mr. Kurt Berchtold 3737 Main Street, Suite 500 Riverside, CA 92501-3348	**California Department of Fish & Game** 4665 Lampson Avenue Los Alamitos, CA 90720

INITIAL STUDY

BARTON PLACE PROJECT

4921 KATELLA AVENUE

CITY OF CYPRESS, CALIFORNIA 90720

Submitted to:

City of Cypress
5275 Orange Avenue
Cypress, California 90630

Prepared by:

LSA Associates, Inc.
20 Executive Park, Suite 200
Irvine, California 92614-4731
(949) 553-0666

Project No. CCP1401

LSA

March 2015

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FIGURES AND TABLES

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1.0 INTRODUCTION

This Initial Study (IS) has been prepared in accordance with the California Environmental Quality Act and the *State CEQA Guidelines* (CEQA) and in conformance with the City of Cypress (City) checklist to evaluate the environmental impacts that may result from the construction and operation of the proposed Barton Place Project (project). As Lead Agency under CEQA, the City has the authority for preparation of this IS and will also have the responsibility for approval or denial of the proposed project. This IS evaluates potential environmental impacts associated with the proposed project.

2.0 PROJECT DESCRIPTION

2.1 PROJECT BACKGROUND

On April 17, 1990, the Cypress City Council adopted the original Cypress Business & Professional Center Specific Plan (Original Specific Plan), which established comprehensive guidance and regulations for the development of approximately 298 acres of land within the City, including the approximately 33-acre project site (project site). On June 5, 2012, voters of the City of Cypress approved an Amended and Restated Cypress Business and Professional Center Specific Plan (Amended Specific Plan) as part of an initiative measure titled “Measure L.” The Amended Specific Plan established a new Planning Area 9 that consists of portions of Planning Areas 6, 7, and 8 from the Original Specific Plan. In addition to the designation of the new Planning Area 9, the Amended Specific Plan expanded the permitted uses in Planning Area 9 to include a variety of office, retail and other commercial uses, as well as senior housing and related uses.

2.2 PROJECT LOCATION

The project site is located at 4921 Katella Avenue, in the southwestern portion of the City. The City encompasses approximately 6.5 square miles of land (approximately 4,218 acres) within northwestern Orange County (County). The Cities of Buena Park and La Palma border the City to the north. The City of Hawaiian Gardens, in Los Angeles County, borders the City to the northwest. The City of Los Alamitos borders the City to the west and south and is immediately south of the project site, and the City of Garden Grove is approximately 1 mile southeast of the project site. To the east, the City is bordered by the Cities of Buena Park, Anaheim, and Stanton. Regional access to the project site is provided by Interstate 605 (I-605), State Route 22 (SR-22) and Interstate 405 (I-405). I-605 is located approximately 2 miles west of the project site and extends in a north-south direction. SR-22 and I-405 are approximately 3 miles south of the project site and extend in an east-west direction. A regional depiction of the project location is presented on Figure 1, Regional and Vicinity Location Map.

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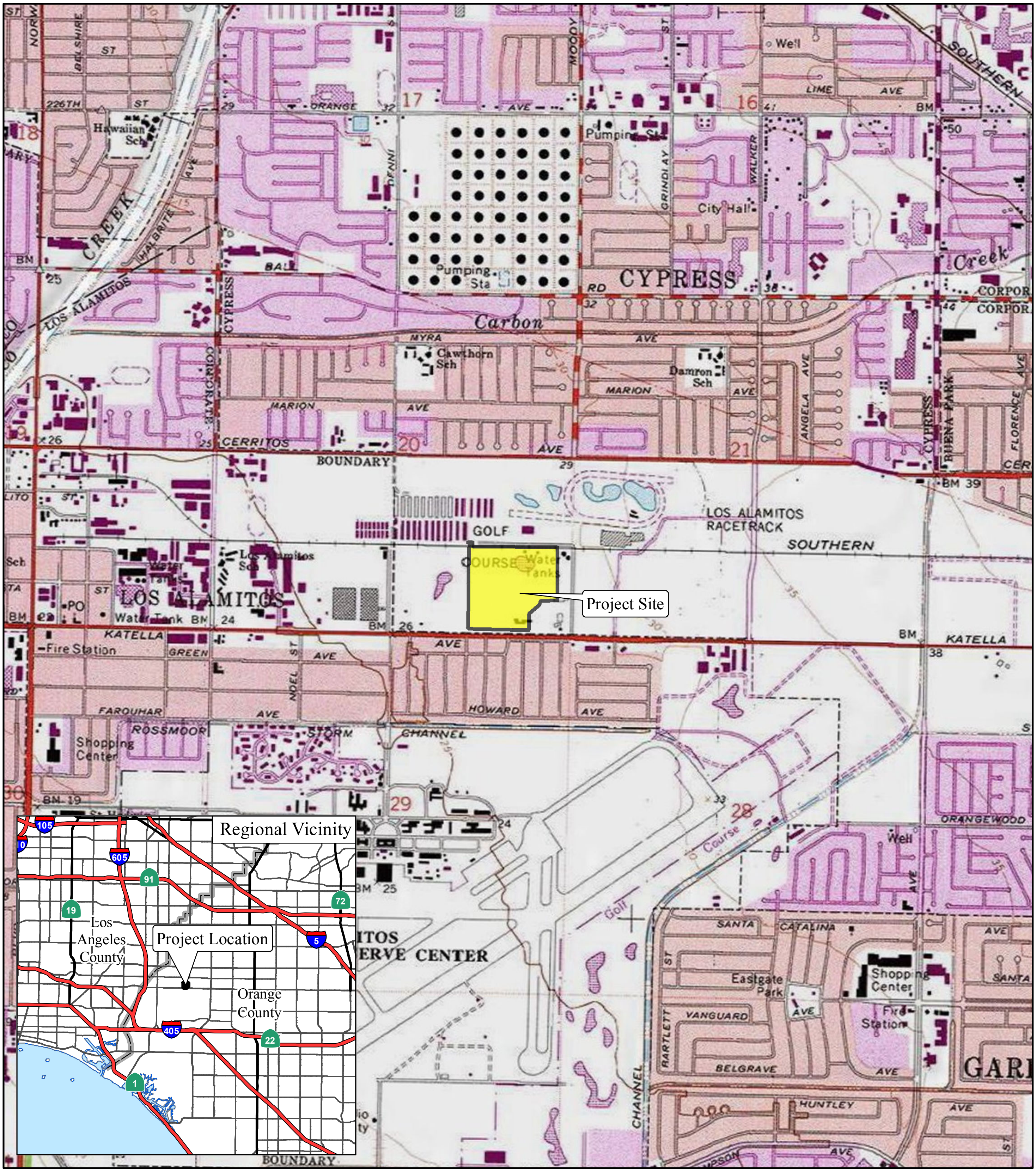

L S A

LEGEND

Project Site

FIGURE 1

N

0 1000 2000

FEET

SOURCE: USGS 7.5' Quad - Los Alamitos (1981), CA

Barton Place

Regional Location and Vicinity Map

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2.3 EXISTING SURROUNDING LAND USES

The project site is located at the northeast corner of Katella Avenue and Enterprise Drive. Land uses south of Katella Avenue are located in the City of Los Alamitos and include commercial, single-family, and multifamily residential uses. The Cottonwood Church campus is located to the west across Enterprise Drive. The project site is directly bordered on the north by a portion of the Los Alamitos Race Course that includes one-story horse barns currently occupied by quarter and thoroughbred horses, associated equipment, and other portions of the Los Alamitos Race Course. A surface parking area for the Los Alamitos Race Course, a small two-story church, and a four-story Residence Inn Hotel are located to the east of the project site, with commercial uses, including a 24 Hour Fitness and Office Depot, located to the east beyond the hotel. The project site and surrounding uses are depicted on Figure 2.

2.4 EXISTING PROJECT SITE

The project site was previously part of the Cypress Golf Club, which permanently closed in 2004. Following the closure of the Golf Club, the golf course on the project site was demolished, the site was re-graded and all vegetation was removed, except for some ornamental trees and vegetation along the southerly and southeasterly boundaries of the project site. The project site is unimproved, and is not currently utilized for any activity. It is relatively flat, with elevations ranging between approximately 21 feet above sea level in the southwest corner and approximately 32 feet in the northeast corner.

2.5 CURRENT GENERAL PLAN LAND USE DESIGNATION

The project site is currently designated "Specific Plan" on the City's General Plan Land Use Policy Map, in recognition that the project site is subject to the Amended Specific Plan. As set forth in the Land Use Element of the City's General Plan, Specific Plans implement General Plan goals and policies by designating land uses, densities, development, and design standards in more specific detail. The Amended Specific Plan was established to provide comprehensive guidance and regulations for the development of approximately 298.2 gross acres of land within the Amended Specific Plan area, including the project site.

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L S A

LEGEND

Project Site

FIGURE 2

0 200 400
FEET

SOURCE: ESRI (2013)

Barton Place

Project Site and Surrounding Land Uses

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2.6 CURRENT ZONING

The Amended Specific Plan is a regulatory plan that constitutes the zoning for the project site. While the City's Zoning Map designates the project site as PBP-25A (Planned Business Park), the Amended Specific Plan largely governs the permitted uses on, and development standards for, the project site. The project site includes most of Planning Area 9, which is designated as Mixed-Use Commercial/Senior Housing in the Amended Specific Plan, and most of the remaining undeveloped portion of Planning Area 6, which is designated as Professional Office/Hotel and Support Commercial in the Amended Specific Plan.

Within Planning Area 9, the Senior Housing designation permits senior housing (at a density of up to 20 units per acre) and related uses, while the Mixed Use Commercial designation allows a variety of retail and commercial uses. The Amended Specific Plan also permits senior housing and various commercial/retail uses in Planning Area 6, subject to approval by the City’s Director of Community Development.

2.7 PROJECT CHARACTERISTICS

Figure 2, Project Site and Surrounding Land Uses, illustrates the land uses proposed as part of the project. The proposed mixed-use project includes two components, a senior residential community and commercial/retail improvements along Katella Avenue.

2.7.1. Senior Residential Community

Figure 3, Conceptual Site Plan, shows that the senior residential community would be developed on approximately 28 acres on the northern portion of the project site, most of which is located in Planning Area 9, and a small portion of which is located in Planning Area 6, as designated in the Amended Specific Plan. The senior residential community would include 244 homes, which would equate to a density of approximately 8.7 dwelling units per acre, considerably lower than the approximately 560 units and the 20 units per acre allowed under the Amended Specific Plan.

The homes would be for-sale and would incorporate a mix of approximately 152 single-family detached homes and approximately 92 single-family attached homes (i.e., paired homes), in one- and two-story configurations. The maximum height of the units would be up to approximately 30 feet, which is substantially below the maximum height of 55 feet allowed in the Amended Specific Plan.

The Amended Specific Plan describes senior residential as “independent living units or other independent housing for persons 55 years of age or older and may include common dining areas and other community facilities.” Each home in the senior residential community would require a qualified occupant 55 years of age or older pursuant to recorded covenants, conditions, and restrictions. Each resident would have access to the amenity center and landscaped areas. The amenity center would be located on approximately 1 acre of common area and would include a community clubhouse, pool, spa, outdoor fire place, and barbeque~~,~~ and gathering areas. The community would include guest parking areas, landscaped parkways, small pocket parks, and access to the adjacent commercial/retail uses. The community would be gated with private streets and all common areas, amenities, and streets would be managed and maintained by a homeowners association (HOA).

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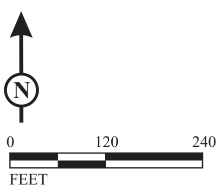
LSA

FIGURE 3



SOURCE: Robert Hidey Architects

Barton Place

Conceptual Site Plan

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2.7.2. Commercial/Retail Improvements

As shown on Figure 3, the proposed commercial/retail improvements would be developed on an approximately 5-acre parcel on the southern portion of the project site and would consist of approximately 50,000 square feet of space. The commercial/retail space would be divided into approximately five buildings. The proposed commercial/retail uses would include neighborhood-serving restaurants, retail stores, and other commercial uses. The commercial/ retail improvements would also feature a hardscape plaza, including a water feature, seating, and a gathering area near the corner of Katella Avenue and Enterprise Drive. The height of the commercial/retail buildings would not exceed 40 feet, which is substantially lower than the maximum height of 99 feet permitted by the Amended Specific Plan.

2.7.3. Building Design

The proposed architectural elements and features of the proposed project is a “Santa Barbara” style consisting of a mix of neutral colors and a variety of materials such as tile, cement, plaster and wood. The use of multiple residential and commercial/retail buildings with various plane breaks and color tones would break up the scale and massing of the proposed project.

2.7.4. Access, Circulation, and Parking

Residential Community. Access to the senior residential community would be provided by two new gated private drives off of Enterprise Drive. The main entry/exit would be near the northwest corner of the project site and would provide the primary entrance and exit for all residents and visitors of the senior residential community. A second private drive would provide access for emergency vehicles only. Circulation within the residential community would be provided by a private two-way street that would loop through the neighborhood. The private loop street would connect to private motor courts that would provide access to the residential units. Pedestrians would have access to the residential community by an existing sidewalk along Enterprise Drive. Within the community, a sidewalk adjacent to the loop street would provide access to the homes and community amenity center. A pedestrian gate would be provided along the southern boundary of the senior residential community to provide easy access to the commercial/retail buildings along Katella Avenue. Community residents would have secure access to this gate.

Each of the senior residential units would include an attached two-car garage. Approximately 74 guest parking spaces, including approximately four Americans with Disabilities Act (ADA)-compliant parking spaces, would be provided along the loop street. No resident or guest parking would be allowed within the private motor courts.

Commercial/Retail. Access to the commercial/retail area would be provided by two new driveways on Katella Avenue (in locations identified in the Amended Specific Plan, aligning with Midway Drive and Ticonderoga Drive) and a third new driveway on Enterprise Drive (see Figure 3, Conceptual Site Plan). The proposed driveway exits would be controlled by stop signs. Circulation within the commercial/retail area would be provided by two-way drive aisles on the surface parking lot. Pedestrian access for the commercial/retail area would be provided by existing sidewalks along Katella Avenue and Enterprise Drive. The surface parking lot that supports the commercial/retail area would include approximately 277 parking spaces (including the required ADA-compliant spaces).

2.7.5. Green Building Characteristics

The proposed project has been designed to meet sustainability goals, including the California Green Building Code, Title 24 energy efficiency requirements, and Assembly Bill (AB) 1881 water efficient landscape requirements. The senior residential community would also incorporate a number of energy and water conservation measures, green building features, and Low Impact Development (LID) design features. These design features and practices may include, but are not limited to:

- Energy-efficient lighting and mechanical systems;
- Water-efficient plumbing fixtures;
- Water-efficient landscaping, including the utilization of some native plant species in addition to drought-tolerant ornamental species;
- Water quality treatment; and
- Education of homeowners and maintenance staff regarding proper irrigation and landscaping maintenance to limit water runoff.

2.7.6. Project Construction

It is anticipated that the construction period for the senior housing community would be approximately 3 years. It is anticipated that the construction period for the commercial/retail improvements would be approximately 2 years, and that the commercial/retail construction would be completed prior to or concurrently with the construction of the senior housing community.

2.8 DISCRETIONARY ACTIONS, PERMITS, AND OTHER APPROVALS

In accordance with Sections 15050 and 15367 of the *State CEQA Guidelines*, the City of Cypress is the designated Lead Agency for the proposed project and has principal authority and jurisdiction for CEQA actions.

It is anticipated that the proposed project would or could require the following discretionary and ministerial approvals and permits from the City:

- Approval of a site plan review through the Design Review Committee permit process pursuant to the Amended Specific Plan
- Vesting tentative and final tract and parcel maps
- Transfer of land uses from Planning Area 9 to Planning Area 6 pursuant to the Amended Specific Plan
- Conditional use permit to allow a shopping center and restaurants
- Administrative approval of a priority project water quality management plan
- Grading, street and infrastructure permits
- Utility permits (sewer, water, and storm drain)
- Sign permits
- Building permits
- Any other necessary discretionary or ministerial permits and approvals required for the construction or operation of the proposed project.

In addition, the proposed project would or could require the following discretionary or ministerial permits and approvals from other governmental agencies:

- Notice of Intent (NOI) to comply with the General Activity Construction National Pollution Discharge Elimination System (NPDES) Permit from the State Water Resources Control Board
- NPDES Permit and Temporary Construction Dewatering Permit from the Regional Water Quality Control Board
- Plan approval, including emergency access and fire water supply, from the Orange County Fire Authority

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CITY OF CYPRESS

3.0 ENVIRONMENTAL CHECKLIST FORM

(To Be Completed By Lead Agency)

1. **Project Title:** Barton Place

2. **Lead Agency Name and Address:** City of Cypress, 5275 Orange Avenue, Cypress, California 90630

3. **Contact Person and Phone Number:** Doug Hawkins, (714) 229-6727

4. **Project Location:** 4921 Katella Avenue, Cypress, California 90720

5. **Project Sponsor's Name and Address:** C33, LLC, 26 Corporate Plaza, Suite 260, Newport Beach, California 92660

6. **General Plan Designation:** Specific Plan

7. **Zoning:** Planning Area 9/Mixed Use Commercial/Senior Housing~~,~~ and Planning Area 6/Professional Office/Hotel and Support Commercial.

   Description of Project: 244 senior residences, including approximately 152 single-family detached homes and approximately 92 single-family attached homes~~)~~, and approximately 50,000 square feet of commercial retail improvements along Katella Avenue. A more detailed overview of the proposed project is provided above in Section 2.0, Project Description.

8. **Surrounding Land Uses and Setting:** The project site is located at the northeast corner of Katella Avenue and Enterprise Drive. Land uses south of Katella Avenue are located in the City of Los Alamitos and include commercial, single-family, and multifamily residential uses. The Cottonwood Church campus is located to the west across Enterprise Drive. The project site is directly bordered on the north by a portion of the Los Alamitos Race Course that includes one-story horse barns currently occupied by quarter horses and thoroughbred horses, associated equipment, and other portions of the Los Alamitos Race Course located beyond. A surface parking area for the Los Alamitos Race course, a small two-story church, and a four-story Residence Inn Hotel are located to the east of the project site, with commercial uses, including a 24 Hour Fitness and Office Depot, located to the east beyond the hotel.

9. Other Agencies whose approval is required:

Table A: Other Agency Permits/Approvals

Agency	Permit/Approval
State Water Resources Control Board (SWRCB)	Notice of Intent (NOI) to comply with the General Activity Construction National Pollution Discharge Elimination System (NPDES) Permit
Regional Water Quality Control Board (RWQCB)	NPDES Permit and Temporary Construction Dewatering Permit (if necessary)
Orange County Fire Authority	Plan Approval, including emergency access and fire water supply

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" or "Potentially Significant Unless Mitigated," as indicated by the checklist on the following pages.

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

3.2 DETERMINATION

(To be completed by the Lead Agency.)
On the basis of this initial evaluation:

I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.	____
I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because the mitigation measures described on an attached sheet have been added to the project. A NEGATIVE DECLARATION will be prepared.	____
I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.	____
I find that the proposed project MAY have a significant effect(s) 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, if the effect is a "potentially significant impact" or "potentially significant unless mitigated." An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.	✓

______________________________ 2-27-15
Signature Date

Douglas Hawkins, City Planner For City of Cypress
Printed Name

3.3 EVALUATION OF ENVIRONMENTAL IMPACTS

1) A brief explanation is required for all answers except “No Impact” answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A “No Impact” answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A “No Impact” answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis). All documents referenced in the checklist explanations are listed in Section 5.0, References. All necessary explanations of the checklist answers are provided in Section 4.0, Environmental Issues.

2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.

3) “Potentially Significant Impact” is appropriate if an effect is significant or potentially significant, or if the lead agency lacks information to make a finding of insignificance. If there are one or more “Potentially Significant Impact” entries when the determination is made, an EIR is required.

4) “Potentially Significant Unless Mitigated” applies where the incorporation of mitigation measures has reduced an effect from “Potentially Significant Impact” to a “Less than Significant Impact.” The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level.

5) Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration (Section 15063(c)(3)(D)). Earlier analyses are referenced in Section 5.0, References.

6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). A source list should be attached (see Section 5.0, References), and other sources used or individuals contacted should be cited in the discussion.

7) This is only a suggested form, and lead agencies are free to use different ones.

4.0 ENVIRONMENTAL ANALYSIS

	Potentially Significant Impact	Potentially Significant Unless Mitigated	Less Than Significant Impact	No Impact
4.1 AESTHETICS. *Would the project:*				
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 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?	✓			
4.2 AGRICULTURE RESOURCES. ***In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the project:***				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?				✓
b) Conflict with existing zoning for agricultural use, or a Williamson act contract?				✓
c) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?				✓
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:***				
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)?	✓			

	Potentially Significant Impact	Potentially Significant Unless Mitigated	Less Than Significant Impact	No Impact
d) Expose sensitive receptors to substantial pollutant concentrations?	✓			
e) Create objectionable odors affecting a substantial number of people?			✓	
4.4 BIOLOGICAL RESOURCES. ***Would the project:***				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and 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 U.S. 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?				✓
4.5 CULTURAL RESOURCES. ***Would the project:***				
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?				✓

	Potentially Significant Impact	Potentially Significant Unless Mitigated	Less Than Significant Impact	No Impact
d) Disturb any human remains, including those interred outside of formal cemeteries?				✓
4.6 GEOLOGY AND SOILS. ***Would the project:***				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? 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 (1994), 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?				✓
4.7 GREENHOUSE GASES. ***Would the project:***				
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?	✓			
4.8 HAZARDS AND HAZARDOUS MATERIALS. ***Would the project:***				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?			✓	

	Potentially Significant Impact	Potentially Significant Unless Mitigated	Less Than Significant Impact	No Impact
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?				✓
4.9 HYDROLOGY AND WATER QUALITY. ***Would the project:***				
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 stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	✓			

	Potentially Significant Impact	Potentially Significant Unless Mitigated	Less Than Significant Impact	No Impact
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?				✓
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?				✓
k) Result in an increase in pollutant discharges to receiving waters? Consider water quality parameters such as temperature, dissolved oxygen, turbidity and other typical stormwater pollutants (e.g., heavy metals, pathogens, petroleum derivatives, synthetic organics, sediment, nutrients, oxygen-demanding substances, and trash)	✓			
l) Result in significant alteration of receiving water quality during or following construction?	✓			
m) Could the proposed project result in increased erosion downstream?	✓			
n) Result in increased impervious surfaces and associated increased runoff?	✓			
o) Create a significant adverse environmental impact to drainage patterns due to changes in runoff flow rates or volumes?	✓			
p) Be tributary to an already impaired water body, as listed on the Clean Water Act Section 303(d) list? If so, can it result in an increase in any pollutant for which the water body is already impaired?	✓			
q) Be tributary to other environmentally sensitive areas? If so, can it exacerbate already existing sensitive conditions?				✓

	Potentially Significant Impact	Potentially Significant Unless Mitigated	Less Than Significant Impact	No Impact
r) Have a potentially significant environmental impact on surface water quality to either marine, fresh, or wetland waters?	✓			
s) Have a potentially significant adverse impact on groundwater quality?	✓			
t) Cause or contribute to an exceeded applicable surface or groundwater receiving water quality objectives or degradation of beneficial uses?	✓			
u) Impact aquatic, wetland, or riparian habitat?	✓			
v) Would the project include new or retrofitted stormwater treatment control Best Management Practices?	✓			
4.10 LAND USE AND PLANNING. ***Would the project:***				
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?				✓
4.11 MINERAL RESOURCES. ***Would the project:***				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?				✓
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?				✓
4.12 NOISE. ***Would the project result in:***				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	✓			
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?	✓			

	Potentially Significant Impact	Potentially Significant Unless Mitigated	Less Than Significant Impact	No Impact
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?				✓
4.13 POPULATION AND HOUSING. ***Would the project:***				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	✓			
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?				✓
4.14 PUBLIC SERVICES.				
a) 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:				
i) Fire protection?	✓			
ii) Police protection?	✓			
iii) Schools?			✓	
iv) Parks?	✓			
v) Other public facilities?	✓			
4.15 RECREATION.				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	✓			

	Potentially Significant Impact	Potentially Significant Unless Mitigated	Less Than Significant Impact	No Impact
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?	✓			
4.16 TRANSPORTATION/TRAFFIC. ***Would the project:***				
a) Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?	✓			
b) Exceed, either individually or cumulatively, a level of service standard 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) Result in inadequate parking capacity?			✓	
g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?				✓
4.17 UTILITIES AND SERVICE SYSTEMS. ***Would the project:***				
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?	✓			

	Potentially Significant Impact	Potentially Significant Unless Mitigated	Less Than Significant Impact	No Impact
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?			✓	
4.18 MANDATORY FINDINGS OF SIGNIFICANCE.				
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 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?	✓			
4.19 EARLIER ANALYSES.				
Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, one or more effects have been adequately analyzed in an earlier EIR or negative declaration (Section 15063(c)(3)(D)). In this case the following earlier analyses and documents were used: • City of Cypress, 2001. Cypress General Plan. • City of Cypress, 2001. Cypress General Plan Environmental Impact Report. • City of Cypress, 2012.Amended and Restated Cypress Business and Professional Center Specific Plan. • City of Cypress, 1990. Cypress Business and Professional Center Environmental Impact Report.				

4.1 AESTHETICS.

Would the project:

a) Have a substantial adverse effect on a scenic vista?

No Impact. A scenic vista is defined as a viewpoint that provides expansive views of a highly valued landscape for the benefit of the general public. Aesthetic components of a scenic vista generally include (1) scenic quality, (2) sensitivity level, and (3) view access. Although the City of Cypress (City) does not provide a definition of scenic vistas, potential scenic vistas includes areas with views of the coastline, mountains, or other prominent scenic features that are considered significant visual resources for residents and businesses.

The City is almost entirely developed and neither the project site nor other properties in the project vicinity provide substantial views of any water bodies, mountains, hilltops, or any other significant visual resources. As such, the City has not designated any scenic corridors or scenic vistas within the City. The project site is located in a flat area and is surrounded by urban development, including the Los Alamitos Race Course to the north and east, hotel and commercial uses to the east, church uses to the west, and commercial, single-family residential, and multifamily residential uses to the south. In addition, the proposed project has a relatively low scale (i.e., the maximum height of the residential and commercial/retail structures are 30-40 feet) and would not block the view of any natural features. For these reasons, the development of proposed project would not have a substantial adverse effect on a scenic vista and such impact would be clearly insignificant and unlikely to occur. This topic will not be analyzed further in the Environmental Impact Report (EIR).

b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

No Impact. The project site is not located in the vicinity of a state scenic highway. According to the Caltrans California Scenic Highway Mapping System, the only State-designated Scenic Highway in the County is a 4-mile portion of SR-91 from State Route 55 (SR-55) to east of the Anaheim City limit. This portion of SR-91 is approximately 12.4 miles east of the project site. Therefore, the proposed project would not damage any scenic resources within a state scenic highway and the impact would be clearly insignificant and unlikely to occur. This topic will not be analyzed further in the EIR.

c) Substantially degrade the existing visual character or quality of the site and its surroundings?

Potentially Significant Impact. In its existing condition, the approximately 33-acre project site is vacant and includes ornamental trees and vegetation in an approximately 1.5-acre area along the southerly and southeasterly boundaries of the property. The proposed project includes the development of senior residences and commercial/retail uses that have the potential to change the visual character or the quality of the project site. Therefore, the EIR will further analyze the project's impact on the existing visual character of the project site and the surrounding area.

d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

Potentially Significant Impact. The proposed project includes the development of senior residences and commercial/retail uses on an existing vacant site, which would create additional sources of light and glare. As the proposed project would introduce new sources of light and glare into the area as compared to the existing conditions, the EIR will further describe project lighting and assess the potential light and glare effects associated with the proposed project.

4.2 AGRICULTURE RESOURCES.

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conversation as an optional model to use in assessing impacts on agriculture and farmland. Would the project:

a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

No Impact. The project site was previously part of the Cypress Golf Club, which permanently closed in 2004. Following the closure of the Golf Club, the golf course was demolished, and the site was re-graded and all vegetation was removed, except for some ornamental trees and vegetation along the southerly and southeasterly boundaries of the project site. According to the California Department of Conservation California Important Farmland Finder, the entire project site and surrounding area is designated as, "Urban and Built Up Land." Therefore, the development of the proposed project would not result in the conversion of any farmland and the impact would be clearly insignificant and unlikely to occur. This topic will not be analyzed further in the EIR.

b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?

No Impact. The project site is not designated for agriculture use in the Amended Specific Plan. The Williamson Act was established to encourage the conservation of farmland and certain open space uses by way of lower property taxes to landowners of such property. The project site is not subject to an existing Williamson Act contract. Therefore, the proposed project would not conflict with existing agricultural zoning or a Williamson Act contract~~,~~ and the impact would be clearly insignificant and unlikely to occur. This topic will not be analyzed further in the EIR.

c) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of farmland to non-agricultural use?

No Impact. As stated previously in response to the threshold question in 4.2(a), above, and as shown on Figure 2, Project Site and Surrounding Land Uses, there are no existing agricultural uses on the project site or on adjacent land uses. Therefore, development of the proposed project would not result in the conversion of on-site or adjacent farmland to non-agricultural use and impacts would be clearly insignificant and unlikely to occur. This topic will not be analyzed further in the EIR.

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:

a) Conflict with or obstruct implementation of the applicable air quality plan?

Potentially Significant Impact. The project site is located in the City of Cypress (City), which is located within the South Coast Air Basin (Basin). Air quality within the Basin is under the jurisdiction of the South Coast Air Quality Management District (SCAQMD). The SCAQMD has adopted its 2012 Air Quality Management Plan (AQMP), which contains policies and measures to achieve federal and State standards for improved air quality in the Basin. Due to the size and nature of the proposed project, air quality impacts during construction and operation of the proposed project have the potential to conflict with or obstruct the AQMP. Therefore, impacts related to compliance/conflict with SCAQMD policies and measures will be further evaluated in the EIR.

b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?

Potentially Significant Impact. The proposed project has the potential to result in significant short-term construction-related and long-term operational air quality impacts from both direct and indirect sources. A comprehensive air quality analysis pursuant to the SCAQMD and California Air Resources Board (ARB) requirements will be completed as part of the EIR, analyzing both the short-term and long-term air quality impacts of the proposed project. Therefore, further analysis in the EIR is required to determine the potential for the proposed project to violate or substantially contribute to a violation of an existing air quality standard.

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)?

Potentially Significant Impact. Development and site improvements associated with the proposed project would result in new indirect, direct, mobile, and stationary source emissions that could contribute to criteria pollutant emissions, in particular criteria pollutants that have been designated as non-attainment status for the Basin. The proposed project could potentially result in a cumulatively considerable net increase in regional non-attainment status criteria pollutants under applicable federal and State ambient air quality standards. Therefore, further analysis in the EIR is required.

d) Expose sensitive receptors to substantial pollutant concentrations?

Potentially Significant Impact. Sensitive populations, including children, senior citizens, and chronically/acutely ill individuals, are more susceptible to the effects of air pollution than the general population. Sensitive receptor land uses typically include residences, schools, playgrounds, childcare centers, hospitals, convalescent homes, and retirement homes. Implementation of the proposed project is anticipated to generate an increase in vehicle trips in the vicinity of the project site during construction and operation that could result in an increase in air pollution. Therefore, further analysis in the EIR is required to determine potential impacts to sensitive receptors.

e) Create objectionable odors affecting a substantial number of people?

Less Than Significant Impact. Construction of the proposed project may involve some equipment that could emit some objectionable odors; however, these vehicles and equipment-related odors would be temporary and insubstantial, and would cease after the construction of the proposed project is completed. In addition, the project site is not located directly adjacent to any residential neighborhood, so any temporary odor associated with construction activities would not affect a substantial number of people. Operation of the proposed project would involve activities typically associated with residential and commercial/retail uses, which generally do not result in objectionable odors that would affect adjacent receptors. Therefore, the proposed project would not create objectionable odors affecting a substantial number of people and the impact would be clearly insignificant and unlikely to occur. This topic will not be analyzed further in the EIR.

4.4 BIOLOGICAL RESOURCES.

Would the project:

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

No Impact. The project site is currently vacant and within an urbanized area of the City. The *Biological Technical Report for the Barton Place Project* was recently prepared for the proposed project that summarized the existing setting and analyzed the potential for impacts to biological resources. The report concludes that (1) there are no State or federally listed threatened or endangered plants or other special-status plants on the project site and no potential habitat that could support special-status plants, (2) there are no State or federally listed threatened or endangered animals or other special-status animals on the project site and no potential habitat that could support special-status animals and (3) the project site does not include any land designated as critical habitat by the United States Fish and Wildlife Service (USFWS). Therefore, the project would not have a substantial adverse effect on any such species and the impact would be clearly insignificant and unlikely to occur. This topic will not be further analyzed in the EIR.

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

No Impact. The project site is currently vacant, and was previously a portion of the former Cypress Golf Club (Figure 2, Project Site and Surrounding Land Uses). However, the Golf Club closed in 2004 and was subsequently re-graded to remove most of the topographical features and vegetation. In additional, the project site is periodically bladed to clear weeds. As set forth in the Biological Technical Report, the project site does not contain any riparian habitat or other sensitive natural communities. In addition, the Cypress General Plan EIR did not identify any riparian habitat or sensitive natural communities on the project site. As such, the project site has not been identified in local or regional plans, policies, or regulations or by the California Department of Fish and Wildlife (CDFW) or the USFWS as having riparian habitat or other sensitive natural communities. Therefore, the proposed project would have no impact on any riparian habitat or other sensitive natural community and the impact would be clearly insignificant and unlikely to occur. This topic will not be analyzed further in the EIR.

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?

No Impact. The project site is devoid of any vegetation or features that would be attributed to wetlands. The former golf course was re-graded and the project site is periodically bladed to clear weeds. As set forth in the Biological Technical Report, the project site and surrounding area do not contain any federally protected wetlands as defined by Section 404 of the Clean Water Act. Therefore, development of the project site would have no impact on federally protected wetlands, and the impact would be clearly insignificant and unlikely to occur. This topic will not be analyzed further in the EIR.

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?

Potentially Significant Impact. As set forth in the Biological Technical Report, no raptor or migrating bird nests were observed within the 1.5-acre ornamental vegetation area along the southerly and southeasterly boundaries of the project site in recent surveys. The proposed project would have no impact on the nests of raptors or other migratory birds if the existing trees in the ornamental vegetation area are removed outside the applicable avian nesting season (February 1-June 30 for raptors and February 1-August 31 for other migratory birds). In addition, no raptor nests were detected in any of the on-site ornamental trees or proximate offsite ornamental trees.

However, it is possible that, in the future, raptors or other migratory birds could establish nests in the ornamental trees prior to their removal. If and to the extent trees in which such future nests might be established were removed during applicable avian nesting bird season, that activity could potentially impact active raptor/migratory bird nests. Therefore, this topic will be analyzed in the EIR.

As also discussed in the Biological Technical Report, the project site is located within a fully urbanized area and is not within any local or regional wildlife corridor. Therefore, the proposed project exhibits no potential to disrupt wildlife corridors or in any way disrupt movement of native wildlife and the impact would therefore be clearly insignificant and unlikely to occur. This topic will not be analyzed further in the EIR.

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Less Than Significant Impact. As discussed in the Biological Technical Report, the ornamental vegetation area includes a variety of non-native ornamental trees, including blue gum eucalyptus, bottlebrush, Brazilian pepper, Mexican fan palm, European olive, lemon-scented gum trees, one myoporum, one rubber tree, one weeping fig, one black willow, one Chinese elm, one carrotwood tree and one white mulberry tree. These non-native trees, which would be removed as part of the proposed project, are all invasive species and are not considered significant biological resources.

Some of the ornamental trees are identified as "landmark trees" in Table 4 of the Amended Specific Plan, which was adopted by Cypress voters on June 5, 2012 and sets forth the zoning and development standards for the Project site. These trees are located in “Tree Survey Area 1” and “Tree Survey Area 2” as shown on Exhibit 21 in the Amended Specific Plan. Pursuant to Section VII.D.5 of the Amended Specific Plan, the removal of these trees is allowed, subject to (i) their replacement with an equivalent number of specimen trees (48” box or larger) that are incorporated into the landscaping treatment of the project site, in addition to normal tree planting requirements, and (ii) otherwise in compliance with the Amended Specific Plan and, with respect to the trees removed in Tree Survey Area 2, the City’s Tree Replacement Policy, as outlined in Sections 17-17 through 17-27 of the Cypress Municipal Code.

Therefore, the non-native, ornamental trees are not significant biological resources and, in any event, their removal would not conflict with any local policy or ordinance protecting biological resources, so that the proposed project’s impact would be clearly insignificant and unlikely to occur. This topic will not be analyzed further in the EIR.

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?

No Impact. As discussed in the Biological Technical Report, the project site is not located within any federal, State, regional or local habitat conservation plan (HCP) area or natural community conservation plan (NCCP) area, including the Orange County Habitat Conservation Plan/Natural Community Conservation Plan area. Therefore, the proposed project would not conflict with the provisions of a HCP or NCCP and the impact would be clearly insignificant and unlikely to occur. This topic will not be analyzed further in the EIR.

4.5 CULTURAL RESOURCES.

Would the project:

a) Cause a substantial adverse change in the significance of a historical resource defined in CEQA Guidelines Section 15064.5?

No Impact. The project site was previously part of the Cypress Golf Club, which permanently closed in 2004. Following the closure of the Golf Club, the golf course was demolished and the site was re-graded and all vegetation was removed, except for the ornamental trees and vegetation along the southerly and southeasterly boundaries of the project site (Figure 2, Project Site and Surrounding Land Uses). The project site is vacant and includes no structures. According to the Orange County Historical Landmarks List from the Office of Historic Preservation, there are no historic resources on the project site.

It is noted that the Cypress Business and Professional Center Environmental Impact Report (City of Cypress, 1990, pg. 103, 105) identified one structure with potential historical value, the Vessel House, which at the time was located in Planning Area 6 as designated in the Amended Specific Plan. However, the Vessel House was subsequently relocated to the Seacoast Grace Church property within Planning Area 8 for preservation and is currently used by Seacoast Grace Church as a chapel and meeting rooms. The Vessel House was never identified as an historical resource on any federal or local register of historic landmarks.

Therefore, the proposed project would not result in any impact on historical resources and impact would be clearly insignificant and unlikely to occur. This topic will not be analyzed further in the EIR.

b) Cause a substantial adverse change in the significance of an archaeological resource defined in CEQA Guidelines Section 15064.5?

No Impact. On January 6, 2015, a record search of all recorded archaeological and built-environment resources was conducted by the California State University, Fullerton, South Central Coast Information Center (SCCIC, 2015). SCCIC's determination letter concluded, based on the record search, that no known archaeological resources are located on the project site or within a ½-mile radius of the project site. In addition, the project site has been heavily disturbed by the prior grading and development of a portion of the former golf course and its subsequent demolition and removal. For these reasons, the proposed project would have no impact on a known archaeological resource and little potential for unknown archaeological resources to be encountered during site preparation activities.

However, if any unique archaeological resource is unexpectedly discovered during grading and construction activities associated with the project, the project applicant would be required to comply with the regulatory standards set forth in Section 21083.2 of the California Public Resources Code and Section 15064.5(c) of the State CEQA Guidelines, including a determination of whether any such potential unique archaeological resource will be preserved in place or left in an undisturbed state.

Due to the low potential that any unique archaeological resources are located on the project site, and because compliance with the regulatory standards in Section 21083.2 and Section 15064.5(c) would ensure appropriate treatment of any potential unique archaeological resources unexpectedly encountered during grading and excavation activities, the proposed project's impact on archaeological resources would be clearly insignificant and unlikely to occur. This topic will not be analyzed further in the EIR.

c) Directly or indirectly destroy a unique paleontological resource or site or unique geological feature?

No Impact. According to the *Geotechnical Investigation and Liquefaction Evaluation* and the City of Cypress General Plan EIR (City of Cypress, 2001, pg. 4.6-1), the project site stratigraphy consists of Artificial Fill (af) and Quaternary Alluvium (Qal), which is too young to exhibit significant paleontological resources or geological features. Therefore, the proposed project would have no impact on any unique paleontological resource or site or unique geological feature and the impact would be clearly insignificant and unlikely to occur. This topic will not be analyzed further in the EIR.

d) Disturb any human remains, including those interred outside of formal cemeteries?

No Impact. The January 6, 2015, records search undertaken at the SCCIC concluded that no known archaeological resources are located on the project site or within a ½-mile radius of the project site. In addition, the project site has been heavily disturbed by the prior grading and development of a portion of the former golf course and its subsequent demolition and removal. For these reasons, the proposed project would have no impact on any known human remains and, due to the level of past disturbance, it is not anticipated that human remains exist within the project site.

However, in the unlikely event that any human remains are unexpectedly encountered during earth removal or grading activities associated with the project, the project applicant would be required to comply with the regulatory standards set forth in Section 15064.5(e) of the State CEQA Guidelines, including the cessation of work and, if the remains are determined to be Native American, to contact the Native American Heritage Commission.

Due to the low potential that any human remains are located on the project site, and because compliance with the regulatory standards in Section 15064.5(e) would ensure appropriate treatment of any potential human remains unexpectedly encountered during grading and excavation activities, the proposed project's impact on human remains would be clearly insignificant and unlikely to occur. This topic will not be analyzed further in the EIR.

4.6 GEOLOGY AND SOILS.

Would the project:

a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.

No Impact. According to the California Department of Conservation 2010 Fault Activity Map, there are no known earthquake faults that run through the project site and there is no other evidence of a known fault that runs through the project site. Therefore, the proposed project would not result in any impact related to the rupture of a known earthquake fault and the impact would be clearly insignificant and unlikely to occur. This topic will not be analyzed further in the EIR.

ii) Strong seismic ground shaking?

Potentially Significant Impact. No known active faults traverse the project site. However, the project site is located in the seismically active region of Southern California, which is capable of generating moderate to large earthquakes within the project vicinity. Therefore, a preliminary geotechnical report will be conducted for the proposed project. Potential effects associated with seismic ground shaking will be evaluated further in the EIR, based on the analysis and conclusions in the preliminary geotechnical report.

iii) Seismic-related ground failure, including liquefaction?

Potentially Significant Impact. Liquefaction is a phenomenon in which water-saturated granular soil loses shear strength and behaves like a fluid during strong ground shaking produced by earthquakes. The loss of soil strength occurs when cyclic pore water pressure increases below the groundwater surface. Potential hazards due to liquefaction include the loss of bearing strength beneath structures, possibly causing foundation failure and/or significant settlements. As identified by the State of California Division of Mines and Geology, the project site is located in a required investigation zone for liquefaction potential (Seismic Hazards Map, Los Alamitos Quadrangle, 1999). Therefore, the preliminary geotechnical report for the proposed project will evaluate potential effects resulting from seismic-related ground failure, including liquefaction will be analyzed further in the EIR.

iv) Landslides?

Less Than Significant Impact. The project site and surrounding vicinity are relatively flat (Figure 2 Project Site and Surrounding Land Uses). In addition, no landslides have previously been recorded within the City's boundaries (City of Cypress, 2001, pg. 9). Therefore, the proposed project's impact associated with landslides would be clearly insignificant and unlikely to occur. This topic will not be analyzed further in the EIR.

b) Result in substantial soil erosion or the loss of topsoil?

Less Than Significant Impact. The project site is currently vacant, and is underlain by Bolsa Series soils, as identified in the United States Soil Conservation Service (Soil Survey of Orange County and Western Part of Riverside County Exhibit 4.6-1, Soils Map, Cypress General Plan EIR). The Bolsa Series consists of somewhat poorly drained soils on alluvial fans. The stratigraphy of the project site includes Artificial Fill (af) across the majority of the project site as a result of the previous golf course use. The project site is also underlain with Quaternary Alluvium (Qal), which consists of deposits of silty clays, sands, silty sands, sandy silts, and clayey silts. These soils are not known to be susceptible to erosion and are suitable for development. Implementation of the proposed project would require grading for construction of improvements, including buildings, roadways~~,~~ and parking lots. Any soil erosion as a result of grading and construction would be subject to City codes and requirements for erosion control, grading, and soil remediation, as well as the requirements established by the National Pollutant Discharge Elimination Systems (NPDES) and under Storm Water Pollution Prevention Plan (SWPPP) rules. After completion of the proposed project, the majority of the project site would be covered by impervious surfaces, including buildings, roadway~~/~~ and parking areas. With compliance of the applicable regulatory standards, the project's impact with respect to soil erosion and loss of topsoil would be clearly insignificant and unlikely to occur. This topic will not be evaluated further in the EIR.

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?

Potentially Significant Impact. As discussed in Response 4.6(a)(iii), the potential for hazards related to liquefaction exists in this area. As stated in Response 4.6 (iv), the potential for landslides is low for the project site and surrounding area, but the project's potential impacts related to unstable soil, lateral spreading, subsidence, or collapse are currently unknown, and will therefore be evaluated in the preliminary geotechnical report and the EIR.

d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?

Less Than Significant Impact. Expansive soils are soils that experience volumetric changes in response to increases or decreases in moisture content. The project site stratigraphy consists of Artificial Fill (af) and Quaternary Alluvium (Qal) (Southern California Geotechnical, 2012) (City of Cypress, 2001, pg. 4.6-1), These soil types have low shrink-swell potential and, therefore, are not susceptible to expansion. In the event that, following the completion of grading, it is determined that near-surface soils within building pad areas exhibit an elevated expansion potential, potential impact of those expansive soils would be addressed through design of structural foundations and floor slabs in compliance with applicable requirements in the California Building Code, as adopted by the City of Cypress in its Municipal Code.

Since the potential for expansive soils is low and any potential expansion would be addressed through compliance with applicable code requirements, the proposed project would not create substantial potential risks to life or property and the impact would be clearly insignificant and unlikely to occur. This topic will not be analyzed further in the EIR.

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?

No Impact. The proposed project would not include the use of septic tanks or alternative wastewater disposal systems because sanitary sewer and wastewater facilities are available in the vicinity of the project site. Therefore, the project would have no impact with respect to septic tanks or alternative wastewater disposal systems and the impact would be clearly insignificant and unlikely to occur. This topic will not be analyzed further in the EIR.

4.7 GREENHOUSE GASES.

Would the project:

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

Potentially Significant Impact. The proposed project consists of a senior residential community and commercial/retail improvements that would generate both direct and indirect greenhouse gas (GHG) emissions. Therefore, further analysis in the EIR is required to determine the potential impacts associated with GHG emissions.

b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

Potentially Significant Impact. While the City does not have an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs, there are other applicable State or regional plans, such as the ARB Scoping Plan or other Assembly Bill (AB) 32 implementation guidance that would be reviewed for project consistency or conflicts. Therefore, further analysis in the EIR is required to determine the potential impacts associated with GHG emissions.

4.8 HAZARDS AND HAZARDOUS MATERIALS.

Would the project:

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Less Than Significant Impact. The construction and operation of the proposed project would involve the use of limited amounts of potentially hazardous materials, including solvents, paints, fuels, oils, and transmission fluids. However, all materials used during construction would be contained, stored, and handled in compliance with applicable standards and regulations established by the Department of Toxic Substances Control (DTSC), the United States Environmental Protection Agency (EPA), and the Occupational Safety and Health Administration (OSHA). Project operation would involve the use of common materials associated with commercial and residential uses (e.g., cleaning products, fertilizers, pesticides, and herbicides, etc.) that could be potentially hazardous if handled improperly or ingested. However, these products are not considered acutely hazardous and are generally considered safe for use. All storage, handling, and disposal of hazardous materials during project construction and operation would comply with applicable laws and regulations. In addition, the proposed senior residential and limited commercial uses would not generate substantial amounts of any hazardous materials. Therefore, the proposed project would have a less than significant impact associated with the routine transport, use, or disposal of hazardous materials and the impact would be clearly insignificant and unlikely to occur. This topic will not be analyzed further in the EIR.

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?

Less Than Significant Impact. As previously stated, the construction and operation of the proposed project would involve the use of potentially hazardous materials, including solvents, paints, fuels, oils, and transmission fluids. Project operation would involve the limited use of hazardous materials typical of residential and commercial uses. All storage, handling and disposal of hazardous materials during project construction and operation would be in compliance with applicable standards and regulations. Therefore, the proposed project would not result in a significant hazard to the public or the environment through a reasonably foreseeable upset or accident condition related to the release of hazardous materials, and the impact would be clearly insignificant and unlikely to occur. This topic will not be analyzed further in the EIR.

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

Less Than Significant Impact. Mayflower Pre-School, Los Alamitos Elementary School, and McAuliffe Middle School are the closest schools to the project site, and are located west of, and more than one-quarter-mile from, the project site at distances of approximately 0.58 miles, 0.66 miles, and 0.68 miles, respectively. In addition, as previously stated, the proposed project would not result in a significant hazard affecting the public during project construction and operation. Furthermore, any use of hazardous materials would be limited and handled, stored, and disposed of in accordance with applicable laws and regulations. Therefore, the proposed project would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances or waste within one-quarter-mile of an existing or proposed school, and the impact would be clearly insignificant and unlikely to occur. This topic will not be analyzed further in the EIR.

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?

No Impact. On April 18, 2014, a site inspection was conducted as part of a Phase I Environmental Site Assessment (Phase I ESA) with respect to the project site, and no recognized environmental conditions were identified on the project site. In addition, no evidence of hazardous substances was observed on the project site. As discussed in the Environmental Data Resources, Inc. (EDR) database report included in the Phase I ESA, the project site is not located on a federal superfund site, State response site, voluntary clean-up site, school clean-up site, corrective action site, or tiered permit site. In addition, the project site is not included on the California Department of Toxic Substance Control Site Cleanup list (Cortese List). Therefore, the project site is not included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and the impact would be clearly insignificant and unlikely to occur. This topic will not be analyzed further in the EIR.

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?

No Impact. The project site is located approximately 0.27 mile north of the Los Alamitos Joint Forces Training Base (JFTB). However, the project site is not located within the area governed by Airport Environs Land Use Plan (AELUP) for the JFTB. The Planning Area for the JFTB in the AELUP includes all area that lies above or penetrates the 100:1 Imaginary Surface, which is graphically shown in Appendix D to the AELUP, as well as Exhibit SAF-7 in the Safety Element of the Cypress General Plan (City of Cypress. General Plan, Exhibit SAF-7, 1995).

As Exhibit SAF-7 in the Safety Element illustrates, the project site does not appear to be located within the area where the construction of improvements potentially requires notification to the Federal Aviation Administration (FAA). Moreover, even if a small portion of the northeast corner of the project site is located within the "+40" area shown on Exhibit SAF-7, none of the proposed residential improvements would be located in the actual notification area. (City of Cypress, General Plan, Exhibit SAF-7, 1995). Based on the mathematical formula in Exhibit SAF-7, given that the highest ground elevation proposed on the northeastern portion of the project site is approximately 35 feet, the maximum allowable structure height without requiring notification to the FAA is 40 feet ([40 +35] - 35). Since the maximum height of the proposed residential buildings would be 30 feet, none of the proposed improvements would penetrate the 100:1 Imaginary Surface.

The Safety Element also includes Exhibit SAF-9 (Building Site Restrictions, 50 to 1 Clearance Surface), which potentially requires notification to the FAA where proposed improvements would penetrate the 50:1 Imaginary Surface. (City of Cypress. General Plan, Exhibit SAF-9, 1995). However, in accordance with Part 77.9 of the Federal Aviation Regulations, the potential notification requirement with respect to the 50:1 Imaginary Surface only applies to airports that have no runways that exceed 3,200 feet in length (in comparison, the potential notification requirement for the 100:1 Imaginary Surface applies to airports with at least one runway that exceeds 3,200 feet in length). The two runways at the JFTB substantially exceed 3,200 feet in length, so that the potential notification requirement relating to the 100:1 Imaginary Surface, and not the 50:1 Imaginary Surface, applies with respect to the JFTB. This is consistent with the AELUP, which states, as previously discussed, that the Planning Area for the JFTB are based on the 100:1 Imaginary Surface.

Even if the 50:1 imaginary surface shown in Exhibit SAF-9 could be applied to the JFTB, the project site does not appear to be located within the area where the construction of improvements potentially requires notification to the FAA. Moreover, even if a small portion of the northeast corner of the project site is located within the “+150” area shown on Exhibit SAF-9, none of the proposed residential improvements would be located in the actual notification area. Based on the mathematical formula in Exhibit SAF-9, given that the highest ground elevation proposed on the northeastern portion of the project site is approximately 35 feet, the maximum allowable structure height without requiring notification to the FAA is 150 feet ([150+35]-35). Since the maximum height of the proposed residential buildings would be 30 feet, none of the proposed improvements would penetrate the 50:1 Imaginary Surface.

Therefore, the project site is not located within the JTFB Planning Area in the AELUP. The project site is also not located within 2 miles of a public airport or public use airport. The nearest public airports are the Long Beach Airport and the Fullerton Municipal Airport, located approximately 5 miles west and 6 miles northeast of the project site, respectively.

For these reasons, the proposed project would not be located within an airport land use plan or within 2 miles of a public airport or public use airport and the impact would be clearly insignificant and unlikely to occur. This topic will not be analyzed further in the EIR.

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?

No Impact. The project site is not located within 2 miles of a private airstrip. There are no private airstrips located in the City of Cypress or in the vicinity of the project site. Therefore, no hazardous impacts related to the project site's proximity to a private airstrip would occur and this impact would be clearly insignificant and unlikely to occur. This topic will not be analyzed further in the EIR.

g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Less Than Significant Impact. As set forth in the Safety Element of the Cypress General Plan, the Cypress Disaster Plan serves as the Community's Emergency Operations Plan (EOP). This plan serves to identify and guide emergency response personnel in emergency situations related to natural disasters, technological incidents, and nuclear defense operations. Pursuant to the Safety Element, Ball Road and Valley View Street are designated evacuation routes in the event of a major emergency. These evacuation routes are located approximately 0.7 mile north and 1.2 miles east of the project site, respectively. The proposed project does not include any improvements to Ball Road or Valley View Street, and~~,~~ therefore~~,~~ would not interfere with the ability of these streets to serve as an emergency evacuation route.

The proposed project would not interfere with the ability of emergency personnel to serve or access the project site in the event of an emergency situation. Development plans for the proposed project would be reviewed and approved by the City and Orange County Fire Authority (OCFA) to ensure that the adequate emergency access is provided. The proposed project site would not interfere with designated evacuation routes and would not impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan.

For these reasons, the project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan, and the impact would be clearly insignificant and unlikely to occur. This topic will not be analyzed further in the EIR.

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?

No Impact. The project site is located in an urbanized area where wildfire is not considered a material risk to people or structures (Figure 1). Therefore, the proposed project would not expose people or structures to a significant risk of loss, injury, or death from wildland fires and the impact would be clearly insignificant and unlikely to occur. This topic will not be analyzed further in the EIR.

4.9 HYDROLOGY AND WATER QUALITY.

Would the project:

a) Violate any water quality standards or waste discharge requirements?

Potentially Significant Impact. The development of the proposed project would cause soil disturbance and increase impervious area, which can potentially lead to pollutant loading and storm water runoff. Therefore, the proposed project has the potential to degrade water quality without appropriate mitigation or project design features. Construction activities would be required to comply with the General Permit for Discharges of Storm Water Associated with Construction Activity, Construction General Permit Order 2009-0009-DWQ.

The proposed project is considered a Priority Project pursuant to the City's Local Implementation Plan and, therefore, a Water Quality Management Plan (WQMP) will be required. The WQMP will evaluate potential effects on water quality and identify low impact development storm water retention and treatment strategies and appropriate hydromodification to address potential effects to water quality. This topic will be evaluated further in the EIR.

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)?

Potentially Significant Impact. The project site is located within the western portion of the Orange County Groundwater Basin (SCS Engineers, 2014). Currently, groundwater levels on the project site occur at approximately 8 to 12 feet below ground surface (Fuscoe Engineering, 2014). The development of the proposed senior residential community and commercial/retail improvements on the currently vacant site would increase impervious surfaces on the project site and reduce infiltration. In addition, grading activities might extend to the depth at which groundwater could be encountered. The effect of the proposed project on groundwater will be evaluated as part of the EIR.

c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?

Potentially Significant Impact. No streams or rivers are located on or in the vicinity of the project site. However, the proposed project includes the development of a senior residential community and commercial/retail improvements, which would require the alteration of the project site's drainage pattern. Therefore, further analysis in the EIR is required to determine the potential significance of the project's impact on the existing drainage pattern of the project site and its potential for 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?

Potentially Significant Impact. As discussed in Response 4.9(a), the amount of impervious area will be increased by the proposed project. The proposed project's impact on drainage patterns and stormwater runoff will be evaluated in the EIR.

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?

Potentially Significant Impact. As stated in Response 4.9(a), the proposed project would increase impervious surfaces on the project site and potentially increase stormwater runoff. This impact will be evaluated in the EIR.

f) Otherwise substantially degrade water quality?

Potentially Significant Impact. The development of the proposed project would result in potential changes to surface water quality associated with pollutants entering the storm drain system. As discussed in Response 4.9(a), the WQMP will analyze potential pollutants and/or contaminant concentrations associated with storm water runoff from the project site and identify appropriate methods to address water quality effects. Water quality effects will be evaluated further in the EIR.

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?

No Impact. According to Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (Map Number 06059C0116J, December 3, 2009), the project site is located within Flood Zone X. By definition, areas within Flood Zone X are considered to be outside the 1-percent risk of annual flooding. Therefore, the project would not place housing within a 100-year flood hazard area and the impact would be clearly insignificant and unlikely to occur. This topic will not be analyzed further in the EIR.

h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?

No Impact. As discussed in Response 4.9(g), the project site is not located in a 100-year flood hazard area. Therefore, the project would not place structures within a 100-year flood hazard area that would impede or redirect flood flows and the impact would be clearly insignificant and unlikely to occur. This topic will not be analyzed further in the EIR.

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?

No Impact. As stated on page 4.7-2 of the Cypress General Plan Environmental Impact Report flood threats to Cypress are posed by 500-year floods and upstream failures from the Prado, Carbon Canyon or Whittier Narrows Dams (City of Cypress, 2001, pg.4.7-2). However, the potential for these threats is remote and, in any event, the City's emergency evacuation plans would be implemented if any of those dams were susceptible to rupture during heavy rains or other events.

In the event of a flood, the six storm drain channels within the area would provide sufficient protection throughout the City of Cypress. The major storm drain facility in the project area is the Bolsa Chica Channel, which runs adjacent to Valley View Street, extending southwest from south of Katella Avenue, through the Warland/Cypress Business Center. This Channel empties into Huntington Harbor, approximately 5.6 mi southwest of the Amended Specific Plan area.

For these reasons, the proposed project would not expose people or structures to a significant risk of loss, injury, or death involving flooding and the impact would be clearly insignificant and unlikely to occur. This topic will not be analyzed further in the EIR.

j) Inundation by seiche, tsunami, or mudflow?

No Impact. The Pacific Ocean is 7.5 miles southwest of the project site, and there are no enclosed bodies of water nearby that would be a potential risk for seiche at the project site. A tsunami is considered a rare event and, according to the California Department of Conservation Tsunami Inundation Map for the Los Alamitos/Long Beach Quadrangle, the project site is not located within a Tsunami Inundation Area. In addition, the project site is located within a relatively flat and urbanized area. As such, the risk from mudflow would be minimal. Furthermore, the Safety Element of the Cypress General plan has not identified seiche, tsunami~~,~~ or mudflow as a key safety risk. Therefore, no impacts relating to inundation from seiche, tsunami, or mudflow are anticipated, and the impacts would be clearly insignificant and unlikely to occur. This topic will not be analyzed further in the EIR.

k) Result in an increase in pollutant discharges to receiving waters? Consider water quality parameters such as temperature, dissolved oxygen, turbidity and other typical stormwater pollutants (e.g., heavy metals, pathogens, petroleum derivatives, synthetic organics, sediments, nutrients, oxygen-demanding substances, and trash)

Potentially Significant Impact. The development of the proposed project could increase the potential for pollutants (e.g., fuels and oils from parked cars, and fertilizers, etc.) to be transported downstream into impaired water bodies, such as Los Alamitos Channel, Coyote Creek, San Gabriel River, and San Pedro Bay Near/ Offshore Zones (Fuscoe Engineering, 2015, pg. 10). Water quality effects on downstream waters will be evaluated further in the EIR.

l) Result in significant alteration of receiving water quality during or following construction?

Potentially Significant Impact. Refer to Response 4.9(c) regarding potential project effects on water quality. Potential water quality impacts will be addressed in the EIR.

m) Could the proposed project result in increased erosion downstream?

Potentially Significant Impact. Refer to Response 4.9(a). The potential for increasing downstream erosion will be evaluated further in the EIR.

n) Result in increased impervious surfaces and associated increased runoff?

Potentially Significant Impact. As described in Response 4.9(a), the development of the proposed project would increase impervious surfaces and potentially increase runoff from the project site. This potential impact will be evaluated in the EIR.

o) Create a significant adverse environmental impact to drainage patterns due to changes in runoff flow rates or volumes?

Potentially Significant Impact. As discussed in Responses 4.9(a), 4.9(c), 4.9(d) and 4.9(e), the proposed project would increase impervious surfaces, alter existing drainage conditions at the project site and potentially increase stormwater runoff. Potential impacts associated with the impact to drainage patterns due to changes in runoff flow rates or volumes will be evaluated further in the EIR.

p) Be tributary to an already impaired water body, as listed on the Clean Water Act Section 303d list? If so, can it result in an increase in any pollutant for which the water body is already impaired?

Potentially Significant Impact. The Los Alamitos Channel, Coyote Creek, San Gabriel River, and San Pedro Bay Near/Offshore Zones are all listed as Section 303(d) water bodies and are located within the same watershed as the project site (County of Los Angeles Public Works, 2007). However, it is presently unknown if runoff from the project site would be tributary to an already impaired water body identified on the Section 303(d) list. Potential impacts associated with Section 303(d) water bodies will be evaluated in the EIR.

q) Be tributary to other environmentally sensitive areas? If so, can it exacerbate already existing sensitive conditions?

No Impact. The project site does not contain any designated environmentally sensitive areas. In addition, runoff from the project site is not tributary to Areas of Special Biological Significance, as designated by the State Water Resources Control Board(Fuscoe Engineering, 2015). Therefore, the proposed project's impact with respect to environmentally sensitive areas would be clearly insignificant and unlikely to occur. This topic will not be evaluated further in the EIR.

r) Have a potentially significant environmental impact on surface water quality on either marine, fresh, or wetland waters?

Potentially Significant Impact. It has not been determined if runoff from the project site would have an impact on surface water quality with respect to marine, fresh or wetland waters. Therefore, this potential impact on surface water quality will be evaluated in the EIR.

s) Have a potentially significant adverse impact on groundwater quality?

Potentially Significant Impact. Refer to Response 4.9(b) regarding the proposed project's potential to affect groundwater and groundwater quality. This potential environmental impact will be evaluated in the EIR.

t) Cause or contribute to an exceeded applicable surface or groundwater receiving water quality objectives or degradation of beneficial uses?

Potentially Significant Impact. As discussed in Response 4.9(a), the proposed project would increase impervious area and potentially introduce new sources of water contaminants that could affect water quality objectives or degrade beneficial uses. This potential impact will be evaluated in the EIR.

u) Impact aquatic, wetland, or riparian habitat?

Potentially Significant Impact. As described in Response 4.4(c), there are no aquatic wetland or riparian habitats on the project site. Potential off-site water quality impacts on aquatic, wetlands or riparian habitats will be evaluated in the EIR.

v) Would the project include new or retrofitted stormwater treatment control Best Management Practices?

Potentially Significant Impact. As described in Response 4.9(a), the proposed project would increase impervious surfaces and alter existing drainage conditions at the project site. A WQMP will be prepared for the proposed project that identifies appropriate BMPs with respect to project design, construction and operation. This potential impact will be evaluated in the EIR

4.10 LAND USE PLANNING.

Would the project:

a) Physically divide an established community?

No Impact. The City of Cypress and the adjacent City of Los Alamitos are located in largely developed areas. The project site is currently vacant, but was previously developed as part of the Cypress Golf Club. There is no established community within the area governed by the Specific Plan. To the north of the project site is a portion of the Los Alamitos Race Course that includes one-story horse barns that are occupied by quarter and thoroughbred horses and associated equipment. To the east of the project site is a surface parking area for the Los Alamitos Race Course, a small two-story church, and a four-story Residence Inn Hotel. To the south, on the far side of Katella Avenue, are commercial and multifamily uses, behind which are single-family residences, all located in the City of Los Alamitos. To the west is Enterprise Drive, with the Cottonwood Church campus beyond. Although there are residential dwelling units located the general vicinity of the project site, none of these homes would be physically divided by project development. Therefore, the proposed project would not physically divide an established community and this impact would be clearly insignificant and unlikely to occur. This topic will not be analyzed further in the EIR.

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?

Less Than Significant Impact. The primary planning documents regulating land use for the project site are the Cypress General Plan, the Amended Specific Plan, and the Cypress Zoning Ordinance~~,~~. The land use designation for the project site in the Land Use Element of the General Plan is "Specific Plan", and the General Plan references and describes the Amended Specific Plan and the various Planning Areas, including Planning Area 9. The Amended Specific Plan implements the General Plan goals and policies and is in conformance with the General Plan.

As previously discussed, the Amended Specific Plan was amended by the voters of Cypress in 2012 to create Planning Area 9 and permit senior housing and a variety of commercial/retail uses within that Planning Area. The proposed project is consistent with the Amended Specific Plan, subject to obtaining the permits and approvals identified in Chapter 2.0 above, from the City in accordance with the Amended Specific Plan and the City's Zoning Ordinance and Subdivision Ordinance.

The project applicant may also be required to obtain permits or approvals from other governmental agencies to proceed with the proposed project, and compliance with the plans, policies and regulations of those agencies will be required to obtain such permits and approvals.

With the foregoing permits and approvals, the proposed project would comply with the applicable requirements in the Amended Specific Plan, Zoning Ordinance and Subdivision Ordinance. Therefore, the proposed project would not conflict with any land use plan, policy, or regulation or regulation of an agency with jurisdiction over the project and the impact would be clearly insignificant and unlikely to occur. This topic will not be analyzed further in the EIR.

c) Conflict with any applicable habitat conservation plan or natural community conservation plan?

No Impact. As discussed in Response 4.4(f), the project site is not located in a habitat conservation plan area or natural community conservation plan area. Therefore, the proposed project would not conflict with any such plan and the impact would be clearly insignificant and unlikely to occur. This topic will not be analyzed further in the EIR.

4.11 MINERAL RESOURCES.

Would the project:

a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

No Impact. As discussed in the Conservation/Open Space/Recreation Element of the Cypress General Plan, no mineral resources have been identified anywhere in the City (Cypress General Plan, 2001, pg. COSR-6). Therefore, the development of the proposed project would not affect the availability of a known mineral resource, and the impact would be clearly insignificant and unlikely to occur. This topic will not be analyzed further in the EIR.

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?

No Impact. As set forth in the Conservation/Open Space/Recreation Element, no mineral resources have been identified anywhere in the City and the project site has not been designated as a locally important resource recovery site.[1] Therefore, the proposed project would not result in the loss of a locally important mineral resource recovery site, and the impact would be clearly insignificant and unlikely to occur. This topic will not be evaluated in the EIR.

4.12 NOISE.

Would the project result in:

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Potentially Significant Impact. Construction and operation of the proposed project may generate noise levels that would potentially exceed standards established in the Cypress General Plan or noise ordinance, or applicable standards of other agencies. The EIR will evaluate the proposed project's potential noise impacts.

b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

[1] City of Cypress General Plan, Conservation/Open Space/Recreation Element. 2001. Page 6.

Potentially Significant Impact. Although operation of the proposed project would not result in groundborne vibration, construction of the proposed project would require earthwork and grading, which could cause potential vibration impacts. The EIR will evaluate the proposed project's potential vibration impacts.

c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

Potentially Significant Impact. The proposed project includes a senior residential community and commercial/retail improvements on the currently undeveloped project site. Therefore, the proposed project would increase ambient noise levels in the project vicinity. The EIR will evaluate the proposed project's potential impacts related to increased ambient noise levels.

d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

Potentially Significant Impact. The construction of the proposed project may generate elevated temporary or periodic increases in ambient noise levels. The EIR will evaluate the proposed project's potential impacts related to increased temporary ambient noise levels.

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?

No Impact. The JFTB is located approximately 0.27 mile south of the project site in the City of Los Alamitos. As shown on Exhibit SAF-8 in the Safety Element of the Cypress General Plan, the project site is not located within the 60 dB CNEL Contour for the JFTB (which is described in Exhibit SAF-8 as an "Impact Zone"). Therefore, the development of the proposed project would not expose people residing or working in the project area to excessive or high noise impact levels and this impact would be clearly insignificant and unlikely to occur. This topic will not be analyzed further in the EIR.

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?

No Impact. Refer to Response 4.8(f). The project site is not located within the vicinity of a private airstrip. Therefore, this impact would be clearly insignificant and unlikely to occur. This topic will not be evaluated in the EIR.

4.13 POPULATION AND HOUSING.

Would the project:

a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

Potentially Significant Impact., The proposed project would increase the number of residents and jobs in the City. The EIR will evaluate potential population growth.

b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?

No Impact. The project site is vacant. Therefore, the proposed project would not displace any existing housing and this impact would be clearly insignificant and unlikely to occur. This topic will not be analyzed further in the EIR.

c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?

No Impact. The project site is vacant. Therefore, the proposed project would not displace any people and the impact would be clearly insignificant and unlikely to occur. This topic will not be analyzed further in the EIR.

4.14 PUBLIC SERVICES.

Would the project:

a) 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:

i) Fire protection?

Potentially Significant Impact. Fire protection services are provided to the City through a contract with the Orange County Fire Authority (OCFA). The proposed project includes the development of a senior residential community and commercial/retail improvements that would generate additional demand for fire protection services. The proposed project's potential impact on fire protection services will be evaluated in the EIR.

ii) Police Protection?

Potentially Significant Impact. Police protection services are provided to the City through its Police Department (CPD). The proposed project includes the development of a senior residential community and commercial/retail improvements that would generate additional demand for police protection services. The proposed project's potential impact on police services will be evaluated in the EIR.

iii) Schools?

Less Than Significant Impact. The proposed senior residential community would not include a school-age population. Employment generated by the commercial element of the proposed project could cause a limited number of employees relocating to the City, resulting in a limited increase of students within the Cypress and/or Los Alamitos School Districts. Therefore, the impact of the proposed project on schools would be clearly insignificant and unlikely to occur. Moreover, the project applicant will be required to pay school fees to the Cypress and/or Los Alamitos School Districts as required pursuant to Section 65995 et seq. of the California Government Code, and the payment of such school fees would constitute full and complete mitigation for any potential impact to school facilities. This topic will not be analyzed further in the EIR.

iv) Parks?

Potentially Significant Impact. The City requires new residential development to pay fees for the purposes of providing park and recreation facilities in accordance with Cypress Municipal Code Chapter 25, Subdivisions, Article 6, Parks and Recreational Facilities, Section 25-41, Provision of Park and Recreational Facilities. Additionally, the proposed project would include an amenity center to be located on approximately 1 acre of common area and would include a community club house. Additional amenities may include a pool, spa, outdoor fire place, barbeque, and gathering areas. However, because the proposed project could potentially increase the use of parks, further analysis in the EIR is required to determine the potential impacts on parks.

v) Other public facilities?

Potentially Significant Impact. The degree to which population growth associated with the proposed project could incrementally increase demand for library facilities, community centers and senior centers has not been determined. Further analysis in the EIR is required to determine the potential impact on these public facilities.

4.15 RECREATION.

Would the project:

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?

Potentially Significant Impact. Implementation of the proposed project could increase the use of park facilities located within the City. The increase in residential units and population is consistent with the growth projections in the Cypress General Plan, and no additional impacts beyond those identified in the Cypress General Plan EIR would occur with implementation of the proposed project. Therefore, the population increase associated with the proposed project would not substantially impact the use of the City's existing parks and/or other recreational facilities. Also, the proposed project has its own recreational facilities. Additionally, the proposed project would be required to pay fees for the purpose of providing park and recreation facilities in accordance with Cypress Municipal Code Chapter 25, Subdivisions, Article 6, Parks and Recreational Facilities, Section 25-41, Provision of Park and Recreational Facilities. Thus, while the proposed project could slightly increase City residents the proposed project provides its own amenities and will pay applicable fees. However, because the proposed project could increase the use of parks or other recreational facilities, further analysis in the EIR is required to determine the potential impacts on parks and other recreational facilities.

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?

Potentially Significant Impact. The proposed senior residential community includes an amenity center in an approximately 1-acre common area that would include a community clubhouse, pool, spa, outdoor fireplace, and barbeque and gathering areas. The impacts associated with the construction and operation of the amenity center will be evaluated in the EIR as part of the proposed project.

4.16 TRANSPORTATION/TRAFFIC.

Would the project:

a) Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?

Potentially Significant Impact. The development of the proposed project would cause an increase in traffic in relation to the existing traffic load and capacity of the street system within the project area. A Traffic Impact Analysis (TIA) will be prepared that evaluates the proposed project's impact on existing traffic levels and roadway capacity–and the EIR will incorporate the analysis and conclusions in the TIA.

b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?

Potentially Significant Impact. As discussed in Response 4.16(a), the proposed project would increase vehicle trips at intersections in the project vicinity. The TIA will evaluate the proposed project's impact on those intersections and the EIR will incorporate the analysis and conclusions in the TIA.

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?

No Impact. The JFTB is the only airport in proximity to the project site, at a distance of approximately 0.27 mile to the south. However, as discussed in Response 4.8(e), based on the notification procedure with respect to structure heights in the vicinity of the JFTB, the proposed project does not include any structures that would potentially interfere with air traffic patterns relating to the JFTB. In addition, the senior residential uses associated with the proposed project would not increase aviation traffic at THE JFTB or materially increase aviation traffic at other airports. Therefore, the proposed project would not result in a change in air traffic patterns and the impact would be clearly insignificant and unlikely to occur. This topic will not be analyzed further in the EIR.

d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

No Impact. The proposed project does not include any design features that would increase a hazard. The onsite access, circulation and parking for the senior residential community and commercial/retail area are typical for these types of uses and would not create or increase a hazard. In addition, as previously discussed in Response 4.8(e), none of the low-scale buildings associated with the proposed project would interfere with military overflights associated with the JFTB.

Similarly, the proposed project does not include any incompatible uses that would increase a hazard risk. The proposed senior residential and commercial/retail uses are consistent with the existing residential and commercial/retail uses in the area.

For these reasons, the proposed project would not substantially increase hazards due to a design feature or incompatible uses and the impact would be clearly insignificant and unlikely to occur. Moreover, the proposed project will be required to comply with all relevant City design standards to ensure that it does not include any design feature that would result in a substantially increased hazard. This topic will not be analyzed further in the EIR.

e) Result in inadequate emergency access?

Less Than Significant Impact. As discussed in Response 4.8(g), the proposed project would be designed with adequate emergency access that would be subject to review and approval by the City and the OCFA. The proposed project would have two vehicle access points to the senior residential community and three vehicle access points to the commercial/retail area. Vehicular access to the senior community would be located along Enterprise Drive. The southerly senior residential access point would be dedicated for emergency access only. Access to the commercial/retail area would be maintained through two vehicular access points along Katella Avenue and one vehicular access point on Enterprise Drive. All access points and circulation would be required to comply with City and OCFA requirements. Therefore, the proposed project would have adequate emergency access and this impact would be clearly insignificant and unlikely to occur. this topic will not be analyzed further in the EIR.

f) Result in inadequate parking capacity?

Less Than Significant Impact. The proposed project includes parking spaces for the senior residential and commercial/retail uses that exceed the number of parking required under the Amended Specific Plan. With respect to the senior residential community, the Amended Specific Plan requires one parking space per residential dwelling unit and one uncovered guest space per 20 dwelling units. Based on these requirements, 244 spaces for residents and 13 guest spaces would be required, for a total of 257 parking spaces. In comparison, the proposed project includes 488 garage spaces for residents and 78 open spaces for guests, for a total of 566 parking spaces. Therefore, the proposed project includes a sufficient number of parking spaces for the senior residential community to comply with the applicable parking requirements in the Amended Specific Plan.

With respect to the approximately 50,000 square feet of proposed commercial/retail uses the Amended Specific Plan requires 277 parking spaces. As shown on the conceptual site plan (Figure 3), the proposed project includes a total of approximately 277 parking spaces for the commercial/retail uses. Therefore, the proposed project includes a sufficient number of commercial/retail parking spaces to comply with the Amended Specific Plan.

However, to allow for a full discussion of the potential parking impacts associated with the proposed project, this topic will be addressed in the EIR.

g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?

No Impact. The project site is not currently subject to any adopted plan or program supporting alternative transportation. In any event, the proposed senior residential community would be developed in close proximity to existing commercial/retail uses and adjacent to the proposed commercial/retail improvements, and a pedestrian gate will be constructed as part of the project to allow senior residents to walk to and from the commercial/retail area. The development of the senior residential community in close proximity to commercial/retail uses would reduce the number and length of vehicle trips by the senior residents.

It is also noted that Katella Avenue is currently served by OCTA Bus Route 50, which includes eastbound and westbound stops between the City of Orange and the City of Long Beach. There is an existing concrete bus turnout near the northeast corner of Katella Avenue and Enterprise Drive, approximately 130 feet west of the proposed commercial/retail driveway access points along Katella Avenue that would be aligned with Midway Drive. However, it is currently inactive. The closest active bus stop to the project is located on Katella Avenue between Enterprise Drive and Cottonwood Way. The proposed project would not conflict with either the active or inactive OCTA bus stops.

For these reasons, the proposed project would not conflict with adopted policies, plans or programs supporting alternative transportation and the impact would be clearly insignificant and unlikely to occur. This topic will not be analyzed further in the EIR.

4.17 UTILITIES AND SERVICE SYSTEMS.

Would the project:

a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?

Potentially Significant Impact. The City of Cypress is located within the service territory of the Orange County Sanitation District (OCSD), which owns and maintains the sewer mains within the project vicinity. Wastewater from the proposed project would be conveyed to treatment plants located in Fountain Valley (Plant No.1) and Huntington Beach (Plant No. 2). This wastewater could potentially contribute to exceedance of the wastewater treatment requirements of the Regional Water Quality Board (RWQCB), but this has not yet been determined. Therefore, impacts related to the OCSD’s ability to provide adequate wastewater treatment services for the proposed project will be evaluated further in the EIR.

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?

Potentially Significant Impact. The proposed project would require treatment of water and wastewater. The City Department of Public Works indicated in a will-serve letter dated June 5, 2014, that the sewer system has adequate capacity to serve the project site. In addition, the Golden State Water Company (GSWC) provided a will-serve letter dated April 11, 2014, indicating that GSWC has an adequate supply of water to serve the proposed project. The EIR will evaluate whether existing water and wastewater treatment facilities will be sufficient to accommodate the proposed project.

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?

Potentially Significant Impact. As described in Response 4.9(c), the proposed project has the potential to increase off-site storm water flow. The EIR will identify whether new or expanded storm water drainage facilities would be required with respect to the proposed project and, if so, evaluate their environmental effects.

d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?

Potentially Significant Impact. GSWC provided a will-serve letter dated April 11, 2014, indicating that GSWC has an adequate water supply to serve the proposed project. However, the proposed project's water demand and the availability of an adequate water supply will be evaluated in the EIR.

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?

Potentially Significant Impact. The proposed project would increase demand on the wastewater treatment or conveyance system over existing conditions. The proposed project's wastewater generation will be identified and its potential impact on existing wastewater facilities will be evaluated in the EIR.

f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?

Potentially Significant Impact. The proposed project would generate solid waste that would require disposal at an appropriate landfill or other disposal facility. Because there are no existing structures on the project site, no demolition waste would be generated. Construction of the proposed project is not anticipated to generate a substantial amount of waste. Operation of the proposed project would produce waste typical of residential and commercial development. As indicated in a will-serve letter dated December 11, 2014, Valley Vista Services would provide waste disposal services for the proposed project. Actual waste generation from construction and operation of the proposed project will be determined and the proposed project's potential impact on landfill facilities will be evaluated in the EIR.

g) Comply with federal, state, and local statutes and regulations related to solid waste?

Less Than Significant Impact. The proposed project would be required to comply with the applicable requirements relating to solid waste in the Cypress Municipal Code, which requires an adequate area for collecting and loading recyclable materials in concert with Countywide efforts and programs to reduce the volume of solid waste entering landfills. In addition, the location of recycling/separation areas is required to comply with all applicable federal, public health, state, or local laws relating to fire, building, access, transportation, circulation, or safety. Compliance with all applicable State and Orange County regulations for the use, collection, and disposal of solid and hazardous wastes is also mandated. The City will require that the proposed project comply with all of these requirements. Therefore, the proposed project would comply with federal, state and local statutes and regulations related to solid waste and the impact would be clearly insignificant and unlikely to occur. This topic will not be analyzed further in the EIR.

4.18 MANDATORY FINDINGS OF SIGNIFICANCE

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?

Potentially Significant Impact. Based on the discussions in Responses 4.4, Biological Resources, and 4.5, Cultural Resources, the proposed project would not 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 major periods of California history or prehistory. However, as discussed in Response 4.4(d), if and to the extent the non-native, ornamental trees on the project site were removed during the applicable avian nesting season for raptors and other migratory birds, that activity could potentially impact active raptor/migratory bird nests. Therefore, the EIR will evaluate the impact of the proposed project on raptors and other migratory birds.

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 past projects, the effects of other current projects, and the effects of probable future projects)?

Potentially Significant Impact. The proposed project, when considered in conjunction with other approved or pending projects the City and elsewhere in the project vicinity, could potentially result in cumulatively considerable impacts. The EIR will assess the potential for the proposed project to contribute to cumulative impacts.

c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

Potentially Significant Impact. The potential for the proposed project to have substantial adverse effects on human beings, either directly or indirectly, will be evaluated in the EIR, as well as other potentially significant environmental impacts identified in this IS.

5.0 REFERENCES

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California Department of Conservation. Tsunami Inundation Map. Los Alamitos/Long Beach Quadrangle. Website: http://www.conservation.ca.gov/cgs/geologic_hazards/Tsunami/Inundation_Maps//Documents/_Inundation_LosAlamitosSealBeach_Quad_Orange.pdf (accessed January 20, 2015).

California Department of Conservation. Website: http://maps.conservation.ca.gov/ciff/ciff.html (accessed December 23, 2014).

California Department of Fish and Wildlife. NCCP Plan Summary – County of Orange (Central/Coastal) NCCP/HCP. Website: https://www.wildlife.ca.gov//Planning/NCCP/Plans/Orange-Coastal.

California Division of Mines and Geology Seismic Hazards Map, Los Alamitos Quadrangle, 1999.

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City of Cypress. General Plan, EIR, 2001.

City of Cypress. General Plan, Safety Element, 1995. Exhibit SAF-7, FAA 100:1 Notification Imaginary Surface.

City of Cypress. General Plan, Safety Element, 1995. Figure SAF-8, Joint Forces Training Base (JFTB) Los Alamitos Air Field Impact Zones.

City of Cypress. General Plan, Safety Element, 1995. Figure SAF-9, Building Height Restrictions, 50 to 1 Clearance Surface

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Glenn Lukos Associates, Inc., *Biological Technical Report for the Barton Place Project*, February 2015

Orange County Transportation Authority System Map. Website: http://www.octa.net/pdf/OCTASystemMapjune14.pdf (accessed December 29, 2014).

SCS Engineers, *Phase I Environmental Assessment*, 4921 Katella Avenue, May 2014.

Southern California Geotechnical, *Geotechnical Investigation and Liquefaction Evaluation.* October 22, 2012.

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ORANGE COUNTY CLERK-RECORDER DEPARTMENT

BY: ______ DEPUTY

PROGRESS

NOTICE OF PREPARATION

To: Interested Agencies and Organizations
(Refer to Attached Distribution List)

Subject: Notice of Preparation of a Draft Environmental Impact Report and Public Scoping Meeting

Lead Agency:
Agency Name: City of Cypress
Street Address: 5275 Orange Avenue
City/State/Zip: Cypress, California 90630
Contact: Douglas Hawkins, AICP, City Planner
Phone: (714) 229-6720

Consulting Firm:
Firm Name: LSA Associates, Inc.
Street Address: 20 Executive Park, Suite 200
City/State/Zip: Irvine, California 92614
Contact: Patrick Zabrocki
Phone: (949) 553-0666

The **CITY OF CYPRESS** will be the Lead Agency and will prepare an Environmental Impact Report (EIR) for the project identified below. We need to know the views of your agency as to the scope and content of the environmental information which is germane to your agency's statutory responsibilities in connection with the proposed project. Your agency will need to use the EIR prepared by our agency when considering your permit or other approval for the project. The project description, location, and the potential environmental effects are contained in the attached materials. A copy of the Initial Study is attached. Due to the time limits mandated by State law, your response must be sent at the earliest possible date ***but not later than 30 days*** after receipt of this notice. **The comment period begins on March 2, 2015 and ends on March 31, 2015.**

Please send your response to **Mr. Douglas Hawkins, AICP, City Planner** at the address shown above. We will need the name for a contact person in your agency.

Scoping Meeting: A public scoping meeting will be held on Monday, March 16, 2015, from 6:30 p.m. to 8:00 p.m. at the Courtyard by Marriott Hotel, located at 5865 Katella Avenue in the City of Cypress, CA 90630. The purpose of the meeting is to obtain information and solicit comments from the public regarding the environmental issues that should be studied in the EIR. No decisions regarding the proposed project will be made at the scoping meeting.

Project Title: Barton Place

Project Location: City of Cypress — Orange
City (nearest) — County

Project Location and Description (brief): The project site consists of approximately 33 acres within the southwestern portion of the City of Cypress in Orange County, California, and is located just north of the City of Los Alamitos boundary and approximately one mile northwest of the City of Garden Grove. The project site is located at 4921 Katella Avenue, at the northeast corner of Katella Avenue and Enterprise Drive. A portion of the Los Alamitos Race Course, including one-story horse barns and associated equipment, is located immediately north of the project site. A surface parking area for the Los Alamitos Race Course, a church, and a hotel are located immediately east of the project site, with commercial uses located further to the east beyond the hotel. To the west of the project site is Enterprise Drive and Cottonwood Church. The southern border of the project site is Katella Avenue, with commercial, single-family, and multi-family residential uses south of Katella Avenue. The project site was previously part of the Cypress Golf Club, which permanently closed in 2004. The project site is unimproved and is not currently utilized for any land use or activity.

The proposed mixed-use project includes two components, a senior residential community and commercial/retail improvements. The community would include approximately 244 senior residential units and the commercial/retail component would consist of approximately 50,000 square feet of commercial space. The attached Initial Study includes additional details regarding the proposed project and its location, a description of the entitlements required for the proposed project, and a discussion of the proposed project's probable environmental effects.

ORANGE COUNTY ALUC

AIRPORT LAND USE COMMISSION

FOR ORANGE COUNTY

3160 Airway Avenue • Costa Mesa, California 92626 • 949.252.5170 fax: 949.252.6012

March 31, 2015

Mr. Douglas Hawkins, AICP
City Planner
City of Cypress
5275 Orange Avenue
Cypress, CA 90630

Subject: NOP of a DEIR for proposed mixed-project (Barton Place)

Dear Mr. Hawkins:

Thank you for the opportunity to review the Notice of Preparation (NOP) of a Draft Environmental Impact Report (DEIR) for the proposed 33-Acre residential/commercial project in the context of the Airport Land Use Commission's (ALUC) *Airport Environs Land Use Plan for Joint Forces Training Base (AELUP for JFTB) Los Alamitos*. The proposed project includes construction of approximately 50,000 square feet of commercial space and 244 senior residential units.

The proposed project is located within the Federal Aviation Regulation (FAR) Part 77 Notification Area for JFTB Los Alamitos. The initial study states that the proposed maximum building height of 30 feet for the project does not penetrate the notification surface for JFTB. Because of the project's close vicinity to JFTB (.27 mile north of JFTB), we recommend that the project proponent utilize the Notice Criteria Tool on the FAA website https://oeaaa.faa.gov/oeaaa/external/portal.jsp to ensure that the proposed project does not affect airport operations such as causing impacts to any navigational aids. The results from the Notice Criteria Tool should be included in the DEIR.

The proposed project is also located within the Obstruction Imaginary Surfaces for JFTB. At the maximum height of 30 feet, the proposed project will not penetrate the horizontal imaginary surface for JFTB Los Alamitos. As described in the *AELUP for JFTB*, buildings that rise to the height of the horizontal surface (150 feet Above Ground Level (AGL)) will violate the established approach criteria for the primary JFTB runway. We recommend the DEIR and the Specific Plan include language stating that the maximum building heights will not surpass the horizontal imaginary surface for JFTB Los Alamitos.

The proposed project is located outside of the 60 dBA and 65 dBA CNEL noise contours for JFTB Los Alamitos and would not be subject to any special noise reduction

DEPARTMENT OF TRANSPORTATION
DISTRICT 12
3347 MICHELSON DRIVE, SUITE 100
IRVINE, CA 92612-8894
PHONE (949) 724-2086
FAX (949) 724-2592
TTY 711
www.dot.ca.gov

Serious drought.
Help save water!

April 7, 2015

Mr. Douglas Hawkins AICP
City of Cypress
5275 Orange Avenue
Cypress, CA. 90630

File: IGR/CEQA
SCH#: 2015031004
Log #: 4214
I-605, SR-22

Dear Mr. Hawkins:

Thank you for the opportunity to review and comment on **the Notice of Preparation for Barton Place.** The proposed project is for the construction of 244 senior residences, including approximately 152 single-family detached homes and approximately 92 single-family attached homes and 50,000 square feet of commercial retail improvements along Katella Avenue.

The Department of Transportation (Department) is a commenting agency on this project and has the following comments for your consideration.

A detailed traffic study for this project should be prepared and include existing and future average daily traffic volumes, traffic generation including peak hour, traffic distribution, intersection capacity utilization analysis along with current and projected capacities of local streets, and State highways and freeway routes I- 605 I-405, SR-22 & SR-39.

Please continue to keep us informed of this project and any future developments that could potentially impact State transportation facilities. If you have any questions or need to contact us, please do not hesitate to call Aileen Kennedy at (949) 724-2239.

Sincerely,

Maureen El Harake

MAUREEN EL HARAKE
Branch Chief, Regional-Community-Transit Planning
District 12

RECEIVED
APR 14 REC'D
City of Cypress
Community Development Department

c: Lee Haber, Traffic Operations North
Scott Morgan, Office of Planning and Research

requirements. The DEIR should also discuss if heliports are proposed as part of the project.

Per the *AELUP for JFTB Los Alamitos*, for projects outside of the 60 dB CNEL Contour, or other areas of special concern as delineated by the FAA and adopted by the Commission, local agencies are required to submit to the ALUC only those matters which contemplate or permit structures that would penetrate the 100:1 Imaginary Surface as defined in FAA FAR Part 77.13.

Thank you again for the opportunity to comment on the initial study. Please contact Lea Choum at (949) 252-5123 or via email at lchoum@ocair.com should you have any questions related to the Airport Land Use Commission for Orange County.

Sincerely,

Kari A. Rigoni
Executive Officer

PUBLIC SCOPING MEETING
Barton Place Project
NE Corner of Katella Avenue and Enterprise Drive
Monday, March 16, 2015

NAME: CHARLES H. PARSONS 714-995-6439

ADDRESS: 10272 JANZELYNN ST CITY: CYPRESS ZIP: 90630

EMAIL ADDRESS: cparsons@dslextreme.com

REPRESENTING (Optional): Self

Do you wish to be added to the project mailing list? [X] YES [ ] NO

Please leave your comments with the City Planner or mail them to: 1 of 2

Douglas Hawkins, City Planner
City of Cypress
5275 Orange Avenue
Cypress, CA 90630

Phone: (714) 229-6720
E-Mail: DHawkins@ci.cypress.ca.us

The purpose of this comment form is to solicit input regarding the scope and content of the draft Environmental Impact Report (EIR). Please submit comments for the record that pertain to the *environmental issues* you would like addressed in the EIR (please print). **Please note that all comments provided on this form will be public information.**

1) ASSUMING 5' DEPTH OF GRADING IT IS ESTIMATED TO TAKE 54 MILLION GALLONS OF WATER FOR SOIL COMPACTION. UNDER CURRENT DROUGHT CONDITIONS HOW WILL WATER USE BE OFF-SET?

2) ASSUMING 2 CARS PER RESIDENCE, HOW WILL KATELLA AVE TRAFFIC BE ADDRESSED ADDING 500 vehicles GOING WEST?

3) Will TRAFFIC BE ALLOWED TO CROSS COTTONWOOD CHURCH PROPERTY TO USE LEXINGTON?

4) CANADIAN GEESE ARE KNOWN OR SUSPECTED TO USE AREA, BETTER ADDRESS MIGRATORY BIRD ISSUE.

5) HOUSING BETTER LOCATED FACING OCEAN TO TAKE ADVANTAGE AFTERNOON OCEAN BREEZES

6) IN THE EVENT OF MAJOR DISASTER EVENT, HOW DO YOU ANTICIPATE THE DEVELOPMENT WILL BE SAFELY EVACUATED?

Please provide comments by Tuesday, March 31, 2015

7) PLEASE NOTE RACE TRACK LOUD SPEAKERS & LIGHTS ARE HEARD & SEEN AT MY HOUSE. THIS DEVELOPMENT IS CLOSER THAN MY HOUSE. HOW DO YOU PROPOSE TO REDUCE THIS OFF-SITE IMPACT FROM IMPACTING DEVELOPMENT

CHARLES PARSONS
COMMENTS

8) GHG DO NOT INCLUDE WATER VAPOR, HOWEVER WATER VAPOR ACTS AS INTENSIFIER OF GHGs. ADDRESS THIS AS PART OF CLIMATE CHANGE ANALYSES.

9) IS THERE A FUTURE PLAN TO CONNECT DEVELOPMENT ROADS (NORTH/SOUTH) ON TO CERRITOS?

Ryan Bensley

Subject: FW: Barton Place EIR Scoping

From: Dave Emerson [mailto:realtorde@gmail.com]
Sent: Monday, March 30, 2015 3:49 PM
To: 33acreproject@ci.cypress.us
Cc: Doug Hawkins
Subject: Barton Place EIR Scoping

Dear Mr. Hawkins,

Thank you for your many years of service to Cypress and surrounding communities, and for the opportunity to offer input to the EIR for the Barton Place Project.

I am supportive of the proposal, but do have three major areas of concern: Traffic Mitigation, and Mitigation of the loss of a significant "wetlands" used by geese and other wildlife. Below are some thoughts or one long time resident about possible mitigation for your consideration.

1. As the Initial Study indicates on page 59 (items 4.16 a & b, there is potentially significant impact on traffic and the possible exceeding of the LOS congestion standards in the area. While a seniors' community creates far less traffic than would the proposed ProLogis Logistics Facility, and the reduction in total units reduces traffic even more, at least two key issues remain:

    1. The massive existing congestion on Katella created by the fact that it is the only major east-west surface thoroughfare between Westminster Blvd. and Lincoln. With CalTrans/OCTA already planning a massive increase of lanes on the 405northbound, ending at the 605, we can only expect cut-through traffic on Katella to worsen in the years ahead. Both Cypress and Los Alanitos residents, businesses, and workers already spend hours trying to get to and from the 605 and 405 freeways, and some mitigation is needed to keep what is already a bad traffic problem from getting worse.
    2. At this point, all access to the new homes and the new businesses from eastbound Katella can only be making a U-turn at Siboney (the Race Track Entrance.) This U turn lane is already congested by people getting to the existing businesses between Siboney and Cottonwood Church. Adding a left turn lane and signal at Enterprise would violate the existing agreement between Cypress and Los Alamitos, and threaten Carrier Row with even more cut-through traffic.
    3. The fact that driving routes into a community designed for seniors should be as simple and direct as possile.
    4. **Possible mitigation optioins:**

        1. Allowing southbound traffic on Lexiington at Katella to continue south would at least allow Cypress residents and our military personnel to access the Base more directly, without having to turn onto Katella from Lexington.
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western exit, b) connecting Enterprise north of Katella to Lexington, so Barton Place residents could travel north to visit other Cypress residents and businesses without accessing Katella, and c) extending Enterprise north to connect with Cerritos.   A combination of all three would be optimal, and might work with a firm future commitment to the Enterprise extension when the Race Course and stables area are developped, or within seven years, whichever occurs first. In addition, to control expense, the eastern gate could be automated, for entrance limied to residents and their guests only and a one-way exit lane for all.

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    1. **Possible Mitigation:** In prior meetings the developper expressed concerns about having such a community integrated within the "active living" community he envisions, but having a separate facility adjoining or at least nearby makes sense.   Licensing requirements would require at least two years time as well. Posibilities could be designation of some of the 5 acres of "retail" along Katella for such a facility, with a gated pedestrian entrance from Barton Place so residents could visit their parents or even spouses in the years to come. Another option would be developping such a facility in conjunction with or by Cottonwood Church on some of their property, or modifying the General Plan for the Race Course to locate such a facility in the current stables area. This would allow both Barton Place residents and other Cypress and West Orange County residents the opportunity to age in place.

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    Possible mitigation: I'm no expert, but I would think a smaller area, perhaps 7 - 15 acres, nearby could solve this challenge. The Cities of Los Alamitos and Cypress are already on record in their desire to create parkland and open space along the northern border of the Race Course property. The northwest corner of the property, which includes some hills and lakes from the former golf course, might be the perfect location. Trails, picnic areas, and a wild zone for waterfowl could be included. Hopefully the Cities of Los Alamtios and Cypress could work together with the County to develop this as one of several OC County Parks in our area, which currently has no County Parks whatsoever.

Thank you for your consideration. If I can be of further assistance in optimizing the benefits of the Barton Place Development, please feel free to contact me.

Sincere regards, and thanks,

Dave Emerson, 562.822.7653, mobile
Realtor, Broker 1980-2011
Real Estate Consultant, 2011-present
Editor, LosAlNews.com, 2008-present
Member, Los Alamitos Traffic Commission

PUBLIC SCOPING MEETING
Barton Place Project
NE Corner of Katella Avenue and Enterprise Drive
Monday, March 16, 2015

NAME: JOHN UNDERWOOD

ADDRESS: 11072 MIDWAY DR. CITY: LOS ALAMITOS ZIP: 90720

EMAIL ADDRESS: JSU @ SOCAL.RR.COM

REPRESENTING (Optional):

Do you wish to be added to the project mailing list? ☑ YES ☐ NO

Please leave your comments with the City Planner or mail them to:

Douglas Hawkins, City Planner
City of Cypress
5275 Orange Avenue
Cypress, CA 90630

Phone: (714) 229-6720
E-Mail: DHawkins@ci.cypress.ca.us

The purpose of this comment form is to solicit input regarding the scope and content of the draft Environmental Impact Report (EIR). Please submit comments for the record that pertain to the ***environmental issues*** you would like addressed in the EIR (please print). **Please note that all comments provided on this form will be public information.**

MY CONCERN, AS I STATED AT THE MARCH 16 SCOPING MEETING CONCERNS THE HYDROLOGY OF THE SITE IN TWO RESPECTS:

1) THE WATER TABLE APPEARS PARTICULARLY HIGH IN THIS AREA WITH SURFACE LAKES APPEARING 5 MONTH OUT OF YEAR. HOW WILL YOU ADDRESS THIS STRUCTURALLY

2) THE HIGH WATER TABLE ON THIS SITE HAS GIVEN RISE TO A NATURAL PERENNIAL WETLANDS, THAT IS CLEARLY PART OF THE GREATER OC WATERSHED. UNDER SECTION 404 (B)(1) OF THE CLEAN WATER ACT, WHEN SUCH A WETLAND, DEFINED BY HYDROLOGY, SOIL CONDITIONS, AND VEGETATION, ARE DISLOCATED SUCH A SITE MUST BE EITHER PRESERVED, RE-ESTABLISHED OFF SITE OR OTHERWISE IN KIND MITIGATED. UNDER FEDERAL LAW THE BARTON PLACE PROJECT PERMITTEES MUST ENGAGE IN SUCH "COMPENATORY MITIGATION" AS PART OF THE EIR PROCESS PRIOR TO OBTAINING PERMITS TO DRAIN, DREDGE AND GRADE ANY PORTION OF THE SITE. HAVE YOU ADEQUETLY ADDRESSED THE

Please provide comments by Tuesday, March 31, 2015

PURSUANT TO CORP OF ENGINEERS AND EPA CRITERIA?

Ryan Bensley

Subject: FW: Wildlife Wetlands Habitat - Doug Hawkings, City Planner

From: Lois Waddle [mailto:loiswaddle@yahoo.com]
Sent: Thursday, March 26, 2015 11:24 PM
To: 33acreproject
Subject: Fw: Wildlife Wetlands Habitat - Doug Hawkings, City Planner

----- Forwarded Message -----
From: Lois Waddle <loiswaddle@yahoo.com>
To: "33acreproject@ci.cypress.us" <33acreproject@ci.cypress.us>; John Underwood <jsu@socal.rr.com>; News Enterprise <editor@newsenterprise.net>; Dave Emerson <realtorde@gmail.com>; Lisa Giancarlo <neighborsagainstgridlock@gmail.com>; Arthur DeBolt <artdebolt@msn.com>; Jody Shloss <jodyshloss@aol.com>; Sherry Poe <poestermom@verizon.net>; Jm Ivler <met00cigar@gmail.com>
Sent: Thursday, March 26, 2015 11:10 PM
Subject: Wildlife Wetlands Habitat - Doug Hawkings, City Planner

I am writing to document and, further, explain the loss of the wetland's wildlife habitat that will occur if the 33 acre Barton Place development is built on Katella Ave.

Hapitually, during the rainy season in the winter, Canadian geese fly into this site in 'wedges' of 40 to 70 strong. They seek shelter, food, and sun. But, specifically, they seek the 'mud'. You can see them in the water feeding, and on the banks of the little lakes sunning themselves. During feriocious storms, gulls, Blue Herion, and other sea birds fly in from the ocean for shelter. They, too, can be seen standing in the water or sunbathing.

The birds don't care if you are close by. (They hang out in groups behind the Marriott Hotel.) I, myself, have enjoyed seeing them over the years. Especially, when they come into land - they 'all' honk in unison. I will hate to see this entire scenario eliminated. It is, most, wonderful to be walking by and see this.

I hope Barton Place Developers will ensure a 'like replacement' in the 'future park structure that the citizens of Cypress will surely insist on in the development of the racetrack land. A '33' acre Wetlands Park, just east of the Marriott, with trails all around it would be perfect. Then, the birds would have a runway so they could land...Lois Waddle

OC Public Works
Integrity, Accountability, Service, Trust
Shane L. Silsby, Director

Mr. Douglas Hawkins, AICP, City Planner
City of Cypress
5275 Orange Avenue
Cypress, CA 90630

Subject: Notice of Preparation (NOP) of a Draft Environmental Impact Report (EIR) for the Barton Place

Dear Mr. Hawkins,

The County of Orange Infrastructure Programs/Flood Program Support/ Hydrology Section has reviewed the Initial Study/Environmental Checklist for the proposed Barton Place and offers the following comments:

1. Section 4.9 (i), page 51, states: "The major storm drain facility in the project area is Bolsa Chica Channel which runs adjacent to Valley View Street, extending southwest from south of Katella Avenue, trough the Warland/Cypress Business Center."

   Based on Orange County Drainage Facilities Map, it appears the proposed project site located at 4921 Katella Avenue is not tributary to Bolsa Chica Channel, Orange County Flood Control District (OCFCD) facility No. C02. Instead, the area drains west, through the local drainage system to subregional OCFCD facility, Katella Storm Channel (C01S05) and ultimately drains to Los Alamitos Channel (C01). Please check and revise as appropriate.

2. The Draft EIR should identify all OCFCD facilities that could potentially be impacted by the proposed Barton Place project.

3. As noted in the Initial Study, the proposed construction may increase the overall impervious area. Therefore, hydrologic and hydraulic analyses need to be performed to evaluate and compare quantitatively the runoff volumes, peak flow rate increases, adequacy of existing storm drains and off-site channels that will ultimately carry these discharges. The analyses are needed to ensure that post-project conditions along Orange County Flood Control District (OCFCD) drainage facilities are not worsened as a result of the project. These analyses should be included in the DEIR.

4. All hydrologic and hydraulic studies must conform to the current guidelines and criteria as specified in the Orange County Hydrology Manual (OCHM), Addendum No. 1 to the OCHM and the Orange County Flood Control Design Manual.

Thank you for the opportunity to respond to the Notice of Preparation. If you have any questions, please contact me at (714) 245-4503 or feel free to call Anna Brzezicki directly. Anna may be reached at (714) 647-3989.

Very truly yours,

Hossein Ajideh, Ph.D., P.E.
OC Flood Program Support/Hydrology

S:\Flood Program\Hydrology\Anna Brzezicki\NCL, EIR\2015\Log # 837, NOP Draft EIR for Barton Place, City of Cypress.doc

Serving:
Anaheim
Brea
Buena Park
Cypress
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Fullerton
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Huntington Beach
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La Habra
La Palma
Los Alamitos
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Santa Ana
Seal Beach
Stanton
Tustin
Villa Park
Yorba Linda
County of Orange
Costa Mesa Sanitary District
Midway City Sanitary District
Irvine Ranch Water District

Orange County Sanitation District
10844 Ellis Avenue, Fountain Valley, CA 92708
(714) 962-2411 www.ocsewers.com

March 26, 2015

Mr. Douglas Hawkins, AICP, City Planner
City of Cypress
5275 Orange Avenue
Cypress, CA 90630

SUBJECT: Notice of Preparation of a Draft Environmental Impact Report for the City of Cypress Barton Place Project.

This letter is in response to the above referenced Notice of Preparation (NOP) for a proposed project in the City of Cypress (City). The City is within the jurisdiction of the Orange County Sanitation District (OCSD).

The proposed mixed-use project would construct 244 senior residential units and a commercial retail component consisting of approximately 50,000 square.

OCSD has several regional sewers that serve the City. The NOP indicates that flow calculations for the proposed development have not been done yet. As such, OCSD requests that both the City and regional sewer systems be modeled to understand any potential impacts to the sewer systems. OCSD also requests that the City review, update, and provide updated sewer maps to OCSD for our records. Please use the following flow factors to estimate current and future flows in the Draft Environmental Impact Report:

- 1488 gpd/acre for low density residential (4-7d.u. /acre)
- 3451 gpd/acre for medium density residential (8-16 d.u./acre)
- 5474 gpd/acre for medium-high density residential (17-25 d.u./acre)
- 7516 gpd/acre for high density residential (26-35 d.u./acre)
- 2262 gpd/acre for commercial/office
- 3167 gpd/acre for industrial
- 2715 gpd/acre for institutional

OCSD is also in the planning phase of a large sewer replacement and rehabilitation project in the City of Cypress. As can be seen on the enclosed map, a portion of the Western Regional Sewers project is in close proximity to the Barton Place Project. Our tentative schedule calls for construction in 2018. OCSD is very interested in coordinating efforts for this and any other project in the City that may coincide with our improvements.

Also, please note that any construction dewatering within the City (public or private) that involve discharges to the local or regional sanitary sewer system must be permitted by OCSD prior to discharges.

OCSD staff will need to review/approve the water quality of any discharges and the measures necessary to eliminate materials like sands, silts, and other regulated compounds prior to discharge to the sanitary sewer system.

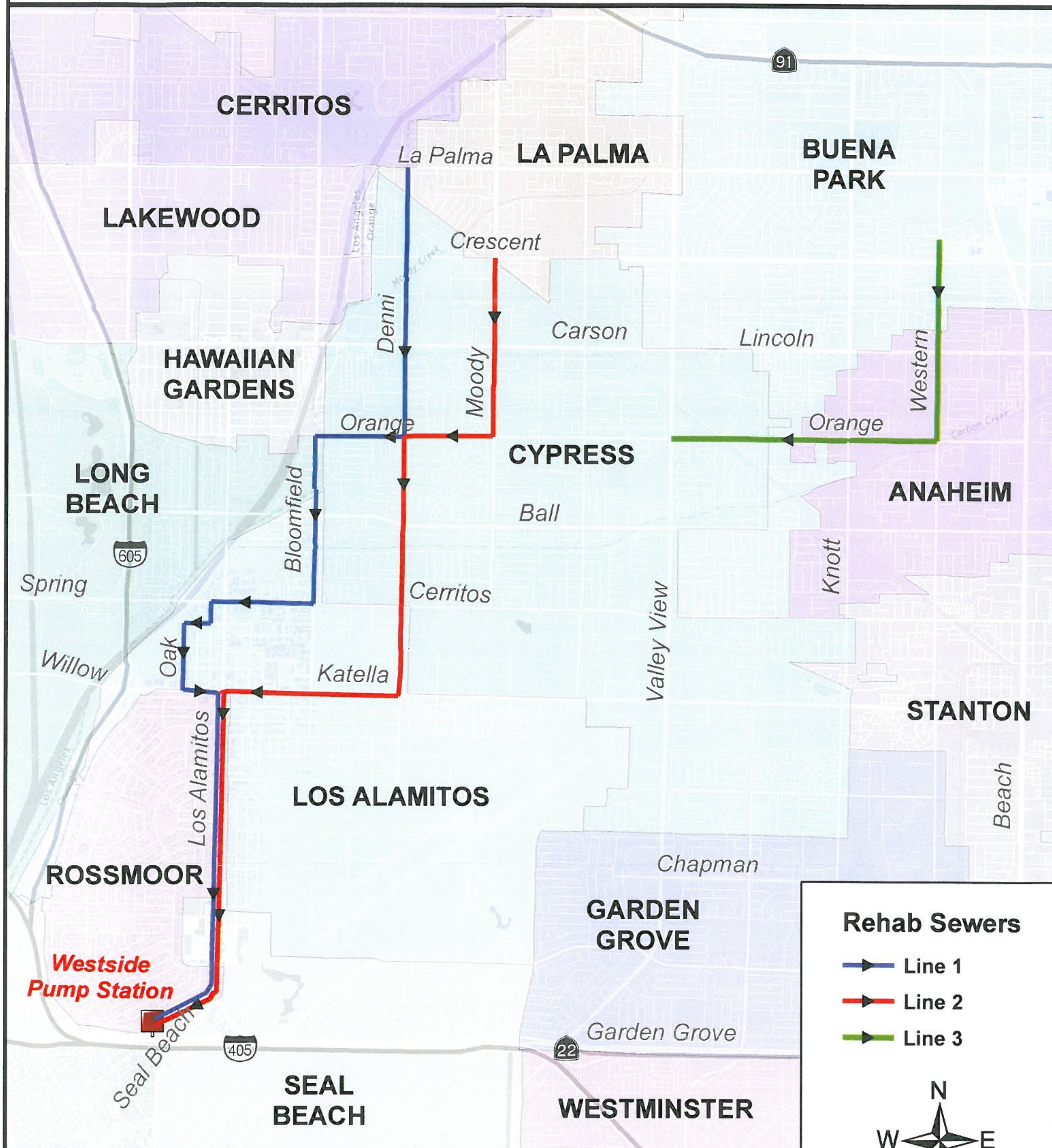
Thank you for the opportunity to comment on the Barton Place Project. If you have any questions, please contact me at 714-593-7119.

Daisy Covarrubias

Daisy Covarrubias, MPA
Senior Staff Analyst

DC:sa
http://project/sites/Planning/CEQA/Externally Generated/20150326 Cypress_Barton_NOP.doc

Orange County Sanitation District Project No. 3-64
Rehabilitation of Western Regional Sewers



ORANGE COUNTY SANITATION DISTRICT (OCSD)
Geographical Information Systems, Information Technology

Disclaimer: This map is intended for graphical representation only. No level of accuracy is claimed for the base mapping shown hereon and graphics should not be used to obtain coordinate values, bearings or distances.

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 • www.aqmd.gov

March 10, 2015

Douglas Hawkins, AICP, City Planner
City of Cypress
5275 Orange Avenue
Cypress, CA 90630

Notice of Preparation of a CEQA Document for the
Barton Place Project

The South Coast Air Quality Management District (SCAQMD) staff appreciates the opportunity to comment on the above-mentioned document. The SCAQMD staff's comments are recommendations regarding the analysis of potential air quality impacts from the proposed project that should be included in the draft CEQA document. Please send the SCAQMD a copy of the CEQA document upon its completion. Note that copies of the Draft EIR that are submitted to the State Clearinghouse are not forwarded to the SCAQMD. Please forward a copy of the Draft EIR directly to SCAQMD at the address in our letterhead. **In addition, please send with the draft EIR all appendices or technical documents related to the air quality and greenhouse gas analyses and electronic versions of all air quality modeling and health risk assessment files. These include original emission calculation spreadsheets and modeling files (not Adobe PDF files). Without all files and supporting air quality documentation, the SCAQMD will be unable to complete its review of the air quality analysis in a timely manner. Any delays in providing all supporting air quality documentation will require additional time for review beyond the end of the comment period.**

Air Quality Analysis

The SCAQMD adopted its California Environmental Quality Act (CEQA) Air Quality Handbook in 1993 to assist other public agencies with the preparation of air quality analyses. The SCAQMD recommends that the Lead Agency use this Handbook as guidance when preparing its air quality analysis. Copies of the Handbook are available from the SCAQMD's Subscription Services Department by calling (909) 396-3720. More recent guidance developed since this Handbook was published is also available on SCAQMD's website here: http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/ceqa-air-quality-handbook-(1993). SCAQMD staff also recommends that the lead agency use the CalEEMod land use emissions software. This software has recently been updated to incorporate up-to-date state and locally approved emission factors and methodologies for estimating pollutant emissions from typical land use development. CalEEMod is the only software model maintained by the California Air Pollution Control Officers Association (CAPCOA) and replaces the now outdated URBEMIS. This model is available free of charge at: www.caleemod.com.

The Lead Agency should identify any potential adverse air quality impacts that could occur from all phases of the project and all air pollutant sources related to the project. Air quality impacts from both construction (including demolition, if any) and operations should be calculated. Construction-related air quality impacts typically include, but are not limited to, emissions from the use of heavy-duty equipment from grading, earth-loading/unloading, paving, architectural coatings, off-road mobile sources (e.g., heavy-duty construction equipment) and on-road mobile sources (e.g., construction worker vehicle trips, material transport trips). Operation-related air quality impacts may include, but are not limited to, emissions from stationary sources (e.g., boilers), area sources (e.g., solvents and coatings), and vehicular trips (e.g., on- and off-road tailpipe emissions and entrained dust). Air quality impacts from indirect sources, that is, sources that generate or attract vehicular trips should be included in the analysis.

The SCAQMD has also developed both regional and localized significance thresholds. The SCAQMD staff requests that the lead agency quantify criteria pollutant emissions and compare the results to the recommended regional significance thresholds found here: http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significance-thresholds.pdf?sfvrsn=2. In addition to analyzing regional air quality impacts, the SCAQMD staff recommends calculating localized air quality impacts and comparing the results to localized significance thresholds (LSTs). LST's can be used in addition to the recommended regional significance thresholds as a second indication of air quality impacts when preparing a CEQA document. Therefore, when preparing the air quality analysis for the proposed project, it is recommended that the lead agency perform a localized analysis by either using the LSTs developed by the SCAQMD or performing dispersion modeling as necessary. Guidance for performing a localized air quality analysis can be found at: http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/localized-significance-thresholds.

In the event that the proposed project generates or attracts vehicular trips, especially heavy-duty diesel-fueled vehicles, it is recommended that the lead agency perform a mobile source health risk assessment. Guidance for performing a mobile source health risk assessment ("*Health Risk Assessment Guidance for Analyzing Cancer Risk from Mobile Source Diesel Idling Emissions for CEQA Air Quality Analysis*") can be found at: http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/mobile-source-toxics-analysis. An analysis of all toxic air contaminant impacts due to the use of equipment potentially generating such air pollutants should also be included.

In addition, guidance on siting incompatible land uses (such as placing homes near freeways) can be found in the California Air Resources Board's *Air Quality and Land Use Handbook: A Community Perspective*, which can be found at the following internet address: http://www.arb.ca.gov/ch/handbook.pdf. CARB's Land Use Handbook is a general reference guide for evaluating and reducing air pollution impacts associated with new projects that go through the land use decision-making process.

Mitigation Measures

In the event that the project generates significant adverse air quality impacts, CEQA requires that all feasible mitigation measures that go beyond what is required by law be utilized during project construction and operation to minimize or eliminate these impacts. Pursuant to state CEQA Guidelines §15126.4 (a)(1)(D), any impacts resulting from mitigation measures must also be discussed. Several resources are available to assist the Lead Agency with identifying possible mitigation measures for the project, including:

- Chapter 11 of the SCAQMD *CEQA Air Quality Handbook*
- SCAQMD's CEQA web pages at: http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/mitigation-measures-and-control-efficiencies.
- CAPCOA's *Quantifying Greenhouse Gas Mitigation Measures* available here: http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf.
- SCAQMD's Rule 403 – Fugitive Dust, and the Implementation Handbook for controlling construction-related emissions
- Other measures to reduce air quality impacts from land use projects can be found in the SCAQMD's Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning. This document can be found at the following internet address: http://www.aqmd.gov/docs/default-source/planning/air-quality-guidance/complete-guidance-document.pdf?sfvrsn=4.

Data Sources

SCAQMD rules and relevant air quality reports and data are available by calling the SCAQMD's Public Information Center at (909) 396-2039. Much of the information available through the Public Information Center is also available via the SCAQMD's webpage (http://www.aqmd.gov).

The SCAQMD staff is available to work with the Lead Agency to ensure that project emissions are accurately evaluated and mitigated where feasible. If you have any questions regarding this letter, please contact me at Jwong1@aqmd.gov or call me at (909) 396-3176.

Sincerely,

Jillian Wong

Jillian Wong, Ph.D.
Program Supervisor
Planning, Rule Development & Area Sources

ORC150303-03
Control Number

Guest 1

From: Doug Hawkins <dhawkins@ci.cypress.ca.us>
Sent: Tuesday, March 31, 2015 7:36 AM
To: Deborah Pracilio; Ryan Bensley; Tim Ramm (tramm@provincegroup.com)
Cc: Maryanne Cronin
Subject: FW: Barton Place EIR Scoping

Team,

Below is an e-mail from Mr. Dave Emerson, a Los Alamitos resident and traffic commissioner, in response to the NOP for Barton Place.

Douglas Hawkins
City Planner
DHawkins@ci.cypress.ca.us
(714) 229-6727
(714) 229-0154 FAX

From: Dave Emerson [mailto:realtorde@gmail.com]
Sent: Monday, March 30, 2015 3:49 PM
To: 33acreproject@ci.cypress.us
Cc: Doug Hawkins
Subject: Barton Place EIR Scoping

Dear Mr. Hawkins,

Thank you for your many years of service to Cypress and surrounding communities, and for the opportunity to offer input to the EIR for the Barton Place Project.

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Sincere regards, and thanks,

Dave Emerson, 562.822.7653, mobile
Realtor, Broker 1980-2011
Real Estate Consultant, 2011-present
Editor, LosAlNews.com, 2008-present
Member, Los Alamitos Traffic Commission

Guest 1

From: Doug Hawkins <dhawkins@ci.cypress.ca.us>
Sent: Friday, March 27, 2015 2:59 PM
To: Deborah Pracilio; Ryan Bensley; Tim Ramm (tramm@provincegroup.com)
Cc: Maryanne Cronin
Subject: Additional Time Request from Caltrans

Hi Team,

I just spoke with Eileen from Caltrans who requested an extension of time to provide their comments on the project NOP. Apparently, the NOP was misplaced in their traffic division and they need additional time to review the project. I gave them until Friday of next week to provide their comments.

I will forward any comments as soon as I receive them.

Thank you,

Douglas Hawkins
City Planner
DHawkins@ci.cypress.ca.us
(714) 229-6727
(714) 229-0154 FAX

Guest 1

From: Doug Hawkins <dhawkins@ci.cypress.ca.us>
Sent: Friday, March 27, 2015 1:33 PM
To: Deborah Pracilio; Ryan Bensley
Cc: Maryanne Cronin
Subject: FW: Wildlife Wetlands Habitat - Doug Hawkings, City Planner

Hi Deby and Ryan,

I just received the e-mail below from one of the attendees at the scoping meeting.

Let me know if you would like to discuss.

Thank you,

Douglas Hawkins
City Planner
DHawkins@ci.cypress.ca.us
(714) 229-6727
(714) 229-0154 FAX

From: Lois Waddle [mailto:loiswaddle@yahoo.com]
Sent: Thursday, March 26, 2015 11:24 PM
To: 33acreproject
Subject: Fw: Wildlife Wetlands Habitat - Doug Hawkings, City Planner

----- Forwarded Message -----
From: Lois Waddle <loiswaddle@yahoo.com>
To: "33acreproject@ci.cypress.us" <33acreproject@ci.cypress.us>; John Underwood <jsu@socal.rr.com>; News Enterprise <editor@newsenterprise.net>; Dave Emerson <realtorde@gmail.com>; Lisa Giancarlo <neighborsagainstgridlock@gmail.com>; Arthur DeBolt <artdebolt@msn.com>; Jody Shloss <jodyshloss@aol.com>; Sherry Poe <poestermom@verizon.net>; Jm Ivler <met00cigar@gmail.com>
Sent: Thursday, March 26, 2015 11:10 PM
Subject: Wildlife Wetlands Habitat - Doug Hawkings, City Planner

I am writing to document and, further, explain the loss of the wetland's wildlife habitat that will occur if the 33 acre Barton Place development is built on Katella Ave.

Hapitually, during the rainy season in the winter, Canadian geese fly into this site in 'wedges' of 40 to 70 strong. They seek shelter, food, and sun. But, specifically, they seek the 'mud'. You can see them in the water feeding, and on the banks of the little lakes sunning themselves. During feriocious storms, gulls, Blue Herion, and other sea birds fly in from the ocean for shelter. They, too, can be seen standing in the water or sunbathing.

The birds don't care if you are close by. (They hang out in groups behind the Marriott Hotel.) I, myself, have enjoyed seeing them over the years. Especially, when they come into land - they 'all' honk in unison. I will hate to see this entire scenario eliminated. It is, most, wonderful to be walking by and see this.

I hope Barton Place Developers will ensure a 'like replacement' in the 'future park structure that the citizens of Cypress will surely insist on in the development of the racetrack land. A '33' acre

Wetlands Park, just east of the Marriott, with trails all around it would be perfect. Then, the birds would have a runway so they could land...Lois Waddle

APPENDIX B

AIR QUALITY TECHNICAL REPORT

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Air Quality Technical Report
The Barton Place Project
4921 Katella Avenue
Cypress, California

Prepared by:
ENVIRON International Corporation
San Francisco, California

Date:
April, 2015

Project Number:
03-36873A

ENVIRON

Contents

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Acronyms and Abbreviations

ACC	Advanced Clean Cars
AQMP	Air Quality Management Plan
BTU	British Thermal Units
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CalEEMod®	California Emissions Estimator Model
CalRecycle	California Department of Resources Recycling and Recovery
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CCAA	California Clean Air Act
CCAR	California Climate Action Registry
CCAQS	California Ambient Air Quality Standards
CEC	California Energy Commission
CO	Carbon Monoxide
CO_2	Carbon Dioxide
DPM	Diesel Exhaust Particulate Matter
DU	Dwelling Unit
EF	Emission Factor
EIR	Environmental Impact Report
EMFAC	EMission FACtors model
ENVIRON	ENVIRON International Corporation
FIND	SCAQMD's Facility Information Detail
FIP	Federal Implementation Plan
g/L	gram per liter
GHG	greenhouse gas
HI	hazard index
lbs	pounds
LOS	Level of Service
LST	Localized Significance Thresholds
$\mu g/m^3$	microgram per cubic meter

MATES	Multiple Air Toxics Exposure Study
mph	miles per hour
MPO	Metropolitan Planning Organization
NAAQS	National Ambient Air Quality Standards
NO_2	Nitrogen Dioxide
NO_X	Oxides of Nitrogen
OFFROAD	Off-road Emissions Inventory Program model
O_3	Ozone
Pb	Lead
PDF	Project Design Features
PM	Particulate Matter
$PM_{2.5}$	Particulates 2.5 Microns or Smaller
PM_{10}	Particulates 10 Microns or Smaller
ppm	parts per million
ROG	Reactive Organic Gasses
RTP/SCS	Regional Transportation Plan/Sustainable Communities Strategy
SCAB	South Coast Air Basin
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
SO_X	Sulfur Oxides
sqft	square foot
TAC	Toxic Air Contaminants
USEPA	United States Environmental Protection Agency
USGS	United States Geologic Survey
VMT	vehicle miles traveled
VOC	Volatile Organic Compound

Executive Summary

The Barton Place Project (the “Project”) proposes a mixed-use senior community comprised of approximately 33 acres in the northwest portion of Orange County, California, within the City of Cypress (the “City”). The project site is immediately north of the City of Los Alamitos boundary, approximately one mile northwest of the City of Garden Grove, two miles east of the San Gabriel River Freeway (Interstate 605), and three miles north of the Garden Grove Freeway (State Route 22) and the San Diego Freeway (Interstate 405). The project site is located within the Amended and Restated Cypress Business and Professional Center Specific Plan (“Specific Plan”) area at 4921 Katella Avenue, at the northeast corner of Katella Avenue and Enterprise Drive. The Los Alamitos Race Course is to the north and east. Hotel and commercial uses are located immediately east of the project site, closest to Katella Avenue. To the west of the project site is Enterprise Drive and Cottonwood Church. The southern border of the Project site is Katella Avenue, with commercial, single-family, and multi-family residential uses south of Katella Avenue.

The Project includes two components: a senior residential community and commercial/retail improvements along Katella Avenue. The homes would be for-sale and incorporate a mix of 152 single-family detached homes and 92 single-family attached homes (i.e. paired homes), in one- and two-story configurations. The single-family detached homes would range in size from approximately 1,790 to 2,605 square feet and the paired homes would range in size from approximately 1,532 to 2,080 square feet.

Each home in the senior residential community would require a qualified occupant 55 years of age or older pursuant to recorded covenants, conditions and restrictions. The residents would have access to community amenities that include a clubhouse, pool and landscaped areas. The community would include guest parking areas, landscaped parkways, small pocket parks, and access to the adjacent commercial/retail uses. The architectural elements and features of the proposed residential buildings would incorporate a Santa Barbara style aesthetic. The community would be gated with private streets and all common areas, amenities, and streets would be managed and maintained by a homeowners association.

The proposed commercial/retail improvements would be developed on an approximately five-acre parcel on the southern portion of the project site and would consist of approximately 50,000 square feet of space, most of which would be located in Planning Area 6 and a small portion of which would be located in Planning Area 9. The commercial/retail space would be divided into approximately five buildings, ranging in size from approximately 6,800-16,250 square feet each. The proposed commercial/retail uses would include neighborhood-serving restaurants, retail stores and other commercial uses.

The Project will result in emissions of criteria pollutants, such as nitrogen oxides (NO_X), carbon dioxide (CO), volatile organic compounds (VOCs), sulfur oxides (SO_X), and particulate matter (PM) of aerodynamic radius less than 10 micrometers (PM_{10}) or less than 2.5 micrometers ($PM_{2.5}$). This report provides an inventory surveying the emissions that would result from the proposed Project and provides the air quality impact analysis contained in the Draft EIR as required by the California Environmental Quality Act (CEQA).

This technical analysis utilized the California Emission Estimator Model version 2013.2.2 (CalEEMod®)[1] to quantify the criteria pollutant emissions for both construction and operation of the Project. The maximum daily emissions are calculated for the criteria pollutants. Air dispersion modeling of construction emissions was performed using methods recommended by regulatory agencies, including the United States Environmental Protection Agency (USEPA), California Air Resources Board (CARB), and South Coast Air Quality Management District (SCAQMD or District).

For construction, the maximum daily criteria pollutant emissions (lbs/day) are less than significant based on the SCAQMD and CEQA thresholds of significance for all criteria pollutants as shown in Table ES-1. The Project will comply with SCAQMD Rule 403 to minimize fugitive dust. SCAQMD requirements, that may apply to the Project, include actions such as watering active construction areas at least three times per day; maintaining soil stabilization of inactive construction areas with exposed soil via water, non-toxic soil stabilizers, or replaced vegetation; covering all haul trucks or maintaining at least six inches of freeboard; suspending earthmoving operations or increasing watering if winds exceed 25 miles per hour (mph); minimizing track-out emissions; and limiting vehicle speeds to 15 mph or less in staging areas and on haul roads. Emissions reductions from watering active construction areas three times per day were quantified in the analysis.

The evaluation of the Project construction activities' impacts on ambient air quality shows that the Project construction emissions would not exceed the ambient air quality standard significance thresholds as shown in Table ES-2. The primary construction activities that contribute to ambient air quality impacts are fuel combustion sources (i.e., off-road construction equipment) and fugitive dust. The construction emissions are based on conservative assumptions to represent the maximum level of construction activity that may occur on the Project site. Furthermore, the construction Localized Significance Thresholds (LST) analysis results are based on the combination of maximum emissions that may occur with the worst-case meteorological conditions. Thus, while it is possible that these estimates of ambient air quality concentrations could occur, the estimates are conservatively high, and thus it is foreseeable that the Project may not produce actual emissions as high as the levels provided in this report.

For operational emissions, the maximum daily criteria pollutant emissions for the Project will be less than significant based on the thresholds for all criteria pollutants as shown in Table ES-3. The primary source of the operational emissions is the mobile sources (i.e., vehicle traffic). The emissions from mobile sources are expected to decline in the future as vehicles are required to become more fuel efficient due to existing regulations (i.e., Pavley Standard and the Advanced Clean Cars program). The anticipated VOC emissions result from traffic mobile sources and consumer products that are expected to be used by residents within the Project. The Project would not exceed the CO hotspots significance thresholds for any intersections.

[1] CAPCOA. 2013. California Emissions Estimator Model. Available at: http://www.CalEEMod.com/.

Table ES-1. Summary of Regional Construction Criteria Air Pollutant Emissions						
	VOC	**NOx**	**CO**	**SO_2**	**PM_{10} Total[1]**	**$PM_{2.5}$ Total[1]**
	Maximum (lbs/day)[2]					
On-Site Emissions	20	54	39	0.1	3	2
Off-Site Emissions	3	41	34	0.1	4	1
Maximum Daily Emissions[3]	23	94	73	0.2	7	3
SCAQMD Threshold	75	100	550	150	150	55
Above Threshold?	No	No	No	No	No	No

Notes:

[1] PM_{10} / $PM_{2.5}$ emissions reflect controlled emissions by watering the construction site three times per day, as well as limiting vehicle speeds on unpaved surfaces, applying non-toxic soil stabilizers or replacing ground cover, and sweeping paved roads at the end of the work day, as required by SCAQMD Rule 403.

[2] Emissions based on CalEEMod® version 2013.2.2.

[3.] Some values may not sum exactly due to rounding.

Abbreviations:

CalEEMod® - California Emissions Estimator Model
CO - carbon monoxide
NOx - nitrogen oxides
PM_{10} - coarse particulate matter
$PM_{2.5}$ - fine particulate matter
ROG - reactive organic gases
VOC - volatile organic compounds
SCAQMD - South Coast Air Quality Management District
SO_2 - sulfur dioxide
lbs - pounds

Reference:

SCAQMD Air Quality CEQA Significance Thresholds. Available at: http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significance-thresholds.pdf?sfvrsn=2. Accessed: March, 2015.

Table ES-2. Comparison of Localized Construction Emissions to Local Significance Thresholds				
	NOx[1]	CO	PM_{10} Total[2]	$PM_{2.5}$ Total[2]
	Maximum (lbs/day)[3]			
On-Site Emissions	54	39	3	2
SCAQMD LST	183	1,253	13	7
Above Threshold?	No	No	No	No

Notes:

[1] The United States EPA (USEPA) 1-hour National Ambient Air Quality Standard (NAAQS) for NO_x is lower than the current SCAQMD standard, 188 ug/m^3 compared to 339 ug/m^3.[5] By applying this ratio to the screening threshold of 183 lbs/day, an equivalent NAAQS threshold would be 101 lbs/day, which is still greater than the calculated on-site emissions.

[2] PM_{10} / $PM_{2.5}$ emissions are controlled by watering the construction site three times per day, as well as limiting vehicle speeds on unpaved surfaces, applying non-toxic soil stabilizers or replacing ground cover, and sweeping paved roads at the end of the work day.

[3] Emissions based on CalEEMod® version 2013.2.2.

Abbreviations:

CalEEMod® - California Emissions Estimator Model
CO - carbon monoxide
lbs - pounds
LST - Localized Significance Threshold
NOx - nitrogen oxides
ug/m^3 - micrograms per meter cubed

Reference:

SCAQMD Mass-Rate LST Lookup Tables. Available at: http://www.aqmd.gov/docs/default-source/ceqa/handbook/localized-significance-thresholds/appendix-c-mass-rate-lst-look-up-tables.pdf?sfvrsn=2. Accessed: March, 2015.

[5] USEPA National Ambient Air Quality Standards. Available At: http://www.epa.gov/air/criteria.html Accessed: March, 2015.

Table ES-3. Summary of Regional Operational Criteria Air Pollutant Emissions						
Source	**ROG**[1]	**NO_x**	**CO**	**SO_2**[2]	**PM_{10}**	**$PM_{2.5}$**
	Maximum Emissions (lbs/day)[3]					
Area	16	0.2	20	0.001	0.4	0.4
Energy	0.3	2	1	0.014	0.2	0.2
Traffic	10	18	86	0.24	17	5
Total[4]	26	20	108	0.26	18	5
AQMD Threshold[5]	55	55	550	150	150	55
Above Threshold?	No	No	No	No	No	No

Notes:

[1] ROG as defined by CalEEMod® is assumed to be equal to VOC as defined by SCAQMD.

[2] CalEEMod® reported SO_2 emissions are assumed to represent SO_X emissions.

[3] Based on CalEEMod® version 2013.2.2.

[4.] Some values may not sum exactly due to rounding.

Abbreviations:

CalEEMod® - California Emissions Estimator Model
CO - carbon monoxide
NOx - nitrogen oxides
PM_{10} - coarse particulate matter
$PM_{2.5}$ - fine particulate matter
ROG - reactive organic gases
VOC - volatile organic compounds
SCAQMD - South Coast Air Quality Management District
SO_2 - sulfur dioxide
lbs - pounds

Reference:

[5] SCAQMD Air Quality CEQA Significance Thresholds. Available at: http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significance-thresholds.pdf?sfvrsn=2. Accessed: March, 2015.

1. Introduction

The purpose of this technical report is to present the quantitative analyses that were used to evaluate the Project's air quality emissions. Emissions during both construction and operations of the Project were quantified and compared against the South Coast Air Quality Management District (SCAQMD) and California Environmental Quality Act (CEQA) Thresholds. The construction emissions were also evaluated against the SCAQMD Localized Significance Thresholds (LST) Thresholds. The results were used to evaluate ambient air impacts associated with construction of the Project.

1.1. Project Description

The Project proposes a mixed-use senior community comprised of approximately 33 acres in the northwest portion of Orange County, California, within the City of Cypress (the "City"). The project site is immediately north of the City of Los Alamitos boundary, approximately one mile northwest of the City of Garden Grove, two miles east of the San Gabriel River Freeway (Interstate 605), and three miles north of the Garden Grove Freeway (State Route 22) and the San Diego Freeway (Interstate 405). The project site is located within the Amended and Restated Cypress Business and Professional Center Specific Plan ("Specific Plan") area at 4921 Katella Avenue,[2] at the northeast corner of Katella Avenue and Enterprise Drive. The Los Alamitos Race Course is to the north and east. Hotel and commercial uses are located immediately east of the project site, closest to Katella Avenue. To the west of the project site is Enterprise Drive and Cottonwood Church. The southern border of the project site is Katella Avenue, with commercial, single-family, and multi-family residential uses south of Katella Avenue.

The Project includes two components: a senior residential community and commercial/retail improvements along Katella Avenue. The homes would be for-sale and incorporate a mix of 152 single-family detached homes and 92 single-family attached homes (i.e. paired homes), in one- and two-story configurations. The single-family detached homes would range in size from approximately 1,790 to 2,605 square feet and the paired homes would range in size from approximately 1,532 to 2,080 square feet.

Each home in the senior residential community would require a qualified occupant 55 years of age or older pursuant to recorded covenants, conditions and restrictions. The residents would have access to community amenities that include a clubhouse, pool and landscaped areas. The community would include guest parking areas, landscaped parkways, small pocket parks, and access to the adjacent commercial/retail uses. The architectural elements and features of the proposed residential buildings would incorporate a Santa Barbara style aesthetic. The community would be gated with private streets and all common areas, amenities, and streets would be managed and maintained by a homeowners association.

The proposed commercial/retail improvements would be developed on an approximately five-acre parcel on the southern portion of the project site and would consist of approximately

[2] City of Cypress. 2012. Second Amended and Restated Cypress Commercial Center & Residential Specific Plan. Available at: http://www.ci.cypress.ca.us/community_develpmnt/commercial_ctr_residential_specific_plan.pdf

50,000 square feet of space, most of which would be located in Planning Area 6 and a small portion of which would be located in Planning Area 9. The commercial/retail space would be divided into approximately five buildings, ranging in size from approximately 6,800 to 16,250 square feet each. The proposed commercial/retail uses would include neighborhood-serving restaurants, retail stores and other commercial uses.

The land use summary is presented in **Table 1**.

Analysis of the Project's criteria pollutant emissions incorporates the following regulatory measures and project design features (PDF):

Regulatory Measures

Construction

- Compliance with SCAQMD Rule 403 regarding fugitive dust is required. The construction emission calculations include a fugitive dust control factor, which is a conservative representation of the level of fugitive dust control expected through compliance with SCAQMD Rule 403. Specifically, the Applicant or its successor shall implement control measures in accordance with SCAQMD Rule 403. The Applicant or its successor shall include in construction contracts the fugitive dust control measures in accordance with SCAQMD Rule 403, with construction controls being at least as effective as the following:
  - Apply water three times daily to all unpaved parking or staging areas, unpaved road surfaces, and active construction areas [3];
  - Maintaining soil stabilization of inactive construction areas with exposed soil via water, non-toxic soil stabilizers, or replaced vegetation;
  - Minimize track-out emissions by covering all haul trucks or maintaining at least six inches of freeboard;
  - Suspending earthmoving operations or increasing watering to meet Rule 403 criteria if winds exceed 25 miles per hour (mph); and,
  - Limiting vehicle speeds to 15 miles per hour or less in staging areas and on Project haul roads.
- Compliance with SCAQMD Rule 1113 regarding Architectural Coatings is required. This rule limits the volatile organic compound (VOC) content of architectural coatings used in the SCAQMD. The rule provides various standards for each coating category;[4]

[3] Note that the control efficiency of watering is dependent on numerous variables such as soil/ground conditions, temperature, and vehicle travel specifics. For unpaved roads, increased frequency and/or water amounts are expected to improve the control efficiency.

[4] Available at: http://www.aqmd.gov/rules/reg/reg11/r1113.pdf.

Operational

- The 2013 Building Energy Efficiency Standards (Title 24) are required and reflect approximately 25% and 30% more energy efficiency compared to the 2008 Building Energy Efficiency Standards for residential and nonresidential construction, respectively, and are included in the energy use and emission calculations for the Project.

Project Design Features

- During construction of the Project, the contractor will use United States Environmental Protection Agency (USEPA) Tier 2 or above certified construction equipment for the grading phases (i.e., scrapers, dozers, and tractors/loaders/backhoes).

2. Environmental and Regulatory Setting

2.1. Air Quality Background

The City is located within the South Coast Air Basin. Climate within the South Coast Air Basin (SCAB) is determined by its terrain and geographical location. The SCAB is a coastal plain characterized by connecting broad valleys and low hills and delineated by the Pacific Ocean as the southwestern border and fringed by high mountains the form the inland portion of the SCAB border. The region lies in the semi-permanent high-pressure zone of the eastern Pacific Ocean. The resulting climate is mild and tempered by cool ocean breezes. It maintains moderate temperatures and comfortable humidity, and typically limits precipitation to a few storms during the winter-wet season. This weather pattern is fairly predictable. However, periods of extremely hot weather, winter storms, or Santa Ana winds do exist.

Although the SCAB has a semi-arid climate, air near the earth surface is generally moist because of the presence of a shallow marine layer. With very low average wind speeds, there is a limited ability to disperse air contaminants horizontally. The typical wind flow pattern fluctuates only with occasional winter storms or strong northeasterly Santa Ana winds from the mountains and deserts northeast of the SCAB. Summer wind flow patterns represent worst-case conditions for air pollution, as this is a period of higher temperatures and more sunlight, which results in ozone formation.

Air pollutant emissions within SCAB are generated primarily by stationary and mobile sources. Stationary sources can be divided into two major subcategories: point and area sources. Point sources occur at a specific location and are often identified by an exhaust vent or stack. Examples include boilers or combustion equipment that produce electricity or generate heat. Area sources are widely distributed and include such sources as residential and commercial water heaters, painting operations, lawn mowers, agricultural fields, landfills, and some consumer products. Mobile sources refer to emissions from motor vehicles, including tailpipe and evaporative emissions, and are classified as either on-road or off-road. On-road sources may be legally operated on roadways and highways. Off-road sources include aircraft, ships, trains, and self-propelled construction equipment. Air pollutants can also be generated by the natural environment such as when high winds suspend fine dust particles.

Both the federal and State governments have established ambient air quality standards for outdoor concentrations of various pollutants in order to protect the public health and welfare. These pollutants are referred to as “criteria air pollutants” as a result of the specific standards, or criteria, which have been adopted for them. The national and State standards have been set at levels considered safe to protect public health, including the health of sensitive populations such as asthmatics, children, and the elderly with a margin of safety; and to protect public welfare, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings. The national and State criteria pollutants and the applicable standards are listed in **Table 2**.

2.2. Air Pollution and Potential Health Effects

Certain air pollutants have been recognized to cause notable health problems and consequential damage to the environment either directly or in reaction with other pollutants, due to their presence in elevated concentrations in the atmosphere. Such pollutants have been identified and regulated as part of the overall endeavor to prevent further deterioration and facilitate improvement in air quality within the SCAB. The criteria air pollutants for which national and state standards have been promulgated and which are most relevant to current air quality planning and regulation in the SCAB include ozone (O_3), respirable particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead (Pb), and vinyl chloride (VC). In addition, toxic air contaminants (TAC) are of concern in the SCAB. Each of these is briefly described below.

2.2.1. Criterial Pollutants

Ozone (O_3)

O_3, a component of smog, is formed in the atmosphere rather than being directly emitted from pollutant sources. O_3 forms as a result of VOCs and NO_X reacting in the presence of sunlight in the atmosphere. O_3 levels are highest in warm-weather months. VOCs and NO_X are termed "O_3 precursors" and their emissions are regulated in order to control the creation of O_3. O_3 damages lung tissue and reduces lung function. Scientific evidence indicates that ambient levels of O_3 not only affect people with impaired respiratory systems (e.g., asthmatics), but also healthy children and adults. O_3 can cause health effects such as chest discomfort, coughing, nausea, respiratory tract and eye irritation, and decreased pulmonary functions.

Particulate Matter (PM10) and Fine Particulate Matter (PM2.5)

Particulate matter consists of solid and liquid particles of dust, soot, aerosols, and other matter small enough to remain suspended in the air for a long period of time. PM_{10} refers to particulate matter with an aerodynamic diameter less than or equal to 10 micrometers (microns, um or µm) and $PM_{2.5}$ refers to particulate matter with an aerodynamic diameter less than or equal to 2.5 micrometers. Particles smaller than 10 micrometers (i.e., PM_{10} and $PM_{2.5}$) represent that portion of particulate matter thought to represent the greatest hazard to public health.[5] PM_{10} and $PM_{2.5}$ can accumulate in the respiratory system and are associated with a variety of negative health effects. Exposure to particulate matter can aggravate existing respiratory conditions, increase respiratory symptoms and disease, decrease long-term lung function, and possibly cause premature death. The segments of the population that are most sensitive to the negative effects of particulate matter in the air are the elderly, individuals with cardiopulmonary disease, and children. Aside from adverse health effects, particulate matter in the air causes a reduction of visibility and damage to paints and building materials.

A portion of the particulate matter in the air comes from natural sources such as windblown dust and pollen. Man-made sources of particulate matter include fuel combustion, automobile exhaust, field burning, cooking, tobacco smoking, factories, and vehicle movement on, or other man-made disturbances of unpaved areas. Secondary formation of particulate matter may occur in some cases where gases like sulfur oxides (SO_X)[6] and NO_X interact with other compounds in

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5 U.S. Environmental Protection Agency, Particle Pollution and Your Health, September 2003.

6 The term SO_X accounts for distinct but related compounds, primarily SO_2 and, to a far lesser degree, sulfur trioxide. As a conservative assumption for this analysis, it was assumed that all SO_X is emitted as SO_2, therefore SO_X and SO_2 are considered equivalent in this document and only the latter term is used henceforth.

the air to form particulate matter. In the SCAB, both VOCs and ammonia are also considered precursors to $PM_{2.5}$. Fugitive dust generated by construction activities can be a major source of suspended particulate matter.

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

Carbon Monoxide (CO)

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

Nitrogen Dioxide (NO2)

NO_2 is a reddish-brown to dark brown gas with an irritating odor. NO_2 forms when nitric oxide reacts with atmospheric oxygen. Most sources of NO_2 are man-made; the primary source of NO_2 is high-temperature combustion. The primary sources of NO_2 associated with the Project are off-road construction equipment and on-road vehicles. The emissions of NO_X are used to determine NO_2 impacts.

NO_2 may produce adverse health effects such as nose and throat irritation, coughing, choking, headaches, nausea, stomach or chest pains, and lung inflammation (e.g., bronchitis, pneumonia). Effective April 12, 2010, the United States Environmental Protection Agency (USEPA) set a new 1-hour NO2 standard at 0.10 part per million (188 $\mu g/m^3$).[7] To attain this standard, the three-year average of the 98th percentile of the daily maximum 1-hour average must not exceed 0.1 ppm. The USEPA cited evidence that short-term NO_2 exposures could contribute to adverse respiratory effects including increased asthma symptoms, worsened control of asthma, and an increase in respiratory illnesses and symptoms. The USEPA also identified that NO_2 concentrations on or near major roads can be approximately 30 to 100 percent higher than concentrations in the surrounding community, which could contribute to health effects for at-risk populations, including people with asthma, children, and the elderly.

[7] USEPA, Final Revisions to the Primary National Ambient Air Quality Standard for Nitrogen Dioxide (NO_2), General Overview, Office of Air and Radiation Office of Air Quality Planning and Standards, January 2010, p. 11-12.

Sulfur Dioxide (SO2)

Sulfur oxides are formed when fuel containing sulfur (typically coal and oil) is burned, and during other industrial processes. The term “sulfur oxides” accounts for distinct but related compounds, primarily SO_2 and sulfur trioxide. As a conservative assumption for this analysis, this Report assumes that all SO_X are emitted as SO_2; therefore, SO_X and SO_2 are considered equivalent in this analysis. Higher SO_2 concentrations are usually found in the vicinity of large industrial facilities. The physical effects of SO_2 include temporary breathing impairment, respiratory illness, and aggravation of existing cardiovascular disease. Children and the elderly are most susceptible to the negative effects of exposure to SO_2.

Lead (Pb)

Lead is emitted from industrial facilities and from the sanding or removal of old lead-based paint. Smelting or processing the metal is the primary source of lead emissions, which is primarily a regional pollutant. Lead affects the brain and other parts of the body’s nervous system. Exposure to lead in very young children impairs the development of the nervous system, kidneys, and blood forming processes in the body.

Volatile Organic Compounds (VOCs)

VOCs are typically formed from combustion of fuels and/or released through evaporation of organic liquids. Some VOCs are also classified by the State as toxic air contaminants. While there are no specific VOC ambient air quality standards, VOC is a prime component (along with NOX) of the photochemical processes by which such criteria pollutants as ozone, nitrogen dioxide, and certain fine particles are formed. They are thus regulated as “precursors” to formation of those criteria pollutants.

Vinyl Chloride (VC)

VC is a chemical building block, or monomer, used in the production of polyvinyl chloride (PVC). PVC is used to make materials, including pipes, used in the construction, packaging, electrical, and transportation industries. Major sources of VC include PVC production and fabrication facilities and, at the other end of PVC’s life cycle, as PVC deteriorates, landfills and publicly-owned treatment works. VC is carcinogenic. Exposure to VC has been associated with a rare cancer, liver angiosarcoma, in workers, and with tumors of the liver, lungs, mammary glands and the nervous system in animals. The state ambient air quality standard reflects the limit of detection for VC in ambient air when the standard was promulgated, in 1978. By 1990, when state staff prepared the technical support document for identifying VC as a TAC, VC had not been detected in ambient air at any of the samplers in CARB’s TAC monitoring network, although ambient hot spot sampling had detected VC at levels up to 150 percent of the standard. VC is primarily of concern as a carcinogenic TAC at hot spots. It is regulated as a TAC to allow implementation of health-protective control measures at levels below the ambient standard.[8]

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[8] CARB, Proposed Identification of Vinyl Chloride as a Toxic Air Contaminant. Staff Report/Executive Summary, October 1990, www.arb.ca.gov/toxics/id/summary/vinyl.pdf, accessed April 11, 2015.

Hydrogen Sulfide (H2S)

H_2S is a colorless gas with the odor of rotten eggs. It is formed during bacterial decomposition of sulfur-containing organic substances. Also, it can be present in sewer gas and some natural gas, and can be emitted as the result of geothermal energy exploitation. Breathing H_2S at levels above the State standard could result in exposure to a very disagreeable odor.

For this Project, six criteria pollutants were evaluated including nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter with an aerodynamic diameter less than or equal to 10 micrometers (PM_{10}), particulate matter with an aerodynamic diameter less than or equal to 2.5 micrometers ($PM_{2.5}$), and ozone (O_3) using as surrogates volatile organic compounds (VOCs)[9] and oxides of nitrogen (NO_X). These pollutants were analyzed because they are considered to be pollutants of concern based on the type of emission sources associated with construction and operation of the proposed Project, and are thus included in this assessment.

2.2.2. Toxic Air Contaminants (TACs)

TACs are chemicals generally referred to as those contaminants known or suspected to cause serious health problems, but do not have a corresponding ambient air quality standard because their effects tend to be local rather than regional. There are hundreds of air toxics, and exposure to these pollutants can cause or contribute to cancer or non-cancer health effects such as birth defects, genetic damage, and other adverse health effects. Effects may be both chronic (i.e., of long duration) or acute (i.e., severe but of short duration) on human health. Acute health effects are attributable to sudden exposure to high quantities of air toxics. These effects can include nausea, skin irritation, respiratory illness, and, in some cases, death. Chronic health effects usually result from low-dose, long-term exposure from routine releases of air toxics. The effect of major concern for this type of exposure is cancer, which typically requires a latency period of 10-30 years after exposure to develop.

Diesel particulate matter (DPM), which is emitted in the exhaust from diesel engines, was listed by the State as a TAC in 1998. DPM has historically been used as a surrogate measure of exposure for all diesel exhaust emissions. DPM consists of fine particles (fine particles have a diameter less than 2.5 μm), including a subgroup of ultrafine particles (ultrafine particles have a diameter less than 0.1 μm). Collectively, these particles have a large surface area which makes them an excellent medium for absorbing organics. The visible emissions in diesel exhaust include carbon particles or “soot.” Diesel exhaust also contains a variety of harmful gases and cancer-causing substances.

Exposure to DPM may be a health hazard, particularly to children whose lungs are still developing and the elderly who may have other serious health problems. DPM levels and resultant potential health effects may be higher in close proximity to heavily traveled roadways with substantial truck traffic or near industrial facilities. According to CARB, DPM exposure may

9 The emissions of volatile organic compounds (VOC) and reactive organic gases (ROG) are essentially the same for the combustion emission sources that are considered in this EIR. This EIR will typically refer to organic emissions as VOC.

lead to the following adverse health effects: (1) Aggravated asthma; (2) Chronic bronchitis; (3) Increased respiratory and cardiovascular hospitalizations; (4) Decreased lung function in children; (5) Lung cancer; and (6) Premature deaths for people with heart or lung disease.[10,11]

2.3. Regulatory Framework

Air quality is regulated by federal, state, and local laws. In addition to rules and standards contained in the federal Clean Air Act (CAA) and the California Clean Air Act (CCAA), air quality in Orange County is subject to the rules and regulations established by California Air Resources Board (CARB) and SCAQMD with oversight provided by the United States Environmental Protection Agency (USEPA), Region IX.

2.3.1. Criteria Pollutants

2.3.1.1. Federal

National Ambient Air Quality Standards

The USEPA is responsible for implementation of the CAA. The CAA was first enacted in 1955 and has been amended numerous times in subsequent years, with the most recent amendments in 1990. At the federal level, the USEPA is responsible for implementation of some portions of the CAA (e.g., certain mobile source and other requirements). Other portions of the CAA (e.g., stationary source requirements) are implemented by state and local agencies.

Under the authority granted by the CAA, USEPA has established NAAQS, which are periodically updated, to protect the public health and welfare from the effects of air pollution. Current federal standards are set for SO_2, CO, NO_2, O_3, PM_{10}, $PM_{2.5}$, and Pb.[12] **Table 2** presents the NAAQS that are currently in effect for criteria air pollutants. As discussed previously, O_3 is a secondary pollutant, meaning that it is formed from reactions of “precursor” compounds under certain conditions. The primary precursor compounds that can lead to the formation of O_3 are VOCs and NO_X.

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

Specific geographic areas are classified as either “attainment” or “non-attainment” areas for each pollutant based upon the comparison of measured data with the NAAQS. Those areas designated as “non-attainment” for purposes of NAAQS compliance are required to prepare

[10] CARB, Diesel and Health Research, Available at: www.arb.ca.gov/research/diesel/diesel-health.htm, accessed April 11, 2015.
[11] CARB, Fact Sheet: Diesel Particulate Matter Health Risk Assessment Study for the West Oakland Community: Preliminary Summary of Results, March 2008, Available at: www.arb.ca.gov/ch/communities/ra/westoakland/documents/factsheet0308.pdf, accessed August 15, 2014.
[12] NAAQS. Available at: http://www.epa.gov/air/criteria.html.

regional air quality plans, which set forth a strategy for bringing an area into compliance with the standards. These regional air quality plans developed to meet federal requirements are included in an overall program referred to as the State Implementation Plan (SIP).

Whenever the USEPA revises or establishes a new NAAQS, the State and the USEPA have specific obligations to ensure that the NAAQS is met.[13] These are listed below:

- The USEPA must designate areas as meeting (attainment areas) or not meeting (non-attainment areas) the NAAQS within two years after its promulgation.
- States must submit "infrastructure SIPs" to show that they have the basic air quality management program components in place to implement the NAAQS within three years after its promulgation.
- States must submit non-attainment area SIPs that outline the strategies and emission control measures that will improve air quality and make the area meet the NAAQS within 18 to 36 months after designation.

The steps involved in the SIP process are described below.[14]

- SIPs must be developed with public input and be formally adopted by the state and submitted to the USEPA by the Governor's designee (California Air Resources Board [CARB] in California).
- The USEPA reviews each SIP and proposes to approve or disapprove all or part it. The public is then provided with an opportunity to comment on the USEPA's proposed action. The USEPA considers public input before taking final action on a state's plan.
- If the USEPA approves all or part of a SIP, those control measures are enforceable in federal court. In the event a state fails to submit an approvable SIP or if the USEPA disapproves a SIP, the USEPA is required to develop a Federal Implementation Plan (FIP).

Table 3, NAAQS Attainment Status,[15] summarizes the attainment status of SCAB for the pollutants regulated by the NAAQS. As seen in **Table 3**, Orange County (located in SCAB) is currently in attainment (or unclassified, meaning not enough monitoring data exists to show attainment or nonattainment) for: the federal 24-hour PM_{10}, CO, NO_2, and lead standard; However, as also shown in **Table 3**, Orange County is currently designated as nonattainment for the federal O_3 standards ("extreme", or having a design value greater than 0.175 ppm) and the federal $PM_{2.5}$ standards.[16]

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[13] USEPA. State Implementation Plan Development Process. Available at: http://www.epa.gov/airquality/urbanair/sipstatus/process.html. Accessed: May 2014.

[14] USEPA. State Implementation Plan Development Process. Available at: http://www.epa.gov/airquality/urbanair/sipstatus/process.html. Accessed: May 2014.

[15] USEPA. The Green Book Non-Attainment Areas for Criteria Pollutants. Available at: http://epa.gov/oaqps001/greenbk/. Accessed: March 2014.

[16] USEPA. The Green Book Non-Attainment Areas for Criteria Pollutants, Available at: http://epa.gov/oaqps001/greenbk/. Accessed: March 2014.

Heavy-duty Engines and Vehicles Fuel Efficiency Standards

On August 9, 2011, the USEPA and the NHTSA announced fuel economy and greenhouse gas (GHG) standards for medium- and heavy-duty trucks, which apply to vehicles from model year 2014-2018.[17] USEPA and NHTSA have adopted standards for carbon dioxide (CO_2) emissions and fuel consumption, respectively, tailored to each of three main vehicle categories: combination tractors, heavy-duty pickup trucks and vans, and vocational vehicles. According to USEPA, this program will reduce GHG emissions and fuel consumption for affected vehicles by 9 percent to 23 percent over the 2010 baselines. These emissions reductions were not included in the Project emissions inventory due to the difficulty in quantifying the reductions consistent with other analysis assumptions. Excluding these reductions results in a more conservative (i.e., higher) Project emissions inventory. While this regulation focuses on the reduction of GHG emissions, compliance with this regulation would also help reduce criteria air pollutants.

2.3.1.2. State

California Ambient Air Quality Standards

The California Clean Air Act (CCAA), signed into law in 1988, requires all areas of the state to achieve and maintain the California Ambient Air Quality Standards (CAAQS) by the earliest practicable date. The California Air Resources Board (CARB), a part of the California Environmental Protection Agency (Cal EPA), is responsible for the coordination and administration of both State and federal air pollution control programs within California. CARB has been granted jurisdiction over a number of air pollutant emission sources that operate in the state. Specifically, CARB has the authority to develop emission standards for on-road motor vehicles, as well as for stationary sources and some off-road mobile sources. In turn, CARB has granted authority to the regional air pollution control and air quality management districts to develop stationary source emission standards, issue air quality permits, and enforce permit conditions. **Table 2** includes the CAAQS currently in effect for each of the criteria pollutants as well as other pollutants recognized by the State. The CAAQS are generally as stringent as, and in several cases more stringent than, the NAAQS; however, in the case of short-term standards for NO_2 and SO_2, the CAAQS are less stringent than the NAAQS. The attainment status with regard to the CAAQS is presented in **Table 3** for each criteria pollutant.

Table 3 also summarizes the attainment status of Orange County for the pollutants regulated by the CAAQS. As seen in **Table 3**, Orange County is currently in attainment (or unclassified, meaning not enough monitoring data exists to show attainment or nonattainment) for: State CO, NO_2, lead, SO_2, hydrogen sulfide, vinyl chloride, sulfates, and visibility-reducing particles standards. However, as also shown in **Table 3**, Orange County is currently designated as nonattainment for the State O_3, PM_{10}, and $PM_{2.5}$ standards.[18]

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[17] USEPA. 2011. Office of Transportation and Air Quality. EPA and NHTSA Adopt First-Ever Program to Reduce Greenhouse Gas Emissions and Improve Fuel Efficiency of Medium-and Heavy-Duty Vehicles. August. Available at: http://www.epa.gov/otaq/climate/documents/420f11031.pdf. Accessed: March 2014.

[18] California standard attainment status based on CARB website. Available at: http://www.arb.ca.gov/desig/adm/adm.htm. Accessed: March 2014.

Mobile Source Reductions (AB 1493)

Assembly Bill (AB) 1493 ("the Pavley Standard" or AB 1493) required CARB to adopt regulations by January 1, 2005, to reduce GHG emissions from non-commercial passenger vehicles and light-duty trucks of model year 2009 through 2016. AB 1493 also required the California Climate Action Registry (CCAR) to develop and adopt protocols for the reporting and certification of GHG emissions reductions from mobile sources for use by CARB in granting emission reduction credits. AB 1493 further authorized CARB to grant emission reduction credits for reductions of GHG emissions prior to the date of enforcement of regulations, using model year 2000 as the baseline for reduction.

In 2004, CARB applied to the USEPA for a waiver under the federal Clean Air Act (CAA) to authorize implementation of the AB 1493 regulations. Subsequently, on June 30, 2009, the USEPA granted the waiver to California for its GHG emission standards for motor vehicles. As part of this waiver, USEPA specified the following provision: CARB may not hold a manufacturer liable or responsible for any noncompliance caused by emission debits generated by a manufacturer for the 2009 model year.

CARB's approach to passenger vehicles (cars and light trucks), under AB 1493, combines the control of smog-causing pollutants and GHG emissions into a single coordinated package of standards. This new approach also includes efforts to support and accelerate the numbers of plug-in hybrids and zero-emission vehicles in California. These standards will apply to all passenger and light duty trucks used by customers, employees of and deliveries to the Proposed Project. While AB 1493 focuses on the reduction of GHG emissions, it is anticipated that this regulation would also help reduce criteria air pollutants.

Advanced Clean Cars

In January 2012, CARB approved the Advanced Clean Cars (ACC) program,[19] a new emissions-control program for model year 2017 through 2025. The program combines the control of smog, soot, and GHGs with requirements for greater numbers of zero-emission vehicles. By 2025, when the rules will be fully implemented, the new automobiles will emit 34 percent fewer global warming gases and 75 percent fewer smog-forming emissions. While ACC focuses on the reduction of GHG emissions, it is anticipated that this regulation would also help reduce criteria air pollutants.

2.3.1.3. Regional

South Coast Air Quality Management District

Together, SCAQMD and CARB are responsible for ensuring compliance with all state and federal air quality standards within the jurisdiction of the District. The SCAQMD has jurisdiction over an area of approximately 10,743 square miles. This area includes all of Orange County and Los Angeles County except for the Antelope Valley, the non-desert portion of western San Bernardino County, and the western and Coachella Valley portions of Riverside County. The Air Basin is a sub-region of the SCAQMD jurisdiction.

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[19] Advanced Clean Car program information. Available at: http://www.arb.ca.gov/msprog/consumer_info/advanced_clean_cars/consumer_acc.htm. Accessed: May 2014.

In order to meet these standards, SCAQMD has adopted a series of Air Quality Management Plans (AQMPs). The 2012 AQMP incorporates the latest scientific and technological information, such as updated emissions inventories, and planning assumptions, including Southern California Association of Governments' (SCAG) 2012 Regional Transportation Plan/Sustainable Communities Strategy (2012–2035 RTP/SCS).[20] The 2012 AQMP also includes updates to federal requirements, implementation of new technology measures, and the continued development of compliance approaches.

The AQMP provides emissions inventories, ambient monitoring results, meteorological data, and air quality modeling tools. The AQMP also provides policies and measures to guide local agencies in achieving federal standards. It also establishes strategy for controlling pollution from all sources, including stationary sources, on-road and off-road mobile sources, and area sources.

SCAQMD adopts rules and regulations to implement the AQMP. Several of these rules may apply to construction or operation of the Project. For example, SCAQMD Rule 403 requires the implementation of best available fugitive dust control measures during active construction periods capable of generating fugitive dust emissions from on-site earth-moving activities, construction/demolition activities, and construction equipment travel on paved and unpaved roads.

Although SCAQMD is responsible for regional air quality planning efforts, it does not have the authority to directly regulate the air quality issues associated with new development projects within the South Coast Air Basin, such as the Project. Instead, in November 1993, SCAQMD published the CEQA Air Quality Handbook to assist lead agencies in evaluating potential air quality impacts of proposed projects. The CEQA Air Quality Handbook provides standards, methodologies, and procedures for conducting air quality analyses in EIRs. The SCAQMD is currently in the process of replacing the CEQA Air Quality Handbook with the Air Quality Analysis Guidance Handbook.

In order to assist in conducting an air quality analysis in the interim while the replacement handbook is awaiting issuance, SCAQMD has provided guidance on its website, which includes:

- EMFAC on-road vehicle emission factors;
- Background CO concentrations;
- Localized significance thresholds (LST);
- Mitigation measures and control efficiencies;
- Mobile source toxics analysis;
- Off-road mobile source emission factors;
- $PM_{2.5}$ significance thresholds and calculation methodology; and
- Updated Air Quality Significance Thresholds.

[20] SCAG. 2012. 2012-2035 Regional Transportation Plan/Sustainable Communities Strategy. April. Available at: http://rtpscs.scag.ca.gov/Pages/default.aspx. Accessed: May 2014.

SCAQMD also recommends using approved models to calculate emissions from land use projects, such as CalEEMod®.

The SCAQMD has also adopted land use planning guidelines, which consider impacts to sensitive receptors from facilities that emit TAC emissions.[21] SCAQMD recommends the same siting distances as CARB (e.g., a 500-foot siting distance for sensitive land uses near high traffic-volume roadways). SCAQMD's guidance also introduces policies that rely on design and distance to minimize emissions and lower potential health risks for sensitive land uses. SCAQMD's guidelines are voluntary initiatives recommended for consideration by local planning agencies.

Southern California Association of Governments

SCAG is the metropolitan planning organization (MPO) for Los Angeles, Orange, Ventura, Riverside, San Bernardino, and Imperial Counties and serves as a forum for the discussion of regional issues related to transportation, the economy, community development, and the environment. As the federally-designated MPO for the Southern California region, SCAG is mandated by the federal government to research and develop plans for transportation, hazardous waste management, and air quality. Pursuant to California Health and Safety Code 40460(b), SCAG has the responsibility for preparing and approving the portions of the AQMP relating to regional demographic projections and integrated regional land use, housing, employment, and transportation programs, measures and strategies. SCAG is also responsible under the CAA for determining conformity of transportation projects, plans, and programs with applicable air quality plans. With regard to air quality planning, SCAG has prepared the 2012-2035 RTP/SCS, which addresses regional development and growth forecasts.

As discussed earlier, the SCAQMD and SCAG are jointly responsible for preparing the AQMP for the SCAB. In particular, the 2012 AQMP is based on demographic growth forecasts for various socioeconomic categories (e.g., population, housing, employment by industry) developed by SCAG for their 2012 RTP, which forms part of SCAG's 2012–2035 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS). Thus, consistency with the planning assumptions contained within the RTP/SCS demonstrates consistency with SCAQMD's 2012 AQMP. As mentioned previously, SCAG's 2012-2035 RTP/SCS was adopted in April 2012. The goals and policies of the RTP/SCS that reduce vehicle miles traveled (VMT) focus on transportation and land use planning that include building infill projects, locating residents closer to where they work and play, and designing communities so there is access to high quality transit service. The 2012-2035 RTP/SCS is expected to reduce per capita transportation emissions by 9 percent by 2020 and 16 percent by 2035.

Pursuant to Government Code Section 65080(b)(2)(K), SCAG's Sustainable Communities Strategy does not: (i) regulate the use of land, (ii) supersede the land use authority of cities and counties; or (iii) require that a city's or county's land use policies and regulations, including those in a general plan, be consistent with it.

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[21] SCAQMD. 2005. Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning. May. Avaliable at: http://www.aqmd.gov/home/library/documents-support-material/planning-guidance/guidance-document. Accessed April 13, 2015.

2.3.1.4. Local

The Air Quality Element of the City of Cypress General Plan is intended to protect public health and welfare. It does this by establishing measures that allow the SCAB to attain federal and state air quality standards. It sets forth a number of programs to reduce emissions and to require new development to include measures to comply with existing standards and potential new requirements.

The Cypress Air Quality Element identifies the following four goals to reduce the generation of pollutants.[22] Specifically, the Air Quality Element focuses on land use, transportation, and energy planning measures to aid the SCAB in reducing air pollution:

- Land Use Pattern: Reduce air pollution through proper land use and transportation planning.
- Transpiration: Improve air quality by reducing the amount of vehicular emissions in Cypress.
- Reduce Particulate Emissions: Reduce particulate emissions to the greatest extent feasible.
- Reduce Energy Consumption: Reduce emissions through reduced energy consumption.

In accordance with CEQA requirements and the CEQA review process, the City assesses the air quality impacts of new development projects, and uses the SCAQMD CEQA Air Quality Handbook, and the SCAQMD website guidance, as the basis for its review.

2.3.2. Toxic Air Contaminants

The CARB’s statewide comprehensive air toxics program was established in the early 1980's. The Toxic Air Contaminant Identification and Control Act (AB 1807) created California's program to reduce exposure to air toxics. The California Air Toxics Program was established in 1983, when the California Legislature adopted AB 1807 to establish a two-step process of risk identification and risk management to address potential health effects from exposure to toxic substances in the air. To identify the risk, CARB and the Office of Environmental Health Hazard Assessment (OEHHA) determine if a substance should be formally identified, or “listed,” as a TAC in California. Since inception of the program, a number of such substances have been listed. In 1993, the California Legislature amended the program to identify the 189 federal hazardous air pollutants (HAPs) as TACs. To manage the risk, CARB reviews emission sources of an identified TAC to determine whether regulatory action is needed to reduce risk. Based on results of that review, CARB has promulgated a number of airborne toxic control measures (ATCMs) as described in the next section.

Air Toxics Control Measure (ATCM)

In 2004, CARB adopted a control measure to limit commercial heavy-duty diesel motor vehicle idling in order to reduce public exposure to DPM and other TACs. The measure applies to diesel-fueled commercial vehicles with gross vehicle weight ratings greater than 10,000 pounds that are licensed to operate on highways, regardless of where they are registered. In general, it prohibits idling for more than 5 minutes at any location.

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[22] City of Cypress. 2001. City of Cypress General Plan, Air Quality Element. October. Available at: http://www.ci.cypress.ca.us/community_develpmnt/general_plan/7_air_quality_doc.pdf. Accessed April 13, 2015.

In addition to limiting exhaust from idling trucks, CARB promulgated emission standards for off-road diesel construction equipment such as bulldozers, loaders, backhoes and forklifts, as well as many other self-propelled off-road diesel vehicles. A CARB regulation that became effective on June 15, 2008, aims to reduce emissions by installation of diesel soot filters and encouraging the replacement of older, dirtier engines with newer emission controlled models. The regulation requires that fleets limit their unnecessary idling to 5 minutes; there are exceptions for vehicles that need to idle to perform work (such as a crane providing hydraulic power to the boom), vehicles being serviced, or in a queue waiting for work. A prohibition against acquiring certain vehicles (e.g., Tier 0 and Tier 1) began on March 1, 2009; Implementation of the fleet averaging emission standards is staggered based on fleet size, with the largest operators required to begin compliance in 2014.[23] By 2020, CARB estimates that DPM will be reduced by 74 percent and smog forming NO_X (an ozone precursor emitted from diesel engines) by 32 percent, compared to what emissions would be without the regulation.[24]

AV 2588 Air Toxic "Hot Spots" Program

In September 1987, the California Legislature established the AB 2588 air toxics "Hot Spots" program. It requires facilities to report their air toxics emissions, ascertain health risks, and to notify nearby residents of significant risks. The SCAQMD has determined that the significance criterion for cancer health risks is a ten in one million increase in the chance of developing cancer. The SCAQMD has also adopted a significance criterion for cancer burden. The cancer burden is the estimated increase in the occurrence of cancer cases in a population as a result of exposures to TAC emissions. The SCAQMD has determined that the significance criterion for cancer burden is 0.5 excess cancer cases within areas with an incremental increase in cancer risk greater than or equal to 1 in 1 million. The significance of non-cancer (acute and chronic) risks is evaluated in terms of hazard indices (HI) for different endpoints. The SCAQMD threshold for non–cancer risk for both acute and chronic HI is 1.0. In September 1992, the "Hot Spots" Act was amended by Senate Bill 1731, which required facilities that pose a significant health risk to the community to reduce their risk through a risk management plan. Beginning in 2000, the CARB has adopted diesel risk reduction plans and measures to reduce Diesel Exhaust Particulate Matter (DPM) emissions and the associated health risk. These are discussed in more detail in the following section.

As discussed later in the report, the significance criterion for cancer, cancer burden, or non-cancer risk is not evaluated for the construction operations because the SCAQMD CEQA guidance does not require a health risk assessment for short-term construction emissions. These criterions were also not evaluated for the operational emissions associated with the Project because the SCAQMD recommends that health risk assessments be conducted for substantial sources of TACs, and Project is not a substantial source of acutely and chronically hazardous TACs.

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[23] California Air Resources Board, In-Use Off-Road Diesel Vehicle Regulation, Overview, revised May 2012, online at http://www.arb.ca.gov/msprog/ ordiesel/faq/overview_fact_sheet_dec_2010-final.pdf, accessed June 2013.

[24] California Air Resources Board, Emissions and Health Benefits of Regulation for In-Use Off-Road Diesel Vehicles, online at http://www.arb.ca.gov/ msprog/ordiesel/documents/OFRDDIESELhealthFS.pdf, accessed March 2013.

Sensitive Receptor Siting Guidance

The CARB published the Air Quality and Land Use Handbook on April 28, 2005 (the "CARB Handbook"), to serve as a general guide for considering health effects associated with siting sensitive receptors proximate to sources of TAC emissions. The recommendations provided therein are voluntary and do not constitute a requirement or mandate for either land use agencies or local air districts. The goal of the guidance document is to protect sensitive receptors, such as children, the elderly, acutely ill, and chronically ill persons, from exposure to TAC emissions. Some examples of CARB's siting recommendations include the following: (1) avoid siting sensitive receptors within 500 feet of a freeway, urban road with 100,000 vehicles per day, or rural roads with 50,000 vehicles per day; (2) avoid siting sensitive receptors within 1,000 feet of a distribution center (that accommodates more than 100 trucks per day, more than 40 trucks with operating transport refrigeration units per day, or where transport refrigeration unit operations exceed 300 hours per week); and (3) avoid siting sensitive receptors within 300 feet of any dry cleaning operation using perchloroethylene and within 500 feet of operations with two or more machines.

2.4. Existing Air Quality Condition

2.4.1. Regional Air Quality

The Southern California region lies in the semi-permanent high-pressure zone of the eastern Pacific. As a result, the climate is mild, tempered by cool sea breezes. The usually mild climate is interrupted infrequently by periods of extremely hot weather, winter storms, or Santa Ana winds. Meteorological conditions and topography affect the dispersion of pollutants, and make the SCAB susceptible to air pollution. The extent and severity of the air pollution problem in the Air Basin is also affected by man-made influences, such as development patterns and lifestyle.

The greatest air pollution impacts throughout the Air Basin occur from June through September. This condition is generally attributed to the high emissions, as well as light winds and shallow vertical atmospheric mixing, which reduce dispersion. Pollutant concentrations in the SCAB vary with location, season, and time of day. Ozone concentrations, for example, tend to be higher in the inland valleys than either along the coast or in the far inland areas of the SCAB and adjacent desert. Over the past 30 years, substantial progress has been made in reducing air pollution levels in Southern California. However, the SCAB still fails to meet national standards for ozone and $PM_{2.5}$.

In 2008, SCAQMD released an SCAB-wide air toxics study, Multiple Air Toxics Exposure Study (MATES-III).[25] The MATES-III Study represents one of the most comprehensive air toxics studies ever conducted in an urban environment. The Study set out to estimate the cancer risk from toxic air emissions throughout the SCAB by conducting a comprehensive monitoring program, updating the emissions inventory of toxic air contaminants, and modeling emissions to characterize health risks for residents throughout the region. The Study calculated an average carcinogenic risk from air pollution in the Air Basin of approximately 1,200 in one million over a 70-year duration as presented in **Figure 1**. Mobile sources (e.g., cars, trucks, trains, ships,

[25] SCAQMD. MATES III. Available at: http://www.aqmd.gov/home/library/air-quality-data-studies/health-studies/mates-iii. Accessed April 13, 2015.

aircraft, etc.) represent the greatest contributors. Approximately 85 percent of the risk is attributed to diesel particulate emissions, approximately 10 percent to other toxics associated with mobile sources (including benzene, butadiene, and formaldehyde). Approximately 5 percent of all carcinogenic risk is attributed to stationary sources (which include industries and other certain businesses, such as dry cleaners and chrome plating operations).

On April 1, 2015, the SCAQMD released a MATES IV Draft Final Report. The Study shows that the level of diesel particulates has a dramatic reduction of 70% in average measured at the 10 monitoring sites compared to MATES III. The Study also concluded that the average carcinogenic risk from air pollution in the Basin is approximately 418 in one million as presented in **Figure 2**, a 65% overall reduction from MATES III based on monitoring. Mobile sources (e.g., cars, trucks, trains, ships, aircraft, etc.) account for 90% of the air toxics risk, and diesel accounts 68% of the air toxics risk.[26]

2.4.2. Local Air Quality

2.4.2.1. Existing Pollutant Levels at Nearby Monitoring Stations

The Project site is located within the SCAQMD jurisdiction. The SCAQMD maintains ambient air quality monitoring stations throughout the SCAB. The Central Orange County air monitoring station (Station No. 3176) is located approximately 6.5 miles east of the Project site and is the closest station. The Central Orange County air monitoring station monitors CO, NO_2, O_3, PM_{10} and $PM_{2.5}$. However, SO_2 is not monitored at this station. As a result, the SO_2 concentrations from the South Coastal Los Angeles County station are shown since this monitor is the next closest (approximately 8 miles to the west) to the Project site with such data.

Table 4 list the most recent five years of published data from 2009 to 2013 at the Central Orange County monitoring station for CO, NO_2, O_3, PM_{10} and $PM_{2.5}$, and at the South Coastal Los Angeles County station for SO_2 which shows:

- O_3 levels have exceeded the State 1-hour standard in 2009 and 2010, State 8-hour standards in 2009, 2010, and 2011, and the federal 8-hour standard in 2009 and 2010;
- CO levels are below the State and federal standards;
- NO_2 levels are below the State and federal standards;
- PM_{10} levels exceeded the State 24-hour standard in 2009, 2011 and 2013, and the State annual standards in 2009 through 2013; PM_{10} levels are below the federal 24-hour standard;
- SO_2 levels are below the State and federal standards; and
- $PM_{2.5}$ levels are below the State and federal annual standards, but exceeded the federal 24-hour standard in 2009, 2011, 2012, and 2013.

[26] SCAQMD. 2015. Draft Final Report – Multiple Air Toxics Exposure Study in the South Coast Air Basin. Available at: http://www.aqmd.gov/docs/default-source/air-quality/air-toxic-studies/mates-iv/mates-iv-final-draft-report-4-1-15.pdf?sfvrsn=4

2.4.2.2. Existing Health Risk in the Surrounding Area

As part of the MATES-III Study, the SCAQMD prepared a series of maps that show regional trends in estimated outdoor inhalation cancer risk from toxic emissions, as part of an ongoing effort to provide insight into relative risks. The maps' estimates represent the number of potential cancers per million people associated with a lifetime of breathing air toxics (24 hours per day outdoors for 70 years) in parts of the area. The MATES-III map is the most recently available map to represent existing conditions near the Project area. Based on the interactive map, the average cancer risk around the Project site was approximately 1,280 in a million.

As discussed earlier, the SCAQMD released MATES IV Draft Final Report on April 1, 2015. Based on SCAQMD's MATES IV cancer risk interactive map, the average cancer risk around the Project site is approximately 380 in a million, approximately 70% below the cancer risk level of 1,280 in a million in the MATES III study.[27,28]

2.4.3. Surrounding Uses and Sensitive Receptors

To the north of the project site is the former Burlington National railroad property and beyond that are one-story horse barns that are occupied by quarter horses and thoroughbred horses, and associated equipment. To the east of the project site is a surface parking area for Los Alamitos Race Course, a small two-story church, and a four-story Residence Inn Hotel. To the south, on the far side of Katella Avenue, are commercial and multi-family uses, behind which are single-family residences. To the west is Enterprise Drive with the Cottonwood Church campus beyond.

The Air Quality Element in the City of Cypress General Plan states that: sensitive populations are more susceptible to the effects of air pollution than are the general population. Sensitive populations (i.e., sensitive receptors) who are in proximity to localized sources of toxics and carbon monoxide are of particular concern. Land uses considered sensitive receptors include residences, schools, playgrounds, child care centers, athletic facilities, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes.

The multiple-family and single family residences south of the Project are considered sensitive receptors. Other land use in close proximity to the Project site include the Marriott Residence Inn Hotel located immediately east of the Project site and, the Cottonwood Church located west of the Project site. The church is being considered a sensitive receptor because it is approved for a daycare facility, which has yet to be constructed to the west of the Project site. In addition, the Marriott Residence Inn Hotel was used as a receptor location to evaluate the worst case impacts from the Project to other receptors, as it is the nearest adjacent property. **Figure 3** presents the location of nearby land uses.

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[27] SCAQMD. 2014. MATES IV Carcinogenic Risk Interactive Map. Available at: http://www3.aqmd.gov/webappl/OI.Web/OI.aspx?jurisdictionID=AQMD.gov&shareID=73f55d6b-82cc-4c41-b779-4c48c9a8b15b

[28] SCAQMD. 2008. MATES III Carcinogenic Risk Interactive Map. Available at: http://www3.aqmd.gov/webappl/matesiii/

2.4.4. Existing Project Site Emissions

The Project site was previously part of the Cypress Golf Club, which permanently closed in 2004. Following the closure of the Golf Club, the golf course was demolished and the site was re-graded and all vegetation was removed, except for some eucalyptus and pepper trees and other vegetation along the southerly and easterly boundary of the Project site. The Project site is unimproved and is not currently utilized for any land use or activity. Therefore, there are no existing emissions from the Project site.

3. Environmental Impacts

3.1. Thresholds of Significance

The CEQA thresholds of significance for analyzing air quality impacts inquire whether the Project would:

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; or

e) Create objectionable odors affecting a substantial number of people.

As stated in Appendix G of the CEQA Guidelines, where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make determinations about a project's impacts. This report uses the adopted thresholds in the local air quality management district. The Initial Study prepared for the Project determined that potential impacts related to objectionable odors was clearly insignificant. The odor issue was scoped out of the Draft EIR and this report does not address the last threshold (e) above.

In the context of the questions above from Appendix G of the CEQA Guidelines, the SCAQMD has established thresholds of significance[29] to assess the impacts of project-related construction and operational emissions on regional and local ambient air quality. These thresholds of significance are presented in **Table 5** and discussed below.

3.1.1. Construction Emission Thresholds

Regional

As shown in **Table 5**, the Project construction would pose significant impact to the regional air quality if the maximum daily construction emissions exceed: 1) 100 pounds per day for NOx; 2) 75 pounds per day for VOC; 3) 150 pounds per day for PM_{10} or SOx; 4) 55 pounds per day for $PM_{2.5}$; or 5) 550 pounds per day for CO.

Localized

The Project construction would pose significant impact to local air quality if the maximum on-site daily localized construction emissions exceed the Localized Significance Thresholds (LST) adopted by SCAQMD. Such exceedance in localized construction emissions would cause the

[29] SCAQMD. 2011. Air Quality Significance Thresholds. March. Available at: http://sfprod.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significance-thresholds.pdf?sfvrsn=2. Accessed: June 2014.

predicted local ambient concentrations near the Project to exceed the most stringent ambient air quality standards for CO and N_2O, and incremental threshold for PM_{10} and $PM_{2.5}$ as listed in **Table 5**.

3.1.2. Operational Emission Thresholds

Regional

As shown in **Table 5**, the Project operation could have a significant impact on the regional air quality if the annual VOC emissions exceeds 10 tons per year or the maximum daily emissions exceed: 1) 55 pounds per day for NOx; 2) 55 pounds per day for VOC; 3) 150 pounds per day for PM_{10} or SOx; 4) 55 pounds per day for $PM_{2.5}$; or 5) 550 pounds per day for CO.

Localized

The Project operation could have a significant impact on local air quality if the maximum on-site daily localized operational emissions exceed the Localized Significance Thresholds (LST) adopted by SCAQMD. Such exceedance in localized construction emissions would cause the predicted local ambient concentrations near the Project to exceed the most stringent ambient air quality standards for CO and N_2O, and incremental threshold for PM_{10} and $PM_{2.5}$ as listed in **Table 5**.

3.1.3. Toxic Air Contaminants

As shown in **Table 5,** the Project could have a significant TAC impact if the carcinogenic or toxic air contaminants emissions results the exceedance of the maximum incremental cancer risk of 10 in one million or an acute or chronic hazard index of 1.0. For projects with a maximum incremental cancer risk between 1 in one million and 10 in one million, a project could have a significant impact if the cancer burden exceeds 0.5 excess cancer cases.

3.2. Criteria Pollutant Methodology and Emission Inventories

This section describes the methodology that ENVIRON International Corporation (ENVIRON) used to develop the criteria pollutant emissions inventories associated with the Project, which include construction emissions and operational emissions. Sub-categories of the operational emissions include: area sources, energy use, and mobile sources.

3.2.1. Methodology for Calculating Mass Emissions

This analysis focuses on the potential change in air quality due to implementation of the Project. The Project would result in criteria pollutant emissions from construction and operational sources. Construction activities would generate emissions at the site from off-road construction equipment, and on roadways resulting from construction-related truck hauling, vendor deliveries, and worker commuting. Operational activities would also generate emissions at the Project site from miscellaneous onsite sources, such as natural gas combustion for cooking and comfort heating and landscaping equipment, and from operational-related traffic.

To calculate the criteria pollutant emissions from the Project, ENVIRON relied on emissions guidance from government-sponsored organizations, energy surveys by other consulting firms, the traffic study prepared by Kimley Horn, and emission modeling software.

CalEEMod®

ENVIRON utilized the California Emission Estimator Model version 2013.2.2 (CalEEMod®)[30] to quantify the criteria pollutant emissions in the inventories presented in this report for the Project. CalEEMod® is a statewide program designed to calculate both criteria and greenhouse gas (GHG) emissions from development projects in California. This model was initially developed under the auspices of the SCAQMD and received input from other California air districts and is currently supported state-wide for use in quantifying the emissions associated with development projects undergoing environmental review. CalEEMod® utilizes widely accepted models for emission estimates combined with appropriate default data that can be used if site-specific information is not available. These models and default estimates use sources such as the United States Environmental Protection Agency (USEPA) AP-42 emission factors.[31] CARB's on-road and off-road equipment emission models such as the EMission FACtor model (EMFAC) and the Off-road Emissions Inventory Program model (OFFROAD), and studies commissioned by California agencies such as the California Energy Commission (CEC) and California Department of Resources Recycling and Recovery (CalRecycle).

CalEEMod® is based upon CARB-approved Off-Road and On-Road Mobile-Source Emission Factor models (OFFROAD and EMFAC, respectively), and is designed to calculate construction and operational emissions for land use development projects and allows for the input of project specific information. OFFROAD2011[32] is an emissions factor model used to calculate emission rates from off-road mobile sources (e.g., construction equipment, agricultural equipment). EMFAC2011[33] is an emissions factor model used to calculate emissions rates from on-road vehicles (e.g., passenger vehicles, haul trucks).

CalEEMod® provides a platform to calculate both construction emissions and operational emissions from a land use project. It calculates both the daily maximum and annual average for criteria pollutants as well as total or annual GHG emissions. The model also provides default values for water and energy use. Specifically, the model performs the following calculations:

- Short-term construction emissions associated with demolition, site preparation, underground utility installation, grading, building, coating, and paving from off-road construction equipment, on-road mobile equipment associated with workers, vendors, and hauling, and fugitive dust associated with grading, demolition, truck loading, and roads, and volatile emissions of reactive organic gasses (ROG) from architectural coating and paving.
- Operational emissions associated with the fully built-out land use development, such as on-road mobile vehicle traffic generated by the land uses, fugitive dust associated with roads, volatile emissions of ROG from architectural coating, off-road emissions from landscaping equipment, volatile emissions of ROG from consumer products and cleaning

[30] CAPCOA. 2013. California Emissions Estimator Model. Version 2013.2.2. Available at: http://www.caleemod.com/. Accessed: November 2013.

[31] The USEPA maintains a compilation of Air Pollutant Emission Factors and process information for several air pollution source categories. The data is based on source test data, material balance studies, and engineering estimates. Available at: http://epa.gov/ttnchie1/ap42/. Accessed: February 2013.

[32] CARB. 2007. Off Road Mobile Source Emission factors. Available at: http://www.arb.ca.gov/msei/msei.htm. Accessed: September 2013.

[33] CARB. 2010. EMFAC 2007 Release. Available at: http://arb.ca.gov/msei/onroad/latest_version.htm. Accessed: February 2013.

supplies, wood stoves and hearth usage, natural gas usage in the buildings, electricity usage in the buildings, water usage by the land uses, and solid waste disposal by the land uses.

In addition, CalEEMod® contains default values and existing regulation methodologies to use in each specific local air district region. Appropriate statewide default values can be utilized if regional default values are not defined. ENVIRON used default factors for the Orange County area that is within the SCAQMD jurisdiction for the emission inventory, unless otherwise noted in the methodology descriptions below. Details regarding the specific methodologies used by CalEEMod® can be found in the CalEEMod® User's Guide and associated appendices.[34] The CalEEMod® output files are provided for reference in Appendix A to this report.

3.2.2. Construction Emissions

This section describes the calculation of emissions from construction activities at the Project Site. The proposed plan for the Project anticipates construction to happen in nine phases from 2016 through 2018.

The major construction phases included in this analysis are:

- Site Preparation (Phase 1): involves clearing vegetation (grubbing and tree/stump removal) and stones prior to grading.
- Grading (Phase 2): involves the cut and fill of land to ensure the proper base and slope for the construction foundation.
- Paving (Phase 2): involves the laying of concrete or asphalt such as in parking lots or roads.
- Utilities (Phase 2): involves the installation of wet and dry utilities to serve the Project.
- Building Construction (Phases 3-9): involves the construction of structures and buildings.
- Architectural Coating (Phases 3-9): involves the application of coatings to both the interior and exterior of buildings or structures

Emissions from these construction phases are largely attributable to fuel use from construction equipment and worker commuting.

Construction-related emissions of ROGs, NO_X, CO, and particulate matter (PM) of aerodynamic radius less than PM_{10} or less than $PM_{2.5}$ were calculated using CalEEMod®. PM emissions are composed of exhaust emissions and fugitive emissions. Exhaust emissions are typically generated out by a combustion engine of on-road vehicles and/or off-road equipment. Fugitive emissions are PM dust suspended in the air by wind action and construction related activities. Default onsite equipment lists in CalEEMod® supplemented with Project specific grading and construction equipment were used for the various construction phases.

ENVIRON's analysis was based on a mix of project specific data including the numbers and types of equipment that will be used in the construction of the Project as well as the duration of

[34] CAPCOA. 2013. California Emissions Estimator Model User's Guide. Version 2013.2.2. February. Available at: http://www.caleemod.com/. Accessed: November 2013.

the different construction phases. The construction specifics (e.g., horsepower and load factor) and number of worker, vendor, and hauling trips were based on CalEEMod® default and project-specific equipment data. The Project area is assumed to be developed in nine phases over a three-year time frame. The construction is assumed to start in 2016 and will be completed in 2018. The construction schedule and equipment list are shown in **Tables 6 and 7**, respectively. The CalEEMod® output files are included in Appendix A.

3.2.2.1. On-site Emissions from Construction Equipment

The emission calculations associated with construction equipment are from off-road equipment engine use based on the equipment list and phase length. The fugitive emissions from off-road equipment performing work are also included in this analysis.

The Project specific construction equipment types, equipment numbers, and construction phasing schedules were provided by the Project applicant. The calculations associated with this screen include the running exhaust emissions from off-road equipment. Since the equipment is assumed to be diesel, there are no starting or evaporative emissions associated with the equipment because diesel-fueled equipment does not create a material amount of these emissions. CalEEMod® calculates the exhaust emissions based on CARB's OFFROAD2011 methodology using the equation presented below.[35]

$$Emissions_{Diesel} = \sum_i (EF_i \times Pop_i \times AvgHP_i \times Load_i \times Activity_i)$$

Where:

EF = Emission factor in grams per horsepower-hour (g/bhp-hr) as processed from OFFROAD2011

Pop = Population, or the number of pieces of equipment

AvgHp = Maximum rated average horsepower

Load = Load factor

Activity = Hours of operation

i = equipment type

CalEEMod® was also used to calculate fugitive dust associated with the site preparation and grading phases from three major activities: haul road grading, earth moving and bulldozing, and truck loading. PM_{10} and $PM_{2.5}$ emissions from fugitive dust will be controlled by watering the construction site three times per day, applying soil stabilizer for unpaved roads, replacing ground cover for disturbed area, limiting the vehicle speed to 15 miles per hour on unpaved roads, and sweeping the paved roads/streets with Rule 1186 compliant PM efficient vacuum

[35] CAPCOA. 2013. California Emissions Estimator Model User's Guide. Appendix A. pages 5-6. Version 2013.2.2. Available at: http://www.CalEEMod.com/. Accessed: November 2013.

units (14-day frequency) in accordance with required fugitive dust control measures. CalEEMod® defaults include that applying water every three hours to the disturbed areas within the construction site (i.e., three times per day) can reduce the fugitive dust emissions up to 61%. The fugitive dust emissions reductions factor compiled by SCAQMD were used for the other measures.[36]

The emissions associated with off-road construction equipment are included in **Table 8**. Most of the emissions occur during the grading phase.

3.2.2.2. On-site Emissions from Architectural Coating

VOC or ROG off-gassing emissions result from evaporation of solvents contained in surface coatings, such as paint. CalEEMod® calculates the VOC evaporative emissions from application of residential and non-residential surface coatings using the following equation:[37]

$$E_{AC} = EF_{AC} \text{ x } F \text{ x } A_{paint}$$

Where:

E = emissions (pound (lb) VOC)

EF = emission factor (lb/square foot (sqft))

A = building surface area (sqft). The total surface for painting was assumed to equals 2.7 times the floor square footage for residential and 2 times that for nonresidential square footage. All of the land use information provided by a metric other than square footage was converted to square footage using the default conversions or user defined equivalence.

F = fraction of surface area. The default values based on SCAQMD methods used in their coating rules are 75% for the exterior surface and 25% for the interior.

The emission factor (EF) is based on the VOC content of the surface coatings and is calculated using the equation below:

$$EF_{AC} = C_{VOC}/454(g/lb) \text{ x } 3.785(L/gal)/180{*}sqft)$$

Where:

EF = emission factor (lb/sqft)

C = VOC content (g/L or gram per liter).

The emission factors for coating categories were calculated using the equation above based on default VOC content from CalEEMod®, which was provided by the air districts, including

36 SCAQMD. Fugitive Dust (Tables XI-A, XI-B, XI-C, XI-D and XI-E). Available at: http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/mitigation-measures-and-control-efficiencies/fugitive-dust

37 CAPCOA. 2013. California Emissions Estimator Model User's Guide. Appendix A. pages 15-16. Version 2013.2.2. Available at: http://www.CalEEMod.com/. Accessed: November. 2013.

SCAQMD where the Project would be located. The CalEEMod® default VOC content for SCAQMD is based on the 2013 version of Rule 1113. The emissions associated with architectural coating are included in **Table 8**. Maximum daily emissions from architectural coating were calculated to be 20 lbs/day for the seven applicable construction phases.

3.2.2.3. On-site Emissions from Paving

While there is no specific screen associated with asphalt paving emissions, CalEEMod® calculates VOC off-gassing emissions associated with asphalt paving of parking lots and roads using the following equation:[38]

$$E_{AP} = EF_{AP} \times A_{parking}$$

Where:

E = emissions (lb)

EF = emission factor (lb/acre). The SMAQMD default emission factor is 2.62 lb/acre.[17]

A = area of the parking lot (acre)

The emissions associated with paving are included in **Table 8**. Maximum daily emissions from paving were calculated to be 2.0 lbs/day.

3.2.2.4. Off-site Emissions from On-Road Trips

Construction generates on-road vehicle exhaust, evaporative, and dust emissions from personal vehicles for worker and vendor commuting, and trucks for soil and material hauling. These emissions are based on the number of trips and vehicle miles traveled (VMT) along with emission factors from EMFAC2011. The Project specific information and CalEEMod® default assumptions were used to calculate construction on-road trips and VMT.

CalEEMod® calculates trips and VMT based on the following assumptions and project-specific inputs:

- The number of hauling trips during the grading phase is based on the CalEEMod® default methodology, which is calculated from the total of 93,390 cubic yards of material imported during the site preparation and grading phases (i.e., grading phases 1 to 3) specified by the Project and an average haul truck volume of 16 cubic yards. The VMT associated with these hauling trips is based on a CalEEMod® default trip length of 20 miles;
- Worker trips are based on CalEEMod® default methodology, which is calculated from the number of pieces of equipment in each phase specified by the Project, except for building construction and architectural coating, where the trips are based on the number of residential dwelling units (DU) and square footage of non-residential land uses. The VMT

[38] CAPCOA. 2013. California Emissions Estimator Model User's Guide. Appendix A. pages 16-17. Version 2013.2.2. Available at: http://www.CalEEMod.com/. Accessed: November. 2013.

associated with these trips is based on the CalEEMod® default trip length equal to the home-work trip length for a project location;

- Vendor trips are based on CalEEMod® default methodology, which is calculated from the number of residential dwelling units and square footage of non-residential land uses for the building construction phase. The VMT associated with these trips is based on the CalEEMod® default trip length equal to the commercial-nonwork trip length for a project location;

Running emissions for all pollutants and PM emissions from tire and brake wear were divided by the VMT of each respective vehicle class from each scenario year and adjusted for unit conversions to derive emission factors in units of grams per VMT. All other emissions (including evaporative) were divided by the number of trips to derive emission factors in units of grams per trip.

The emissions from mobile sources were calculated with the trip rates, trip lengths, and emission factors for running from EMFAC2011 as follows:[39]

$$\text{Emissions}_{\text{pollutant}} = \text{VMT} * \text{EF}_{\text{running,pollutant}}$$

Where:

$\text{Emissions}_{\text{pollutant}}$ = emissions from vehicle running for each pollutant

VMT = vehicle miles traveled

$\text{EF}_{\text{running,pollutant}}$ = emission factor for running emissions

Evaporative emissions, starting and idling emissions are multiplied by the number of trips times the respective emission factor for each pollutant.

The total trips and VMT associated with construction mobile sources were calculated using CalEEMod® and the trip rate and length assumptions described above. The mobile source emissions were then calculated using CalEEMod® and the emission factors derived from EMFAC2011.

CalEEMod® was also used to calculate on-road fugitive dust associated with paved and unpaved roads consistent with the method discussed in the traffic section. All vehicle miles traveled from worker commuting, vendor commutes, and soil hauling are accounted for based on the trip rate and length assumptions described above.

The emissions associated with on-road activities are shown in **Table 9**. Most of the emissions were calculated to occur from the workers' and vendors' trips during the building construction phase.

[39] CAPCOA. 2013. California Emissions Estimator Model User's Guide. Appendix A. pages 13-14. Version 2013.2.2. Available at: http://www.CalEEMod.com/. Accessed: November 2013.

3.2.2.5. Maximum Daily Emissions from Construction

Since construction phases may or may not overlap in time, the maximum daily construction emissions will not necessarily be the sum of all possible daily emissions. CalEEMod® therefore calculates the maximum daily emissions for each construction phase. The program will then add together the maximum daily emissions for each construction phase that overlaps in time. Finally the program will report the highest of these combined overlapping phases as a daily maximum. For fugitive dust calculations during grading and site preparation, the maximum amount of acres graded in a day is determined by the number of grading equipment which is assumed to operate for 6 hours per day.

Regional

The regional maximum daily emissions include both on-site criterial pollutant emissions from construction equipment, on-site off-gassing VOC emissions from architecture coating and paving, and off-sit criteria pollutant emissions from construction related mobile sources. The construction emission figures conservatively represent the maximum emissions for the Project because the calculation accounts for the overlapping construction phases as discussed above. The Project will comply with SCAQMD Rules and Regulations that require the use of low VOC containing coatings to minimize the potential VOC emissions.

The daily emissions figures due to construction of the Project are summarized in **Table 10** and presented below.

- 23 lbs/day of VOC,
- 94 lbs/day of NO_X,
- 73 lbs/day of CO,
- 0.2 lbs/day of SO_2,
- 6.5 lbs/day of PM_{10}, and
- 3.3 lbs/day of $PM_{2.5}$.

In Section 3.3, these emissions are compared against the SCAQMD mass emission threshold discussed in Section 3.1.1 to determine the impact of construction emissions to the regional air quality.

Localized

The localized maximum daily emissions include only on-site criterial pollutant emissions from construction equipment and on-site off-gassing VOC emissions from architecture coating and paving. The maximum daily on-site emissions are also summarized in **Table 10** and presented below:

- 20 lbs/day of VOC,
- 54 lbs/day of NO_X,
- 39 lbs/day of CO,
- 0.1 lbs/day of SO_2,

- 2.8 lbs/day of PM_{10}, and
- 2.0 lbs/day of $PM_{2.5}$.

In Section 3.3, these emissions are compared against the SCAQMD's LST discussed in Section 3.1.1 to determine the construction of the Project would result the local criterial pollutant ambient concentration to exceed the ambient air quality standards.

3.2.3. Operational Emissions

Operational emissions are emissions that would occur after build-out of the Project. The criteria air pollutant operational mass emissions of VOC, NO_X, CO, SO_2, PM_{10}, and $PM_{2.5}$ were calculated using CalEEMod®. The CalEEMod® output can be found in Appendix A. This analysis identifies operational emissions for source categories including area sources, natural gas energy use, and mobile sources.

3.2.3.1. Area Sources

Area sources are those emissions that are generally too small to be uniquely identified as point sources, and are thus generally aggregated as a group. CalEEMod® calculates emissions for the following sources, which are included under the category of "area" sources: landscaping equipment (e.g., lawn mowers), hearths, consumer products, and architectural coatings. Criteria pollutant emissions due to natural gas combustion in buildings, except for hearths, could also be considered area sources, but are reported by CalEEMod® in the emissions associated with building energy use (described below). The criteria pollutants from area source emissions generated by the Project were calculated using CalEEMod® defaults. Sources include landscaping equipment, natural gas hearths, consumer products, and architectural coating.

3.2.3.2. Landscaping Equipment

Landscaping equipment is the primary area source of carbon monoxide associated with the Project's operational emissions. Landscape maintenance includes fuel combustion emissions from equipment such as lawnmowers, rototillers, shredders/grinders, blowers, trimmers, chain saws, and hedge trimmers, as well as air compressors, generators, and pumps. The mass emissions of VOC, NO_X, CO, SO_2, PM_{10}, and $PM_{2.5}$ associated with landscaping equipment were calculated using the CalEEMod® default emission factors (i.e., grams per dwelling unit per day for residential buildings and grams per square foot per day for non-residential buildings), which were processed using OFFROAD 2011 and CARB's Technical Memo: Change in Population and Activity Factors for Lawn and Garden Equipment.[40] The emission factors were then multiplied by the total residential dwelling units and non-residential building square footage and the number of summer days that represent the number of operational days. As shown in **Table 11**, the Project results in the following emissions from landscaping equipment.

- 0.6 lbs/day of VOC,
- 0.2 lbs/day of NO_X,
- 20 lbs/day of CO,

[40] CARB. 2003. Change in Population and Activity Factors for Lawn and Garden Equipment. Available at: http://www.arb.ca.gov/msprog/offroad/sore/lawn-and-garden-activity.pdf

- 0.001 lbs/day of SO_2,
- 0.1 lbs/day of PM_{10}, and
- 0.1 lbs/day of $PM_{2.5}$.

3.2.3.3. Hearths

All stoves and fireplaces were assumed to be natural gas-fired, based on SCAQMD Rule 445. Emissions were calculated based on the regulatory requirement that all new residential units will have gas-fired fireplaces. The criteria pollutant emission factors are based on USEPA AP-42. The average heating rate in British Thermal Units (BTU) per hour for fireplaces in homes is 60,000 BTU/hr. Default values for annual fireplace usage are specific to Orange County. Natural gas is assumed to have 1,020 BTU per standard cubic foot.[41] This methodology parallels the CalEEMod® methodology.

As shown in **Table 11**, the Project results in the following emissions from hearths.

- 0.5 lbs/day of VOC,
- 0.00002 lbs/day of NO_X,
- 0.03 lbs/day of CO,
- 0 lbs/day of SO_2,
- 0.3 lbs/day of PM_{10}, and
- 0.3 lbs/day of $PM_{2.5}$.

3.2.3.4. Consumer Products

Consumer products are chemically formulated products used by household and institutional consumers, including, but not limited to, detergents; cleaning compounds; polishes; floor finishes; cosmetics; personal care products; home, lawn, and garden products; disinfectants; sanitizers; aerosol paints; and automotive specialty products; but does not include other paint products, furniture coatings, or architectural coatings. SCAQMD did an evaluation of consumer product use compared to the total square footage of buildings using data from CARB consumer product Emission Inventory. To calculate the VOC emissions from consumer product use, the following equation was used in CalEEMod®:[42]

Emissions = EF x BuildingArea

Where:

EF = pounds of VOC per building square foot per day

The factor is 1.98 x 10^{-5} lbs/sqft/day for SCAQMD areas.

41 CAPCOA. 2013. California Emissions Estimator Model User's Guide. Appendix A. page 27. Version 2013.2.2. Available at: http://www.CalEEMod.com/. Accessed: November. 2013.

42 CAPCOA. 2013. California Emissions Estimator Model User's Guide. Appendix A. page 27. Version 2013.2.2. Available at: http://www.CalEEMod.com/. Accessed: November. 2013.

BuidlingArea = The total square footage of all buildings including residential square footage

As shown in **Table 11**, the Project results in 13 lbs/day of VOC emissions from consumer products.

3.2.3.5. Architectural Coatings

VOC off-gassing emissions result from evaporation of solvents contained in surface coatings such as in paints and primers. The operational emission methodology from architecture coating is the same as the construction methodology. All buildings are assumed to be repainted at a rate of 10% of area per year. This is based on the assumptions used by SCAQMD.

As shown in **Table 11**, the Project results in 1.1 lbs/day of VOC emissions from architectural coatings.

3.2.3.6. Calculated Emissions from Area Sources

The Project results in the following total emissions from all area sources combined.

- 16 lbs/day of VOC,
- 0.2 lbs/day of NO_X,
- 20 lbs/day of CO,
- 0.001 lbs/day of SO_2,
- 0.4 lbs/day of PM_{10}, and
- 0.4 lbs/day of $PM_{2.5}$.

Detailed criteria pollutant emissions for the Project according to area source type are discussed above and shown in **Table 11**. The primary source of VOC (or ROG) emissions is due to consumer products, and the primary source of NO_x, CO, PM_{10}, and $PM_{2.5}$ emissions results from landscaping equipment.

3.2.3.7. Building Energy Use

Criteria pollutants are emitted as a result of activities in buildings for which natural gas is typically used as an energy source. Combustion of any type of fuel emits criteria pollutants directly into the atmosphere; when this occurs in a building, this is a direct emission source associated with that building. Unless otherwise noted, CalEEMod® default parameters were used. For both residential and non-residential land-uses, climate zone 8, which best represents the City of Cypress, was selected based on the CalEEMod® forecast climate zone map. The calculated emissions also reflect that the Project will meet the 2013 Title 24 part 6 Building Code for residential and nonresidential construction. The CalEEMod® default assumptions of building energy intensity (i.e., 2008 Title 24 Standard) were updated based on the reduction presented in the California Energy Commission's 2013 Impact Analysis.[43]/[44]The percent reductions by land use type are as follows:

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[43] The California Energy Commission's Impact Analysis is available at: http://www.energy.ca.gov/2013publications/CEC-400-2013-008/CEC-400-2013-008.pdf?_sm_au_=iVVvrHfcRRF3MMR7. Accessed March, 2015.

For electricity usage:

- Single-family residential – 36.4%
- Multi-family residential – 23.3%
- Non-residential – 21.8%

And for natural gas usage:

- Single-family residential – 6.5%
- Multi-family residential – 3.8%
- Non-residential – 16.8%

Using CalEEMod®'s default factors, the Project results in the following emissions from building energy use.

- 0.3 lbs/day of VOC,
- 2.2 lbs/day of NO_X,
- 1.3 lbs/day of CO,
- 0.01 lbs/day of SO_2,
- 0.2 lbs/day of PM_{10}, and
- 0.2 lbs/day of $PM_{2.5}$.

Table 12 summarizes the total natural gas use, and total criteria pollutant emissions for the Project. The primary source of energy related operational emissions is due to natural gas usage in the residential land use.

3.2.3.8. Mobile Source Emissions

The criteria air pollutant emissions associated with on-road mobile sources are generated from residents, workers, customers, and delivery vehicles visiting the land use types in the Project. The emissions associated with on-road mobile sources includes running and starting exhaust emissions, evaporative emissions, brake and tire wear, and fugitive dust from paved and unpaved roads. Starting and evaporative emissions are associated with the number of starts or time between vehicle uses and the assumptions used in determining these values are described below. All of the other emissions are dependent on VMT. ENVIRON calculated traffic emissions using the trip rates specified in the Traffic Impact Study,[45] and CalEEMod® default trip lengths and home-based and commercial-based trip breakdown.

As the starting point, Kimley-Horn provided the total number of trips by land use, as presented in **Table 13**. To convert these total trip numbers to CalEEMod® inputs, the total trips by land use

[44] The Title 24 2013 Building Energy Efficiency Standards are pending. Available at: http://www.energy.ca.gov/title24/2013standards/rulemaking/documents/2013_Building_Energy_Efficiency_Standards_FAQ.pdf. Accessed: February. 2013.

[45] Kimley-Horn, Traffic Impact Study for the Barton Place Mixed-Use Project, 2015.

were divided by the appropriate land use size metric – number of residences for residential land uses, and 1,000 square feet for non-residential land uses.[46]

In addition to total trips, Kimley-Horn also calculated trip adjustment due to internal capture. Internal capture represents trips between land uses on the Project, such as a resident traveling to the retail space, or a retail customer traveling to the restaurant. As reported in the traffic study, Kimley-Horn calcluated internal capture to be 14% of total trips based on the Institute of Traffic Engineers Trip General Manual, 9th Edition. Accordingly, trip rates were reduced by 14% when input to CalEEMod®.

It is possible for CalEEMod® to calculate emissions reductions based on whether a trip is classified as a pass-by or diverted trip. For example, a commercial customer pass-by trip could be a person going from home to shop on his/her way to work. In addition, a commercial customer diverted-link trip could be a person going from home to work, and on its way making a diversion to shop. Pass-by trips generate virtually no additional running emissions but could generate additional resting and startup emissions. Diverted trips generate less running emissions compared to primary trips, and can also generate additional resting and startup emissions. CalEEMod® assigns default splits between primary, diverted, and pass-by trips based on land use type.

The analysis for criteria pollutants does not include the benefit of reductions from the regulatory programs such as Pavley and Advance Clean Cars. AB 1493 ("the Pavley Standard") requires CARB to adopt regulations by January 1, 2005, to reduce GHG emissions from non-commercial passenger vehicles and light-duty trucks of model year 2009 and thereafter so this analysis is conservative. The CalEEMod® model includes GHG emission reductions for non-commercial passenger vehicles and light-duty trucks of model years 2017 – 2025. While there is an expectation that the increased fuel efficiency would also help reduce criteria pollutant emissions, CalEEMod® does not incorporate a specific calculation or the benefits to criteria air pollutants. The ACC program, introduced in 2012, combines the control of smog, soot causing pollutants and greenhouse gas emissions into a single coordinated package of requirements for model years 2015 through 2025. This regulation has also not been incorporated into CalEEMod®. Thus, if the Pavley Standard and Advanced Clean Car program were incorporated, the traffic mobile related emissions would be expected to be lower than that calculated here.

3.2.3.9. Calculated Emissions from Mobile Sources

The Project generates approximately 6,932,578 VMT/yr and results in the following emissions.

- 10 lbs/day of VOC,
- 18 lbs/day of NO_X,
- 86 lbs/day of CO,
- 0.2 lbs/day of SO_2,
- 17 lbs/day of PM_{10}, and

[46] Provided by Kimley-Horn.

- 4.8 lbs/day of $PM_{2.5}$.

Detailed mobile source emissions are reported in **Table 14**.

As discussed earlier in the report, the project site was previously part of the Cypress Golf Club, which permanently closed in 2004. Following the closure of the Golf Club, the golf course was demolished and the site was re-graded and all vegetation was removed, except for some eucalyptus and pepper trees and other vegetation along the southerly and easterly boundary of the project site. Therefore, the Project site is currently vacant and does not generate any substantial emissions under the existing condition.

3.2.3.10. Operational Emissions Results

The Project operational emissions were calculated using the methodology as described above. The emissions include area sources (landscaping equipment, hearths, consumer products, and architectural coatings) and building energy use emissions, and offsite emissions from on-road sources.

Regional

The regional maximum daily emissions include criteria pollutant emissions from source categories. The daily emissions figures due to construction of the Project are summarized in **Table 15** and presented below.

- 26 lbs/day of VOC,
- 20 lbs/day of NO_X,
- 108 lbs/day of CO,
- 0.3 lbs/day of SO_2,
- 18 lbs/day of PM_{10}, and
- 5.4 lbs/day of $PM_{2.5}$.

In Section 3.3, these emissions are compared against the SCAQMD mass emission threshold discussed in Section 3.1.1 to determine the impact of construction emissions to the regional air quality.

Localized

As discussed later in Section 3.3.2.2, this is Project is a senior housing project, with a retail/commercial component, that does not include on-site emission sources such as large stationary source or on-site aggregate operations that would generate significant amount of emissions and dust, or other pollutants. Therefore, localized impacts from on-site emission sources would be less than significant. Since a quantitative determination of significance is not necessary based on the type of project, the localized operational emissions are not presented in this analysis.

3.3. Analysis of Project Impacts

This section evaluates whether the construction and operation of the Project would violate any air quality standard or contribute substantially to an existing or projected air quality violation.

3.3.1. Construction Impacts

3.3.1.1. Regional Construction Impact

The regional maximum daily construction emissions including both on-site and off-site emissions are discussed in Section 3.2.2 and summarized in **Table 10**, which indicates that the Project has relatively low levels of construction emissions. **Table 16** compares the regional maximum daily construction emissions against SCAQMD's construction mass daily significance threshold discussed in Section 3.1.1 to determine whether the Project construction emissions would pose significant impact to the regional air quality. As shown in **Table 16**, the regional daily emissions for construction are less than the SCAQMD mass daily significance thresholds for all criteria air pollutants. For all of the criteria pollutants (except NOx) the Project emissions are substantially less than the significance thresholds. Therefore, the construction activities associated with the Project would not violate any air quality standard or substantially contribute to an existing or projected air quality violation. The Project's regional construction emissions would result in a less-than-significant air quality impact.

3.3.1.2. Localized Impacts from On-Site Construction Activities

The localized impacts from the daily emissions associated with on-site construction activities were evaluated at nearby sensitive receptor locations following the SCAQMD's LST methodology, which uses on-site mass emissions rate look-up tables and Project specific modeling, where appropriate.[47] SCAQMD provides LSTs applicable to the following criteria pollutants: NO_X, CO, PM_{10}, and $PM_{2.5}$. Since land use development projects typically result in negligible construction and long-term operation SO_2 emissions, SCAQMD does not provide an LST for this pollutant. There is also no ambient standard or SCAQMD LST for VOCs since VOCs are not a criteria pollutant. VOCs are classified as a precursor pollutant, and only a regional emissions threshold has been established.

LSTs represent the Project's maximum emissions that are not expected to cause or contribute to an exceedance of the most stringent applicable federal or State ambient air quality standard. LSTs for each pollutant are developed for each source receptor area and distance to the nearest sensitive receptor based on the ambient concentrations of that pollutant. For, LSTs for PM_{10} and $PM_{2.5}$ were derived based on requirements in SCAQMD Rule 403, Fugitive Dust. For each source receptor area, a Project's localized air quality impact can be determined using the mass rate look-up tables. SCAQMD provides LST mass rate look-up tables for projects with active construction areas that are less than or equal to 5 acres. While the mass-rate LST are designed for sites/activity for 5-acres or less, the mass rate LST can be conservatively used for larger parcels, such as this Project.[48]

[47] SCAQMD, 2009. LST Methodology Appendix C-Mass Rate LST Look-up Table, Available at: www.aqmd.gov/docs/defaultsource/ ceqa/handbook/localized-significance-thresholds/appendix-c-mass-rate-lst-look-up-tables.pdf?sfvrsn=2, Accessed April 11, 2015.

[48] Per a phone discussion with Ian MacMillan at SCAQMD (August 29, 2014), this mass rate LST can be conservatively used to assess Project's greater than 5- acres in size.

In **Table 17**, the maximum daily onsite construction emissions are conservatively compared to the SCAQMD mass rate localized significance thresholds (mass rate LSTs)[49], chosen for a Project less than or equal to five acres using the receptor area of Central Orange County,[50] and for the shortest receptor distance of 25 meters, to cover the Marriott Residence Inn Hotel adjacent to the Project. The hotel is 20 meters from the edge of the Project boundary; however, as stated in the LST guidance, "The closest receptor distance on the mass rate LST look-up tables is 25 meters. It is possible that a project may have receptors closer than 25 meters. Projects with boundaries located closer than 25 meters to the nearest receptor should use the LSTs for receptors located at 25 meters."[51] The analysis shows that the construction emissions will not exceed the mass rate LSTs, and thus the Project construction emissions will not exceed the ambient air quality significance thresholds established by SCAQMD. Onsite NO_X emissions were also discussed in **Table 17** for the federal 1-hour NO_2 NAAQS, since this threshold was introduced after the mass LSTs were published. As a conservative approximation, the screening mass rate threshold for the federal 1-hour NO_2 NAAQS would be at least 45% lower than that estimated by SCAQMD. This estimate is based on a ratio of the federal threshold (188 μg/m^3) to the 1-hour NO_2 SCAQMD/CAAQS threshold (339 μg/m^3), on which the NO_2 mass rate LST is based. Since the federal threshold is based on the 98th percentile and on a 3-year average, this estimate is a conservatively low estimate. As shown in **Table 17**, maximum localized construction emissions for off-site sensitive receptors would not exceed any of the SCAQMD-recommended localized screening thresholds or the threshold corresponding to the federal 1-hour NOx NAAQs. Therefore, localized construction emissions resulting from the Project would result in a less-than-significant air quality impact.

3.3.1.3. Toxic Air Contaminants

The off-road diesel construction equipment during grading and excavation activities emits most of the TAC emissions during the Project construction. Based on the SCAQMD methodology, health effects from carcinogenic air toxics are usually described in terms of "Individual Cancer Risk", which is the likelihood that a person exposed to concentrations of TACs over a 70-year lifetime will contract cancer, based on the use of standard risk-assessment. Because the construction duration would last less than three years, and the phases that requires the most heavy-duty diesel vehicle usage (e.g., grading) would last for a much shorter period of time (e.g., three months, the Project construction would not result in a long-term (i.e., 70-year) substantial source of TAC emissions. In addition, the SCAQMD CEQA guidance does not require a health risk assessment for short-term construction emissions. It is therefore not necessary or meaningful to evaluate long-term cancer impacts from construction activities which occur over a relatively short duration. There would also be no residual emissions after construction. As such, the Project's construction TAC emission impact would be less than significant.

[49] Available at: http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/localized-significance-thresholds. Accessed: August 2014.

[50] Per a phone discussion with Ian MacMillan at SCAQMD (August 29, 2014), this mass rate LST can be conservatively used to assess Project's greater than 5 - acres in size.

[51] South Coast Air Quality Management District (SCAQMD). 2008. Final Localized Significant Threshold Methodology. July. Available at: http://www.aqmd.gov/docs/default-source/ceqa/handbook/localized-significance-thresholds/final-lst-methodology-document.pdf?sfvrsn=2. Accessed April 9, 2015.

3.3.1.4. Correlation of Potential Impacts to Human Health Effects

The health effects associated with the criteria pollutants are summarized in Section 2.2 of this report. The criteria pollutants evaluated as part of the Project air quality analysis are identified by the USEPA due to the concern regarding health effects from these pollutants. The National Ambient Air Quality Standards were established to “protect public health, including the health of at-risk populations such as people with pre-existing heart or lung disease (such as asthmatics), children, and older adults.” These thresholds were established by USEPA based on numerous studies on the relationship of health effects and PM concentrations. The SCAQMD has established both regional and localized significance thresholds as the basis to evaluate individual projects under CEQA. These significance thresholds were derived to inform the public when air quality emissions may be significant due to the potential health effects of these criteria pollutants, consistent with how the USEPA has suggested these pollutants be regulated (i.e., in relationship to the Clean Air Act and the NAAQS).

As presented in earlier sections, the maximum daily Project construction emissions are well below the SCAQMD significance threshold for all criteria pollutants, and the maximum daily Project onsite construction emissions are well below the SCAQMD LSTs for NOx, CO, and PM_{10} and $PM_{2.5}$. Therefore, the criteria pollutant emissions associated with the construction of the Project are not expected to cause any additional daily exceedances of local, state, or federal air pollution standards. The Project is not expected to emit any pollutants at a level sufficient to impact local human health, or create a level of adverse air concentrations that would force nearby residents to modify their activities in a meaningful way. Construction emissions associated with the Project are not expected to cause residents in the area to experience a material increase in respiratory illness or other health symptoms associated with air emissions. Additionally, construction would not limit residents from engaging in normal outdoor activities. Construction emissions associated with the Project are minor, well below established health-protective thresholds, and are not expected to alter daily activities or aggravate any illnesses typically associated with air emissions.

3.3.2. Operational Impacts

3.3.2.1. Regional Operational Impact

The regional maximum daily operational emissions are discussed in Section 3.2.3 and summarized in **Table 15**, which indicates that the Project has relatively low levels of operational emissions. **Table 18** compares the regional maximum daily operational emissions against SCAQMD’s operational mass daily significance threshold discussed in Section 3.1.1 to determine whether the Project operational emissions would pose significant impact to the regional air quality. As shown in **Table 18**, the regional daily emissions for Project operation are less than the SCAQMD mass daily significance thresholds for all criteria air pollutants. For all of the criteria pollutants, the Project emissions are substantially less than the significance thresholds. Therefore, the operation of the Project would not violate any air quality standard or substantially contribute to an existing or projected air quality violation. The Project’s regional operational emissions would result in a less-than-significant air quality impact.

3.3.2.2. Localized Impacts from On-Site Operational Activities

The Project does not include an evaluation of ambient air impacts for operational emissions because the Project does not include any of the land uses that typically require such an analysis to be performed based on SCAQMD's LST methodology.[52] As stated in SCAQMD's LST methodology, "[t]he primary emissions from operational activities include, but are not limited to NOx and CO combustion emissions from stationary sources and/or on-site mobile equipment. Some operational activities may also include fugitive $PM_{2.5}$ and PM_{10} dust generating activities such as aggregate operations or earthmoving activities at landfills." This Project is a senior housing project with a retail/commercial component and would not include on-site emission sources such as large stationary source or on-site aggregate operations that would generate significant amount of emissions and dust. Therefore, localized impacts from on-site emission sources would be less than significant.

3.3.2.3. Localized CO Impacts

Based on the analysis presented below, a CO "hot spots" analysis is not needed to determine whether the change in the level of service (LOS) of an intersection in the Project area would have the potential to result in exceedances of the California Ambient Air Quality Standards (CAAQS) or National Ambient Air Quality Standards (NAAQS).

It has long been recognized that CO exceedances are caused by vehicular emissions,[53] primarily when idling at intersections.[54,55] Accordingly, vehicle emissions standards have become increasingly more stringent. Before the first vehicle emission regulations, cars in the 1950's were typically emitting about 87 grams of CO per mile.[56] Since the first regulation of CO emissions from vehicles (model year 1966) in California, vehicle emissions standards for CO applicable to light duty vehicles have decreased by 96% for automobiles,[57,58] and new cold weather CO standards have been implemented, effective for the 1996 model year.[59] Currently, the CO standard in California is a maximum of 3.4 grams/mile for passenger cars (with provisions for certain cars to emit even less).[60] With the turnover of older vehicles, introduction of cleaner fuels and implementation of control technology on industrial facilities, CO concentrations in the SCAQMD have steadily declined.

The analysis prepared for CO attainment in the SCAB by the SCAQMD can be used to assist in evaluating the potential for CO exceedances in the SCAB. CO attainment was thoroughly analyzed as part of the SCAQMD's 2003 Air Quality Management Plan (2003 AQMP) and the

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[52] SCAQMD. 2008. Final Localized Significance Threshold Methodology. July. Available at: http://www.aqmd.gov/docs/default-source/ceqa/handbook/localized-significance-thresholds/final-lst-methodology-document.pdf?sfvrsn=2. Accessed: June 2014.

[53] USEPA. 2000. Air Quality Criteria for Carbon Monoxide. EPA 600/P-099/001F. June.

[54] SCAQMD. 1993. CEQA Air Quality Handbook. Section 4.5. April.

[55] SCAQMD. 2003. Air Quality Management Plan. August.

[56] USEPA. Available at: http://yosemite.epa.gov/R10/airpage.nsf/webpage/Milestones+in+Auto+Emissions+Control. Accessed: February, 2013.

[57] National Academy Board on Energy and Environmental Systems. 2008. Review of the 21st Century Truck Partnership. Appendix D: Vehicle Emission Regulations [excerpt from http://books.nap.edu/openbook.php?record_id=12258&page=107]

[58] Kavanagh, Jason. 2008. Untangling U.S. Vehicle Emissions Regulations.

[59] Title 13. California Code of Regulations. Section 1960.1(f)(2) [for 50,000 mile half-life]

[60] CARB. 2010. Available at: http://www.arb.ca.gov/msprog/levprog/cleandoc/ldtps_clean_complete_warranty_12-10.pdf. Accessed: February 2013.

1992 Federal Attainment Plan for Carbon Monoxide (1992 CO Plan).[61] As discussed in the 1992 CO Plan, peak carbon monoxide concentrations in the SCAB are due to unusual meteorological and topographical conditions, and not due to the impact of particular intersections. Considering the region's unique meteorological conditions and the increasingly stringent CO emissions standards, CO modeling was performed as part of 1992 CO Plan and subsequent plan updates and air quality management plans.

In the 1992 CO Plan, a CO hot spot analysis was conducted for four busy intersections in Los Angeles at the peak morning and afternoon time periods. The intersections evaluated included: Long Beach Blvd. and Imperial Highway (Lynwood); Wilshire Blvd. and Veteran Ave. (Westwood); Sunset Blvd. and Highland Ave. (Hollywood); and La Cienega Blvd. and Century Blvd. (Inglewood). These analyses did not predict a violation of CO standards. The busiest intersection evaluated was that at Wilshire Blvd. and Veteran Ave., which had a daily traffic volume of approximately 100,000 vehicles per day. The 2003 AQMP estimated that the 1-hour concentration for this intersection was 4.6 ppm, which indicates that the most stringent 1-hour CO standard (20.0 ppm) would likely not be exceeded until the daily traffic at the intersection exceeded more than 400,000 vehicles per day.[62] The Los Angeles County Metropolitan Transportation Authority evaluated the LOS in the vicinity of the Wilshire Blvd./Veteran Ave. intersection[63] in 2004 and found it to be Level E at peak morning traffic and Level F at peak afternoon traffic.[64]

At buildout of the Project, the highest average daily trips at an intersection would be approximately 83,770 at the Katella Avenue and Valley View Street intersection,[65] which is below the daily traffic volumes that would be expected to generate CO exceedances as evaluated in the 2003 AQMP. This daily trip estimate is based on the peak hour conditions of the intersection. There is no reason unique to SCAB meteorology to conclude that the CO concentrations at the Katella Avenue and Valley View Street intersection would exceed the 1-hour CO standard if modeled in detail, based on the studies undertaken for the 2003 AQMP. Therefore, the Project does not trigger the need for a detailed CO hotspot model and would not cause any new or exacerbate any existing CO hotspots. As a result, potential impacts related to localized mobile-source CO emissions are considered less than significant. The supporting data for this analysis is included in Appendix C.

3.3.2.4. Toxic Air Contaminants

The CARB has published and adopted the Air Quality and Land Use Handbook: A Community Health Perspective,[66] which provides recommendations regarding the siting of new sensitive

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[61] SCAQMD. 1992. Federal Attainment Plan for Carbon Monoxide.

[62] Based on the ratio of the CO standard (20.0 ppm) and the modeled value (4.6 ppm).

[63] The Metropolitan Transportation Authority measured traffic volumes and calculated the LOS for the intersection Wilshire Blvd/ Sepulveda Ave. which is a block west along Wilshire Blvd., still east of Highway 405.

[64] Metropolitan Transportation Authority. 2004. Congestion Management Program for Los Angeles County. Exhibit 2-6 and Appendix A. July 22.

[65] Kimley-Horn and associates, Inc. 2015. Traffic Impact Study for the Barton Place Mixed-Use Project.

[66] CARB. 2005. Air Quality and Land Use Handbook: A Community Health Perspective. Available at: http://www.arb.ca.gov/ch/handbook.pdf

land uses near potential sources of air toxic emissions (e.g., freeways, distribution centers, rail yards, ports, refineries, chrome plating facilities, dry cleaners, and gasoline dispensing facilities). The SCAQMD adopted similar recommendations in its Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning.[67] Together the CARB and SCAQMD guidelines recommend siting distances for both the development of sensitive land uses in proximity to TAC sources, and the addition of new TAC sources in proximity to existing sensitive land uses.

The primary sources of potential TACs associated with Project operations include DPM from delivery trucks associated with the Project's commercial and retail component (e.g., truck traffic on local streets and idling on adjacent streets). However, these activities, and the Project land uses, are not considered land uses that generate substantial TAC emissions. It should be noted that the health risk assessments are recommended by the SCAQMD to be conducted for substantial sources of DPM (e.g., truck stops and warehouse distribution facilities that generate more than 100 trucks per day or more than 40 trucks with operating transport refrigeration units), and the guidance for analyzing mobile source DPM emissions are also provided by the SCAQMD.[68] According to this guidance, the Project is not considered to be a substantial source of DPM requiring a health risk assessment since daily truck trips to the Project Site would not exceed 100 trucks per day or more than 40 trucks with operating transport refrigeration units. In addition, based on the CARB-mandated ATCM, diesel-fueled commercial vehicles (delivery trucks) are limited to idle for no more than 5 minutes at any given time that would further reduce DPM emissions.

As the Project would not contain substantial TAC sources and is consistent with CARB and SCAQMD guidelines regarding TAC sources in proximity to existing sensitive land uses, the potential Project TAC impacts would be less than significant.

For acutely and chronically non-cancer hazardous TACs, typical sources include industrial manufacturing processes (e.g., chrome plating, electrical manufacturing, and petroleum refinery). The Project would not include these types of sources, and the quantities of on-site hazardous TACs associated with the Project would be below thresholds that would trigger further study under California Accidental Release Program (CalARP). As such, the Project would not release substantial amounts of TACs, and impacts would be less than significant.

3.3.2.5. Correlation of Potential Impacts to Human Health Effects

Similar to Project construction, the maximum daily Project operational emissions are well below the SCAQMD significance threshold for all criteria pollutants. The localized impacts from on-site emission sources would be less than significant because the Project would not include on-site emission sources that would generate significant amount of emissions or dust. Therefore, the

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[67] SCAQMD. 2005. Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning. Available at: http://www.aqmd.gov/docs/default-source/planning/air-quality-guidance/complete-guidance-document.pdf?sfvrsn=4

[68] SCAQMD, 2002. Health Risk Assessment Guidance for Analyzing Cancer Risks from Mobile Source Diesel Idling Emissions for CEQA Air Quality Analysis, Available at: www.aqmd.gov/home/regulations/ceqa/air-qualityanalysis-handbook/mobile-source-toxics-analysis).

criteria pollutant emissions associated with the operation of the Project are not expected to cause any additional daily exceedances of local, state, or federal air pollution standards. The Project is not expected to emit any pollutants at a level sufficient to impact local human health, or create a level of adverse air concentrations that would force nearby residents to modify their activities in a meaningful way. Operational emissions associated with the Project are not expected to cause residents in the area to experience a material increase in respiratory illness or other health symptoms associated with air emissions. Additionally, operation would not limit residents from engaging in normal outdoor activities. Operational emissions associated with the Project are minor, well below established health-protective thresholds, and are not expected to alter daily activities or aggravate any illnesses typically associated with air emissions.

3.4. Analysis of Consistency with Applicable Air Quality Plans

This section determines whether the Project's would conflict with or obstruct implementation of the applicable air quality plan. As discussed below, the Project is consistent with the AQMP, and applicable provisions of the City of Cypress General Plan.

3.4.1. SCAQMD Air Quality Management Plan

The Project would not delay the attainment of air quality standards or the interim emission reductions specified in the AQMP; nor will the Project exceed the assumptions utilized in preparing the AQMP.

Regarding air quality standards, impacts to localized concentrations of PM_{10}, $PM_{2.5}$, CO, and NO_X have been analyzed for the Project, and found to be less than significant for both construction and operational emissions. SO_2 emissions would be negligible during construction and long-term operations, and therefore would not have the potential to cause or affect a violation of the SO_2 ambient air quality standard. Since VOCs are not a criteria pollutant, there is no ambient standard or localized threshold for VOCs. Due to the role VOCs play in ozone formation, it is classified as a precursor pollutant and only a regional emissions threshold has been established.

Regarding assumptions used in preparing the AQMP, the Project is consistent with the applicable population, housing, and employment growth projections in the AQMP. The 2012 AQMP was prepared to accommodate growth, to reduce the high levels of pollutants within the areas under the jurisdiction of SCAQMD. Projects that are considered to be consistent with the AQMP would not interfere with attainment because this growth is included in the projections utilized in the formulation of the 2012 AQMP. The Project is consistent with the SCAG population, housing and employment projections applicable to the Project Site. According to SCAG's 2012–2035 RTP/SCS, the forecasted population, households, and employment for Orange County will increase by approximately 92,300 residents, 20,700 households, and 670 jobs between 2015 and 2019.[69] The Project will result a net increase of 427 residents (0.5% of SCAG's projection for Orange County) and 244 households (1.2% of the SCAG's projection for Orange County). Therefore, the Project would not conflict with the 2012 AQMP and, as such, would not jeopardize attainment of State and national ambient air quality standards in the area under the jurisdiction of the SCAQMD.

In conclusion, Project development would not have a significant short- or long-term impact on the region's ability to meet State and federal air quality standards. The Project's long-term influence would also be consistent with the goals and policies of the AQMP. Therefore, the Project is considered consistent with the SCAQMD's AQMP.

3.4.2. City of Cypress Policies

The City of Cypress General Plan includes an Air Quality Element, which was written to coordinate with the AQMP and SCAG. In an effort to attain air quality standards, the Cypress Air Quality Element identifies goals and policies to reduce the generation of pollutants. Most of

[69] Based on a linear interpolation of data from 2008 to 2020.

these goals and policies are for City actions and do not relate to individual development projects. The following goals, however, could be interpreted to apply to the Project:

- AQ-1.3: Locate multiple family developments close to commercial areas to encourage pedestrian rather than vehicular travel.
- AQ-1.5: Encourage the design of commercial areas to foster pedestrian circulation.
- AQ-3.1: Adopt incentives, regulations, and/or procedures to minimize particulate emissions from unpaved roads, agricultural uses, and building construction.
- AQ-4.1: Promote energy conservation in all sectors of the City including residential, commercial, and industrial.
- AQ-4.2: Promote local recycling of wastes and the use of recycled materials.

The Project would promote these goals because it: allows easy access to the commercial/retail land uses through its mixed-use design and the proximity of the residential and commercial uses; reduces vehicle emissions by increasing internal capture between residential and retail segments; complies with SCAQMD Rule 403 to minimize fugitive dust emissions; complies with energy efficiency measures that promote conservation through Title 24; and complies with applicable waste recycling/diversion measures. Therefore, to the extent that the General Plan policies and goals apply to specific projects, the Project is consistent with the policies and goals of the City of Cypress General Plan Air Quality Element.

3.5. Analysis of Cumulative Impact

This section evaluates whether the project would result in a cumulatively considerable net increase of any criteria pollutant

The cumulative air quality impacts analysis is based on the guidance provided by SCAQMD "...the [SCAQMD] uses the same significance thresholds for project specific and cumulative impacts for all environmental topics analyzed in an Environmental Assessment or EIR. The only case where the significance thresholds for project specific and cumulative impacts differ is the Hazard Index (HI) significance threshold for toxic air contaminant (TAC) emissions. Projects that exceed the project-specific significance thresholds are considered by the SCAQMD to be cumulatively considerable. This is the reason project-specific and cumulative significance thresholds are the same. Conversely, projects that do not exceed the project-specific thresholds are generally not considered to be cumulatively significant."[70] Therefore, based on the fact that the Project does not exceed any of the quantitative air quality thresholds of significance, it is concluded that the Project does not have a cumulatively considerable impact.

The Project construction-related regional daily emissions are less than the SCAQMD mass daily significance thresholds for all criteria pollutants. Thus, the Project would not have a cumulatively considerable increase in emissions due to construction-related emissions. Similarly, in terms of localized air quality concentrations of NO_2, CO, SO_2, PM_{10}, and $PM_{2.5}$, construction of the

[70] SCAQMD. 2003. Cumulative Impacts White Paper, Appendices. August. Available at: http://www.aqmd.gov/docs/default-source/Agendas/Environmental-Justice/cumulative-impacts-working-group/cumulative-impacts-white-paper-appendix.pdf?sfvrsn=4. Accessed April 9, 2015.

Project would have a less-than-significant impact. Therefore, according to SCAQMD's guidance, the Project's contribution to cumulative localized air quality concentrations of these pollutants would not be cumulatively considerable and, therefore, less than significant. Likewise regarding toxic emissions, the greatest potential for construction-related TAC emissions generally involves diesel particulate emissions associated with heavy equipment operations during grading and excavation activities. As discussed in Section 3.3.1.3, construction of the Project would have a less-than-significant impact associated with TAC impacts. Therefore, according to SCAQMD's guidance, the Project's construction-related contribution to toxic emission impacts would not be cumulatively considerable, and, therefore, would be less than significant.

The Project operational emissions would be below the SCAQMD's threshold for all criteria pollutant emissions. Thus, the Project would not have a cumulatively considerable increase in emissions due to operational-related emissions. With respect to TAC emissions, the Project is not a substantial source of TAC emissions, as such emissions are typically associated with large-scale industrial, manufacturing, and transportation hub facilities based on the CARB Handbook. Additionally, the Project would be consistent with the recommended screening level siting distances for TAC sources, as set forth in the CARB Handbook. Therefore, the Project's operational-related contribution of criteria pollutant emissions or TAC emissions would not be cumulatively considerable, and therefore, would be less than significant.

3.6. Analysis of Siting for Sensitive Receptors

This section evaluates whether the Project's would expose sensitive receptors to substantial pollutant concentrations. To inform this analysis, ENVIRON referred to the SCAQMD CEQA Handbook Land Use Siting Criteria and the CARB Handbook Land Use Siting Criteria.

The Project is primarily a senior housing project with a retail/commercial component. It also contains a recreational /community swimming pool area. Residential uses are generally considered "sensitive receptors," meaning that they are particularly sensitive to adverse effects associated with environmental impacts (including air pollution). The SCAQMD CEQA Handbook also identifies recreational areas as a land use that should be considered as a "sensitive receptor."[71]

The Project is located within a quarter-mile of existing facility that could emit toxic air contaminants. As illustrated in **Figure 4,** there are existing TAC-emitting sources located within ¼ mile of the Project site. The SCAQMD Facility INformation Detail (FIND) web tool was used to search for facilities with known TAC emissions inside this ¼-mile radius. The SCAQMD FIND web tool indicated that several existing potential sources of TACs are located with ¼-mile from the residential units, including:

- Cottonwood Christian Center (1,073 feet)
- Hassan 16/Union Oil Co (76 Gas Station) (989 feet)
- Kohler Rental Power (189 feet)

[71] SCAQMD CEQA Handbook (1993), pg. 4-12.

- Los Alamitos Race Course (627 feet)
- Los Alamitos Race Course (gasoline dispensing) (1,210 feet)
- PMI-Dental Health Plan (1,130 feet)
- Racer Cleaners (841 feet)
- Starting Gate Saloon (804 feet)
- ZZ Construction (1,096 feet)

Of these facilities, the only actively permitted equipment are a 364 horsepower emergency diesel generator at the Cottonwood Christian Center, the gasoline dispensing facility at the race course, and a 125 horsepower emergency diesel generator at the race course. The gasoline dispensing facility is located toward the northwestern corner of the racetrack property, more than 1,000 feet from the boundary of the Project which is much further than the minimum distance of 300 feet recommended in the CARB Air Quality and Land Use Handbook for large gas dispensing facility. The diesel generators at the Cottonwood Christian Center and race course are permitted for emergency use only, and are limited to 50 hours of maintenance and testing per year. A screening model, conducted with the USEPA's SCREEN3, results in impacts below the single-source thresholds. The cumulative impact of these sources is also expected to be below the cumulative thresholds. See Appendix B for details. Based on the distance, source type, and location, these sources will not pose a significant health impact to the Project due to the emissions of toxic air pollutants. Therefore, the Project would not expose new sensitive receptors to high concentration of TACs.

The Project will not locate a sensitive receptor adjacent to a congested roadway or in an area with high background concentrations of CO. An analysis of CO "hotspots" showed that the proposed Project would not cause any significant CO impacts at the most congested intersections. These areas are typically the location of the highest CO concentrations due to roadway traffic.

The CARB Air Quality and Land Use Handbook also recommends siting criteria for sensitive receptors. The recommended minimum distances from sensitive receptors to the relevant sources applicable to the Project are 500 feet from a freeway, and 300 feet from a large gas dispensing facility (or 50 feet from a typical gas dispensing facility) as discussed in Section 2.3.2.3. The Project's sensitive receptors are not within these minimum distances recommended in the Handbook.

3.7. Summary of CEQA Impact Analysis

As part of any project, CEQA requires the evaluation of the environmental impacts as specified in Appendix G of the CEQA guidelines. Below is a summary the technical analysis described above evaluates each air quality impact listed in Appendix G of the CEQA guidelines, consistent with guidance in SCAQMD CEQA Handbook.

3.7.1. Potential AQ Impact 1: Does the Project conflict with or obstruct implementation of the applicable air quality plan?

No. As discussed in Sections 3.4, the project is consistent with the SCAQMD's AQMP and would serve to implement applicable policies of the City of Cypress pertaining to air quality.

Therefore, the Project would not conflict with or obstruct implementation of the applicable air quality plan.

3.7.2. Potential AQ Impact 2: Does the Project violate any air quality standard or contribute substantially to a projected air quality standard?

No. The Project construction and operational emissions were compared against SCAQMD's regional and localized emission thresholds as discussed in Section 3.3. The Project emissions do not exceed any thresholds. Section 3.3.2.3 discusses the Project operation's impact on local CO concentrations and concludes that the Project meets the criteria to be below significance thresholds. Sections 3.3.1.3 and 3.3.2.4 discusses the health risk impact due to Project's construction and operational TAC emissions, respectively, and concludes that the Project meets the criteria to be below significance thresholds.

3.7.3. Potential AQ Impact 3: Does the Project result in a cumulatively considerable net increase in criteria pollutants?

No. As presented in Section 3.5, projects that do not exceed the project-specific thresholds are generally not considered to be cumulatively significant. Both Project construction and operation related regional daily emissions are less than the SCAQMD mass daily significance thresholds for all criteria pollutants. Thus, the Project would not have a cumulatively considerable increase in emissions. In terms of localized air quality impacts, neither the construction nor operation of the Project would have a cumulatively considerable impact. Therefore, the Project would not result in a cumulatively considerable net increase of any criteria pollutant.

3.7.4. Potential AQ Impact 4: Does the Project expose sensitive receptors to substantial pollutant concentrations?

No. As discussed in Section 3.6, the Project is evaluated using the land use citing criteria from SCAQMD CEQA Handbook and CARB Handbook. Based on the distance, source type, and location of the emission sources identified within ¼ miles of the Project boundary, these permitted sources will not pose a significant health impact to the Project due to the emissions of toxic air pollutants. Therefore, the Project would not expose new sensitive receptor to substantial pollutant concentrations.

Tables

Table 1. Land Uses and Square Footages

Project Entitlement[1]		CalEEMod Analysis			
		CalEEMod Land Use Category	CalEEMod Land Use Subtype	Land Use Unit Amount	Size Metric
Paired Homes	92 DU	Residential	Condo/Townhouse	92	DU
Club House	5,216 sqft	Recreational	Health Club	5.22	1000 sqft
Restaurants	11,380 sqft	Recreational	High Turnover (Sit Down Restaurant)	11.38	1000 sqft
Parking Lot	355 spaces	Parking	Parking Lot	355	spaces
Community Pool	3,380 sqft	Recreational	Recreational Swimming Pool	3.38	1000 sqft
Shopping Center	36,500 sqft	Retail	Regional Shopping Center	36.5	1000 sqft
Single Family Detached Home	152 DU	Residential	Single Family Housing	152	DU

Notes:

[1] Based on the Project description.

Abbreviations:

sqft - square feet

CalEEMod - California Emissions Estimator Model

DU - dwelling units

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Table 2. Summary of NAAQS and CAAQS

Pollutant	Averaging Period	California Standard[1]	Federal Standard[2]
Ozone (O_3)	1 hour	0.09 ppm (180 μg/m^3)	---
	8 hour	0.070 ppm (137 μg/m^3)	0.075 ppm (147 μg/m^3)
Respirable Particulate Matter (PM_{10})	24 hour	50 μg/m^3	150 μg/m^3
	Annual Arithmetic Mean	20 μg/m^3	---
Fine Particulate Matter ($PM_{2.5}$)	24 hour	---	35 μg/m^3
	Annual	12 μg/m^3	12.0 μg/m^3
Carbon Monoxide (CO)	1 hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)
	8 hour	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)
Nitrogen Dioxide (NO_2)	1 hour[3]	0.18 ppm (339 μg/m^3)	0.100 ppm (188 μg/m^3)
	Annual Arithmetic Mean	0.030 ppm (57 μg/m^3)	0.053 ppm (100 μg/m^3)
Lead (Pb)	30 day average	1.5 μg/m^3	---
	Rolling 3-month average	---	0.15 μg/m^3
Sulfur Dioxide (SO_2)	1 hour[4]	0.25 ppm (655 μg/m^3)	0.075 ppm (196 μg/m^3)
	3 hour[5]	---	0.5 ppm (1300 μg/m^3)
	24 hour	0.04 ppm (105 μg/m^3)	---
Hydrogen Sulfide (H_2S)	1 hour	0.03 ppm (42 μg/m^3)	---
Vinyl Chloride	24 hour	0.01 ppm (26 μg/m^3)	---
Sulfates	24 hour	25 μg/m^3	---
Visibility-Reducing Particles	8 hour	Extinction coefficient of 0.23 per kilometer (visibility of ten miles or more due to particles when relative humidity is less than 70 percent)	---

Notes:

[1] California standards from CARB website (www.arb.ca.gov/research/aaqs/aaqs2.pdf), updated June 4, 2013.

[2] Federal standards from EPA website (http://www.epa.gov/oar/criteria.html), updated December 14, 2012.

[3] To attain the federal 1-hour NO_2 standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average must not exceed the threshold.

[4] To attain the federal 1-hour SO_2 standard, the 3-year average of the 99th percentile of the daily maximum 1-hour average must not exceed the threshold.

[5] This is a secondary standard.

Abbreviations:

μg/m^3 - micrograms per cubic meter
CARB - California Air Resources Board
EPA - Environmental Protection Agency
mg/m^3 - milligrams per cubic meter
ppm - parts per million

Table 3. NAAQS and CAAQS Attainment Status

Pollutant	Averaging Period	Orange County Attainment Status	
		California Standard[1]	Federal Standard[2]
Ozone (O_3)	1 hour	Non-Attainment	---
	8 hour	Non-Attainment	Extreme Non-Attainment
Respirable Particulate Matter (PM_{10})	24 hour	Non-Attainment	Attainment
	Annual	Non-Attainment	---
Fine Particulate Matter ($PM_{2.5}$)	24 hour	---	Non-Attainment
	Annual	Non-Attainment	Non-Attainment
Carbon Monoxide (CO)	1 hour	Attainment	Attainment (Maintenance)
	8 hour	Attainment	Attainment (Maintenance)
Nitrogen Dioxide (NO_2)[3]	1 hour	Non-Attainment	Unclassified/Attainment
	Annual	Non-Attainment	Unclassified/Attainment
Lead (Pb)[3,4]	30 day average	Non-Attainment	---
	Rolling 3-month average	---	Non-Attainment
Sulfur Dioxide (SO_2)	1 hour	Attainment	Attainment
	3 hour	---	Attainment
Hydrogen Sulfide (H_2S)	1 hour	Unclassified	---
Vinyl Chloride	24 hour	No information Available	---
Sulfates	24 hour	Attainment	---
Visibility-Reducing Particles	8 hour	Unclassified	---

Notes:

[1] California standard attainment status based on CARB website (www.arb.ca.gov/desig/adm/adm.htm).

[2] Federal standard attainment status based on USEPA Green book and Regional 9 Air Quality Maps.

[3] Attainment status for the California standard is for the year 2013.

[4] Non-attainment applies to the southern portion of Los Angeles County only.

Abbreviations:

CAAQS - California Ambient Air Quality Standard: NAAQS - National Ambient Air Quality Standards

CARB - California Air Resources Board USEPA - United States Environmental Protection Agency

References:

CARB. 2013. Area Designations Maps / State and National. Available at: www.arb.ca.gov/desig/adm/adm.htm. Accessed on: April, 2014.

USEPA. 2013. The Green book of Nonattaiment Areas for Criteria Pollutants. Available at: www.epa.gov/air/oaqps/greenbk/index.html. Accessed on: April, 2014.

USEPA. 2014. EPA Region 9 Air Quality Maps. Available at: http://www.epa.gov/region09/air/maps/. Accessed on: April, 2014.

Table 4. Air Quality Data for Nearest SCAQMD Monitoring Stations[1,2]

Pollutant	2009	2010	2011	2012	2013
Ozone (O_3)[3] - Central Orange County					
Maximum Concentration 1-hr period, ppm	**0.093**	**0.104**	0.088	0.079	0.084
Maximum Concentration 8-hr period, ppm	**0.077**	**0.088**	**0.072**	0.067	0.070
Annual 4th Highest 8-hr maximum over 3 years	0.068	0.060	0.064	0.065	0.063
Days of Exceedances, California Standard Concentration 1-hr period	0	1	0	0	0
Days of Exceedances, California Standard Concentration 8-hr period	2	1	1	0	0
Days of Exceedances, National Standard Concentration 8-hr period	1	1	0	0	0
Carbon Monoxide (CO) - Central Orange County					
Maximum Concentration 1-hr period, ppm	3	3	NM	NM	NM
Maximum Concentration 8-hr period, ppm	2.7	2.0	2.1	2.3	2.6
Number of Exceedances, California Standard Concentration 1-hr period	0	0	N/A	N/A	N/A
Number of Exceedances, California Standard Concentration 8-hr period	0	0	0	0	0
Number of Exceedances, National Standard Concentration 1-hr period	0	0	N/A	N/A	N/A
Number of Exceedances, National Standard Concentration 8-hr period	0	0	0	0	0
Nitrogen Dioxide (NO_2) - Central Orange County					
Maximum Concentration 1-hr period, ppm	0.070	0.073	0.074	0.067	0.082
98th Percentile Daily Maximum Concentration 1-hr period, ppm	0.060	0.061	0.061	0.054	0.059
Annual Arithmetic Mean (AAM), ppm	0.018	0.018	0.017	0.015	0.018
Number of Exceedances, California Standard Concentration 1-hr period	0	0	0	0	0
Exceed California Standard Annual Arithmetic Mean (AAM)?	No	No	No	No	No
Number of Exceedances, National Standard Concentration 1-hr period	0	0	0	0	0
Exceed National Standard Annual Arithmetic Mean (AAM)?	No	No	No	No	No
Sulfur Dioxide (SO_2)[4] - South Los Angeles County Coastal					
Maximum Concentration 1-hr period, ppm	0.02	0.0400	0.0148	0.0222	0.0218
99th Percentile Daily Maximum Concentration 1-hr period, ppm	NM	NM	0.0107	0.0143	0.0101
Maximum Concentration 24-hr period, ppm	0.005	0.0060	NM	NM	NM
Annual Arithmetic Mean (AAM), ppm	NM	NM	NM	NM	NM
Number of Exceedances, California Standard Concentration 1-hr period	0	0	0	0	0
Number of Exceedances, California Standard Concentration 24-hr period	0	0	N/A	N/A	N/A
Number of Exceedances, National Standard Concentration 1-hr period	N/A	N/A	0	0	0
Number of Exceedances, National Standard Concentration 24-hr period	0	0	N/A	N/A	N/A
Exceed National Standard Annual Arithmetic Mean (AAM)?	N/A	N/A	N/A	N/A	N/A

Table 4. Air Quality Data for Nearest SCAQMD Monitoring Stations[1,2]

Pollutant	2009	2010	2011	2012	2013
Respirable Particulate Matter (PM_{10}) - Central Orange County					
Maximum Concentration 24-hr period, μg/m^3	**63**	43	**53**	48	**77**
Annual Arithmetic Mean (AAM), μg/m^3	**30.9**	**22.4**	**24.8**	**22.4**	**25.4**
Number of Exceedances, California Standard 24-hr period	1	0	2	0	1
Exceed California Standard Annual Arithmetic Mean?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Number of Exceedances, National Standard Concentration 24-hr period	0	0	0	0	0
Fine Particulate Matter ($PM_{2.5}$)[5] - Central Orange County					
Maximum Concentration 24-hr period, μg/m^3	**64.6**	31.7	**39.2**	**50.1**	**37.8**
98th Percentile Concentration 24-hr period, μg/m^3	32.1	25.2	28.1	24.9	22.7
Annual Arithmetic Mean (AAM), μg/m^3	11.8	10.2	11.0	10.81	10.09
Number of Exceedances, National Standard Concentration 24-hr period	4	0	2	4	1
Exceed National Standard Annual Arithmetic Mean (AAM)?	No	No	No	No	No
Exceed California Standard Annual Arithmetic Mean (AAM)?	No	No	No	No	No

Notes:

1 NM indicates pollutants that were Not Monitored. N/A indicates that information was not available.

2 Bold values are Monitoring data that exceed the standards.

3 The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard.

4 USEPA adopted new SO_2 standards of 75 ppb for 99th percentile of 1-hr daily maximum concentrations over 3 years in 2010.

5 USEPA adopted new $PM_{2.5}$ annual average standard of 12.0 μg/m^3 in 2012

Abbreviations:

mg/m^3 - micrograms per cubic meter

hr - hour

CARB - California Air Resources Board

References:

SCAQMD. 2015. Historical Data by Year. Available at: http://www.aqmd.gov/home/library/air-quality-data-studies/historical-data-by-year. Accessed: March, 2015.

CARB. 2014. Ambient Air Quality Standards. Available at: http://www.arb.ca.gov/research/aaqs/aaqs2.pdf. Accessed: March, 2015.

Table 5. SCAQMD Air Quality Significance Thresholds

Mass Daily Thresholds (lbs/day)		
Pollutant	**Construction**	**Operation**
NO_X	100	55
VOC	75	55
PM_{10}	150	150
$PM_{2.5}$	55	55
SO_X	150	150
CO	550	550
Toxic Air Contaminants (TACs) Threshold		
TACs	Maximum Incremental Cancer Risk ≥ 10 in 1 million Cancer Burden > 0.5 excess cancer cases (in areas ≥ 1 in 1 million) Chronic & Acute Hazard Index ≥ 1.0 (project increment)	
Ambient Air Quality Standards for Criteria Pollutants		
NO_2 1-hour average Annual Arithmetic Mean	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 0.18 ppm (state) 0.03 ppm (state) and 0.0534 ppm (federal)	
PM_{10} 24-hour Average Annual Average	10.4 μg/m^3 (construction); 2.5 μg/m^3 (operation) 1.0 μg/m^3	
$PM_{2.5}$ 24-hour Average	10.4 μg/m^3 (construction); 2.5 μg/m^3 (operation)	
CO 1-hour Average 8-hour Average	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 20 ppm (state) and 35 ppm (federal) 9.0 ppm (state/federal)	

Abbreviations:

μg/m^3 - micrograms per cubic meter
CO - carbon monoxide
lbs - pounds
MT - metric tonnes
NOx - nitrogen oxides
PM - particulate matter
ppm - parts per million
SCAQMD - South Coast Air Quality Management District
SO_2 - sulfur dioxide
VOC - volatile organic compounds

Reference:

SCAQMD Significance Thresholds Revision March 2011. Available at - http://www.aqmd.gov/ceqa/handbook/signthres.pdf. Accessed: January, 2014.

Table 6. Construction Phasing Schedule

Phase Name	Sub-Phase	Start Date	End Date	Days/Week	Total Days
Phase 1	Site Preperation	3/1/2016	3/11/2016	6	10
Phase 2	Grading Phase 1	3/12/2016	5/9/2016	6	50
	Grading Phase 2	5/10/2016	6/6/2016	6	24
	Grading Phase 3	6/7/2016	6/15/2016	6	8
	Utility	6/16/2016	9/16/2016	6	80
	Paving	9/1/2016	10/31/2016	6	50
Phase 3	Building Construction	8/1/2016	12/31/2016	6	132
	Architectural Coatings	11/28/2016	12/31/2016	6	30
Phase 4	Building Construction	12/1/2016	4/30/2017	6	132
	Architectural Coatings	3/27/2017	4/30/2017	6	30
Phase 5	Building Construction	4/1/2017	8/31/2017	6	132
	Architectural Coatings	7/28/2017	8/31/2017	6	30
Phase 6	Building Construction	8/1/2017	12/31/2017	6	132
	Architectural Coatings	11/27/2017	12/31/2017	6	30
Phase 7	Building Construction	12/1/2017	4/30/2018	6	132
	Architectural Coatings	3/26/2018	4/30/2018	6	30
Phase 8	Building Construction	4/1/2018	8/31/2018	6	132
	Architectural Coatings	7/28/2018	8/31/2018	6	30
Phase 9	Building Construction	8/1/2018	12/31/2018	6	132
	Architectural Coatings	11/26/2018	12/31/2018	6	30

Notes:

[1] Construction schedule provided by C33, LLC.

Table 7. Construction Equipment List

Phase	Sub-Phase	Equipment Type	Unit Amount	Hours/Day	Horsepower Phase (HP)	Tier
Phase 1	Site Preparation	Rubber Tired Dozer	1	6	315	2
		Loader	1	6	210	2
		Water Truck	1	6	400	3
Phase 2	Grading Phase 1	Water Truck	1	6	400	3
		Paddlewheel Scrapper	5	6	360	2
		Track Dozer	1	6	305	2
	Grading Phase 2	G Blade	1	6	185	3
		Water Truck	1	6	400	3
		Skip Loader	2	6	70	3
		Paddlewheel Scrapper	1	6	360	2
	Grading Phase 3	G Blade	1	6	185	3
		Paddlewheel Scrapper	1	6	360	2
		Water Truck	1	6	400	3
	Utilities	Water Truck	1	6	400	na
		Back Hoe	1	6	150	na
		Skip Loader	2	6	70	3
	Paving	Pavers	2	6	89	na
		Paving Equipment	2	6	82	na
		Rollers	2	6	84	na
Phase 3	Building Construction	Concrete Trucks	1	2	250	na
		Forklifts	1	6	125	na
		Backhoe	2	4	150	na
		Cement/Mortar Mixer	1	4	9	na
	Architectural Coating	Air Compressor	2	3	78	na
Phase 4	Building Construction	Concrete Trucks	1	2	250	na
		Forklifts	1	6	125	na
		Backhoe	2	4	150	na
		Cement/Mortar Mixer	1	4	9	na
	Architectural Coating	Air Compressor	2	3	78	na
Phase 5	Building Construction	Concrete Trucks	1	2	250	na
		Forklifts	1	6	125	na
		Backhoe	2	4	150	na
		Cement/Mortar Mixer	1	4	9	na
	Architectural Coating	Air Compressor	2	3	78	na
Phase 6	Building Construction	Concrete Trucks	1	2	250	na
		Forklifts	1	6	125	na
		Backhoe	2	4	150	na
		Cement/Mortar Mixer	1	4	9	na
	Architectural Coating	Air Compressor	2	3	78	na

Table 7. Construction Equipment List

Phase	Sub-Phase	Equipment Type	Unit Amount	Hours/Day	Horsepower Phase (HP)	Tier
Phase 7	Building Construction	Concrete Trucks	1	2	250	na
		Forklifts	1	6	125	na
		Backhoe	2	4	150	na
		Cement/Mortar Mixer	1	4	9	na
	Architectural Coating	Air Compressor	2	3	78	na
Phase 8	Building Construction	Concrete Trucks	1	2	250	na
		Forklifts	1	6	125	na
		Backhoe	2	4	150	na
		Cement/Mortar Mixer	1	4	9	na
	Architectural Coating	Air Compressor	2	3	78	na
Phase 9	Building Construction	Concrete Trucks	1	2	250	na
		Forklifts	1	6	125	na
		Backhoe	2	4	150	na
		Cement/Mortar Mixer	1	4	9	na
	Architectural Coating	Air Compressor	2	3	78	na

Notes:

[1] Construction schedule provided by C33, LLC.

Table 8. Maximum Daily On-Site Construction Emissions

Phase	VOC	NOx	CO	SO_2	PM_{10} Total[1]	$PM_{2.5}$ Total[1]
	Maximum Daily Construction Emissions (lbs/day) [2]					
Site Preparation	0.6	15.2	12.2	0.02	2.1	1.3
Grading Phase 1	1.8	53.6	38.8	0.1	2.8	1.5
Grading Phase 2	0.7	17.5	16.3	0.03	1.1	0.7
Grading Phase 3	0.6	15.7	13.8	0.03	1.0	0.5
Utilities	1.1	13.3	8.7	0.02	0.6	0.6
Paving[3]	2.0	15.3	10.6	0.01	1.3	1.1
Building Construction	0.8	8.4	5.2	0.01	0.4	0.4
Architectural Coating[4]	19.6	2.4	1.9	0.003	0.2	0.2

Notes:

[1] PM_{10} / $PM_{2.5}$ emissions are controlled by watering the construction site three times a day (estimated to reduce emissions by 61%), as well as limiting vehichle speeds on unpaved surfaces, applying non-toxic soil stabilizers or replacing ground cover, and sweeping paved roads at the end of the work day.

[2] Emissions calculated using CalEEMod® version 2013.2.2.

[3] The Paving VOC emissions include both emissions from construction equipment and off-gassing emissions.

[4] Architectural coating VOC emissions were calculated assuming same amount of square feet of building would be coated for each of the seven architectural coating phases.

Abbreviations:

CalEEMod® - California Emissions Estimator Model
CO - carbon monoxide
lbs - pounds
NOx - nitrogen oxides
PM_{10} - coarse particulate matter
$PM_{2.5}$ - fine particulate matter
VOC - volatile organic compound
SO_2 - sulfur dioxide

Table 9. Maximum Daily Off-Site Construction Emissions

Phase	VOC	NOx	CO	SO_2	PM_{10} Total	$PM_{2.5}$ Total
	Maximum Daily Construction Emissions (lbs/day) [1]					
Site Preparation	0.03	0.05	0.5	0.001	0.1	0.03
Grading Phase 1	2.9	40.7	33.9	0.1	3.0	1.2
Grading Phase 2	2.8	40.7	33.6	0.1	2.9	1.2
Grading Phase 3	2.8	40.6	33.2	0.1	2.9	1.2
Utilities	0.04	0.1	0.7	0.002	0.1	0.04
Paving	0.1	0.1	1.0	0.003	0.2	0.1
Building Construction	1.4	7.1	21.3	0.0	3.2	0.9
Architectural Coating	0.2	0.3	2.8	0.01	0.5	0.1

Notes:

[1] Emissions calculated using CalEEMod® version 2013.2.2.

Abbreviations:

CalEEMod® - California Emissions Estimator Model
CO - carbon monoxide
lbs - pounds
NOx - nitrogen oxides
PM_{10} - coarse particulate matter
$PM_{2.5}$ - fine particulate matter
VOC - volatile organic compound
SO_2 - sulfur dioxide

Table 10. Summary of Criteria Air Pollutant Construction Emissions

	VOC	NOx	CO	SO_2	PM_{10} Total[1]	$PM_{2.5}$ Total[1]
	Maximum (lbs/day)[2]					
On-Site Emissions	20	54	39	0.1	2.8	2.0
Off-Site Emissions	3	41	34	0.1	3.7	1.2
Maximum Daily Emissions	**23**	**94**	**73**	**0.2**	**6.5**	**3.3**

Notes:

[1] PM_{10} / $PM_{2.5}$ emissions are controlled by watering the construction site three times a day (estimated to reduce emissions by 50%), as well as limiting vehichle speeds on unpaved surfaces, applying non-toxic soil stabilizers or replacing ground cover, and sweeping paved roads at the end of the work day.

[2] Emissions calculated using CalEEMod® version 2013.2.2.

Abbreviations:

ARB - Air Resource Board
CalEEMod® - California Emissions Estimator Model
CO - carbon monoxide
lbs - pounds
NOx - nitrogen oxides
PM_{10} - coarse particulate matter
$PM_{2.5}$ - fine particulate matter
VOC - volatile organic compound
SO_2 - sulfur dioxide

Table 11. Criteria Air Pollutant Emissions Associated with Area Sources

Area Sources[1]	ROG[3]	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$
	(lbs/day)					
Architectural Coating	1.1	0	0	0	0	0
Consumer Products	13	0	0	0	0	0
Hearth[2]	0.5	2.0E-05	0.03	0	0.3	0.3
Landscaping	0.6	0.2	20	0.001	0.1	0.1
Total	**16**	**0.2**	**20**	**0.001**	**0.4**	**0.4**

Notes:

[1] Emissions calculated using CalEEMod® 2013.2.2. The emission sources shown are classified by CalEEMod® as "Area Sources." Emissions reported as zero are considered below the reporting level of CalEEMod® and not

[2] Assumed no wood burning devices as per SCAQMD Rule 445 and project description. Emissions were calculated assuming all residential units will have gas fireplaces.

[3] ROG as defined by CalEEMod® is assumed to be equal to VOC as defined by SCAQMD.

Abbreviations:

CalEEMod® - California Emissions Estimator Model
CO - carbon monoxide
lbs - pounds
NOx - nitrogen oxides
PM_{10} - coarse particulate matter
$PM_{2.5}$ - fine particulate matter
ROG - reactive organic gases
SO_2 - sulfur dioxide
SCAQMD - South Coast Air Quality Management District
VOC - volatile organic compounds

Table 12. Criteria Air Pollutant Emissions Associated with Natural Gas Use

CalEEMod Land Use	Project Entitlement	Natural Gas Use[1] (kBtu/day)	ROG[2]	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$
			(lbs/day)[3]					
Condo/Townhouse	Paired Homes	3.9	0.04	0.4	0.2	0.002	0.03	0.03
Health Club	Club House	0.3	0.003	0.03	0.02	1.6E-04	0.002	0.002
High Turnover (Sit Down Restaurant)	Restaurants	7.8	0.08	0.8	0.6	0.005	0.06	0.06
Parking Lot	Parking Lot	0	0	0	0	0	0	0
Recreational Swimming Pool	Community Pool	0	0	0	0	0	0	0
Regional Shopping Center	Shopping Center	0.2	0.002	0.02	0.02	1.1E-04	0.001	0.001
Single Family Housing	Single Family Detached Home	11.4	0.1	1.1	0.4	0.007	0.09	0.09
	Total	**24**	**0.3**	**2.2**	**1.3**	**0.01**	**0.2**	**0.2**

Notes:

[1] Energy usage for each land use was assumed to be consistent with CalEEMod defaults, which were obtained from CEUS or RASS studies on energy use and adjusted to account for 2013 Title 24 building standards. See Appendix A of the CalEEMod user's guide for details.

[2] ROG as defined by CalEEMod® is assumed to be equal to VOC as defined by SCAQMD.

[3] Emissions were calculated using CalEEMod® version 2013.2.2. See report for assumptions.

Abbreviations:

CalEEMod® - California Emissions Estimator Model
CAP - criteria air pollutants
CEUS - California Commercial End-Use Survey
CO - carbon monoxide
kBTU - 1,000 British thermal units
lbs - pounds
NOx - nitrogen oxides
PM_{10} - coarse particulate matter
$PM_{2.5}$ - fine particulate matter
RASS - California Statewide Residential Appliance Saturation Study
ROG - reactive organic gases
SCAQMD - South Coast Air Quality Management District
SO_2 - sulfur dioxide
VOC - volatile organic compounds

Table 13. CalEEMod® Model Inputs Associated with Traffic

CalEEMod Land Use	Project Entitlement	Unit	Tripend Rates[1] (trips/day/unit)		
			Weekday	Saturday	Sunday
Condo/Townhouse	Paired Homes	Dwelling Unit	3.0	2.2	2.4
Health Club	Club House[2]	1000sqft	0.0	0.0	0.0
High Turnover (Sit Down Restaurant)	Restaurants	Dwelling Unit	109.3	136.2	113.4
Parking Lot	Parking Lot	Space	0.0	0.0	0.0
Recreational Swimming Pool	Community Pool[2]	1000sqft	0.0	0.0	0.0
Regional Shopping Center	Shopping Center	1000sqft	36.7	43.0	21.7
Single Family Housing	Single Family Detached Home	Dwelling Unit	3.2	2.4	2.0

Notes:

[1] Trip rates were based on Kimley Horn's Traffic Impact Study and accounted for the trip reduction due to internal capture.

[3] The Project amenities including club house and pool are for Project residents use only and do not generate trips.

Abbreviations:

CalEEMod® - California Emissions Estimator Model

sqft - square feet

Reference:

Kimley-Horn and Associates, Inc. Traffic Impact Study for the Barton Place Mixed-Use Project.

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Table 14. Criteria Air Pollutant Emissions Associated with Traffic[1]

CalEEMod® Land Use	Project Entitlement	Vehicles Miles Travelled (VMT / year)	ROG[2]	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$
			(lbs/day)					
Condo/Townhouse	Paired Homes	872,623	1.2	2	11	0.03	2.2	0.6
Health Club	Club House[3]	0	0	0	0	0	0	0
High Turnover (Sit Down Restaurant)	Restaurants	1,764,217	2.5	5	22	0.06	4.4	1.2
Parking Lot	Parking Lot	0	0	0	0	0	0	0
Recreational Swimming Pool	Community Pool[3]	0	0	0	0	0	0	0
Regional Shopping Center	Shopping Center	2,800,588	4.0	7	35	0.1	7.0	1.9
Single Family Housing	Single Family Detached Home	1,495,150	2	4	19	0.05	3.7	1.0
	Total	**6,932,578**	**10**	**18**	**86**	**0.2**	**17**	**4.8**

Notes:

[1] Emissions were calculated using CalEEMod® 2013.2.2. Emissions associated with transportation include exhaust emissions during running, idling, and startup, and particulate matter fugitive emissions.

[2] ROG as defined by CalEEMod® is assumed to be equal to VOC as defined by SCAQMD.

[3] The Project amenities including club house and pool are for Project residents use only and do not generate external trips.

Abbreviations:

CalEEMod® - California Emissions Estimator Model
CO - carbon monoxide
NOx - nitrogen oxides
lbs - pounds
PM_{10} - coarse particulate matter
$PM_{2.5}$ - fine particulate matter
VOC - volatile organic compounds
VMT - vehicle miles traveled
SO_2 - sulfur dioxide

Table 15. Summary of Operational Criteria Air Pollutant Emissions

Source[1]	ROG[2]	NO_x	CO	SO_2 [3]	PM_{10}	$PM_{2.5}$
	(lbs/day)					
Area	16	0.2	20	0.001	0.4	0.4
Energy	0.3	2	1	0.01	0.2	0.2
Traffic	10	18	86	0.2	17	4.8
Total	26	20	108	0.3	18	5.4

Notes:

[1] All operational categories are presented in greater detail in the previous tables.

[2] ROG as defined by CalEEMod® is assumed to be equal to VOC as defined by SCAQMD.

[3] CalEEMod® reported SO_2 emissions are assumed to represent SO_X emissions.

Abbreviations:

CalEEMod® - California Emissions Estimator Model
CO - carbon monoxide
lbs - pounds
NOx - nitrogen oxides
PM_{10} - coarse particulate matter
$PM_{2.5}$ - fine particulate matter
ROG - reactive organic gases
VOC - volatile organic compounds
SCAQMD - South Coast Air Quality Management Distr
SO_2 - sulfur dioxide

Table 16. Comparison of Regional Construction Emissions to SCAQMD Emissions Thresholds

	VOC	NOx	CO	SO_2	PM_{10} Total[1]	$PM_{2.5}$ Total[1]
	Maximum (lbs/day)[2]					
Maximum Daily Emissions	23	94	73	0.2	6.5	3.3
SCAQMD Threshold	75	100	550	150	150	55
Above Threshold?	No	No	No	No	No	No

Notes:

[1] PM_{10} / $PM_{2.5}$ emissions are controlled by watering the construction site three times a day (estimated to reduce emissions by 50%), as well as limiting vehichle speeds on unpaved surfaces, applying non-toxic soil stabilizers or replacing ground cover, and sweeping paved roads at the end of the work day.

[2] Emissions calculated using CalEEMod® version 2013.2.2.

Abbreviations:

ARB - Air Resource Board

CalEEMod® - California Emissions Estimator Model

CO - carbon monoxide

lbs - pounds

NOx - nitrogen oxides

PM_{10} - coarse particulate matter

$PM_{2.5}$ - fine particulate matter

VOC - volatile organic compound

SO_2 - sulfur dioxide

Reference:

SCAQMD Air Quality CEQA Significance Thresholds. Available at: http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significance-thresholds.pdf?sfvrsn=2. Accessed: March, 2015.

Table 17. Comparison of On-Site Construction Emissions to Local Significance Thresholds

	NOx[1]	CO	PM_{10} Total[2]	$PM_{2.5}$ Total[2]
	Maximum (lbs/day)[3]			
On-site Emissions	54	39	3	2
SCAQMD LST	183	1,253	13	7
Above Threshold?	No	No	No	No

Notes:

[1] The United States EPA (USEPA) 1-hour National Ambient Air Quality Standard (NAAQS) for NO_x is lower than the current SCAQMD standard, 188 ug/m^3 compared to 339 ug/m^3. By applying this ratio to the screening threshold of 183 lbs/day, an equivalent NAAQS threshold would be 101 lbs/day, which is still greater than the calculated on-site emissions.

[2] PM_{10} / $PM_{2.5}$ emissions are controlled by watering the construction site three times a day (estimated to reduce emissions by 50%), as well as limiting vehichle speeds on unpaved surfaces, applying non-toxic soil stabilizers or replacing ground cover, and sweeping paved roads at the end of the work day.

[3] Emissions calculated using CalEEMod® version 2013.2.2.

Abbreviations:

ARB - Air Resource Board

CalEEMod® - California Emissions Estimator Model

CO - carbon monoxide

lbs - pounds

LST - Localized Significance Threshold

NOx - nitrogen oxides

ug/m^3 - micrograms per meter cubed

Reference:

SCAQMD Mass-Rate LST Lookup Tables. Available at: http://www.aqmd.gov/docs/default-source/ceqa/handbook/localized-significance-thresholds/appendix-c-mass-rate-lst-look-up-tables.pdf?sfvrsn=2. Accessed: March, 2015.

USEPA National Ambient Air Quality Standards. Available At: http://www.epa.gov/air/criteria.html Accessed: March, 2015.

Table 18. Comparison of Regional Operational Emissions to SCAQMD Emissions Thresholds

Source[1]	ROG^2	NO_x	CO	SO_2 [3]	PM_{10}	$PM_{2.5}$
	(lbs/day)					
Total Operational Emissions	26	20	108	0.3	18	5.4
AQMD Threshold	55	55	550	150	150	55
Above Threshold?	No	No	No	No	No	No

Notes:

[1] All operational categories are presented in greater detail in the previous tables.

[2] ROG as defined by CalEEMod® is assumed to be equal to VOC as defined by SCAQMD.

[3] CalEEMod® reported SO_2 emissions are assumed to represent SO_X emissions.

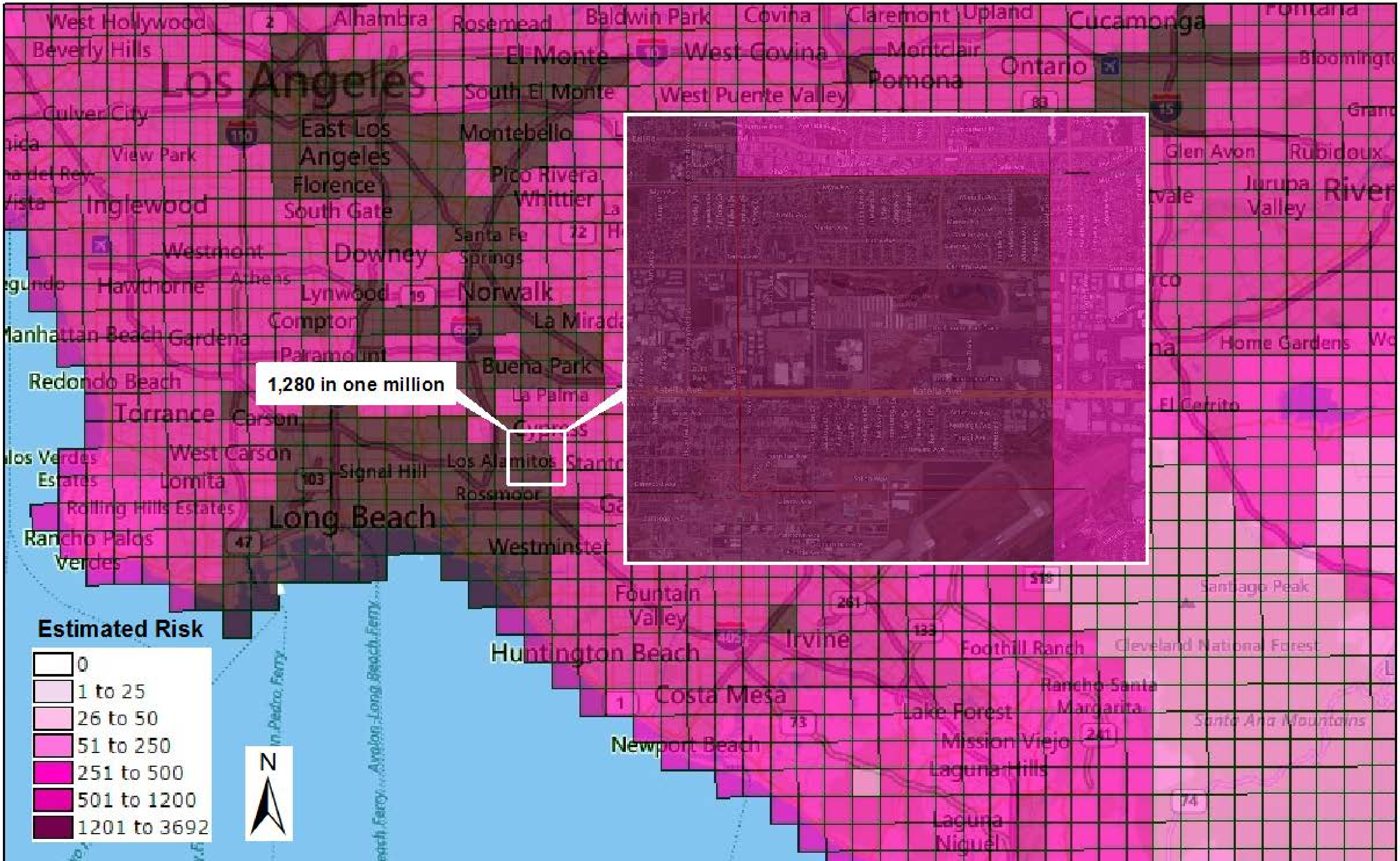
Abbreviations:

CalEEMod® - California Emissions Estimator Model
CO - carbon monoxide
lbs - pounds
NOx - nitrogen oxides
PM_{10} - coarse particulate matter
$PM_{2.5}$ - fine particulate matter
ROG - reactive organic gases
VOC - volatile organic compounds
SCAQMD - South Coast Air Quality Management District
SO_2 - sulfur dioxide

Reference:

SCAQMD Air Quality CEQA Significance Thresholds. Available at: http://www.aqmd.gov/ceqa/handbook/signthres.pdf. Accessed: March, 2015.

Figures



ENVIRON

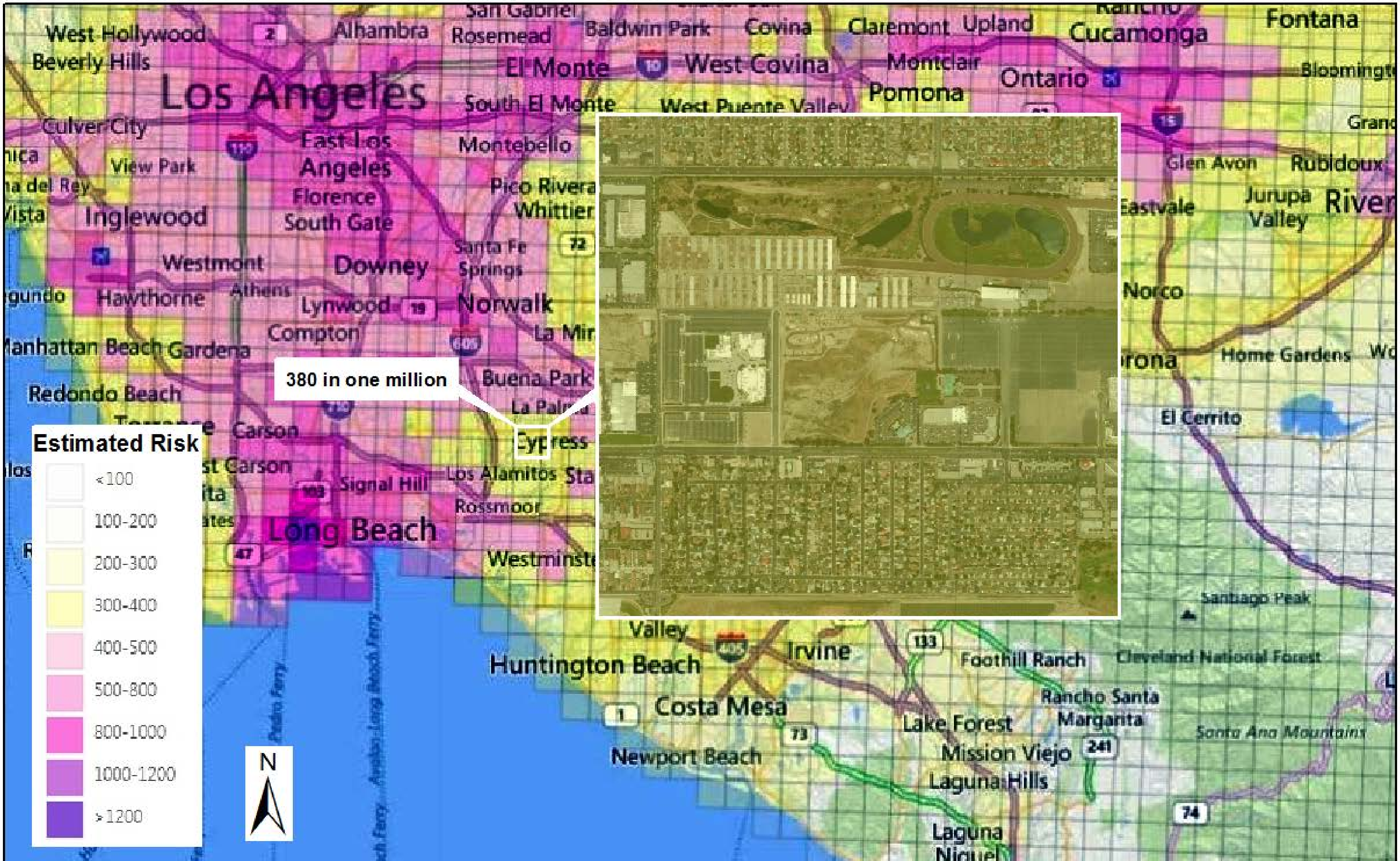
MATES III Total Cancer Risk for Project Area

Figure 1

Drafter: DCW

Date: 13 April 2015

Project: 03-36873A

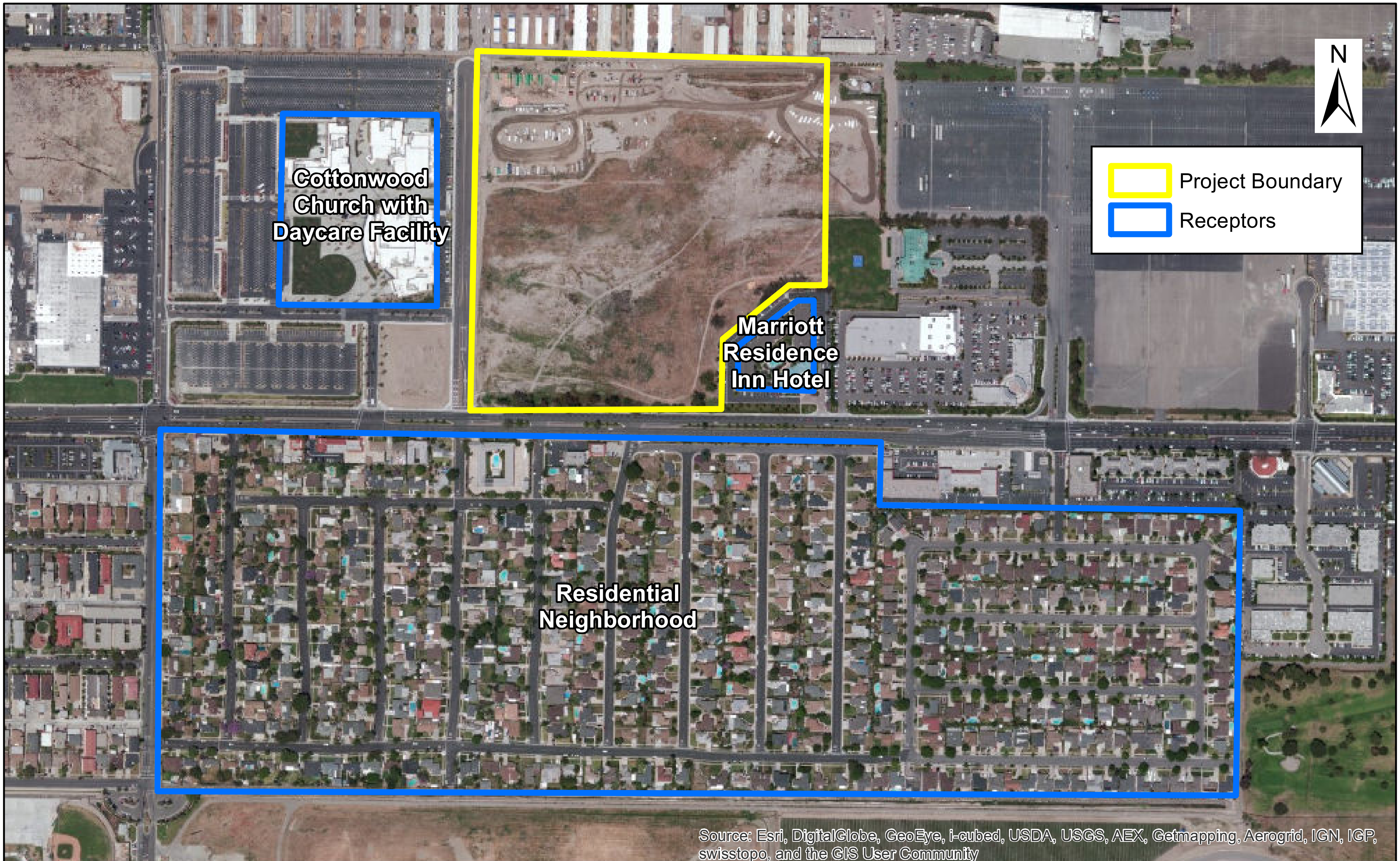


ENVIRON

MATES IV Total Cancer Risk for Project Area

Figure 2

Drafter: DCW | Date: 13 April 2015 | Project: 03-36873A



ENVIRON	**Nearby Receptors**	Figure 3

Drafter: MJH | Date: 13 April 2015 | Project: 03-36873A

ENVIRON

Nearby FIND Database Sources

Figure 4

Drafter: MJH

Date: 13 April 2015

Project: 03-36873A

Appendix A

CalEEMod® Output Files

List of Files:

- **Construction**
  - Tiered Engine Equipment – Summer
  - Tiered Engine Equipment – Winter
  - Non-Tiered Engine Equipment – Summer
  - Non-Tiered Engine Equipment – Winter
  - Paving – Summer
  - Paving – Winter
- **Operational**
  - Project (2019) – Summer
  - Project (2019) – Winter

Construction - Tiered Engine Equipment - Summer

Orange County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	355.00	Space	0.00	142,000.00	0
Health Club	5.22	1000sqft	0.00	5,220.00	0
High Turnover (Sit Down Restaurant)	11.38	1000sqft	0.00	11,376.00	0
Recreational Swimming Pool	3.38	1000sqft	0.00	3,375.00	0
Condo/Townhouse	92.00	Dwelling Unit	0.00	161,581.00	161
Single Family Housing	152.00	Dwelling Unit	33.00	319,230.00	266
Regional Shopping Center	36.50	1000sqft	0.00	36,500.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	30
Climate Zone	8			**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 - Acreage and number of units provided in data request. Parking lot size from project description. Assumes provided 5 acre value for commercial includes parking

Construction Phase - Phasing provided by client

Off-road Equipment - Provided by client

Off-road Equipment - .

Off-road Equipment - .

Off-road Equipment - .

Off-road Equipment - .

Off-road Equipment - .

Trips and VMT -

Grading - Provided by client

Architectural Coating - Client has committed to low-VOC coatings

Construction Off-road Equipment Mitigation - Provided by client

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	16
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	7.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstructionPhase	NumDays	45.00	50.00
tblConstructionPhase	NumDays	45.00	24.00
tblConstructionPhase	NumDays	45.00	8.00
tblConstructionPhase	NumDays	45.00	80.00
tblConstructionPhase	NumDays	20.00	10.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00

tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblFireplaces	NumberGas	78.20	90.95
tblFireplaces	NumberGas	129.20	116.45
tblFireplaces	NumberNoFireplace	9.20	10.70
tblFireplaces	NumberNoFireplace	15.20	13.70
tblFireplaces	NumberWood	4.60	5.35
tblFireplaces	NumberWood	7.60	6.85
tblGrading	MaterialImported	0.00	56,945.00
tblGrading	MaterialImported	0.00	27,334.00
tblGrading	MaterialImported	0.00	9,111.00
tblLandUse	LandUseSquareFeet	11,380.00	11,376.00
tblLandUse	LandUseSquareFeet	3,380.00	3,375.00
tblLandUse	LandUseSquareFeet	92,000.00	161,581.00
tblLandUse	LandUseSquareFeet	273,600.00	319,230.00
tblLandUse	LotAcreage	3.19	0.00
tblLandUse	LotAcreage	0.12	0.00
tblLandUse	LotAcreage	0.26	0.00
tblLandUse	LotAcreage	0.08	0.00
tblLandUse	LotAcreage	5.75	0.00
tblLandUse	LotAcreage	49.35	33.00
tblLandUse	LotAcreage	0.84	0.00
tblLandUse	Population	263.00	161.00
tblLandUse	Population	435.00	266.00
tblOffRoadEquipment	HorsePower	174.00	185.00
tblOffRoadEquipment	HorsePower	174.00	185.00
tblOffRoadEquipment	HorsePower	255.00	315.00
tblOffRoadEquipment	HorsePower	361.00	360.00
tblOffRoadEquipment	HorsePower	361.00	360.00
tblOffRoadEquipment	HorsePower	361.00	360.00

tblOffRoadEquipment	HorsePower	97.00	305.00
tblOffRoadEquipment	HorsePower	97.00	210.00
tblOffRoadEquipment	HorsePower	199.00	70.00
tblOffRoadEquipment	HorsePower	199.00	70.00
tblOffRoadEquipment	LoadFactor	0.36	0.37
tblOffRoadEquipment	LoadFactor	0.36	0.37
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	5.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblProjectCharacteristics	OperationalYear	2014	2019
tblSolidWaste	SolidWasteGenerationRate	42.32	49.22
tblSolidWaste	SolidWasteGenerationRate	109.06	98.40
tblVehicleTrips	CC_TL	8.40	10.10
tblVehicleTrips	CC_TL	8.40	10.10
tblVehicleTrips	CC_TL	8.40	10.10
tblVehicleTrips	CC_TL	8.40	10.10
tblVehicleTrips	CC_TL	8.40	10.10
tblVehicleTrips	CNW_TL	6.90	7.90
tblVehicleTrips	CNW_TL	6.90	7.90

tblVehicleTrips	CNW_TL	6.90	7.90
tblVehicleTrips	CNW_TL	6.90	7.90
tblVehicleTrips	CNW_TL	6.90	7.90
tblVehicleTrips	CW_TL	16.60	18.50
tblVehicleTrips	CW_TL	16.60	18.50
tblVehicleTrips	CW_TL	16.60	18.50
tblVehicleTrips	CW_TL	16.60	18.50
tblVehicleTrips	CW_TL	16.60	18.50
tblVehicleTrips	HO_TL	8.70	12.90
tblVehicleTrips	HO_TL	8.70	12.90
tblVehicleTrips	HS_TL	5.90	9.60
tblVehicleTrips	HS_TL	5.90	9.60
tblVehicleTrips	HW_TL	14.70	19.80
tblVehicleTrips	HW_TL	14.70	19.80
tblWater	IndoorWaterUseRate	5,994,170.36	6,971,480.74
tblWater	IndoorWaterUseRate	9,903,411.89	8,926,101.51
tblWater	OutdoorWaterUseRate	3,778,933.49	4,395,063.95
tblWater	OutdoorWaterUseRate	6,243,455.32	5,627,324.87
tblWoodstoves	NumberCatalytic	4.60	5.35
tblWoodstoves	NumberCatalytic	7.60	6.85
tblWoodstoves	NumberNoncatalytic	4.60	5.35
tblWoodstoves	NumberNoncatalytic	7.60	6.85

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					
2016	8.9636	118.9006	77.1306	0.1800	6.7868	3.7462	10.5330	2.5064	3.4463	4.6276	0.0000	18,324.2713	18,324.2713	2.3669	0.0000	18,373.9757
Total	**8.9636**	**118.9006**	**77.1306**	**0.1800**	**6.7868**	**3.7462**	**10.5330**	**2.5064**	**3.4463**	**4.6276**	**0.0000**	**18,324.2713**	**18,324.2713**	**2.3669**	**0.0000**	**18,373.9757**

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					
2016	4.4554	92.9454	68.2810	0.1800	4.2023	1.9053	6.1076	0.9435	1.8579	2.7566	0.0000	18,324.2713	18,324.2713	2.3669	0.0000	18,373.9757
Total	**4.4554**	**92.9454**	**68.2810**	**0.1800**	**4.2023**	**1.9053**	**6.1076**	**0.9435**	**1.8579**	**2.7566**	**0.0000**	**18,324.2713**	**18,324.2713**	**2.3669**	**0.0000**	**18,373.9757**

	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	**50.29**	**21.83**	**11.47**	**0.00**	**38.08**	**49.14**	**42.01**	**62.35**	**46.09**	**40.43**	**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	79.4258	1.8569	142.9170	0.1962		18.7498	18.7498		18.7468	18.7468	2,285.5281	4,428.3368	6,713.8649	6.8517	0.1551	6,905.8397

Energy	0.2668	2.3315	1.3466	0.0146		0.1844	0.1844		0.1844	0.1844		2,910.8052	2,910.8052	0.0558	0.0534	2,928.5199
Mobile	16.2350	37.0327	179.2074	0.5608	39.9225	0.5767	40.4992	10.6526	0.5321	11.1847		44,272.5063	44,272.5063	1.5889		44,305.8722
Total	**95.9276**	**41.2210**	**323.4711**	**0.7716**	**39.9225**	**19.5108**	**59.4333**	**10.6526**	**19.4633**	**30.1159**	**2,285.5281**	**51,611.6483**	**53,897.1764**	**8.4964**	**0.2085**	**54,140.2318**

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	79.4258	1.8569	142.9170	0.1962		18.7498	18.7498		18.7468	18.7468	2,285.5281	4,428.3368	6,713.8649	6.8517	0.1551	6,905.8397
Energy	0.2668	2.3315	1.3466	0.0146		0.1844	0.1844		0.1844	0.1844		2,910.8052	2,910.8052	0.0558	0.0534	2,928.5199
Mobile	16.2350	37.0327	179.2074	0.5608	39.9225	0.5767	40.4992	10.6526	0.5321	11.1847		44,272.5063	44,272.5063	1.5889		44,305.8722
Total	**95.9276**	**41.2210**	**323.4711**	**0.7716**	**39.9225**	**19.5108**	**59.4333**	**10.6526**	**19.4633**	**30.1159**	**2,285.5281**	**51,611.6483**	**53,897.1764**	**8.4964**	**0.2085**	**54,140.2318**

	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	Site Prep	Site Preparation	3/1/2016	3/11/2016	6	10	
2	Grading-1	Grading	3/12/2016	5/9/2016	6	50	
3	Grading-2	Grading	5/10/2016	6/6/2016	6	24	
4	Grading-3	Grading	6/7/2016	6/15/2016	6	8	

5	Grading-4	Grading	6/16/2016	9/16/2016	6	80	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Prep	Off-Highway Trucks	1	6.00	400	0.38
Site Prep	Rubber Tired Dozers	1	6.00	315	0.40
Site Prep	Tractors/Loaders/Backhoes	1	6.00	210	0.37
Grading-1	Off-Highway Trucks	1	6.00	400	0.38
Grading-1	Scrapers	5	6.00	360	0.48
Grading-1	Tractors/Loaders/Backhoes	1	6.00	305	0.37
Grading-2	Graders	1	6.00	185	0.41
Grading-2	Off-Highway Trucks	1	6.00	400	0.38
Grading-2	Rubber Tired Loaders	2	6.00	70	0.37
Grading-2	Scrapers	1	6.00	360	0.48
Grading-3	Graders	1	6.00	185	0.41
Grading-3	Off-Highway Trucks	1	6.00	400	0.38
Grading-3	Scrapers	1	6.00	360	0.48
Grading-4	Rubber Tired Loaders	2	6.00	70	0.37

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
Site Prep	3	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading-1	7	18.00	0.00	7,118.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading-2	5	13.00	0.00	3,417.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

Grading-3		3	8.00	0.00	1,139.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading-4		2	5.00	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

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Site Prep - 2016

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					4.5166	0.0000	4.5166	2.4827	0.0000	2.4827			0.0000			0.0000
Off-Road	2.1730	25.5389	14.8891	0.0231		1.0539	1.0539		0.9696	0.9696		2,399.0873	2,399.0873	0.7237		2,414.2839
Total	**2.1730**	**25.5389**	**14.8891**	**0.0231**	**4.5166**	**1.0539**	**5.5704**	**2.4827**	**0.9696**	**3.4522**		**2,399.0873**	**2,399.0873**	**0.7237**		**2,414.2839**

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	0.0278	0.0359	0.4392	1.0900e-003	0.0894	6.2000e-004	0.0901	0.0237	5.8000e-004	0.0243		90.7681	90.7681	4.2700e-003		90.8578
Total	**0.0278**	**0.0359**	**0.4392**	**1.0900e-003**	**0.0894**	**6.2000e-004**	**0.0901**	**0.0237**	**5.8000e-004**	**0.0243**		**90.7681**	**90.7681**	**4.2700e-003**		**90.8578**

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					1.6734	0.0000	1.6734	0.9198	0.0000	0.9198			0.0000			0.0000
Off-Road	0.5646	15.2468	12.2333	0.0231		0.4141	0.4141		0.4141	0.4141	0.0000	2,399.0873	2,399.0873	0.7237		2,414.2839
Total	**0.5646**	**15.2468**	**12.2333**	**0.0231**	**1.6734**	**0.4141**	**2.0874**	**0.9198**	**0.4141**	**1.3339**	**0.0000**	**2,399.0873**	**2,399.0873**	**0.7237**		**2,414.2839**

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	0.0278	0.0359	0.4392	1.0900e-003	0.0894	6.2000e-004	0.0901	0.0237	5.8000e-004	0.0243		90.7681	90.7681	4.2700e-003		90.8578
Total	**0.0278**	**0.0359**	**0.4392**	**1.0900e-003**	**0.0894**	**6.2000e-004**	**0.0901**	**0.0237**	**5.8000e-004**	**0.0243**		**90.7681**	**90.7681**	**4.2700e-003**		**90.8578**

3.3 Grading-1 - 2016

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					4.1057	0.0000	4.1057	0.4489	0.0000	0.4489			0.0000			0.0000
Off-Road	6.3001	79.5924	47.6731	0.0728		3.1549	3.1549		2.9025	2.9025		7,566.3331	7,566.3331	2.2823		7,614.2609
Total	**6.3001**	**79.5924**	**47.6731**	**0.0728**	**4.1057**	**3.1549**	**7.2605**	**0.4489**	**2.9025**	**3.3514**		**7,566.3331**	**7,566.3331**	**2.2823**		**7,614.2609**

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	2.6011	39.2275	28.4693	0.1047	2.4799	0.5899	3.0698	0.6791	0.5425	1.2216		10,553.7099	10,553.7099	0.0750		10,555.2849
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	0.0625	0.0807	0.9882	2.4400e-003	0.2012	1.4100e-003	0.2026	0.0534	1.3000e-003	0.0547		204.2283	204.2283	9.6000e-003		204.4300
Total	**2.6635**	**39.3082**	**29.4575**	**0.1072**	**2.6811**	**0.5913**	**3.2724**	**0.7324**	**0.5438**	**1.2762**		**10,757.9382**	**10,757.9382**	**0.0846**		**10,759.7149**

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					1.5212	0.0000	1.5212	0.1663	0.0000	0.1663			0.0000			0.0000
Off-Road	1.7919	53.6372	38.8235	0.0728		1.3140	1.3140		1.3140	1.3140	0.0000	7,566.3331	7,566.3331	2.2823		7,614.2609
Total	**1.7919**	**53.6372**	**38.8235**	**0.0728**	**1.5212**	**1.3140**	**2.8352**	**0.1663**	**1.3140**	**1.4804**	**0.0000**	**7,566.3331**	**7,566.3331**	**2.2823**		**7,614.2609**

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	2.6011	39.2275	28.4693	0.1047	2.4799	0.5899	3.0698	0.6791	0.5425	1.2216		10,553.7099	10,553.7099	0.0750		10,555.2849
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	0.0625	0.0807	0.9882	2.4400e-003	0.2012	1.4100e-003	0.2026	0.0534	1.3000e-003	0.0547		204.2283	204.2283	9.6000e-003		204.4300
Total	**2.6635**	**39.3082**	**29.4575**	**0.1072**	**2.6811**	**0.5913**	**3.2724**	**0.7324**	**0.5438**	**1.2762**		**10,757.9382**	**10,757.9382**	**0.0846**		**10,759.7149**

3.4 Grading-2 - 2016

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					1.3219	0.0000	1.3219	0.1483	0.0000	0.1483			0.0000			0.0000
Off-Road	2.6900	31.4917	16.3839	0.0292		1.4093	1.4093		1.2965	1.2965		3,038.2415	3,038.2415	0.9164		3,057.4868

	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
Total	**2.6900**	**31.4917**	**16.3839**	**0.0292**	**1.3219**	**1.4093**	**2.7311**	**0.1483**	**1.2965**	**1.4449**		**3,038.2415**	**3,038.2415**	**0.9164**		**3,057.4868**

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	2.6013	39.2317	28.4723	0.1047	2.4802	0.5900	3.0701	0.6791	0.5426	1.2217		10,554.8219	10,554.8219	0.0750		10,556.3971
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	0.0451	0.0583	0.7137	1.7600e-003	0.1453	1.0200e-003	0.1463	0.0385	9.4000e-004	0.0395		147.4982	147.4982	6.9400e-003		147.6439
Total	**2.6464**	**39.2900**	**29.1860**	**0.1065**	**2.6255**	**0.5910**	**3.2165**	**0.7177**	**0.5435**	**1.2612**		**10,702.3201**	**10,702.3201**	**0.0820**		**10,704.0410**

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					0.4898	0.0000	0.4898	0.0550	0.0000	0.0550			0.0000			0.0000
Off-Road	0.7182	17.5328	16.3144	0.0292		0.5979	0.5979		0.5979	0.5979	0.0000	3,038.2415	3,038.2415	0.9164		3,057.4868
Total	**0.7182**	**17.5328**	**16.3144**	**0.0292**	**0.4898**	**0.5979**	**1.0877**	**0.0550**	**0.5979**	**0.6529**	**0.0000**	**3,038.2415**	**3,038.2415**	**0.9164**		**3,057.4868**

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	2.6013	39.2317	28.4723	0.1047	2.4802	0.5900	3.0701	0.6791	0.5426	1.2217		10,554.8219	10,554.8219	0.0750		10,556.3971
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	0.0451	0.0583	0.7137	1.7600e-003	0.1453	1.0200e-003	0.1463	0.0385	9.4000e-004	0.0395		147.4982	147.4982	6.9400e-003		147.6439
Total	**2.6464**	**39.2900**	**29.1860**	**0.1065**	**2.6255**	**0.5910**	**3.2165**	**0.7177**	**0.5435**	**1.2612**		**10,702.3201**	**10,702.3201**	**0.0820**		**10,704.0410**

3.5 Grading-3 - 2016

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					1.3219	0.0000	1.3219	0.1483	0.0000	0.1483			0.0000			0.0000
Off-Road	2.1400	26.9808	13.4976	0.0260		1.0221	1.0221		0.9403	0.9403		2,695.9217	2,695.9217	0.8132		2,712.9986
Total	**2.1400**	**26.9808**	**13.4976**	**0.0260**	**1.3219**	**1.0221**	**2.3439**	**0.1483**	**0.9403**	**1.0886**		**2,695.9217**	**2,695.9217**	**0.8132**		**2,712.9986**

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	2.6013	39.2317	28.4723	0.1047	2.4802	0.5900	3.0701	0.6791	0.5426	1.2217		10,554.8219	10,554.8219	0.0750		10,556.3971
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	0.0278	0.0359	0.4392	1.0900e-003	0.0894	6.2000e-004	0.0901	0.0237	5.8000e-004	0.0243		90.7681	90.7681	4.2700e-003		90.8578
Total	**2.6291**	**39.2675**	**28.9115**	**0.1058**	**2.5696**	**0.5906**	**3.1602**	**0.7028**	**0.5432**	**1.2460**		**10,645.5901**	**10,645.5901**	**0.0793**		**10,647.2549**

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					0.4898	0.0000	0.4898	0.0550	0.0000	0.0550			0.0000			0.0000
Off-Road	0.6360	15.6553	13.7792	0.0260		0.4664	0.4664		0.4664	0.4664	0.0000	2,695.9217	2,695.9217	0.8132		2,712.9986
Total	**0.6360**	**15.6553**	**13.7792**	**0.0260**	**0.4898**	**0.4664**	**0.9561**	**0.0550**	**0.4664**	**0.5213**	**0.0000**	**2,695.9217**	**2,695.9217**	**0.8132**		**2,712.9986**

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	2.6013	39.2317	28.4723	0.1047	2.4802	0.5900	3.0701	0.6791	0.5426	1.2217		10,554.8219	10,554.8219	0.0750		10,556.3971
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	0.0278	0.0359	0.4392	1.0900e-003	0.0894	6.2000e-004	0.0901	0.0237	5.8000e-004	0.0243		90.7681	90.7681	4.2700e-003		90.8578
Total	**2.6291**	**39.2675**	**28.9115**	**0.1058**	**2.5696**	**0.5906**	**3.1602**	**0.7028**	**0.5432**	**1.2460**		**10,645.5901**	**10,645.5901**	**0.0793**		**10,647.2549**

3.6 Grading-4 - 2016

Unmitigated Construction On-Site

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					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.5499	4.5109	2.8863	3.2900e-003		0.3872	0.3872		0.3562	0.3562		342.3198	342.3198	0.1033		344.4882
Total	**0.5499**	**4.5109**	**2.8863**	**3.2900e-003**	**0.0000**	**0.3872**	**0.3872**	**0.0000**	**0.3562**	**0.3562**		**342.3198**	**342.3198**	**0.1033**		**344.4882**

Unmitigated Construction Off-Site

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					
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	0.0174	0.0224	0.2745	6.8000e-004	0.0559	3.9000e-004	0.0563	0.0148	3.6000e-004	0.0152		56.7301	56.7301	2.6700e-003		56.7861
Total	**0.0174**	**0.0224**	**0.2745**	**6.8000e-004**	**0.0559**	**3.9000e-004**	**0.0563**	**0.0148**	**3.6000e-004**	**0.0152**		**56.7301**	**56.7301**	**2.6700e-003**		**56.7861**

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.0822	1.8774	2.5352	3.2900e-003		0.1316	0.1316		0.1316	0.1316	0.0000	342.3198	342.3198	0.1033		344.4882
Total	**0.0822**	**1.8774**	**2.5352**	**3.2900e-003**	**0.0000**	**0.1316**	**0.1316**	**0.0000**	**0.1316**	**0.1316**	**0.0000**	**342.3198**	**342.3198**	**0.1033**		**344.4882**

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	0.0174	0.0224	0.2745	6.8000e-004	0.0559	3.9000e-004	0.0563	0.0148	3.6000e-004	0.0152		56.7301	56.7301	2.6700e-003		56.7861
Total	**0.0174**	**0.0224**	**0.2745**	**6.8000e-004**	**0.0559**	**3.9000e-004**	**0.0563**	**0.0148**	**3.6000e-004**	**0.0152**		**56.7301**	**56.7301**	**2.6700e-003**		**56.7861**

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	16.2350	37.0327	179.2074	0.5608	39.9225	0.5767	40.4992	10.6526	0.5321	11.1847		44,272.50 63	44,272.506 3	1.5889		44,305.872 2
Unmitigated	16.2350	37.0327	179.2074	0.5608	39.9225	0.5767	40.4992	10.6526	0.5321	11.1847		44,272.50 63	44,272.506 3	1.5889		44,305.872 2

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Condo/Townhouse	606.28	658.72	558.44	2,949,610	2,949,610
Health Club	171.89	108.94	139.53	395,470	395,470
High Turnover (Sit Down Restaurant)	1,446.97	1,802.25	1500.34	2,416,070	2,416,070
Parking Lot	0.00	0.00	0.00		
Recreational Swimming Pool	111.30	70.54	90.35	287,225	287,225
Regional Shopping Center	1,567.31	1,823.91	921.26	3,821,826	3,821,826
Single Family Housing	1,454.64	1,532.16	1333.04	7,038,698	7,038,698
Total	5,358.40	5,996.52	4,542.96	16,908,899	16,908,899

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
Condo/Townhouse	19.80	9.60	12.90	40.20	19.20	40.60	86	11	3
Health Club	18.50	10.10	7.90	16.90	64.10	19.00	52	39	9
High Turnover (Sit Down Restaurant)	18.50	10.10	7.90	8.50	72.50	19.00	37	20	43
Parking Lot	18.50	10.10	7.90	0.00	0.00	0.00	0	0	0
Recreational Swimming Pool	18.50	10.10	7.90	33.00	48.00	19.00	52	39	9
Regional Shopping Center	18.50	10.10	7.90	16.30	64.70	19.00	54	35	11
Single Family Housing	19.80	9.60	12.90	40.20	19.20	40.60	86	11	3

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.509471	0.056616	0.192725	0.151095	0.041772	0.005913	0.015766	0.015535	0.001447	0.002155	0.004735	0.000502	0.002269

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	lb/day										lb/day					
NaturalGas Mitigated	0.2668	2.3315	1.3466	0.0146		0.1844	0.1844		0.1844	0.1844		2,910.8052	2,910.8052	0.0558	0.0534	2,928.5199
NaturalGas Unmitigated	0.2668	2.3315	1.3466	0.0146		0.1844	0.1844		0.1844	0.1844		2,910.8052	2,910.8052	0.0558	0.0534	2,928.5199

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					
High Turnover (Sit Down Restaurant)	8210.36	0.0885	0.8049	0.6762	4.8300e-003		0.0612	0.0612		0.0612	0.0612		965.9242	965.9242	0.0185	0.0177	971.8026
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
Recreational Swimming Pool	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
Regional Shopping Center	205	2.2100e-003	0.0201	0.0169	1.2000e-004		1.5300e-003	1.5300e-003		1.5300e-003	1.5300e-003		24.1177	24.1177	4.6000e-004	4.4000e-004	24.2644
Single Family Housing	12028.2	0.1297	1.1085	0.4717	7.0800e-003		0.0896	0.0896		0.0896	0.0896		1,415.0820	1,415.0820	0.0271	0.0259	1,423.6940
Condo/Townhouse	3988.81	0.0430	0.3676	0.1564	2.3500e-003		0.0297	0.0297		0.0297	0.0297		469.2718	469.2718	8.9900e-003	8.6000e-003	472.1277
Health Club	309.482	3.3400e-003	0.0303	0.0255	1.8000e-004		2.3100e-003	2.3100e-003		2.3100e-003	2.3100e-003		36.4096	36.4096	7.0000e-004	6.7000e-004	36.6312

Total		**0.2668**	**2.3315**	**1.3466**	**0.0146**		**0.1844**	**0.1844**		**0.1844**	**0.1844**		**2,910.8052**	**2,910.8052**	**0.0558**	**0.0534**	**2,928.5199**

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					
High Turnover (Sit Down Restaurant)	8.21036	0.0885	0.8049	0.6762	4.8300e-003		0.0612	0.0612		0.0612	0.0612		965.9242	965.9242	0.0185	0.0177	971.8026
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
Recreational Swimming Pool	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
Regional Shopping Center	0.205	2.2100e-003	0.0201	0.0169	1.2000e-004		1.5300e-003	1.5300e-003		1.5300e-003	1.5300e-003		24.1177	24.1177	4.6000e-004	4.4000e-004	24.2644
Single Family Housing	12.0282	0.1297	1.1085	0.4717	7.0800e-003		0.0896	0.0896		0.0896	0.0896		1,415.0820	1,415.0820	0.0271	0.0259	1,423.6940
Condo/Townhouse	3.98881	0.0430	0.3676	0.1564	2.3500e-003		0.0297	0.0297		0.0297	0.0297		469.2718	469.2718	8.9900e-003	8.6000e-003	472.1277
Health Club	0.309482	3.3400e-003	0.0303	0.0255	1.8000e-004		2.3100e-003	2.3100e-003		2.3100e-003	2.3100e-003		36.4096	36.4096	7.0000e-004	6.7000e-004	36.6312
Total		**0.2668**	**2.3315**	**1.3466**	**0.0146**		**0.1844**	**0.1844**		**0.1844**	**0.1844**		**2,910.8052**	**2,910.8052**	**0.0558**	**0.0534**	**2,928.5199**

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	79.4258	1.8569	142.9170	0.1962		18.7498	18.7498		18.7468	18.7468	2,285.5281	4,428.3368	6,713.8649	6.8517	0.1551	6,905.8397

Unmitigated	79.4258	1.8569	142.9170	0.1962		18.7498	18.7498		18.7468	18.7468	2,285.5281	4,428.3368	6,713.8649	6.8517	0.1551	6,905.8397

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	1.4159					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	13.4498					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	63.9368	1.6222	122.6446	0.1951		18.6388	18.6388		18.6358	18.6358	2,285.5281	4,392.0000	6,677.5281	6.8159	0.1551	6,868.7506
Landscaping	0.6233	0.2347	20.2724	1.0700e-003		0.1110	0.1110		0.1110	0.1110		36.3368	36.3368	0.0358		37.0891
Total	**79.4258**	**1.8569**	**142.9170**	**0.1962**		**18.7498**	**18.7498**		**18.7468**	**18.7468**	**2,285.5281**	**4,428.3368**	**6,713.8649**	**6.8517**	**0.1551**	**6,905.8397**

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	1.4159					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	13.4498					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	63.9368	1.6222	122.6446	0.1951		18.6388	18.6388		18.6358	18.6358	2,285.5281	4,392.0000	6,677.5281	6.8159	0.1551	6,868.7506
Landscaping	0.6233	0.2347	20.2724	1.0700e-003		0.1110	0.1110		0.1110	0.1110		36.3368	36.3368	0.0358		37.0891

Total	79.4258	1.8569	142.9170	0.1962		18.7498	18.7498		18.7468	18.7468	2,285.528 1	4,428.336 8	6,713.8649	6.8517	0.1551	6,905.8397

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

Construction - Tiered Engine Equipment - Winter

Orange County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	355.00	Space	0.00	142,000.00	0
Health Club	5.22	1000sqft	0.00	5,220.00	0
High Turnover (Sit Down Restaurant)	11.38	1000sqft	0.00	11,376.00	0
Recreational Swimming Pool	3.38	1000sqft	0.00	3,375.00	0
Condo/Townhouse	92.00	Dwelling Unit	0.00	161,581.00	161
Single Family Housing	152.00	Dwelling Unit	33.00	319,230.00	266
Regional Shopping Center	36.50	1000sqft	0.00	36,500.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	30
Climate Zone	8			**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 - Acreage and number of units provided in data request. Parking lot size from project description. Assumes provided 5 acre value for commercial includes parking

Construction Phase - Phasing provided by client

Off-road Equipment - Provided by client

Off-road Equipment - .

Off-road Equipment - .

Off-road Equipment - .

Off-road Equipment - .

Off-road Equipment - .

Trips and VMT -

Grading - Provided by client

Architectural Coating - Client has committed to low-VOC coatings

Construction Off-road Equipment Mitigation - Provided by client

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	16
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	7.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstructionPhase	NumDays	45.00	50.00
tblConstructionPhase	NumDays	45.00	24.00
tblConstructionPhase	NumDays	45.00	8.00
tblConstructionPhase	NumDays	45.00	80.00
tblConstructionPhase	NumDays	20.00	10.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00

tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblFireplaces	NumberGas	78.20	90.95
tblFireplaces	NumberGas	129.20	116.45
tblFireplaces	NumberNoFireplace	9.20	10.70
tblFireplaces	NumberNoFireplace	15.20	13.70
tblFireplaces	NumberWood	4.60	5.35
tblFireplaces	NumberWood	7.60	6.85
tblGrading	MaterialImported	0.00	56,945.00
tblGrading	MaterialImported	0.00	27,334.00
tblGrading	MaterialImported	0.00	9,111.00
tblLandUse	LandUseSquareFeet	11,380.00	11,376.00
tblLandUse	LandUseSquareFeet	3,380.00	3,375.00
tblLandUse	LandUseSquareFeet	92,000.00	161,581.00
tblLandUse	LandUseSquareFeet	273,600.00	319,230.00
tblLandUse	LotAcreage	3.19	0.00
tblLandUse	LotAcreage	0.12	0.00
tblLandUse	LotAcreage	0.26	0.00
tblLandUse	LotAcreage	0.08	0.00
tblLandUse	LotAcreage	5.75	0.00
tblLandUse	LotAcreage	49.35	33.00
tblLandUse	LotAcreage	0.84	0.00
tblLandUse	Population	263.00	161.00
tblLandUse	Population	435.00	266.00
tblOffRoadEquipment	HorsePower	174.00	185.00
tblOffRoadEquipment	HorsePower	174.00	185.00
tblOffRoadEquipment	HorsePower	255.00	315.00
tblOffRoadEquipment	HorsePower	361.00	360.00
tblOffRoadEquipment	HorsePower	361.00	360.00
tblOffRoadEquipment	HorsePower	361.00	360.00

tblOffRoadEquipment	HorsePower	97.00	305.00
tblOffRoadEquipment	HorsePower	97.00	210.00
tblOffRoadEquipment	HorsePower	199.00	70.00
tblOffRoadEquipment	HorsePower	199.00	70.00
tblOffRoadEquipment	LoadFactor	0.36	0.37
tblOffRoadEquipment	LoadFactor	0.36	0.37
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	5.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblProjectCharacteristics	OperationalYear	2014	2019
tblSolidWaste	SolidWasteGenerationRate	42.32	49.22
tblSolidWaste	SolidWasteGenerationRate	109.06	98.40
tblVehicleTrips	CC_TL	8.40	10.10
tblVehicleTrips	CC_TL	8.40	10.10
tblVehicleTrips	CC_TL	8.40	10.10
tblVehicleTrips	CC_TL	8.40	10.10
tblVehicleTrips	CC_TL	8.40	10.10
tblVehicleTrips	CNW_TL	6.90	7.90
tblVehicleTrips	CNW_TL	6.90	7.90

tblVehicleTrips	CNW_TL	6.90	7.90
tblVehicleTrips	CNW_TL	6.90	7.90
tblVehicleTrips	CNW_TL	6.90	7.90
tblVehicleTrips	CW_TL	16.60	18.50
tblVehicleTrips	CW_TL	16.60	18.50
tblVehicleTrips	CW_TL	16.60	18.50
tblVehicleTrips	CW_TL	16.60	18.50
tblVehicleTrips	CW_TL	16.60	18.50
tblVehicleTrips	HO_TL	8.70	12.90
tblVehicleTrips	HO_TL	8.70	12.90
tblVehicleTrips	HS_TL	5.90	9.60
tblVehicleTrips	HS_TL	5.90	9.60
tblVehicleTrips	HW_TL	14.70	19.80
tblVehicleTrips	HW_TL	14.70	19.80
tblWater	IndoorWaterUseRate	5,994,170.36	6,971,480.74
tblWater	IndoorWaterUseRate	9,903,411.89	8,926,101.51
tblWater	OutdoorWaterUseRate	3,778,933.49	4,395,063.95
tblWater	OutdoorWaterUseRate	6,243,455.32	5,627,324.87
tblWoodstoves	NumberCatalytic	4.60	5.35
tblWoodstoves	NumberCatalytic	7.60	6.85
tblWoodstoves	NumberNoncatalytic	4.60	5.35
tblWoodstoves	NumberNoncatalytic	7.60	6.85

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					
2016	9.1476	120.2532	81.2791	0.1797	6.7868	3.7476	10.5344	2.5064	3.4476	4.6290	0.0000	18,288.3100	18,288.3100	2.3679	0.0000	18,338.0355
Total	**9.1476**	**120.2532**	**81.2791**	**0.1797**	**6.7868**	**3.7476**	**10.5344**	**2.5064**	**3.4476**	**4.6290**	**0.0000**	**18,288.3100**	**18,288.3100**	**2.3679**	**0.0000**	**18,338.0355**

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					
2016	4.6394	94.2980	72.4296	0.1797	4.2023	1.9068	6.1090	0.9435	1.8592	2.7579	0.0000	18,288.3100	18,288.3100	2.3679	0.0000	18,338.0355
Total	**4.6394**	**94.2980**	**72.4296**	**0.1797**	**4.2023**	**1.9068**	**6.1090**	**0.9435**	**1.8592**	**2.7579**	**0.0000**	**18,288.3100**	**18,288.3100**	**2.3679**	**0.0000**	**18,338.0355**

	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	**49.28**	**21.58**	**10.89**	**0.00**	**38.08**	**49.12**	**42.01**	**62.35**	**46.07**	**40.42**	**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	79.4258	1.8569	142.9170	0.1962		18.7498	18.7498		18.7468	18.7468	2,285.5281	4,428.3368	6,713.8649	6.8517	0.1551	6,905.8397

Energy	0.2668	2.3315	1.3466	0.0146		0.1844	0.1844		0.1844	0.1844		2,910.8052	2,910.8052	0.0558	0.0534	2,928.5199
Mobile	17.1229	39.0664	178.0414	0.5356	39.9225	0.5787	40.5013	10.6526	0.5340	11.1866		42,354.6837	42,354.6837	1.5899		42,388.0705
Total	**96.8155**	**43.2548**	**322.3051**	**0.7463**	**39.9225**	**19.5128**	**59.4354**	**10.6526**	**19.4652**	**30.1178**	**2,285.5281**	**49,693.8257**	**51,979.3538**	**8.4974**	**0.2085**	**52,222.4301**

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	79.4258	1.8569	142.9170	0.1962		18.7498	18.7498		18.7468	18.7468	2,285.5281	4,428.3368	6,713.8649	6.8517	0.1551	6,905.8397
Energy	0.2668	2.3315	1.3466	0.0146		0.1844	0.1844		0.1844	0.1844		2,910.8052	2,910.8052	0.0558	0.0534	2,928.5199
Mobile	17.1229	39.0664	178.0414	0.5356	39.9225	0.5787	40.5013	10.6526	0.5340	11.1866		42,354.6837	42,354.6837	1.5899		42,388.0705
Total	**96.8155**	**43.2548**	**322.3051**	**0.7463**	**39.9225**	**19.5128**	**59.4354**	**10.6526**	**19.4652**	**30.1178**	**2,285.5281**	**49,693.8257**	**51,979.3538**	**8.4974**	**0.2085**	**52,222.4301**

	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	Site Prep	Site Preparation	3/1/2016	3/11/2016	6	10	
2	Grading-1	Grading	3/12/2016	5/9/2016	6	50	
3	Grading-2	Grading	5/10/2016	6/6/2016	6	24	
4	Grading-3	Grading	6/7/2016	6/15/2016	6	8	

5	Grading-4	Grading	6/16/2016	9/16/2016	6	80	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Prep	Off-Highway Trucks	1	6.00	400	0.38
Site Prep	Rubber Tired Dozers	1	6.00	315	0.40
Site Prep	Tractors/Loaders/Backhoes	1	6.00	210	0.37
Grading-1	Off-Highway Trucks	1	6.00	400	0.38
Grading-1	Scrapers	5	6.00	360	0.48
Grading-1	Tractors/Loaders/Backhoes	1	6.00	305	0.37
Grading-2	Graders	1	6.00	185	0.41
Grading-2	Off-Highway Trucks	1	6.00	400	0.38
Grading-2	Rubber Tired Loaders	2	6.00	70	0.37
Grading-2	Scrapers	1	6.00	360	0.48
Grading-3	Graders	1	6.00	185	0.41
Grading-3	Off-Highway Trucks	1	6.00	400	0.38
Grading-3	Scrapers	1	6.00	360	0.48
Grading-4	Rubber Tired Loaders	2	6.00	70	0.37

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
Site Prep	3	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading-1	7	18.00	0.00	7,118.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading-2	5	13.00	0.00	3,417.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

Grading-3		3	8.00	0.00	1,139.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading-4		2	5.00	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

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Site Prep - 2016

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					4.5166	0.0000	4.5166	2.4827	0.0000	2.4827			0.0000			0.0000
Off-Road	2.1730	25.5389	14.8891	0.0231		1.0539	1.0539		0.9696	0.9696		2,399.0873	2,399.0873	0.7237		2,414.2839
Total	**2.1730**	**25.5389**	**14.8891**	**0.0231**	**4.5166**	**1.0539**	**5.5704**	**2.4827**	**0.9696**	**3.4522**		**2,399.0873**	**2,399.0873**	**0.7237**		**2,414.2839**

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	0.0292	0.0394	0.4137	1.0300e-003	0.0894	6.2000e-004	0.0901	0.0237	5.8000e-004	0.0243		85.9654	85.9654	4.2700e-003		86.0551
Total	**0.0292**	**0.0394**	**0.4137**	**1.0300e-003**	**0.0894**	**6.2000e-004**	**0.0901**	**0.0237**	**5.8000e-004**	**0.0243**		**85.9654**	**85.9654**	**4.2700e-003**		**86.0551**

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					1.6734	0.0000	1.6734	0.9198	0.0000	0.9198			0.0000			0.0000
Off-Road	0.5646	15.2468	12.2333	0.0231		0.4141	0.4141		0.4141	0.4141	0.0000	2,399.0873	2,399.0873	0.7237		2,414.2839
Total	**0.5646**	**15.2468**	**12.2333**	**0.0231**	**1.6734**	**0.4141**	**2.0874**	**0.9198**	**0.4141**	**1.3339**	**0.0000**	**2,399.0873**	**2,399.0873**	**0.7237**		**2,414.2839**

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	0.0292	0.0394	0.4137	1.0300e-003	0.0894	6.2000e-004	0.0901	0.0237	5.8000e-004	0.0243		85.9654	85.9654	4.2700e-003		86.0551
Total	**0.0292**	**0.0394**	**0.4137**	**1.0300e-003**	**0.0894**	**6.2000e-004**	**0.0901**	**0.0237**	**5.8000e-004**	**0.0243**		**85.9654**	**85.9654**	**4.2700e-003**		**86.0551**

3.3 Grading-1 - 2016

Unmitigated Construction On-Site

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					
Fugitive Dust					4.1057	0.0000	4.1057	0.4489	0.0000	0.4489			0.0000			0.0000
Off-Road	6.3001	79.5924	47.6731	0.0728		3.1549	3.1549		2.9025	2.9025		7,566.3331	7,566.3331	2.2823		7,614.2609
Total	**6.3001**	**79.5924**	**47.6731**	**0.0728**	**4.1057**	**3.1549**	**7.2605**	**0.4489**	**2.9025**	**3.3514**		**7,566.3331**	**7,566.3331**	**2.2823**		**7,614.2609**

Unmitigated Construction Off-Site

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					
Hauling	2.7818	40.5721	32.6753	0.1045	2.4799	0.5913	3.0713	0.6791	0.5439	1.2229		10,528.5547	10,528.5547	0.0760		10,530.1508
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	0.0657	0.0887	0.9308	2.3100e-003	0.2012	1.4100e-003	0.2026	0.0534	1.3000e-003	0.0547		193.4222	193.4222	9.6000e-003		193.6239
Total	**2.8475**	**40.6608**	**33.6060**	**0.1069**	**2.6811**	**0.5927**	**3.2739**	**0.7324**	**0.5452**	**1.2776**		**10,721.9769**	**10,721.9769**	**0.0856**		**10,723.7747**

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					1.5212	0.0000	1.5212	0.1663	0.0000	0.1663			0.0000			0.0000
Off-Road	1.7919	53.6372	38.8235	0.0728		1.3140	1.3140		1.3140	1.3140	0.0000	7,566.3331	7,566.3331	2.2823		7,614.2609
Total	**1.7919**	**53.6372**	**38.8235**	**0.0728**	**1.5212**	**1.3140**	**2.8352**	**0.1663**	**1.3140**	**1.4804**	**0.0000**	**7,566.3331**	**7,566.3331**	**2.2823**		**7,614.2609**

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	2.7818	40.5721	32.6753	0.1045	2.4799	0.5913	3.0713	0.6791	0.5439	1.2229		10,528.5547	10,528.5547	0.0760		10,530.1508
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	0.0657	0.0887	0.9308	2.3100e-003	0.2012	1.4100e-003	0.2026	0.0534	1.3000e-003	0.0547		193.4222	193.4222	9.6000e-003		193.6239
Total	**2.8475**	**40.6608**	**33.6060**	**0.1069**	**2.6811**	**0.5927**	**3.2739**	**0.7324**	**0.5452**	**1.2776**		**10,721.9769**	**10,721.9769**	**0.0856**		**10,723.7747**

3.4 Grading-2 - 2016

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					1.3219	0.0000	1.3219	0.1483	0.0000	0.1483			0.0000			0.0000
Off-Road	2.6900	31.4917	16.3839	0.0292		1.4093	1.4093		1.2965	1.2965		3,038.2415	3,038.2415	0.9164		3,057.4868

	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
Total	**2.6900**	**31.4917**	**16.3839**	**0.0292**	**1.3219**	**1.4093**	**2.7311**	**0.1483**	**1.2965**	**1.4449**		**3,038.2415**	**3,038.2415**	**0.9164**		**3,057.4868**

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	2.7821	40.5763	32.6787	0.1046	2.4802	0.5914	3.0716	0.6791	0.5439	1.2230		10,529.6641	10,529.6641	0.0760		10,531.2603
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	0.0475	0.0641	0.6722	1.6700e-003	0.1453	1.0200e-003	0.1463	0.0385	9.4000e-004	0.0395		139.6938	139.6938	6.9400e-003		139.8395
Total	**2.8296**	**40.6404**	**33.3509**	**0.1062**	**2.6255**	**0.5924**	**3.2179**	**0.7177**	**0.5449**	**1.2625**		**10,669.3579**	**10,669.3579**	**0.0830**		**10,671.0998**

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					0.4898	0.0000	0.4898	0.0550	0.0000	0.0550			0.0000			0.0000
Off-Road	0.7182	17.5328	16.3144	0.0292		0.5979	0.5979		0.5979	0.5979	0.0000	3,038.2415	3,038.2415	0.9164		3,057.4868
Total	**0.7182**	**17.5328**	**16.3144**	**0.0292**	**0.4898**	**0.5979**	**1.0877**	**0.0550**	**0.5979**	**0.6529**	**0.0000**	**3,038.2415**	**3,038.2415**	**0.9164**		**3,057.4868**

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	2.7821	40.5763	32.6787	0.1046	2.4802	0.5914	3.0716	0.6791	0.5439	1.2230		10,529.6641	10,529.6641	0.0760		10,531.2603
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	0.0475	0.0641	0.6722	1.6700e-003	0.1453	1.0200e-003	0.1463	0.0385	9.4000e-004	0.0395		139.6938	139.6938	6.9400e-003		139.8395
Total	**2.8296**	**40.6404**	**33.3509**	**0.1062**	**2.6255**	**0.5924**	**3.2179**	**0.7177**	**0.5449**	**1.2625**		**10,669.3579**	**10,669.3579**	**0.0830**		**10,671.0998**

3.5 Grading-3 - 2016

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					1.3219	0.0000	1.3219	0.1483	0.0000	0.1483			0.0000			0.0000
Off-Road	2.1400	26.9808	13.4976	0.0260		1.0221	1.0221		0.9403	0.9403		2,695.9217	2,695.9217	0.8132		2,712.9986
Total	**2.1400**	**26.9808**	**13.4976**	**0.0260**	**1.3219**	**1.0221**	**2.3439**	**0.1483**	**0.9403**	**1.0886**		**2,695.9217**	**2,695.9217**	**0.8132**		**2,712.9986**

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	2.7821	40.5763	32.6787	0.1046	2.4802	0.5914	3.0716	0.6791	0.5439	1.2230		10,529.6641	10,529.6641	0.0760		10,531.2603
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	0.0292	0.0394	0.4137	1.0300e-003	0.0894	6.2000e-004	0.0901	0.0237	5.8000e-004	0.0243		85.9654	85.9654	4.2700e-003		86.0551
Total	**2.8113**	**40.6158**	**33.0924**	**0.1056**	**2.5696**	**0.5920**	**3.1616**	**0.7028**	**0.5445**	**1.2473**		**10,615.6295**	**10,615.6295**	**0.0803**		**10,617.3154**

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					0.4898	0.0000	0.4898	0.0550	0.0000	0.0550			0.0000			0.0000
Off-Road	0.6360	15.6553	13.7792	0.0260		0.4664	0.4664		0.4664	0.4664	0.0000	2,695.9217	2,695.9217	0.8132		2,712.9986
Total	**0.6360**	**15.6553**	**13.7792**	**0.0260**	**0.4898**	**0.4664**	**0.9561**	**0.0550**	**0.4664**	**0.5213**	**0.0000**	**2,695.9217**	**2,695.9217**	**0.8132**		**2,712.9986**

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	2.7821	40.5763	32.6787	0.1046	2.4802	0.5914	3.0716	0.6791	0.5439	1.2230		10,529.6641	10,529.6641	0.0760		10,531.2603
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	0.0292	0.0394	0.4137	1.0300e-003	0.0894	6.2000e-004	0.0901	0.0237	5.8000e-004	0.0243		85.9654	85.9654	4.2700e-003		86.0551
Total	**2.8113**	**40.6158**	**33.0924**	**0.1056**	**2.5696**	**0.5920**	**3.1616**	**0.7028**	**0.5445**	**1.2473**		**10,615.6295**	**10,615.6295**	**0.0803**		**10,617.3154**

3.6 Grading-4 - 2016

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.5499	4.5109	2.8863	3.2900e-003		0.3872	0.3872		0.3562	0.3562		342.3198	342.3198	0.1033		344.4882
Total	**0.5499**	**4.5109**	**2.8863**	**3.2900e-003**	**0.0000**	**0.3872**	**0.3872**	**0.0000**	**0.3562**	**0.3562**		**342.3198**	**342.3198**	**0.1033**		**344.4882**

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	0.0183	0.0247	0.2586	6.4000e-004	0.0559	3.9000e-004	0.0563	0.0148	3.6000e-004	0.0152		53.7284	53.7284	2.6700e-003		53.7844
Total	**0.0183**	**0.0247**	**0.2586**	**6.4000e-004**	**0.0559**	**3.9000e-004**	**0.0563**	**0.0148**	**3.6000e-004**	**0.0152**		**53.7284**	**53.7284**	**2.6700e-003**		**53.7844**

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.0822	1.8774	2.5352	3.2900e-003		0.1316	0.1316		0.1316	0.1316	0.0000	342.3198	342.3198	0.1033		344.4882
Total	**0.0822**	**1.8774**	**2.5352**	**3.2900e-003**	**0.0000**	**0.1316**	**0.1316**	**0.0000**	**0.1316**	**0.1316**	**0.0000**	**342.3198**	**342.3198**	**0.1033**		**344.4882**

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	0.0183	0.0247	0.2586	6.4000e-004	0.0559	3.9000e-004	0.0563	0.0148	3.6000e-004	0.0152		53.7284	53.7284	2.6700e-003		53.7844
Total	**0.0183**	**0.0247**	**0.2586**	**6.4000e-004**	**0.0559**	**3.9000e-004**	**0.0563**	**0.0148**	**3.6000e-004**	**0.0152**		**53.7284**	**53.7284**	**2.6700e-003**		**53.7844**

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	17.1229	39.0664	178.0414	0.5356	39.9225	0.5787	40.5013	10.6526	0.5340	11.1866		42,354.6837	42,354.6837	1.5899		42,388.0705
Unmitigated	17.1229	39.0664	178.0414	0.5356	39.9225	0.5787	40.5013	10.6526	0.5340	11.1866		42,354.6837	42,354.6837	1.5899		42,388.0705

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Condo/Townhouse	606.28	658.72	558.44	2,949,610	2,949,610
Health Club	171.89	108.94	139.53	395,470	395,470
High Turnover (Sit Down Restaurant)	1,446.97	1,802.25	1500.34	2,416,070	2,416,070
Parking Lot	0.00	0.00	0.00		
Recreational Swimming Pool	111.30	70.54	90.35	287,225	287,225
Regional Shopping Center	1,567.31	1,823.91	921.26	3,821,826	3,821,826
Single Family Housing	1,454.64	1,532.16	1333.04	7,038,698	7,038,698
Total	5,358.40	5,996.52	4,542.96	16,908,899	16,908,899

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
Condo/Townhouse	19.80	9.60	12.90	40.20	19.20	40.60	86	11	3
Health Club	18.50	10.10	7.90	16.90	64.10	19.00	52	39	9
High Turnover (Sit Down Restaurant)	18.50	10.10	7.90	8.50	72.50	19.00	37	20	43
Parking Lot	18.50	10.10	7.90	0.00	0.00	0.00	0	0	0
Recreational Swimming Pool	18.50	10.10	7.90	33.00	48.00	19.00	52	39	9
Regional Shopping Center	18.50	10.10	7.90	16.30	64.70	19.00	54	35	11
Single Family Housing	19.80	9.60	12.90	40.20	19.20	40.60	86	11	3

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.509471	0.056616	0.192725	0.151095	0.041772	0.005913	0.015766	0.015535	0.001447	0.002155	0.004735	0.000502	0.002269

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	lb/day										lb/day					
NaturalGas Mitigated	0.2668	2.3315	1.3466	0.0146		0.1844	0.1844		0.1844	0.1844		2,910.8052	2,910.8052	0.0558	0.0534	2,928.5199
NaturalGas Unmitigated	0.2668	2.3315	1.3466	0.0146		0.1844	0.1844		0.1844	0.1844		2,910.8052	2,910.8052	0.0558	0.0534	2,928.5199

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					
Health Club	309.482	3.3400e-003	0.0303	0.0255	1.8000e-004		2.3100e-003	2.3100e-003		2.3100e-003	2.3100e-003		36.4096	36.4096	7.0000e-004	6.7000e-004	36.6312
High Turnover (Sit Down Restaurant)	8210.36	0.0885	0.8049	0.6762	4.8300e-003		0.0612	0.0612		0.0612	0.0612		965.9242	965.9242	0.0185	0.0177	971.8026
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
Recreational Swimming Pool	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
Regional Shopping Center	205	2.2100e-003	0.0201	0.0169	1.2000e-004		1.5300e-003	1.5300e-003		1.5300e-003	1.5300e-003		24.1177	24.1177	4.6000e-004	4.4000e-004	24.2644
Single Family Housing	12028.2	0.1297	1.1085	0.4717	7.0800e-003		0.0896	0.0896		0.0896	0.0896		1,415.0820	1,415.0820	0.0271	0.0259	1,423.6940
Condo/Townhouse	3988.81	0.0430	0.3676	0.1564	2.3500e-003		0.0297	0.0297		0.0297	0.0297		469.2718	469.2718	8.9900e-003	8.6000e-003	472.1277

Total		0.2668	2.3315	1.3466	0.0146		0.1844	0.1844		0.1844	0.1844		2,910.8052	2,910.8052	0.0558	0.0534	2,928.5199

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					
High Turnover (Sit Down Restaurant)	8.21036	0.0885	0.8049	0.6762	4.8300e-003		0.0612	0.0612		0.0612	0.0612		965.9242	965.9242	0.0185	0.0177	971.8026
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
Recreational Swimming Pool	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
Regional Shopping Center	0.205	2.2100e-003	0.0201	0.0169	1.2000e-004		1.5300e-003	1.5300e-003		1.5300e-003	1.5300e-003		24.1177	24.1177	4.6000e-004	4.4000e-004	24.2644
Single Family Housing	12.0282	0.1297	1.1085	0.4717	7.0800e-003		0.0896	0.0896		0.0896	0.0896		1,415.0820	1,415.0820	0.0271	0.0259	1,423.6940
Condo/Townhouse	3.98881	0.0430	0.3676	0.1564	2.3500e-003		0.0297	0.0297		0.0297	0.0297		469.2718	469.2718	8.9900e-003	8.6000e-003	472.1277
Health Club	0.309482	3.3400e-003	0.0303	0.0255	1.8000e-004		2.3100e-003	2.3100e-003		2.3100e-003	2.3100e-003		36.4096	36.4096	7.0000e-004	6.7000e-004	36.6312
Total		**0.2668**	**2.3315**	**1.3466**	**0.0146**		**0.1844**	**0.1844**		**0.1844**	**0.1844**		**2,910.8052**	**2,910.8052**	**0.0558**	**0.0534**	**2,928.5199**

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	79.4258	1.8569	142.9170	0.1962		18.7498	18.7498		18.7468	18.7468	2,285.5281	4,428.3368	6,713.8649	6.8517	0.1551	6,905.8397

Unmitigated	79.4258	1.8569	142.9170	0.1962		18.7498	18.7498		18.7468	18.7468	2,285.5281	4,428.3368	6,713.8649	6.8517	0.1551	6,905.8397

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	1.4159					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	13.4498					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	63.9368	1.6222	122.6446	0.1951		18.6388	18.6388		18.6358	18.6358	2,285.5281	4,392.0000	6,677.5281	6.8159	0.1551	6,868.7506
Landscaping	0.6233	0.2347	20.2724	1.0700e-003		0.1110	0.1110		0.1110	0.1110		36.3368	36.3368	0.0358		37.0891
Total	**79.4258**	**1.8569**	**142.9170**	**0.1962**		**18.7498**	**18.7498**		**18.7468**	**18.7468**	**2,285.5281**	**4,428.3368**	**6,713.8649**	**6.8517**	**0.1551**	**6,905.8397**

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	1.4159					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	13.4498					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	63.9368	1.6222	122.6446	0.1951		18.6388	18.6388		18.6358	18.6358	2,285.5281	4,392.0000	6,677.5281	6.8159	0.1551	6,868.7506
Landscaping	0.6233	0.2347	20.2724	1.0700e-003		0.1110	0.1110		0.1110	0.1110		36.3368	36.3368	0.0358		37.0891

Total	**79.4258**	**1.8569**	**142.9170**	**0.1962**		**18.7498**	**18.7498**		**18.7468**	**18.7468**	**2,285.5281**	**4,428.3368**	**6,713.8649**	**6.8517**	**0.1551**	**6,905.8397**

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

Construction - Non-Tiered Engine Equipment - Summer

Orange County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	355.00	Space	0.00	142,000.00	0
Health Club	5.22	1000sqft	0.00	5,220.00	0
High Turnover (Sit Down Restaurant)	11.38	1000sqft	0.00	11,376.00	0
Recreational Swimming Pool	3.38	1000sqft	0.00	3,375.00	0
Condo/Townhouse	92.00	Dwelling Unit	0.00	161,581.00	161
Single Family Housing	152.00	Dwelling Unit	33.00	319,230.00	266
Regional Shopping Center	36.50	1000sqft	0.00	36,500.00	0

1.2 Other Project Characteristics

Urbanization Urban **Wind Speed (m/s)** 2.2 **Precipitation Freq (Days)** 30

Climate Zone 8 **Operational Year** 2019

Utility Company Southern California Edison

CO_2 Intensity (lb/MWhr) 630.89 **CH_4 Intensity (lb/MWhr)** 0.029 **N_2O Intensity (lb/MWhr)** 0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Acreage and number of units provided in data request. Parking lot size from project description. Assumes provided 5 acre value for commercial includes parking

Construction Phase - Phasing provided by client

Off-road Equipment - Provided by client

Off-road Equipment - .

Off-road Equipment - Amount and hours provided by client

Off-road Equipment - Provided by client

Off-road Equipment - Provided by client

Off-road Equipment - Provided by client

Off-road Equipment - Provided by client

Off-road Equipment - Provided by client

Off-road Equipment - Provided by client

Off-road Equipment - Provided by client

Off-road Equipment - Provided by client

Off-road Equipment - Provided by client

Off-road Equipment - Provided by client

Off-road Equipment - Provided by client

Off-road Equipment - Provided by client

Off-road Equipment - Provided by client

Off-road Equipment - Provided by client

Trips and VMT - .

Grading - Provided by client

Architectural Coating - Client has committed to low-VOC coatings

Construction Off-road Equipment Mitigation - Provided by client

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	100.00
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	100.00
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	100.00
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	100.00
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	100.00
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	100.00
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	100.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	50.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	50.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	50.00

tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	50.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	50.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	50.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	50.00
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	16
tblConstructionPhase	NumDays	35.00	30.00
tblConstructionPhase	NumDays	35.00	30.00
tblConstructionPhase	NumDays	35.00	30.00
tblConstructionPhase	NumDays	35.00	30.00
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tblConstructionPhase	NumDays	35.00	30.00
tblConstructionPhase	NumDays	500.00	132.00
tblConstructionPhase	NumDays	500.00	132.00
tblConstructionPhase	NumDays	500.00	132.00
tblConstructionPhase	NumDays	500.00	132.00
tblConstructionPhase	NumDays	500.00	132.00
tblConstructionPhase	NumDays	500.00	132.00
tblConstructionPhase	NumDays	500.00	132.00
tblConstructionPhase	NumDays	45.00	80.00
tblConstructionPhase	NumDays	35.00	50.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
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tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
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tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00

tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
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tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	2/5/2018	12/30/2017
tblConstructionPhase	PhaseEndDate	6/7/2018	4/28/2018
tblConstructionPhase	PhaseEndDate	10/6/2018	8/31/2018
tblConstructionPhase	PhaseEndDate	2/5/2019	12/29/2018
tblConstructionPhase	PhaseEndDate	12/19/2016	12/31/2016
tblConstructionPhase	PhaseEndDate	6/7/2017	4/29/2017
tblConstructionPhase	PhaseEndDate	10/6/2017	8/31/2017
tblConstructionPhase	PhaseEndDate	6/2/2018	5/3/2018
tblConstructionPhase	PhaseEndDate	9/29/2018	9/1/2018
tblConstructionPhase	PhaseEndDate	2/1/2019	1/1/2019
tblConstructionPhase	PhaseEndDate	2/17/2017	12/31/2016
tblConstructionPhase	PhaseEndDate	6/3/2017	5/3/2017
tblConstructionPhase	PhaseEndDate	9/30/2017	9/1/2017
tblConstructionPhase	PhaseEndDate	2/1/2018	1/1/2018
tblConstructionPhase	PhaseEndDate	2/28/2017	11/14/2016
tblConstructionPhase	PhaseStartDate	1/2/2018	11/27/2017
tblConstructionPhase	PhaseStartDate	5/4/2018	3/26/2018
tblConstructionPhase	PhaseStartDate	9/2/2018	7/28/2018
tblConstructionPhase	PhaseStartDate	1/2/2019	11/26/2018
tblConstructionPhase	PhaseStartDate	11/15/2016	11/28/2016
tblConstructionPhase	PhaseStartDate	5/4/2017	3/27/2017
tblConstructionPhase	PhaseStartDate	9/2/2017	7/28/2017
tblConstructionPhase	PhaseStartDate	12/31/2017	12/1/2017

tblConstructionPhase	PhaseStartDate	4/29/2018	4/1/2018
tblConstructionPhase	PhaseStartDate	9/1/2018	8/1/2018
tblConstructionPhase	PhaseStartDate	9/17/2016	8/1/2016
tblConstructionPhase	PhaseStartDate	1/1/2017	12/1/2016
tblConstructionPhase	PhaseStartDate	4/30/2017	4/1/2017
tblConstructionPhase	PhaseStartDate	9/1/2017	8/1/2017
tblConstructionPhase	PhaseStartDate	1/1/2017	9/17/2016
tblFireplaces	NumberGas	78.20	90.95
tblFireplaces	NumberGas	129.20	116.45
tblFireplaces	NumberNoFireplace	9.20	10.70
tblFireplaces	NumberNoFireplace	15.20	13.70
tblFireplaces	NumberWood	4.60	5.35
tblFireplaces	NumberWood	7.60	6.85
tblGrading	AcresOfGrading	200.00	0.00
tblLandUse	LandUseSquareFeet	11,380.00	11,376.00
tblLandUse	LandUseSquareFeet	3,380.00	3,375.00
tblLandUse	LandUseSquareFeet	92,000.00	161,581.00
tblLandUse	LandUseSquareFeet	273,600.00	319,230.00
tblLandUse	LotAcreage	3.19	0.00
tblLandUse	LotAcreage	0.12	0.00
tblLandUse	LotAcreage	0.26	0.00
tblLandUse	LotAcreage	0.08	0.00
tblLandUse	LotAcreage	5.75	0.00
tblLandUse	LotAcreage	49.35	33.00
tblLandUse	LotAcreage	0.84	0.00
tblLandUse	Population	263.00	161.00
tblLandUse	Population	435.00	266.00
tblOffRoadEquipment	HorsePower	89.00	125.00
tblOffRoadEquipment	HorsePower	89.00	125.00
tblOffRoadEquipment	HorsePower	89.00	125.00

tblOffRoadEquipment	HorsePower	89.00	125.00
tblOffRoadEquipment	HorsePower	89.00	125.00
tblOffRoadEquipment	HorsePower	89.00	125.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
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tblOffRoadEquipment	PhaseName		P7-BC
tblOffRoadEquipment	PhaseName		P8-BC
tblOffRoadEquipment	PhaseName		P2-BC
tblOffRoadEquipment	PhaseName		P3-BC
tblOffRoadEquipment	PhaseName		P4-BC
tblOffRoadEquipment	PhaseName		P5-BC
tblOffRoadEquipment	PhaseName		Grading
tblOffRoadEquipment	PhaseName		P6-BC
tblOffRoadEquipment	PhaseName		P7-BC
tblOffRoadEquipment	PhaseName		P8-BC
tblOffRoadEquipment	PhaseName		P2-BC
tblOffRoadEquipment	PhaseName		P3-BC
tblOffRoadEquipment	PhaseName		P4-BC
tblOffRoadEquipment	PhaseName		P5-BC
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tblOffRoadEquipment	UsageHours	6.00	3.00
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tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00

tblOffRoadEquipment	UsageHours	8.00	6.00
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tblOffRoadEquipment	UsageHours	7.00	4.00
tblOffRoadEquipment	UsageHours	7.00	4.00
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tblOffRoadEquipment	UsageHours	7.00	4.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblProjectCharacteristics	OperationalYear	2014	2019
tblSolidWaste	SolidWasteGenerationRate	42.32	49.22
tblSolidWaste	SolidWasteGenerationRate	109.06	98.40
tblTripsAndVMT	VendorTripLength	6.90	7.90
tblTripsAndVMT	VendorTripLength	6.90	7.90
tblTripsAndVMT	VendorTripLength	6.90	7.90
tblTripsAndVMT	VendorTripLength	6.90	7.90
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tblTripsAndVMT	VendorTripLength	6.90	7.90
tblTripsAndVMT	VendorTripLength	6.90	7.90
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tblTripsAndVMT	VendorTripLength	6.90	7.90
tblTripsAndVMT	VendorTripLength	6.90	7.90
tblTripsAndVMT	VendorTripLength	6.90	7.90
tblTripsAndVMT	VendorTripLength	6.90	7.90
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tblTripsAndVMT	VendorTripLength	6.90	7.90
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tblTripsAndVMT	VendorTripLength	6.90	7.90
tblTripsAndVMT	WorkerTripLength	14.70	19.80
tblTripsAndVMT	WorkerTripLength	14.70	19.80

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tblTripsAndVMT	WorkerTripLength	14.70	19.80
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tblTripsAndVMT	WorkerTripNumber	20.00	5.00
tblTripsAndVMT	WorkerTripNumber	40.00	41.00
tblTripsAndVMT	WorkerTripNumber	201.00	206.00
tblTripsAndVMT	WorkerTripNumber	40.00	41.00
tblTripsAndVMT	WorkerTripNumber	201.00	206.00
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tblTripsAndVMT	WorkerTripNumber	201.00	206.00
tblTripsAndVMT	WorkerTripNumber	40.00	41.00
tblTripsAndVMT	WorkerTripNumber	201.00	206.00
tblTripsAndVMT	WorkerTripNumber	40.00	41.00
tblTripsAndVMT	WorkerTripNumber	201.00	206.00
tblTripsAndVMT	WorkerTripNumber	40.00	41.00
tblTripsAndVMT	WorkerTripNumber	201.00	206.00
tblTripsAndVMT	WorkerTripNumber	40.00	41.00
tblTripsAndVMT	WorkerTripNumber	201.00	206.00
tblVehicleTrips	CC_TL	8.40	10.10

tblVehicleTrips	CC_TL	8.40	10.10
tblVehicleTrips	CC_TL	8.40	10.10
tblVehicleTrips	CC_TL	8.40	10.10
tblVehicleTrips	CC_TL	8.40	10.10
tblVehicleTrips	CNW_TL	6.90	7.90
tblVehicleTrips	CNW_TL	6.90	7.90
tblVehicleTrips	CNW_TL	6.90	7.90
tblVehicleTrips	CNW_TL	6.90	7.90
tblVehicleTrips	CNW_TL	6.90	7.90
tblVehicleTrips	CW_TL	16.60	18.50
tblVehicleTrips	CW_TL	16.60	18.50
tblVehicleTrips	CW_TL	16.60	18.50
tblVehicleTrips	CW_TL	16.60	18.50
tblVehicleTrips	CW_TL	16.60	18.50
tblVehicleTrips	HO_TL	8.70	12.90
tblVehicleTrips	HO_TL	8.70	12.90
tblVehicleTrips	HS_TL	5.90	9.60
tblVehicleTrips	HS_TL	5.90	9.60
tblVehicleTrips	HW_TL	14.70	19.80
tblVehicleTrips	HW_TL	14.70	19.80
tblWater	IndoorWaterUseRate	5,994,170.36	6,971,480.74
tblWater	IndoorWaterUseRate	9,903,411.89	8,926,101.51
tblWater	OutdoorWaterUseRate	3,778,933.49	4,395,063.95
tblWater	OutdoorWaterUseRate	6,243,455.32	5,627,324.87
tblWoodstoves	NumberCatalytic	4.60	5.35
tblWoodstoves	NumberCatalytic	7.60	6.85
tblWoodstoves	NumberNoncatalytic	4.60	5.35
tblWoodstoves	NumberNoncatalytic	7.60	6.85

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					
2016	141.8301	33.1196	57.3982	0.1317	9.6200	1.6838	10.6180	4.2726	1.5497	5.1913	0.0000	11,857.0753	11,857.0753	0.9041	0.0000	11,876.0606
2017	141.4380	30.0812	53.6449	0.1316	7.6627	1.1364	8.7991	2.0485	1.0606	3.1091	0.0000	11,514.8483	11,514.8483	0.8765	0.0000	11,533.2549
2018	140.9679	26.0585	50.1662	0.1316	7.6627	0.9550	8.6176	2.0485	0.8920	2.9405	0.0000	11,191.2585	11,191.2585	0.8537	0.0000	11,209.1856
2019	1.6002	10.7487	21.7456	0.0608	3.5228	0.3565	3.8793	0.9424	0.3287	1.2711	0.0000	5,043.5411	5,043.5411	0.3953	0.0000	5,051.8427
Total	**425.8363**	**100.0080**	**182.9548**	**0.4557**	**28.4683**	**4.1317**	**31.9141**	**9.3119**	**3.8310**	**12.5120**	**0.0000**	**39,606.7231**	**39,606.7231**	**3.0296**	**0.0000**	**39,670.3437**

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					
2016	141.8301	33.1196	57.3982	0.1317	6.6152	1.6838	7.8710	2.0682	1.5497	2.9869	0.0000	11,857.0753	11,857.0753	0.9041	0.0000	11,876.0606
2017	141.4380	30.0812	53.6449	0.1316	6.6155	1.1364	7.7518	1.7914	1.0606	2.8521	0.0000	11,514.8483	11,514.8483	0.8765	0.0000	11,533.2549
2018	140.9679	26.0585	50.1662	0.1316	6.6154	0.9550	7.5704	1.7914	0.8920	2.6834	0.0000	11,191.2585	11,191.2585	0.8537	0.0000	11,209.1856
2019	1.6002	10.7487	21.7456	0.0608	3.0421	0.3565	3.3986	0.8244	0.3287	1.1531	0.0000	5,043.5411	5,043.5411	0.3953	0.0000	5,051.8427
Total	**425.8363**	**100.0080**	**182.9548**	**0.4557**	**22.8882**	**4.1317**	**26.5917**	**6.4755**	**3.8310**	**9.6755**	**0.0000**	**39,606.7231**	**39,606.7231**	**3.0296**	**0.0000**	**39,670.3437**

	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**	**19.60**	**0.00**	**16.68**	**30.46**	**0.00**	**22.67**	**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	79.4258	1.8569	142.9170	0.1962		18.7498	18.7498		18.7468	18.7468	2,285.5281	4,428.3368	6,713.8649	6.8517	0.1551	6,905.8397
Energy	0.2668	2.3315	1.3466	0.0146		0.1844	0.1844		0.1844	0.1844		2,910.8052	2,910.8052	0.0558	0.0534	2,928.5199
Mobile	16.2350	37.0327	179.2074	0.5608	39.9225	0.5767	40.4992	10.6526	0.5321	11.1847		44,272.5063	44,272.5063	1.5889		44,305.8722
Total	**95.9276**	**41.2210**	**323.4711**	**0.7716**	**39.9225**	**19.5108**	**59.4333**	**10.6526**	**19.4633**	**30.1159**	**2,285.5281**	**51,611.6483**	**53,897.1764**	**8.4964**	**0.2085**	**54,140.2318**

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	79.4258	1.8569	142.9170	0.1962		18.7498	18.7498		18.7468	18.7468	2,285.5281	4,428.3368	6,713.8649	6.8517	0.1551	6,905.8397
Energy	0.2668	2.3315	1.3466	0.0146		0.1844	0.1844		0.1844	0.1844		2,910.8052	2,910.8052	0.0558	0.0534	2,928.5199
Mobile	16.2350	37.0327	179.2074	0.5608	39.9225	0.5767	40.4992	10.6526	0.5321	11.1847		44,272.5063	44,272.5063	1.5889		44,305.8722
Total	**95.9276**	**41.2210**	**323.4711**	**0.7716**	**39.9225**	**19.5108**	**59.4333**	**10.6526**	**19.4633**	**30.1159**	**2,285.5281**	**51,611.6483**	**53,897.1764**	**8.4964**	**0.2085**	**54,140.2318**

	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	Grading	Grading	6/16/2016	9/16/2016	6	80	
2	P2-BC	Building Construction	8/1/2016	12/31/2016	6	132	
3	Paving	Paving	9/17/2016	11/14/2016	6	50	
4	P2-AC	Architectural Coating	11/28/2016	12/31/2016	6	30	
5	P3-BC	Building Construction	12/1/2016	5/3/2017	6	132	
6	P3-AC	Architectural Coating	3/27/2017	4/29/2017	6	30	
7	P4-BC	Building Construction	4/1/2017	9/1/2017	6	132	
8	P4-AC	Architectural Coating	7/28/2017	8/31/2017	6	30	
9	P5-BC	Building Construction	8/1/2017	1/1/2018	6	132	
10	P5-AC	Architectural Coating	11/27/2017	12/30/2017	6	30	
11	P6-BC	Building Construction	12/1/2017	5/3/2018	6	132	
12	P6-AC	Architectural Coating	3/26/2018	4/28/2018	6	30	
13	P7-BC	Building Construction	4/1/2018	9/1/2018	6	132	
14	P7-AC	Architectural Coating	7/28/2018	8/31/2018	6	30	
15	P8-BC	Building Construction	8/1/2018	1/1/2019	6	132	
16	P8-AC	Architectural Coating	11/26/2018	12/29/2018	6	30	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 973,642; Residential Outdoor: 324,547; Non-Residential Indoor: 91,097; Non-Residential Outdoor: 30,366

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Off-Highway Trucks	1	6.00	400	0.38
Grading	Tractors/Loaders/Backhoes	1	6.00	150	0.37
P2-BC	Cement and Mortar Mixers	1	4.00	9	0.56
P2-BC	Forklifts	1	6.00	125	0.20
P2-BC	Off-Highway Trucks	1	2.00	250	0.38
P2-BC	Tractors/Loaders/Backhoes	2	4.00	150	0.37
Paving	Pavers	2	6.00	89	0.42
Paving	Paving Equipment	2	6.00	82	0.36
Paving	Rollers	2	6.00	84	0.38
P2-AC	Air Compressors	2	3.00	78	0.48
P3-BC	Cement and Mortar Mixers	1	4.00	9	0.56
P3-BC	Forklifts	1	6.00	125	0.20
P3-BC	Off-Highway Trucks	1	2.00	250	0.38
P3-BC	Tractors/Loaders/Backhoes	2	4.00	150	0.37
P3-AC	Air Compressors	2	3.00	78	0.48
P4-BC	Cement and Mortar Mixers	1	4.00	9	0.56
P4-BC	Forklifts	1	6.00	125	0.20
P4-BC	Off-Highway Trucks	1	2.00	250	0.38
P4-BC	Tractors/Loaders/Backhoes	2	4.00	150	0.37
P4-AC	Air Compressors	2	3.00	78	0.48
P5-BC	Cement and Mortar Mixers	1	4.00	9	0.56
P5-BC	Forklifts	1	6.00	125	0.20
P5-BC	Off-Highway Trucks	1	2.00	250	0.38
P5-BC	Tractors/Loaders/Backhoes	2	4.00	150	0.37
P5-AC	Air Compressors	2	3.00	78	0.48
P6-BC	Cement and Mortar Mixers	1	4.00	9	0.56
P6-BC	Forklifts	1	6.00	125	0.20
P6-BC	Off-Highway Trucks	1	2.00	250	0.38
P6-BC	Tractors/Loaders/Backhoes	2	4.00	150	0.37
P6-AC	Air Compressors	2	3.00	78	0.48

P7-BC	Cement and Mortar Mixers	1	4.00	9	0.56
P7-BC	Forklifts	1	6.00	125	0.20
P7-BC	Off-Highway Trucks	1	2.00	250	0.38
P7-BC	Tractors/Loaders/Backhoes	2	4.00	150	0.37
P7-AC	Air Compressors	2	3.00	78	0.48
P8-BC	Cement and Mortar Mixers	1	4.00	9	0.56
P8-BC	Forklifts	1	6.00	125	0.20
P8-BC	Off-Highway Trucks	1	2.00	250	0.38
P8-BC	Tractors/Loaders/Backhoes	2	4.00	150	0.37
P8-AC	Air Compressors	2	3.00	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
Grading	8	5.00	0.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
P2-BC	8	206.00	59.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
P2-AC	2	41.00	0.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
P3-BC	8	206.00	59.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
P3-AC	2	41.00	0.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
P4-BC	8	206.00	59.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
P4-AC	2	41.00	0.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
P5-BC	8	206.00	59.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
P5-AC	2	41.00	0.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
P6-BC	8	206.00	59.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
P6-AC	2	41.00	0.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
P7-BC	8	206.00	59.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
P7-AC	2	41.00	0.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
P8-BC	8	206.00	59.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
P8-AC	2	41.00	0.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Grading - 2016

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					6.0221	0.0000	6.0221	3.3102	0.0000	3.3102			0.0000			0.0000
Off-Road	0.9922	11.3541	6.1634	0.0134		0.4700	0.4700		0.4324	0.4324		1,394.1334	1,394.1334	0.4205		1,402.9643
Total	**0.9922**	**11.3541**	**6.1634**	**0.0134**	**6.0221**	**0.4700**	**6.4921**	**3.3102**	**0.4324**	**3.7426**		**1,394.1334**	**1,394.1334**	**0.4205**		**1,402.9643**

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	0.0193	0.0294	0.3600	9.1000e-004	0.0753	5.1000e-004	0.0758	0.0200	4.7000e-004	0.0204		76.0062	76.0062	3.5400e-003		76.0805

	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
Total	**0.0193**	**0.0294**	**0.3600**	**9.1000e-004**	**0.0753**	**5.1000e-004**	**0.0758**	**0.0200**	**4.7000e-004**	**0.0204**		**76.0062**	**76.0062**	**3.5400e-003**		**76.0805**

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					2.2312	0.0000	2.2312	1.2264	0.0000	1.2264			0.0000			0.0000
Off-Road	0.9922	11.3541	6.1634	0.0134		0.4700	0.4700		0.4324	0.4324	0.0000	1,394.1334	1,394.1334	0.4205		1,402.9643
Total	**0.9922**	**11.3541**	**6.1634**	**0.0134**	**2.2312**	**0.4700**	**2.7012**	**1.2264**	**0.4324**	**1.6589**	**0.0000**	**1,394.1334**	**1,394.1334**	**0.4205**		**1,402.9643**

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	0.0193	0.0294	0.3600	9.1000e-004	0.0648	5.1000e-004	0.0653	0.0174	4.7000e-004	0.0179		76.0062	76.0062	3.5400e-003		76.0805
Total	**0.0193**	**0.0294**	**0.3600**	**9.1000e-004**	**0.0648**	**5.1000e-004**	**0.0653**	**0.0174**	**4.7000e-004**	**0.0179**		**76.0062**	**76.0062**	**3.5400e-003**		**76.0805**

3.3 P2-BC - 2016

Unmitigated Construction On-Site

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					
Off-Road	0.7724	8.3697	5.2304	8.7300e-003		0.4143	0.4143		0.3817	0.3817		895.1312	895.1312	0.2650		900.6964
Total	**0.7724**	**8.3697**	**5.2304**	**8.7300e-003**		**0.4143**	**0.4143**		**0.3817**	**0.3817**		**895.1312**	**895.1312**	**0.2650**		**900.6964**

Unmitigated Construction Off-Site

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					
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	0.5409	5.6727	6.2168	0.0145	0.4219	0.0921	0.5140	0.1201	0.0847	0.2048		1,449.6016	1,449.6016	0.0101		1,449.8139
Worker	0.7958	1.2108	14.8338	0.0375	3.1008	0.0211	3.1219	0.8222	0.0195	0.8417		3,131.4554	3,131.4554	0.1458		3,134.5174
Total	**1.3367**	**6.8835**	**21.0506**	**0.0519**	**3.5227**	**0.1132**	**3.6359**	**0.9424**	**0.1041**	**1.0465**		**4,581.0570**	**4,581.0570**	**0.1559**		**4,584.3314**

Mitigated Construction On-Site

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					

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
Off-Road	0.7724	8.3697	5.2304	8.7300e-003		0.4143	0.4143		0.3817	0.3817	0.0000	895.1312	895.1312	0.2650		900.6964
Total	**0.7724**	**8.3697**	**5.2304**	**8.7300e-003**		**0.4143**	**0.4143**		**0.3817**	**0.3817**	**0.0000**	**895.1312**	**895.1312**	**0.2650**		**900.6964**

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	0.5409	5.6727	6.2168	0.0145	0.3726	0.0921	0.4647	0.1080	0.0847	0.1927		1,449.6016	1,449.6016	0.0101		1,449.8139
Worker	0.7958	1.2108	14.8338	0.0375	2.6693	0.0211	2.6905	0.7164	0.0195	0.7358		3,131.4554	3,131.4554	0.1458		3,134.5174
Total	**1.3367**	**6.8835**	**21.0506**	**0.0519**	**3.0420**	**0.1132**	**3.1552**	**0.8244**	**0.1041**	**0.9285**		**4,581.0570**	**4,581.0570**	**0.1559**		**4,584.3314**

3.4 Paving - 2016

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	1.6599	15.2013	9.8628	0.0127		1.1548	1.1548		1.0625	1.0625		1,324.0034	1,324.0034	0.3994		1,332.3901
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.6599**	**15.2013**	**9.8628**	**0.0127**		**1.1548**	**1.1548**		**1.0625**	**1.0625**		**1,324.0034**	**1,324.0034**	**0.3994**		**1,332.3901**

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	0.0580	0.0882	1.0801	2.7300e-003	0.2258	1.5400e-003	0.2273	0.0599	1.4200e-003	0.0613		228.0186	228.0186	0.0106		228.2416
Total	**0.0580**	**0.0882**	**1.0801**	**2.7300e-003**	**0.2258**	**1.5400e-003**	**0.2273**	**0.0599**	**1.4200e-003**	**0.0613**		**228.0186**	**228.0186**	**0.0106**		**228.2416**

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	1.6599	15.2013	9.8628	0.0127		1.1548	1.1548		1.0625	1.0625	0.0000	1,324.0034	1,324.0034	0.3994		1,332.3901
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.6599**	**15.2013**	**9.8628**	**0.0127**		**1.1548**	**1.1548**		**1.0625**	**1.0625**	**0.0000**	**1,324.0034**	**1,324.0034**	**0.3994**		**1,332.3901**

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	0.0580	0.0882	1.0801	2.7300e-003	0.1944	1.5400e-003	0.1959	0.0522	1.4200e-003	0.0536		228.0186	228.0186	0.0106		228.2416
Total	**0.0580**	**0.0882**	**1.0801**	**2.7300e-003**	**0.1944**	**1.5400e-003**	**0.1959**	**0.0522**	**1.4200e-003**	**0.0536**		**228.0186**	**228.0186**	**0.0106**		**228.2416**

3.5 P2-AC - 2016

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	137.0852					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3685	2.3722	1.8839	2.9700e-003		0.1966	0.1966		0.1966	0.1966		281.4481	281.4481	0.0332		282.1449
Total	**137.4536**	**2.3722**	**1.8839**	**2.9700e-003**		**0.1966**	**0.1966**		**0.1966**	**0.1966**		**281.4481**	**281.4481**	**0.0332**		**282.1449**

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	0.1584	0.2410	2.9524	7.4500e-003	0.6171	4.2100e-003	0.6213	0.1637	3.8700e-003	0.1675		623.2508	623.2508	0.0290		623.8603

Total	**0.1584**	**0.2410**	**2.9524**	**7.4500e-003**	**0.6171**	**4.2100e-003**	**0.6213**	**0.1637**	**3.8700e-003**	**0.1675**		**623.2508**	**623.2508**	**0.0290**		**623.8603**

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	137.0852					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3685	2.3722	1.8839	2.9700e-003		0.1966	0.1966		0.1966	0.1966	0.0000	281.4481	281.4481	0.0332		282.1449
Total	**137.4536**	**2.3722**	**1.8839**	**2.9700e-003**		**0.1966**	**0.1966**		**0.1966**	**0.1966**	**0.0000**	**281.4481**	**281.4481**	**0.0332**		**282.1449**

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	0.1584	0.2410	2.9524	7.4500e-003	0.5313	4.2100e-003	0.5355	0.1426	3.8700e-003	0.1465		623.2508	623.2508	0.0290		623.8603
Total	**0.1584**	**0.2410**	**2.9524**	**7.4500e-003**	**0.5313**	**4.2100e-003**	**0.5355**	**0.1426**	**3.8700e-003**	**0.1465**		**623.2508**	**623.2508**	**0.0290**		**623.8603**

3.6 P3-BC - 2016

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	0.7724	8.3697	5.2304	8.7300e-003		0.4143	0.4143		0.3817	0.3817		895.1312	895.1312	0.2650		900.6964
Total	**0.7724**	**8.3697**	**5.2304**	**8.7300e-003**		**0.4143**	**0.4143**		**0.3817**	**0.3817**		**895.1312**	**895.1312**	**0.2650**		**900.6964**

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	0.5409	5.6727	6.2168	0.0145	0.4219	0.0921	0.5140	0.1201	0.0847	0.2048		1,449.6016	1,449.6016	0.0101		1,449.8139
Worker	0.7958	1.2108	14.8338	0.0375	3.1008	0.0211	3.1219	0.8222	0.0195	0.8417		3,131.4554	3,131.4554	0.1458		3,134.5174
Total	**1.3367**	**6.8835**	**21.0506**	**0.0519**	**3.5227**	**0.1132**	**3.6359**	**0.9424**	**0.1041**	**1.0465**		**4,581.0570**	**4,581.0570**	**0.1559**		**4,584.3314**

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	0.7724	8.3697	5.2304	8.7300e-003		0.4143	0.4143		0.3817	0.3817	0.0000	895.1312	895.1312	0.2650		900.6964
Total	**0.7724**	**8.3697**	**5.2304**	**8.7300e-003**		**0.4143**	**0.4143**		**0.3817**	**0.3817**	**0.0000**	**895.1312**	**895.1312**	**0.2650**		**900.6964**

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	0.5409	5.6727	6.2168	0.0145	0.3726	0.0921	0.4647	0.1080	0.0847	0.1927		1,449.6016	1,449.6016	0.0101		1,449.8139
Worker	0.7958	1.2108	14.8338	0.0375	2.6693	0.0211	2.6905	0.7164	0.0195	0.7358		3,131.4554	3,131.4554	0.1458		3,134.5174
Total	**1.3367**	**6.8835**	**21.0506**	**0.0519**	**3.0420**	**0.1132**	**3.1552**	**0.8244**	**0.1041**	**0.9285**		**4,581.0570**	**4,581.0570**	**0.1559**		**4,584.3314**

3.6 P3-BC - 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	0.7183	7.5838	5.1619	8.7200e-003		0.3766	0.3766		0.3471	0.3471		880.7793	880.7793	0.2648		886.3391
Total	**0.7183**	**7.5838**	**5.1619**	**8.7200e-003**		**0.3766**	**0.3766**		**0.3471**	**0.3471**		**880.7793**	**880.7793**	**0.2648**		**886.3391**

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	0.4997	5.1550	5.8470	0.0144	0.4221	0.0822	0.5043	0.1202	0.0756	0.1958		1,426.0085	1,426.0085	9.7800e-003		1,426.2139
Worker	0.7206	1.0999	13.5328	0.0375	3.1008	0.0206	3.1214	0.8222	0.0191	0.8413		3,010.3397	3,010.3397	0.1354		3,013.1829
Total	**1.2203**	**6.2548**	**19.3798**	**0.0519**	**3.5228**	**0.1029**	**3.6257**	**0.9424**	**0.0947**	**1.0371**		**4,436.3482**	**4,436.3482**	**0.1452**		**4,439.3968**

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	0.7183	7.5838	5.1619	8.7200e-003		0.3766	0.3766		0.3471	0.3471	0.0000	880.7793	880.7793	0.2648		886.3391
Total	**0.7183**	**7.5838**	**5.1619**	**8.7200e-003**		**0.3766**	**0.3766**		**0.3471**	**0.3471**	**0.0000**	**880.7793**	**880.7793**	**0.2648**		**886.3391**

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	0.4997	5.1550	5.8470	0.0144	0.3728	0.0822	0.4550	0.1081	0.0756	0.1837		1,426.0085	1,426.0085	9.7800e-003		1,426.2139
Worker	0.7206	1.0999	13.5328	0.0375	2.6693	0.0206	2.6900	0.7164	0.0191	0.7354		3,010.3397	3,010.3397	0.1354		3,013.1829
Total	**1.2203**	**6.2548**	**19.3798**	**0.0519**	**3.0421**	**0.1029**	**3.1449**	**0.8244**	**0.0947**	**0.9191**		**4,436.3482**	**4,436.3482**	**0.1452**		**4,439.3968**

3.7 P3-AC - 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					
Archit. Coating	137.0852					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3323	2.1850	1.8681	2.9700e-003		0.1733	0.1733		0.1733	0.1733		281.4481	281.4481	0.0297		282.0721
Total	**137.4175**	**2.1850**	**1.8681**	**2.9700e-003**		**0.1733**	**0.1733**		**0.1733**	**0.1733**		**281.4481**	**281.4481**	**0.0297**		**282.0721**

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	0.1434	0.2189	2.6934	7.4500e-003	0.6171	4.1100e-003	0.6213	0.1637	3.7900e-003	0.1674		599.1453	599.1453	0.0270		599.7112

	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
Total	**0.1434**	**0.2189**	**2.6934**	**7.4500e-003**	**0.6171**	**4.1100e-003**	**0.6213**	**0.1637**	**3.7900e-003**	**0.1674**		**599.1453**	**599.1453**	**0.0270**		**599.7112**

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	137.0852					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3323	2.1850	1.8681	2.9700e-003		0.1733	0.1733		0.1733	0.1733	0.0000	281.4481	281.4481	0.0297		282.0721
Total	**137.4175**	**2.1850**	**1.8681**	**2.9700e-003**		**0.1733**	**0.1733**		**0.1733**	**0.1733**	**0.0000**	**281.4481**	**281.4481**	**0.0297**		**282.0721**

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	0.1434	0.2189	2.6934	7.4500e-003	0.5313	4.1100e-003	0.5354	0.1426	3.7900e-003	0.1464		599.1453	599.1453	0.0270		599.7112
Total	**0.1434**	**0.2189**	**2.6934**	**7.4500e-003**	**0.5313**	**4.1100e-003**	**0.5354**	**0.1426**	**3.7900e-003**	**0.1464**		**599.1453**	**599.1453**	**0.0270**		**599.7112**

3.8 P4-BC - 2017

Unmitigated Construction On-Site

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					
Off-Road	0.7183	7.5838	5.1619	8.7200e-003		0.3766	0.3766		0.3471	0.3471		880.7793	880.7793	0.2648		886.3391
Total	**0.7183**	**7.5838**	**5.1619**	**8.7200e-003**		**0.3766**	**0.3766**		**0.3471**	**0.3471**		**880.7793**	**880.7793**	**0.2648**		**886.3391**

Unmitigated Construction Off-Site

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					
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	0.4997	5.1550	5.8470	0.0144	0.4221	0.0822	0.5043	0.1202	0.0756	0.1958		1,426.0085	1,426.0085	9.7800e-003		1,426.2139
Worker	0.7206	1.0999	13.5328	0.0375	3.1008	0.0206	3.1214	0.8222	0.0191	0.8413		3,010.3397	3,010.3397	0.1354		3,013.1829
Total	**1.2203**	**6.2548**	**19.3798**	**0.0519**	**3.5228**	**0.1029**	**3.6257**	**0.9424**	**0.0947**	**1.0371**		**4,436.3482**	**4,436.3482**	**0.1452**		**4,439.3968**

Mitigated Construction On-Site

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					

	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
Off-Road	0.7183	7.5838	5.1619	8.7200e-003		0.3766	0.3766		0.3471	0.3471	0.0000	880.7793	880.7793	0.2648		886.3391
Total	**0.7183**	**7.5838**	**5.1619**	**8.7200e-003**		**0.3766**	**0.3766**		**0.3471**	**0.3471**	**0.0000**	**880.7793**	**880.7793**	**0.2648**		**886.3391**

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	0.4997	5.1550	5.8470	0.0144	0.3728	0.0822	0.4550	0.1081	0.0756	0.1837		1,426.0085	1,426.0085	9.7800e-003		1,426.2139
Worker	0.7206	1.0999	13.5328	0.0375	2.6693	0.0206	2.6900	0.7164	0.0191	0.7354		3,010.3397	3,010.3397	0.1354		3,013.1829
Total	**1.2203**	**6.2548**	**19.3798**	**0.0519**	**3.0421**	**0.1029**	**3.1449**	**0.8244**	**0.0947**	**0.9191**		**4,436.3482**	**4,436.3482**	**0.1452**		**4,439.3968**

3.9 P4-AC - 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					
Archit. Coating	137.0852					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3323	2.1850	1.8681	2.9700e-003		0.1733	0.1733		0.1733	0.1733		281.4481	281.4481	0.0297		282.0721
Total	**137.4175**	**2.1850**	**1.8681**	**2.9700e-003**		**0.1733**	**0.1733**		**0.1733**	**0.1733**		**281.4481**	**281.4481**	**0.0297**		**282.0721**

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	0.1434	0.2189	2.6934	7.4500e-003	0.6171	4.1100e-003	0.6213	0.1637	3.7900e-003	0.1674		599.1453	599.1453	0.0270		599.7112
Total	**0.1434**	**0.2189**	**2.6934**	**7.4500e-003**	**0.6171**	**4.1100e-003**	**0.6213**	**0.1637**	**3.7900e-003**	**0.1674**		**599.1453**	**599.1453**	**0.0270**		**599.7112**

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	137.0852					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3323	2.1850	1.8681	2.9700e-003		0.1733	0.1733		0.1733	0.1733	0.0000	281.4481	281.4481	0.0297		282.0721
Total	**137.4175**	**2.1850**	**1.8681**	**2.9700e-003**		**0.1733**	**0.1733**		**0.1733**	**0.1733**	**0.0000**	**281.4481**	**281.4481**	**0.0297**		**282.0721**

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	0.1434	0.2189	2.6934	7.4500e-003	0.5313	4.1100e-003	0.5354	0.1426	3.7900e-003	0.1464		599.1453	599.1453	0.0270		599.7112
Total	**0.1434**	**0.2189**	**2.6934**	**7.4500e-003**	**0.5313**	**4.1100e-003**	**0.5354**	**0.1426**	**3.7900e-003**	**0.1464**		**599.1453**	**599.1453**	**0.0270**		**599.7112**

3.10 P5-BC - 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	0.7183	7.5838	5.1619	8.7200e-003		0.3766	0.3766		0.3471	0.3471		880.7793	880.7793	0.2648		886.3391
Total	**0.7183**	**7.5838**	**5.1619**	**8.7200e-003**		**0.3766**	**0.3766**		**0.3471**	**0.3471**		**880.7793**	**880.7793**	**0.2648**		**886.3391**

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	0.4997	5.1550	5.8470	0.0144	0.4221	0.0822	0.5043	0.1202	0.0756	0.1958		1,426.0085	1,426.0085	9.7800e-003		1,426.2139
Worker	0.7206	1.0999	13.5328	0.0375	3.1008	0.0206	3.1214	0.8222	0.0191	0.8413		3,010.3397	3,010.3397	0.1354		3,013.1829

Total	**1.2203**	**6.2548**	**19.3798**	**0.0519**	**3.5228**	**0.1029**	**3.6257**	**0.9424**	**0.0947**	**1.0371**		**4,436.3482**	**4,436.3482**	**0.1452**		**4,439.3968**

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	0.7183	7.5838	5.1619	8.7200e-003		0.3766	0.3766		0.3471	0.3471	0.0000	880.7793	880.7793	0.2648		886.3391
Total	**0.7183**	**7.5838**	**5.1619**	**8.7200e-003**		**0.3766**	**0.3766**		**0.3471**	**0.3471**	**0.0000**	**880.7793**	**880.7793**	**0.2648**		**886.3391**

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	0.4997	5.1550	5.8470	0.0144	0.3728	0.0822	0.4550	0.1081	0.0756	0.1837		1,426.0085	1,426.0085	9.7800e-003		1,426.2139
Worker	0.7206	1.0999	13.5328	0.0375	2.6693	0.0206	2.6900	0.7164	0.0191	0.7354		3,010.3397	3,010.3397	0.1354		3,013.1829
Total	**1.2203**	**6.2548**	**19.3798**	**0.0519**	**3.0421**	**0.1029**	**3.1449**	**0.8244**	**0.0947**	**0.9191**		**4,436.3482**	**4,436.3482**	**0.1452**		**4,439.3968**

3.10 P5-BC - 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	0.6041	6.1955	4.9749	8.7200e-003		0.3023	0.3023		0.2787	0.2787		867.2143	867.2143	0.2647		872.7737
Total	**0.6041**	**6.1955**	**4.9749**	**8.7200e-003**		**0.3023**	**0.3023**		**0.2787**	**0.2787**		**867.2143**	**867.2143**	**0.2647**		**872.7737**

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	0.4687	4.7269	5.5513	0.0144	0.4220	0.0775	0.4995	0.1202	0.0713	0.1914		1,401.7982	1,401.7982	9.7200e-003		1,402.0024
Worker	0.6541	1.0040	12.3962	0.0374	3.1008	0.0204	3.1211	0.8222	0.0189	0.8411		2,897.5446	2,897.5446	0.1264		2,900.1996
Total	**1.1229**	**5.7310**	**17.9475**	**0.0519**	**3.5228**	**0.0979**	**3.6206**	**0.9424**	**0.0901**	**1.0325**		**4,299.3428**	**4,299.3428**	**0.1362**		**4,302.2019**

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					

	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
Off-Road	0.6041	6.1955	4.9749	8.7200e-003		0.3023	0.3023		0.2787	0.2787	0.0000	867.2143	867.2143	0.2647		872.7737
Total	**0.6041**	**6.1955**	**4.9749**	**8.7200e-003**		**0.3023**	**0.3023**		**0.2787**	**0.2787**	**0.0000**	**867.2143**	**867.2143**	**0.2647**		**872.7737**

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	0.4687	4.7269	5.5513	0.0144	0.3727	0.0775	0.4502	0.1081	0.0713	0.1793		1,401.7982	1,401.7982	9.7200e-003		1,402.0024
Worker	0.6541	1.0040	12.3962	0.0374	2.6693	0.0204	2.6897	0.7164	0.0189	0.7352		2,897.5446	2,897.5446	0.1264		2,900.1996
Total	**1.1229**	**5.7310**	**17.9475**	**0.0519**	**3.0421**	**0.0979**	**3.1399**	**0.8244**	**0.0901**	**0.9146**		**4,299.3428**	**4,299.3428**	**0.1362**		**4,302.2019**

3.11 P5-AC - 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					
Archit. Coating	137.0852					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3323	2.1850	1.8681	2.9700e-003		0.1733	0.1733		0.1733	0.1733		281.4481	281.4481	0.0297		282.0721
Total	**137.4175**	**2.1850**	**1.8681**	**2.9700e-003**		**0.1733**	**0.1733**		**0.1733**	**0.1733**		**281.4481**	**281.4481**	**0.0297**		**282.0721**

Unmitigated Construction Off-Site

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					
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	0.1434	0.2189	2.6934	7.4500e-003	0.6171	4.1100e-003	0.6213	0.1637	3.7900e-003	0.1674		599.1453	599.1453	0.0270		599.7112
Total	**0.1434**	**0.2189**	**2.6934**	**7.4500e-003**	**0.6171**	**4.1100e-003**	**0.6213**	**0.1637**	**3.7900e-003**	**0.1674**		**599.1453**	**599.1453**	**0.0270**		**599.7112**

Mitigated Construction On-Site

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					
Archit. Coating	137.0852					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3323	2.1850	1.8681	2.9700e-003		0.1733	0.1733		0.1733	0.1733	0.0000	281.4481	281.4481	0.0297		282.0721
Total	**137.4175**	**2.1850**	**1.8681**	**2.9700e-003**		**0.1733**	**0.1733**		**0.1733**	**0.1733**	**0.0000**	**281.4481**	**281.4481**	**0.0297**		**282.0721**

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	0.1434	0.2189	2.6934	7.4500e-003	0.5313	4.1100e-003	0.5354	0.1426	3.7900e-003	0.1464		599.1453	599.1453	0.0270		599.7112
Total	**0.1434**	**0.2189**	**2.6934**	**7.4500e-003**	**0.5313**	**4.1100e-003**	**0.5354**	**0.1426**	**3.7900e-003**	**0.1464**		**599.1453**	**599.1453**	**0.0270**		**599.7112**

3.12 P6-BC - 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	0.7183	7.5838	5.1619	8.7200e-003		0.3766	0.3766		0.3471	0.3471		880.7793	880.7793	0.2648		886.3391
Total	**0.7183**	**7.5838**	**5.1619**	**8.7200e-003**		**0.3766**	**0.3766**		**0.3471**	**0.3471**		**880.7793**	**880.7793**	**0.2648**		**886.3391**

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	0.4997	5.1550	5.8470	0.0144	0.4221	0.0822	0.5043	0.1202	0.0756	0.1958		1,426.0085	1,426.0085	9.7800e-003		1,426.2139
Worker	0.7206	1.0999	13.5328	0.0375	3.1008	0.0206	3.1214	0.8222	0.0191	0.8413		3,010.3397	3,010.3397	0.1354		3,013.1829

Total	**1.2203**	**6.2548**	**19.3798**	**0.0519**	**3.5228**	**0.1029**	**3.6257**	**0.9424**	**0.0947**	**1.0371**		**4,436.3482**	**4,436.3482**	**0.1452**		**4,439.3968**

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	0.7183	7.5838	5.1619	8.7200e-003		0.3766	0.3766		0.3471	0.3471	0.0000	880.7793	880.7793	0.2648		886.3391
Total	**0.7183**	**7.5838**	**5.1619**	**8.7200e-003**		**0.3766**	**0.3766**		**0.3471**	**0.3471**	**0.0000**	**880.7793**	**880.7793**	**0.2648**		**886.3391**

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	0.4997	5.1550	5.8470	0.0144	0.3728	0.0822	0.4550	0.1081	0.0756	0.1837		1,426.0085	1,426.0085	9.7800e-003		1,426.2139
Worker	0.7206	1.0999	13.5328	0.0375	2.6693	0.0206	2.6900	0.7164	0.0191	0.7354		3,010.3397	3,010.3397	0.1354		3,013.1829
Total	**1.2203**	**6.2548**	**19.3798**	**0.0519**	**3.0421**	**0.1029**	**3.1449**	**0.8244**	**0.0947**	**0.9191**		**4,436.3482**	**4,436.3482**	**0.1452**		**4,439.3968**

3.12 P6-BC - 2018

Unmitigated Construction On-Site

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					
Off-Road	0.6041	6.1955	4.9749	8.7200e-003		0.3023	0.3023		0.2787	0.2787		867.2143	867.2143	0.2647		872.7737
Total	**0.6041**	**6.1955**	**4.9749**	**8.7200e-003**		**0.3023**	**0.3023**		**0.2787**	**0.2787**		**867.2143**	**867.2143**	**0.2647**		**872.7737**

Unmitigated Construction Off-Site

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					
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	0.4687	4.7269	5.5513	0.0144	0.4220	0.0775	0.4995	0.1202	0.0713	0.1914		1,401.7982	1,401.7982	9.7200e-003		1,402.0024
Worker	0.6541	1.0040	12.3962	0.0374	3.1008	0.0204	3.1211	0.8222	0.0189	0.8411		2,897.5446	2,897.5446	0.1264		2,900.1996
Total	**1.1229**	**5.7310**	**17.9475**	**0.0519**	**3.5228**	**0.0979**	**3.6206**	**0.9424**	**0.0901**	**1.0325**		**4,299.3428**	**4,299.3428**	**0.1362**		**4,302.2019**

Mitigated Construction On-Site

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					

	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
Off-Road	0.6041	6.1955	4.9749	8.7200e-003		0.3023	0.3023		0.2787	0.2787	0.0000	867.2143	867.2143	0.2647		872.7737
Total	**0.6041**	**6.1955**	**4.9749**	**8.7200e-003**		**0.3023**	**0.3023**		**0.2787**	**0.2787**	**0.0000**	**867.2143**	**867.2143**	**0.2647**		**872.7737**

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	0.4687	4.7269	5.5513	0.0144	0.3727	0.0775	0.4502	0.1081	0.0713	0.1793		1,401.7982	1,401.7982	9.7200e-003		1,402.0024
Worker	0.6541	1.0040	12.3962	0.0374	2.6693	0.0204	2.6897	0.7164	0.0189	0.7352		2,897.5446	2,897.5446	0.1264		2,900.1996
Total	**1.1229**	**5.7310**	**17.9475**	**0.0519**	**3.0421**	**0.0979**	**3.1399**	**0.8244**	**0.0901**	**0.9146**		**4,299.3428**	**4,299.3428**	**0.1362**		**4,302.2019**

3.13 P6-AC - 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	137.0852					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	**137.3838**	**2.0058**	**1.8542**	**2.9700e-003**		**0.1506**	**0.1506**		**0.1506**	**0.1506**		**281.4485**	**281.4485**	**0.0267**		**282.0102**

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	0.1302	0.1998	2.4672	7.4500e-003	0.6171	4.0600e-003	0.6212	0.1637	3.7600e-003	0.1674		576.6958	576.6958	0.0252		577.2242
Total	**0.1302**	**0.1998**	**2.4672**	**7.4500e-003**	**0.6171**	**4.0600e-003**	**0.6212**	**0.1637**	**3.7600e-003**	**0.1674**		**576.6958**	**576.6958**	**0.0252**		**577.2242**

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	137.0852					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	0.0000	281.4485	281.4485	0.0267		282.0102
Total	**137.3838**	**2.0058**	**1.8542**	**2.9700e-003**		**0.1506**	**0.1506**		**0.1506**	**0.1506**	**0.0000**	**281.4485**	**281.4485**	**0.0267**		**282.0102**

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	0.1302	0.1998	2.4672	7.4500e-003	0.5313	4.0600e-003	0.5353	0.1426	3.7600e-003	0.1463		576.6958	576.6958	0.0252		577.2242
Total	**0.1302**	**0.1998**	**2.4672**	**7.4500e-003**	**0.5313**	**4.0600e-003**	**0.5353**	**0.1426**	**3.7600e-003**	**0.1463**		**576.6958**	**576.6958**	**0.0252**		**577.2242**

3.14 P7-BC - 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	0.6041	6.1955	4.9749	8.7200e-003		0.3023	0.3023		0.2787	0.2787		867.2143	867.2143	0.2647		872.7737
Total	**0.6041**	**6.1955**	**4.9749**	**8.7200e-003**		**0.3023**	**0.3023**		**0.2787**	**0.2787**		**867.2143**	**867.2143**	**0.2647**		**872.7737**

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	0.4687	4.7269	5.5513	0.0144	0.4220	0.0775	0.4995	0.1202	0.0713	0.1914		1,401.7982	1,401.7982	9.7200e-003		1,402.0024
Worker	0.6541	1.0040	12.3962	0.0374	3.1008	0.0204	3.1211	0.8222	0.0189	0.8411		2,897.5446	2,897.5446	0.1264		2,900.1996

Total	**1.1229**	**5.7310**	**17.9475**	**0.0519**	**3.5228**	**0.0979**	**3.6206**	**0.9424**	**0.0901**	**1.0325**		**4,299.3428**	**4,299.3428**	**0.1362**		**4,302.2019**

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	0.6041	6.1955	4.9749	8.7200e-003		0.3023	0.3023		0.2787	0.2787	0.0000	867.2143	867.2143	0.2647		872.7737
Total	**0.6041**	**6.1955**	**4.9749**	**8.7200e-003**		**0.3023**	**0.3023**		**0.2787**	**0.2787**	**0.0000**	**867.2143**	**867.2143**	**0.2647**		**872.7737**

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	0.4687	4.7269	5.5513	0.0144	0.3727	0.0775	0.4502	0.1081	0.0713	0.1793		1,401.7982	1,401.7982	9.7200e-003		1,402.0024
Worker	0.6541	1.0040	12.3962	0.0374	2.6693	0.0204	2.6897	0.7164	0.0189	0.7352		2,897.5446	2,897.5446	0.1264		2,900.1996
Total	**1.1229**	**5.7310**	**17.9475**	**0.0519**	**3.0421**	**0.0979**	**3.1399**	**0.8244**	**0.0901**	**0.9146**		**4,299.3428**	**4,299.3428**	**0.1362**		**4,302.2019**

3.15 P7-AC - 2018

Unmitigated Construction On-Site

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					
Archit. Coating	137.0852					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	**137.3838**	**2.0058**	**1.8542**	**2.9700e-003**		**0.1506**	**0.1506**		**0.1506**	**0.1506**		**281.4485**	**281.4485**	**0.0267**		**282.0102**

Unmitigated Construction Off-Site

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					
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	0.1302	0.1998	2.4672	7.4500e-003	0.6171	4.0600e-003	0.6212	0.1637	3.7600e-003	0.1674		576.6958	576.6958	0.0252		577.2242
Total	**0.1302**	**0.1998**	**2.4672**	**7.4500e-003**	**0.6171**	**4.0600e-003**	**0.6212**	**0.1637**	**3.7600e-003**	**0.1674**		**576.6958**	**576.6958**	**0.0252**		**577.2242**

Mitigated Construction On-Site

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					

Archit. Coating	137.0852					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	0.0000	281.4485	281.4485	0.0267		282.0102
Total	**137.3838**	**2.0058**	**1.8542**	**2.9700e-003**		**0.1506**	**0.1506**		**0.1506**	**0.1506**	**0.0000**	**281.4485**	**281.4485**	**0.0267**		**282.0102**

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	0.1302	0.1998	2.4672	7.4500e-003	0.5313	4.0600e-003	0.5353	0.1426	3.7600e-003	0.1463		576.6958	576.6958	0.0252		577.2242
Total	**0.1302**	**0.1998**	**2.4672**	**7.4500e-003**	**0.5313**	**4.0600e-003**	**0.5353**	**0.1426**	**3.7600e-003**	**0.1463**		**576.6958**	**576.6958**	**0.0252**		**577.2242**

3.16 P8-BC - 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	0.6041	6.1955	4.9749	8.7200e-003		0.3023	0.3023		0.2787	0.2787		867.2143	867.2143	0.2647		872.7737
Total	**0.6041**	**6.1955**	**4.9749**	**8.7200e-003**		**0.3023**	**0.3023**		**0.2787**	**0.2787**		**867.2143**	**867.2143**	**0.2647**		**872.7737**

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	0.4687	4.7269	5.5513	0.0144	0.4220	0.0775	0.4995	0.1202	0.0713	0.1914		1,401.7982	1,401.7982	9.7200e-003		1,402.0024
Worker	0.6541	1.0040	12.3962	0.0374	3.1008	0.0204	3.1211	0.8222	0.0189	0.8411		2,897.5446	2,897.5446	0.1264		2,900.1996
Total	**1.1229**	**5.7310**	**17.9475**	**0.0519**	**3.5228**	**0.0979**	**3.6206**	**0.9424**	**0.0901**	**1.0325**		**4,299.3428**	**4,299.3428**	**0.1362**		**4,302.2019**

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	0.6041	6.1955	4.9749	8.7200e-003		0.3023	0.3023		0.2787	0.2787	0.0000	867.2143	867.2143	0.2647		872.7737
Total	**0.6041**	**6.1955**	**4.9749**	**8.7200e-003**		**0.3023**	**0.3023**		**0.2787**	**0.2787**	**0.0000**	**867.2143**	**867.2143**	**0.2647**		**872.7737**

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	0.4687	4.7269	5.5513	0.0144	0.3727	0.0775	0.4502	0.1081	0.0713	0.1793		1,401.7982	1,401.7982	9.7200e-003		1,402.0024
Worker	0.6541	1.0040	12.3962	0.0374	2.6693	0.0204	2.6897	0.7164	0.0189	0.7352		2,897.5446	2,897.5446	0.1264		2,900.1996
Total	**1.1229**	**5.7310**	**17.9475**	**0.0519**	**3.0421**	**0.0979**	**3.1399**	**0.8244**	**0.0901**	**0.9146**		**4,299.3428**	**4,299.3428**	**0.1362**		**4,302.2019**

3.16 P8-BC - 2019

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	0.5491	5.4376	4.9091	8.7200e-003		0.2637	0.2637		0.2432	0.2432		853.7912	853.7912	0.2648		859.3512
Total	**0.5491**	**5.4376**	**4.9091**	**8.7200e-003**		**0.2637**	**0.2637**		**0.2432**	**0.2432**		**853.7912**	**853.7912**	**0.2648**		**859.3512**

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	0.4409	4.3800	5.2587	0.0144	0.4221	0.0723	0.4943	0.1202	0.0665	0.1867		1,382.3527	1,382.3527	9.7800e-003		1,382.5581
Worker	0.6102	0.9311	11.5779	0.0376	3.1008	0.0205	3.1213	0.8222	0.0190	0.8413		2,807.3972	2,807.3972	0.1208		2,809.9333

Total	**1.0511**	**5.3111**	**16.8366**	**0.0521**	**3.5228**	**0.0928**	**3.6156**	**0.9424**	**0.0855**	**1.0280**		**4,189.7499**	**4,189.7499**	**0.1306**		**4,192.4915**

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	0.5491	5.4376	4.9091	8.7200e-003		0.2637	0.2637		0.2432	0.2432	0.0000	853.7912	853.7912	0.2648		859.3512
Total	**0.5491**	**5.4376**	**4.9091**	**8.7200e-003**		**0.2637**	**0.2637**		**0.2432**	**0.2432**	**0.0000**	**853.7912**	**853.7912**	**0.2648**		**859.3512**

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	0.4409	4.3800	5.2587	0.0144	0.3728	0.0723	0.4451	0.1081	0.0665	0.1746		1,382.3527	1,382.3527	9.7800e-003		1,382.5581
Worker	0.6102	0.9311	11.5779	0.0376	2.6693	0.0205	2.6899	0.7164	0.0190	0.7354		2,807.3972	2,807.3972	0.1208		2,809.9333
Total	**1.0511**	**5.3111**	**16.8366**	**0.0521**	**3.0421**	**0.0928**	**3.1349**	**0.8244**	**0.0855**	**0.9100**		**4,189.7499**	**4,189.7499**	**0.1306**		**4,192.4915**

3.17 P8-AC - 2018

Unmitigated Construction On-Site

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					
Archit. Coating	137.0852					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	**137.3838**	**2.0058**	**1.8542**	**2.9700e-003**		**0.1506**	**0.1506**		**0.1506**	**0.1506**		**281.4485**	**281.4485**	**0.0267**		**282.0102**

Unmitigated Construction Off-Site

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					
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	0.1302	0.1998	2.4672	7.4500e-003	0.6171	4.0600e-003	0.6212	0.1637	3.7600e-003	0.1674		576.6958	576.6958	0.0252		577.2242
Total	**0.1302**	**0.1998**	**2.4672**	**7.4500e-003**	**0.6171**	**4.0600e-003**	**0.6212**	**0.1637**	**3.7600e-003**	**0.1674**		**576.6958**	**576.6958**	**0.0252**		**577.2242**

Mitigated Construction On-Site

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					

	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
Archit. Coating	137.0852					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	0.0000	281.4485	281.4485	0.0267		282.0102
Total	**137.3838**	**2.0058**	**1.8542**	**2.9700e-003**		**0.1506**	**0.1506**		**0.1506**	**0.1506**	**0.0000**	**281.4485**	**281.4485**	**0.0267**		**282.0102**

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	0.1302	0.1998	2.4672	7.4500e-003	0.5313	4.0600e-003	0.5353	0.1426	3.7600e-003	0.1463		576.6958	576.6958	0.0252		577.2242
Total	**0.1302**	**0.1998**	**2.4672**	**7.4500e-003**	**0.5313**	**4.0600e-003**	**0.5353**	**0.1426**	**3.7600e-003**	**0.1463**		**576.6958**	**576.6958**	**0.0252**		**577.2242**

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	16.2350	37.0327	179.2074	0.5608	39.9225	0.5767	40.4992	10.6526	0.5321	11.1847		44,272.5063	44,272.5063	1.5889		44,305.8722
Unmitigated	16.2350	37.0327	179.2074	0.5608	39.9225	0.5767	40.4992	10.6526	0.5321	11.1847		44,272.5063	44,272.5063	1.5889		44,305.8722

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Condo/Townhouse	606.28	658.72	558.44	2,949,610	2,949,610
Health Club	171.89	108.94	139.53	395,470	395,470
High Turnover (Sit Down Restaurant)	1,446.97	1,802.25	1500.34	2,416,070	2,416,070
Parking Lot	0.00	0.00	0.00		
Recreational Swimming Pool	111.30	70.54	90.35	287,225	287,225
Regional Shopping Center	1,567.31	1,823.91	921.26	3,821,826	3,821,826
Single Family Housing	1,454.64	1,532.16	1333.04	7,038,698	7,038,698
Total	5,358.40	5,996.52	4,542.96	16,908,899	16,908,899

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
Condo/Townhouse	19.80	9.60	12.90	40.20	19.20	40.60	86	11	3
Health Club	18.50	10.10	7.90	16.90	64.10	19.00	52	39	9
High Turnover (Sit Down Restaurant)	18.50	10.10	7.90	8.50	72.50	19.00	37	20	43
Parking Lot	18.50	10.10	7.90	0.00	0.00	0.00	0	0	0
Recreational Swimming Pool	18.50	10.10	7.90	33.00	48.00	19.00	52	39	9
Regional Shopping Center	18.50	10.10	7.90	16.30	64.70	19.00	54	35	11
Single Family Housing	19.80	9.60	12.90	40.20	19.20	40.60	86	11	3

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.509471	0.056616	0.192725	0.151095	0.041772	0.005913	0.015766	0.015535	0.001447	0.002155	0.004735	0.000502	0.002269

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	lb/day										lb/day					
NaturalGas Mitigated	0.2668	2.3315	1.3466	0.0146		0.1844	0.1844		0.1844	0.1844		2,910.8052	2,910.8052	0.0558	0.0534	2,928.5199
NaturalGas Unmitigated	0.2668	2.3315	1.3466	0.0146		0.1844	0.1844		0.1844	0.1844		2,910.8052	2,910.8052	0.0558	0.0534	2,928.5199

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					
Condo/Townhouse	3988.81	0.0430	0.3676	0.1564	2.3500e-003		0.0297	0.0297		0.0297	0.0297		469.2718	469.2718	8.9900e-003	8.6000e-003	472.1277
Health Club	309.482	3.3400e-003	0.0303	0.0255	1.8000e-004		2.3100e-003	2.3100e-003		2.3100e-003	2.3100e-003		36.4096	36.4096	7.0000e-004	6.7000e-004	36.6312
High Turnover (Sit Down Restaurant)	8210.36	0.0885	0.8049	0.6762	4.8300e-003		0.0612	0.0612		0.0612	0.0612		965.9242	965.9242	0.0185	0.0177	971.8026
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
Recreational Swimming Pool	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
Regional Shopping Center	205	2.2100e-003	0.0201	0.0169	1.2000e-004		1.5300e-003	1.5300e-003		1.5300e-003	1.5300e-003		24.1177	24.1177	4.6000e-004	4.4000e-004	24.2644
Single Family Housing	12028.2	0.1297	1.1085	0.4717	7.0800e-003		0.0896	0.0896		0.0896	0.0896		1,415.0820	1,415.0820	0.0271	0.0259	1,423.6940
Total		**0.2668**	**2.3315**	**1.3466**	**0.0146**		**0.1844**	**0.1844**		**0.1844**	**0.1844**		**2,910.8052**	**2,910.8052**	**0.0558**	**0.0534**	**2,928.5199**

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					
Health Club	0.309482	3.3400e-003	0.0303	0.0255	1.8000e-004		2.3100e-003	2.3100e-003		2.3100e-003	2.3100e-003		36.4096	36.4096	7.0000e-004	6.7000e-004	36.6312
High Turnover (Sit Down Restaurant)	8.21036	0.0885	0.8049	0.6762	4.8300e-003		0.0612	0.0612		0.0612	0.0612		965.9242	965.9242	0.0185	0.0177	971.8026
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
Recreational Swimming Pool	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
Regional Shopping Center	0.205	2.2100e-003	0.0201	0.0169	1.2000e-004		1.5300e-003	1.5300e-003		1.5300e-003	1.5300e-003		24.1177	24.1177	4.6000e-004	4.4000e-004	24.2644
Single Family Housing	12.0282	0.1297	1.1085	0.4717	7.0800e-003		0.0896	0.0896		0.0896	0.0896		1,415.0820	1,415.0820	0.0271	0.0259	1,423.6940
Condo/Townhouse	3.98881	0.0430	0.3676	0.1564	2.3500e-003		0.0297	0.0297		0.0297	0.0297		469.2718	469.2718	8.9900e-003	8.6000e-003	472.1277
Total		**0.2668**	**2.3315**	**1.3466**	**0.0146**		**0.1844**	**0.1844**		**0.1844**	**0.1844**		**2,910.8052**	**2,910.8052**	**0.0558**	**0.0534**	**2,928.5199**

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	79.4258	1.8569	142.9170	0.1962		18.7498	18.7498		18.7468	18.7468	2,285.5281	4,428.3368	6,713.8649	6.8517	0.1551	6,905.8397
Unmitigated	79.4258	1.8569	142.9170	0.1962		18.7498	18.7498		18.7468	18.7468	2,285.5281	4,428.3368	6,713.8649	6.8517	0.1551	6,905.8397

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	1.4159					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	13.4498					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	63.9368	1.6222	122.6446	0.1951		18.6388	18.6388		18.6358	18.6358	2,285.5281	4,392.0000	6,677.5281	6.8159	0.1551	6,868.7506
Landscaping	0.6233	0.2347	20.2724	1.0700e-003		0.1110	0.1110		0.1110	0.1110		36.3368	36.3368	0.0358		37.0891
Total	**79.4258**	**1.8569**	**142.9170**	**0.1962**		**18.7498**	**18.7498**		**18.7468**	**18.7468**	**2,285.5281**	**4,428.3368**	**6,713.8649**	**6.8517**	**0.1551**	**6,905.8397**

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	1.4159					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	13.4498					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	63.9368	1.6222	122.6446	0.1951		18.6388	18.6388		18.6358	18.6358	2,285.5281	4,392.0000	6,677.5281	6.8159	0.1551	6,868.7506
Landscaping	0.6233	0.2347	20.2724	1.0700e-003		0.1110	0.1110		0.1110	0.1110		36.3368	36.3368	0.0358		37.0891
Total	**79.4258**	**1.8569**	**142.9170**	**0.1962**		**18.7498**	**18.7498**		**18.7468**	**18.7468**	**2,285.5281**	**4,428.3368**	**6,713.8649**	**6.8517**	**0.1551**	**6,905.8397**

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

Construction - Non-Tiered Engine Equipment - Winter

Orange County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	355.00	Space	0.00	142,000.00	0
Health Club	5.22	1000sqft	0.00	5,220.00	0
High Turnover (Sit Down Restaurant)	11.38	1000sqft	0.00	11,376.00	0
Recreational Swimming Pool	3.38	1000sqft	0.00	3,375.00	0
Condo/Townhouse	92.00	Dwelling Unit	0.00	161,581.00	161
Single Family Housing	152.00	Dwelling Unit	33.00	319,230.00	266
Regional Shopping Center	36.50	1000sqft	0.00	36,500.00	0

1.2 Other Project Characteristics

Urbanization Urban **Wind Speed (m/s)** 2.2 **Precipitation Freq (Days)** 30

Climate Zone 8 **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 - Acreage and number of units provided in data request. Parking lot size from project description. Assumes provided 5 acre value for commercial includes parking

Construction Phase - Phasing provided by client

Off-road Equipment - Provided by client

Off-road Equipment - .

Off-road Equipment - Amount and hours provided by client

Off-road Equipment - Provided by client

Off-road Equipment - Provided by client

Off-road Equipment - Provided by client

Off-road Equipment - Provided by client

Off-road Equipment - Provided by client

Off-road Equipment - Provided by client

Off-road Equipment - Provided by client

Off-road Equipment - Provided by client

Off-road Equipment - Provided by client

Off-road Equipment - Provided by client

Off-road Equipment - Provided by client

Off-road Equipment - Provided by client

Off-road Equipment - Provided by client

Off-road Equipment - Provided by client

Trips and VMT - .

Grading - Provided by client

Architectural Coating - Client has committed to low-VOC coatings

Construction Off-road Equipment Mitigation - Provided by client

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	100.00
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	100.00
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tblSolidWaste	SolidWasteGenerationRate	42.32	49.22
tblSolidWaste	SolidWasteGenerationRate	109.06	98.40
tblTripsAndVMT	VendorTripLength	6.90	7.90
tblTripsAndVMT	VendorTripLength	6.90	7.90
tblTripsAndVMT	VendorTripLength	6.90	7.90
tblTripsAndVMT	VendorTripLength	6.90	7.90
tblTripsAndVMT	VendorTripLength	6.90	7.90
tblTripsAndVMT	VendorTripLength	6.90	7.90
tblTripsAndVMT	VendorTripLength	6.90	7.90
tblTripsAndVMT	VendorTripLength	6.90	7.90
tblTripsAndVMT	VendorTripLength	6.90	7.90
tblTripsAndVMT	VendorTripLength	6.90	7.90
tblTripsAndVMT	VendorTripLength	6.90	7.90
tblTripsAndVMT	VendorTripLength	6.90	7.90
tblTripsAndVMT	VendorTripLength	6.90	7.90
tblTripsAndVMT	VendorTripLength	6.90	7.90
tblTripsAndVMT	VendorTripLength	6.90	7.90
tblTripsAndVMT	VendorTripLength	6.90	7.90
tblTripsAndVMT	WorkerTripLength	14.70	19.80
tblTripsAndVMT	WorkerTripLength	14.70	19.80

tblTripsAndVMT	WorkerTripLength	14.70	19.80
tblTripsAndVMT	WorkerTripLength	14.70	19.80
tblTripsAndVMT	WorkerTripLength	14.70	19.80
tblTripsAndVMT	WorkerTripLength	14.70	19.80
tblTripsAndVMT	WorkerTripLength	14.70	19.80
tblTripsAndVMT	WorkerTripLength	14.70	19.80
tblTripsAndVMT	WorkerTripLength	14.70	19.80
tblTripsAndVMT	WorkerTripLength	14.70	19.80
tblTripsAndVMT	WorkerTripLength	14.70	19.80
tblTripsAndVMT	WorkerTripLength	14.70	19.80
tblTripsAndVMT	WorkerTripLength	14.70	19.80
tblTripsAndVMT	WorkerTripLength	14.70	19.80
tblTripsAndVMT	WorkerTripLength	14.70	19.80
tblTripsAndVMT	WorkerTripLength	14.70	19.80
tblTripsAndVMT	WorkerTripNumber	20.00	5.00
tblTripsAndVMT	WorkerTripNumber	40.00	41.00
tblTripsAndVMT	WorkerTripNumber	201.00	206.00
tblTripsAndVMT	WorkerTripNumber	40.00	41.00
tblTripsAndVMT	WorkerTripNumber	201.00	206.00
tblTripsAndVMT	WorkerTripNumber	40.00	41.00
tblTripsAndVMT	WorkerTripNumber	201.00	206.00
tblTripsAndVMT	WorkerTripNumber	40.00	41.00
tblTripsAndVMT	WorkerTripNumber	201.00	206.00
tblTripsAndVMT	WorkerTripNumber	40.00	41.00
tblTripsAndVMT	WorkerTripNumber	201.00	206.00
tblTripsAndVMT	WorkerTripNumber	40.00	41.00
tblTripsAndVMT	WorkerTripNumber	201.00	206.00
tblTripsAndVMT	WorkerTripNumber	40.00	41.00
tblTripsAndVMT	WorkerTripNumber	201.00	206.00
tblVehicleTrips	CC_TL	8.40	10.10

tblVehicleTrips	CC_TL	8.40	10.10
tblVehicleTrips	CC_TL	8.40	10.10
tblVehicleTrips	CC_TL	8.40	10.10
tblVehicleTrips	CC_TL	8.40	10.10
tblVehicleTrips	CNW_TL	6.90	7.90
tblVehicleTrips	CNW_TL	6.90	7.90
tblVehicleTrips	CNW_TL	6.90	7.90
tblVehicleTrips	CNW_TL	6.90	7.90
tblVehicleTrips	CNW_TL	6.90	7.90
tblVehicleTrips	CW_TL	16.60	18.50
tblVehicleTrips	CW_TL	16.60	18.50
tblVehicleTrips	CW_TL	16.60	18.50
tblVehicleTrips	CW_TL	16.60	18.50
tblVehicleTrips	CW_TL	16.60	18.50
tblVehicleTrips	HO_TL	8.70	12.90
tblVehicleTrips	HO_TL	8.70	12.90
tblVehicleTrips	HS_TL	5.90	9.60
tblVehicleTrips	HS_TL	5.90	9.60
tblVehicleTrips	HW_TL	14.70	19.80
tblVehicleTrips	HW_TL	14.70	19.80
tblWater	IndoorWaterUseRate	5,994,170.36	6,971,480.74
tblWater	IndoorWaterUseRate	9,903,411.89	8,926,101.51
tblWater	OutdoorWaterUseRate	3,778,933.49	4,395,063.95
tblWater	OutdoorWaterUseRate	6,243,455.32	5,627,324.87
tblWoodstoves	NumberCatalytic	4.60	5.35
tblWoodstoves	NumberCatalytic	7.60	6.85
tblWoodstoves	NumberNoncatalytic	4.60	5.35
tblWoodstoves	NumberNoncatalytic	7.60	6.85

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					
2016	142.0169	33.6714	57.6432	0.1271	9.6200	1.6847	10.6189	4.2726	1.5505	5.1921	0.0000	11,469.8326	11,469.8326	0.9046	0.0000	11,488.8294
2017	141.6030	30.5768	53.9690	0.1270	7.6627	1.1378	8.8006	2.0485	1.0620	3.1105	0.0000	11,141.7601	11,141.7601	0.8771	0.0000	11,160.1784
2018	141.1141	26.5073	50.5647	0.1270	7.6627	0.9563	8.6190	2.0485	0.8932	2.9417	0.0000	10,831.3867	10,831.3867	0.8542	0.0000	10,849.3257
2019	1.6630	10.9454	22.0597	0.0587	3.5228	0.3571	3.8799	0.9424	0.3293	1.2717	0.0000	4,883.5809	4,883.5809	0.3956	0.0000	4,891.8886
Total	**426.3970**	**101.7008**	**184.2366**	**0.4397**	**28.4683**	**4.1359**	**31.9183**	**9.3119**	**3.8349**	**12.5159**	**0.0000**	**38,326.5603**	**38,326.5603**	**3.0315**	**0.0000**	**38,390.2222**

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					
2016	142.0169	33.6714	57.6432	0.1271	6.6152	1.6847	7.8727	2.0682	1.5505	2.9877	0.0000	11,469.8326	11,469.8326	0.9046	0.0000	11,488.8294
2017	141.6030	30.5768	53.9690	0.1270	6.6155	1.1378	7.7533	1.7914	1.0620	2.8534	0.0000	11,141.7601	11,141.7601	0.8771	0.0000	11,160.1784
2018	141.1141	26.5073	50.5647	0.1270	6.6154	0.9563	7.5717	1.7914	0.8932	2.6846	0.0000	10,831.3867	10,831.3867	0.8542	0.0000	10,849.3257
2019	1.6630	10.9454	22.0597	0.0587	3.0421	0.3571	3.3992	0.8244	0.3293	1.1537	0.0000	4,883.5809	4,883.5809	0.3956	0.0000	4,891.8886
Total	**426.3970**	**101.7008**	**184.2366**	**0.4397**	**22.8882**	**4.1359**	**26.5969**	**6.4755**	**3.8349**	**9.6794**	**0.0000**	**38,326.5603**	**38,326.5603**	**3.0315**	**0.0000**	**38,390.2221**

	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	19.60	0.00	16.67	30.46	0.00	22.66	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	79.4258	1.8569	142.9170	0.1962		18.7498	18.7498		18.7468	18.7468	2,285.5281	4,428.3368	6,713.8649	6.8517	0.1551	6,905.8397
Energy	0.2668	2.3315	1.3466	0.0146		0.1844	0.1844		0.1844	0.1844		2,910.8052	2,910.8052	0.0558	0.0534	2,928.5199
Mobile	17.1229	39.0664	178.0414	0.5356	39.9225	0.5787	40.5013	10.6526	0.5340	11.1866		42,354.6837	42,354.6837	1.5899		42,388.0705
Total	**96.8155**	**43.2548**	**322.3051**	**0.7463**	**39.9225**	**19.5128**	**59.4354**	**10.6526**	**19.4652**	**30.1178**	**2,285.5281**	**49,693.8257**	**51,979.3538**	**8.4974**	**0.2085**	**52,222.4301**

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	79.4258	1.8569	142.9170	0.1962		18.7498	18.7498		18.7468	18.7468	2,285.5281	4,428.3368	6,713.8649	6.8517	0.1551	6,905.8397
Energy	0.2668	2.3315	1.3466	0.0146		0.1844	0.1844		0.1844	0.1844		2,910.8052	2,910.8052	0.0558	0.0534	2,928.5199
Mobile	17.1229	39.0664	178.0414	0.5356	39.9225	0.5787	40.5013	10.6526	0.5340	11.1866		42,354.6837	42,354.6837	1.5899		42,388.0705
Total	**96.8155**	**43.2548**	**322.3051**	**0.7463**	**39.9225**	**19.5128**	**59.4354**	**10.6526**	**19.4652**	**30.1178**	**2,285.5281**	**49,693.8257**	**51,979.3538**	**8.4974**	**0.2085**	**52,222.4301**

	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	Grading	Grading	6/16/2016	9/16/2016	6	80	
2	P2-BC	Building Construction	8/1/2016	12/31/2016	6	132	
3	Paving	Paving	9/17/2016	11/14/2016	6	50	
4	P2-AC	Architectural Coating	11/28/2016	12/31/2016	6	30	
5	P3-BC	Building Construction	12/1/2016	5/3/2017	6	132	
6	P3-AC	Architectural Coating	3/27/2017	4/29/2017	6	30	
7	P4-BC	Building Construction	4/1/2017	9/1/2017	6	132	
8	P4-AC	Architectural Coating	7/28/2017	8/31/2017	6	30	
9	P5-BC	Building Construction	8/1/2017	1/1/2018	6	132	
10	P5-AC	Architectural Coating	11/27/2017	12/30/2017	6	30	
11	P6-BC	Building Construction	12/1/2017	5/3/2018	6	132	
12	P6-AC	Architectural Coating	3/26/2018	4/28/2018	6	30	
13	P7-BC	Building Construction	4/1/2018	9/1/2018	6	132	
14	P7-AC	Architectural Coating	7/28/2018	8/31/2018	6	30	
15	P8-BC	Building Construction	8/1/2018	1/1/2019	6	132	
16	P8-AC	Architectural Coating	11/26/2018	12/29/2018	6	30	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 973,642; Residential Outdoor: 324,547; Non-Residential Indoor: 91,097; Non-Residential Outdoor: 30,366

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Off-Highway Trucks	1	6.00	400	0.38
Grading	Tractors/Loaders/Backhoes	1	6.00	150	0.37
P2-BC	Cement and Mortar Mixers	1	4.00	9	0.56
P2-BC	Forklifts	1	6.00	125	0.20
P2-BC	Off-Highway Trucks	1	2.00	250	0.38
P2-BC	Tractors/Loaders/Backhoes	2	4.00	150	0.37
Paving	Pavers	2	6.00	89	0.42
Paving	Paving Equipment	2	6.00	82	0.36
Paving	Rollers	2	6.00	84	0.38
P2-AC	Air Compressors	2	3.00	78	0.48
P3-BC	Cement and Mortar Mixers	1	4.00	9	0.56
P3-BC	Forklifts	1	6.00	125	0.20
P3-BC	Off-Highway Trucks	1	2.00	250	0.38
P3-BC	Tractors/Loaders/Backhoes	2	4.00	150	0.37
P3-AC	Air Compressors	2	3.00	78	0.48
P4-BC	Cement and Mortar Mixers	1	4.00	9	0.56
P4-BC	Forklifts	1	6.00	125	0.20
P4-BC	Off-Highway Trucks	1	2.00	250	0.38
P4-BC	Tractors/Loaders/Backhoes	2	4.00	150	0.37
P4-AC	Air Compressors	2	3.00	78	0.48
P5-BC	Cement and Mortar Mixers	1	4.00	9	0.56
P5-BC	Forklifts	1	6.00	125	0.20
P5-BC	Off-Highway Trucks	1	2.00	250	0.38
P5-BC	Tractors/Loaders/Backhoes	2	4.00	150	0.37
P5-AC	Air Compressors	2	3.00	78	0.48
P6-BC	Cement and Mortar Mixers	1	4.00	9	0.56
P6-BC	Forklifts	1	6.00	125	0.20
P6-BC	Off-Highway Trucks	1	2.00	250	0.38
P6-BC	Tractors/Loaders/Backhoes	2	4.00	150	0.37
P6-AC	Air Compressors	2	3.00	78	0.48

P7-BC	Cement and Mortar Mixers	1	4.00	9	0.56
P7-BC	Forklifts	1	6.00	125	0.20
P7-BC	Off-Highway Trucks	1	2.00	250	0.38
P7-BC	Tractors/Loaders/Backhoes	2	4.00	150	0.37
P7-AC	Air Compressors	2	3.00	78	0.48
P8-BC	Cement and Mortar Mixers	1	4.00	9	0.56
P8-BC	Forklifts	1	6.00	125	0.20
P8-BC	Off-Highway Trucks	1	2.00	250	0.38
P8-BC	Tractors/Loaders/Backhoes	2	4.00	150	0.37
P8-AC	Air Compressors	2	3.00	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
Grading	8	5.00	0.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
P2-BC	8	206.00	59.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
P2-AC	2	41.00	0.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
P3-BC	8	206.00	59.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
P3-AC	2	41.00	0.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
P4-BC	8	206.00	59.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
P4-AC	2	41.00	0.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
P5-BC	8	206.00	59.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
P5-AC	2	41.00	0.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
P6-BC	8	206.00	59.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
P6-AC	2	41.00	0.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
P7-BC	8	206.00	59.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
P7-AC	2	41.00	0.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
P8-BC	8	206.00	59.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
P8-AC	2	41.00	0.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Grading - 2016

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					6.0221	0.0000	6.0221	3.3102	0.0000	3.3102			0.0000			0.0000
Off-Road	0.9922	11.3541	6.1634	0.0134		0.4700	0.4700		0.4324	0.4324		1,394.1334	1,394.1334	0.4205		1,402.9643
Total	**0.9922**	**11.3541**	**6.1634**	**0.0134**	**6.0221**	**0.4700**	**6.4921**	**3.3102**	**0.4324**	**3.7426**		**1,394.1334**	**1,394.1334**	**0.4205**		**1,402.9643**

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	0.0201	0.0323	0.3359	8.6000e-004	0.0753	5.1000e-004	0.0758	0.0200	4.7000e-004	0.0204		71.9702	71.9702	3.5400e-003		72.0445

Total	**0.0201**	**0.0323**	**0.3359**	**8.6000e-004**	**0.0753**	**5.1000e-004**	**0.0758**	**0.0200**	**4.7000e-004**	**0.0204**		**71.9702**	**71.9702**	**3.5400e-003**		**72.0445**

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					2.2312	0.0000	2.2312	1.2264	0.0000	1.2264			0.0000			0.0000
Off-Road	0.9922	11.3541	6.1634	0.0134		0.4700	0.4700		0.4324	0.4324	0.0000	1,394.1334	1,394.1334	0.4205		1,402.9643
Total	**0.9922**	**11.3541**	**6.1634**	**0.0134**	**2.2312**	**0.4700**	**2.7012**	**1.2264**	**0.4324**	**1.6589**	**0.0000**	**1,394.1334**	**1,394.1334**	**0.4205**		**1,402.9643**

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	0.0201	0.0323	0.3359	8.6000e-004	0.0648	5.1000e-004	0.0653	0.0174	4.7000e-004	0.0179		71.9702	71.9702	3.5400e-003		72.0445
Total	**0.0201**	**0.0323**	**0.3359**	**8.6000e-004**	**0.0648**	**5.1000e-004**	**0.0653**	**0.0174**	**4.7000e-004**	**0.0179**		**71.9702**	**71.9702**	**3.5400e-003**		**72.0445**

3.3 P2-BC - 2016

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	0.7724	8.3697	5.2304	8.7300e-003		0.4143	0.4143		0.3817	0.3817		895.1312	895.1312	0.2650		900.6964
Total	**0.7724**	**8.3697**	**5.2304**	**8.7300e-003**		**0.4143**	**0.4143**		**0.3817**	**0.3817**		**895.1312**	**895.1312**	**0.2650**		**900.6964**

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	0.5969	5.8153	7.4325	0.0144	0.4219	0.0929	0.5149	0.1201	0.0855	0.2056		1,438.8134	1,438.8134	0.0104		1,439.0315
Worker	0.8298	1.3320	13.8395	0.0354	3.1008	0.0211	3.1219	0.8222	0.0195	0.8417		2,965.1701	2,965.1701	0.1458		2,968.2321
Total	**1.4267**	**7.1473**	**21.2720**	**0.0498**	**3.5227**	**0.1141**	**3.6368**	**0.9424**	**0.1049**	**1.0473**		**4,403.9835**	**4,403.9835**	**0.1562**		**4,407.2636**

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					

	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
Off-Road	0.7724	8.3697	5.2304	8.7300e-003		0.4143	0.4143		0.3817	0.3817	0.0000	895.1312	895.1312	0.2650		900.6964
Total	**0.7724**	**8.3697**	**5.2304**	**8.7300e-003**		**0.4143**	**0.4143**		**0.3817**	**0.3817**	**0.0000**	**895.1312**	**895.1312**	**0.2650**		**900.6964**

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	0.5969	5.8153	7.4325	0.0144	0.3726	0.0929	0.4656	0.1080	0.0855	0.1935		1,438.8134	1,438.8134	0.0104		1,439.0315
Worker	0.8298	1.3320	13.8395	0.0354	2.6693	0.0211	2.6905	0.7164	0.0195	0.7358		2,965.1701	2,965.1701	0.1458		2,968.2321
Total	**1.4267**	**7.1473**	**21.2720**	**0.0498**	**3.0420**	**0.1141**	**3.1561**	**0.8244**	**0.1049**	**0.9293**		**4,403.9835**	**4,403.9835**	**0.1562**		**4,407.2636**

3.4 Paving - 2016

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	1.6599	15.2013	9.8628	0.0127		1.1548	1.1548		1.0625	1.0625		1,324.0034	1,324.0034	0.3994		1,332.3901
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.6599**	**15.2013**	**9.8628**	**0.0127**		**1.1548**	**1.1548**		**1.0625**	**1.0625**		**1,324.0034**	**1,324.0034**	**0.3994**		**1,332.3901**

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	0.0604	0.0970	1.0077	2.5800e-003	0.2258	1.5400e-003	0.2273	0.0599	1.4200e-003	0.0613		215.9104	215.9104	0.0106		216.1334
Total	**0.0604**	**0.0970**	**1.0077**	**2.5800e-003**	**0.2258**	**1.5400e-003**	**0.2273**	**0.0599**	**1.4200e-003**	**0.0613**		**215.9104**	**215.9104**	**0.0106**		**216.1334**

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	1.6599	15.2013	9.8628	0.0127		1.1548	1.1548		1.0625	1.0625	0.0000	1,324.0034	1,324.0034	0.3994		1,332.3901
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.6599**	**15.2013**	**9.8628**	**0.0127**		**1.1548**	**1.1548**		**1.0625**	**1.0625**	**0.0000**	**1,324.0034**	**1,324.0034**	**0.3994**		**1,332.3901**

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	0.0604	0.0970	1.0077	2.5800e-003	0.1944	1.5400e-003	0.1959	0.0522	1.4200e-003	0.0536		215.9104	215.9104	0.0106		216.1334
Total	**0.0604**	**0.0970**	**1.0077**	**2.5800e-003**	**0.1944**	**1.5400e-003**	**0.1959**	**0.0522**	**1.4200e-003**	**0.0536**		**215.9104**	**215.9104**	**0.0106**		**216.1334**

3.5 P2-AC - 2016

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	137.0852					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3685	2.3722	1.8839	2.9700e-003		0.1966	0.1966		0.1966	0.1966		281.4481	281.4481	0.0332		282.1449
Total	**137.4536**	**2.3722**	**1.8839**	**2.9700e-003**		**0.1966**	**0.1966**		**0.1966**	**0.1966**		**281.4481**	**281.4481**	**0.0332**		**282.1449**

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	0.1652	0.2651	2.7545	7.0500e-003	0.6171	4.2100e-003	0.6213	0.1637	3.8700e-003	0.1675		590.1552	590.1552	0.0290		590.7646

Total	**0.1652**	**0.2651**	**2.7545**	**7.0500e-003**	**0.6171**	**4.2100e-003**	**0.6213**	**0.1637**	**3.8700e-003**	**0.1675**		**590.1552**	**590.1552**	**0.0290**		**590.7646**

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	137.0852					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3685	2.3722	1.8839	2.9700e-003		0.1966	0.1966		0.1966	0.1966	0.0000	281.4481	281.4481	0.0332		282.1449
Total	**137.4536**	**2.3722**	**1.8839**	**2.9700e-003**		**0.1966**	**0.1966**		**0.1966**	**0.1966**	**0.0000**	**281.4481**	**281.4481**	**0.0332**		**282.1449**

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	0.1652	0.2651	2.7545	7.0500e-003	0.5313	4.2100e-003	0.5355	0.1426	3.8700e-003	0.1465		590.1552	590.1552	0.0290		590.7646
Total	**0.1652**	**0.2651**	**2.7545**	**7.0500e-003**	**0.5313**	**4.2100e-003**	**0.5355**	**0.1426**	**3.8700e-003**	**0.1465**		**590.1552**	**590.1552**	**0.0290**		**590.7646**

3.6 P3-BC - 2016

Unmitigated Construction On-Site

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					
Off-Road	0.7724	8.3697	5.2304	8.7300e-003		0.4143	0.4143		0.3817	0.3817		895.1312	895.1312	0.2650		900.6964
Total	**0.7724**	**8.3697**	**5.2304**	**8.7300e-003**		**0.4143**	**0.4143**		**0.3817**	**0.3817**		**895.1312**	**895.1312**	**0.2650**		**900.6964**

Unmitigated Construction Off-Site

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					
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	0.5969	5.8153	7.4325	0.0144	0.4219	0.0929	0.5149	0.1201	0.0855	0.2056		1,438.8134	1,438.8134	0.0104		1,439.0315
Worker	0.8298	1.3320	13.8395	0.0354	3.1008	0.0211	3.1219	0.8222	0.0195	0.8417		2,965.1701	2,965.1701	0.1458		2,968.2321
Total	**1.4267**	**7.1473**	**21.2720**	**0.0498**	**3.5227**	**0.1141**	**3.6368**	**0.9424**	**0.1049**	**1.0473**		**4,403.9835**	**4,403.9835**	**0.1562**		**4,407.2636**

Mitigated Construction On-Site

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					

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
Off-Road	0.7724	8.3697	5.2304	8.7300e-003		0.4143	0.4143		0.3817	0.3817	0.0000	895.1312	895.1312	0.2650		900.6964
Total	**0.7724**	**8.3697**	**5.2304**	**8.7300e-003**		**0.4143**	**0.4143**		**0.3817**	**0.3817**	**0.0000**	**895.1312**	**895.1312**	**0.2650**		**900.6964**

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	0.5969	5.8153	7.4325	0.0144	0.3726	0.0929	0.4656	0.1080	0.0855	0.1935		1,438.8134	1,438.8134	0.0104		1,439.0315
Worker	0.8298	1.3320	13.8395	0.0354	2.6693	0.0211	2.6905	0.7164	0.0195	0.7358		2,965.1701	2,965.1701	0.1458		2,968.2321
Total	**1.4267**	**7.1473**	**21.2720**	**0.0498**	**3.0420**	**0.1141**	**3.1561**	**0.8244**	**0.1049**	**0.9293**		**4,403.9835**	**4,403.9835**	**0.1562**		**4,407.2636**

3.6 P3-BC - 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	0.7183	7.5838	5.1619	8.7200e-003		0.3766	0.3766		0.3471	0.3471		880.7793	880.7793	0.2648		886.3391
Total	**0.7183**	**7.5838**	**5.1619**	**8.7200e-003**		**0.3766**	**0.3766**		**0.3471**	**0.3471**		**880.7793**	**880.7793**	**0.2648**		**886.3391**

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	0.5496	5.2818	7.0485	0.0143	0.4221	0.0830	0.5050	0.1202	0.0763	0.1965		1,415.3691	1,415.3691	0.0101		1,415.5804
Worker	0.7502	1.2099	12.5875	0.0354	3.1008	0.0206	3.1214	0.8222	0.0191	0.8413		2,850.3557	2,850.3557	0.1354		2,853.1989
Total	**1.2998**	**6.4917**	**19.6360**	**0.0498**	**3.5228**	**0.1036**	**3.6264**	**0.9424**	**0.0953**	**1.0378**		**4,265.7249**	**4,265.7249**	**0.1455**		**4,268.7793**

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	0.7183	7.5838	5.1619	8.7200e-003		0.3766	0.3766		0.3471	0.3471	0.0000	880.7793	880.7793	0.2648		886.3391
Total	**0.7183**	**7.5838**	**5.1619**	**8.7200e-003**		**0.3766**	**0.3766**		**0.3471**	**0.3471**	**0.0000**	**880.7793**	**880.7793**	**0.2648**		**886.3391**

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	0.5496	5.2818	7.0485	0.0143	0.3728	0.0830	0.4557	0.1081	0.0763	0.1844		1,415.3691	1,415.3691	0.0101		1,415.5804
Worker	0.7502	1.2099	12.5875	0.0354	2.6693	0.0206	2.6900	0.7164	0.0191	0.7354		2,850.3557	2,850.3557	0.1354		2,853.1989
Total	**1.2998**	**6.4917**	**19.6360**	**0.0498**	**3.0421**	**0.1036**	**3.1457**	**0.8244**	**0.0953**	**0.9198**		**4,265.7249**	**4,265.7249**	**0.1455**		**4,268.7793**

3.7 P3-AC - 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					
Archit. Coating	137.0852					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3323	2.1850	1.8681	2.9700e-003		0.1733	0.1733		0.1733	0.1733		281.4481	281.4481	0.0297		282.0721
Total	**137.4175**	**2.1850**	**1.8681**	**2.9700e-003**		**0.1733**	**0.1733**		**0.1733**	**0.1733**		**281.4481**	**281.4481**	**0.0297**		**282.0721**

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	0.1493	0.2408	2.5053	7.0500e-003	0.6171	4.1100e-003	0.6213	0.1637	3.7900e-003	0.1674		567.3038	567.3038	0.0270		567.8697

Total	0.1493	0.2408	2.5053	7.0500e-003	0.6171	4.1100e-003	0.6213	0.1637	3.7900e-003	0.1674		567.3038	567.3038	0.0270		567.8697

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	137.0852					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3323	2.1850	1.8681	2.9700e-003		0.1733	0.1733		0.1733	0.1733	0.0000	281.4481	281.4481	0.0297		282.0721
Total	**137.4175**	**2.1850**	**1.8681**	**2.9700e-003**		**0.1733**	**0.1733**		**0.1733**	**0.1733**	**0.0000**	**281.4481**	**281.4481**	**0.0297**		**282.0721**

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	0.1493	0.2408	2.5053	7.0500e-003	0.5313	4.1100e-003	0.5354	0.1426	3.7900e-003	0.1464		567.3038	567.3038	0.0270		567.8697
Total	**0.1493**	**0.2408**	**2.5053**	**7.0500e-003**	**0.5313**	**4.1100e-003**	**0.5354**	**0.1426**	**3.7900e-003**	**0.1464**		**567.3038**	**567.3038**	**0.0270**		**567.8697**

3.8 P4-BC - 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	0.7183	7.5838	5.1619	8.7200e-003		0.3766	0.3766		0.3471	0.3471		880.7793	880.7793	0.2648		886.3391
Total	**0.7183**	**7.5838**	**5.1619**	**8.7200e-003**		**0.3766**	**0.3766**		**0.3471**	**0.3471**		**880.7793**	**880.7793**	**0.2648**		**886.3391**

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	0.5496	5.2818	7.0485	0.0143	0.4221	0.0830	0.5050	0.1202	0.0763	0.1965		1,415.3691	1,415.3691	0.0101		1,415.5804
Worker	0.7502	1.2099	12.5875	0.0354	3.1008	0.0206	3.1214	0.8222	0.0191	0.8413		2,850.3557	2,850.3557	0.1354		2,853.1989
Total	**1.2998**	**6.4917**	**19.6360**	**0.0498**	**3.5228**	**0.1036**	**3.6264**	**0.9424**	**0.0953**	**1.0378**		**4,265.7249**	**4,265.7249**	**0.1455**		**4,268.7793**

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	0.7183	7.5838	5.1619	8.7200e-003		0.3766	0.3766		0.3471	0.3471	0.0000	880.7793	880.7793	0.2648		886.3391
Total	**0.7183**	**7.5838**	**5.1619**	**8.7200e-003**		**0.3766**	**0.3766**		**0.3471**	**0.3471**	**0.0000**	**880.7793**	**880.7793**	**0.2648**		**886.3391**

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	0.5496	5.2818	7.0485	0.0143	0.3728	0.0830	0.4557	0.1081	0.0763	0.1844		1,415.3691	1,415.3691	0.0101		1,415.5804
Worker	0.7502	1.2099	12.5875	0.0354	2.6693	0.0206	2.6900	0.7164	0.0191	0.7354		2,850.3557	2,850.3557	0.1354		2,853.1989
Total	**1.2998**	**6.4917**	**19.6360**	**0.0498**	**3.0421**	**0.1036**	**3.1457**	**0.8244**	**0.0953**	**0.9198**		**4,265.7249**	**4,265.7249**	**0.1455**		**4,268.7793**

3.9 P4-AC - 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					
Archit. Coating	137.0852					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3323	2.1850	1.8681	2.9700e-003		0.1733	0.1733		0.1733	0.1733		281.4481	281.4481	0.0297		282.0721
Total	**137.4175**	**2.1850**	**1.8681**	**2.9700e-003**		**0.1733**	**0.1733**		**0.1733**	**0.1733**		**281.4481**	**281.4481**	**0.0297**		**282.0721**

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	0.1493	0.2408	2.5053	7.0500e-003	0.6171	4.1100e-003	0.6213	0.1637	3.7900e-003	0.1674		567.3038	567.3038	0.0270		567.8697
Total	**0.1493**	**0.2408**	**2.5053**	**7.0500e-003**	**0.6171**	**4.1100e-003**	**0.6213**	**0.1637**	**3.7900e-003**	**0.1674**		**567.3038**	**567.3038**	**0.0270**		**567.8697**

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	137.0852					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3323	2.1850	1.8681	2.9700e-003		0.1733	0.1733		0.1733	0.1733	0.0000	281.4481	281.4481	0.0297		282.0721
Total	**137.4175**	**2.1850**	**1.8681**	**2.9700e-003**		**0.1733**	**0.1733**		**0.1733**	**0.1733**	**0.0000**	**281.4481**	**281.4481**	**0.0297**		**282.0721**

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	0.1493	0.2408	2.5053	7.0500e-003	0.5313	4.1100e-003	0.5354	0.1426	3.7900e-003	0.1464		567.3038	567.3038	0.0270		567.8697
Total	**0.1493**	**0.2408**	**2.5053**	**7.0500e-003**	**0.5313**	**4.1100e-003**	**0.5354**	**0.1426**	**3.7900e-003**	**0.1464**		**567.3038**	**567.3038**	**0.0270**		**567.8697**

3.10 P5-BC - 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	0.7183	7.5838	5.1619	8.7200e-003		0.3766	0.3766		0.3471	0.3471		880.7793	880.7793	0.2648		886.3391
Total	**0.7183**	**7.5838**	**5.1619**	**8.7200e-003**		**0.3766**	**0.3766**		**0.3471**	**0.3471**		**880.7793**	**880.7793**	**0.2648**		**886.3391**

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	0.5496	5.2818	7.0485	0.0143	0.4221	0.0830	0.5050	0.1202	0.0763	0.1965		1,415.3691	1,415.3691	0.0101		1,415.5804
Worker	0.7502	1.2099	12.5875	0.0354	3.1008	0.0206	3.1214	0.8222	0.0191	0.8413		2,850.3557	2,850.3557	0.1354		2,853.1989

Total	**1.2998**	**6.4917**	**19.6360**	**0.0498**	**3.5228**	**0.1036**	**3.6264**	**0.9424**	**0.0953**	**1.0378**		**4,265.7249**	**4,265.7249**	**0.1455**		**4,268.7793**

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	0.7183	7.5838	5.1619	8.7200e-003		0.3766	0.3766		0.3471	0.3471	0.0000	880.7793	880.7793	0.2648		886.3391
Total	**0.7183**	**7.5838**	**5.1619**	**8.7200e-003**		**0.3766**	**0.3766**		**0.3471**	**0.3471**	**0.0000**	**880.7793**	**880.7793**	**0.2648**		**886.3391**

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	0.5496	5.2818	7.0485	0.0143	0.3728	0.0830	0.4557	0.1081	0.0763	0.1844		1,415.3691	1,415.3691	0.0101		1,415.5804
Worker	0.7502	1.2099	12.5875	0.0354	2.6693	0.0206	2.6900	0.7164	0.0191	0.7354		2,850.3557	2,850.3557	0.1354		2,853.1989
Total	**1.2998**	**6.4917**	**19.6360**	**0.0498**	**3.0421**	**0.1036**	**3.1457**	**0.8244**	**0.0953**	**0.9198**		**4,265.7249**	**4,265.7249**	**0.1455**		**4,268.7793**

3.10 P5-BC - 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	0.6041	6.1955	4.9749	8.7200e-003		0.3023	0.3023		0.2787	0.2787		867.2143	867.2143	0.2647		872.7737
Total	**0.6041**	**6.1955**	**4.9749**	**8.7200e-003**		**0.3023**	**0.3023**		**0.2787**	**0.2787**		**867.2143**	**867.2143**	**0.2647**		**872.7737**

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	0.5135	4.8410	6.7437	0.0143	0.4220	0.0782	0.5002	0.1202	0.0719	0.1920		1,391.3151	1,391.3151	0.0100		1,391.5252
Worker	0.6799	1.1044	11.4930	0.0354	3.1008	0.0204	3.1211	0.8222	0.0189	0.8411		2,743.4286	2,743.4286	0.1264		2,746.0836
Total	**1.1934**	**5.9454**	**18.2367**	**0.0498**	**3.5228**	**0.0985**	**3.6213**	**0.9424**	**0.0907**	**1.0332**		**4,134.7437**	**4,134.7437**	**0.1364**		**4,137.6088**

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	0.6041	6.1955	4.9749	8.7200e-003		0.3023	0.3023		0.2787	0.2787	0.0000	867.2143	867.2143	0.2647		872.7737
Total	**0.6041**	**6.1955**	**4.9749**	**8.7200e-003**		**0.3023**	**0.3023**		**0.2787**	**0.2787**	**0.0000**	**867.2143**	**867.2143**	**0.2647**		**872.7737**

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	0.5135	4.8410	6.7437	0.0143	0.3727	0.0782	0.4509	0.1081	0.0719	0.1799		1,391.3151	1,391.3151	0.0100		1,391.5252
Worker	0.6799	1.1044	11.4930	0.0354	2.6693	0.0204	2.6897	0.7164	0.0189	0.7352		2,743.4286	2,743.4286	0.1264		2,746.0836
Total	**1.1934**	**5.9454**	**18.2367**	**0.0498**	**3.0421**	**0.0985**	**3.1406**	**0.8244**	**0.0907**	**0.9152**		**4,134.7437**	**4,134.7437**	**0.1364**		**4,137.6088**

3.11 P5-AC - 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					
Archit. Coating	137.0852					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3323	2.1850	1.8681	2.9700e-003		0.1733	0.1733		0.1733	0.1733		281.4481	281.4481	0.0297		282.0721
Total	**137.4175**	**2.1850**	**1.8681**	**2.9700e-003**		**0.1733**	**0.1733**		**0.1733**	**0.1733**		**281.4481**	**281.4481**	**0.0297**		**282.0721**

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	0.1493	0.2408	2.5053	7.0500e-003	0.6171	4.1100e-003	0.6213	0.1637	3.7900e-003	0.1674		567.3038	567.3038	0.0270		567.8697
Total	**0.1493**	**0.2408**	**2.5053**	**7.0500e-003**	**0.6171**	**4.1100e-003**	**0.6213**	**0.1637**	**3.7900e-003**	**0.1674**		**567.3038**	**567.3038**	**0.0270**		**567.8697**

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	137.0852					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3323	2.1850	1.8681	2.9700e-003		0.1733	0.1733		0.1733	0.1733	0.0000	281.4481	281.4481	0.0297		282.0721
Total	**137.4175**	**2.1850**	**1.8681**	**2.9700e-003**		**0.1733**	**0.1733**		**0.1733**	**0.1733**	**0.0000**	**281.4481**	**281.4481**	**0.0297**		**282.0721**

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	0.1493	0.2408	2.5053	7.0500e-003	0.5313	4.1100e-003	0.5354	0.1426	3.7900e-003	0.1464		567.3038	567.3038	0.0270		567.8697
Total	**0.1493**	**0.2408**	**2.5053**	**7.0500e-003**	**0.5313**	**4.1100e-003**	**0.5354**	**0.1426**	**3.7900e-003**	**0.1464**		**567.3038**	**567.3038**	**0.0270**		**567.8697**

3.12 P6-BC - 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	0.7183	7.5838	5.1619	8.7200e-003		0.3766	0.3766		0.3471	0.3471		880.7793	880.7793	0.2648		886.3391
Total	**0.7183**	**7.5838**	**5.1619**	**8.7200e-003**		**0.3766**	**0.3766**		**0.3471**	**0.3471**		**880.7793**	**880.7793**	**0.2648**		**886.3391**

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	0.5496	5.2818	7.0485	0.0143	0.4221	0.0830	0.5050	0.1202	0.0763	0.1965		1,415.3691	1,415.3691	0.0101		1,415.5804
Worker	0.7502	1.2099	12.5875	0.0354	3.1008	0.0206	3.1214	0.8222	0.0191	0.8413		2,850.3557	2,850.3557	0.1354		2,853.1989

Total	**1.2998**	**6.4917**	**19.6360**	**0.0498**	**3.5228**	**0.1036**	**3.6264**	**0.9424**	**0.0953**	**1.0378**		**4,265.7249**	**4,265.7249**	**0.1455**		**4,268.7793**

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	0.7183	7.5838	5.1619	8.7200e-003		0.3766	0.3766		0.3471	0.3471	0.0000	880.7793	880.7793	0.2648		886.3391
Total	**0.7183**	**7.5838**	**5.1619**	**8.7200e-003**		**0.3766**	**0.3766**		**0.3471**	**0.3471**	**0.0000**	**880.7793**	**880.7793**	**0.2648**		**886.3391**

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	0.5496	5.2818	7.0485	0.0143	0.3728	0.0830	0.4557	0.1081	0.0763	0.1844		1,415.3691	1,415.3691	0.0101		1,415.5804
Worker	0.7502	1.2099	12.5875	0.0354	2.6693	0.0206	2.6900	0.7164	0.0191	0.7354		2,850.3557	2,850.3557	0.1354		2,853.1989
Total	**1.2998**	**6.4917**	**19.6360**	**0.0498**	**3.0421**	**0.1036**	**3.1457**	**0.8244**	**0.0953**	**0.9198**		**4,265.7249**	**4,265.7249**	**0.1455**		**4,268.7793**

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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	0.6041	6.1955	4.9749	8.7200e-003		0.3023	0.3023		0.2787	0.2787		867.2143	867.2143	0.2647		872.7737
Total	**0.6041**	**6.1955**	**4.9749**	**8.7200e-003**		**0.3023**	**0.3023**		**0.2787**	**0.2787**		**867.2143**	**867.2143**	**0.2647**		**872.7737**

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	0.5135	4.8410	6.7437	0.0143	0.4220	0.0782	0.5002	0.1202	0.0719	0.1920		1,391.3151	1,391.3151	0.0100		1,391.5252
Worker	0.6799	1.1044	11.4930	0.0354	3.1008	0.0204	3.1211	0.8222	0.0189	0.8411		2,743.4286	2,743.4286	0.1264		2,746.0836
Total	**1.1934**	**5.9454**	**18.2367**	**0.0498**	**3.5228**	**0.0985**	**3.6213**	**0.9424**	**0.0907**	**1.0332**		**4,134.7437**	**4,134.7437**	**0.1364**		**4,137.6088**

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					

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
Off-Road	0.6041	6.1955	4.9749	8.7200e-003		0.3023	0.3023		0.2787	0.2787	0.0000	867.2143	867.2143	0.2647		872.7737
Total	**0.6041**	**6.1955**	**4.9749**	**8.7200e-003**		**0.3023**	**0.3023**		**0.2787**	**0.2787**	**0.0000**	**867.2143**	**867.2143**	**0.2647**		**872.7737**

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	0.5135	4.8410	6.7437	0.0143	0.3727	0.0782	0.4509	0.1081	0.0719	0.1799		1,391.3151	1,391.3151	0.0100		1,391.5252
Worker	0.6799	1.1044	11.4930	0.0354	2.6693	0.0204	2.6897	0.7164	0.0189	0.7352		2,743.4286	2,743.4286	0.1264		2,746.0836
Total	**1.1934**	**5.9454**	**18.2367**	**0.0498**	**3.0421**	**0.0985**	**3.1406**	**0.8244**	**0.0907**	**0.9152**		**4,134.7437**	**4,134.7437**	**0.1364**		**4,137.6088**

3.13 P6-AC - 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	137.0852					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	**137.3838**	**2.0058**	**1.8542**	**2.9700e-003**		**0.1506**	**0.1506**		**0.1506**	**0.1506**		**281.4485**	**281.4485**	**0.0267**		**282.0102**

Unmitigated Construction Off-Site

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					
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	0.1353	0.2198	2.2874	7.0500e-003	0.6171	4.0600e-003	0.6212	0.1637	3.7600e-003	0.1674		546.0222	546.0222	0.0252		546.5506
Total	**0.1353**	**0.2198**	**2.2874**	**7.0500e-003**	**0.6171**	**4.0600e-003**	**0.6212**	**0.1637**	**3.7600e-003**	**0.1674**		**546.0222**	**546.0222**	**0.0252**		**546.5506**

Mitigated Construction On-Site

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					
Archit. Coating	137.0852					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	0.0000	281.4485	281.4485	0.0267		282.0102
Total	**137.3838**	**2.0058**	**1.8542**	**2.9700e-003**		**0.1506**	**0.1506**		**0.1506**	**0.1506**	**0.0000**	**281.4485**	**281.4485**	**0.0267**		**282.0102**

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	0.1353	0.2198	2.2874	7.0500e-003	0.5313	4.0600e-003	0.5353	0.1426	3.7600e-003	0.1463		546.0222	546.0222	0.0252		546.5506
Total	**0.1353**	**0.2198**	**2.2874**	**7.0500e-003**	**0.5313**	**4.0600e-003**	**0.5353**	**0.1426**	**3.7600e-003**	**0.1463**		**546.0222**	**546.0222**	**0.0252**		**546.5506**

3.14 P7-BC - 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	0.6041	6.1955	4.9749	8.7200e-003		0.3023	0.3023		0.2787	0.2787		867.2143	867.2143	0.2647		872.7737
Total	**0.6041**	**6.1955**	**4.9749**	**8.7200e-003**		**0.3023**	**0.3023**		**0.2787**	**0.2787**		**867.2143**	**867.2143**	**0.2647**		**872.7737**

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	0.5135	4.8410	6.7437	0.0143	0.4220	0.0782	0.5002	0.1202	0.0719	0.1920		1,391.3151	1,391.3151	0.0100		1,391.5252
Worker	0.6799	1.1044	11.4930	0.0354	3.1008	0.0204	3.1211	0.8222	0.0189	0.8411		2,743.4286	2,743.4286	0.1264		2,746.0836

Total	1.1934	5.9454	18.2367	0.0498	3.5228	0.0985	3.6213	0.9424	0.0907	1.0332		4,134.7437	4,134.7437	0.1364		4,137.6088

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	0.6041	6.1955	4.9749	8.7200e-003		0.3023	0.3023		0.2787	0.2787	0.0000	867.2143	867.2143	0.2647		872.7737
Total	**0.6041**	**6.1955**	**4.9749**	**8.7200e-003**		**0.3023**	**0.3023**		**0.2787**	**0.2787**	**0.0000**	**867.2143**	**867.2143**	**0.2647**		**872.7737**

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	0.5135	4.8410	6.7437	0.0143	0.3727	0.0782	0.4509	0.1081	0.0719	0.1799		1,391.3151	1,391.3151	0.0100		1,391.5252
Worker	0.6799	1.1044	11.4930	0.0354	2.6693	0.0204	2.6897	0.7164	0.0189	0.7352		2,743.4286	2,743.4286	0.1264		2,746.0836
Total	**1.1934**	**5.9454**	**18.2367**	**0.0498**	**3.0421**	**0.0985**	**3.1406**	**0.8244**	**0.0907**	**0.9152**		**4,134.7437**	**4,134.7437**	**0.1364**		**4,137.6088**

3.15 P7-AC - 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	137.0852					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	**137.3838**	**2.0058**	**1.8542**	**2.9700e-003**		**0.1506**	**0.1506**		**0.1506**	**0.1506**		**281.4485**	**281.4485**	**0.0267**		**282.0102**

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	0.1353	0.2198	2.2874	7.0500e-003	0.6171	4.0600e-003	0.6212	0.1637	3.7600e-003	0.1674		546.0222	546.0222	0.0252		546.5506
Total	**0.1353**	**0.2198**	**2.2874**	**7.0500e-003**	**0.6171**	**4.0600e-003**	**0.6212**	**0.1637**	**3.7600e-003**	**0.1674**		**546.0222**	**546.0222**	**0.0252**		**546.5506**

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	137.0852					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	0.0000	281.4485	281.4485	0.0267		282.0102
Total	**137.3838**	**2.0058**	**1.8542**	**2.9700e-003**		**0.1506**	**0.1506**		**0.1506**	**0.1506**	**0.0000**	**281.4485**	**281.4485**	**0.0267**		**282.0102**

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	0.1353	0.2198	2.2874	7.0500e-003	0.5313	4.0600e-003	0.5353	0.1426	3.7600e-003	0.1463		546.0222	546.0222	0.0252		546.5506
Total	**0.1353**	**0.2198**	**2.2874**	**7.0500e-003**	**0.5313**	**4.0600e-003**	**0.5353**	**0.1426**	**3.7600e-003**	**0.1463**		**546.0222**	**546.0222**	**0.0252**		**546.5506**

3.16 P8-BC - 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	0.6041	6.1955	4.9749	8.7200e-003		0.3023	0.3023		0.2787	0.2787		867.2143	867.2143	0.2647		872.7737
Total	**0.6041**	**6.1955**	**4.9749**	**8.7200e-003**		**0.3023**	**0.3023**		**0.2787**	**0.2787**		**867.2143**	**867.2143**	**0.2647**		**872.7737**

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	0.5135	4.8410	6.7437	0.0143	0.4220	0.0782	0.5002	0.1202	0.0719	0.1920		1,391.3151	1,391.3151	0.0100		1,391.5252
Worker	0.6799	1.1044	11.4930	0.0354	3.1008	0.0204	3.1211	0.8222	0.0189	0.8411		2,743.4286	2,743.4286	0.1264		2,746.0836
Total	**1.1934**	**5.9454**	**18.2367**	**0.0498**	**3.5228**	**0.0985**	**3.6213**	**0.9424**	**0.0907**	**1.0332**		**4,134.7437**	**4,134.7437**	**0.1364**		**4,137.6088**

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	0.6041	6.1955	4.9749	8.7200e-003		0.3023	0.3023		0.2787	0.2787	0.0000	867.2143	867.2143	0.2647		872.7737
Total	**0.6041**	**6.1955**	**4.9749**	**8.7200e-003**		**0.3023**	**0.3023**		**0.2787**	**0.2787**	**0.0000**	**867.2143**	**867.2143**	**0.2647**		**872.7737**

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	0.5135	4.8410	6.7437	0.0143	0.3727	0.0782	0.4509	0.1081	0.0719	0.1799		1,391.3151	1,391.3151	0.0100		1,391.5252
Worker	0.6799	1.1044	11.4930	0.0354	2.6693	0.0204	2.6897	0.7164	0.0189	0.7352		2,743.4286	2,743.4286	0.1264		2,746.0836
Total	**1.1934**	**5.9454**	**18.2367**	**0.0498**	**3.0421**	**0.0985**	**3.1406**	**0.8244**	**0.0907**	**0.9152**		**4,134.7437**	**4,134.7437**	**0.1364**		**4,137.6088**

3.16 P8-BC - 2019

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	0.5491	5.4376	4.9091	8.7200e-003		0.2637	0.2637		0.2432	0.2432		853.7912	853.7912	0.2648		859.3512
Total	**0.5491**	**5.4376**	**4.9091**	**8.7200e-003**		**0.2637**	**0.2637**		**0.2432**	**0.2432**		**853.7912**	**853.7912**	**0.2648**		**859.3512**

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	0.4804	4.4837	6.4443	0.0144	0.4221	0.0729	0.4950	0.1202	0.0671	0.1872		1,372.0264	1,372.0264	0.0101		1,372.2379
Worker	0.6334	1.0240	10.7064	0.0356	3.1008	0.0205	3.1213	0.8222	0.0190	0.8413		2,657.7633	2,657.7633	0.1208		2,660.2994

Total	**1.1139**	**5.5078**	**17.1507**	**0.0499**	**3.5228**	**0.0934**	**3.6162**	**0.9424**	**0.0861**	**1.0285**		**4,029.7897**	**4,029.7897**	**0.1308**		**4,032.5373**

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	0.5491	5.4376	4.9091	8.7200e-003		0.2637	0.2637		0.2432	0.2432	0.0000	853.7912	853.7912	0.2648		859.3512
Total	**0.5491**	**5.4376**	**4.9091**	**8.7200e-003**		**0.2637**	**0.2637**		**0.2432**	**0.2432**	**0.0000**	**853.7912**	**853.7912**	**0.2648**		**859.3512**

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	0.4804	4.4837	6.4443	0.0144	0.3728	0.0729	0.4457	0.1081	0.0671	0.1751		1,372.0264	1,372.0264	0.0101		1,372.2379
Worker	0.6334	1.0240	10.7064	0.0356	2.6693	0.0205	2.6899	0.7164	0.0190	0.7354		2,657.7633	2,657.7633	0.1208		2,660.2994
Total	**1.1139**	**5.5078**	**17.1507**	**0.0499**	**3.0421**	**0.0934**	**3.1355**	**0.8244**	**0.0861**	**0.9105**		**4,029.7897**	**4,029.7897**	**0.1308**		**4,032.5373**

3.17 P8-AC - 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	137.0852					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	**137.3838**	**2.0058**	**1.8542**	**2.9700e-003**		**0.1506**	**0.1506**		**0.1506**	**0.1506**		**281.4485**	**281.4485**	**0.0267**		**282.0102**

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	0.1353	0.2198	2.2874	7.0500e-003	0.6171	4.0600e-003	0.6212	0.1637	3.7600e-003	0.1674		546.0222	546.0222	0.0252		546.5506
Total	**0.1353**	**0.2198**	**2.2874**	**7.0500e-003**	**0.6171**	**4.0600e-003**	**0.6212**	**0.1637**	**3.7600e-003**	**0.1674**		**546.0222**	**546.0222**	**0.0252**		**546.5506**

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	137.0852					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	0.0000	281.4485	281.4485	0.0267		282.0102
Total	**137.3838**	**2.0058**	**1.8542**	**2.9700e-003**		**0.1506**	**0.1506**		**0.1506**	**0.1506**	**0.0000**	**281.4485**	**281.4485**	**0.0267**		**282.0102**

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	0.1353	0.2198	2.2874	7.0500e-003	0.5313	4.0600e-003	0.5353	0.1426	3.7600e-003	0.1463		546.0222	546.0222	0.0252		546.5506
Total	**0.1353**	**0.2198**	**2.2874**	**7.0500e-003**	**0.5313**	**4.0600e-003**	**0.5353**	**0.1426**	**3.7600e-003**	**0.1463**		**546.0222**	**546.0222**	**0.0252**		**546.5506**

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	17.1229	39.0664	178.0414	0.5356	39.9225	0.5787	40.5013	10.6526	0.5340	11.1866		42,354.6837	42,354.6837	1.5899		42,388.0705
Unmitigated	17.1229	39.0664	178.0414	0.5356	39.9225	0.5787	40.5013	10.6526	0.5340	11.1866		42,354.6837	42,354.6837	1.5899		42,388.0705

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Condo/Townhouse	606.28	658.72	558.44	2,949,610	2,949,610
Health Club	171.89	108.94	139.53	395,470	395,470
High Turnover (Sit Down Restaurant)	1,446.97	1,802.25	1500.34	2,416,070	2,416,070
Parking Lot	0.00	0.00	0.00		
Recreational Swimming Pool	111.30	70.54	90.35	287,225	287,225
Regional Shopping Center	1,567.31	1,823.91	921.26	3,821,826	3,821,826
Single Family Housing	1,454.64	1,532.16	1333.04	7,038,698	7,038,698
Total	5,358.40	5,996.52	4,542.96	16,908,899	16,908,899

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
Condo/Townhouse	19.80	9.60	12.90	40.20	19.20	40.60	86	11	3
Health Club	18.50	10.10	7.90	16.90	64.10	19.00	52	39	9
High Turnover (Sit Down Restaurant)	18.50	10.10	7.90	8.50	72.50	19.00	37	20	43
Parking Lot	18.50	10.10	7.90	0.00	0.00	0.00	0	0	0
Recreational Swimming Pool	18.50	10.10	7.90	33.00	48.00	19.00	52	39	9
Regional Shopping Center	18.50	10.10	7.90	16.30	64.70	19.00	54	35	11
Single Family Housing	19.80	9.60	12.90	40.20	19.20	40.60	86	11	3

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.509471	0.056616	0.192725	0.151095	0.041772	0.005913	0.015766	0.015535	0.001447	0.002155	0.004735	0.000502	0.002269

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	lb/day										lb/day					
NaturalGas Mitigated	0.2668	2.3315	1.3466	0.0146		0.1844	0.1844		0.1844	0.1844		2,910.8052	2,910.8052	0.0558	0.0534	2,928.5199
NaturalGas Unmitigated	0.2668	2.3315	1.3466	0.0146		0.1844	0.1844		0.1844	0.1844		2,910.8052	2,910.8052	0.0558	0.0534	2,928.5199

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					
Condo/Townhouse	3988.81	0.0430	0.3676	0.1564	2.3500e-003		0.0297	0.0297		0.0297	0.0297		469.2718	469.2718	8.9900e-003	8.6000e-003	472.1277
Health Club	309.482	3.3400e-003	0.0303	0.0255	1.8000e-004		2.3100e-003	2.3100e-003		2.3100e-003	2.3100e-003		36.4096	36.4096	7.0000e-004	6.7000e-004	36.6312
High Turnover (Sit Down Restaurant)	8210.36	0.0885	0.8049	0.6762	4.8300e-003		0.0612	0.0612		0.0612	0.0612		965.9242	965.9242	0.0185	0.0177	971.8026
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
Recreational Swimming Pool	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
Regional Shopping Center	205	2.2100e-003	0.0201	0.0169	1.2000e-004		1.5300e-003	1.5300e-003		1.5300e-003	1.5300e-003		24.1177	24.1177	4.6000e-004	4.4000e-004	24.2644
Single Family Housing	12028.2	0.1297	1.1085	0.4717	7.0800e-003		0.0896	0.0896		0.0896	0.0896		1,415.0820	1,415.0820	0.0271	0.0259	1,423.6940
Total		**0.2668**	**2.3315**	**1.3466**	**0.0146**		**0.1844**	**0.1844**		**0.1844**	**0.1844**		**2,910.8052**	**2,910.8052**	**0.0558**	**0.0534**	**2,928.5199**

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					
Health Club	0.309482	3.3400e-003	0.0303	0.0255	1.8000e-004		2.3100e-003	2.3100e-003		2.3100e-003	2.3100e-003		36.4096	36.4096	7.0000e-004	6.7000e-004	36.6312
High Turnover (Sit Down Restaurant)	8.21036	0.0885	0.8049	0.6762	4.8300e-003		0.0612	0.0612		0.0612	0.0612		965.9242	965.9242	0.0185	0.0177	971.8026
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
Recreational Swimming Pool	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
Regional Shopping Center	0.205	2.2100e-003	0.0201	0.0169	1.2000e-004		1.5300e-003	1.5300e-003		1.5300e-003	1.5300e-003		24.1177	24.1177	4.6000e-004	4.4000e-004	24.2644
Single Family Housing	12.0282	0.1297	1.1085	0.4717	7.0800e-003		0.0896	0.0896		0.0896	0.0896		1,415.0820	1,415.0820	0.0271	0.0259	1,423.6940
Condo/Townhouse	3.98881	0.0430	0.3676	0.1564	2.3500e-003		0.0297	0.0297		0.0297	0.0297		469.2718	469.2718	8.9900e-003	8.6000e-003	472.1277
Total		**0.2668**	**2.3315**	**1.3466**	**0.0146**		**0.1844**	**0.1844**		**0.1844**	**0.1844**		**2,910.8052**	**2,910.8052**	**0.0558**	**0.0534**	**2,928.5199**

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	79.4258	1.8569	142.9170	0.1962		18.7498	18.7498		18.7468	18.7468	2,285.5281	4,428.3368	6,713.8649	6.8517	0.1551	6,905.8397
Unmitigated	79.4258	1.8569	142.9170	0.1962		18.7498	18.7498		18.7468	18.7468	2,285.5281	4,428.3368	6,713.8649	6.8517	0.1551	6,905.8397

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	1.4159					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	13.4498					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	63.9368	1.6222	122.6446	0.1951		18.6388	18.6388		18.6358	18.6358	2,285.5281	4,392.0000	6,677.5281	6.8159	0.1551	6,868.7506
Landscaping	0.6233	0.2347	20.2724	1.0700e-003		0.1110	0.1110		0.1110	0.1110		36.3368	36.3368	0.0358		37.0891
Total	**79.4258**	**1.8569**	**142.9170**	**0.1962**		**18.7498**	**18.7498**		**18.7468**	**18.7468**	**2,285.5281**	**4,428.3368**	**6,713.8649**	**6.8517**	**0.1551**	**6,905.8397**

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	1.4159					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	13.4498					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	63.9368	1.6222	122.6446	0.1951		18.6388	18.6388		18.6358	18.6358	2,285.5281	4,392.0000	6,677.5281	6.8159	0.1551	6,868.7506
Landscaping	0.6233	0.2347	20.2724	1.0700e-003		0.1110	0.1110		0.1110	0.1110		36.3368	36.3368	0.0358		37.0891
Total	**79.4258**	**1.8569**	**142.9170**	**0.1962**		**18.7498**	**18.7498**		**18.7468**	**18.7468**	**2,285.5281**	**4,428.3368**	**6,713.8649**	**6.8517**	**0.1551**	**6,905.8397**

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

Cypress - Paving

Orange County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	355.00	Space	5.00	142,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	30
Climate Zone	8			**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 - Cover all of non-residential space

Construction Phase - specified by client

Off-road Equipment - Specified by client

Construction Off-road Equipment Mitigation - .

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	16
tblConstructionPhase	NumDays	18.00	50.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblLandUse	LotAcreage	3.19	5.00
tblOffRoadEquipment	HorsePower	125.00	89.00

tblOffRoadEquipment	HorsePower	130.00	82.00
tblOffRoadEquipment	HorsePower	80.00	84.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblProjectCharacteristics	OperationalYear	2014	2019

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					
2016	1.9739	15.2685	10.6863	0.0148	0.1677	1.1560	1.3237	0.0445	1.0635	1.1080	0.0000	1,494.1936	1,494.1936	0.4074	0.0000	1,502.7484
Total	**1.9739**	**15.2685**	**10.6863**	**0.0148**	**0.1677**	**1.1560**	**1.3237**	**0.0445**	**1.0635**	**1.1080**	**0.0000**	**1,494.1936**	**1,494.1936**	**0.4074**	**0.0000**	**1,502.7484**

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					
2016	1.9739	15.2685	10.6863	0.0148	0.1443	1.1560	1.3004	0.0387	1.0635	1.1023	0.0000	1,494.1936	1,494.1936	0.4074	0.0000	1,502.7484
Total	**1.9739**	**15.2685**	**10.6863**	**0.0148**	**0.1443**	**1.1560**	**1.3004**	**0.0387**	**1.0635**	**1.1023**	**0.0000**	**1,494.1936**	**1,494.1936**	**0.4074**	**0.0000**	**1,502.7484**

	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**	**13.91**	**0.00**	**1.76**	**12.89**	**0.00**	**0.52**	**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	2.8421	3.4000e-004	0.0366	0.0000		1.3000e-004	1.3000e-004		1.3000e-004	1.3000e-004		0.0777	0.0777	2.1000e-004		0.0821
Energy	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
Mobile	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	**2.8421**	**3.4000e-004**	**0.0366**	**0.0000**	**0.0000**	**1.3000e-004**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**1.3000e-004**		**0.0777**	**0.0777**	**2.1000e-004**	**0.0000**	**0.0821**

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	2.8421	3.4000e-004	0.0366	0.0000		1.3000e-004	1.3000e-004		1.3000e-004	1.3000e-004		0.0777	0.0777	2.1000e-004		0.0821
Energy	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
Mobile	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	2.8421	3.4000e-004	0.0366	0.0000	0.0000	1.3000e-004	1.3000e-004	0.0000	1.3000e-004	1.3000e-004		0.0777	0.0777	2.1000e-004	0.0000	0.0821

	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	Paving	Paving	9/17/2016	11/14/2016	6	50	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Paving	Pavers	2	6.00	89	0.42
Paving	Paving Equipment	2	6.00	82	0.36
Paving	Rollers	2	6.00	84	0.38

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
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Paving - 2016

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	1.6599	15.2013	9.8628	0.0127		1.1548	1.1548		1.0625	1.0625		1,324.0034	1,324.0034	0.3994		1,332.3901
Paving	0.2620					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.9219**	**15.2013**	**9.8628**	**0.0127**		**1.1548**	**1.1548**		**1.0625**	**1.0625**		**1,324.0034**	**1,324.0034**	**0.3994**		**1,332.3901**

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	0.0520	0.0672	0.8235	2.0400e-003	0.1677	1.1700e-003	0.1688	0.0445	1.0800e-003	0.0455		170.1902	170.1902	8.0000e-003		170.3583
Total	**0.0520**	**0.0672**	**0.8235**	**2.0400e-003**	**0.1677**	**1.1700e-003**	**0.1688**	**0.0445**	**1.0800e-003**	**0.0455**		**170.1902**	**170.1902**	**8.0000e-003**		**170.3583**

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	1.6599	15.2013	9.8628	0.0127		1.1548	1.1548		1.0625	1.0625	0.0000	1,324.0034	1,324.0034	0.3994		1,332.3901
Paving	0.2620					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.9219**	**15.2013**	**9.8628**	**0.0127**		**1.1548**	**1.1548**		**1.0625**	**1.0625**	**0.0000**	**1,324.0034**	**1,324.0034**	**0.3994**		**1,332.3901**

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	0.0520	0.0672	0.8235	2.0400e-003	0.1443	1.1700e-003	0.1455	0.0387	1.0800e-003	0.0398		170.1902	170.1902	8.0000e-003		170.3583
Total	**0.0520**	**0.0672**	**0.8235**	**2.0400e-003**	**0.1443**	**1.1700e-003**	**0.1455**	**0.0387**	**1.0800e-003**	**0.0398**		**170.1902**	**170.1902**	**8.0000e-003**		**170.3583**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

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					
Mitigated	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
Unmitigated	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

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Parking Lot	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

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
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.509471	0.056616	0.192725	0.151095	0.041772	0.005913	0.015766	0.015535	0.001447	0.002155	0.004735	0.000502	0.002269

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	lb/day										lb/day					
NaturalGas Mitigated	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
NaturalGas Unmitigated	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

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					
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
Total		**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**

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
Total		**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**

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	2.8421	3.4000e-004	0.0366	0.0000		1.3000e-004	1.3000e-004		1.3000e-004	1.3000e-004		0.0777	0.0777	2.1000e-004		0.0821
Unmitigated	2.8421	3.4000e-004	0.0366	0.0000		1.3000e-004	1.3000e-004		1.3000e-004	1.3000e-004		0.0777	0.0777	2.1000e-004		0.0821

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	0.0271					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	2.8116					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	3.4700e-003	3.4000e-004	0.0366	0.0000		1.3000e-004	1.3000e-004		1.3000e-004	1.3000e-004		0.0777	0.0777	2.1000e-004		0.0821
Total	**2.8421**	**3.4000e-004**	**0.0366**	**0.0000**		**1.3000e-004**	**1.3000e-004**		**1.3000e-004**	**1.3000e-004**		**0.0777**	**0.0777**	**2.1000e-004**		**0.0821**

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	0.0271					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	2.8116					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	3.4700e-003	3.4000e-004	0.0366	0.0000		1.3000e-004	1.3000e-004		1.3000e-004	1.3000e-004		0.0777	0.0777	2.1000e-004		0.0821
Total	**2.8421**	**3.4000e-004**	**0.0366**	**0.0000**		**1.3000e-004**	**1.3000e-004**		**1.3000e-004**	**1.3000e-004**		**0.0777**	**0.0777**	**2.1000e-004**		**0.0821**

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

Cypress - Paving

Orange County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	355.00	Space	5.00	142,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	30
Climate Zone	8			**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 - Cover all of non-residential space

Construction Phase - specified by client

Off-road Equipment - Specified by client

Construction Off-road Equipment Mitigation - .

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	16
tblConstructionPhase	NumDays	18.00	50.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblLandUse	LotAcreage	3.19	5.00
tblOffRoadEquipment	HorsePower	125.00	89.00

tblOffRoadEquipment	HorsePower	80.00	84.00
tblOffRoadEquipment	HorsePower	130.00	82.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblProjectCharacteristics	OperationalYear	2014	2019

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					
2016	1.9766	15.2752	10.6385	0.0147	0.1677	1.1560	1.3237	0.0445	1.0635	1.1080	0.0000	1,485.1886	1,485.1886	0.4074	0.0000	1,493.7433
Total	**1.9766**	**15.2752**	**10.6385**	**0.0147**	**0.1677**	**1.1560**	**1.3237**	**0.0445**	**1.0635**	**1.1080**	**0.0000**	**1,485.1886**	**1,485.1886**	**0.4074**	**0.0000**	**1,493.7433**

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					
2016	1.9766	15.2752	10.6385	0.0147	0.1443	1.1560	1.3004	0.0387	1.0635	1.1023	0.0000	1,485.1886	1,485.1886	0.4074	0.0000	1,493.7433
Total	**1.9766**	**15.2752**	**10.6385**	**0.0147**	**0.1443**	**1.1560**	**1.3004**	**0.0387**	**1.0635**	**1.1023**	**0.0000**	**1,485.1886**	**1,485.1886**	**0.4074**	**0.0000**	**1,493.7433**

	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**	**13.91**	**0.00**	**1.76**	**12.89**	**0.00**	**0.52**	**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	2.8421	3.4000e-004	0.0366	0.0000		1.3000e-004	1.3000e-004		1.3000e-004	1.3000e-004		0.0777	0.0777	2.1000e-004		0.0821
Energy	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
Mobile	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	**2.8421**	**3.4000e-004**	**0.0366**	**0.0000**	**0.0000**	**1.3000e-004**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**1.3000e-004**		**0.0777**	**0.0777**	**2.1000e-004**	**0.0000**	**0.0821**

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	2.8421	3.4000e-004	0.0366	0.0000		1.3000e-004	1.3000e-004		1.3000e-004	1.3000e-004		0.0777	0.0777	2.1000e-004		0.0821
Energy	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
Mobile	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	2.8421	3.4000e-004	0.0366	0.0000	0.0000	1.3000e-004	1.3000e-004	0.0000	1.3000e-004	1.3000e-004		0.0777	0.0777	2.1000e-004	0.0000	0.0821

	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	Paving	Paving	9/17/2016	11/14/2016	6	50	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Paving	Pavers	2	6.00	89	0.42
Paving	Rollers	2	6.00	84	0.38
Paving	Paving Equipment	2	6.00	82	0.36

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
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Paving - 2016

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	1.6599	15.2013	9.8628	0.0127		1.1548	1.1548		1.0625	1.0625		1,324.0034	1,324.0034	0.3994		1,332.3901
Paving	0.2620					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.9219**	**15.2013**	**9.8628**	**0.0127**		**1.1548**	**1.1548**		**1.0625**	**1.0625**		**1,324.0034**	**1,324.0034**	**0.3994**		**1,332.3901**

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	0.0548	0.0739	0.7757	1.9300e-003	0.1677	1.1700e-003	0.1688	0.0445	1.0800e-003	0.0455		161.1852	161.1852	8.0000e-003		161.3532
Total	**0.0548**	**0.0739**	**0.7757**	**1.9300e-003**	**0.1677**	**1.1700e-003**	**0.1688**	**0.0445**	**1.0800e-003**	**0.0455**		**161.1852**	**161.1852**	**8.0000e-003**		**161.3532**

Mitigated Construction On-Site

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					
Off-Road	1.6599	15.2013	9.8628	0.0127		1.1548	1.1548		1.0625	1.0625	0.0000	1,324.0034	1,324.0034	0.3994		1,332.3901
Paving	0.2620					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.9219**	**15.2013**	**9.8628**	**0.0127**		**1.1548**	**1.1548**		**1.0625**	**1.0625**	**0.0000**	**1,324.0034**	**1,324.0034**	**0.3994**		**1,332.3901**

Mitigated Construction Off-Site

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					
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	0.0548	0.0739	0.7757	1.9300e-003	0.1443	1.1700e-003	0.1455	0.0387	1.0800e-003	0.0398		161.1852	161.1852	8.0000e-003		161.3532
Total	**0.0548**	**0.0739**	**0.7757**	**1.9300e-003**	**0.1443**	**1.1700e-003**	**0.1455**	**0.0387**	**1.0800e-003**	**0.0398**		**161.1852**	**161.1852**	**8.0000e-003**		**161.3532**

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	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
Unmitigated	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

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Parking Lot	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

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
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.509471	0.056616	0.192725	0.151095	0.041772	0.005913	0.015766	0.015535	0.001447	0.002155	0.004735	0.000502	0.002269

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	lb/day										lb/day					
NaturalGas Mitigated	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
NaturalGas Unmitigated	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

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					
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
Total		**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**

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
Total		**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**

6.0 Area Detail

6.1 Mitigation Measures Area

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					
Mitigated	2.8421	3.4000e-004	0.0366	0.0000		1.3000e-004	1.3000e-004		1.3000e-004	1.3000e-004		0.0777	0.0777	2.1000e-004		0.0821
Unmitigated	2.8421	3.4000e-004	0.0366	0.0000		1.3000e-004	1.3000e-004		1.3000e-004	1.3000e-004		0.0777	0.0777	2.1000e-004		0.0821

6.2 Area by SubCategory

Unmitigated

SubCategory	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					
Architectural Coating	0.0271					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	2.8116					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	3.4700e-003	3.4000e-004	0.0366	0.0000		1.3000e-004	1.3000e-004		1.3000e-004	1.3000e-004		0.0777	0.0777	2.1000e-004		0.0821
Total	**2.8421**	**3.4000e-004**	**0.0366**	**0.0000**		**1.3000e-004**	**1.3000e-004**		**1.3000e-004**	**1.3000e-004**		**0.0777**	**0.0777**	**2.1000e-004**		**0.0821**

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	0.0271					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	2.8116					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	3.4700e-003	3.4000e-004	0.0366	0.0000		1.3000e-004	1.3000e-004		1.3000e-004	1.3000e-004		0.0777	0.0777	2.1000e-004		0.0821
Total	**2.8421**	**3.4000e-004**	**0.0366**	**0.0000**		**1.3000e-004**	**1.3000e-004**		**1.3000e-004**	**1.3000e-004**		**0.0777**	**0.0777**	**2.1000e-004**		**0.0821**

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

Cypress - Operational CAPs - 2019 Project Scenario

Orange County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	355.00	Space	5.00	142,000.00	0
Health Club	5.22	1000sqft	0.00	5,216.00	0
High Turnover (Sit Down Restaurant)	11.38	1000sqft	0.00	11,376.00	0
Recreational Swimming Pool	3.38	1000sqft	0.00	3,375.00	0
Condo/Townhouse	92.00	Dwelling Unit	0.00	161,581.00	161
Single Family Housing	152.00	Dwelling Unit	28.00	319,230.00	266
Regional Shopping Center	36.50	1000sqft	0.00	36,500.00	0

1.2 Other Project Characteristics

Urbanization Urban **Wind Speed (m/s)** 2.2 **Precipitation Freq (Days)** 30

Climate Zone 8 **Operational Year** 2019

Utility Company Southern California Edison

CO2 Intensity (lb/MWhr) 501.9 **CH4 Intensity (lb/MWhr)** 0.029 **N2O Intensity (lb/MWhr)** 0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - 20% RPS by 2013

Land Use - Acreage and number of units provided in data request. Parking lot size from project description. Assumes provided 5 acre value for commercial includes parking

Construction Phase - Phasing provided by client

Off-road Equipment - Provided by client

Off-road Equipment - Amount and hours provided by client

Grading - Provided by client

Architectural Coating - Client has committed to low-VOC coatings

Vehicle Trips - Residential and commercial trip rates provided by client. Assume health club and pool are for residents only, and will generate no external trips

Vechicle Emission Factors - Removal of Pavley and LCFS

Vechicle Emission Factors - ACC adjustment

Vechicle Emission Factors - ACC adjustment

Woodstoves - Provided by client

Area Coating - Provided by client

Energy Use - 2014 Title 24 Standard

Water And Wastewater -

Solid Waste -

Land Use Change -

Sequestration -

Construction Off-road Equipment Mitigation - Provided by client

Area Mitigation - .

Energy Mitigation -

Waste Mitigation -

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_EF_Nonresidential_Exterior	250	100
tblAreaMitigation	UseLowVOCPaintNonresidentialInteriorValue	250	50
tblConstructionPhase	NumDays	45.00	0.00
tblEnergyUse	T24E	197.21	151.26
tblEnergyUse	T24E	1.99	1.56
tblEnergyUse	T24E	10.64	8.32
tblEnergyUse	T24E	3.58	2.80
tblEnergyUse	T24E	391.02	248.69
tblEnergyUse	T24NG	12,874.17	12,384.95
tblEnergyUse	T24NG	14.78	12.30
tblEnergyUse	T24NG	82.67	68.78
tblEnergyUse	T24NG	1.00	0.83

tblEnergyUse	T24NG	23,064.50	21,565.31
tblFireplaces	FireplaceWoodMass	1,019.20	0.00
tblFireplaces	FireplaceWoodMass	1,019.20	0.00
tblFireplaces	NumberGas	78.20	92.00
tblFireplaces	NumberGas	129.20	152.00
tblFireplaces	NumberNoFireplace	9.20	0.00
tblFireplaces	NumberNoFireplace	15.20	0.00
tblFireplaces	NumberWood	4.60	0.00
tblFireplaces	NumberWood	7.60	0.00
tblGrading	AcresOfGrading	0.00	112.50
tblLandUse	LandUseSquareFeet	5,220.00	5,216.00
tblLandUse	LandUseSquareFeet	11,380.00	11,376.00
tblLandUse	LandUseSquareFeet	3,380.00	3,375.00
tblLandUse	LandUseSquareFeet	92,000.00	161,581.00
tblLandUse	LandUseSquareFeet	273,600.00	319,230.00
tblLandUse	LotAcreage	3.19	5.00
tblLandUse	LotAcreage	0.12	0.00
tblLandUse	LotAcreage	0.26	0.00
tblLandUse	LotAcreage	0.08	0.00
tblLandUse	LotAcreage	5.75	0.00
tblLandUse	LotAcreage	49.35	28.00
tblLandUse	LotAcreage	0.84	0.00
tblLandUse	Population	263.00	161.00
tblLandUse	Population	435.00	266.00
tblProjectCharacteristics	CO2IntensityFactor	630.89	501.9
tblProjectCharacteristics	OperationalYear	2014	2019
tblSequestration	NumberOfNewTrees	0.00	508.00
tblTripsAndVMT	HaulingTripNumber	0.00	10,000.00
tblVehicleTrips	ST_TR	7.16	2.24
tblVehicleTrips	ST_TR	20.87	0.00

tblVehicleTrips	ST_TR	158.37	136.20
tblVehicleTrips	ST_TR	20.87	0.00
tblVehicleTrips	ST_TR	49.97	42.97
tblVehicleTrips	ST_TR	10.08	2.35
tblVehicleTrips	SU_TR	6.07	2.44
tblVehicleTrips	SU_TR	26.73	0.00
tblVehicleTrips	SU_TR	131.84	113.38
tblVehicleTrips	SU_TR	26.73	0.00
tblVehicleTrips	SU_TR	25.24	21.71
tblVehicleTrips	SU_TR	8.77	2.00
tblVehicleTrips	WD_TR	6.59	2.95
tblVehicleTrips	WD_TR	32.93	0.00
tblVehicleTrips	WD_TR	127.15	109.34
tblVehicleTrips	WD_TR	32.93	0.00
tblVehicleTrips	WD_TR	42.94	36.73
tblVehicleTrips	WD_TR	9.57	3.16
tblWoodstoves	NumberCatalytic	4.60	0.00
tblWoodstoves	NumberCatalytic	7.60	0.00
tblWoodstoves	NumberNoncatalytic	4.60	0.00
tblWoodstoves	NumberNoncatalytic	7.60	0.00
tblWoodstoves	WoodstoveWoodMass	999.60	0.00
tblWoodstoves	WoodstoveWoodMass	999.60	0.00

2.0 Emissions Summary

	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**

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	15.9047	0.2347	20.2983	1.0700e-003		0.4383	0.4383		0.4348	0.4348	0.0000	5,203.3956	5,203.3956	0.1349	0.0947	5,235.5938
Energy	0.2535	2.2150	1.2773	0.0138		0.1752	0.1752		0.1752	0.1752		2,765.7206	2,765.7206	0.0530	0.0507	2,782.5523
Mobile	9.2919	17.0974	84.3672	0.2427	17.0600	0.2559	17.3159	4.5522	0.2362	4.7883		19,163.1602	19,163.1602	0.7060		19,177.9868
Total	**25.4501**	**19.5471**	**105.9428**	**0.2576**	**17.0600**	**0.8694**	**17.9293**	**4.5522**	**0.8461**	**5.3983**	**0.0000**	**27,132.2765**	**27,132.2765**	**0.8939**	**0.1454**	**27,196.1328**

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	15.6734	0.2347	20.2983	1.0700e-003		0.4383	0.4383		0.4348	0.4348	0.0000	5,203.3956	5,203.3956	0.1349	0.0947	5,235.5938
Energy	0.2535	2.2150	1.2773	0.0138		0.1752	0.1752		0.1752	0.1752		2,765.7206	2,765.7206	0.0530	0.0507	2,782.5523
Mobile	9.2919	17.0974	84.3672	0.2427	17.0600	0.2559	17.3159	4.5522	0.2362	4.7883		19,163.1602	19,163.1602	0.7060		19,177.9868
Total	**25.2187**	**19.5471**	**105.9428**	**0.2576**	**17.0600**	**0.8694**	**17.9293**	**4.5522**	**0.8461**	**5.3983**	**0.0000**	**27,132.2765**	**27,132.2765**	**0.8939**	**0.1454**	**27,196.1328**

	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	**0.91**	**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	Grading	Grading	1/1/2016	12/31/2015	5	0	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 112.5

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
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

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
Grading	8	20.00	0.00	10,000.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

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					
Unmitigated	9.2919	17.0974	84.3672	0.2427	17.0600	0.2559	17.3159	4.5522	0.2362	4.7883		19,163.1602	19,163.1602	0.7060		19,177.9868
Mitigated	9.2919	17.0974	84.3672	0.2427	17.0600	0.2559	17.3159	4.5522	0.2362	4.7883		19,163.1602	19,163.1602	0.7060		19,177.9868

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Condo/Townhouse	271.40	206.08	224.48	872,623	872,623
Health Club	0.00	0.00	0.00		
High Turnover (Sit Down Restaurant)	1,244.29	1,549.96	1290.26	1,764,217	1,764,217
Parking Lot	0.00	0.00	0.00		
Recreational Swimming Pool	0.00	0.00	0.00		
Regional Shopping Center	1,340.65	1,568.41	792.42	2,800,588	2,800,588
Single Family Housing	480.32	357.20	304.00	1,495,150	1,495,150
Total	3,336.65	3,681.64	2,611.16	6,932,578	6,932,578

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
Condo/Townhouse	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Health Club	16.60	8.40	6.90	16.90	64.10	19.00	52	39	9
High Turnover (Sit Down Restaurant)	16.60	8.40	6.90	8.50	72.50	19.00	37	20	43
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Recreational Swimming Pool	16.60	8.40	6.90	33.00	48.00	19.00	52	39	9
Regional Shopping Center	16.60	8.40	6.90	16.30	64.70	19.00	54	35	11
Single Family Housing	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.509471	0.056616	0.192725	0.151095	0.041772	0.005913	0.015766	0.015535	0.001447	0.002155	0.004735	0.000502	0.002269

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

Install High Efficiency Lighting

Install Energy Efficient Appliances

	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	0.2535	2.2150	1.2773	0.0138		0.1752	0.1752		0.1752	0.1752		2,765.7206	2,765.7206	0.0530	0.0507	2,782.5523
NaturalGas Unmitigated	0.2535	2.2150	1.2773	0.0138		0.1752	0.1752		0.1752	0.1752		2,765.7206	2,765.7206	0.0530	0.0507	2,782.5523

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					
Condo/Townhouse	3865.5	0.0417	0.3562	0.1516	2.2700e-003		0.0288	0.0288		0.0288	0.0288		454.7647	454.7647	8.7200e-003	8.3400e-003	457.5323
Health Club	273.804	2.9500e-003	0.0268	0.0226	1.6000e-004		2.0400e-003	2.0400e-003		2.0400e-003	2.0400e-003		32.2123	32.2123	6.2000e-004	5.9000e-004	32.4083

High Turnover (Sit Down Restaurant)	7777.44	0.0839	0.7625	0.6405	4.5700e-003		0.0580	0.0580		0.0580	0.0580		914.9934	914.9934	0.0175	0.0168	920.5619
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
Recreational Swimming Pool	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
Regional Shopping Center	188	2.0300e-003	0.0184	0.0155	1.1000e-004		1.4000e-003	1.4000e-003		1.4000e-003	1.4000e-003		22.1177	22.1177	4.2000e-004	4.1000e-004	22.2523
Single Family Housing	11403.9	0.1230	1.0510	0.4472	6.7100e-003		0.0850	0.0850		0.0850	0.0850		1,341.6326	1,341.6326	0.0257	0.0246	1,349.7976
Total		**0.2535**	**2.2149**	**1.2773**	**0.0138**		**0.1752**	**0.1752**		**0.1752**	**0.1752**		**2,765.7206**	**2,765.7206**	**0.0530**	**0.0507**	**2,782.5523**

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					
Condo/Townhouse	3.8655	0.0417	0.3562	0.1516	2.2700e-003		0.0288	0.0288		0.0288	0.0288		454.7647	454.7647	8.7200e-003	8.3400e-003	457.5323
Health Club	0.273804	2.9500e-003	0.0268	0.0226	1.6000e-004		2.0400e-003	2.0400e-003		2.0400e-003	2.0400e-003		32.2123	32.2123	6.2000e-004	5.9000e-004	32.4083
High Turnover (Sit Down Restaurant)	7.77744	0.0839	0.7625	0.6405	4.5700e-003		0.0580	0.0580		0.0580	0.0580		914.9934	914.9934	0.0175	0.0168	920.5619
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
Recreational Swimming Pool	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
Regional Shopping Center	0.188	2.0300e-003	0.0184	0.0155	1.1000e-004		1.4000e-003	1.4000e-003		1.4000e-003	1.4000e-003		22.1177	22.1177	4.2000e-004	4.1000e-004	22.2523
Single Family Housing	11.4039	0.1230	1.0510	0.4472	6.7100e-003		0.0850	0.0850		0.0850	0.0850		1,341.6326	1,341.6326	0.0257	0.0246	1,349.7976
Total		**0.2535**	**2.2149**	**1.2773**	**0.0138**		**0.1752**	**0.1752**		**0.1752**	**0.1752**		**2,765.7206**	**2,765.7206**	**0.0530**	**0.0507**	**2,782.5523**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

Use only Natural Gas Hearths

	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					
Unmitigated	15.9047	0.2347	20.2983	1.0700e-003		0.4383	0.4383		0.4348	0.4348	0.0000	5,203.3956	5,203.3956	0.1349	0.0947	5,235.5938
Mitigated	15.6734	0.2347	20.2983	1.0700e-003		0.4383	0.4383		0.4348	0.4348	0.0000	5,203.3956	5,203.3956	0.1349	0.0947	5,235.5938

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	1.3581					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	13.4497					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.4737	2.0000e-005	0.0258	0.0000		0.3273	0.3273		0.3238	0.3238	0.0000	5,167.0588	5,167.0588	0.0990	0.0947	5,198.5047
Landscaping	0.6233	0.2347	20.2724	1.0700e-003		0.1110	0.1110		0.1110	0.1110		36.3368	36.3368	0.0358		37.0891
Total	**15.9047**	**0.2347**	**20.2983**	**1.0700e-003**		**0.4383**	**0.4383**		**0.4348**	**0.4348**	**0.0000**	**5,203.3956**	**5,203.3956**	**0.1349**	**0.0947**	**5,235.5938**

Mitigated

SubCategory	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					
Architectural Coating	1.1267					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	13.4497					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.4737	2.0000e-005	0.0258	0.0000		0.3273	0.3273		0.3238	0.3238	0.0000	5,167.0588	5,167.0588	0.0990	0.0947	5,198.5047
Landscaping	0.6233	0.2347	20.2724	1.0700e-003		0.1110	0.1110		0.1110	0.1110		36.3368	36.3368	0.0358		37.0891
Total	**15.6734**	**0.2347**	**20.2983**	**1.0700e-003**		**0.4383**	**0.4383**		**0.4348**	**0.4348**	**0.0000**	**5,203.3956**	**5,203.3956**	**0.1349**	**0.0947**	**5,235.5938**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

9.0 Operational Offroad

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

10.0 Vegetation

Cypress - Operational CAPs - 2019 Project Scenario

Orange County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	355.00	Space	5.00	142,000.00	0
Health Club	5.22	1000sqft	0.00	5,216.00	0
High Turnover (Sit Down Restaurant)	11.38	1000sqft	0.00	11,376.00	0
Recreational Swimming Pool	3.38	1000sqft	0.00	3,375.00	0
Condo/Townhouse	92.00	Dwelling Unit	0.00	161,581.00	161
Single Family Housing	152.00	Dwelling Unit	28.00	319,230.00	266
Regional Shopping Center	36.50	1000sqft	0.00	36,500.00	0

1.2 Other Project Characteristics

Urbanization Urban

Wind Speed (m/s) 2.2

Precipitation Freq (Days) 30

Climate Zone 8

Operational Year 2019

Utility Company Southern California Edison

CO2 Intensity (lb/MWhr) 501.9

CH4 Intensity (lb/MWhr) 0.029

N2O Intensity (lb/MWhr) 0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - 20% RPS by 2013

Land Use - Acreage and number of units provided in data request. Parking lot size from project description. Assumes provided 5 acre value for commercial includes parking

Construction Phase - Phasing provided by client

Off-road Equipment - Provided by client

Off-road Equipment - Amount and hours provided by client

Grading - Provided by client

Architectural Coating - Client has committed to low-VOC coatings

Vehicle Trips - Residential and commercial trip rates provided by client. Assume health club and pool are for residents only, and will generate no external trips

Vechicle Emission Factors - Removal of Pavley and LCFS

Vechicle Emission Factors - ACC adjustment

Vechicle Emission Factors - ACC adjustment

Woodstoves - Provided by client

Area Coating - Provided by client

Energy Use - 2014 Title 24 Standard

Water And Wastewater -

Solid Waste -

Land Use Change -

Sequestration -

Construction Off-road Equipment Mitigation - Provided by client

Area Mitigation - .

Energy Mitigation -

Waste Mitigation -

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_EF_Nonresidential_Exterior	250	100
tblAreaMitigation	UseLowVOCPaintNonresidentialInteriorValue	250	50
tblConstructionPhase	NumDays	45.00	0.00
tblEnergyUse	T24E	197.21	151.26
tblEnergyUse	T24E	1.99	1.56
tblEnergyUse	T24E	10.64	8.32
tblEnergyUse	T24E	3.58	2.80
tblEnergyUse	T24E	391.02	248.69
tblEnergyUse	T24NG	12,874.17	12,384.95
tblEnergyUse	T24NG	14.78	12.30
tblEnergyUse	T24NG	82.67	68.78
tblEnergyUse	T24NG	1.00	0.83

tblEnergyUse	T24NG	23,064.50	21,565.31
tblFireplaces	FireplaceWoodMass	1,019.20	0.00
tblFireplaces	FireplaceWoodMass	1,019.20	0.00
tblFireplaces	NumberGas	78.20	92.00
tblFireplaces	NumberGas	129.20	152.00
tblFireplaces	NumberNoFireplace	9.20	0.00
tblFireplaces	NumberNoFireplace	15.20	0.00
tblFireplaces	NumberWood	4.60	0.00
tblFireplaces	NumberWood	7.60	0.00
tblGrading	AcresOfGrading	0.00	112.50
tblLandUse	LandUseSquareFeet	5,220.00	5,216.00
tblLandUse	LandUseSquareFeet	11,380.00	11,376.00
tblLandUse	LandUseSquareFeet	3,380.00	3,375.00
tblLandUse	LandUseSquareFeet	92,000.00	161,581.00
tblLandUse	LandUseSquareFeet	273,600.00	319,230.00
tblLandUse	LotAcreage	3.19	5.00
tblLandUse	LotAcreage	0.12	0.00
tblLandUse	LotAcreage	0.26	0.00
tblLandUse	LotAcreage	0.08	0.00
tblLandUse	LotAcreage	5.75	0.00
tblLandUse	LotAcreage	49.35	28.00
tblLandUse	LotAcreage	0.84	0.00
tblLandUse	Population	263.00	161.00
tblLandUse	Population	435.00	266.00
tblProjectCharacteristics	CO2IntensityFactor	630.89	501.9
tblProjectCharacteristics	OperationalYear	2014	2019
tblSequestration	NumberOfNewTrees	0.00	508.00
tblTripsAndVMT	HaulingTripNumber	0.00	10,000.00
tblVehicleTrips	ST_TR	7.16	2.24
tblVehicleTrips	ST_TR	20.87	0.00

tblVehicleTrips	ST_TR	158.37	136.20
tblVehicleTrips	ST_TR	20.87	0.00
tblVehicleTrips	ST_TR	49.97	42.97
tblVehicleTrips	ST_TR	10.08	2.35
tblVehicleTrips	SU_TR	6.07	2.44
tblVehicleTrips	SU_TR	26.73	0.00
tblVehicleTrips	SU_TR	131.84	113.38
tblVehicleTrips	SU_TR	26.73	0.00
tblVehicleTrips	SU_TR	25.24	21.71
tblVehicleTrips	SU_TR	8.77	2.00
tblVehicleTrips	WD_TR	6.59	2.95
tblVehicleTrips	WD_TR	32.93	0.00
tblVehicleTrips	WD_TR	127.15	109.34
tblVehicleTrips	WD_TR	32.93	0.00
tblVehicleTrips	WD_TR	42.94	36.73
tblVehicleTrips	WD_TR	9.57	3.16
tblWoodstoves	NumberCatalytic	4.60	0.00
tblWoodstoves	NumberCatalytic	7.60	0.00
tblWoodstoves	NumberNoncatalytic	4.60	0.00
tblWoodstoves	NumberNoncatalytic	7.60	0.00
tblWoodstoves	WoodstoveWoodMass	999.60	0.00
tblWoodstoves	WoodstoveWoodMass	999.60	0.00

2.0 Emissions Summary

	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**

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	15.9047	0.2347	20.2983	1.0700e-003		0.4383	0.4383		0.4348	0.4348	0.0000	5,203.3956	5,203.3956	0.1349	0.0947	5,235.5938
Energy	0.2535	2.2150	1.2773	0.0138		0.1752	0.1752		0.1752	0.1752		2,765.7206	2,765.7206	0.0530	0.0507	2,782.5523
Mobile	9.8835	17.9876	86.1851	0.2319	17.0600	0.2573	17.3172	4.5522	0.2374	4.7895		18,336.2797	18,336.2797	0.7067		18,351.1195
Total	**26.0417**	**20.4373**	**107.7607**	**0.2468**	**17.0600**	**0.8707**	**17.9306**	**4.5522**	**0.8473**	**5.3995**	**0.0000**	**26,305.3959**	**26,305.3959**	**0.8945**	**0.1454**	**26,369.2656**

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	15.6734	0.2347	20.2983	1.0700e-003		0.4383	0.4383		0.4348	0.4348	0.0000	5,203.3956	5,203.3956	0.1349	0.0947	5,235.5938
Energy	0.2535	2.2150	1.2773	0.0138		0.1752	0.1752		0.1752	0.1752		2,765.7206	2,765.7206	0.0530	0.0507	2,782.5523
Mobile	9.8835	17.9876	86.1851	0.2319	17.0600	0.2573	17.3172	4.5522	0.2374	4.7895		18,336.2797	18,336.2797	0.7067		18,351.1195
Total	**25.8103**	**20.4373**	**107.7607**	**0.2468**	**17.0600**	**0.8707**	**17.9306**	**4.5522**	**0.8473**	**5.3995**	**0.0000**	**26,305.3959**	**26,305.3959**	**0.8945**	**0.1454**	**26,369.2656**

	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	**0.89**	**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	Grading	Grading	1/1/2016	12/31/2015	5	0	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 112.5

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
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

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
Grading	8	20.00	0.00	10,000.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

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					
Unmitigated	9.8835	17.9876	86.1851	0.2319	17.0600	0.2573	17.3172	4.5522	0.2374	4.7895		18,336.2797	18,336.2797	0.7067		18,351.1195
Mitigated	9.8835	17.9876	86.1851	0.2319	17.0600	0.2573	17.3172	4.5522	0.2374	4.7895		18,336.2797	18,336.2797	0.7067		18,351.1195

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Condo/Townhouse	271.40	206.08	224.48	872,623	872,623
Health Club	0.00	0.00	0.00		
High Turnover (Sit Down Restaurant)	1,244.29	1,549.96	1290.26	1,764,217	1,764,217
Parking Lot	0.00	0.00	0.00		
Recreational Swimming Pool	0.00	0.00	0.00		
Regional Shopping Center	1,340.65	1,568.41	792.42	2,800,588	2,800,588
Single Family Housing	480.32	357.20	304.00	1,495,150	1,495,150
Total	3,336.65	3,681.64	2,611.16	6,932,578	6,932,578

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
Condo/Townhouse	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Health Club	16.60	8.40	6.90	16.90	64.10	19.00	52	39	9
High Turnover (Sit Down Restaurant)	16.60	8.40	6.90	8.50	72.50	19.00	37	20	43
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Recreational Swimming Pool	16.60	8.40	6.90	33.00	48.00	19.00	52	39	9
Regional Shopping Center	16.60	8.40	6.90	16.30	64.70	19.00	54	35	11
Single Family Housing	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.509471	0.056616	0.192725	0.151095	0.041772	0.005913	0.015766	0.015535	0.001447	0.002155	0.004735	0.000502	0.002269

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

Install High Efficiency Lighting

Install Energy Efficient Appliances

	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	0.2535	2.2150	1.2773	0.0138		0.1752	0.1752		0.1752	0.1752		2,765.7206	2,765.7206	0.0530	0.0507	2,782.5523
NaturalGas Unmitigated	0.2535	2.2150	1.2773	0.0138		0.1752	0.1752		0.1752	0.1752		2,765.7206	2,765.7206	0.0530	0.0507	2,782.5523

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					
Condo/Townhouse	3865.5	0.0417	0.3562	0.1516	2.2700e-003		0.0288	0.0288		0.0288	0.0288		454.7647	454.7647	8.7200e-003	8.3400e-003	457.5323
Health Club	273.804	2.9500e-003	0.0268	0.0226	1.6000e-004		2.0400e-003	2.0400e-003		2.0400e-003	2.0400e-003		32.2123	32.2123	6.2000e-004	5.9000e-004	32.4083

High Turnover (Sit Down Restaurant)	7777.44	0.0839	0.7625	0.6405	4.5700e-003		0.0580	0.0580		0.0580	0.0580		914.9934	914.9934	0.0175	0.0168	920.5619
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
Recreational Swimming Pool	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
Regional Shopping Center	188	2.0300e-003	0.0184	0.0155	1.1000e-004		1.4000e-003	1.4000e-003		1.4000e-003	1.4000e-003		22.1177	22.1177	4.2000e-004	4.1000e-004	22.2523
Single Family Housing	11403.9	0.1230	1.0510	0.4472	6.7100e-003		0.0850	0.0850		0.0850	0.0850		1,341.6326	1,341.6326	0.0257	0.0246	1,349.7976
Total		**0.2535**	**2.2149**	**1.2773**	**0.0138**		**0.1752**	**0.1752**		**0.1752**	**0.1752**		**2,765.7206**	**2,765.7206**	**0.0530**	**0.0507**	**2,782.5523**

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					
Condo/Townhouse	3.8655	0.0417	0.3562	0.1516	2.2700e-003		0.0288	0.0288		0.0288	0.0288		454.7647	454.7647	8.7200e-003	8.3400e-003	457.5323
Health Club	0.273804	2.9500e-003	0.0268	0.0226	1.6000e-004		2.0400e-003	2.0400e-003		2.0400e-003	2.0400e-003		32.2123	32.2123	6.2000e-004	5.9000e-004	32.4083
High Turnover (Sit Down Restaurant)	7.77744	0.0839	0.7625	0.6405	4.5700e-003		0.0580	0.0580		0.0580	0.0580		914.9934	914.9934	0.0175	0.0168	920.5619
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
Recreational Swimming Pool	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
Regional Shopping Center	0.188	2.0300e-003	0.0184	0.0155	1.1000e-004		1.4000e-003	1.4000e-003		1.4000e-003	1.4000e-003		22.1177	22.1177	4.2000e-004	4.1000e-004	22.2523
Single Family Housing	11.4039	0.1230	1.0510	0.4472	6.7100e-003		0.0850	0.0850		0.0850	0.0850		1,341.6326	1,341.6326	0.0257	0.0246	1,349.7976
Total		**0.2535**	**2.2149**	**1.2773**	**0.0138**		**0.1752**	**0.1752**		**0.1752**	**0.1752**		**2,765.7206**	**2,765.7206**	**0.0530**	**0.0507**	**2,782.5523**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

Use only Natural Gas Hearths

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					
Mitigated	15.6734	0.2347	20.2983	1.0700e-003		0.4383	0.4383		0.4348	0.4348	0.0000	5,203.3956	5,203.3956	0.1349	0.0947	5,235.5938
Unmitigated	15.9047	0.2347	20.2983	1.0700e-003		0.4383	0.4383		0.4348	0.4348	0.0000	5,203.3956	5,203.3956	0.1349	0.0947	5,235.5938

6.2 Area by SubCategory

Unmitigated

SubCategory	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					
Architectural Coating	1.3581					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	13.4497					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.4737	2.0000e-005	0.0258	0.0000		0.3273	0.3273		0.3238	0.3238	0.0000	5,167.0588	5,167.0588	0.0990	0.0947	5,198.5047
Landscaping	0.6233	0.2347	20.2724	1.0700e-003		0.1110	0.1110		0.1110	0.1110		36.3368	36.3368	0.0358		37.0891
Total	**15.9047**	**0.2347**	**20.2983**	**1.0700e-003**		**0.4383**	**0.4383**		**0.4348**	**0.4348**	**0.0000**	**5,203.3956**	**5,203.3956**	**0.1349**	**0.0947**	**5,235.5938**

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	1.1267					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	13.4497					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.4737	2.0000e-005	0.0258	0.0000		0.3273	0.3273		0.3238	0.3238	0.0000	5,167.0588	5,167.0588	0.0990	0.0947	5,198.5047
Landscaping	0.6233	0.2347	20.2724	1.0700e-003		0.1110	0.1110		0.1110	0.1110		36.3368	36.3368	0.0358		37.0891
Total	**15.6734**	**0.2347**	**20.2983**	**1.0700e-003**		**0.4383**	**0.4383**		**0.4348**	**0.4348**	**0.0000**	**5,203.3956**	**5,203.3956**	**0.1349**	**0.0947**	**5,235.5938**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

9.0 Operational Offroad

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

10.0 Vegetation

Appendix B

SCREEN3 Analysis for Identified Off-site Generators

In order to determine health impacts from nearby sources on the Project, ENVIRON used the United States Environmental Protection Agency (USEPA) screening model, SCREEN3. The SCREEN3 model generates conservative air concentrations for a single source, which can be used to calculate health risk impacts.

As identified in section 3.6.1 of this report, there are two emergency generators near the Project; one to the North, at the Los Alamitos Race Course, and one to the West, at the Cottonwood Christian Center. Both of these generators have active permits in the South Coast Air Quality Management District (SCAQMD) Facility Information Detail (FIND) Database.[1] Both generators are permitted for maximum annual operation of 50 hours of maintenance and testing, and both permits provide horsepower ratings (125 hp at the Race Course, and 364 hp at the Christian Center). Information on specific location, release parameters, or emissions controls are unknown. Both engines were assumed to be Tier 2 based on permit year and rated horsepower.

SCREEN3 Model

The generators were modeled in SCREEN3 using the X/Q ("chi over Q") approach, where emissions are modeled as 1 g/s (gram per second) instead of actual emission rates. Instead of an air concentration at the receptor, the X/Q method yields a "dispersion factor" with units of concentration over emission rate. This dispersion factor can then be combined with an emission rate to calculate a concentration, using the following equation:

$$Conc = DF \; x \; ER$$

Where:

Conc = Concentration ($\mu g/m^3$)
DF = Dispersion Factor ($\mu g/m^3/g/s$)
ER = Emission Rate (g/s)

By employing this method, both generators can be modeled simultaneously. The modeled emission rate is 1 g/s, and all other parameters such as release height, release velocity, and temperature are assumed to be equal, as no specific information is available. ENVIRON assumed conservative parameter values for emergency generators, based on similar engines considered in previous ENVIRON projects. The full list of parameters and the values used can be found in **Table B-1**.

The SCREEN3 model calculates a maximum 1-hour dispersion factor for each receptor distance specified by the user. The location of the race course generator was confirmed by the client to be on the near side of the main building, to the East of the Project (see **Figure 4**). The location of the Cottonwood Christian Centre generator is unknown, so it was modeled at the shortest distance between a Cottonwood Center building and the Project boundary. The 1-hour dispersion factor was converted to an annual average dispersion factor by multiplying by 0.1, per USEPA guidance.[2]

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1 SCAQMD. 2015. FIND Database. Available at: http://www3.aqmd.gov/webappl/fim/prog/search.aspx. Accessed April 14, 2015.

2 USEPA. 2011. AERSCREEN User's Guide. March. Available at: http://www.epa.gov/scram001/models/screen/aerscreen_userguide.pdf. Accessed April 14, 2015.

Emissions Calculations

Annual diesel particulate matter (DPM) emissions for both generators were calculated using information in the permits and CARB default emission factors. Emissions were calculated via the following equation:

$$ER = EF \ x \ H \ x \ HP \ x \ C$$

Where:

ER = Emission Rate (g/s)
EF = Emission Factor (g/hp-h)
H = annual hours of operation (h)
C = unit conversion factor

The horsepower and maximum hours of operation for each generator were provided in the FIND database permits. The emission factors for each generator were selected from the CARB and USEPA Off-Road Compression-Ignition (Diesel) Engine Standards.[3] Emission factors were chosen based on the horsepower of the engine and the year the permit was issued. Both engines fall under Tier 2, based on year and rated horsepower. The emissions calculations for both generators can be found in **Table B-2**.

Health Risk Assessment

Following the methods described above, a maximum annual average DPM concentration was calculated for each generator. These concentrations were then used to calculate cancer risk and non-cancer chronic health index (HI), based on California Office of Environmental Health Hazard Assessment (OEHHA) guidance.[4,5]

Chronic HI was calculated by the following equation:

$$HI = Conc/REL$$

Where:

HI = Chronic Hazard Index (unitless)
Conc = Concentration (μg/m^3)
REL = OEHHA Reference Exposure Level (μg/m^3)

There is no Acute HI associated with DPM.

Cancer risk was similarly calculated by OEHHA guidance, using the following equation:

$$CR = Conc \ x \ URF$$

Where:

CR = Cancer Risk (in 1 million)

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3 CARB. 2011. Amendments to the Airborne Toxic Control Measure for Stationary Compression Ignition Engines. May. Available at: http://www.arb.ca.gov/diesel/documents/FinalReg2011.pdf. Accessed April 14, 2015.

4 Cal/EPA. 2014. OEHHA/ARB Consolidated Table of Approved Risk Assessment Health Values. July. Available at: http://www.arb.ca.gov/toxics/healthval/contable.pdf. Accessed April 14, 2015.

5 Cal/EPA. 2014. OEHHA Acute, 8-Hour and Chronic Reference Exposure Levels. June. Available at: http://www.oehha.org/air/allrels.html. Accessed April 14, 2015.

Conc = Concentration ($\mu g/m^3$)
URF = OEHHA Unit Risk Factor ($m^3/\mu g$)

Calculated Chronic HI and Cancer Risk for each generator are in **Table B-2**.

Table B-1: SCREEN3 Input Parameters

Parameter	Value	Basis
Emission Rate (g/s)	1	"chi/Q" method
Stack Height (m)	3.048	ENVIRON Assumption[1]
Stack Inside Diameter (m)	0.2	ENVIRON Assumption[1]
Stack Exit Velocity (m/s)	22.52	ENVIRON Assumption[1]
Stack Gas Exit Temperature (K)	652	ENVIRON Assumption[1]
Ambient Air Temperature (K)	293	SCREEN3 Default
Receptor Height (m)	2	SCAQMD LST Guidance
Urban/Rural Option	Rural	Conservative
Consider buidling downwash?	Y	Conservative
Building Height (m)	10	Estimated
Minimum Horizontal Building Dimension (m)	20	Estimated
Maximim Horizontal Building Dimension (m)	20	Estimated
Use complex terrain?	N	Conservative
Use simple terrain above stack base?	N	Conservative
Distance - Cottonwood) (m)	50	Closest building to Project Boundary
Distance - Race course (m)	200	Actual location to Project Boundary (see figure 4)

Notes:
1. Because detailed source parameters are not available, ENVIRON conducted modeling using release parameters from engines of similar size used in other projects.

Abbreviations:
g: gram
K: degrees Kelvin
LST: Localized Significance Thresholds
m: meter
s: second
SCAQMD: South Coast Air Quality Management District

References:

SCAQMD. 2008. Localized Significane Threshold Methodology. July. Available at: http://www.aqmd.gov/docs/default-source/ceqa/handbook/localized-significance- thresholds/final-lst-methodology-document.pdf?sfvrsn=2. Accessed April 14, 2015.
USEPA. 1995. SCREEN3 User's Guide. September. Available at: http://www.epa.gov/ttn/scram/userg/screen/screen3d.pdf. Accessed April 14, 2015.

Table B-2: Existing Source Screening Results

Source	Engine Horsepower[1]	Maximum Permitted Annual Hours of Operation[1]	Engine Tier[2]	DPM Emission Factor[2]	Annual Emission Rate	Annual Average Dispersion Factor[3]	Annual Concentration	DPM Chronic REL[4]	Chronic HI	DPM Cancer Unit Risk Factor[5]	Cancer Risk
				(g/bhp-hr)	g/s	($\mu g/m^3$)/(g/s)	$\mu g/m^3$	$\mu g/m^3$	--	$(\mu g/m^3)^{-1}$	in a million
Los Alamitos Race Course	125	50	Tier 2	0.22	4.36E-05	138	0.006	5	0.001	3.0E-04	1.8
Cottonwood Christian Center	364	50	Tier 2	0.15	8.66E-05	374.2	0.032	5	0.006	3.0E-04	9.7

Notes:
1. Taken from permit images from the SCAQMD FIND Database (http://www3.aqmd.gov/webappl/fim/prog/search.aspx)
2. From CARB and USEPA Off-Road Compression-Ignition (Diesel) Engine Standards, based on horsepower and permit year. (CARB 2011).
3. Hourly dispersion factors from the USEPA's SCREEN3 model were converted to Annual values by a factor of 0.08, per USEPA guidance (USEPA 2011).
4. From OEHHA guidance (Cal/EPA 2014).
5. From OEHHA Consolidated Table (Cal/EPA 2013).

Abbreviations:
bph: brake horsepower
CARB: California Air Resources Board
DPM: Diesel Particulate Matter
FIND: Facility Information Detail
g: gram
HI: Hazard Index
hr: hour
m: meter
REL: Reference Exposure Level
s: second
SCAQMD: South Coast Air Quality Management District
µg: microgram

References:

Cal/EPA. 2014. OEHHA/ARB Consolidated Table of Approved Risk Assessment Health Values. July. Available at: http://www.arb.ca.gov/toxics/healthval/contable.pdf. Accessed April 14, 2015.
Cal/EPA. 2014. OEHHA Acute, 8-Hour and Chronic Reference Exposure Levels. June. Available at: http://www.oehha.org/air/allrels.html. accessed April 14, 2015.
CARB. 2011. Amendments to the Airborne Toxic Control Measure for Stationary Compression Ignition Engines. May. Available at: http://www.arb.ca.gov/diesel/documents/FinalReg2011.pdf. Accessed April 14, 2015.
USEPA. 1995. SCREEN3 User's Guide. September. Available at: http://www.epa.gov/ttn/scram/userg/screen/screen3d.pdf. Accessed April 14, 2015.
USEPA. 2011. AERSCREEN User's Guide. March. Available at: http://www.epa.gov/scram001/models/screen/aerscreen_userguide.pdf. Accessed April 14, 2015.

Appendix C

Supporting Data for CO "Hot Spot" Analysis

Table C-1. Hourly and Daily Instersection Traffic Counts Evaluated for the Project

Intersection	Hourly Traffic Counts			Daily Traffic Counts[1]
	AM	PM	Maximum	
Cerritos at Walker	4,171	4,457	4,457	44,570
Cerritos at Valley View	5,374	5,921	5,921	59,210
Katella at 605 NB Ramp	4,669	5,624	5,624	56,240
Katella at Los Alamitos	6,790	7,197	7,197	71,970
Katella at Bloomfield	4,861	4,778	4,861	48,610
Katella at Lexington	3,989	4,338	4,338	43,380
Katella at Siboney	3,689	4,497	4,497	44,970
Katella at Valley View	7,527	8,377	8,377	83,770
Orangewood at Valley View	4,993	5,189	5,189	51,890

Notes:
1.The maximum hourly traffic counts were multiplied by 10 to estimate the daily traffic counts.

APPENDIX C

BIOLOGICAL TECHNICAL REPORT

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Photograph 1: View of site looking southeast. Note lack of vegetation across much of site and berm vegetated with ornamental trees at the south end of site

Photograph 2: View of site looking northeast. Note large areas that are unvegetated as well as areas at north end of site subject to storage uses.

Photograph 3: View of site looking southeast. Note lack of native habitat and non-native trees on berm at south end of the site.

Photograph 4: View of typical storage area at northern end of site.

GLENN LUKOS ASSOCIATES

Exhibit 4

Barton Place Project

Site Photographs

APPENDIX A

FLORAL COMPENDIUM

The floral compendium lists species identified on the project site. Taxonomy follows the Jepson Manual Second Edition (Baldwin et. al. 2012) and, for sensitive species, the California Native Plant Society's Rare Plant Inventory, Online Edition v8-01a (CNPS 2013). Common plant names are taken from Munz (1974) and Roberts (1998). An asterisk (*) denotes a non-native species.

SCIENTIFIC NAME	COMMON NAME
ANGIOSPERMS-DICOTS	
Anacardiaceae	**Sumac Family**
**Schinus terebinthifolius*	Brazilian Pepper
Amaranthaceae	**Amaranth Family**
**Amaranthus albus*	tumbleweed
Asteraceae	**Sunflower Family**
Baccharis salicifolia	mulefat
**Centaurea melitensis*	tocalote
Conyza canadensis	common horseweed
**Helminthotheca echioides*	bristly ox-tongue
Heterotheca grandiflora	telegraph weed
**Lactuca serriola*	prickly lettuce
**Senecio vulgaris*	common groundsel
**Sonchus oleraceus*	common sow thistle
Symphyotrichum subulatum	Slim aster
Boraginaceae	**Borage Family**
Heliotropium curassavicum	heliotrope
Brassicaceae	**Mustard Family**
**Brassica nigra*	black mustard
**Sisymbrium irio*	London rocket
Chenopodiaceae	**Goosefoot Family**
Atriplex semibaccata	Australian saltbush
Bassia hyssopifolia	five-hook bassia
**Chenopodium album*	lamb's quarters
**Salsola tragus*	Russian thistle
Convolvulaceae	**Morning-Glory Family**
**Convovulus arvensis*	field bindweed

Geraniaceae	**Geranium Family**
**Erodium botrys*	long-beaked filaree
**Erodium cicutarium*	red-stemmed filaree
Malvaceae	**Mallow Family**
**Malva parviflora*	cheeseweed
Moraceae	**Mulberry Family**
Ficus benjimina	weeping fig
Ficus elastica	rubber tree
Morus alba	white mulberry
Myoporaceae	**Myoporum Family**
**Myoporum laetum*	myoporum
Myrtaceae	**Myrtle Family**
Callistemon rigidus	bottlebrush
Corymbia citriodora	Lemon-scented gum
**Eucalyptus globulus.*	blue gum eucalyptus
**Eucalyptus sideroxylon*	red ironbark
Oleaceae	**Olive Family**
Olea europa	European olive
Oxalidaceae	**Oxalis Family**
**Oxalis pres-caprae*	Bermuda buttercup
Polygonaceae	**Buckwheat Family**
Persicaria lapathifolia	willow weed
**Rumex crispus*	curly dock
Salicaceae	**Willow Family**
Salix gooddingii	Goodding's black willow
Sapindaceae	**Soapberry Family**
Cupaniopsis anacarioides	carrotwood tree
Ulmaceae	**Elm Family**
Ulmus parvifloia	Chinese elm
Urticaceae	**Nettle Family**
**Urtica urens*	dwarf nettle

ANGIOSPERMS-MONOCOTS	
Arecaceae	**Palm Family**
**Washingtonia robusta*	Mexican fan palm
Poaceae	**Grass Family**
**Avena barbata*	slender wild oat
**Bromus diandrus*	ripgut grass
**Bromus hordeaceus*	soft chess
**Bromus madritensis* ssp. *rubens*	foxtail chess
**Cynodon dactylon*	Bermuda grass
**Crypsis schoenoides*	Swamp timothy
**Hordeum marinum* ssp. gussoneanum	Mediterranean barley
**Hordeum murinum* ssp. *leporinum*	hare barley
**Pennisetum clandestinum*	kikuyu grass

APPENDIX D

GEOTECHNICAL ASSESSMENT

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GEOTECHNICAL FEASIBILITY AND CEQA-LEVEL ASSESSMENT
33-ACRE PARCEL LOCATED NORTHEAST OF THE
INTERSECTION OF KATELLA AVENUE AND ENTERPRISE DRIVE
CITY OF CYPRESS, CALIFORNIA

C33, LLC

J.N. 14-243

February 23, 2015

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February 23, 2015
J.N. 14-243

Mr. Tim Ramm
C33, LLC
26 Corporate Plaza, Suite 260
Newport Beach, California 92660

Subject: Geotechnical Feasibility and CEQA-Level Assessment, 33-Acre Parcel Located Northeast of the Intersection of Katella Avenue and Enterprise Drive, City of Cypress, California

Dear Mr. Ramm:

Petra Geosciences, Inc. (Petra) is pleased to present our geotechnical feasibility and CEQA-level assessment of the 33-acre parcel located in the city of Cypress. The purposes of our study were to evaluate the geotechnical feasibility of development of the site for residential and commercial/retail purposes, and to determine what geotechnical constraints are inherent to the property that may influence the proposed development.

It should be noted that this evaluation pertains only to engineering geotechnical aspects of the site and does not address soil contamination or other environmental issues that may affect the property.

It is a pleasure to be of continued service to you and C33, LLC on this project. Should you have any questions regarding the contents of this report, or should you require additional information, please do not hesitate to contact us.

Respectfully submitted,

PETRA GEOSCIENCES, INC.

Siamak Jafroudi, Ph.D., GE
President

GEOTECHNICAL FEASIBILITY AND CEQA-LEVEL ASSESSMENT 33-ACRE PARCEL LOCATED NORTHEAST OF THE INTERSECTION OF KATELLA AVENUE AND ENTERPRISE DRIVE, CITY OF CYPRESS, CALIFORNIA

INTRODUCTION

The following CEQA-level assessment report presents our findings and opinions with respect to the geotechnical feasibility of the proposed project and constraints that may have an impact on the development of the subject property. This evaluation is based on our review of published geotechnical maps and literature pertinent to the area of the subject site, limited subsurface investigation, and our previous experience with similar projects in the area. The design concept assumed for purposes of this study is based on the current conceptual site plan prepared by Robert Hidey Architects (dated December 12, 2014).

PURPOSE AND SCOPE OF SERVICES

The purpose of this study is to collect the required regional and site-specific geotechnical data in order to provide an assessment of potential geologic and seismic-related constraints that may affect the development as currently proposed. The results of our assessment, as well as preliminary mitigation measures intended to reduce the impact of the identified geologic constraints, are provided in this report.

This study has been performed in general accordance with relevant provisions of the California Environmental Quality Act (CEQA) of 1970, and the guidelines for implementation of CEQA as amended. In preparing this report, our scope of services has included the following:

a. Review of available published and unpublished literature and maps pertaining to regional faulting, seismic hazards and soil and geologic conditions within and adjacent to the site that could have an impact on the proposed development.

b. Review of the referenced site-specific geotechnical reports prepared by Southern California Geotechnical and Pacific Soils Engineering, Inc.

c. Cursory reconnaissance of the subject site and surrounding areas.

d. Performing 14 cone penetrometer test (CPT) soundings at pre-selected locations within the project site.

e. Engineering and geologic analyses of the field data as they pertain to the proposed construction.

f. Evaluation of faulting and seismicity of the region and the possible impact of regional seismicity on the site and the proposed construction.

g. Analysis of liquefaction and its potential impact on the site and proposed construction.

h. Preparation of this report presenting our findings, conclusions and recommendations.

LOCATION AND SITE DESCRIPTION

The study area considered under the purview of this report is composed of approximately 33 acres of undeveloped land located northeast of the intersection of Katella Avenue and Enterprise Drive in the city of Cypress, Orange County, California. The location of the site with respect to nearby roadways and other landmarks is shown on Figure 1. The site is bounded by the westbound lanes of Katella Avenue on the south, Enterprise Drive on the west, and stable facilities associated with the Los Alamitos Race Course horse racing track on the north. To the east, the site is bounded by a paved entrance driveway and parking lots serving the race track, as well as an existing two-story church building (formerly a golf clubhouse) and associated landscape improvements. A Marriott Residence Inn hotel property bounds the subject site to the southeast.

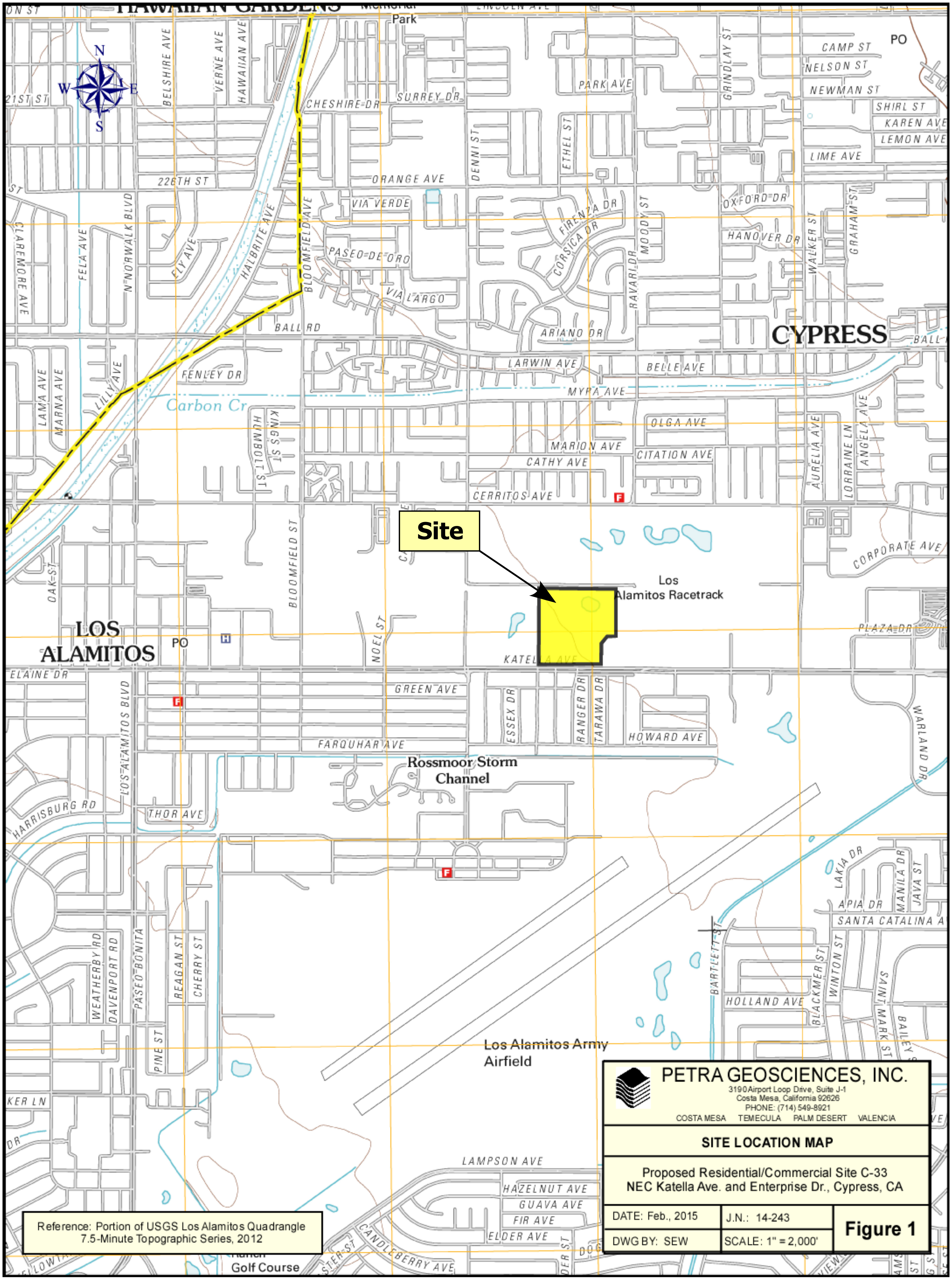
The site is presently vacant of permanent above-ground structures with the exception of an approximately 325-foot-long, masonry block wall that runs along a portion of the northerly property boundary. Vegetation within the area of study consists primarily of a low growth of weeds and grass within the central and northern portions of the site, with a number of mature trees located along the southerly site boundary adjacent to Katella Avenue.

Topography within the majority of the site is characterized by a generally flat surface that has a total relief of approximately 10 feet. The highest elevation of approximately 32 feet above mean sea level occurs within the northeast corner of the property, with the lowest elevation of approximately 22 feet occurring within the southwest corner. Local variations in topography occur along the southerly property boundary where a number of earthen berms approximately 6 to 12 feet in height exist as possible remnants of the previous golf course topography. Storm runoff appears to be presently controlled by sheet flow from the dominant high points to low-lying areas, including an existing unlined temporary storm water retention basin located within the southwest corner of the site.

BACKGROUND INFORMATION

Previous Site Usage

Based on our review of the referenced geotechnical report by Pacific Soils Engineering, Inc (PSE) dated November 25, 2003, as well as on aerial imagery that was accessed through the Google Earth web-based virtual globe information program, the subject property was previously occupied by a golf course that closed in 2004. The former golf course landscape included three small lakes, numerous graded mounds that were constructed of artificial fill, numerous sand bunkers, and paved golf cart paths. Numerous mature trees were scattered throughout the site. Remnants of this former golf course topography currently exist along the property's Katella Avenue frontage.


Site
Los Alamitos Racetrack
CYPRESS
LOS ALAMITOS
Los Alamitos Army Airfield
Rossmoor Storm Channel
Carbon Cr
KATELLA AVE
CERRITOS AVE
BALL RD
ORANGE AVE
LAMPSON AVE
BLOOMFIELD ST
PLAZA DR
CORPORATE AVE
HOWARD AVE
GREEN AVE
FARQUHAR AVE
N
S
E
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COSTA MESA TEMECULA PALM DESERT VALENCIA
SITE LOCATION MAP
Proposed Residential/Commercial Site C-33
NEC Katella Ave. and Enterprise Dr., Cypress, CA
DATE: Feb., 2015
J.N.: 14-243
DWG BY: SEW
SCALE: 1" = 2,000'
Figure 1
Reference: Portion of USGS Los Alamitos Quadrangle
7.5-Minute Topographic Series, 2012

Following closure of the golf course, grading of the formerly varied golf course topography was performed within the site to create the level surface that exists presently. This included backfilling of the three previously existing lakes and numerous sand bunkers, and excavating topographically high areas. As mentioned previously, some remnant golf course topography presently exists along the Katella Avenue frontage.

Previous Geotechnical Studies

Pacific Soils Engineering, Inc. (2003)

Several geotechnical reports by previous consultants were provided to our firm for review as part of this study. The earliest of these is a limited feasibility-level investigation prepared by Pacific Soils Engineering (PSE) in November, 2003. The field investigation by their firm included performing five cone penetrometer (CPT) soundings, six small-diameter exploratory borings to depths ranging from 31 to 51 feet, and four direct-push sampling holes. Samples obtained during their investigation were subjected to a number of laboratory tests to determine various engineering and chemical properties. On the basis of their findings, PSE cited the following as the primary geotechnical factors affecting development of the site:

- Earthquake-induced liquefaction and related effects including dynamic settlement.
- The presence of undocumented artificial fill to depths ranging from approximately 2 to 10 feet below the surface.
- Compressibility of near-surface native alluvial soils.
- The presence of shallow groundwater, typically occurring at depths of between 5 feet and 12 feet below the surface.
- The need for stabilization of yielding soils within excavated areas, and for special handling of excessively wet soil materials prior to re-use in compacted fills.
- The need for special grading procedures during abandonment and backfilling of the former lakes.
- Strong ground motion associated with earthquakes along active regional fault systems.

In their referenced feasibility-level investigation report, PSE concluded that mass grading of the site was feasible from a geotechnical standpoint provided that the recommendations for remedial grading included in that report were implemented.

Pacific Soils Engineering, Inc. (2004)

A brief letter report was issued by PSE on September 21, 2004 which provided geotechnical recommendations for stabilizing the bottoms of the drained golf course lakes prior to backfilling of the lake cavities with compacted fill. This letter describes the use of a combination of crushed concrete fragments and aggregate base, along with a geotextile fabric, to achieve a stable surface on which to place compacted fill.

Pacific Soils Engineering, Inc. (2006)

During the months of October through December of 2004, the three previously existing lakes associated with the former golf course were abandoned and backfilled. The abandonment operations, which included the demolition and removal of plastic lake liners, as well as the previously existing lakeside retaining walls, pipelines, and concrete sidewalks, were performed with observation and testing services provided by PSE. The referenced report by PSE dated November 21, 2006 indicates that, following the demolition and removal of the lake liners, the moisture-softened soils exposed on the lake bottoms were stabilized by placement of an approximately 12- to 24-inch-thick layer of broken concrete fragments ranging up to 12 inches in maximum dimension, followed by a single layer of geotextile fabric. Once the lake bottoms were stabilized in this manner, the lakes were backfilled with compacted, engineered fill.

Southern California Geotechnical (2012)

In September 2012, an independent field investigation program was undertaken by Southern California Geotechnical (SCG) for a previous development concept that included construction of two large tilt-up concrete commercial/industrial buildings. Their investigation included advancing four CPT soundings to a depth of 50 feet, and 19 exploratory brings to depths ranging from 5 to 50 feet. A number of laboratory tests were performed on representative samples of soils to determine their engineering characteristics. The results of their study revealed generally the same geotechnical factors that were previously identified by PSE, with the exception that SCG reported the presence of undocumented artificial fill to a maximum depth of 14½ feet at one location. Based on our review of available documentation, it appears that the location where deeper undocumented fill was encountered by SCG corresponds with the location of one of the former lakes. This fill, therefore, is likely representative of the lake backfill material that was observed and documented by PSE in their November 21, 2006 report. Evidently, SCG did not have access to either of the referenced PSE reports and, for this reason, classified this fill as undocumented.

As a design-phase investigation, the SCG report presents recommendations for site remedial grading, and for design of building foundation and floor slab systems.

REGULATORY ENVIRONMENT

Construction projects of the type presently being considered in this report are regulated by the local permitting agency, in this case the Building Division of the City of Cypress Community Development Department. Prior to issuing grading and building permits, the City is tasked with ensuring that structural design is in compliance with all applicable provisions of the state and local regulatory standards listed below.

California Building Code (CBC)

The California Building Code (Title 24 of the California Code of Regulations) provides the regulatory framework for building code enforcement within the City of Cypress. The various requirements contained within the CBC are based on the International Building Code and are intended to provide minimum standards to protect public property and welfare by regulating the design and construction of excavations, structural foundations and building framing systems to mitigate the effects of strong ground shaking and adverse soil conditions. By order of the California legislature, the CBC is published by the California Building Standards Commission every three years. The regulations contained in each revision take effect 180 days after the publication date. The current 2013 revision of the CBC was adopted by the City of Cypress in January, 2014 and is in effect as of the date of this report.

California Alquist-Priolo Earthquake Fault Zoning Act

In December 1972, the State legislature enacted the Alquist-Priolo Earthquake Fault Zoning Act which directed the State Geologist to begin compiling maps of known surface traces of active faults within the urbanized areas of California. The intent of this law was to improve earthquake safety by prohibiting the construction of buildings intended for human occupancy across the traces of known active earthquake faults. The term "Earthquake Fault Zones" refers to areas established by the California Geologic Survey (CGS) wherein comprehensive geologic investigations are required in order to demonstrate that locations designated for new construction are not traversed by active fault traces. The Alquist-Priolo Earthquake Fault Zoning Act also requires property owners or their representatives to disclose whether or not their property is situated within an established Earthquake Fault Zone prior to selling the property. Local regulatory agencies (such as city- or county-level building departments) are responsible for local implementation of the Act and must regulate development projects within the zones.

California Seismic Hazards Mapping Act

As a further means to protect public safety and property from seismic hazards, the California legislature adopted the Seismic Hazards Mapping Act in 1990. In contrast to the Alquist-Priolo Act, the Seismic Hazards Mapping Act specifically addresses potential hazards posed by secondary effects of seismic activity including strong ground shaking, soil liquefaction and associated ground failure, and seismically-induced landslides. Maps showing zones of required investigation for one or more of these hazards are prepared and published by the California Geologic Survey and, like the Alquist-Priolo maps, are available to the public via an online resource. Inclusion within a designated seismic hazard zone does not necessarily indicate that such hazards have been confirmed within the zone, but only that the prevalent soil and groundwater conditions within the zone render the area susceptible to the hazard. The local jurisdiction (i.e., the city or county permitting agency) is responsible for ensuring that the required site-specific geotechnical investigations have been performed for construction projects proposed within these seismic hazard zones.

City of Cypress General Plan and Municipal Code

The Safety Element of the City of Cypress General Plan provides a means by which known natural and manmade hazards can be related to city planning and land use issues (City of Cypress, 2000). Natural hazards considered within the Safety Element include flooding, seismicity and associated secondary seismic effects, and inherent geologic conditions such as landslide susceptibility. The ultimate purpose of the Safety Element is to serve as an official guide to the City Council and the local planning and permitting agencies, and to drive the adoption of official codes and implementation measures to reduce the potential impact of such hazards.

The official codes that govern construction projects within the City of Cypress are contained within Chapter 5 of the City's Municipal Code. The following State of California building codes have been adopted by reference (and amended by Section 5-2 of that chapter) as the Building Codes of the City of Cypress:

a. California Building Code, 2013 edition, Part 2, Volumes I and II (based on the 2012 International Building Code).
b. California Residential Code, 2013 edition (based on the 2012 International Residential Code).
c. California Green Building Standards Code (2013 edition).
d. California Mechanical, Plumbing and Electrical Codes, 2013 edition (based on the 2012 Uniform Mechanical, Plumbing and Electrical Codes).
e. Uniform Housing Code, 1997 edition.
f. International Property Maintenance Code, 2006 edition.
g. California Administrative Code, 2013 edition.

PROPOSED CONSTRUCTION AND GRADING

General Project Design

Based on the current conceptual site plan (dated January 30, 2015) for the proposed project by Robert Hidey Architects (Figure 2), the northern portion of the 33-acre project site, which includes approximately 28 acres, will be developed as a senior residential community with 244 units. The remaining approximately 5 acres will be developed for low-rise commercial/retail uses. The building footprint areas for the commercial/retail buildings will be 16,250 square feet or less. Associated exterior improvements are expected to include asphalt-paved access streets, concrete driveways and pedestrian sidewalks, surface drainage controls, perimeter walls, common landscaped areas, underground infrastructure, and required storm water quality devices (including permeable pavement surfaces and storm water detention basins). It is also expected that the proposed structures will be supported by post-tensioned and/or strengthened concrete mat foundation systems.

Proposed Grading

The current conceptual grading plan for the project prepared by Fuscoe Engineering (dated January 30, 2015) indicates that the proposed finished surface elevations around the perimeter of the site will generally correspond to those of the surrounding commercial and street areas. However, fills ranging from less than 1 foot to approximately 10 feet in thickness will be required to establish the planned pad elevations and surface drainage gradients. Local grade changes are likely to be accommodated by low-height retaining walls and graded slopes reaching a maximum height of approximately 4 feet.

INVESTIGATION PROGRAM

Petra's scope of geotechnical services on this project site has included performing a CEQA-level study with a limited subsurface investigation. The invasive testing was performed in an effort to provide a preliminary characterization of subsurface soil and groundwater conditions within the project site. Details pertaining to our field methodology are presented in the following sections.

Subsurface Exploration

Our subsurface exploration was performed on June 11 and July 14, 2014, and included advancing 14 cone penetrometer (CPT) soundings to a maximum depth of 50 feet below the surface using a 25-ton, CPT truck provided by Gregg Drilling and Testing, Inc. of Signal Hill, California. The information obtained in this manner was supplemented by drilling four exploratory borings within the site to depths ranging from approximately 21½ to 31½ feet below the surface on July 14, 2014. The exploratory borings were drilled utilizing a truck-mounted, hollow-stem auger drill rig provided by 2R Drilling of Chino, California. Additional excavations were performed for purposes of conducting a pilot soil percolation study.

Earth materials encountered in our exploratory borings were classified and logged in accordance with Unified Soil Classification System procedures. The approximate locations of the CPT soundings (identified herein as CPT-1 through CPT-14) and exploratory borings (B-1 through B-4) are shown on the attached exploration map (Figure 2). Descriptive CPT and boring logs are presented in Appendix A of this report. Laboratory test data pertinent to the findings and conclusions presented in this report are discussed in the following sections as applicable.

Explanation

B-4	Approximate Location of Exploratory Boring (Petra, 2014)
CPT-14	Approximate Location of Cone Penetrometer Test (Petra, 2014)
B-17	Approximate Location of Exploratory Boring (SCG, 2012)
CPT-4	Approximate Location of Cone Penetrometer Test (SCG, 2012)

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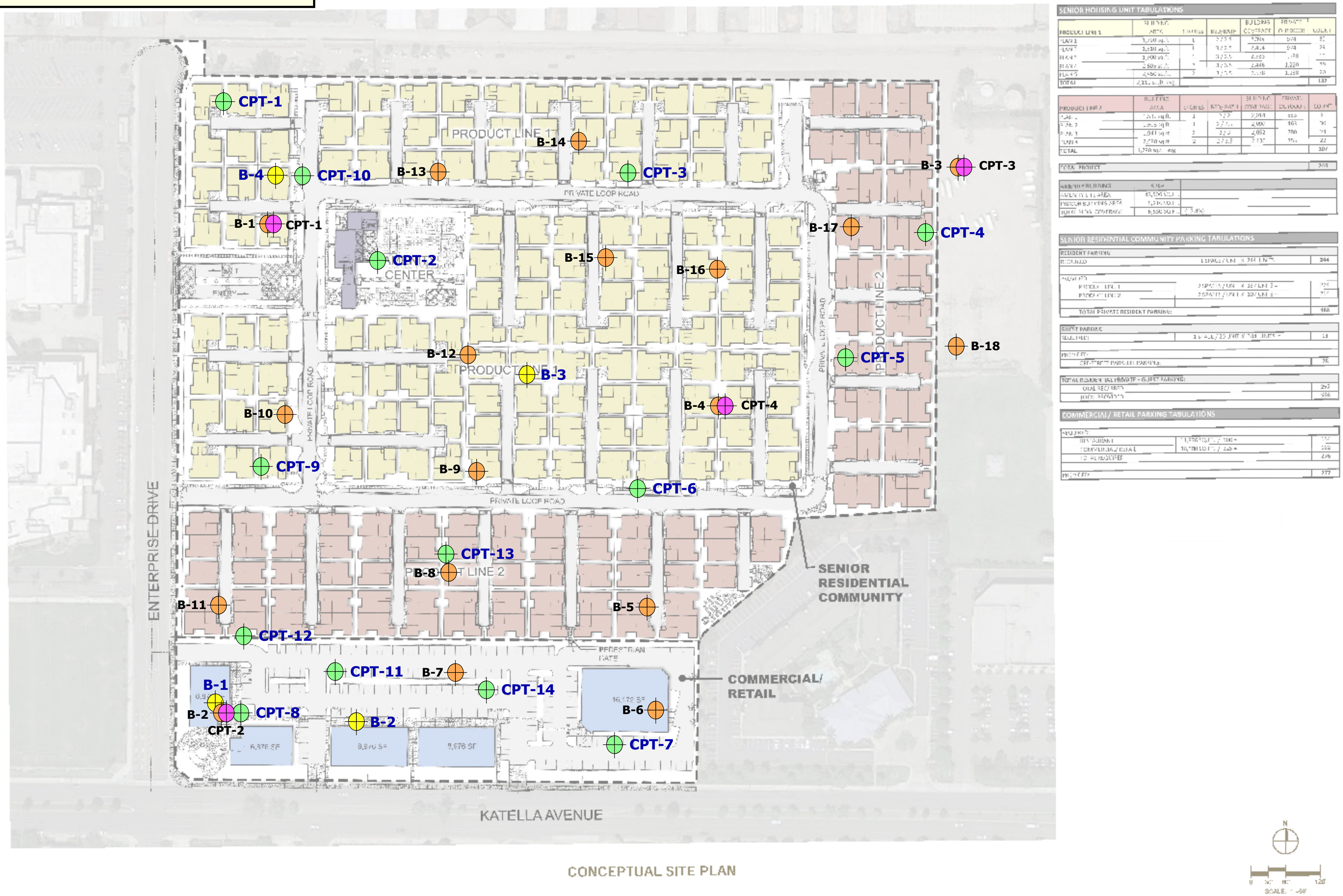
EXPLORATION MAP

Proposed Residential/Commercial Site C-33
NEC Katella Ave. and Enterprise Dr., Cypress, CA

DATE: Feb., 2015	J.N.: 14-243	**Figure 2**
DWG BY: SW	SCALE: See Plan	



CONCEPTUAL SITE PLAN

Robert Hidey Architects

BARTON PLACE

CYPRESS, CALIFORNIA

C33, LLC

Our subsurface exploration included the collection of bulk (disturbed) and relatively undisturbed samples of subsurface soil materials from the borings for laboratory testing purposes. Bulk samples consisted of composite earth materials obtained at selected depth intervals from the borings. Relatively undisturbed samples were collected using a 3-inch outside-diameter, modified California split-spoon soil sampler lined with 1-inch high brass rings. The sampler was driven to a depth of 18 inches with successive 30-inch drops of a hydraulically operated, 140-pound automatic trip hammer. Blow counts for each 6-inch driving increment were recorded on the exploration logs. The central portions of the driven core samples were placed in sealed containers and transported to our laboratory for testing.

Where deemed appropriate based on the CPT data collected, Standard Penetration (SPT) tests were also performed at selected depth intervals in accordance with the American Society for Testing Materials (ASTM) Standard Procedure D 1586. This method consists of mechanically driving an unlined standard split-barrel sampler 18 inches into the soil with successive 30-inch drops of the 140-pound automatic trip hammer. Blow counts for each 6-inch driving increment were recorded on the exploration logs. The number of blows required to drive the standard split-spoon sampler for the last 12 of the 18 inches was identified as the uncorrected standard penetration resistance (N). Disturbed soil samples from the unlined standard split-spoon samplers were placed in plastic bags and transported to our laboratory for testing.

Laboratory Testing

In order to evaluate the engineering properties of onsite soils, a number of laboratory tests were performed by our firm on selected samples considered representative of the materials encountered within the study area. These laboratory tests were performed shortly after completion of our field investigation and included determination of in-place dry density and moisture content, maximum dry density and optimum moisture content, expansion index, shear strength, consolidation characteristics, grain size distribution, Atterberg limits and organic content, as well as chemical activity (soluble sulfate and chloride content, pH, and minimum resistivity). A description of laboratory test methods is provided in the Laboratory Test Procedures section of this report (Appendix B). Summaries of the test data are presented on the exploration logs (Appendix A) and in Appendix B, and are discussed as applicable below.

FINDINGS

Regional Physiographic Setting

The subject site is located within the Los Angeles Basin, a northwest-trending alluviated lowland situated at the north end of the Peninsular Ranges geomorphic province of coastal southern California. This basin, which is the surface expression of a deep structural trough, has been subdivided into four primary structural blocks that are distinguished from one another by contrasting basement rock types and stratigraphy. These structural blocks are generally separated by zones of faulting along which movement has been occurring intermittently since middle Miocene time (Yerkes et al., 1965).

More specifically, the subject property is located within the east-central portion of the Downey Plain, a broad lowland area that comprises a large portion of the Central Block of the Los Angeles Basin. This plain is bounded by the Santa Monica Mountains to the north, the Puente Hills and Santa Ana Mountains to the northeast and east, and a northwest-trending alignment of hills and mesas to the west and southwest which represent surface expressions of uplift along the Newport-Inglewood fault. In the area of the subject site, the soils that form this extensive alluvial plain are composed primarily of geologically youthful materials deposited as a result of sedimentation along the Santa Ana and San Gabriel rivers, with additional materials contributed from smaller canyons that drain the adjoining upland areas to the northeast.

Local Geology and Subsurface Conditions

The distribution, thicknesses and characteristics of near-surface soils in the western portion of the Orange County coastal plain have been previously mapped by other investigators at a scale of 1:48,000 for purposes of seismic zonation. Based on our review of published maps (Figure 3), the area occupied by the northernmost portion of the City of Cypress is underlain by unconsolidated, generally fine-grained, Holocene-age alluvial flood plain deposits composed primarily of various combinations of silt, sand and clay. The thickness of these geologically young sediments generally ranges up to approximately 90 feet in the area of the subject site (Sprotte and others, 1980). Underlying these Holocene alluvial deposits are older, semi-consolidated to consolidated Quaternary-age sediments which extend to depths of 2,700 to greater than 4,200 feet below the surface.

Our subsurface investigation revealed that the area of proposed development is underlain predominantly by Quaternary-age alluvial deposits that extend beyond the maximum depth explored (50 feet). As shown on the exploration logs included in Appendix A, these materials consist of interlayered silty sand, sand, sandy silt, clayey silt, clay, and silty clay. Although not detailed during our investigation, the native alluvial materials described above are likely to be capped by several feet of artificial fill in most areas of the site, and as much as approximately 14 feet of fill in areas of the previously abandoned lakes. With the exception of the former lake areas where documentation of fill placement is available (PSE 2006), it is unlikely that the onsite fill materials were placed in accordance with current grading standards and certified by a geotechnical professional. For this reason, any existing onsite fill beyond the limits of grading identified in the referenced PSE report would be classified as "undocumented" for purposes of the site assessment.

ABBREVIATED EXPLANATION

Approximate stratigraphic relationships only: see accompanying Sheet 2 for correlation of map units and more detailed descriptions.

QUATERNARY — HOLOCENE

Symbol	Description
af	Artificial fill
Qw	Active channel and wash deposits
Qa	Alluvial flood plain deposits
Qls	Landslide deposits
Qb	Beach deposits
Qe	Eolian deposits
Qpe	Paralic estuarine deposits
Qyf	Young alluvial fan and valley deposits, undivided a = sand, s = silt, c = clay
Qyf2	Young alluvial fan deposits, unit 2
Qyf1	Young alluvial fan deposits, unit 1
Qya	Young alluvial flood plain deposits, unit 1
Qye	Young eolian deposits
Qype	Young paralic estuarine deposits
Qof	Old alluvial fan and valley deposits, undivided a = sand, s = silt, c = clay
Qoa	Old alluvial flood plain deposits, undivided

QUATERNARY — PLEISTOCENE

Symbol	Description
Qoe	Old eolian deposits
Qom	Old marine deposits, undivided
Qop	Old paralic deposits, undivided, a = sand, s = silt, c = clay
Qlh	La Habra Formation
	San Pedro Formation
Qsp	San Pedro Formation, undivided
Qspt	Timms Point Silt Member
Qspl	Lomita Marl Member
Qi	Inglewood Formation

TERTIARY — PLIOCENE

Symbol	Description
	Fernando Formation
Tfu	Upper Member
Tfl	Lower Member, Tflc = conglomerate
	Puente Formation
Tpsc	Sycamore Canyon Member, Tpscc = conglomerate

TERTIARY — MIOCENE

Symbol	Description
Tpy	Yorba Member
Tps	Soquel Member
Tplv	La Vida Member
	Monterey Formation
Tmm	Malaga Mudstone Member
Tmvd	Valmonte Diatomite Member
Tmv	Volcanic rocks within the Monterey Formation
Tma	Altamira Shale Member

CRETACEOUS JURASSIC

Symbol	Description
mcs	Catalina Schist

Offshore Region

Symbol	Description
Qms	Unconsolidated shelf sediment
Qmf	Unconsolidated flank sediment
Qmb	Unconsolidated basin sediment
Qmr	Unconsolidated ridge sediment
Qmc	Unconsolidated canyon sediment
Qct	Canyon terrace
Qcf	Canyon fill
Qgf	Gully fill
Qf	Fan deposits
Qls	Landslide deposits
Qp	Pleistocene sedimentary deposits, undivided
QTt	Plio-Pleistocene terrace deposits
Tp	Pliocene sedimentary rocks, undivided*
Tmp	Mio-Pliocene sedimentary rocks, undivided*
Tu	Tertiary sedimentary and volcanic rocks, undivided*
Tmu	Miocene sedimentary rocks, undivided*
Tmv	Miocene volcanic rocks*
ms	Metamorphic rocks of pre- Late Cretaceous age*

* Q/ – Map unit overlain by more than 3 meters of unconsolidated Quaternary sediment.

MAP SYMBOLS

Contact - accuracy of location ranges from well located to inferred. All offshore contacts are considered approximately located.

U D ?

Fault - solid where well located; dashed where approximately located or inferred; dotted where concealed; queried where continuation or existence is uncertain. Where age was determined in offshore area, age symbol is shown astride fault and relative offset is shown by U, upthrown side; D, downthrown side (relative or apparent). Age of faults are indicated as follows:

- cuts strata of Holocene age
- cuts strata of Pleistocene age
- cuts strata of Quaternary age
- cuts strata of Pliocene age
- cuts Miocene or older strata

Anticlinal fold - solid where well located; dashed where approximately located or inferred; dotted where concealed. Plunge direction indicated by arrowhead on fold axis.

Synclinal fold - solid where well located; dashed where approximately located or inferred; dotted where concealed. Plunge direction indicated by arrowhead on fold axis.

Strike and dip of stratified rocks. Number indicates dip angle in degrees when known.

25 Inclined beds

80 Overturned beds

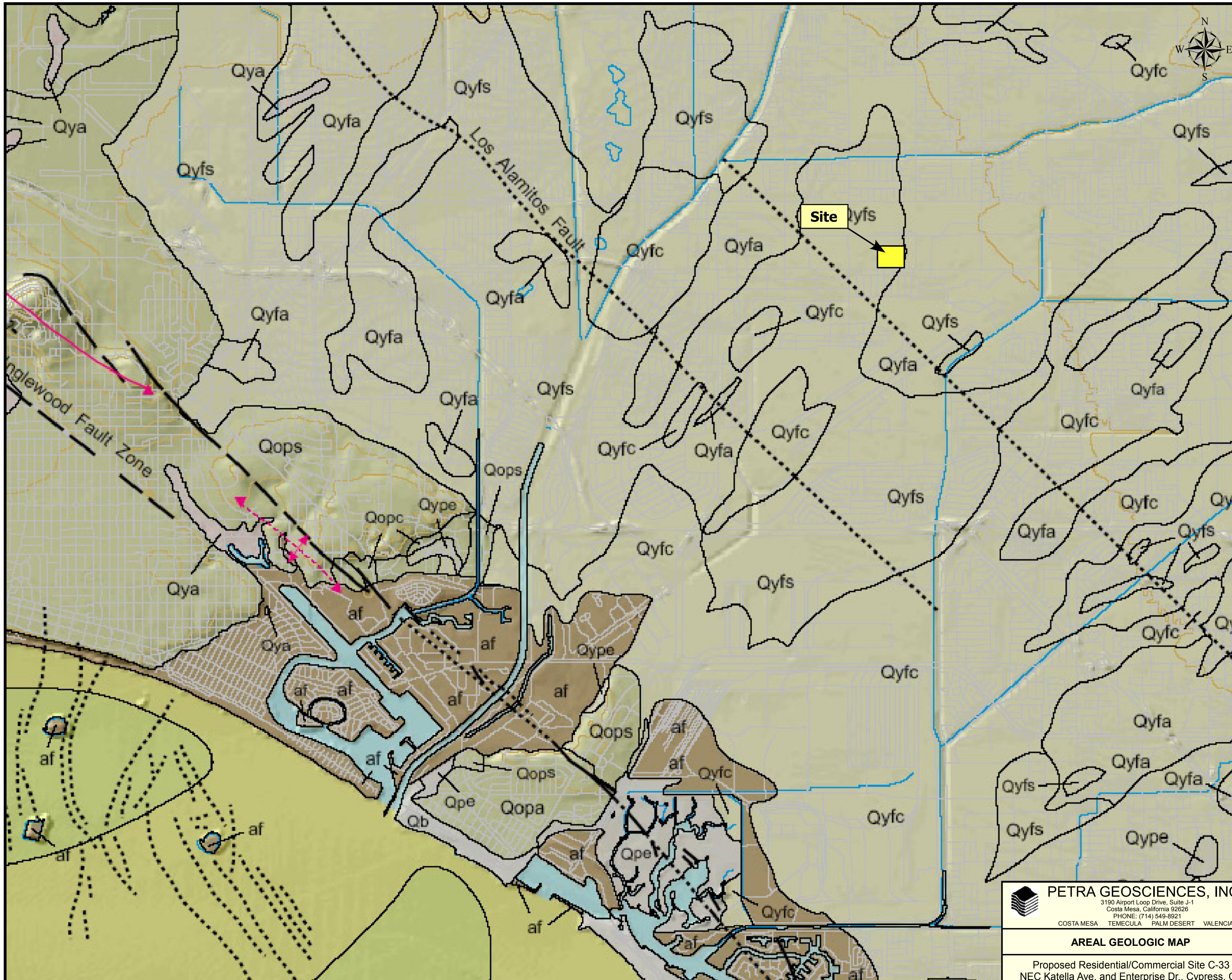
Horizontal beds

Strike and dip of metamorphic and igneous foliation.

Vertical foliation

Arrows on landslides indicate direction of movement. Hachured where headscarp is mappable.

Oil and/or gas seep.



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AREAL GEOLOGIC MAP

Proposed Residential/Commercial Site C-33
NEC Katella Ave. and Enterprise Dr., Cypress, CA

DATE: Feb., 2015	J.N.: 14-243	**Figure 3**
DWG BY: SW	SCALE: 1" = 4,000'	

Local Groundwater Conditions

Information pertaining to the occurrence of groundwater within inland portions of Orange County has primarily been obtained from borehole logs prepared during installation of the numerous water wells throughout the area. In general, ground water occurs in at least three distinct bodies; in downward succession, these are 1) a body of semi-perched water that occurs within the upper portion of alluvial deposits of Holocene age, 2) the principal body of fresh water occurring within the lowermost portion of the Recent alluvium and in nearly all deposits of Pleistocene age and some Pliocene rocks, and 3) one or more bodies of saline water which underlies the principal fresh-water aquifers throughout the area (Poland and Piper, 1956).

Of interest with respect to development within the City of Cypress and surrounding areas is the body of semi-perched groundwater occurring within the upper 40 to 50 feet of Holocene-age sediments. This water typically occurs within thin layers of silty sand and sand at depths of between 5 and 50 feet below the surface. In almost all cases, these water-bearing sediments are separated from the underlying fresh-water zones by relatively impermeable layers of semi-consolidated silt and clay. The extent of shallow semi-perched groundwater in the area of the subject site is described in general terms in the referenced Seismic Hazard Zone report for the Los Alamitos quadrangle published by the California Division of Mines and Geology (CDMG, 1998). Based on information provided in that report, the subject property is located within a portion of the Los Alamitos quadrangle where shallow groundwater (i.e., groundwater existing at a depth of 40 feet or less below the ground surface) would typically be expected to occur. The figures included in the report indicate that the historical high groundwater depth for the site is approximately 10 feet below the surface.

Although no direct readings of groundwater depth were taken within the site, the CPT data obtained during our subsurface investigation suggest that static groundwater levels ranged from approximately 8 to 12 feet below the surface at the time of our field investigation within the area of proposed development. This depth range is consistent with groundwater depths reported by previous investigators. It should be noted that this depth is representative of the date and time that our investigation was performed, and that this level is likely to fluctuate in response to seasonal changes and variations in the rates of local groundwater withdrawal.

Regional Surface Fault Systems

The geologic structure of Southern California is dominated by northwest-trending faults associated with the San Andreas system. Faults such as the Newport-Inglewood, the Whittier-Elsinore, the San Jacinto, and various segments of the San Andreas Fault itself are all major faults associated with this system. They are all known to be seismically active, and most are known to have ruptured the ground surface in historic time. Also within the southern California region are a number of west-trending, low-angle reverse (thrust) faults that are similarly active. The majority of these faults occur as north-dipping planes which trend along the south-facing flanks of the Transverse Ranges. Among the known active thrust faults in the region include the Cucamonga, Sierra Madre, Santa Monica, and Hollywood faults.

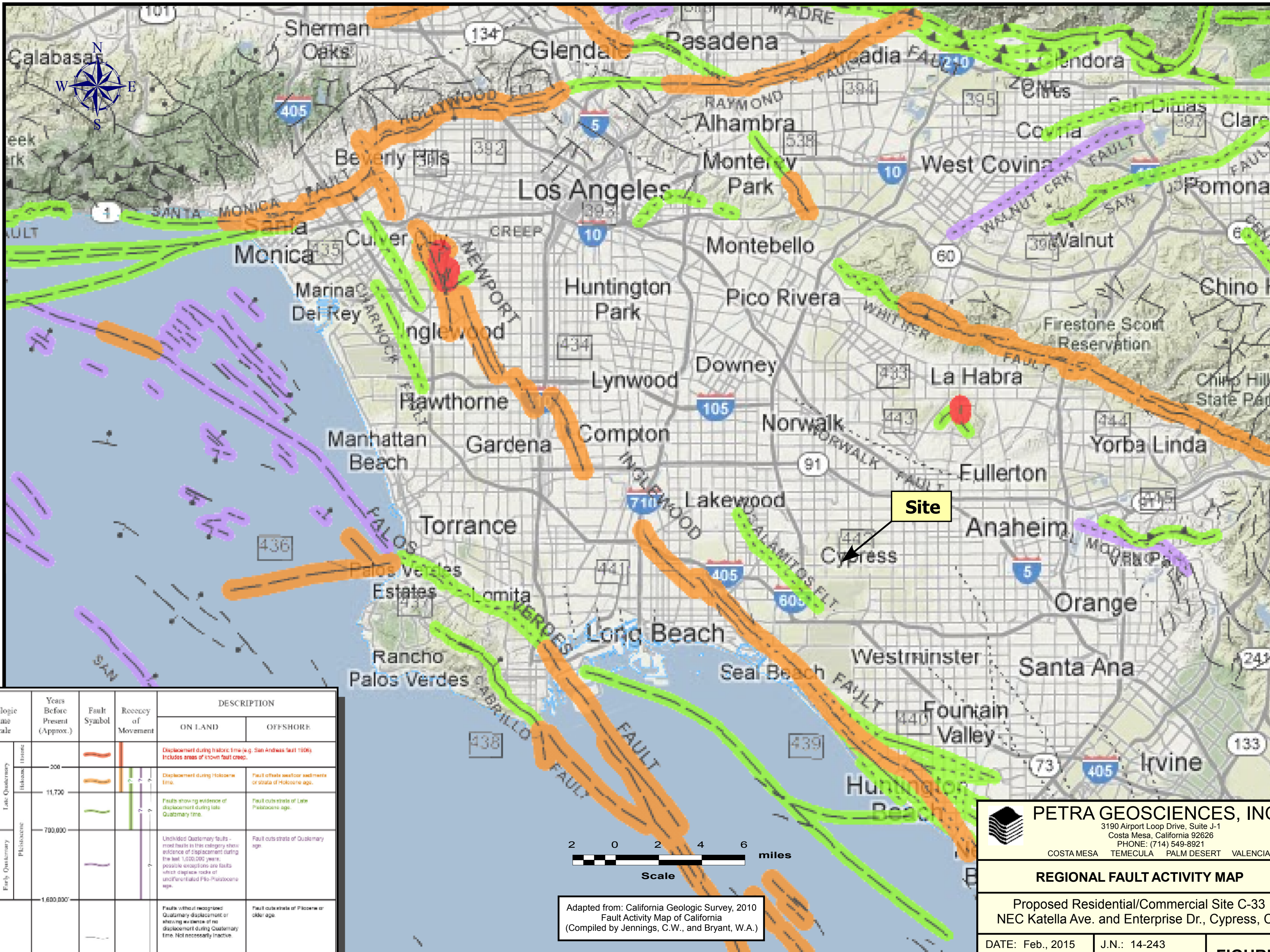
<u>Concealed Faults</u>

Another category of fault known as the "blind thrust" became recognized as a significant seismic hazard as a result of the 1987 moment magnitude (Mw) 6.0 Whittier Narrows earthquake. Blind thrusts are concealed beneath the earth's surface and are defined as dip-slip faults that tend to fold and/or uplift the near surface sediments during moderate to large magnitude earthquakes (Shaw and Suppe, 1996). In 1994, the Mw 6.7 Northridge earthquake occurred along what researchers have interpreted as a south-dipping thrust ramp beneath the San Fernando Valley. Together, these events caused more than $25 billion in property damage and clearly demonstrate the risks that blind thrusts pose to the greater Los Angeles metropolitan area.

Recent structural models of the Los Angeles basin suggest that deep-seated, blind thrust sheets underlie portions of Orange and Los Angeles Counties. These structures are apparently accommodating north-south compression with slip rates of several millimeters per year (Hauksson, 1992; Petersen and Wesnouski, 1994). The Puente Hills and Upper Elysian Park blind thrust systems represent two such blind thrusts that are reported to extend below and in close proximity to the site (Dolan et al, 2003, Shaw et al, 2002, and Oskin et al 2000). A similar system underlies the San Joaquin Hills (Grant et al., 1999). Structural models and seismicity values for these three blind thrust systems and the Northridge blind thrust have been incorporated into the California Geological Survey seismic model, which was updated in April 2003 (Cao, et al., 2003).

<u>Nearby Seismic Sources</u>

Published geologic maps and literature indicate that the site lies within 50 kilometers of a number of significant active and potentially active faults that, in addition to the various segments of the more distant San Andreas fault zone, are considered capable of generating strong ground motion at the subject site. The names and locations of these faults relative to the subject property are provided in Table 1. The locations of these faults are graphically depicted on Figure 4.



Geologic Time Scale			Years Before Present (Approx.)	Fault Symbol	Recency of Movement	DESCRIPTION	
						ON LAND	OFFSHORE
Quaternary	Late Quaternary	Historic	200			Displacement during historic time (e.g. San Andreas fault 1906). Includes areas of known fault creep.	
		Holocene	11,700			Displacement during Holocene time.	Fault offsets seafloor sediments or strata of Holocene age.
		Pleistocene	700,000			Faults showing evidence of displacement during late Quaternary time.	Fault cuts strata of Late Pleistocene age.
	Early Quaternary		1,600,000			Undivided Quaternary faults - most faults in this category show evidence of displacement during the last 1,600,000 years; possible exceptions are faults which displace rocks of undifferentiated Plio-Pleistocene age.	Fault cuts strata of Quaternary age.
Pre-Quaternary			4.5 billion (Age of Earth)			Faults without recognized Quaternary displacement or showing evidence of no displacement during Quaternary time. Not necessarily inactive.	Fault cuts strata of Pliocene or older age.

Adapted from: California Geologic Survey, 2010
Fault Activity Map of California
(Compiled by Jennings, C.W., and Bryant, W.A.)

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REGIONAL FAULT ACTIVITY MAP

Proposed Residential/Commercial Site C-33
NEC Katella Ave. and Enterprise Dr., Cypress, CA

DATE: Feb., 2015	J.N.: 14-243	FIGURE 4
DWG BY: SW	SCALE: See Map	

Table 1 - Significant Nearby Seismic Sources

Fault Name	Approximate Distance/ Direction From Site	Source Type[1]	Slip Rate (mm/yr)[2]	Maximum Magnitude[2,3]
Newport-Inglewood	7.8 kilometers southwest	B	1.0	6.9 (7.2 – 7.5)[4]
Puente Hills Blind Thrust	14.9 kilometers northeast	B	0.7	7.1
San Joaquin Hills Thrust	18.2 kilometers southeast	B	0.5	6.6 (7.1)[5]
Whittier	20.7 kilometers northeast	B	2.5	6.8 (7.0)[5]
Palos Verdes	20.8 kilometers southwest	B	3.0	7.1 (7.3-7.7)[5]
Upper Elysian Park	29.6 kilometers north-northwest	B	1.3	6.4 (6.7)[5]
San Jose	30.9 kilometers northeast	B	0.5	6.5 (6.7)[5]
Chino-Central Ave.	34.0 kilometers northeast	B	1.0	6.7
Raymond	36.6 kilometers north	B	0.5	6.5 (6.8)[5]
Elsinore (Glen Ivy)	38.6 kilometers southeast	B	5.0	6.8 (6.9)[5]
Verdugo	39.7 kilometers northwest	B	0.5	6.7 (6.9)[5]
Hollywood	39.9 kilometers northwest	B	1.0	6.5 (6.7)[5]
Sierra Madre	42.9 kilometers northwest	B	3.0	7.0 (7.3)[5]
Clamshell-Sawpit	44.1 kilometers north-northeast	B	0.5	6.5 (6.7)[5]
Santa Monica	45.5 kilometers northwest	B	1.0	6.6 (6.8 – 7.4)[5]
Cucamonga	47.8 kilometers northeast	A	5.0	7.0 (6.7)[5]

Notes:
1) As classified according to 2001 California Building Code Table 16-U.
2) Per CGS 2002 fault data file (Cao et al, 2003).
3) Moment Magnitude (M_W).
4) The expected magnitude on the Newport-Inglewood fault according to the 2008 USGS fault files ranges from 7.2 to 7.5 depending on the cascade models chosen (EZ-FRISK 2010).
5) 2008 USGS fault file (EZ-FRISK 2010)

Based on a review of published geotechnical maps and literature pertaining to regional faulting, the closest known fault considered capable of causing strong ground motion at the subject site is the onshore segment of the Newport-Inglewood fault. Located approximately 7.8 kilometers southwest of the subject site, the Newport Inglewood fault consists of a series of parallel and en-echelon, northwest-trending faults and folds that extend from the southern edge of the Santa Monica Mountains southeast to the offshore area of Newport Beach. This zone has a history of moderate to high seismic activity and has produced numerous earthquakes greater than magnitude 4.0, including the March 11, 1933 magnitude 6.3 Long Beach earthquake (which was actually centered near the city of Newport Beach). At the time of the 1933 earthquake, secondary effects of strong ground shaking including sand boils, ground fissures, and liquefaction were noted in the city of Long Beach, as well as in the city of Huntington Beach along Pacific Coast Highway near the Huntington Beach Pier and in the Bolsa Chica area. In addition, subsurface fault displacement of a few inches was documented following the October 21, 1941 earthquake (magnitude 4.9) and the June 18, 1944 earthquake (magnitude 4.5), both of which occurred along the Newport-Inglewood fault in the Dominguez Hills area (Barrows, 1974). Various segments of the Newport-Inglewood fault have been included within the boundaries of an Alquist-Priolo fault rupture hazard zone.

Four additional faults that are considered to be significant seismogenic sources are located in relatively close proximity to the subject site and thus warrant mention in this report. These include the San Joaquin Hills thrust fault, the Palos Verdes fault, the Puente Hills blind thrust and the Whittier fault. Descriptions of these faults are provided in the following paragraphs:

Puente Hills Blind Thrust Fault

Located approximately 19.9 kilometers northeast of the site, the Puente Hills blind thrust lies buried about two miles beneath the surface and dips to the north at approximately 25 degrees (Shaw et al, 2002; Dolan et al, 2003). The fault extends approximately 40 kilometers from the City of Brea to downtown Los Angeles and consists of the Coyote Hills, Santa Fe Springs and Los Angeles segments. According to research, this fault generated the 1987 Mw 5.9 Whittier Narrows earthquake (Hauksson and Stein, 1989), which caused an estimated $358 million in property damage. This earthquake occurred at a depth of approximately six miles and was followed by an aftershock of slightly lower magnitude three days later. More recently, the Mw 5.1 earthquake that occurred in the La Habra area on March 28 2014, and the subsequent Mw 4.1 Rowland Heights event on March 29 2014, have been tentatively attributed to seismicity associated with the Puente Hills blind thrust.

San Joaquin Hills Thrust Fault

Recent studies by various researchers have suggested that the hilly terrain that characterizes the San Joaquin Hills in central and southern Orange County is the result of late Quaternary folding associated with tectonic uplift along an active thrust fault. Recognition of this potentially seismogenic blind thrust extends the known area of active blind thrusts and fault-related folding present in Los Angeles County southward into coastal Orange County (Grant et al., 1999). Recent blind thrust earthquakes, including the 1987 magnitude 5.9 Whittier Narrows and the 1994 magnitude 6.7 Northridge events, have demonstrated the significance of these features with respect to the tectonic setting of southern California. Although the San Joaquin Hills thrust has not been observed directly at the surface, structural modeling indicates that this fault has a slip rate of approximately 0.5 millimeters per year that yields a recurrence interval of 1,650 to 3,100 years for moderate-sized earthquakes.

Whittier Fault

Located approximately 20.7 kilometers northeast of the subject site, it is one of the most prominent structural features in the Los Angeles Basin. It occurs as three subparallel strands that form a zone approximately 1.2 kilometers wide and about 74 kilometers long. Topographic expression of this zone is marked by a distinct linear valley with offset drainages along the valley margins. Published investigations reveal that this fault offsets Holocene stratigraphy just east of the city of Whittier, as well as to the northwest of Brea Canyon (Leighton and Associates, 1990). For this reason, this fault is considered active and is included within the boundaries of an Alquist-Priolo Earthquake Fault zone.

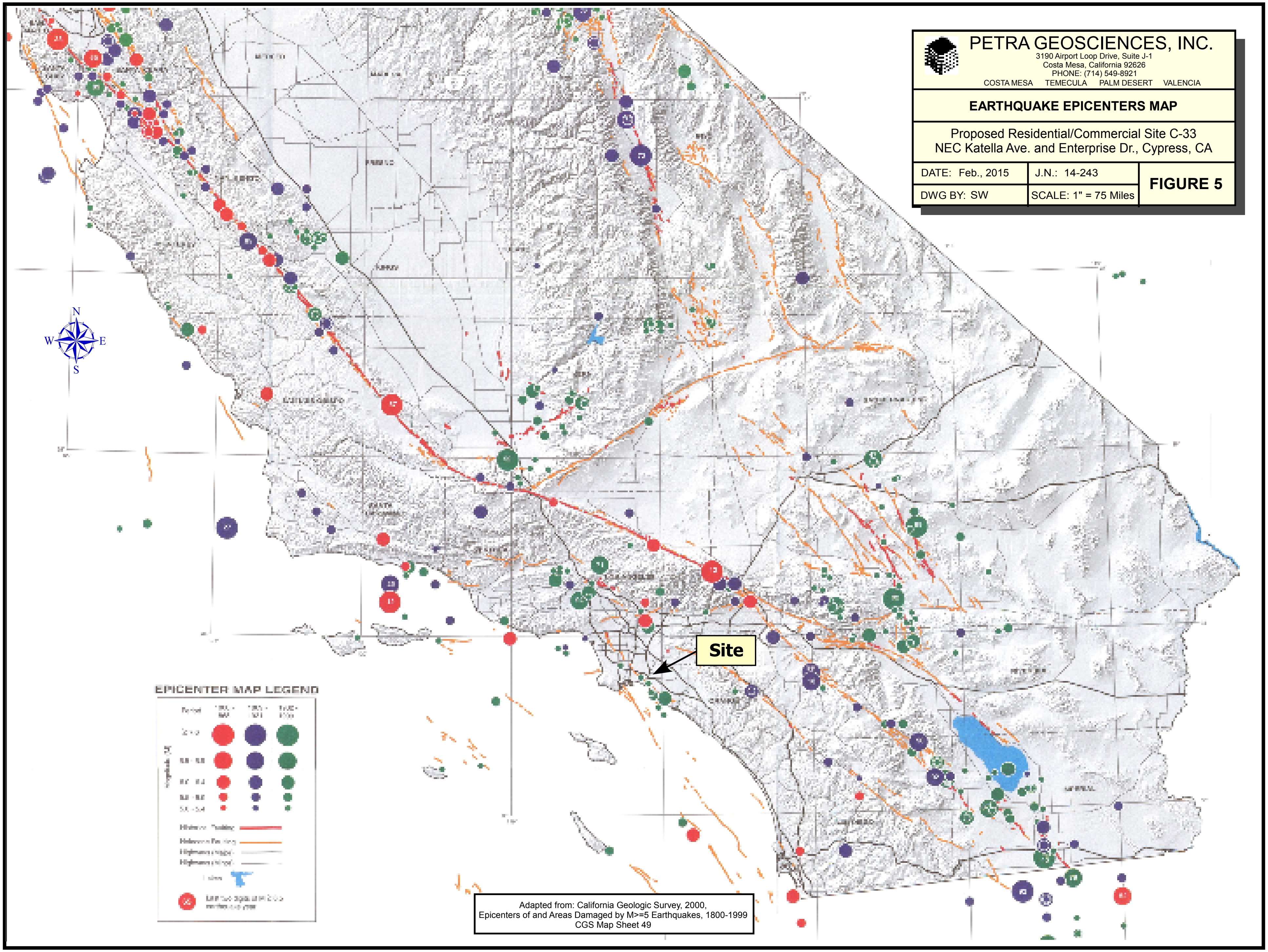
Most sources report a relatively low level of seismic activity along the eastern portion of the Whittier fault with earthquake magnitudes rarely exceeding Richter Magnitude 5.0. However, on September 3, 2002, a magnitude 4.6 earthquake occurred northeast of Yorba Linda in Orange County that has been attributed to a small conjugate fault related to the Whittier fault zone (Hauksson and Hutton, 2002). Another moderate earthquake having a Richter Magnitude of 5.4 occurred in the same general area on July 28, 2008 and was also initially attributed to the Whittier fault; however, subsequent analysis suggests that this seismic event was associated with a newly postulated feature that has been referred to as the "Yorba Linda Trend." Researchers currently suspect that this feature consists of a one- to two-mile-wide fault system that traverses the area where the Whittier, Elsinore and Chino Hills faults intersect near the northern end of the Santa Ana Mountains.

Palos Verdes Fault

The Palos Verdes fault is located approximately 20.8 kilometers to the southwest of the subject site and is generally described in terms of three individual segments, namely the San Pedro Bay, the onshore, and the Santa Monica Bay segments (Ziony, 1985). All segments are believed to possess a reverse or reverse right oblique sense of motion. References reviewed as part of this report indicate that the San Pedro Bay portion of the fault has been shown to displace Holocene sedimentary materials; however, evidence for Holocene activity along the onshore and Santa Monica Bay segments is currently in dispute. Nonetheless, in light of the increased amount of seismicity that has been attributed to the Santa Monica Bay segment, the Palos Verdes Hills fault has been classified as active.

Historical Seismicity

As is the case with most locations in Southern California, the subject site is located in a region that is characterized by moderate to high seismic activity. The project site and vicinity have experienced strong ground shaking due to earthquakes on a number of occasions in historic time. Some of the more significant historic seismic events for which detailed ground motion data are available are listed in Table 2, along with the corresponding approximate epicentral distances to the subject site, the calculated moment magnitude, and the approximate peak horizontal site accelerations based on various published earthquake databases. The locations of selected earthquake epicenters with respect to the subject site are shown graphically on Figure 5.



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EARTHQUAKE EPICENTERS MAP

Proposed Residential/Commercial Site C-33
NEC Katella Ave. and Enterprise Dr., Cypress, CA

DATE: Feb., 2015	J.N.: 14-243	FIGURE 5
DWG BY: SW	SCALE: 1" = 75 Miles	

Adapted from: California Geologic Survey, 2000,
Epicenters of and Areas Damaged by M>=5 Earthquakes, 1800-1999
CGS Map Sheet 49

Table 2 - Significant Historic Earthquakes

Earthquake Events	Approximate Epicentral Distance From Site (kilometers)	Moment Magnitude (Mw)	Approximate Site Acceleration (g)	Approximate Modified Mercalli Intensity[4]
La Habra (March 28, 2014)[1]	13	5.1	0.003	II
Calexico/Sierra El Mayor (April 4, 2010)[2]	313	7.2	0.02	IV
Inglewood (May 17, 2009)[1]	36	4.7	0.03	IV
Chino Hills (July 29, 2008)[1]	25	5.4	0.16	VI
Hector Mine (October 16, 1999)[3]	184	7.4	0.02	IV
Northridge (Jan. 17, 1994)[1]	57	6.7	0.09	VI
Whittier Narrows (Oct. 1, 1987)[2]	17	5.9	0.05	V
Sylmar (Feb. 9, 1971)[3]	75	6.4	0.04	V
Landers (June 28, 1992)[3]	152	7.6	0.04	V
Big Bear (June 28, 1992)[3]	119	6.7	0.03	IV
Kern County (July 21, 1952)[3]	160	7.7	0.04	V
Long Beach (March 11, 1933)[3]	20	6.3	0.16	VI
Glen Ivy Hot Springs (May 15, 1910)[3]	59	6.0	0.04	V
Lytle Creek (July 30, 1894)[3]	66	6.0	0.04	V
Los Angeles (July 11, 1855)[3]	32	6.3	0.11	VI
Wrightwood (Dec. 8, 1812)[3]	70	7.0	0.07	V

Notes: [1] Maximum free-field site accelerations based on Southern California Seismic Network (SCSN) published accelerogram data for Station BRE, located approximately 6.3 kilometers east of the subject site.

[2] Maximum site acceleration based on the published accelerogram data for CGS CSMIP Station No. 14400, located approximately 4.4 kilometers northwest of the subject site.

[3] Site accelerations are estimated based on the results of a computerized database search using a program developed by T.F. Blake (Eqsearch V3.0, 2000). For purposes of the computerized site acceleration estimates, the attenuation relationship developed by Bozorgnia, Campbell and Niazi (1999) for Holocene soil sites was considered appropriate.

[4] Based on Wald, D.J. et al, 1999.

Active Fault Zonation

No portion of the area of study is located within the boundaries of an "Earthquake Fault Zone" as defined by the State of California in the Alquist-Priolo Earthquake Fault Zoning Act (Hart and Bryant, 1997). The site is, however, located approximately 6.8 kilometers to the northeast of an earthquake fault zone that has been established around the active traces of the Newport-Inglewood fault.

On the basis of our review of the current revision of the Safety Element of the City of Cypress General Plan, no active faults have been identified within the City boundaries. In addition, the City has not independently designated any zones wherein additional subsurface investigation would be required to determine the presence and level of activity of suspected active branches of local fault systems (City of Cypress Planning Division, 2000).

Secondary Seismic Hazard Zonation

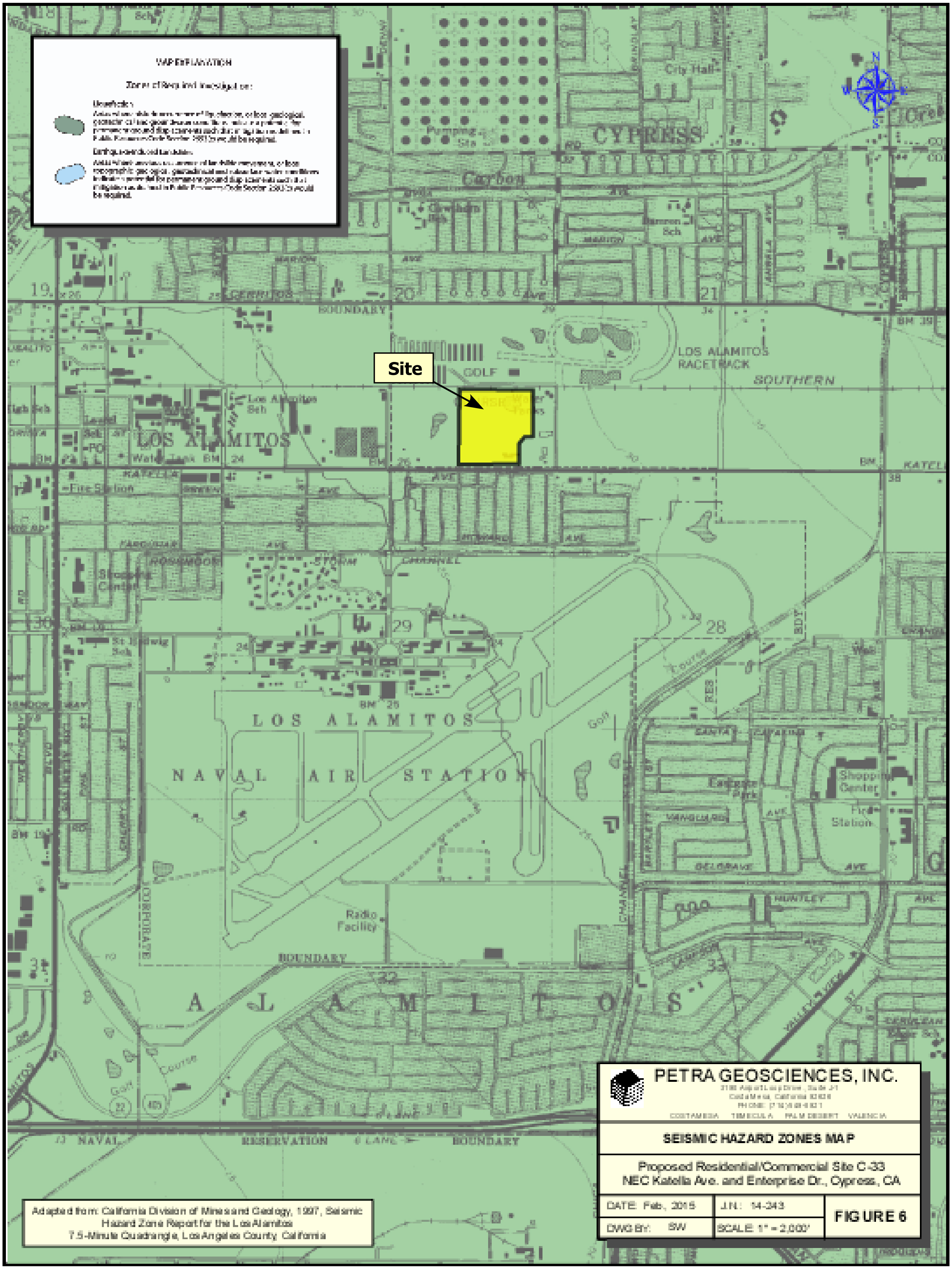
Based on our review of the published Seismic Hazard Zone Report for the U.S.G.S. Los Alamitos 7.5-minute quadrangle (CDMG, 1998), the subject site lies within a designated Liquefaction Hazard Zone (see Figure 6). This zone extends well beyond the limits of Figure 6 and encompasses all of the land area within the corporate boundaries of the City of Cypress, as well as large portions of the adjacent cities of Los Alamitos, Garden Grove, Stanton, Anaheim and Buena Park. Given the essentially flat topography that characterizes the southern portion of the City of Cypress, the site has not been included within a State-designated seismically-induced landslide hazard zone.

Our review of the Safety Element of the City of Cypress General Plan indicates that the City has adopted the seismic hazards maps prepared by the California Geologic Survey and has not independently designated additional zones that are considered susceptible to secondary seismic hazards such as liquefaction and earthquake-induced landslides.

Seismically-Induced Flooding

The types of seismically induced flooding which may be considered as potential hazards to a particular site normally include flooding due to a tsunami (seismic sea wave), a seiche, or failure of a major reservoir or other water retention structure upstream of the site. Since the site lies 9 kilometers inland from the Pacific Ocean at an average elevation of approximately 24 feet above sea level, and since it does not lie in close proximity to an enclosed body of water, the probability of flooding from a tsunami or seiche is considered to be very low. In addition, the site is not located within a designated tsunami inundation area as identified on published Tsunami Inundation maps (CEMA, 2009).

Three major flood control dams lie upstream of the city of Cypress. These include Carbon Canyon Dam (located 23 kilometers to the northeast of the site), Whittier Narrows Dam (23 kilometers north-northwest), and Prado Dam (39 kilometers to the east-northeast). Although the City's General Plan indicates that failure of any of these dams would result in inundation throughout the City, Exhibit SAF-2 (Dam Inundation Areas) of the General Plan suggests that the subject site would only be affected by flooding related to a failure of Prado Dam. In the event that a seismically-induced failure of the Prado Dam facility was to occur when this dam basin was filled to capacity, most, if not all, of the resulting flood waters would be expected to dissipate prior to reaching the Cypress city limits. However, the flood inundation maps prepared by the Army Corps of Engineers indicate that a failure of the Prado Dam could cause extensive flooding to a depth of approximately 7 feet in the city of Cypress (U.S. Army Corps of Engineers, 1985).



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SEISMIC HAZARD ZONES MAP

Proposed Residential/Commercial Site C-33
NEC Katella Ave. and Enterprise Dr., Cypress, CA

DATE: Feb., 2015	J.N.: 14-243	FIGURE 6
DWG By: SW	SCALE: 1" = 2,000'	

Adapted from: California Division of Mines and Geology, 1997, Seismic Hazard Zone Report for the Los Alamitos 7.5-Minute Quadrangle, Los Angeles County, California

The potential for seismically-induced flooding within the boundaries of the City of Cypress is addressed in Section V of the City's General Plan. Page SAF-5 of that document indicates that the City has adopted an evacuation plan that would be implemented in the event of a catastrophic failure of the Prado Dam.

Flooding Not Related to Seismicity

As part of this investigation, we conducted an independent review of the applicable FEMA flood insurance rate map for the area of the subject site (FEMA, 2009). This map indicates that the project site is located within an area that is designated as having one or more of the following conditions:

- Located within an area having a 0.2 percent annual chance of flooding;
- An area having a 0.1 percent annual chance of flooding with an average floodwater depth of less than 1 foot or with a drainage area of less than one square mile; and
- An area protected from the 0.1 percent annual chance flood by a levee system.

Historically, portions of Orange County have experienced intermittent but often widespread flooding. In more recent time, the Orange County Flood Control District has constructed storm drainage improvements that generally provide protection from flooding related to the projected 100-year storm event. Flooding from the 500-year event, however, would likely encompass a large potion of the city of Cypress.

DEFINITION AND USE OF SIGNIFICANCE CRITERIA

This section provides an evaluation of the potential impacts of the proposed project with regard to geologic and geotechnical features and processes. The guidelines provided in the following three publications served as a basis for identifying potential impacts:

1. State CEQA Guidelines, Appendix G (Environmental Checklist Form), Section VI (Geology and Soils).
2. City of Cypress General Plan EIR (2001), Section 4.6 (Geologic and Seismic Hazards).
3. California Division of Mines and Geology Note 46, "Guidelines for Geologic/Seismic Considerations in Environmental Impact Reports" (currently in revision).

Generally speaking, geological and seismological impacts occur as two basic categories: natural events which may occur whether or not the project advances to the construction phase, and impacts that occur as a direct result of construction of the project. Examples of the former include fault displacement, earthquake shaking, liquefaction, and landslides. These can often be reduced to a level of insignificance through avoidance or by proper engineering design. Examples of potential geological impacts that can occur as a result of project construction are typically related to disturbance of surficial geologic formations and include induced hydroconsolidation of collapsible soils, induced slope instability, and increased soil erosion. Regardless of whether the impact is due to a natural event or a direct result of the proposed development, Appendix G of the State CEQA Guidelines state that implementation of the project would normally result in a significant impact if the one or more of the following conditions is identified:

1. The project will expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

   a) 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 from a known fault;

   b) Strong seismic ground shaking;

   c) Seismically-induced ground failure, including liquefaction; and

   d) Landslides.

2. The project results in substantial soil erosion or the loss of topsoil.

3. The project is 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.

4. The project is located on expansive soil as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to like and property.

5. The project is underlain by 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.

Generic examples of potentially significant impacts from natural geologic conditions include the following:

- Ground rupture occurs beneath proposed structures for human occupancy or support infrastructure as a result of surface displacement along active earthquake faults.

- Earthquake-induced ground shaking causes landslides, liquefaction, settlement, lateral spreading and/or surface cracking that damages project structures or facilities.

- Failure of construction excavations resulting from the presence of loose or saturated sand, soft clay, or highly fractured or weathered rock.

- Differential subsidence or hydroconsolidation of collapsible soil results in excessive differential settlement directly under project structures or facilities.

Examples of potentially significant impacts of a particular project on the geological environment include the following:

- Unique geologic features or geologic features of unusual scientific value for study or interpretation would be disturbed or otherwise adversely affected by the project or the associated construction activities.

- Adverse geological processes such as landslides would be triggered or accelerated by construction or disturbance of landforms.

- Substantial alteration of topography would be required or could occur beyond that which would result from natural erosion and deposition.

- Shallow, hard bedrock is encountered during grading that requires blasting.

SITE-SPECIFIC GEOLOGIC IMPACTS AND MITIGATION MEASURES

The following paragraphs provide our assessment of the potential geologic impacts of the proposed project in consideration of the significance thresholds described above. This assessment is based on our review of available geologic literature and maps, as well as our subsurface investigation, laboratory testing and engineering analysis completed to date. The range of potential impacts with respect to the proposed project are *No Impact*, *Less than Significant*, *Less than Significant with Compliance with Regulatory Standards*, and *Less than Significant with Mitigation*. Proposed mitigation measures are recommended where appropriate that would reduce the effect of potentially significant impacts to a less-than-significant level.

Impact No. 1(a) – Fault Rupture

Level of Significance: Less than Significant

Discussion

No portion of the area of proposed construction is located within the boundaries of an "Earthquake Fault Zone" as defined by the State of California in the Alquist-Priolo Earthquake Fault Zoning Act (Hart and Bryant, 1997). The site is, however, located approximately 10 kilometers to the northeast of the earthquake fault zone that has been established around the active traces of the Newport-Inglewood fault.

Our research included a review of published geological maps that depict the locations of known active and potentially-active fault traces in the area of the subject site. The referenced literature indicates that no known surface traces of active or potentially active faults traverse any portion of the subject site. For this reason, the potential for substantial adverse effects due to surface rupture along a known earthquake fault is considered to be negligible.

Impact No. 1(b) - Strong Ground Shaking

Level of Significance: Less than Significant with Compliance with Regulatory Standards

Discussion

The subject site is located in a seismically active area of southern California. The type and magnitude of seismic hazards that may affect the site are dependent on both the distance to causative faults and the intensity and duration of the seismic event. Although the probability of primary surface rupture is considered very low, ground shaking hazards posed by earthquakes occurring along regional active faults do exist and should be taken into account in the design and construction of the proposed structures within the subject site.

Earthquake loads on earthen structures and buildings are a function of ground acceleration which may be determined from the site-specific acceleration response spectrum. To construct a preliminary site-specific acceleration response spectrum for the proposed project, we used two computer applications that are available on the United States Geological Survey (USGS) website http://geohazards.usgs.gov/. Specifically, the Design Maps website http://geohazards.usgs.gov/designmaps/us/application.php was used to calculate the ground motion parameters. In addition, the 2008 PSHA Interactive Deaggregation website http://geohazards.usgs.gov/deaggint/2008/ was used to determine the appropriate earthquake magnitude.

To run the above computer applications, site latitude, longitude and knowledge of "Site Class" are required. The site class definition depends on the average shear wave velocity (Vs_{30}) for the upper 30 meters (approximately 100 feet) of site soils. A shear wave velocity of 259 meters per second for the upper 100 feet was used for the site based on CPT shear wave velocity testing performed during our subsurface investigation at the site. The following Table 3 provides preliminary parameters required to construct the site-specific acceleration response spectrum based 2013 CBC guidelines.

Table 3 - 2013 CBC Section 1613 Earthquake Loads

Acceleration Response Spectrum

Ground Motion Parameters	Reference	Parameter Value	Unit
Latitude (North)	-	33.805001	°
Longitude (West)	-	-118.048557	°
Site Class Definition	Table 20.3-1, ASCE 7-10	D	-
Assumed Risk Category	Table 1604.5, CBC 2013	III	-
M_w - Earthquake Magnitude	Section 1803.5.12.2, CBC 2013	7.5	-
S_s - Mapped Spectral Response Acceleration	Figure 1613.3.1(1), CBC 2013	1.503	g
S_1 - Mapped Spectral Response Acceleration	Figure 1613.3.1(2), CBC 2013	0.548	g
F_a - Site Coefficient	Table 1613.3.3(1), CBC 2013	1.0	-
F_v - Site Coefficient	Table 1613.3.3(2), CBC 2013	1.5	-
S_{MS} - Adjusted Maximum Considered Earthquake Spectral Response Acceleration	Equation 16-37, CBC 2013	1.503	g
S_{M1} - Adjusted Maximum Considered Earthquake Spectral Response Acceleration	Equation 16-38, CBC 2013	0.822	g
S_{DS} - Design Spectral Response Acceleration	Equation 16-39, CBC 2013	1.002	g
S_{D1} - Design Spectral Response Acceleration	Equation 16-40, CBC 2013	0.548	g
T_o - (0.2 S_{D1}/ S_{DS})	Section 11.3, ASCE 7-10	0.109	s
T_s - (S_{D1}/ S_{DS})	Section 11.3, ASCE 7-10	0.547	s
T_L - Long Period Transition Period	Figure 22-12, ASCE 7-10	8	s
F_{PGA} - Site Coefficient	Figure 22-7, ASCE 7-10	1.0	-
[1] PGA_M - Peak Ground Acceleration at MCE	Equation 11.8-1, ASCE 7-10	0.551	g
[2] PGA – Design Level – (0.4 S_{DS})	Equation 11.4-5, ASCE 7-10	0.401	g
C_{RS} - Short Period Risk Coefficient	Figure 22-17, ASCE 7-10	1.008	-
C_{R1} - Long Period Risk Coefficient	Figure 22-18, ASCE 7-10	1.046	-
[3] Seismic Design Category	Section 1613.3.5, CBC 2013	D	-

[1] PGA Calculated at the MCE return period of 2475 years (2 percent chance of exceedance in 50 years).

[2] PGA Calculated at the Design Level of 2/3 of MCE which is approximately equivalent to a return period of 475 years (10 percent chance of exceedance in 50 years).

[3] Seismic Design Category may be calculated by the structural engineer in accordance with the alternate design procedures of Section 1613.3.5.1 based on structural characteristics in addition to the ground motion parameters, this may supersede the category listed herein.

References: USGS Seismic Design Web Application – http://geohazards.usgs.gov/designmaps/us/application.php
USGS 2008 Interactive Deaggregation Tool - https://geohazards.usgs.gov/deaggint/2008/

Compliance with Regulatory Standards

City approval of the plans and specifications for this project is predicated upon compliance with all applicable State and local building codes. The design-phase geotechnical report for the project will provide the required engineering geotechnical input to assist the project designers (including the architect, structural engineer and civil engineer) in achieving this compliance with applicable State and local codes, regulations and ordinances. Provided that the structures proposed within the site are designed and constructed in accordance with the

California Building Code as adopted by the City of Cypress in its Municipal Code, and the site-specific recommendations to achieve such compliance that will be provided in the comprehensive design-phase geotechnical report for the project, the potential impact with respect to seismically-induced strong ground shaking at the project site would be less than significant.

Impact No. 1(c) – Seismically-Induced Ground Failure (Including Liquefaction)

General Discussion

The secondary effects of seismic activity that are typically considered as potential hazards to a particular site include several types of ground failure. The general types of ground failure that can occur as a consequence of severe ground shaking include landsliding, ground subsidence, ground lurching and shallow ground rupture, as well as liquefaction-induced vertical settlement, lateral spreading, and surface manifestation of liquefaction. The probability of occurrence of each type of ground failure depends on the severity of the earthquake, distance from the causative fault, topography, soil, and groundwater conditions and other factors.

As discussed below, of the seismically-induced ground failure modes listed above, liquefaction-induced settlement and surface manifestation appear to be the only potential concerns with respect to development of the proposed project. Liquefaction occurs when dynamic loading of a saturated sand or silt causes pore-water pressures to increase to levels where grain-to-grain contact is lost or significantly reduced and material temporarily behaves as a viscous fluid. Liquefaction can cause settlement of the ground surface, settlement and tilting of engineered structures, flotation of buoyant buried structures and fissuring of the ground surface. A common surface manifestation of liquefaction is the formation of sand boils (short-lived fountains of soil and water that emerge from fissures or vents and leave freshly deposited conical mounds of sand or silt on the ground surface).

Assessment of liquefaction potential for a particular site requires knowledge of a number of regional as well as site-specific parameters including the estimated design earthquake magnitude, the distance to the assumed causative fault and the associated probable peak horizontal ground acceleration at the site, subsurface stratigraphy and soil characteristics. Parameters such as distance to causative faults and estimated probable peak horizontal ground acceleration were determined using published references and by utilizing online computer programs by the U.S. Geological Survey (USGS). Stratigraphy and soil characteristics were determined by means of a site-specific subsurface investigation combined with appropriate laboratory analysis of representative samples of onsite soils.

A variety of computer programs are available that were developed specifically for liquefaction and seismic settlement analyses. For purposes of this study, we selected the commercially available software program Cliq Version 1.7.6.34 (Geologismiki, 2014) that implements updated versions of the National Center for Earthquake Engineering Research (NCEER) procedure as recommended by Dr. Peter Robertson (2010) and Idriss and Boulanger (2008, 2014). The procedures were based on the methods originally recommended by Seed and Idriss (1982). Our analysis was performed solely using data from the 14 cone penetrometer test (CPT) soundings performed by our firm at the project site due to the fact that the CPT provides *continuous* penetration resistance data as opposed to blow count data that is typically assumed to be an average value over discrete sampling increments (e.g., 5 or 10 feet).

As previously discussed, groundwater was observed at depths of between 8 and 12 feet below the ground surface at the time of our field investigation in the area of proposed construction. This depth is generally consistent with published maps which indicate that the historic high groundwater level in the vicinity of the site is approximately 10 feet below the ground surface (CDMG, 1998). In accordance with current standards of practice, we have assumed a historical high groundwater level of 8 feet below the surface for purposes of our analysis.

Standards for Mitigation of Liquefaction Hazards

In April 1991, the State of California enacted the Seismic Hazards Mapping Act (California Public Resources Code, Division 2, Chapter 7.8, subsequently referred to herein as the "SHMA"). The purpose of the SHMA is to protect the public safety from the effects of strong ground shaking, liquefaction, landslides, or other ground failure. The SHMA defines mitigation as "… those measures that are consistent with established practice and that will reduce seismic risk to acceptable levels" (California Public Resources Code, Division 2, Chapter 7.8, Section 2693[c]). Acceptable level of risk is defined as "that level that provides reasonable protection of the public safety, though it does not necessarily ensure continued structural integrity and functionality of the project (California Code of Regulations Volume 18, Title 14, Article 10, Section 3721[a])." Within the context of the Act, mitigation of the project's potential liquefaction impact to an acceptable level of risk (to the extent that mitigation is required as described herein) can be accomplished through appropriate foundation design and subsurface soil improvement.

Results of Site-Specific Liquefaction Study and Impact Analysis

As stated previously in this section, liquefaction and liquefaction-related surface phenomena (surface manifestation) appear to be the only substantial concerns with respect to ground failure at the project site. For clarity, the potential resultant effects (including total settlement, differential settlement, and surface manifestation), their levels of significance, and proposed mitigation (where appropriate) are discussed individually in the following paragraphs.

Liquefaction-Induced Total Settlement

Level of Significance: Less than Significant with Mitigation

Discussion

Many jurisdictions including the Counties of Orange and Los Angeles allow structural fortification of slabs and footings to mitigate the adverse effect of up to 4 inches of liquefaction-induced total settlement. Guidelines published by the California Geological Survey (CGS) also suggest that structural mitigation may be acceptable where vertical displacements of less than 4 inches are predicted (reference CGS Special Publication 117A, p.54). If liquefaction-induced settlement would exceed 4 inches, some form of ground improvement is required to reduce the potential *total* settlement to 4 inches or less. Typical ground improvement techniques include compaction grouting, installation of stone columns, and construction of reinforced earth zones beneath proposed structural areas. In cases where the amount of potential settlement is excessive, a deepened foundation system (such as concrete caissons or driven piles) may be required.

Based on the results of our site-specific evaluation, the maximum estimated dynamic free-field total settlement was calculated to be approximately 2.7 inches for all but one of the exploratory cone penetrometer test locations within the project site. This is well within the commonly accepted limitations of structural mitigation described above (i.e., 4 inches). This limit was only exceeded in the area of exploration point CPT-1 (see Figure 2) where approximately 4.5 inches of liquefaction-induced total settlement is predicted. CPT-1 is located in the northwestern corner of the project site where a portion of the senior residential community would be developed. In this area, mitigation will be required in order to reduce the amount of predicted dynamic total settlement to 4 inches or less.

The project will incorporate post-tensioned and/or strengthened concrete mat-type foundation systems into the design of the proposed buildings. Given this project design feature, the potential adverse effects of liquefaction-induced total settlement would be less than significant, and no mitigation would therefore be required for all portions of the project site other than the area represented by CPT-1.

Proposed Mitigation in Area of CPT-1

For the area represented by CPT-1 where the maximum estimated liquefaction-induced total settlement is 4.5 inches, ground improvement or soil reinforcement will be required to reduce the potential total dynamic settlement to less than 4 inches. Given the relatively light foundation loadings that are anticipated for the residential structures that are proposed within this portion of the project site, the required level of mitigation can be achieved through the use of a polymer geogrid-reinforced soil zone beneath the residential structures in conjunction with a post-tensioned or strengthened concrete mat foundation. With implementation of this mitigation, the proposed project's impact with respect to liquefaction-induced total settlement in the area of CPT-1 would be less than significant.

Liquefaction-Induced Differential Settlement

Level of Significance: Less than Significant

Discussion

The results of our liquefaction analysis indicate that the maximum differential settlement between exploratory points within the project site is approximately 2.5 inches over a horizontal span of 400 feet, with a corresponding equivalent angular distortion ratio of approximately 1:1,920. This value is within the commonly accepted construction tolerance of 1:480 when appropriate structural design features (e.g., a fortified foundation system) are used for residential and low-rise commercial buildings. It should be noted that these estimates are for settlement at the ground surface in the free field (in other words, this settlement would occur with or without construction of the project). Settlement of building structures may be different from that of the free field estimate.

For the proposed residential and lightly-loaded commercial foundation systems, the potential detrimental effects of liquefaction-induced differential settlement would be reduced to an acceptable level of risk for engineering purposes through the use of the properly designed and constructed post-tensioned or strengthened concrete mat foundation systems that will be incorporated into the project design. This is due to the fact that such strengthened foundation systems provide increased rigidity over conventional building foundations and are thus capable of tolerating a greater amount of angular distortion without losing structural integrity. Therefore, the project would have a less-than-significant impact with respect to liquefaction-induced differential settlement.

Surface Manifestation of Liquefaction

Level of Significance: Less than Significant with Mitigation

Discussion

Considering the shallow depth of the liquefiable layers identified during cone penetrometer testing, the thickness of the surficial non-liquefiable layer above the liquefiable zone appears to be insufficient to prevent surface manifestation of liquefaction (including sand boils, ground fissures, and associated phenomena). In addition, the foundations for the proposed residential and commercial structures to be constructed on the project site may lose a portion of the available bearing capacity during a strong seismic event that results in surface manifestation of liquefaction.

The architectural plans for the project prepared by Robert Hidey Architects (dated February 19, 2015) indicate that post-tensioned concrete foundation systems will be utilized for the proposed buildings within the site. The post-tensioned slab design would provide an added degree of stiffness over what would typically be afforded by a conventionally-reinforced foundation. The design of the foundation systems will be required to comply with applicable State and local laws and ordinances, including Chapter 18 of the California Building Code, as adopted by the City of Cypress in its Municipal Code.

Proposed Mitigation

The potentially significant impact with respect to surface manifestation of liquefaction would be reduced to a less-than-significant level through proper remedial grading applied in combination with strengthened foundation designs that have been incorporated into the architectural plans (Robert Hidey Architects, February 19, 2015). Remedial grading would include excavation and recompaction of near-surface soils to increase the relative density of the surficial non-liquefiable layer. In order to provide adequate support for the proposed new engineered fills, structural foundations and exterior site improvements, the existing ground surfaces should be over-excavated and the excavated material replaced as properly compacted, engineered fill. Available data suggests that the average depth of required over-excavation will be on the order of 3 to 4 feet below existing grades in proposed building areas. Somewhat shallower over-excavation may be adequate beneath areas of proposed pavement and concrete flatwork. These estimates should be further refined as part of the comprehensive design-phase geotechnical investigation.

<u>Impact No. 1(d) – Slope Instability and Landslides</u>

<u>Level of Significance</u>: No Impact

<u>Discussion</u>

As previously discussed, our review of the pertinent Seismic Hazard Zone Report for the area of the project site indicates that the property does not lie within a designated seismically-induced landslide hazard zone. This is expected given the essentially flat topography that characterizes the southern portion of the city of Cypress. In addition, given the absence of any existing or likely proposed slopes of significant height within or adjacent to the site, the potential for gross or surficial slope instability is considered to be nonexistent.

<u>Impact No. 2 – Soil Erosion or Loss of Topsoil</u>

<u>Level of Significance</u>: Less than Significant with Compliance with Regulatory Standards

<u>Discussion</u>

There are no existing or likely proposed slopes of significant height within the project site; therefore, the potential for significant erosion and downslope transport of topsoil material is considered to be minimal. Under conditions where runoff from precipitation or uncontrolled irrigation is concentrated over an extended period of time, some localized erosion of graded areas could occur that would result in offsite transport of the non-cohesive (sandy) near-surface soils within the project site if the project did not comply with applicable regulatory standards relating to erosion control.

<u>Compliance with Regulatory Standards:</u>

The localized soil erosion and loss of topsoil associated with the project would be less than significant because the project would be required to comply with applicable regulatory standards relating to erosion control and storm water management. Such standards include proper implementation of storm water Best Management Practices (as mandated by the City's water quality ordinance set forth in Chapter 13, Article IV of the City of Cypress Municipal Code) prior to commencement of earthwork operations within the project site, as well as diligent maintenance of erosion control devices throughout the early phases of construction until such time as the permanent storm water conveyance system has been constructed and activated. During the post-construction and occupancy period, the potential for soil erosion and loss of topsoil would remain less than significant through proper maintenance of irrigation systems and permanent storm water conveyance devices, as well as though compliance with the City's water quality ordinance.

<u>Impact No. 3 – Stability of Geologic Unit or Soil</u>

<u>Level of Significance</u>: Less than Significant with Mitigation

<u>Discussion</u>

The results of our subsurface investigation within the site, as well as those conducted by previous consultants, indicate that the majority of the site is underlain by a mantle of fill soil that extends to depths of 2 to 4 feet below the surface. In localized areas, this fill may extend as deep as 8 feet. Given the previous non-structural usage of the site, it is unlikely that the onsite fill materials were placed in accordance with current grading standards and certified by a geotechnical professional. The exception to this would be the previous golf course lake areas (see discussion in the following paragraph). With the lack of documentation of original grading operations within the site, the future settlement behavior of these materials under the proposed loading conditions cannot be accurately predicted. For this reason, the existing onsite fill (beyond the former lake boundaries) are classified as "undocumented" for purposes of this investigation and will thus be considered unsuitable for support of the proposed buildings and appurtenant site improvements. Where existing undocumented fill occurs in areas where new engineered fills or structures are proposed, the existing fill will require excavation and recompaction as part of remedial grading operations.

As noted previously in this report, portions of the subject site that were previously occupied by golf course lakes are underlain by as much as 14½ feet of artificial fill. Due to the fact that placement of this fill was observed, tested and documented by a geotechnical consultant (Pacific Soils Engineering, Inc.), this material is classified as engineered fill and is not likely to be subject to the same degree of compressibility as the undocumented fill material described above.

During our recent subsurface investigation, we noted the presence of soft and potentially compressible native alluvial soils in the southwest corner of the site in the area of CPT-8 (see Plate 2 for location). The potentially soft layers were noted from a depth of about 7 feet to a depth of approximately 25 feet below the existing ground surface. These materials generally exist below the present groundwater levels. Static settlement resulting from the consolidation of these potentially compressible materials is expected to remain within acceptable construction tolerances for well-designed structures provided that the new loads imposed by the proposed commercial buildings or placement of significant thicknesses of compacted fill are not excessive.

Based on the current conceptual grading plan, proposed finished grades within this area may be raised as much as 7 feet in localized areas to establish the planned finished grade elevation. As a result, settlement due to consolidation of compressible subsurface soils may locally exceed design tolerances of the proposed commercial buildings and associated exterior improvements. Additional settlement may occur if the proposed commercial buildings will impose foundation loads that are greater than what is typical for a single-story, wood-framed or light-gauge steel retail building.

<u>Proposed Mitigation</u>

Provided that design and remedial grading, ground improvement (as necessary), and design of building foundation systems are performed in accordance with the applicable requirements in the California Building Code (as adopted by the City of Cypress in its Municipal Code), current standards of practice in the area, and the site-specific recommendations to be provided by in the comprehensive design-phase geotechnical report, excessive settlement resulting from compression of existing undocumented fill and low-density native alluvial soils in areas outside of the zone represented by exploration point CPT-8 would be reduced to a less-than-significant level.

As discussed above, in the area of CPT-8 where existing surface elevations will be raised as part of design grading, the additional loads imposed by placement of compacted fill may result in excessive settlement as low-density subsurface soils are compressed. The same effect could result from placement of heavily-loaded commercial structures in the area of CPT-8. The potential for excessive static settlement in these areas can also be reduced to a less than significant level by a variety of methods, including (1) reducing building foundation loadings, (2) pre-compressing the soils using a temporary soil surcharge prior to construction, (3) implementing a localized ground improvement program such as compaction grouting, stone columns, or construction of a polymer geogrid-reinforced soil zone, or (4) bypassing the potentially compressible soils by means of a deep foundation system (such as caissons or driven piles). With implementation of such ground improvement mitigation in the area of CPT-8, the potentially significant impact associated with unstable soil would be reduced to a less-than-significant level.

<u>Impact No. 4 – Expansive Soils</u>

<u>Level of Significance</u>: Less than Significant with Compliance with Regulatory Standards

<u>Discussion</u>

Expansive soils are soils that experience volumetric changes in response to increases or decreases in moisture content. Relatively thin, rigid structural elements such as building floor slabs and exterior concrete flatwork may experience uplift, shifting, or cracking as a result of swelling or contraction of expansive soils. Within the subject site, soil shrink-swell issues are considered to be the second most likely problem a homeowner or commercial property owner will encounter, after insect damage. In recognition of these issues, Section 1808.6 of the current California Building Code (CBC), as adopted by the City of Cypress in its Municipal Code, contains provisions for design of building foundations and floor slabs to address the potential detrimental effects of expansive soils.

Compliance with Regulatory Standards

If, after completion of grading, it is determined that near-surface soils within building pad areas exhibit an elevated expansion potential, the potential impact of those expansive soils would be addressed through design of structural foundations and floor slabs in compliance with the provisions of Section 1808.6 of the CBC, as adopted by the City of Cypress in its Municipal Code, and the other publications that are incorporated therein by reference. The purpose of Section 1808.6 is to provide guidelines for the design of structural foundations and concrete floor slabs that are capable of resisting the differential volume changes that can develop in expansive soils and to prevent structural damage to the structures supported thereon. With the implementation of Section 1808.6 (as applicable), the project's impact with respect to expansive soils would be less than significant.

Impact No. 5 – Suitability of Site to Support Wastewater Disposal Systems

Level of Significance: No Impact

Discussion

The proposed senior residential units and commercial/retail development on the project site would be served by the local municipal sewer system. Therefore, the project would not include the use of private on-site septic systems or alternative wastewater disposal systems.

RECOMMENDATIONS FOR ADDITIONAL STUDY

Once a final grading plan has been developed for the proposed project, a design-phase engineering geotechnical investigation will be prepared. The results of the exploratory work discussed in this report will form the basis of a comprehensive site-specific geotechnical engineering report that provides detailed recommendations for site grading and ground improvement, design of structural foundations and floor slabs for the proposed senior residential units and commercial buildings, and design and construction of exterior concrete flatwork, masonry walls, and asphalt pavement surfaces.

CONCLUSIONS

Based on the results of our review of available geotechnical literature and maps and the results of our limited subsurface investigation within the subject site, it is our opinion that development of the subject site with the proposed residential and commercial structures is feasible from a geotechnical standpoint. In addition, with the implementation of the mitigation measures/performance standards described in this study and the final recommendations to be provided in the comprehensive design-phase geotechnical report, the potentially significant geologic and seismic impacts identified in this report would be reduced to a less-than-significant level.

REPORT LIMITATIONS

This report is based on the proposed project and geotechnical data as described herein. The materials encountered on the project site, described in other literature, and utilized in our liquefaction analysis are assumed to be representative of the entire project site, and the conclusions and recommendations contained in this report are presented on that basis. However, the engineering characteristics of soil materials typically vary between points of exploration, both laterally and vertically, and those variations could affect the conclusions and recommendations contained herein.

This report has been prepared consistent with that level of care being provided by other professionals providing similar services at the same locale and time period. The contents of this report are professional opinions and as such, are not to be considered a guarantee or warranty. This report should be reviewed and updated after a period of one year or if the general project design concept changes from that described herein.

Respectfully submitted,

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2-23-15

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APPENDIX A

EXPLORATORY BORING LOGS

CONE PENETROMETER SOUNDINGS

Petra Geotechnical, Inc. (2014)

Southern California Geotechnical (2012)

Key to Soil and Bedrock Symbols and Terms

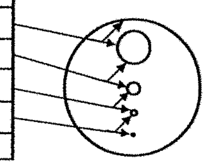
PETRA

Unified Soil Classification System

Coarse-grained Soils > 1/2 of materials is larger than #200 sieve	The No. 200 U.S. Standard Sieve is about the smallest particle visible to the naked eye	GRAVELS more than half of coarse fraction is larger than #4 sieve	Clean Gravels (less than 5% fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines
				GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines
			Gravels with fines	GM	Silty Gravels, poorly-graded gravel-sand-silt mixtures
				GC	Clayey Gravels, poorly-graded gravel-sand-clay mixtures
		SANDS more than half of coarse fraction is smaller than #4 sieve	Clean Sands (less than 5% fines)	SW	Well-graded sands, gravelly sands, little or no fines
				SP	Poorly-graded sands, gravelly sands, little or no fines
			Sands with fines	SM	Silty Sands, poorly-graded sand-gravel-silt mixtures
				SC	Clayey Sands, poorly-graded sand-gravel-clay mixtures
Fine-grained Soils > 1/2 of materials is smaller than #200 sieve		SILTS & CLAYS Liquid Limit Less Than 50		ML	Inorganic silts & very fine sands, silty or clayey fine sands, clayey silts with slight plasticity
				CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
				OL	Organic silts & clays of low plasticity
		SILTS & CLAYS Liquid Limit Greater Than 50		MH	Inorganic silts, micaceous or diatomaceous fine sand or silt
				CH	Inorganic clays of high plasticity, fat clays
				OH	Organic silts and clays of medium-to-high plasticity
Highly Organic Soils				PT	Peat, humus swamp soils with high organic content

Grain Size

Description		Sieve Size	Grain Size	Approximate Size
Boulders		>12"	>12"	Larger than basketball-sized
Cobbles		3 - 12"	3 - 12"	Fist-sized to basketball-sized
Gravel	coarse	3/4 - 3"	3/4 - 3"	Thumb-sized to fist-sized
	fine	#4 - 3/4"	0.19 - 0.75"	Pea-sized to thumb-sized
Sand	coarse	#10 - #4	0.079 - 0.19"	Rock salt-sized to pea-sized
	medium	#40 - #10	0.017 - 0.079"	Sugar-sized to rock salt-sized
	fine	#200 - #40	0.0029 - 0.017"	Flour-sized to sugar-sized to
Fines		Passing #200	<0.0029"	Flour-sized and smaller



Laboratory Test Abbreviations

MAX	Maximum Dry Density	MA	Mechanical (Particle Size) Analysis
EXP	Expansion Potential	AT	Atterberg Limits
SO4	Soluble Sulfate Content	#200	#200 Screen Wash
RES	Resistivity	DSU	Direct Shear (Undisturbed Sample)
pH	Acidity	DSR	Direct Shear (Remolded Sample)
CON	Consolidation	HYD	Hydrometer Analysis
SW	Swell	SE	Sand Equivalent
CL	Chloride Content	OC	Organic Content
RV	R-Value	COMP	Mortar Cylinder Compression

Modifiers

Trace	< 1 %
Few	1 - 5%
Some	5 - 12 %
Numerous	12 - 20 %

Sampler and Symbol Descriptions

- ▽ Approximate Depth of Seepage
- ▼ Approximate Depth of Standing Groundwater
- Modified California Split Spoon Sample
- Standard Penetration Test
- Bulk Sample
- Shelby Tube
- No Recovery in Sampler

Bedrock Hardness

Soft	Can be crushed and granulated by hand; "soil like" and structureless
Moderately Hard	Can be grooved with fingernails; gouged easily with butter knife; crumbles under light hammer blows
Hard	Cannot break by hand; can be grooved with a sharp knife; breaks with a moderate hammer blow
Very Hard	Sharp knife leaves scratch; chips with repeated hammer blows

Notes:

Blows Per Foot: Number of blows required to advance sampler 1 foot (unless a lesser distance is specified). Samplers in general were driven into the soil or bedrock at the bottom of the hole with a standard (140 lb.) hammer dropping a standard 30 inches unless noted otherwise in Log Notes. Drive samples collected in bucket auger borings may be obtained by dropping non-standard weight from variable heights. When a SPT sampler is used the blow count conforms to ASTM D-1586

EXPLORATION LOG

Project: **33-Acre Parcel**		Boring No.: **B-1**	
Location: **NE Corner of Katella Ave. and Enterprise Dr., Cypress**		Elevation: **+/- 29**	
Job No.: **14-243**	Client: **C33, LLC**	Date: **7/14/14**	
Drill Method: **Hollow-Stem Auger**	Driving Weight: **140 lbs / 30 in**	Logged By: **SHW**	

Depth (Feet)	Material Description	Water	Samples: Blows Per 6 Inches	Laboratory Tests: Moisture Content (%)	Laboratory Tests: Dry Density (pcf)	Laboratory Tests: Other Lab Tests
	ARTIFICIAL FILL (af) Sandy Silt (ML): Light gray; dry; soft; very fine-grained sand. Silty Sand (SM): Brown to olive gray; slightly moist to moist; medium dense; very fine-grained sand.		13 9 12	24.0	90.4	MAX EXP AT HYD SO4 pH RES CL
5	**ALLUVIUM (Qal)** Sandy Clay (CL): Olive brown; moist; stiff; very fine-grained sand. Interbedded Silt and Silty Sand (ML/SM): Olive brown to olive gray; very moist to wet; stiff to medium dense; very fine-grained sand; laminated.		7 9 10	32.9	86.6	
	Silty Clay (CH): Olive brown; very moist to wet; soft; plastic.		2 2 2	41.9	71.1	CON
	@ 8': with increasing silt; slightly porous; micaceous.	∇	3 5 7	32.6	86.5	
10	Silt (ML): Olive gray to olive brown; wet; firm; micaceous; groundwater encountered. @ 10': same as above.		3 4 6	29.9	94.4	CON
	@ 12.5': becomes dark olive gray; with few clay and hard silt nodules.		5 6 8	28.6	92.1	
15	Sand (SP): Gray; wet; medium dense; fine-grained sand.		7 12 13	27.1	92.9	
	Silty Clay (CH): Olive gray; wet; stiff; micaceous; plastic.					
	Sandy Silt (ML): Olive gray to olive brown; wet; stiff; micaceous.		6 9 12	22.9	100.8	
20	Clay (CH): Dark gray to olive brown; wet; firm; with few silt; plastic.		6 5 6	27.2	98.8	AT
	Silty Sand to Sandy Silt (SM/ML): Olive gray; wet; medium dense to stiff; very fine- to fine-grained sand; with few clay.		6 1 12	21.2	103.4	

PLATE A-1

EXPLORATION LOG

Project: 33-Acre Parcel		Boring No.:	B-1
Location: NE Corner of Katella Ave. and Enterprise Dr., Cypress		Elevation:	+/- 29
Job No.: 14-243	Client: C33, LLC	Date:	7/14/14
Drill Method: Hollow-Stem Auger	Driving Weight: 140 lbs / 30 in	Logged By:	SHW

Depth (Feet)	Material Description	Water	Samples: Blows Per 6 Inches	Laboratory Tests: Moisture Content (%)	Laboratory Tests: Dry Density (pcf)	Other Lab Tests
	@ 25': with decreasing silt.		6 10 11	27.3	95.4	
	Clay (CL): Dark gray; wet; stiff.					
	Silty Clay (CL/ML): Light olive gray to light olive brown; wet; very stiff; slightly porous; with trace organics.		12 13 15	29.1	92.1	AT OC
30	Sand (SP): Brownish-gray; wet; dense; fine-grained sand; with few silt.		10 20 25 6 10 16			
	Total Depth = 33 Feet Groundwater Encountered @ 9 Feet Boring Backfilled with Cuttings.					
35						
40						
45						

PLATE A-2

EXPLORATION LOG

Project: **33-Acre Parcel**		Boring No.:	**B-2**
Location: **NE Corner of Katella Ave. and Enterprise Dr., Cypress**		Elevation:	**+/- 29**
Job No.: **14-243**	Client: **C33, LLC**	Date:	**7/14/14**
Drill Method: **Hollow-Stem Auger**	Driving Weight: **140 lbs / 30 in**	Logged By:	**SHW**

Depth (Feet)	Material Description	Water	Samples: Blows Per 6 Inches	Samples: Core	Samples: Bulk	Laboratory Tests: Moisture Content (%)	Laboratory Tests: Dry Density (pcf)	Laboratory Tests: Other Lab Tests
	ARTIFICIAL FILL (af)							
	Sandy Silt (ML): Light gray; dry; soft; very fine-grained sand.		18 13 12			7.0	109.9	
	Silty Sand (SM): Grayish-brown to strong brown; slightly moist; medium dense; very fine- to fine-grained sand.							
	@ 3': with decreasing silt.		9 17 19			14.6	114.3	CON
5	Sand (SP): Gray; moist to very moist; medium dense; fine-grained sand.		6 7 8			19.2	93.3	
	ALLUVIUM (Qal)							
	Silt (ML): Olive brown; very moist; firm; micaceous.							
	Clay (CH): Olive brown; wet; soft; plastic.		2 2 4			31.7	87.3	CON
	@ 8': groundwater encountered.	∇						
10	@ 10': with thin silt lenses.		2 2 3			30.0	93.7	
15	Sand with Silt (SP): Gray to olive brown; wet; medium dense; very fine- to fine-grained sand.		3 6 7			26.1	95.5	
20	Silty Sand (SM): Dark gray; wet; medium dense; very fine- to fine-grained sand; micaceous.		6 12 12			26.0	98.3	
	Silty Clay (CH): Olive brown to olive gray; wet; stiff; plastic.							

PLATE A-3

EXPLORATION LOG

Project: 33-Acre Parcel		Boring No.: B-2
Location: NE Corner of Katella Ave. and Enterprise Dr., Cypress		Elevation: +/- 29
Job No.: 14-243	Client: C33, LLC	Date: 7/14/14
Drill Method: Hollow-Stem Auger	Driving Weight: 140 lbs / 30 in	Logged By: SHW

Depth (Feet)	Lith-ology	Material Description	Water	Samples: Blows Per 6 Inches	Samples: Core	Samples: Bulk	Laboratory Tests: Moisture Content (%)	Laboratory Tests: Dry Density (pcf)	Laboratory Tests: Other Lab Tests
		Sandy Silt (ML): Olive gray to olive brown; wet; stiff; very fine-grained sand; micaceous.		6 11 14			28.5	92.5	
30		Silty Sand to Sand (SM/SP): Olive brown to olive gray; wet; dense; very fine- to fine-grained sand; with few clay.		11 16 30			21.0	103.2	
		Total Depth = 31.5 Feet Groundwater Encountered @ 8 Feet Boring Backfilled with Cuttings.							
35									
40									
45									

PLATE A-4

EXPLORATION LOG

Project: **33-Acre Parcel**		Boring No.:	**B-3**
Location: **NE Corner of Katella Ave. and Enterprise Dr., Cypress**		Elevation:	**+/- 29**
Job No.: **14-243**	Client: **C33, LLC**	Date:	**7/14/14**
Drill Method: **Hollow-Stem Auger**	Driving Weight: **140 lbs / 30 in**	Logged By:	**SHW**

Depth (Feet)	Material Description	Water	Samples: Blows Per 6 Inches	Samples: Core	Samples: Bulk	Laboratory Tests: Moisture Content (%)	Laboratory Tests: Dry Density (pcf)	Laboratory Tests: Other Lab Tests
0	**ARTIFICIAL FILL (af)** Sandy Silt (ML): Light gray; dry; soft; very fine-grained sand. @ 1': becomes light olive brown; slightly moist.							
2	Silty Sand (SM): Olive brown to olive gray; slightly moist to moist; dense; very fine- to fine-grained sand.		16 24 28	■		12.6	112.0	DSU
4	@ 4': becomes very dense; with increasing silt.		14 24 36	■		13.4	114.7	
6	Clayey Sandy Silt (ML): Dark gray; moist; very stiff; very fine-grained sand.		12 21 26	■		17.5	110.2	
8			12 13 16	■		22.8	98.0	
10	Sandy Clay (CL): Light brown; wet; stiff; very fine-grained sand; plastic; with geogrid fabric @ 10'.		5 7 12	■		23.1	92.4	
11.5	Gravel (GP): Gray; wet; medium dense; clean gravel; groundwater encountered @ 11.5'.	▽						
12.5			5 3 3	■				
13.5	@ 13.5': geogrid fabric. **ALLUVIUM (Qal)** Silty Clay (CL): Light brown; wet; stiff.							
15	Sandy Silt to Silty Sand (ML/SM): Olive gray to olive brown; wet; stiff to medium dense; very fine-grained sand.		4 7 10	■		28.8	93.6	
20	Silty Clay (CL): Dark gray; wet; firm; plastic.		5 6 5	■		30.9	90.8	

PLATE A-5

EXPLORATION LOG

Project: 33-Acre Parcel		Boring No.: B-3
Location: NE Corner of Katella Ave. and Enterprise Dr., Cypress		Elevation: +/- 29
Job No.: 14-243	Client: C33, LLC	Date: 7/14/14
Drill Method: Hollow-Stem Auger	Driving Weight: 140 lbs / 30 in	Logged By: SHW

Depth (Feet)	Lithology	Material Description	Water	Samples: Blows Per 6 Inches	Samples: Core	Samples: Bulk	Laboratory Tests: Moisture Content (%)	Laboratory Tests: Dry Density (pcf)	Laboratory Tests: Other Lab Tests
		Clay (CH): Light gray to light olive brown; wet; stiff; plastic; porous.		3 6 8			27.0	94.0	
		Total Depth = 26.5 Feet Groundwater Encountered @ 11.5 Feet Boring Backfilled with Cuttings.							

EXPLORATION LOG - V3 14-243.GPJ PETRA.GDT 1/6/15

Petra Geotechnical, Inc.

EXPLORATION LOG

Project: **33-Acre Parcel**		Boring No.:	**B-4**
Location: **NE Corner of Katella Ave. and Enterprise Dr., Cypress**		Elevation:	**+/- 29**
Job No.: **14-243**	Client: **C33, LLC**	Date:	**7/14/14**
Drill Method: **Hollow-Stem Auger**	Driving Weight: **140 lbs / 30 in**	Logged By:	**SHW**

Depth (Feet)	Material Description	Water	Samples: Blows Per 6 Inches	Laboratory Tests: Moisture Content (%)	Laboratory Tests: Dry Density (pcf)	Laboratory Tests: Other Lab Tests
	AGGREGATE BASE Gravelly Sand (SP): Gray; slightly moist; medium dense to dense; fine- to coarse-grained sand; with some, fine-grained gravel.					
	ARTIFICIAL FILL (af) Silty Sand (SM): Brownish-gray; moist; dense; very fine-grained sand; with few, rounded, fine- to coarse-grained sand and gravel.		12 17 27	10.9	109.2	
			17 19 22	11.8	100.5	
5	**ALLUVIUM (Qal)** Sand (SP): Gray to brown; moist; dense; very fine- to fine-grained sand; with few silt.		8 8 6	23.3	92.3	
	Clayey Silt (ML): Brown to dark brown; very moist; very stiff; micaceous.					
	Sandy Silt (ML): Brownish-gray; very moist to wet; firm; very fine- to fine-grained sand; micaceous.		2 3 5	32.8	85.0	CON
	@ 8': groundwater encountered; becomes wet.	▽				
10	@ 10': becomes olive brown to olive gray; soft; with few clay; increasing.		1 2 1	28.5	90.4	AT
	Silty Clay (CL): Olive brown to olive gray; wet; soft; plastic.					
15	Interbedded Sandy to Clayey Silt (ML): Olive gray to olive brown; wet; soft; very fine-grained sand; plastic.		1 2 3	32.9	87.9	AT
20	Sand to Sand with Silt (SP): Gray to dark gray; wet; medium dense; fine-grained sand; with decreasing silt.		5 6 9	26.1	95.6	#200

EXPLORATION LOG

Project: 33-Acre Parcel		Boring No.: B-4
Location: NE Corner of Katella Ave. and Enterprise Dr., Cypress		Elevation: +/- 29
Job No.: 14-243	Client: C33, LLC	Date: 7/14/14
Drill Method: Hollow-Stem Auger	Driving Weight: 140 lbs / 30 in	Logged By: SHW

Depth (Feet)	Lith-ology	Material Description	Water	Samples: Blows Per 6 Inches	Samples: Core	Samples: Bulk	Laboratory Tests: Moisture Content (%)	Laboratory Tests: Dry Density (pcf)	Laboratory Tests: Other Lab Tests
		@ 25': becomes gray; dense; no silt.		8 15 24			23.1	102.2	#200
		Total Depth =26.5 Feet Groundwater Encountered @ 8 Feet Boring Backfilled with Cuttings.							

EXPLORATION LOG - V3 14-243.GPJ PETRA.GDT 1/6/15

GREGG DRILLING & TESTING, INC.
GEOTECHNICAL AND ENVIRONMENTAL INVESTIGATION SERVICES

June 12, 2014

Petra Geotechnical
Attn: Scott Winslow

Subject: CPT Site Investigation
Province Group - Cypress
Cypress, California
GREGG Project Number: 14-761SH

Dear Mr. Winslow:

The following report presents the results of GREGG Drilling & Testing's Cone Penetration Test investigation for the above referenced site. The following testing services were performed:

1	Cone Penetration Tests	(CPTU)	☒
2	Pore Pressure Dissipation Tests	(PPD)	☒
3	Seismic Cone Penetration Tests	(SCPTU)	☒
4	UVOST Laser Induced Fluorescence	(UVOST)	☐
5	Groundwater Sampling	(GWS)	☐
6	Soil Sampling	(SS)	☐
7	Vapor Sampling	(VS)	☐
8	Pressuremeter Testing	(PMT)	☐
9	Vane Shear Testing	(VST)	☐
10	Dilatometer Testing	(DMT)	☐

A list of reference papers providing additional background on the specific tests conducted is provided in the bibliography following the text of the report. If you would like a copy of any of these publications or should you have any questions or comments regarding the contents of this report, please do not hesitate to contact our office at (925) 313-5800.

Sincerely,
GREGG Drilling & Testing, Inc.

Peter Robertson
Technical Director, Gregg Drilling & Testing, Inc.

GREGG

GREGG DRILLING & TESTING, INC.
GEOTECHNICAL AND ENVIRONMENTAL INVESTIGATION SERVICES

Cone Penetration Test Sounding Summary

-Table 1-

CPT Sounding Identification	Date	Termination Depth (feet)	Depth of Groundwater Samples (feet)	Depth of Soil Samples (feet)	Depth of Pore Pressure Dissipation Tests (feet)
CPT-1	6/11/14	50	-	-	21.3
CPT-2	6/11/14	50	-	-	-
CPT-3	6/11/14	50	-	-	-
CPT-4	6/11/14	50	-	-	-
CPT-5	6/11/14	50	-	-	-
CPT-6	6/11/14	50	-	-	17.1, 34.6
CPT-7	6/11/14	50	-	-	-
CPT-8	6/11/14	50	-	-	-
CPT-9	6/11/14	50	-	-	-

2726 Walnut Ave. • Signal Hill, California 90755 • (562) 427-6899 • FAX (562) 427-3314
www.greggdrilling.com

Bibliography

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Copies of ASTM Standards are available through www.astm.org

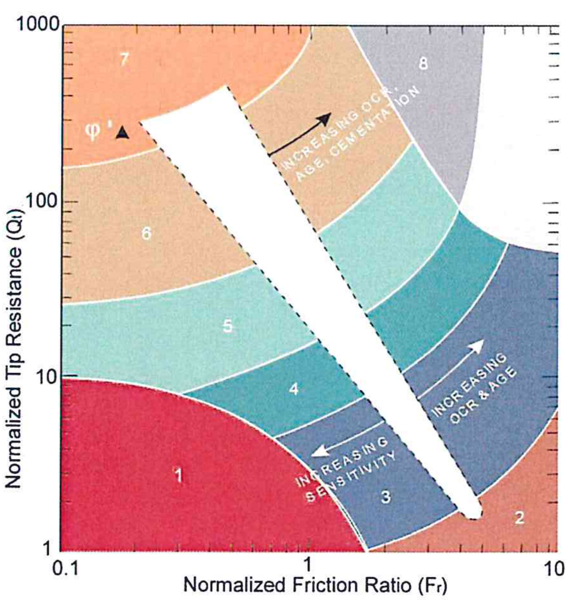
Cone Penetration Test Data & Interpretation

The Cone Penetration Test (CPT) data collected from your site are presented in graphical form in the attached report. The plots include interpreted Soil Behavior Type (SBT) based on the charts described by Robertson (1990). Typical plots display SBT based on the non-normalized charts of Robertson et al (1986). For CPT soundings extending greater than 50 feet, we recommend the use of the normalized charts of Robertson (1990) which can be displayed as SBTn, upon request. The report also includes spreadsheet output of computer calculations of basic interpretation in terms of SBT and SBTn and various geotechnical parameters using current published correlations based on the comprehensive review by Lunne, Robertson and Powell (1997), as well as recent updates by Professor Robertson. The interpretations are presented only as a guide for geotechnical use and should be carefully reviewed. Gregg Drilling & Testing Inc. do not warranty the correctness or the applicability of any of the geotechnical parameters interpreted by the software and do not assume any liability for any use of the results in any design or review. The user should be fully aware of the techniques and limitations of any method used in the software.

Some interpretation methods require input of the groundwater level to calculate vertical effective stress. An estimate of the in-situ groundwater level has been made based on the field observations and/or CPT results, but should be verified by the user.

A summary of locations and depths is available in Table 1. Note that all penetration depths referenced in the data are with respect to the existing ground surface.

Note that it is not always possible to clearly identify a soil type based solely on q_t, f_s, and u_2. In these situations, experience, judgment, and an assessment of the pore pressure dissipation data should be used to infer the correct soil behavior type.



(After Robertson, 1990)

Zone		Normailzed Soil Behavior Type
1		sensitive fine grained
2		organic material
3		clay to silty clay
4		clayey silt to silty clay
5		silty sand to sandy silt
6		clean sands to silty sands
7		gravelly sand to sand
8		very stiff sand to clayey sand
9		very stiff fine grained

Figure SBTn

Pore Pressure Dissipation Tests (PPDT)

Pore Pressure Dissipation Tests (PPDT's) conducted at various intervals measured hydrostatic water pressures and determined the approximate depth of the ground water table. A PPDT is conducted when the cone is halted at specific intervals determined by the field representative. The variation of the penetration pore pressure (u) with time is measured behind the tip of the cone and recorded by a computer system.

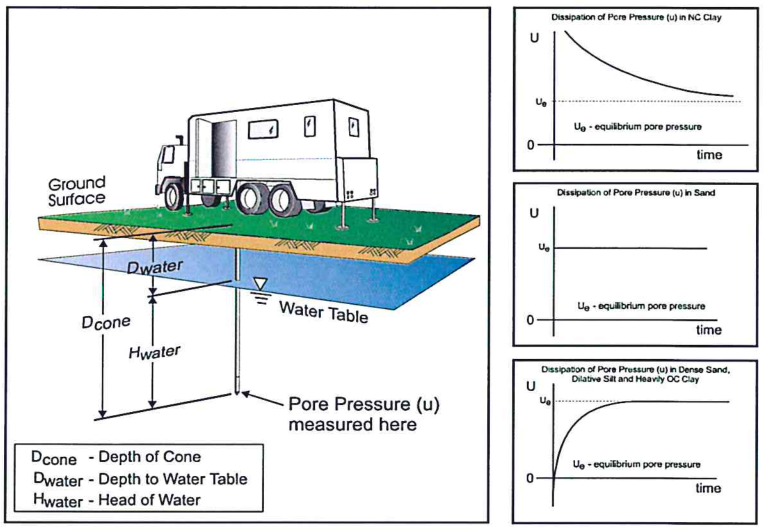
Pore pressure dissipation data can be interpreted to provide estimates of:

- Equilibrium piezometric pressure
- Phreatic Surface
- In situ horizontal coefficient of consolidation (c_h)
- In situ horizontal coefficient of permeability (k_h)

In order to correctly interpret the equilibrium piezometric pressure and/or the phreatic surface, the pore pressure must be monitored until such time as there is no variation in pore pressure with time, *Figure PPDT*. This time is commonly referred to as t_{100}, the point at which 100% of the excess pore pressure has dissipated.

A complete reference on pore pressure dissipation tests is presented by Robertson et al. 1992.

A summary of the pore pressure dissipation tests is summarized in Table 1.



Water Table Calculation

$$D_{water} = D_{cone} - H_{water}$$

where $H_{water} = U_e$ (depth units)

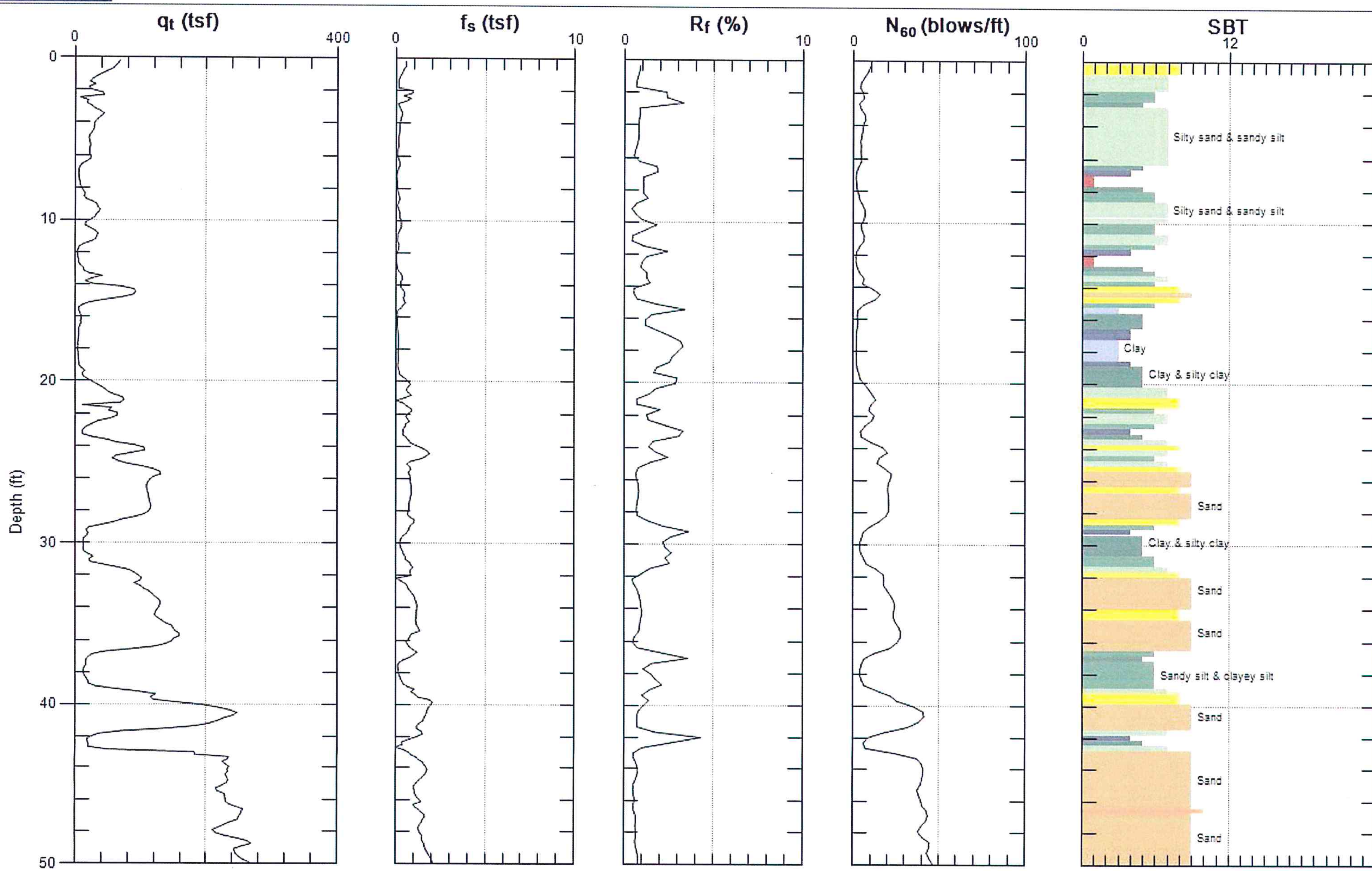
Useful Conversion Factors: 1psi = 0.704m = 2.31 feet (water)
1tsf = 0.958 bar = 13.9 psi
1m = 3.28 feet

Figure PPDT

GREGG **PETRA GEOTECHNICAL**

Site: PROVINCE GROUP
Sounding: CPT-1

Engineer: S.WINSLOW
Date: 6/11/2014 09:30



Max. Depth: 50.525 (ft)
Avg. Interval: 0.328 (ft)

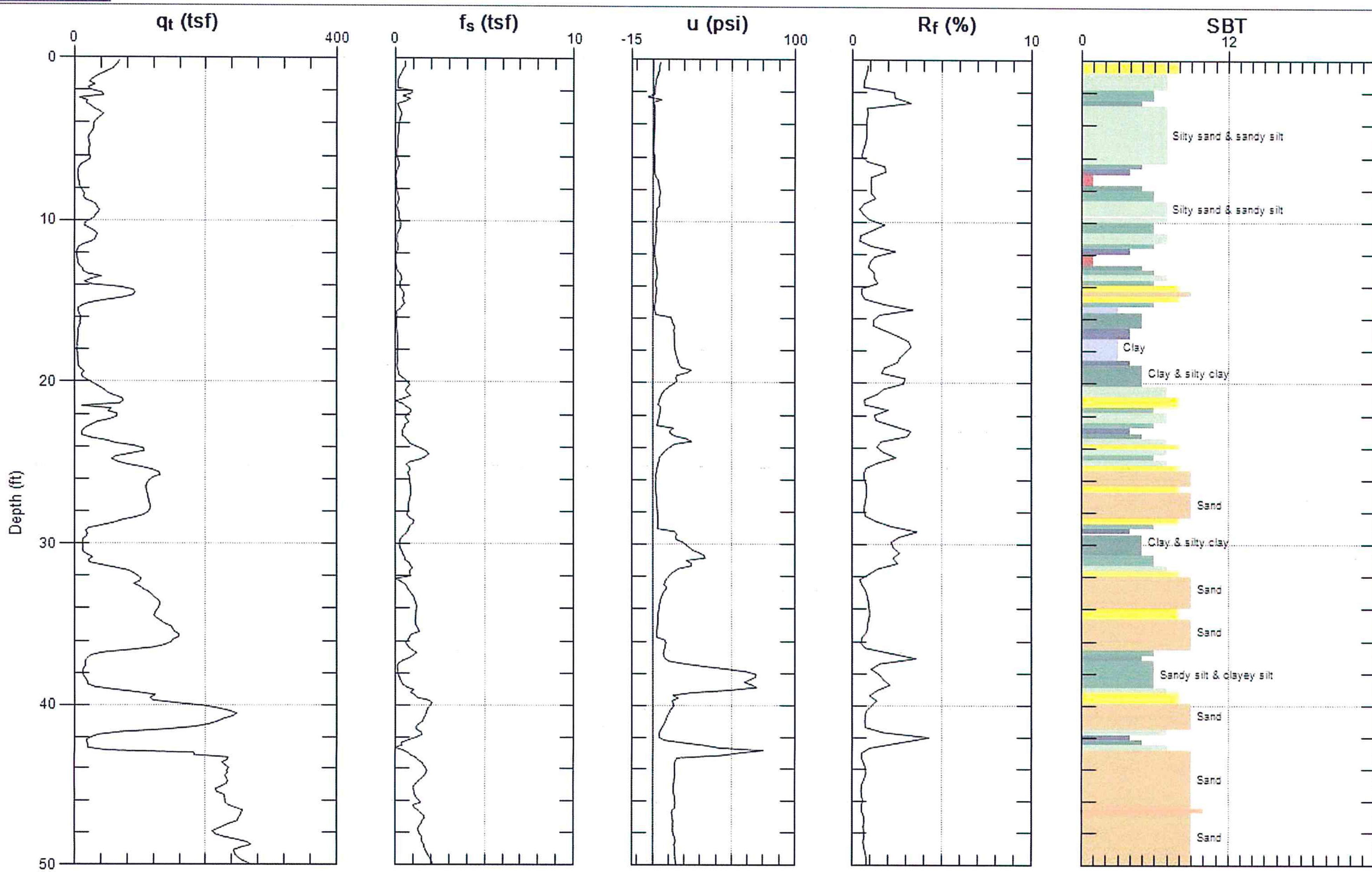
SBT: Soil Behavior Type (Robertson 1990)

GREGG

PETRA GEOTECHNICAL

Site: PROVINCE GROUP
Sounding: CPT-1

Engineer: S.WINSLOW
Date: 6/11/2014 09:30



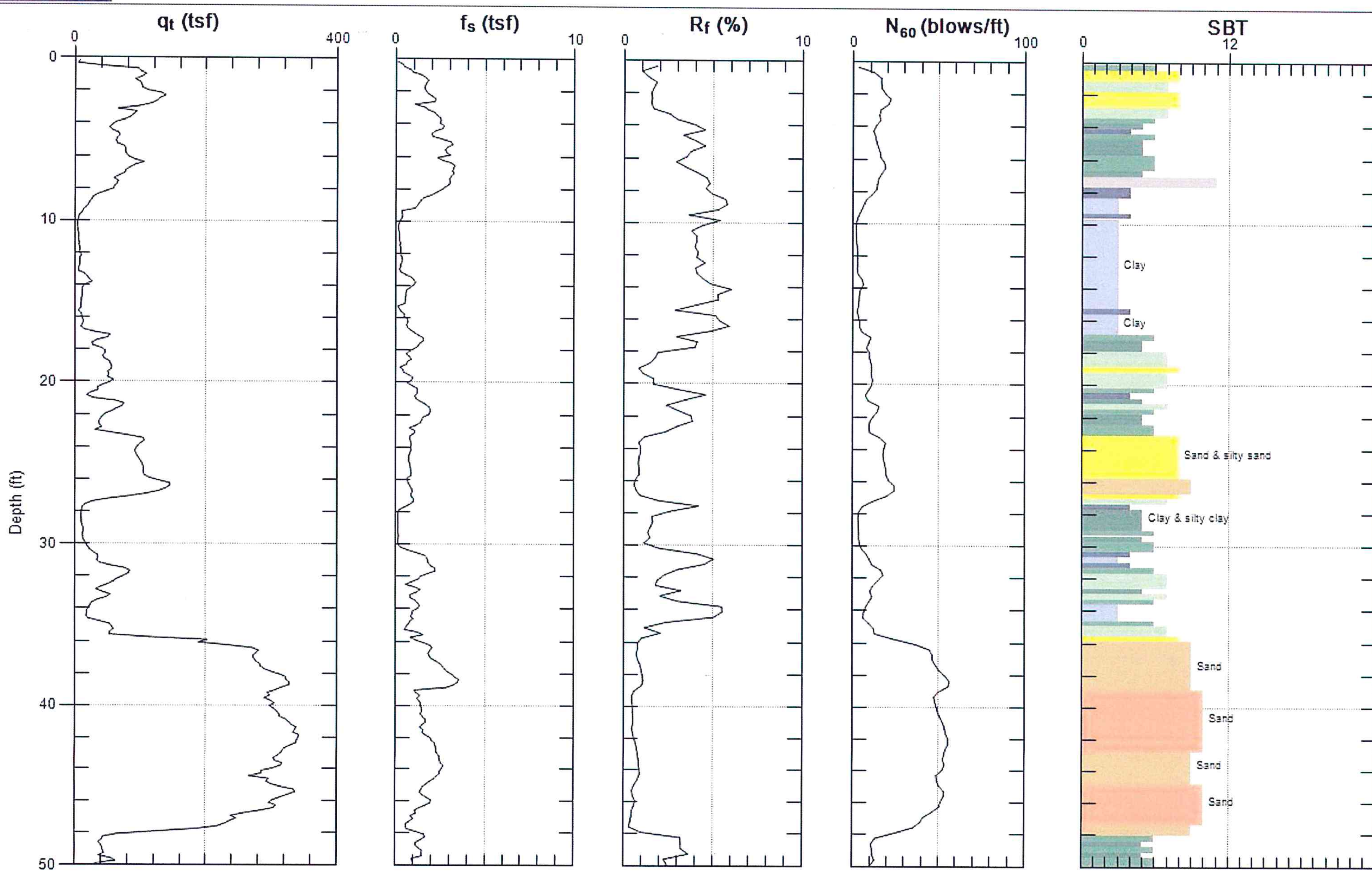
Max. Depth: 50.525 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

PETRA GEOTECHNICAL

Site: PROVINCE GROUP
Sounding: CPT-2

Engineer: S.WINSLOW
Date: 6/11/2014 10:08



Max. Depth: 50.525 (ft)
Avg. Interval: 0.328 (ft)

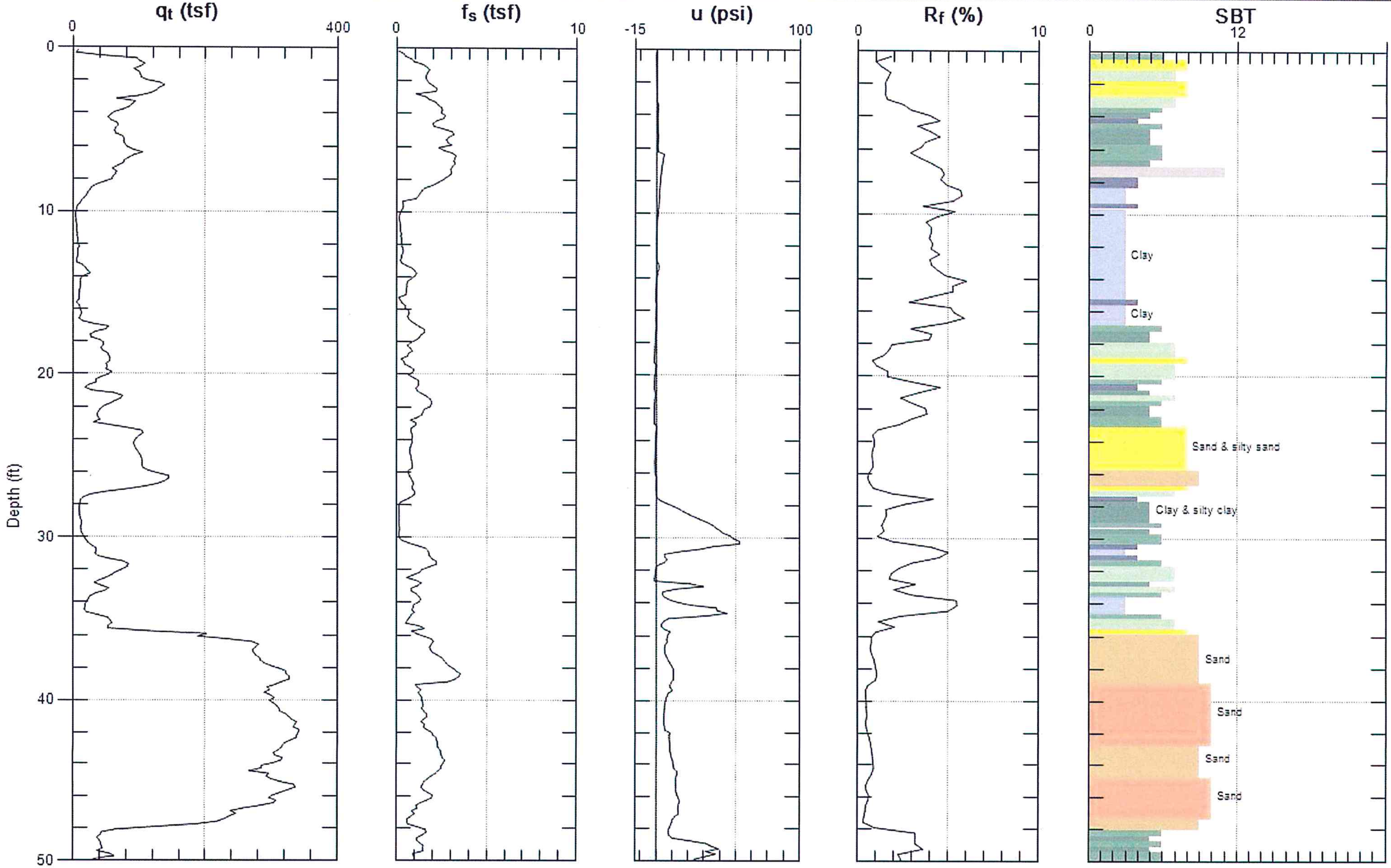
SBT: Soil Behavior Type (Robertson 1990)

GREGG

PETRA GEOTECHNICAL

Site: PROVINCE GROUP
Sounding: CPT-2

Engineer: S.WINSLOW
Date: 6/11/2014 10:08



Max. Depth: 50.525 (ft)
Avg. Interval: 0.328 (ft)

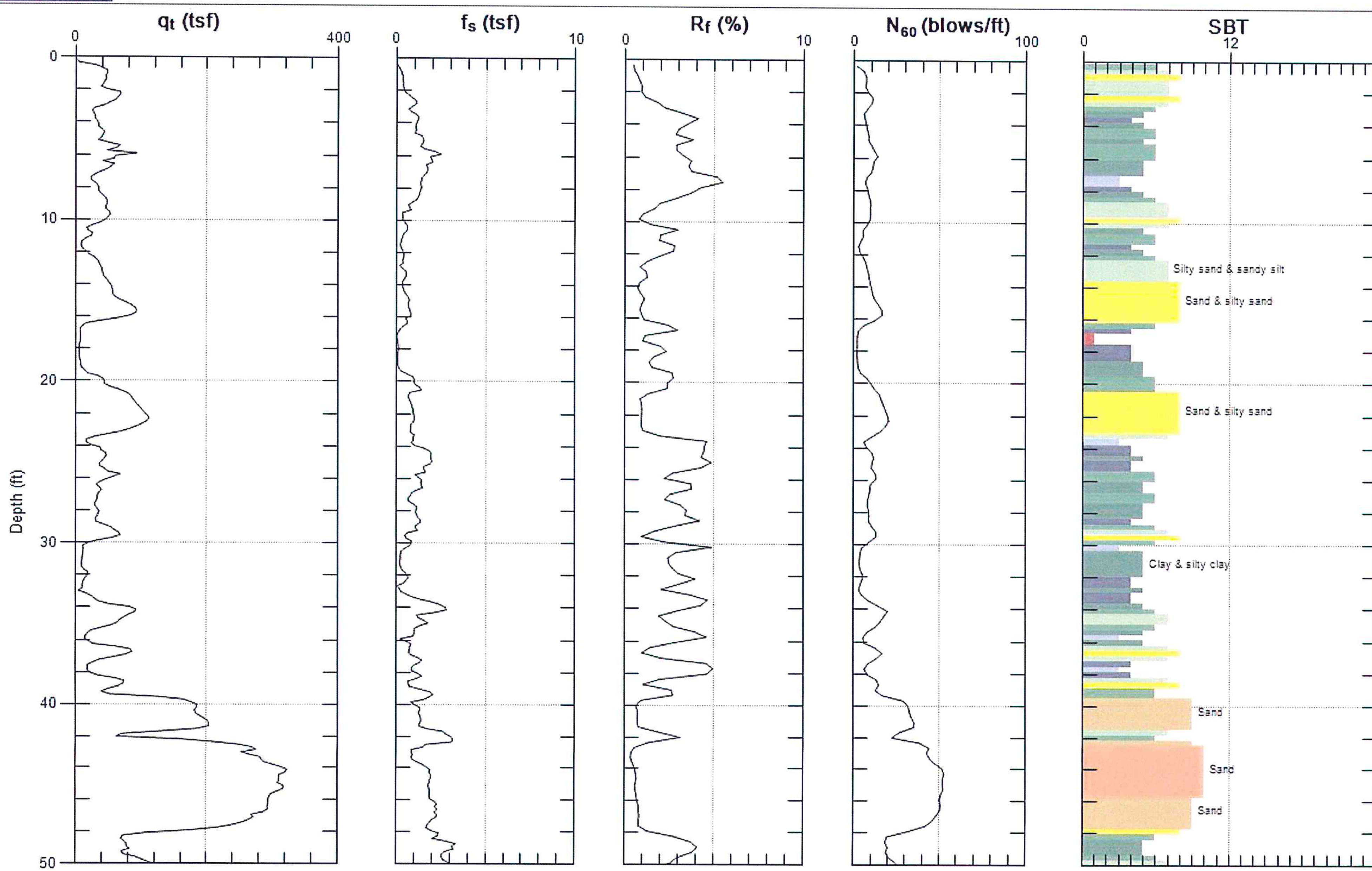
SBT: Soil Behavior Type (Robertson 1990)

GREGG

PETRA GEOTECHNICAL

Site: PROVINCE GROUP
Sounding: CPT-3

Engineer: S.WINSLOW
Date: 6/11/2014 10:36



Max. Depth: 50.525 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

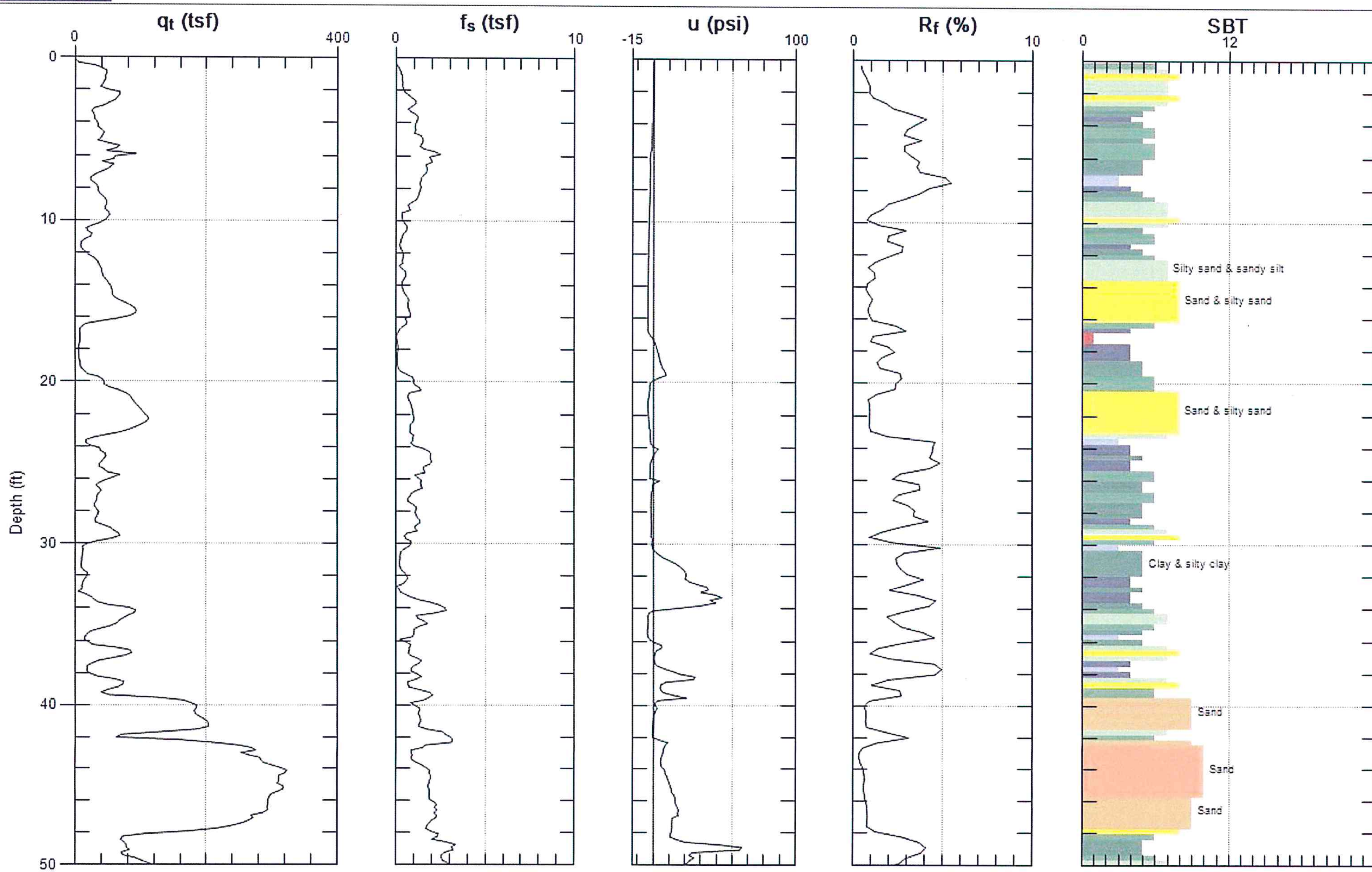
GREGG **PETRA GEOTECHNICAL**

Site: PROVINCE GROUP

Sounding: CPT-3

Engineer: S.WINSLOW

Date: 6/11/2014 10:36



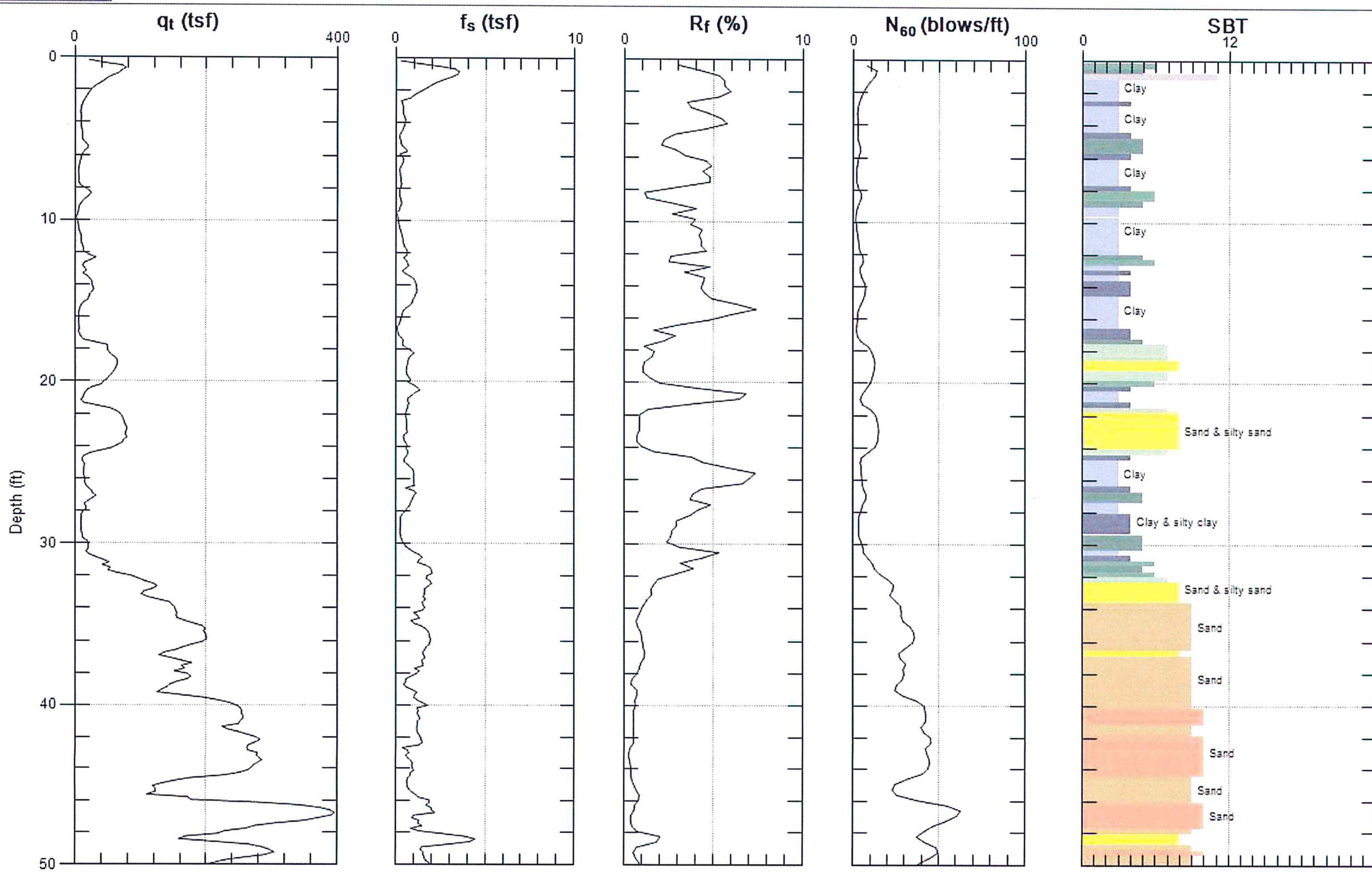
Max. Depth: 50.525 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

PETRA GEOTECHNICAL

Site: PROVINCE GROUP
Sounding: CPT-4

Engineer: S.WINSLOW
Date: 6/11/2014 11:11



Max. Depth: 50.525 (ft)
Avg. Interval: 0.328 (ft)

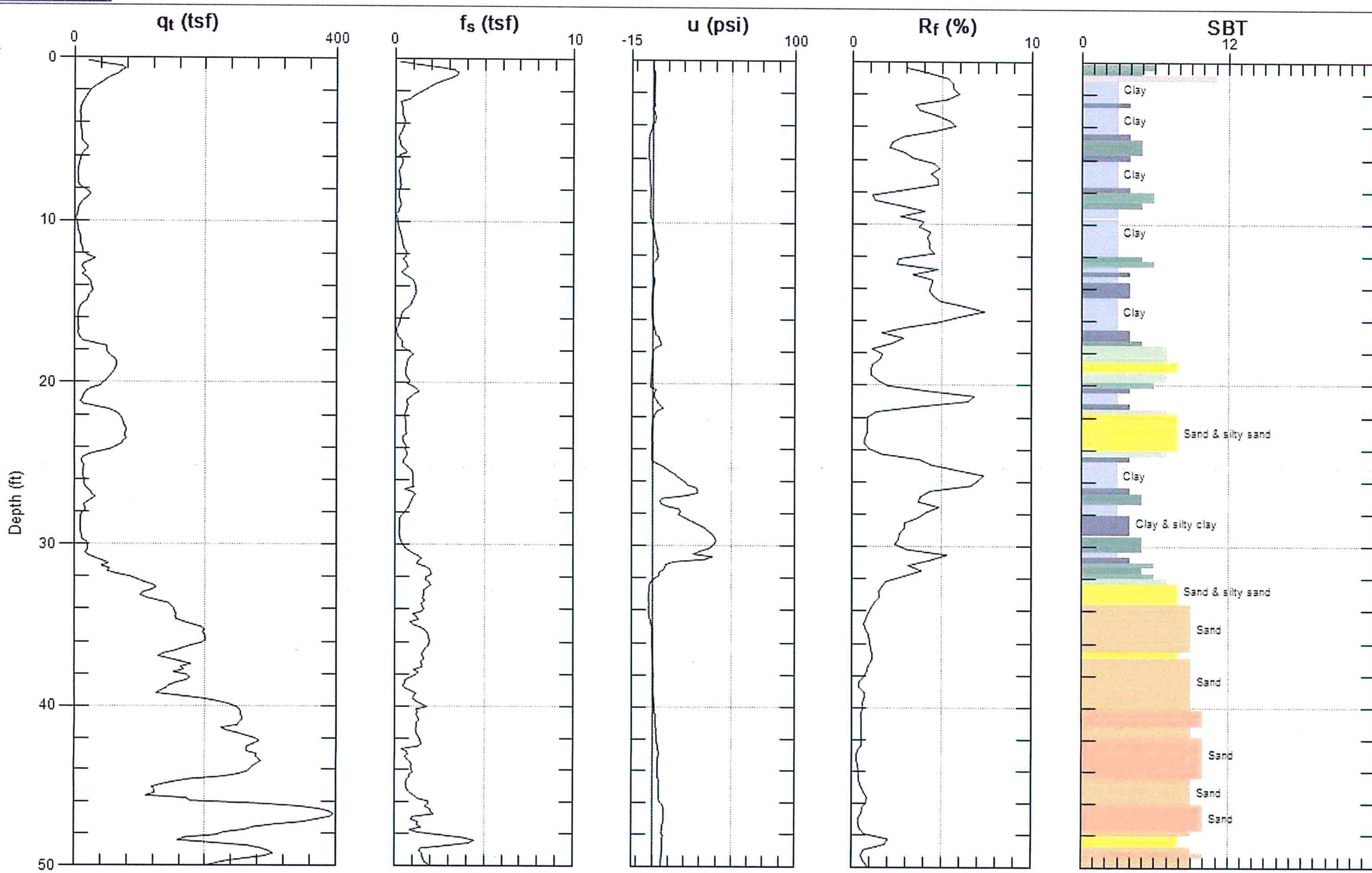
SBT: Soil Behavior Type (Robertson 1990)

GREGG

PETRA GEOTECHNICAL

Site: PROVINCE GROUP
Sounding: CPT-4

Engineer: S.WINSLOW
Date: 6/11/2014 11:11



Max. Depth: 50.525 (ft)
Avg. Interval: 0.328 (ft)

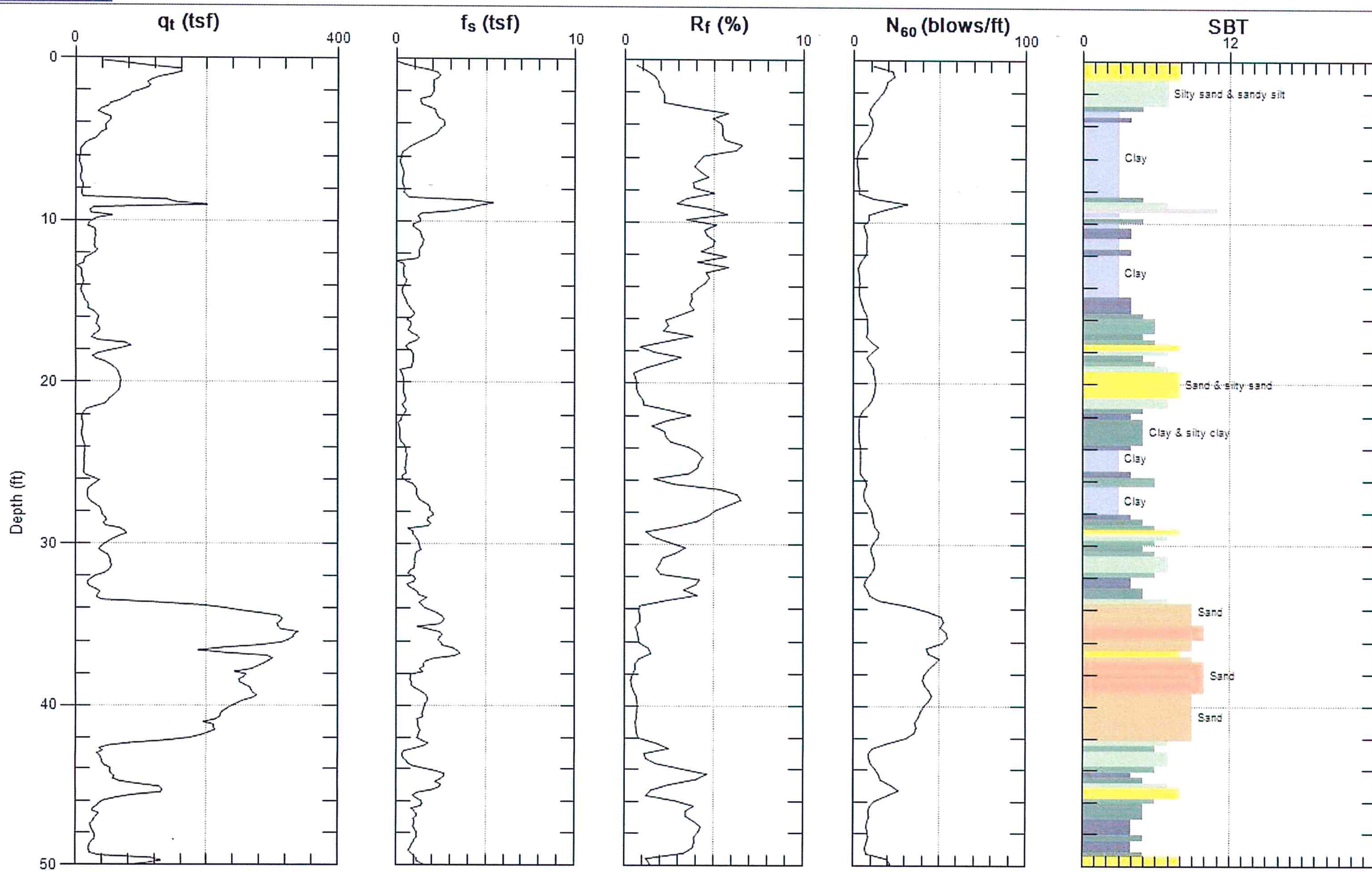
SBT: Soil Behavior Type (Robertson 1990)

GREGG

PETRA GEOTECHNICAL

Site: PROVINCE GROUP
Sounding: CPT-5

Engineer: S.WINSLOW
Date: 6/11/2014 11:37



Max. Depth: 50.361 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG

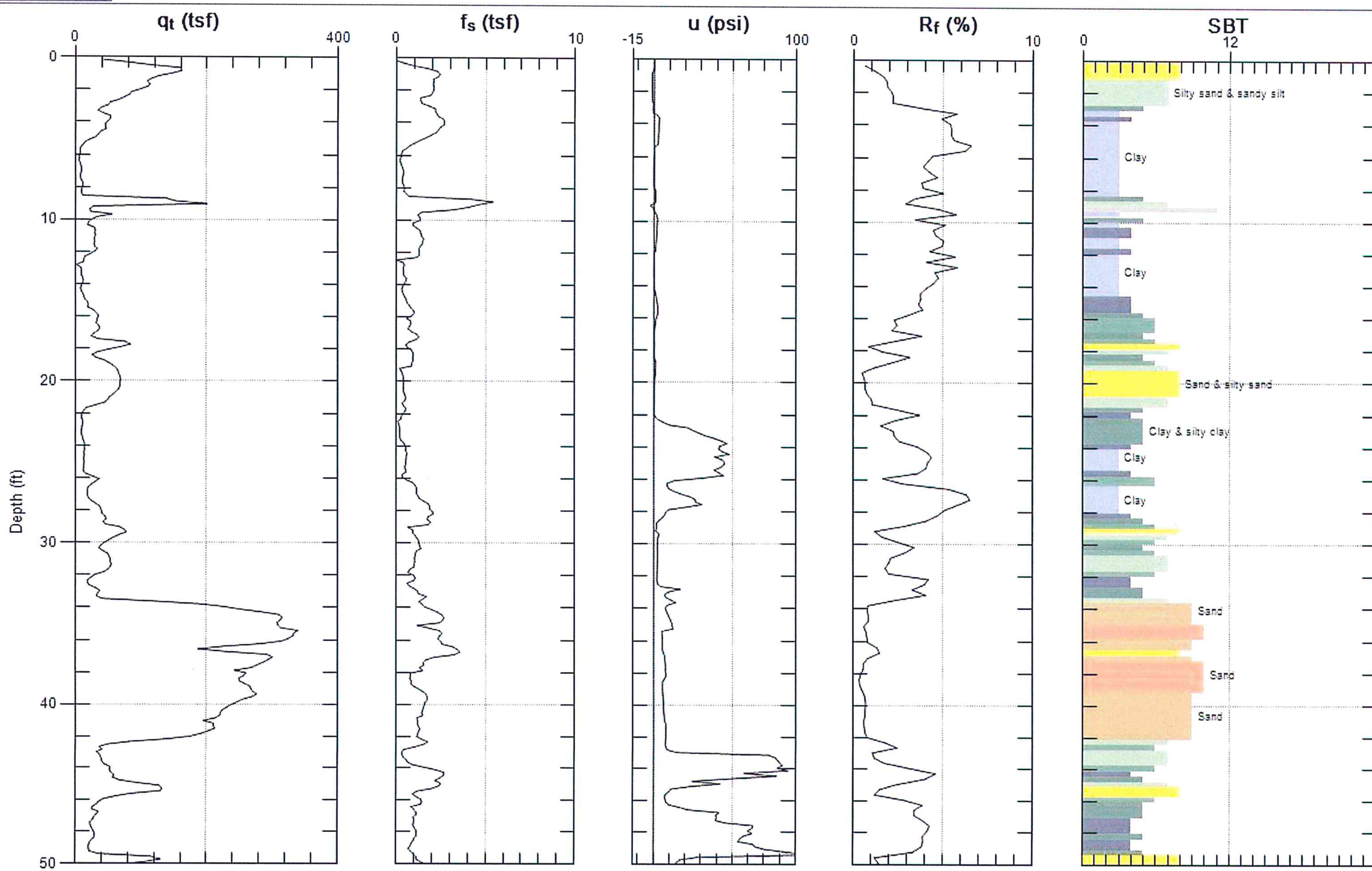
PETRA GEOTECHNICAL

Site: PROVINCE GROUP

Sounding: CPT-5

Engineer: S.WINSLOW

Date: 6/11/2014 11:37



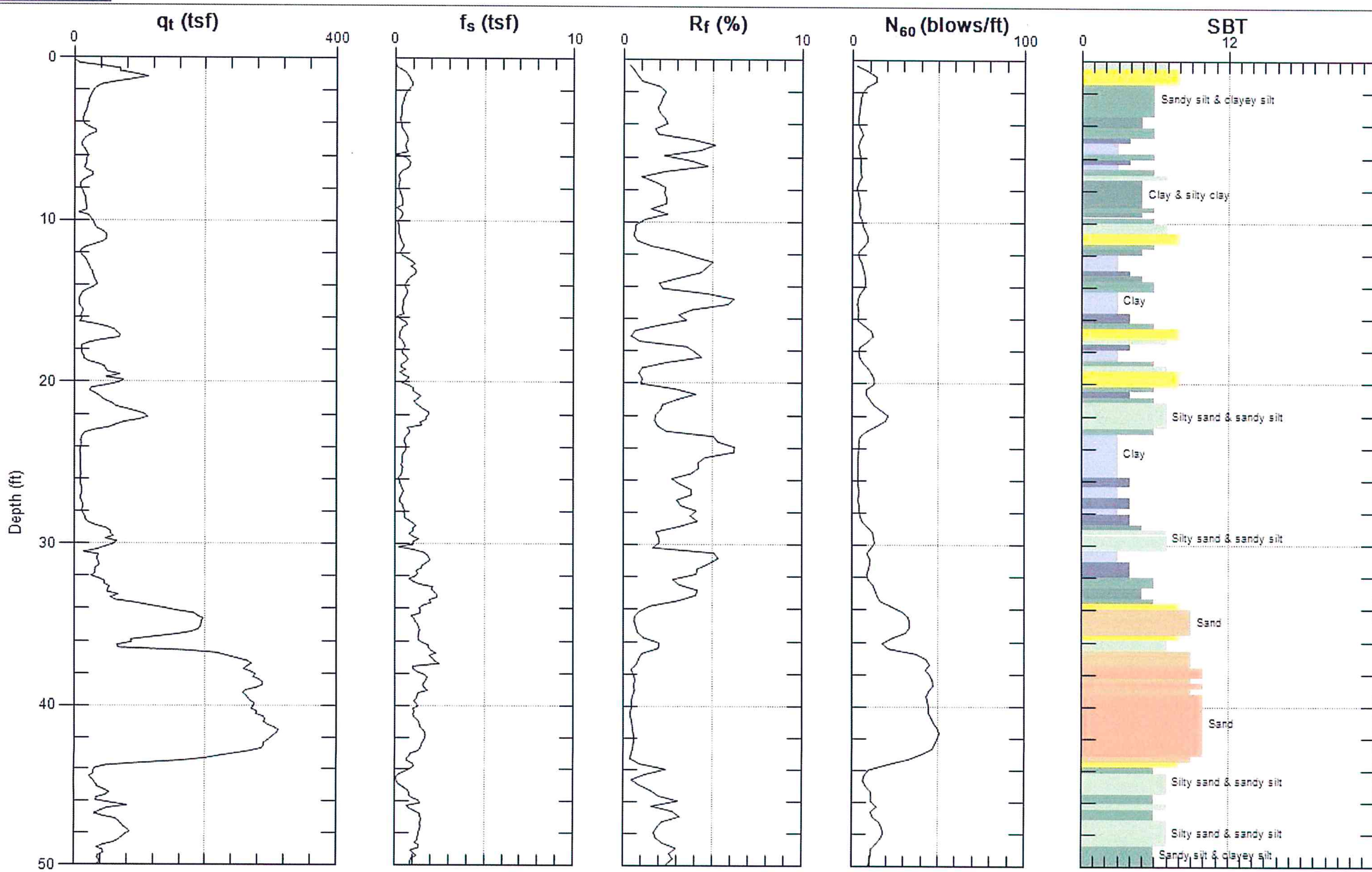
Max. Depth: 50.361 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

PETRA GEOTECHNICAL

Site: PROVINCE GROUP
Sounding: CPT-6

Engineer: S.WINSLOW
Date: 6/11/2014 12:12



Max. Depth: 50.525 (ft)
Avg. Interval: 0.328 (ft)

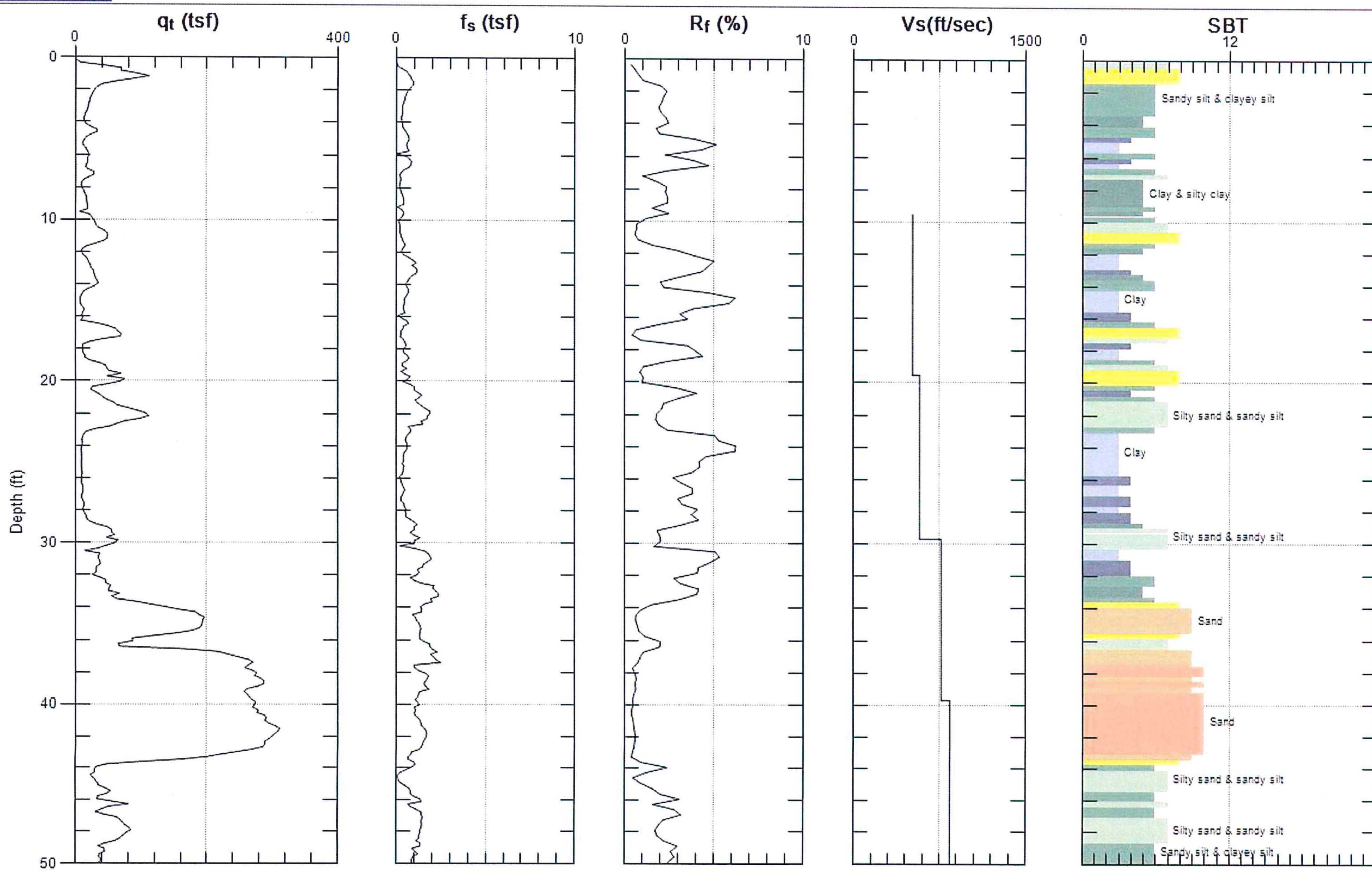
SBT: Soil Behavior Type (Robertson 1990)

GREGG

PETRA GEOTECHNICAL

Site: PROVINCE GROUP
Sounding: CPT-6

Engineer: S.WINSLOW
Date: 6/11/2014 12:12



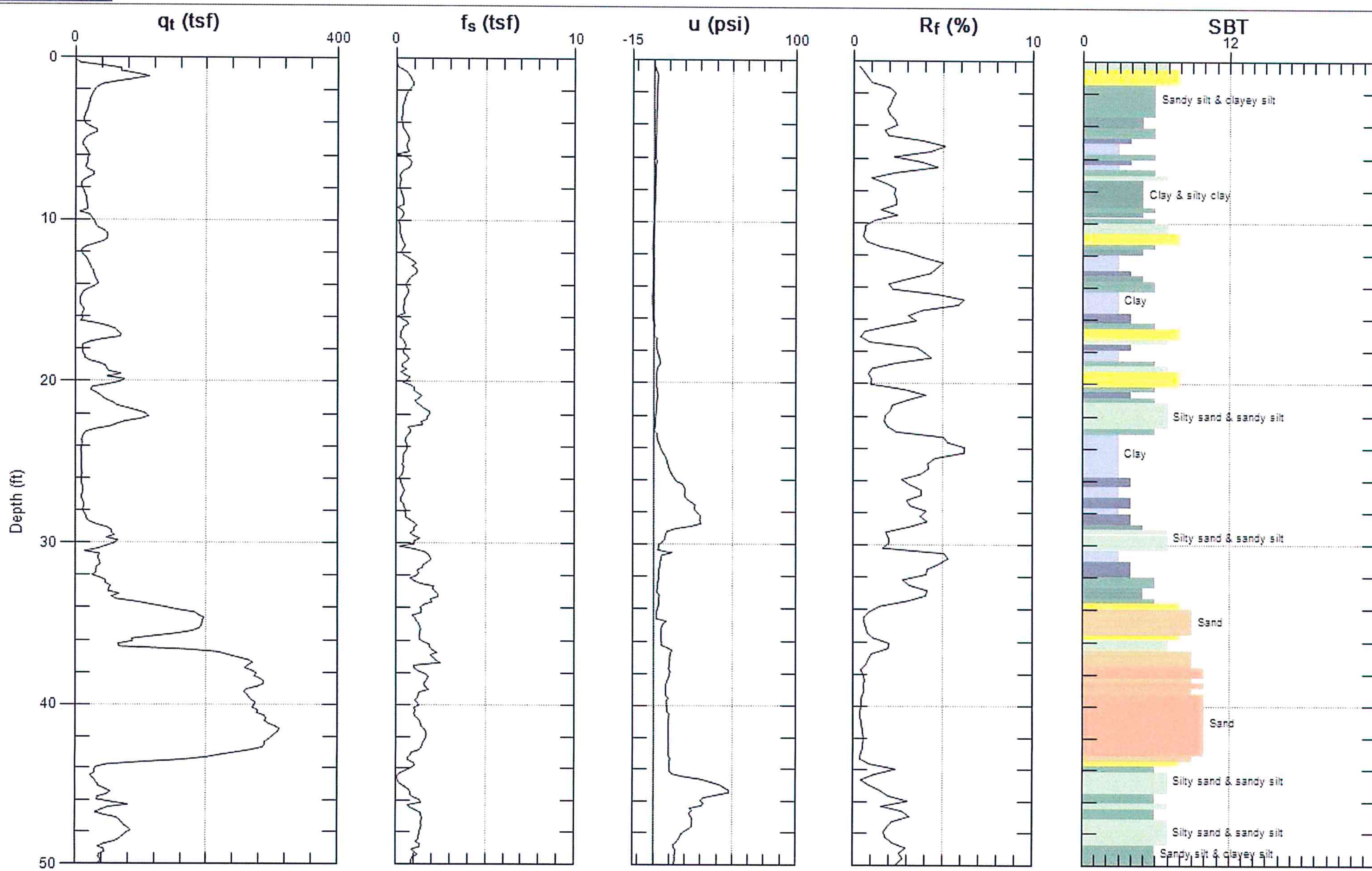
Max. Depth: 50.525 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG **PETRA GEOTECHNICAL**

Site: PROVINCE GROUP
Sounding: CPT-6

Engineer: S.WINSLOW
Date: 6/11/2014 12:12



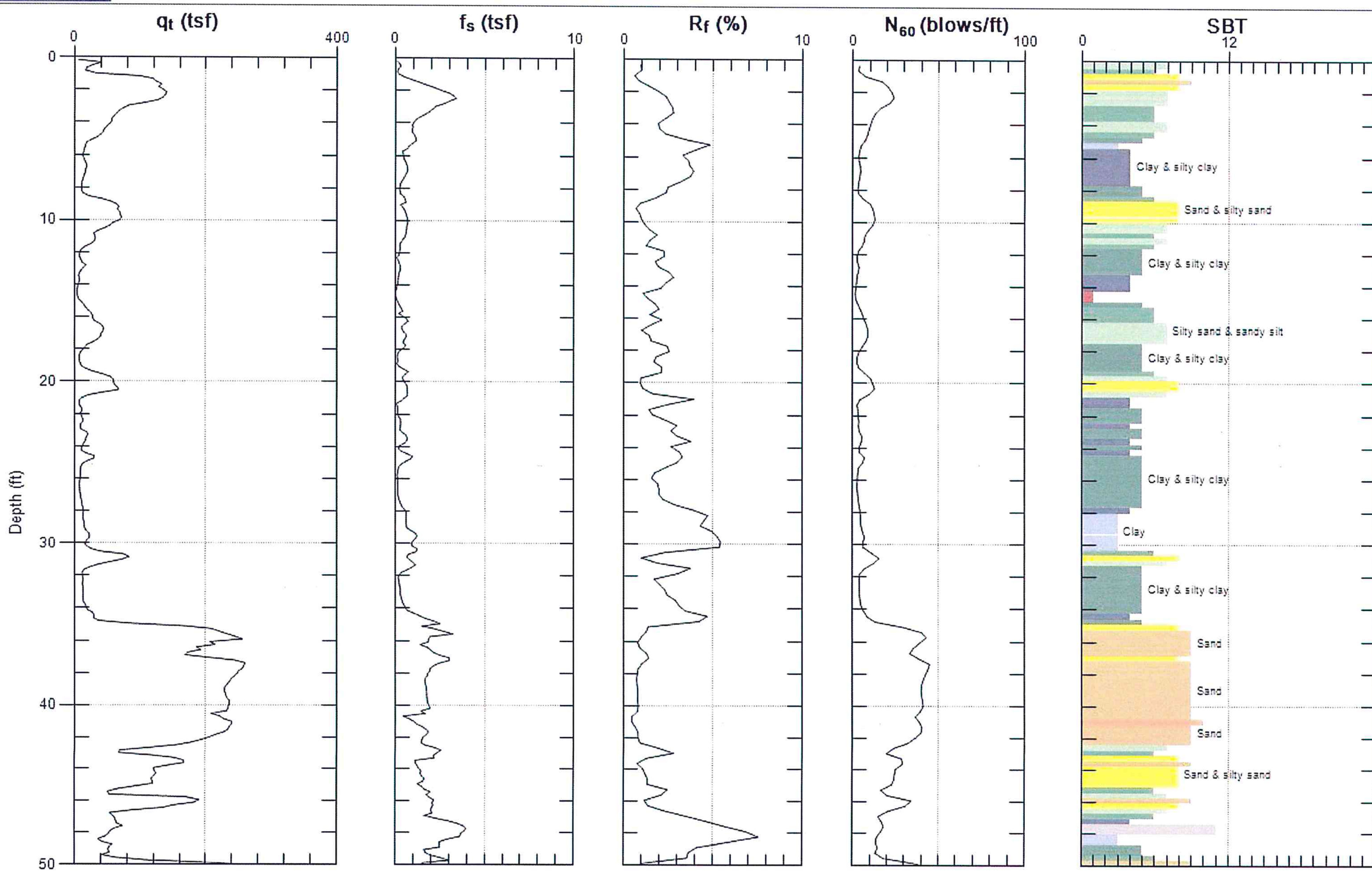
Max. Depth: 50.525 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

PETRA GEOTECHNICAL

Site: PROVINCE GROUP
Sounding: CPT-7

Engineer: S.WINSLOW
Date: 6/11/2014 01:14



Max. Depth: 50.525 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG

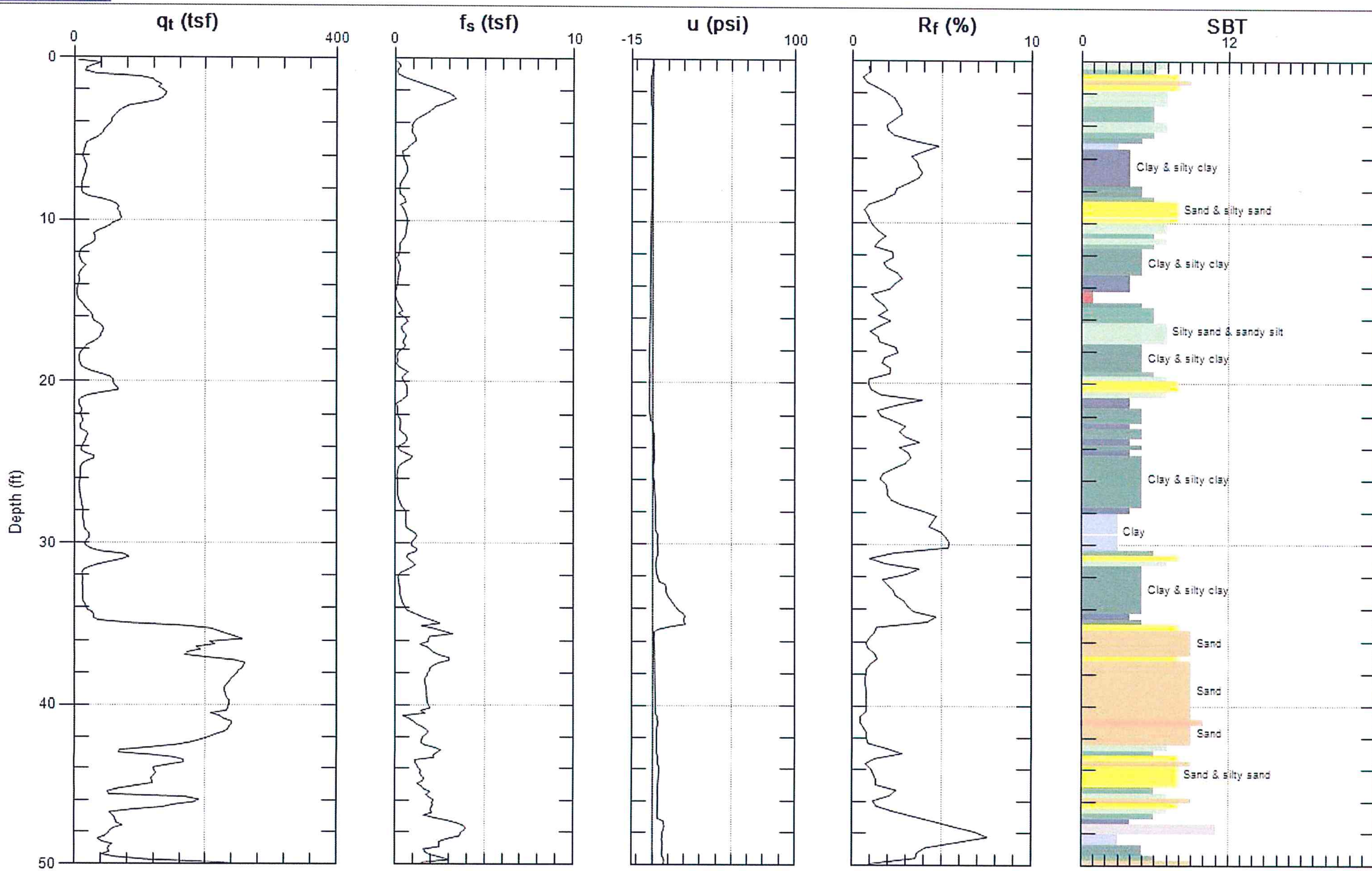
PETRA GEOTECHNICAL

Site: PROVINCE GROUP

Sounding: CPT-7

Engineer: S.WINSLOW

Date: 6/11/2014 01:14



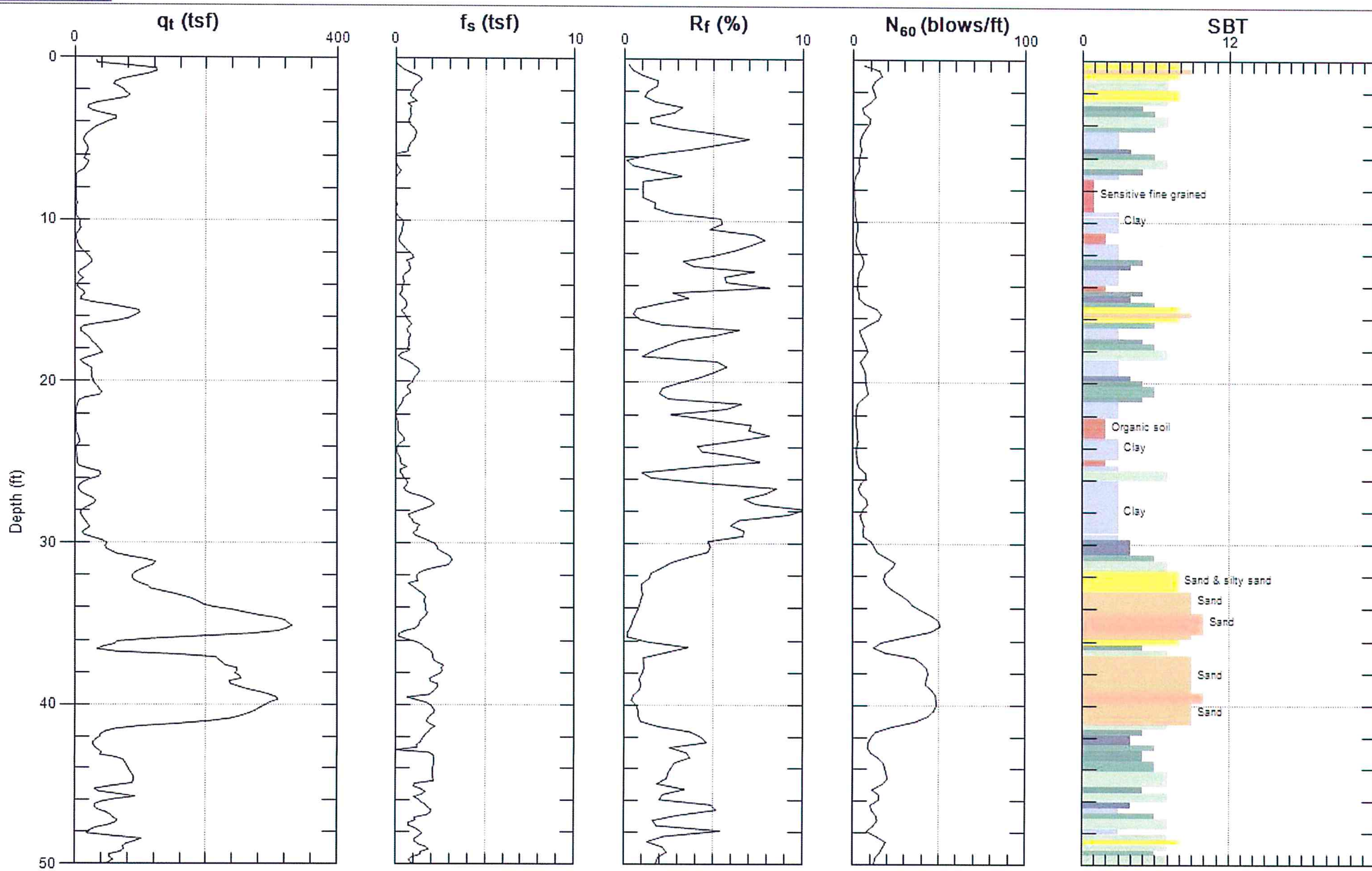
Max. Depth: 50.525 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG **PETRA GEOTECHNICAL**

Site: PROVINCE GROUP
Sounding: CPT-8

Engineer: S.WINSLOW
Date: 6/11/2014 01:47



Max. Depth: 50.525 (ft)
Avg. Interval: 0.328 (ft)

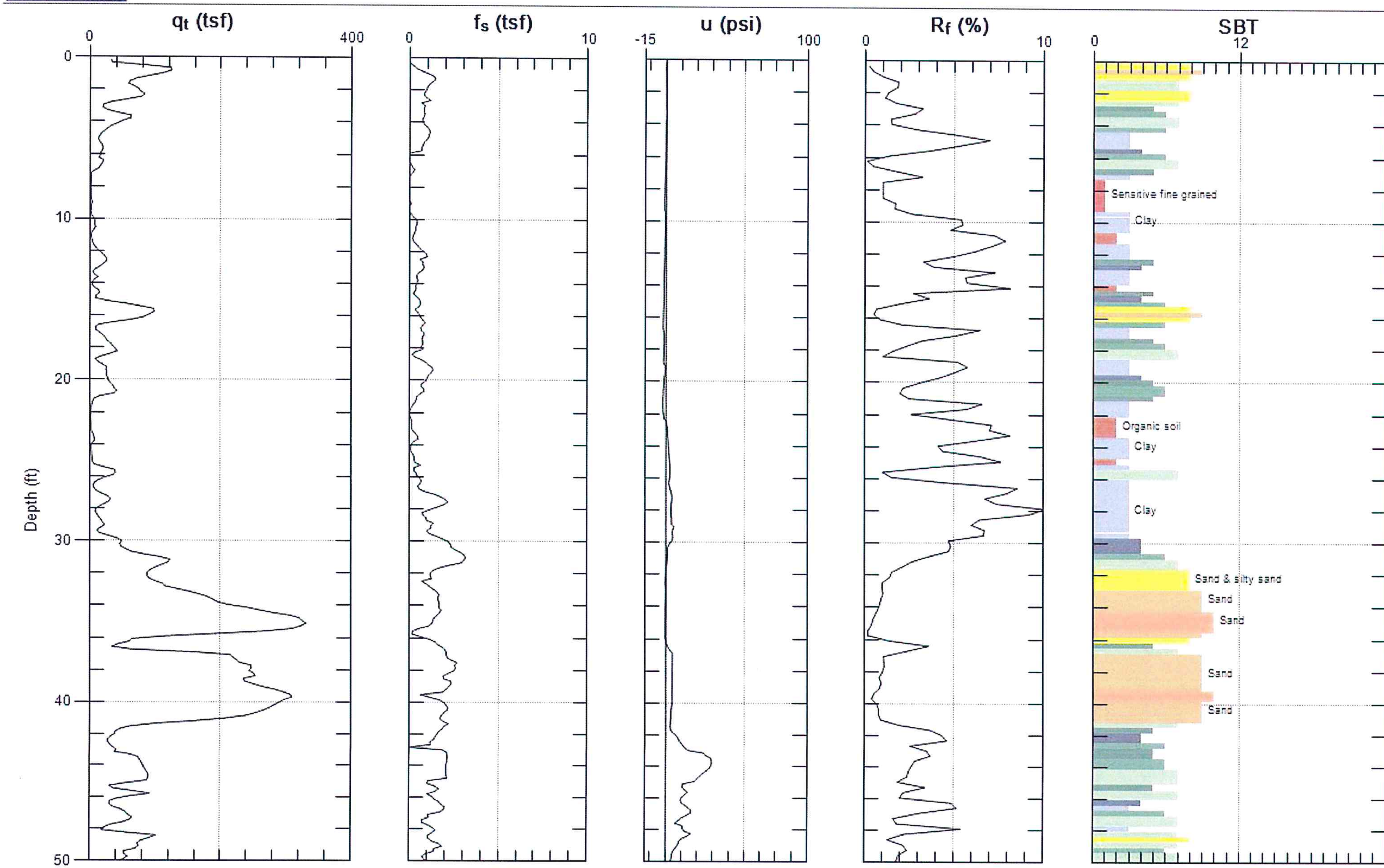
SBT: Soil Behavior Type (Robertson 1990)

GREGG

PETRA GEOTECHNICAL

Site: PROVINCE GROUP
Sounding: CPT-8

Engineer: S.WINSLOW
Date: 6/11/2014 01:47



Max. Depth: 50.525 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG

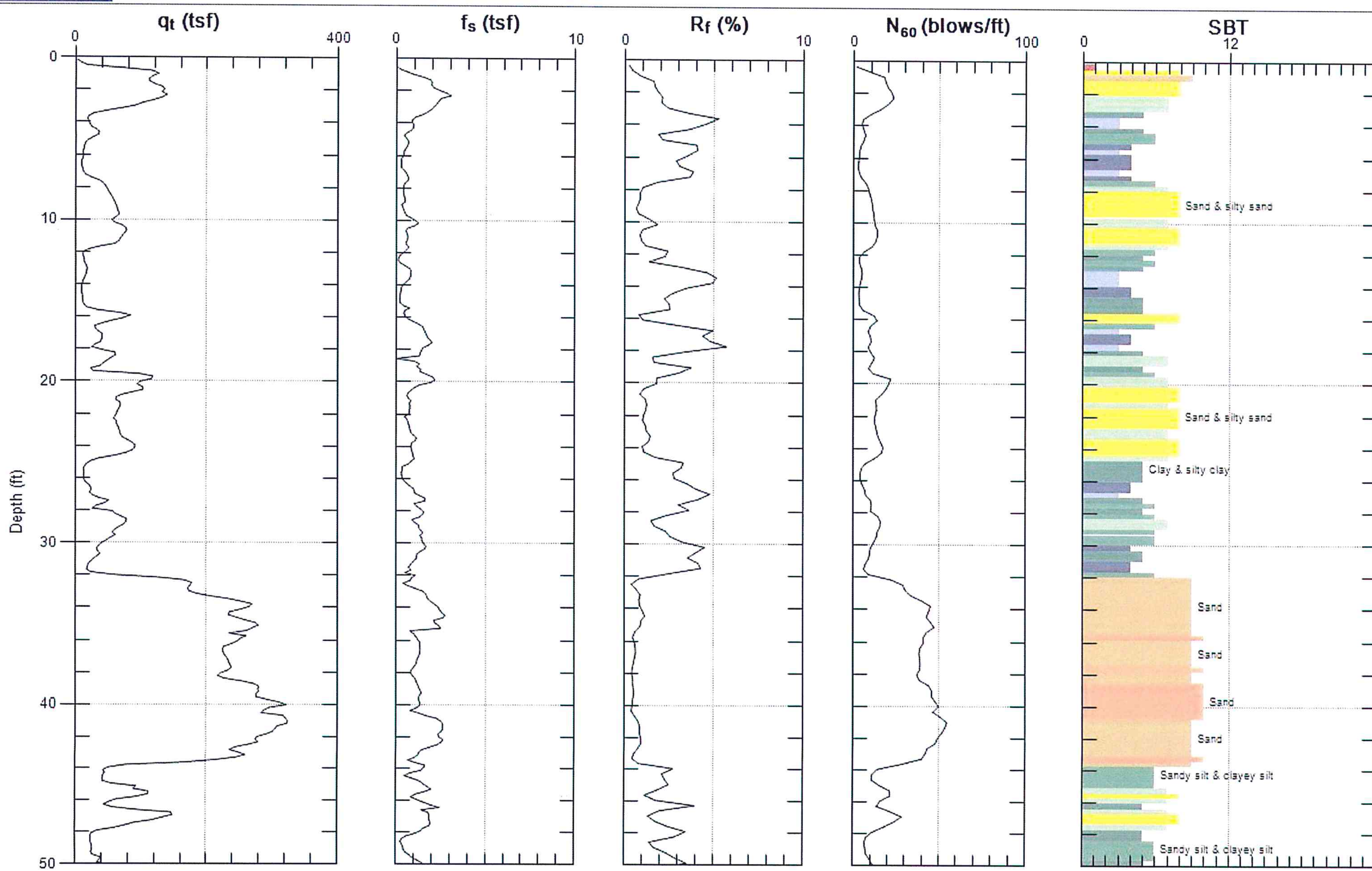
PETRA GEOTECHNICAL

Site: PROVINCE GROUP

Sounding: CPT-9

Engineer: S.WINSLOW

Date: 6/11/2014 02:13



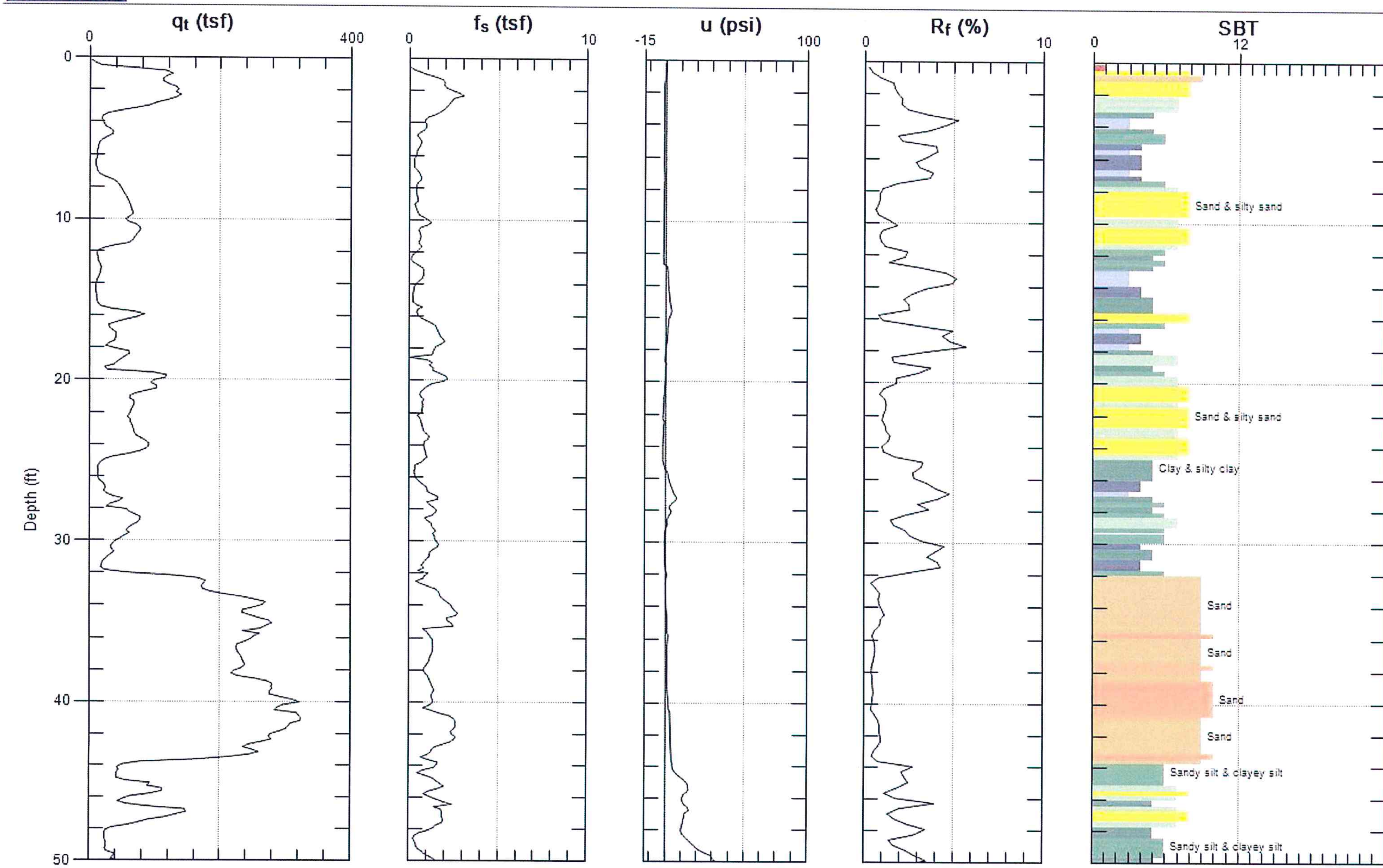
Max. Depth: 50.525 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG **PETRA GEOTECHNICAL**

Site: PROVINCE GROUP
Sounding: CPT-9

Engineer: S.WINSLOW
Date: 6/11/2014 02:13



Max. Depth: 50.525 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG DRILLING & TESTING, INC.
GEOTECHNICAL AND ENVIRONMENTAL INVESTIGATION SERVICES

July 17, 2014

Petra Geotechnical
Attn: Scott Winslow

Subject: CPT Site Investigation
Newport Equities
Cypress, California
GREGG Project Number: 14-761SH – part 2

Dear Mr. Winslow:

The following report presents the results of GREGG Drilling & Testing's Cone Penetration Test investigation for the above referenced site. The following testing services were performed:

1	Cone Penetration Tests	(CPTU)	☒
2	Pore Pressure Dissipation Tests	(PPD)	☐
3	Seismic Cone Penetration Tests	(SCPTU)	☐
4	UVOST Laser Induced Fluorescence	(UVOST)	☐
5	Groundwater Sampling	(GWS)	☐
6	Soil Sampling	(SS)	☐
7	Vapor Sampling	(VS)	☐
8	Pressuremeter Testing	(PMT)	☐
9	Vane Shear Testing	(VST)	☐
10	Dilatometer Testing	(DMT)	☐

A list of reference papers providing additional background on the specific tests conducted is provided in the bibliography following the text of the report. If you would like a copy of any of these publications or should you have any questions or comments regarding the contents of this report, please do not hesitate to contact our office at (925) 313-5800.

Sincerely,
GREGG Drilling & Testing, Inc.

Peter Robertson
Technical Director, Gregg Drilling & Testing, Inc.

Cone Penetration Test Sounding Summary

-Table 1-

CPT Sounding Identification	Date	Termination Depth (feet)	Depth of Groundwater Samples (feet)	Depth of Soil Samples (feet)	Depth of Pore Pressure Dissipation Tests (feet)
CPT-10	7/14/14	50	-	-	-
CPT-11	7/14/14	50	-	-	-
CPT-12	7/14/14	50	-	-	-
CPT-13	7/14/14	50	-	-	-
CPT-14	7/14/14	50	-	-	-

Bibliography

Lunne, T., Robertson, P.K. and Powell, J.J.M., "Cone Penetration Testing in Geotechnical Practice" E & FN Spon. ISBN 0 419 23750, 1997

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Robertson, P.K., R.G. Campanella, D. Gillespie and A. Rice, "Seismic CPT to Measure In-Situ Shear Wave Velocity", Journal of Geotechnical Engineering ASCE, Vol. 112, No. 8, 1986 pp. 791-803.

Robertson, P.K., Sully, J., Woeller, D.J., Lunne, T., Powell, J.J.M., and Gillespie, D.J., "Guidelines for Estimating Consolidation Parameters in Soils from Piezocone Tests", Canadian Geotechnical Journal, Vol. 29, No. 4, August 1992, pp. 539-550.

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Campanella, R.G. and I. Weemees, "Development and Use of An Electrical Resistivity Cone for Groundwater Contamination Studies", Canadian Geotechnical Journal, Vol. 27 No. 5, 1990 pp. 557-567.

DeGroot, D.J. and A.J. Lutenegger, "Reliability of Soil Gas Sampling and Characterization Techniques", International Site Characterization Conference - Atlanta, 1998.

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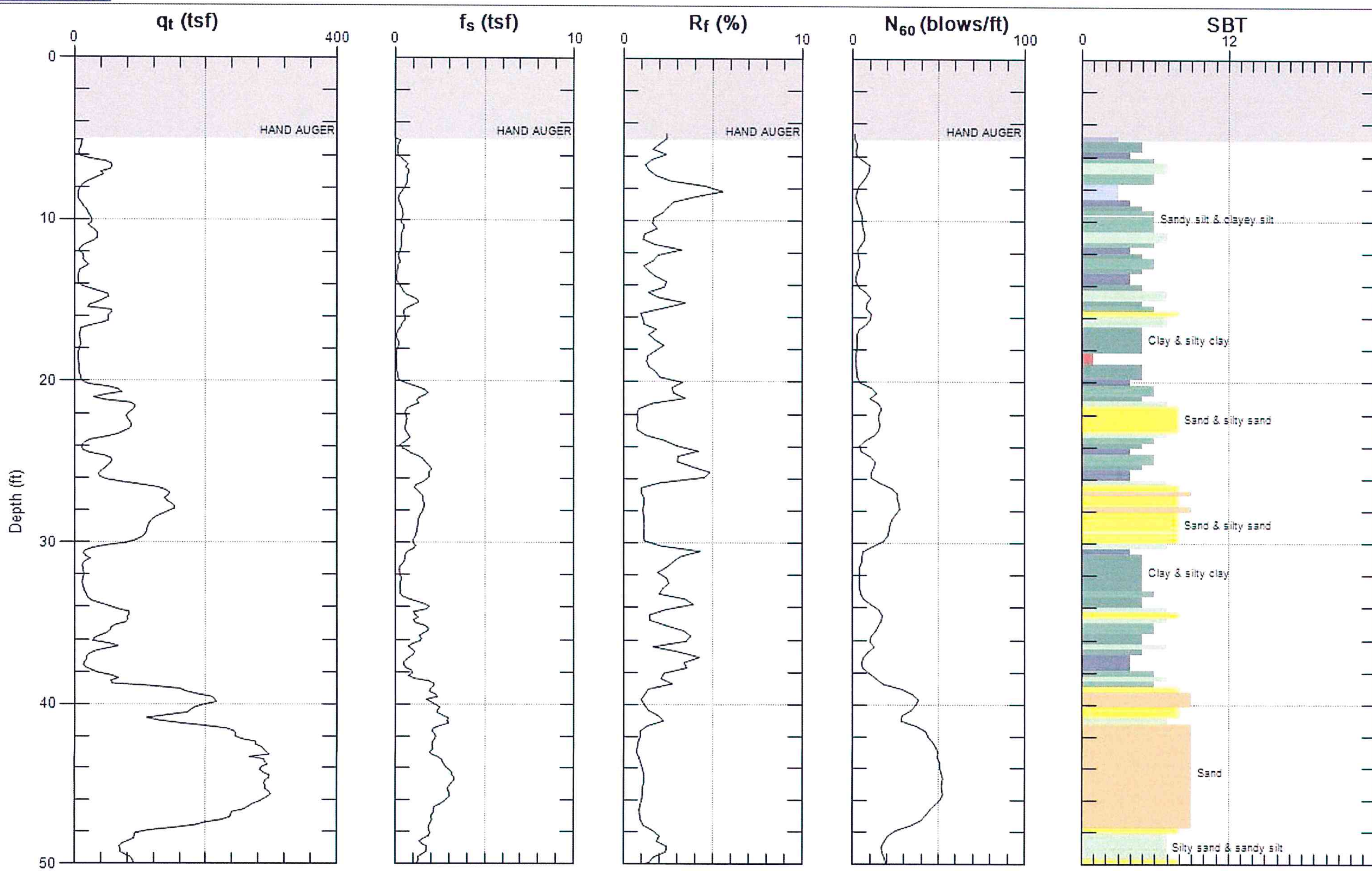
Zemo, D.A., T.A. Delfino, J.D. Gallinatti, V.A. Baker and L.R. Hilpert, "Field Comparison of Analytical Results from Discrete-Depth Groundwater Samplers" BAT EnviroProbe and QED HydroPunch, Sixth national Outdoor Action Conference, Las Vegas, Nevada Proceedings, 1992, pp 299-312.

Copies of ASTM Standards are available through www.astm.org

PETRA GEOTECHNICAL

Site: NEWPORT EQUITIES
Sounding: CPT-10

Engineer: S.WINSLOW
Date: 7/14/2014 11:38



Max. Depth: 50.361 (ft)
Avg. Interval: 0.328 (ft)

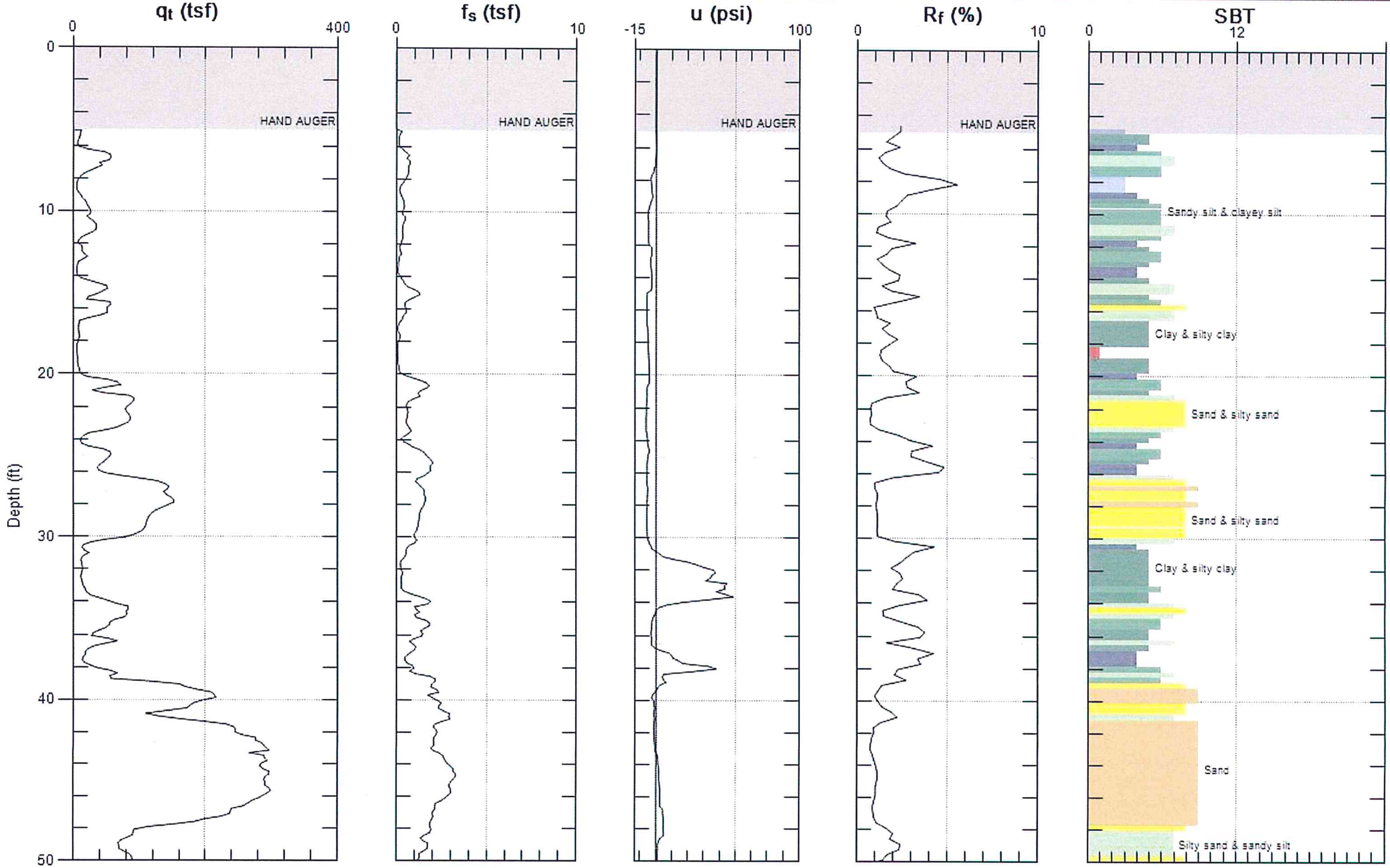
SBT: Soil Behavior Type (Robertson 1990)

GREGG

PETRA GEOTECHNICAL

Site: NEWPORT EQUITIES
Sounding: CPT-10

Engineer: S.WINSLOW
Date: 7/14/2014 11:38



Max. Depth: 50.361 (ft)
Avg. Interval: 0.328 (ft)

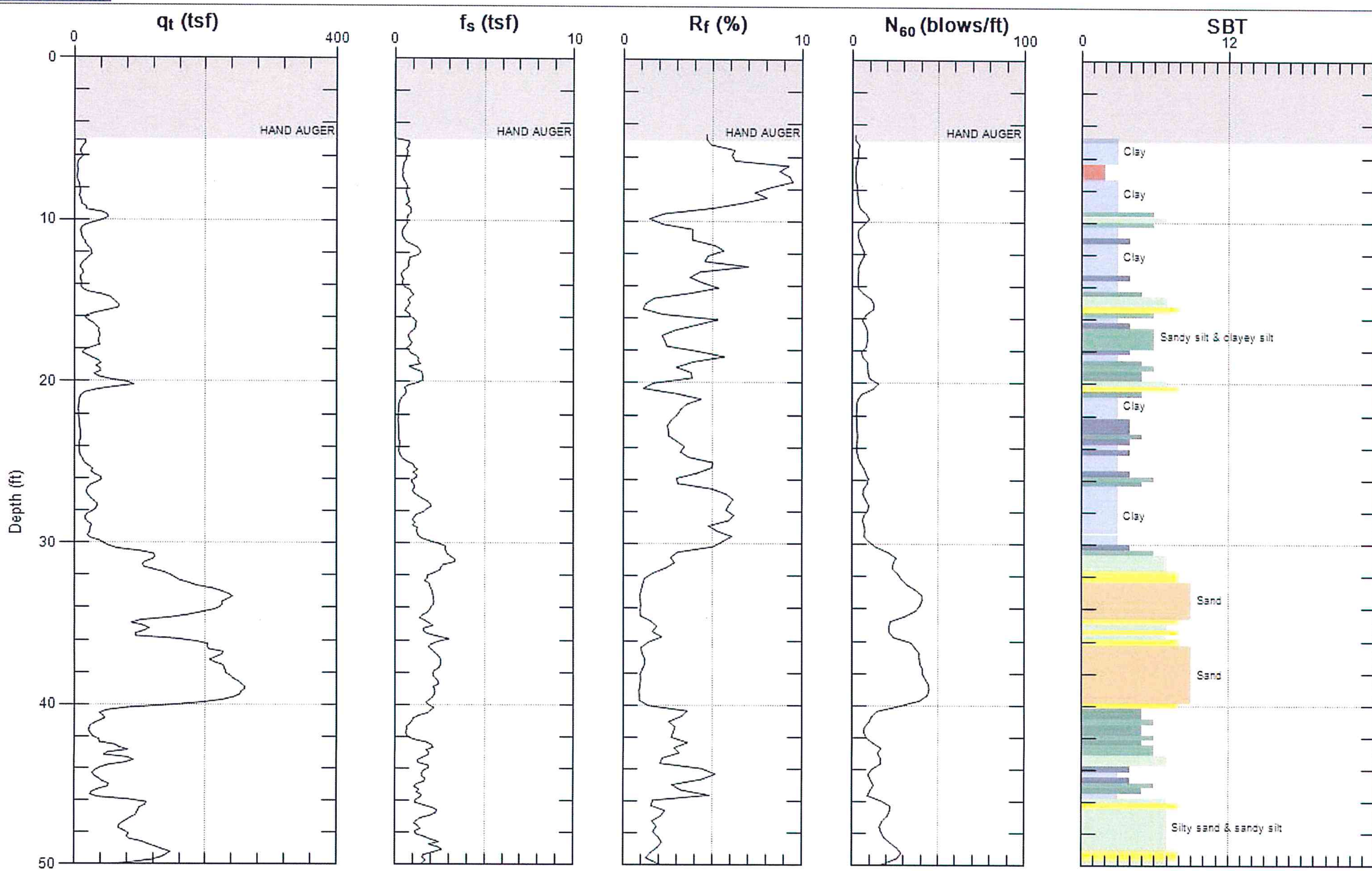
SBT: Soil Behavior Type (Robertson 1990)

GREGG

PETRA GEOTECHNICAL

Site: NEWPORT EQUITIES
Sounding: CPT-11

Engineer: S.WINSLOW
Date: 7/14/2014 09:37



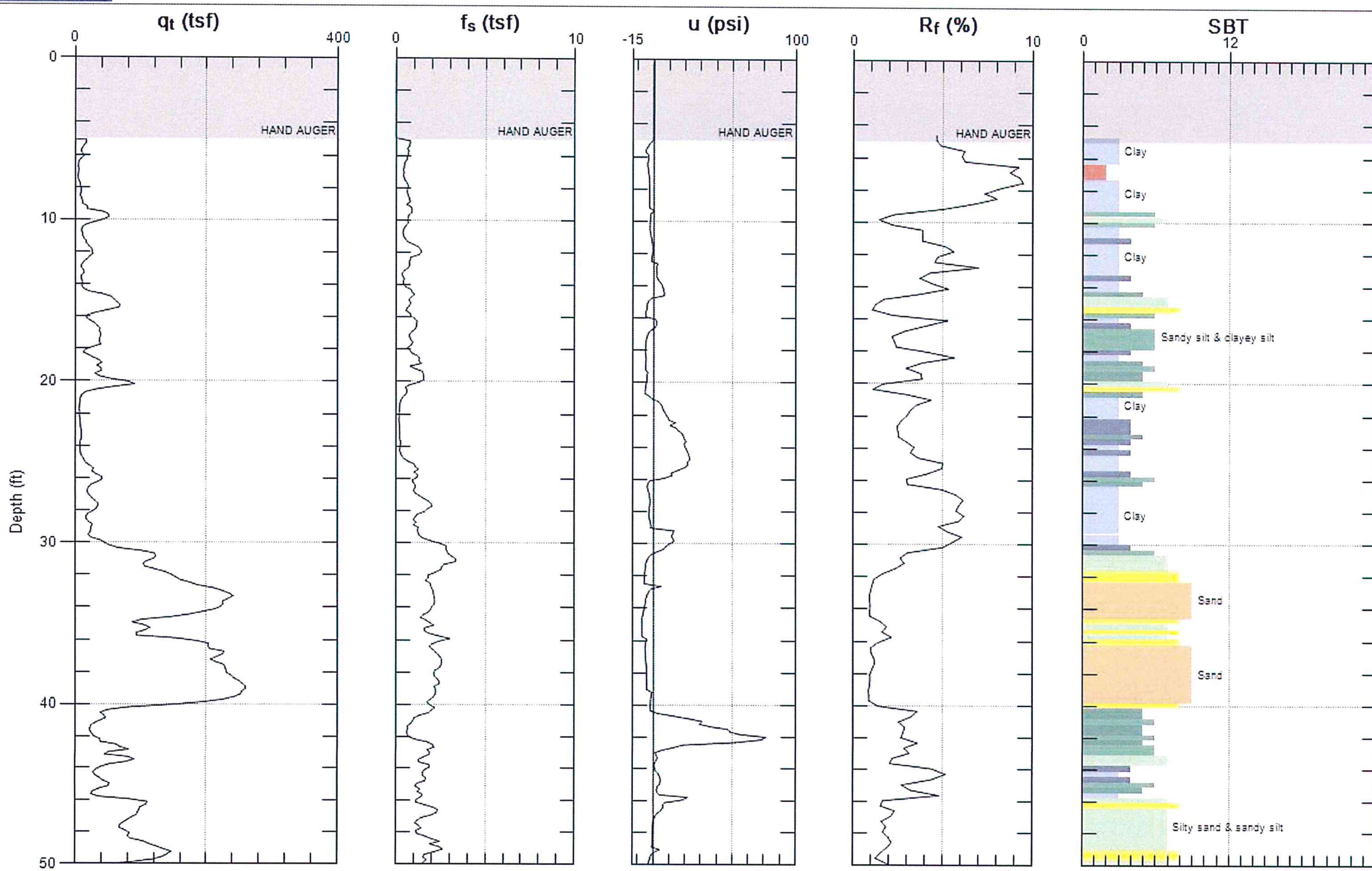
Max. Depth: 50.525 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

PETRA GEOTECHNICAL

Site: NEWPORT EQUITIES
Sounding: CPT-11

Engineer: S.WINSLOW
Date: 7/14/2014 09:37



Max. Depth: 50.525 (ft)
Avg. Interval: 0.328 (ft)

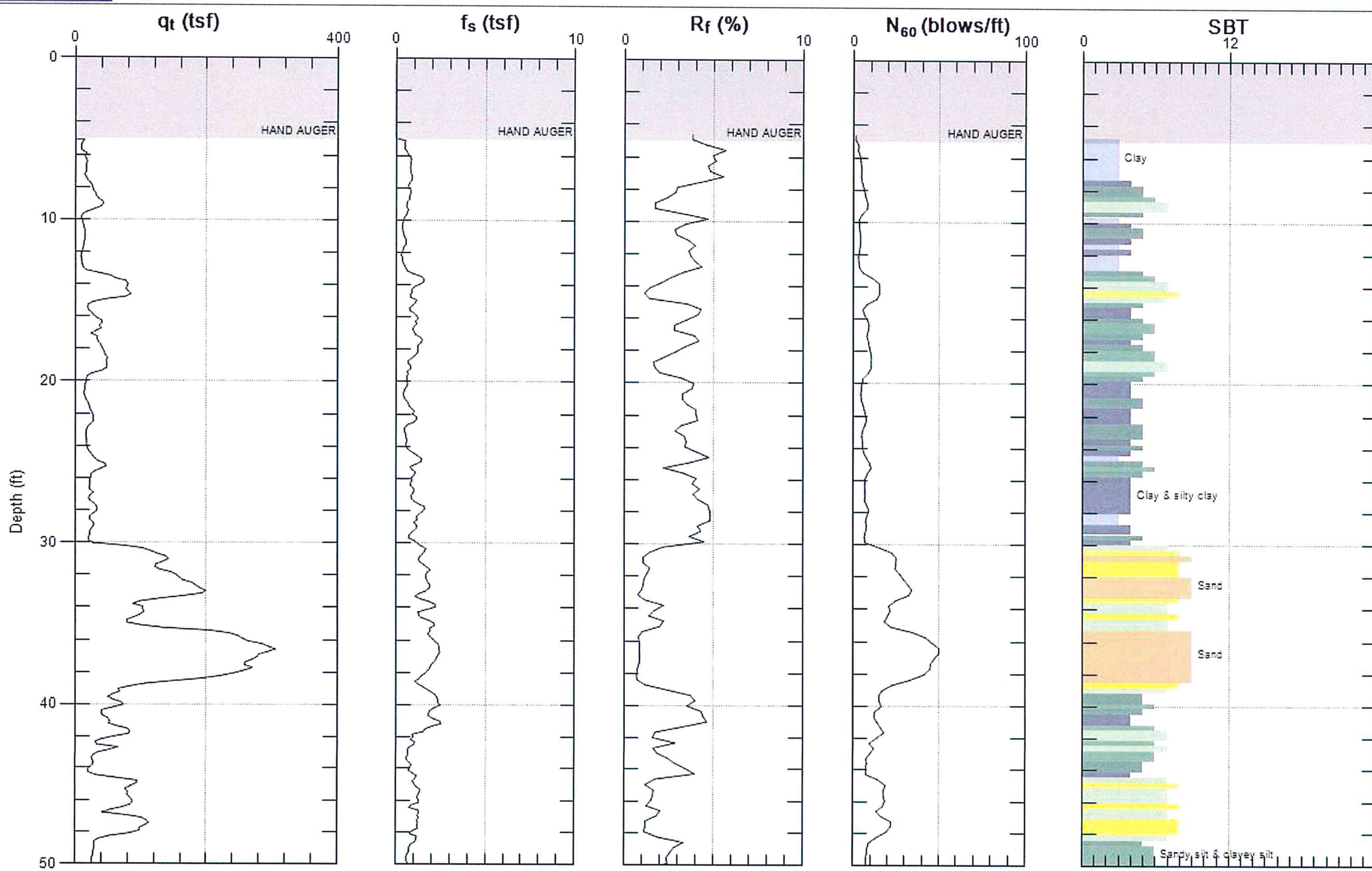
SBT: Soil Behavior Type (Robertson 1990)

GREGG

PETRA GEOTECHNICAL

Site: NEWPORT EQUITIES
Sounding: CPT-12

Engineer: S.WINSLOW
Date: 7/14/2014 09:06



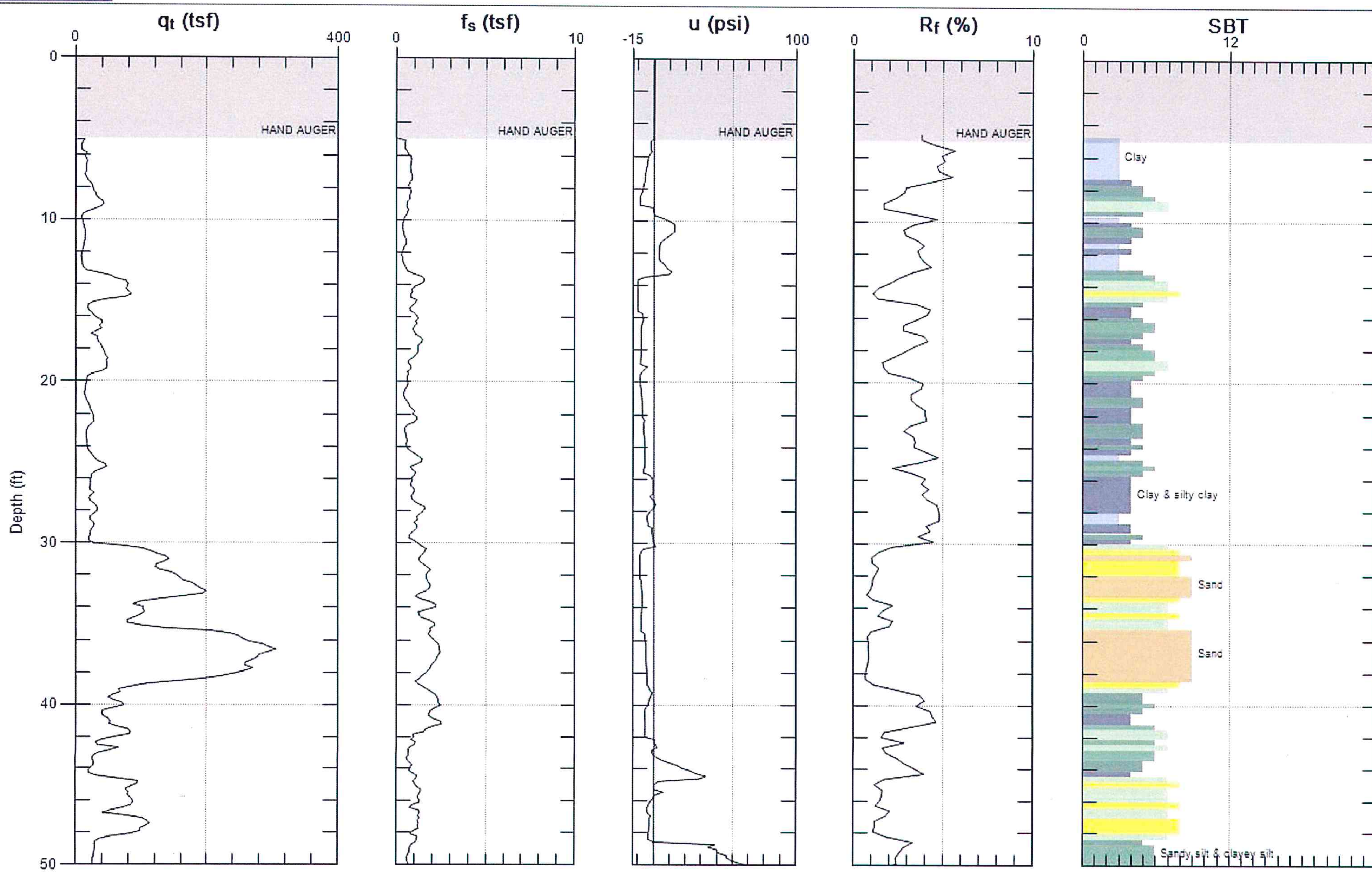
Max. Depth: 50.525 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

PETRA GEOTECHNICAL

Site: NEWPORT EQUITIES
Sounding: CPT-12

Engineer: S.WINSLOW
Date: 7/14/2014 09:06



Max. Depth: 50.525 (ft)
Avg. Interval: 0.328 (ft)

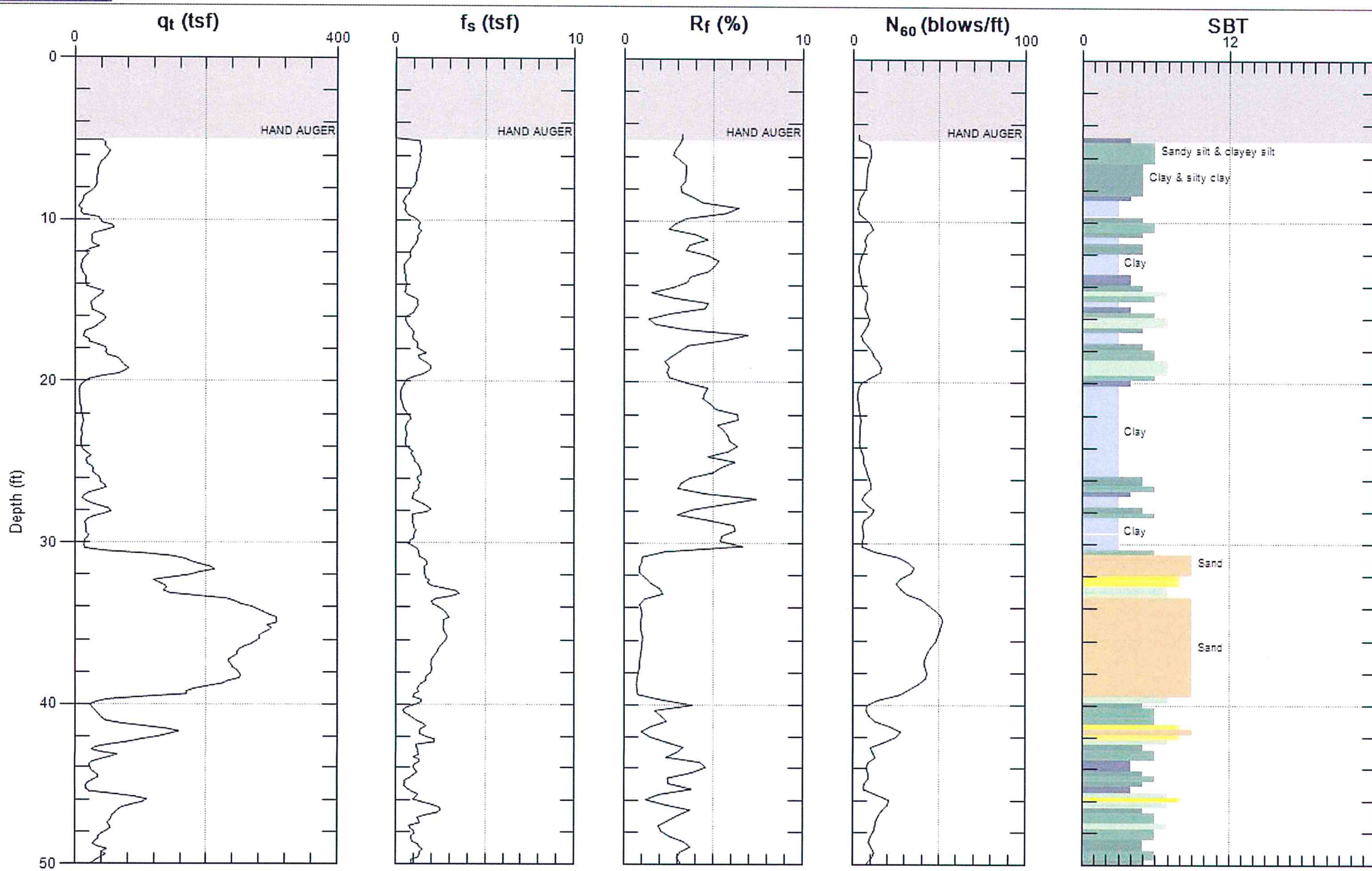
SBT: Soil Behavior Type (Robertson 1990)

GREGG

PETRA GEOTECHNICAL

Site: NEWPORT EQUITIES
Sounding: CPT-13

Engineer: S.WINSLOW
Date: 7/14/2014 10:56



Max. Depth: 50.525 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG

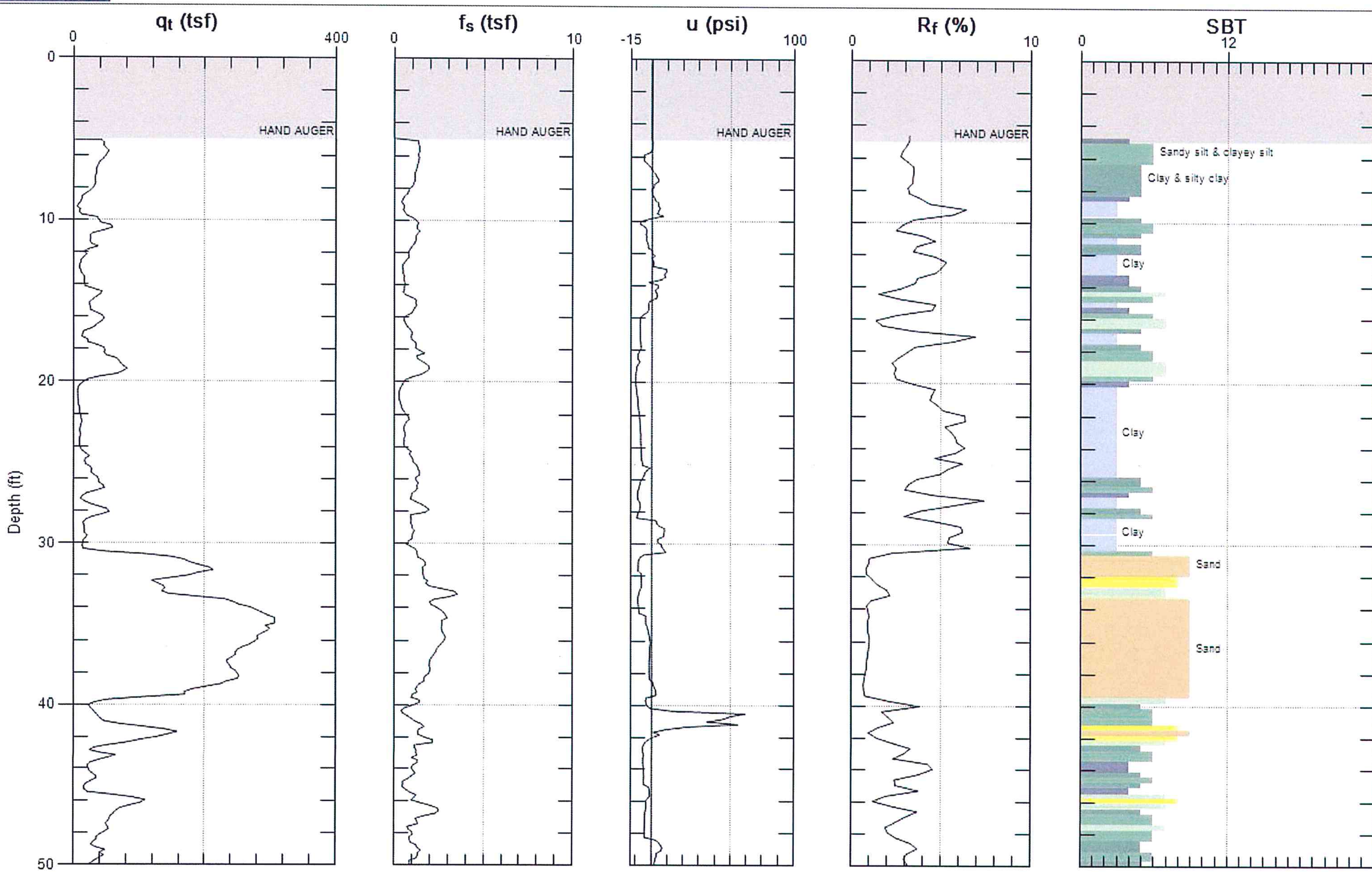
PETRA GEOTECHNICAL

Site: NEWPORT EQUITIES

Sounding: CPT-13

Engineer: S.WINSLOW

Date: 7/14/2014 10:56



Max. Depth: 50.525 (ft)
Avg. Interval: 0.328 (ft)

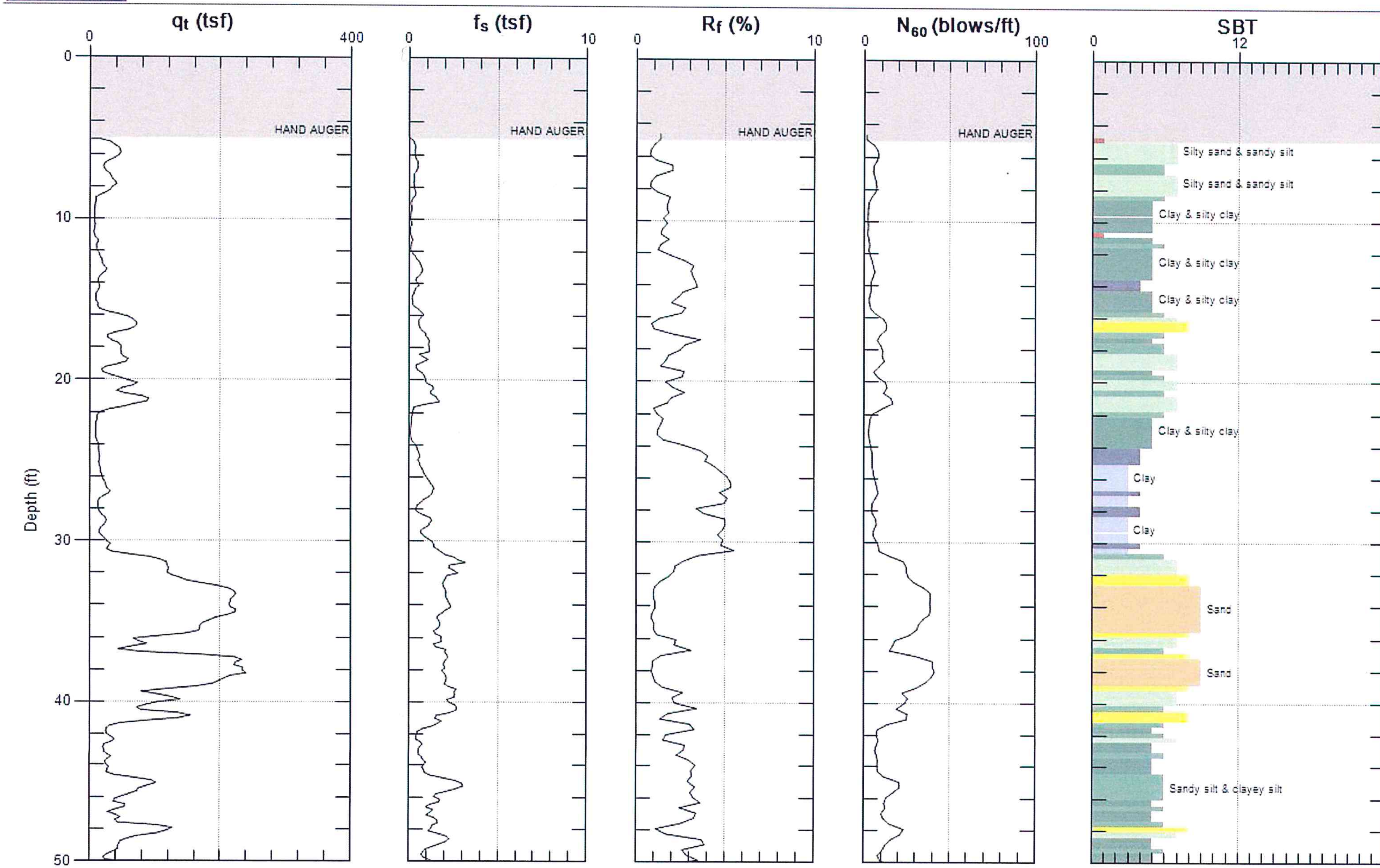
SBT: Soil Behavior Type (Robertson 1990)

GREGG

PETRA GEOTECHNICAL

Site: NEWPORT EQUITIES
Sounding: CPT-14

Engineer: S.WINSLOW
Date: 7/14/2014 10:20



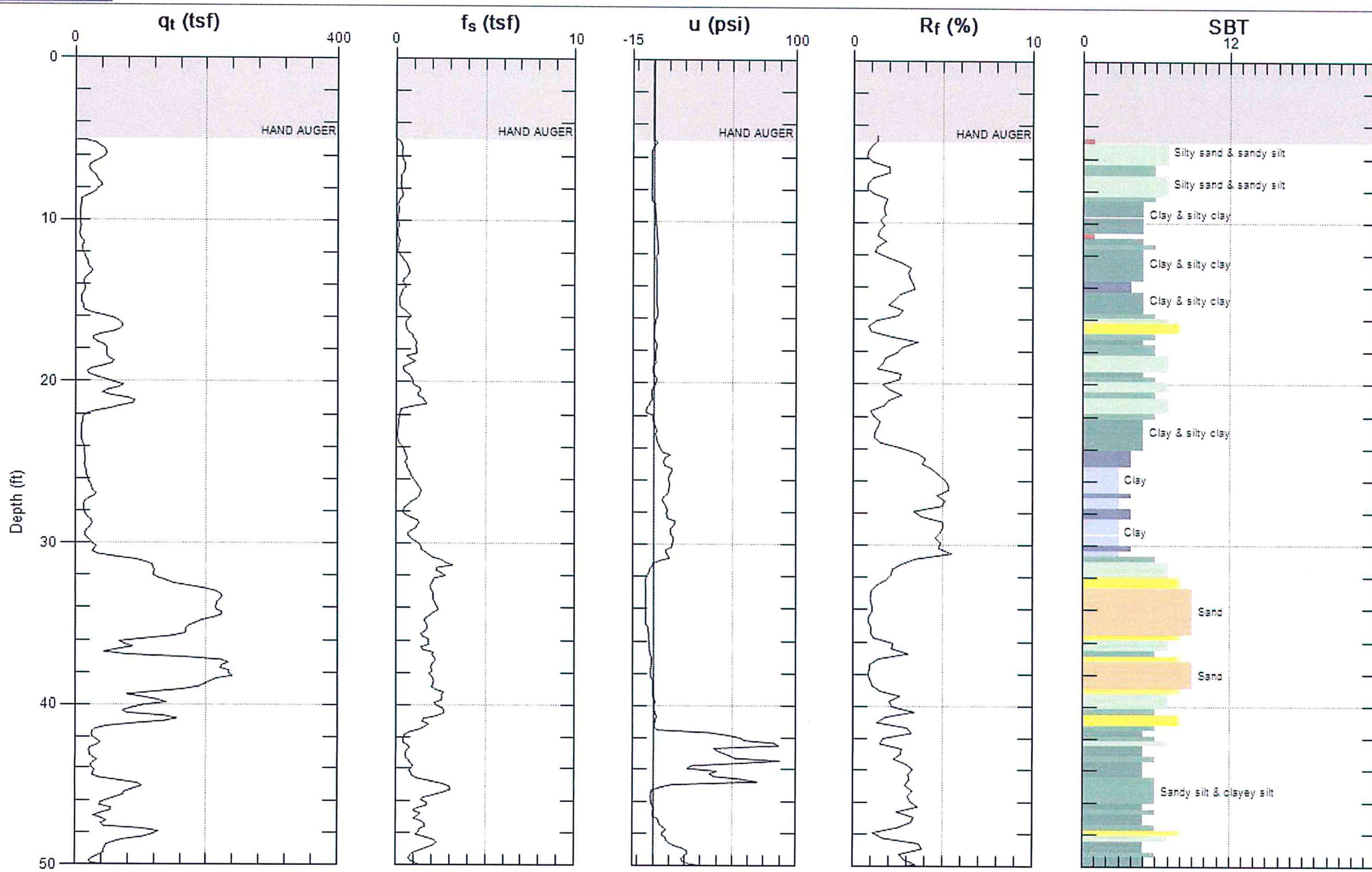
Max. Depth: 50.525 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

PETRA GEOTECHNICAL

Site: NEWPORT EQUITIES
Sounding: CPT-14

Engineer: S.WINSLOW
Date: 7/14/2014 10:20



Max. Depth: 50.525 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

Shear Wave Velocity Calculations

PROVINCE GROUP - CYPRESS

CPT-6

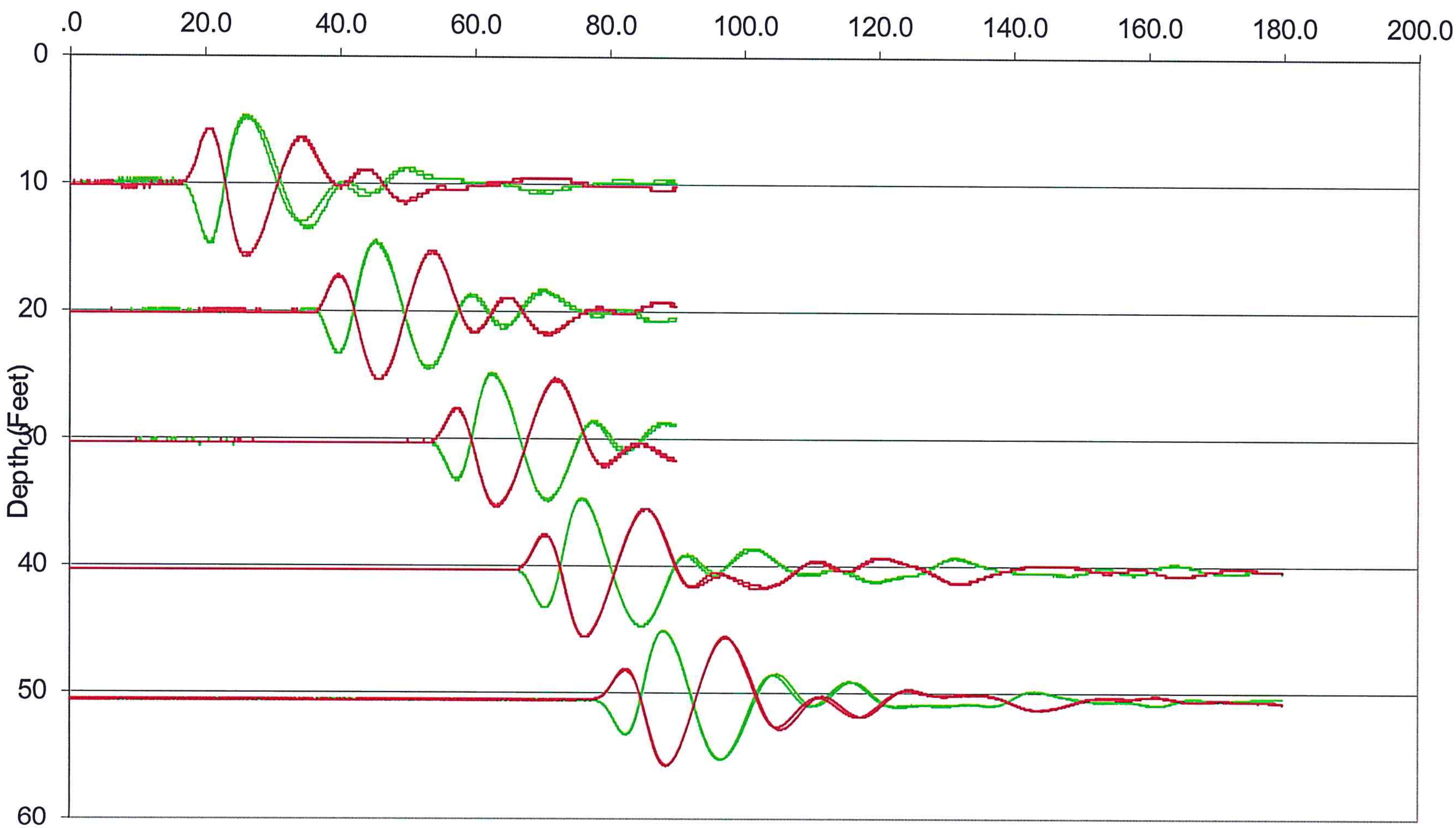
Geophone Offset: 0.66 Feet

Source Offset: 1.67 Feet

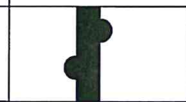
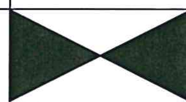
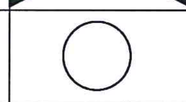
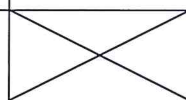
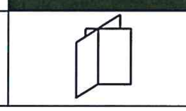
06/11/14

Test Depth (Feet)	Geophone Depth (Feet)	Waveform Ray Path (Feet)	Incremental Distance (Feet)	Characteristic Arrival Time (ms)	Incremental Time Interval (ms)	Interval Velocity (Ft/Sec)	Interval Depth (Feet)
10.17	9.51	9.66	9.66	22.7000			
20.18	19.52	19.59	9.93	41.9500	19.2500	516.0	14.51
30.35	29.69	29.73	10.15	59.5000	17.5500	578.1	24.60
40.35	39.69	39.73	9.99	72.5500	13.0500	765.9	34.69
50.52	49.86	49.89	10.16	84.6500	12.1000	840.0	44.78

Waveforms for Sounding CPT-6



BORING LOG LEGEND

SAMPLE TYPE	GRAPHICAL SYMBOL	SAMPLE DESCRIPTION
AUGER		SAMPLE COLLECTED FROM AUGER CUTTINGS, NO FIELD MEASUREMENT OF SOIL STRENGTH. (DISTURBED)
CORE		ROCK CORE SAMPLE: TYPICALLY TAKEN WITH A DIAMOND-TIPPED CORE BARREL. TYPICALLY USED ONLY IN HIGHLY CONSOLIDATED BEDROCK.
GRAB		SOIL SAMPLE TAKEN WITH NO SPECIALIZED EQUIPMENT, SUCH AS FROM A STOCKPILE OR THE GROUND SURFACE. (DISTURBED)
CS		CALIFORNIA SAMPLER: 2-1/2 INCH I.D. SPLIT BARREL SAMPLER, LINED WITH 1-INCH HIGH BRASS RINGS. DRIVEN WITH SPT HAMMER. (RELATIVELY UNDISTURBED)
NSR		NO RECOVERY: THE SAMPLING ATTEMPT DID NOT RESULT IN RECOVERY OF ANY SIGNIFICANT SOIL OR ROCK MATERIAL.
SPT		STANDARD PENETRATION TEST: SAMPLER IS A 1.4 INCH INSIDE DIAMETER SPLIT BARREL, DRIVEN 18 INCHES WITH THE SPT HAMMER. (DISTURBED)
SH		SHELBY TUBE: TAKEN WITH A THIN WALL SAMPLE TUBE, PUSHED INTO THE SOIL AND THEN EXTRACTED. (UNDISTURBED)
VANE		VANE SHEAR TEST: SOIL STRENGTH OBTAINED USING A 4 BLADED SHEAR DEVICE. TYPICALLY USED IN SOFT CLAYS-NO SAMPLE RECOVERED.

COLUMN DESCRIPTIONS

DEPTH: Distance in feet below the ground surface.

SAMPLE: Sample Type as depicted above.

BLOW COUNT: Number of blows required to advance the sampler 12 inches using a 140 lb hammer with a 30-inch drop. 50/3" indicates penetration refusal (>50 blows) at 3 inches. WH indicates that the weight of the hammer was sufficient to push the sampler 6 inches or more.

POCKET PEN.: Approximate shear strength of a cohesive soil sample as measured by pocket penetrometer.

GRAPHIC LOG: Graphic Soil Symbol as depicted on the following page.

DRY DENSITY: Dry density of an undisturbed or relatively undisturbed sample in lbs/ft^3.

MOISTURE CONTENT: Moisture content of a soil sample, expressed as a percentage of the dry weight.

LIQUID LIMIT: The moisture content above which a soil behaves as a liquid.

PLASTIC LIMIT: The moisture content above which a soil behaves as a plastic.

PASSING #200 SIEVE: The percentage of the sample finer than the #200 standard sieve.

UNCONFINED SHEAR: The shear strength of a cohesive soil sample, as measured in the unconfined state.

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		(LITTLE OR NO FINES)		GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
		(APPRECIABLE AMOUNT OF FINES)		GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	SAND AND SANDY SOILS	CLEAN SANDS		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		(LITTLE OR NO FINES)		SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	SANDS WITH FINES		SM	SILTY SANDS, SAND - SILT MIXTURES
		(APPRECIABLE AMOUNT OF FINES)		SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-1

JOB NO.: 12G192	DRILLING DATE: 9/17/12	WATER DEPTH: 6 feet
PROJECT: Proposed ProLogis Park	DRILLING METHOD: Hollow Stem Auger	CAVE DEPTH: 7 feet
LOCATION: Cypress, California	LOGGED BY: Brett Isen	READING TAKEN: At Completion

SURFACE ELEVATION: 29 feet MSL

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	UNCONFINED SHEAR (TSF)	COMMENTS
	X	19			FILL: Dark Gray Brown to Gray Brown fine Sandy Silt to Clayey Silt, trace fine Sand, trace fine Gravel, trace Brick fragments, medium dense-damp to very moist		6					EI = 48 @ 0 to 5'
	X	11	2.0				30					
5					ALLUVIUM: Dark Brown Clayey Silt, trace fine Sand with thinly interbedded fine Sandy layers, trace fine root fibers, loose to medium dense-very moist		23					
	X	4	0.75		@ 6 feet, Water encountered during drilling		38			87		
	X	4			Dark Brown Silty fine Sand to fine Sandy Silt, trace fine root fibers, loose-wet		30			49		
10												
	X	7	0.75		Dark Gray Brown Clayey Silt, trace Iron oxide staining, trace fine Gravel, loose-wet		34	40	28	94		
15	■	13	0.75			88	34					
	X	6			Dark Gray Brown fine Sandy Silt to Silty fine Sand, trace calcareous nodules, trace Iron oxide staining, loose-wet		24			48		
20	X	8			Gray Silty fine Sand, medium stiff-wet		27					
	X	7					22			47		
25	X	12	1.0		Dark Gray Silty Clay, medium stiff-wet		39					
					Dark Gray Silty fine Sand, medium dense-wet		26			23		
	X	6					23					
			0.75		Gray Silty Clay to Clayey Silt, trace calcareous nodules, trace Organic fibers, soft to stiff-wet		31					
30	X	4	1.25				29	35	22	75		
	X	9	0.75				36					
					Dark Gray Brown fine Sandy Silt, trace Iron oxide staining, loose-wet		30					
					Dark Gray Brown Silty fine Sand, medium dense-wet							

TBL 12G192.GPJ SOCALGEO.GDT 10/22/12

TEST BORING LOG

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-19

JOB NO.: 12G192
PROJECT: Proposed ProLogis Park
LOCATION: Cypress, California

DRILLING DATE: 9/19/12
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Brett Isen

WATER DEPTH: 10 feet
CAVE DEPTH: 9 feet
READING TAKEN: At Completion

SURFACE ELEVATION: 30 feet MSL

FIELD RESULTS					DESCRIPTION	LABORATORY RESULTS						COMMENTS
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	UNCONFINED SHEAR (TSF)	COMMENTS
					FILL: Gray Brown Clayey Silt, little to some fine Sand, mottled, medium dense-damp							
	X	22	4.5+			109	13					EI = 37 @ 0 to 5'
					ALLUVIUM: Brown to Gray Brown Silty fine Sand, trace to little Clay, medium dense-damp to moist							
	X	17				96	13					
5	X	11	2.75		Dark Gray Brown Silty Clay, little fine Sand, medium stiff-very moist	102	22					
					Gray Brown Silty fine Sand, loose-very moist							
	X	10			@ 7 to 8 feet, some thinly interbedded fine Sand layers	84	22					
					Dark Brown Silty fine Sand, loose-wet							
10	X	8			@ 10 feet, Water encountered during drilling	97	24					
					Dark Gray Brown to Black fine Sandy Clay, little Silt, loose-wet							
15	X	9	0.75			104	22					
					Gray Brown fine Sandy Silt, trace medium Sand, trace Clay, trace Iron oxide staining, medium dense-wet							
20	X	10					25					

Boring Terminated 20'

TBL 12G192.GPJ SOCALGEO.GDT 10/22/12

TEST BORING LOG

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-2

JOB NO.: 12G192
PROJECT: Proposed ProLogis Park
LOCATION: Cypress, California

DRILLING DATE: 9/17/12
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Brett Isen

WATER DEPTH: 6 feet
CAVE DEPTH: 8 feet
READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION SURFACE ELEVATION: 25 feet MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	UNCONFINED SHEAR (TSF)	COMMENTS
					FILL: Brown Silty fine Sand, trace fine Sand, loose-moist							
	X	8					18					
					ALLUVIUM: Brown fine Sandy Silt, trace Clay nodules, trace calcareous nodules, slightly porous, loose-moist							
	X	6					30					
5												
					Interbedded Gray Brown Silty Clay and Silt, little fine Sand, trace calcareous nodules, soft to medium stiff-wet @ 6 feet, Water encountered during drilling							
	X	4					36	52	26			
	X	6					36			85		
10												
	X	12			@ 13½ to 14½ feet, stiff		33					
15					Dark Gray Brown Silty fine Sand, medium dense-wet		23			32		
					Dark Gray to Dark Gray Brown interbedded layers of fine Sandy Silt and Silty Clay, medium stiff-wet							
	X	8					20			64		
20												
					Gray Brown Silty Clay with thin interbedded layers of Silty fine Sand, trace Iron oxide staining, loose to medium stiff-wet							
	X	7					22	29	17	78		
25												
					Gray Brown Silty fine Sand, medium dense-wet							
	X	18					25			44		
30												
	X	16					25					

TBL 12G192.GPJ SOCALGEO.GDT 10/22/12

TEST BORING LOG

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-2

JOB NO.: 12G192
PROJECT: Proposed ProLogis Park
LOCATION: Cypress, California

DRILLING DATE: 9/17/12
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Brett Isen

WATER DEPTH: 6 feet
CAVE DEPTH: 8 feet
READING TAKEN: At Completion

FIELD RESULTS					DESCRIPTION (Continued)	LABORATORY RESULTS						COMMENTS
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG		DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	UNCONFINED SHEAR (TSF)	
					Gray Brown Silty fine Sand, medium dense-wet							
					Gray Brown fine to medium Sand, trace Silt, medium dense-wet							
	X	22					24			6		
40												
					Gray Brown Silty fine Sand, trace medium Sand, loose to medium dense-wet							
	X	17					21					
45												
	X	10					25			17		
50												
					Boring Terminated 50'							

TBL 12G192.GPJ SOCALGEO.GDT 10/22/12

TEST BORING LOG

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-3

JOB NO.: 12G192
PROJECT: Proposed ProLogis Park
LOCATION: Cypress, California

DRILLING DATE: 9/17/12
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Brett Isen

WATER DEPTH: 6 feet
CAVE DEPTH: 9 feet
READING TAKEN: At Completion

FIELD RESULTS					DESCRIPTION	LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	SURFACE ELEVATION: --- MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	UNCONFINED SHEAR (TSF)	COMMENTS
					FILL: Light Brown fine Sandy Silt, trace Clay, trace fine Gravel, mottled, medium dense-moist							
	X	15					12					
					ALLUVIUM: Brown to Gray Brown Silty Clay with thin interbedded layers of Silty fine Sand, trace calcareous veining, stiff-very moist to wet							
	X	10	4.5+				19					
5												
	X	10			@ 6 feet, Water encountered during drilling		29	41	25	51		
					Gray Clayey Silt, trace Iron oxide staining, trace Organic fibers, soft-wet							
	X	4					36			88		
10												
					Dark Gray Silty Clay with thinly interbedded layers of Silty fine Sand, trace Iron oxide staining, soft-wet							
	X	4					35			86		
15												
					Dark Gray Silty fine Sand, loose-wet							
	X	13					25			34		
20												
	X	6					24 27			48		
					Dark Gray Brown to Black Silty fine Sand, with interbedded Clayey Silt, layers, loose-wet							
25												
					Gray to Gray Brown Silty Clay, little fine Sand, medium stiff to stiff-wet							
	X	8	1.5				30			84		
30												
	X	10					30					
					Brown Silty fine Sand, trace Clay, medium dense-wet		25			44		

TBL 12G192.GPJ SOCALGEO.GDT 10/22/12

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-3

JOB NO.: 12G192	DRILLING DATE: 9/17/12	WATER DEPTH: 6 feet
PROJECT: Proposed ProLogis Park	DRILLING METHOD: Hollow Stem Auger	CAVE DEPTH: 9 feet
LOCATION: Cypress, California	LOGGED BY: Brett Isen	READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION (Continued)	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	UNCONFINED SHEAR (TSF)	COMMENTS
					Brown Silty fine Sand, trace Clay, medium dense-wet							
	X	12			Gray Brown fine to medium Sand, trace to little Silt, with occasional thin interbedded Silty Clay layers, medium dense-wet		26					
40												
	X	15					23			23		
45												
					Gray Brown interbedded layers of Clayey Silt and fine Sandy Silt, medium dense-wet							
	X	14					29	34	18	75		
50												
					Boring Terminated 50'							

TBL 12G192.GPJ SOCALGEO.GDT 10/22/12

TEST BORING LOG

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-4

JOB NO.: 12G192
PROJECT: Proposed ProLogis Park
LOCATION: Cypress, California

DRILLING DATE: 9/17/12
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Brett Isen

WATER DEPTH: 6 feet
CAVE DEPTH: 9 feet
READING TAKEN: At Completion

SURFACE ELEVATION: --- MSL

DEPTH (FEET)	BLOW COUNT	POCKET PEN. (TSF)	DESCRIPTION	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	UNCONFINED SHEAR (TSF)	COMMENTS
	15	4.5+	ALLUVIUM: Gray Brown Silty Clay with interbedded Silty fine Sand layers, trace fine root fibers, trace calcareous nodules, medium dense to stiff to very stiff-moist		17					
	6		Dark Brown fine Sandy Silt, trace Clay, trace fine root fibers, loose-very moist		31					
5			Dark Brown to Dark Gray Brown fine Sandy Silt to Clayey Silt, little Iron oxide staining, trace Organic fibers, medium stiff-wet		37					
	6		Gray Brown Silty fine Sand, trace fine root fibesr, loose-wet @ 6 feet, Water encountered during drilling		26			27		
	6				33					
10			Gray Brown fine Sandy Silt, trace Clay, trace Iron oxide staining, loose-wet		26			75		
	10		Gray Brown Silty fine Sand to fine Sandy Silt, medium dense-wet		32			56		
			Dark Brown Silty Clay with interbedded layers of Silty fine Sand, stiff-wet		24			59		
15	8		Gray Brown interbedded layers of Silty fine Sand and fine Sandy Silt, loose-wet		26			46		
	10		Dark Brown to Dark Gray Brown Silty fine Sand with a 2" thick interbedded layer of Gray Silty Clay, trace Iron oxide staining, loose to medium dense-wet		25			30		
20	10				31			34		
	7	0.75	Dark Gray Brown fine Sandy Clay, medium stiff-wet		25					
			Gray Brown Silty Clay, trace calcareous nodules, medium stiff-wet		22			71		
25	6	0.25			7			69		
	11				29					
			Gray fine Sandy Silt, medium dense-wet		27					
30	18		Gray to Gray Brown interbedded layers of fine to medium Sand and Silty Clay, trace Iron oxide staining, medium dense to very stiff-wet		32			78		
	17		Gray Brown Clayey Silt to Silty Clay, little to some fine Sand, trace Iron oxide staining, medium dense-wet		29			71		
			Gray Silty fine to medium Sand, medium dense-wet		22					

TBL 12G192.GPJ SOCALGEO.GDT 10/22/12

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-4

JOB NO.: 12G192	DRILLING DATE: 9/17/12	WATER DEPTH: 6 feet
PROJECT: Proposed ProLogis Park	DRILLING METHOD: Hollow Stem Auger	CAVE DEPTH: 9 feet
LOCATION: Cypress, California	LOGGED BY: Brett Isen	READING TAKEN: At Completion

FIELD RESULTS					DESCRIPTION	LABORATORY RESULTS						COMMENTS
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	(Continued)	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	UNCONFINED SHEAR (TSF)	
	X	12			Gray Silty fine to medium Sand, medium dense-wet		26			21		
	X	29					22					
40	X	21					20					
	X	22	2.5		Gray Brown Clayey Silt, little fine Sand, very stiff-wet		25			84		
45	X	13	1.75		Dark Gray Silty Clay, trace fine Sand, medium dense-wet		33			87		
	X	12					30					
50	X	13					44					
					Boring Terminated 50'							

TBL 12G192.GPJ SOCALGEO.GDT 10/22/12

TEST BORING LOG

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-5

JOB NO.: 12G192
PROJECT: Proposed ProLogis Park
LOCATION: Cypress, California

DRILLING DATE: 9/18/12
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Brett Isen

WATER DEPTH: 9 feet
CAVE DEPTH: 9 feet
READING TAKEN: At Completion

SURFACE ELEVATION: 30 feet MSL

DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	UNCONFINED SHEAR (TSF)	COMMENTS
					FILL: Light Brown fine Sandy Silt, trace Clay nodules, trace fine root fibers, medium dense-damp							
		15				104	6					
					FILL: Brown Silty fine Sand to fine Sandy Silt, trace Clay, trace fine Gravel, some Asphaltic concrete fragments, medium dense-damp							
		21				107	7					
5		33				112	3					
					FILL: Dark Brown Silty fine Sand, trace medium Sand, trace Asphaltic concrete fragments, medium dense-dry							
					FILL: Light Gray Brown fine Sandy Silt, trace Clay, trace Brick fragments, loose-damp							
		13				79	6					
					ALLUVIUM: Dark Brown fine Sandy Silt, loose-wet @ 9 feet, Water encountered during drilling							
		6				85	34					
10												
		7					26					
15												
					Gray Brown fine Sandy Silt, trace Clay, loose-wet							
		8					25					
20		11				101	24					
					Interbedded layers of Dark Gray Brown Silty fine Sand and Silty Clay, loose to stiff-wet							
		10					26					
25												
		13			@ 28½ to 29 feet, Gray Brown, medium dense							
					Gray Brown Silty fine Sand, medium dense-wet		22					
30												
					Boring Terminated 30'							

TBL 12G192.GPJ SOCALGEO.GDT 10/22/12

TEST BORING LOG

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-6

JOB NO.: 12G192
PROJECT: Proposed ProLogis Park
LOCATION: Cypress, California

DRILLING DATE: 9/18/12
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Brett Isen

WATER DEPTH: 8 feet
CAVE DEPTH: 8 feet
READING TAKEN: At Completion

SURFACE ELEVATION: 30 feet MSL

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	UNCONFINED SHEAR (TSF)	COMMENTS
	X	18			FILL: Light Brown Silty fine Sand to fine Sandy Silt, slightly porous, trace fine Sand, trace Iron oxide staining, trace fine root fibers, medium dense-dry	110	10					
					FILL: Dark Gray fine Sandy Silt, trace Clay, mottled, medium dense-moist							
	X	11			FILL: Gray Brown Silty fine Sand to fine Sandy Silt, trace Iron oxide stianing, mottled, loose-damp	101	3					
5	X	19										No Sample Recovered
	X	8	2.25		ALLUVIUM: Brown Silty Clay, trace calcareous nodules, medium stiff-very moist to wet @ 8 feet, Water encountered during drilling	94	27					
10	X	22			Gray Brown Silty fine Sand, medium dense-wet	104	24					
					Gray Brown Silty Clay, trace calcareous nodules, soft-wet							
15	X	3			Gray fine Sandy Silt, with thinly interbeded Silty Clay layers, trace fine Sand, very loose-wet		33 25					
					Brown Silt, little Clay, trace fine Sand, medium dense-wet							
20	X	11					28					
					Boring Terminated 20'							

TBL 12G192.GPJ SOCALGEO.GDT 10/22/12

TEST BORING LOG

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-7

JOB NO.: 12G192
PROJECT: Proposed ProLogis Park
LOCATION: Cypress, California

DRILLING DATE: 9/18/12
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Brett Isen

WATER DEPTH: 6 feet
CAVE DEPTH: 9 feet
READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION SURFACE ELEVATION: 27 feet MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	UNCONFINED SHEAR (TSF)	COMMENTS
		10	3.25		FILL: Gray Brown Clayey Silt to Silty Clay, trace Iron oxide staining, trace fine root fibers, mottled, stiff-damp to moist		15					EI = 54 @ 0 to 5'
		7			ALLUVIUM: Brown Silty fine Sand, loose-moist to very moist		24					
5		7			Brown fine Sandy Silt to Silty fine Sand, loose-wet @ 6 feet, Water encountered during drilling		30					
					Gray Silty Clay, trace calcareous nodules, medium stiff-wet		34					
		8			@ 8½ to 10 feet, trace to little fine Sand		30					
10												
		3			Gray Brown interbedded layers of fine Sandy Silt and Silty Clay, trace calcareous nodules, very loose to soft-wet		20					
15					Boring Terminated 15'							

TBL 12G192.GPJ SOCALGEO.GDT 10/22/12

TEST BORING LOG

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-8

JOB NO.: 12G192	DRILLING DATE: 9/18/12	WATER DEPTH: Dry
PROJECT: Proposed ProLogis Park	DRILLING METHOD: Hollow Stem Auger	CAVE DEPTH: 9 feet
LOCATION: Cypress, California	LOGGED BY: Brett Isen	READING TAKEN: At Completion

FIELD RESULTS					DESCRIPTION	LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	SURFACE ELEVATION: 25 feet MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	UNCONFINED SHEAR (TSF)	COMMENTS
	X	23			FILL: Brown Clayey Silt, trace fine Sand, trace fine root fibers, medium dense-damp to moist		15					
	X	19			FILL: Gray Brown fine Sandy Silt, trace Clay, trace Brick fragments, trace calcareous nodules, trace Iron oxide staining, medium dense-damp to moist		11					
					Boring Terminated 5'							

TBL 12G192.GPJ SOCALGEO.GDT 10/22/12

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-9

JOB NO.: 12G192	DRILLING DATE: 9/18/12	WATER DEPTH: 9 feet
PROJECT: Proposed ProLogis Park	DRILLING METHOD: Hollow Stem Auger	CAVE DEPTH: 8 feet
LOCATION: Cypress, California	LOGGED BY: Brett Isen	READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION SURFACE ELEVATION: 26 feet MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	UNCONFINED SHEAR (TSF)	COMMENTS
					POSSIBLE FILL: Brown Clayey Silt, some fine Sand, trace fine root fibers, loose-very moist							
	X	7	2.25				32					
					POSSIBLE FILL: Brown interbedded layers of Clayey Silt and Silty fine Sand, trace Iron oxide staining, trace calcareous nodules, loose-very moist							
	X	6	1.5				32					
5												
	X	6	0.25		@ 6 to 7½ feet, Gray Brown, very moist to wet		28					
					ALLUVIUM: Gray Brown Silty fine Sand, loose-wet							
	X	8			@ 9 feet, Water encountered during drilling		27					
10			2.0		Gray Brown Clayey Silt to Silty Clay, trace calcareous deposits with interbedded Silty fine Sand layers, medium stiff-wet		26					
	X	11	1.5				30 26					
15					Brown to Dark Gray Brown Silty fine Sand to fine Sandy Silt, medium dense-wet							
	X	14					23					
20												
					Gray Silty Clay, trace Iron oxide staining, medium stiff-wet							
	X	8	0.75				29					
25												
					Boring Terminated 25'							

TBL 12G192.GPJ SOCALGEO.GDT 10/22/12

TEST BORING LOG

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-1

JOB NO.: 12G192
PROJECT: Proposed ProLogis Park
LOCATION: Cypress, California

DRILLING DATE: 9/17/12
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Brett Isen

WATER DEPTH: 6 feet
CAVE DEPTH: 7 feet
READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION (Continued)	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	UNCONFINED SHEAR (TSF)	COMMENTS
	X	10			Dark Gray Brown Silty fine Sand, medium dense-wet		30			54		
			1.75		Dark Gray Brown Silty Clay, stiff to very stiff-wet		25			73		
	X	19	0.75				31					
					Gray Brown Clayey Silt, little fine Sand, very stiff-wet		23			83		
40	X	26			Gray Brown fine Sandy Silt to Silty fine Sand, medium dense-wet		33			48		
					Gray Brown Silty fine Sand, trace Clay, medium dense-wet		27			30		
	X	13			Light Gray Brown Silty fine Sand, trace medium dense-medium dense-wet		26					
45	X	20					21			15		
	X	23					26					
50	X	9	1.5		Gray Brown Silty Clay, trace Iron oxide staining, stiff-wet		24			65		

Boring Terminated 51½'

TBL 12G192.GPJ SOCALGEO.GDT 10/22/12

TEST BORING LOG

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-10

JOB NO.: 12G192
PROJECT: Proposed ProLogis Park
LOCATION: Cypress, California

DRILLING DATE: 9/18/12
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Brett Isen

WATER DEPTH: 7 feet
CAVE DEPTH: 6 feet
READING TAKEN: At Completion

SURFACE ELEVATION: 27 feet MSL

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	UNCONFINED SHEAR (TSF)	COMMENTS
					FILL: Light Brown Silty fine Sand, trace fine root fibers, horizontaly laminated, medium dense-damp							
		28			FILL: Gray Brown fine Sandy Silt to Silty fine Sand, slightly porous, trace fine root fibers, medium dense-damp	108	5					
		9	3.5		FILL: Dark Brown fine Sandy Clay, trace fine Sand, mottled, medium stiff-moist	97	21					
					ALLUVIUM: Brown Silty fine Sand to fine Sandy Silt, trace Iron oxide staining, loose-moist							
5		11	3.0		Gray Brown Silty Clay, trace Iron oxide staining, slightly porous, trace Organic fibers, medium stiff-wet	91	32					
		7			Dark Brown Silty fine Sand, loose-very wet @ 7 feet, Water encountered during drilling	101	22					
10		13			Brown fine to medium Sand, trace Silt, loose-wet	98	23					
15		8	1.0		Gray Brown Silty Clay, trace fine Sand, trace Iron oxide staining, trace calcareous nodules, medium stiff-wet		27					
20		10			Gray Brown Silty fine Sand to fine Sandy Silt, trace thin interbedded layers of Silty Clay, trace calcareous nodules, medium dense-wet		25					
25		6			Gray Silty fine Sand, loose-wet		29					
30		12			Gray Brown fine Sandy Silt, occasional thinly interbedded Silty Clay layers, medium dense-wet		22					
					Boring Terminated 30'							

TBL 12G192.GPJ SOCALGEO.GDT 10/22/12

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-11

JOB NO.: 12G192
PROJECT: Proposed ProLogis Park
LOCATION: Cypress, California

DRILLING DATE: 9/18/12
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Brett Isen

WATER DEPTH: 7 feet
CAVE DEPTH: 6 feet
READING TAKEN: At Completion

SURFACE ELEVATION: 25 feet MSL

DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	UNCONFINED SHEAR (TSF)	COMMENTS
		18	3.75		FILL: Light Brown fine Sandy Clay, little Silt, trace fine root fibers, stiff-damp to moist	101	13					
		11			FILL: Dark Gray Silty fine Sand to fine Sandy Silt, some fine root fibers, loose-very moist	96	24					
					ALLUVIUM: Brown Silty fine Sand, loose-damp							
5		11	1.75		Dark Brown Silty Clay, little fine Sand, medium stiff-wet	98	25					
		8			Brown Silty fine Sand, trace fine root fibers, loose-wet @ 7 feet, Water encountered during drilling	95	26					
10		14			Light Gray Brown fine to medium Sand, trace to little Silt, loose-wet	93	28					
15		8			Gray Brown Silty fine Sand to fine Sandy Silt, loose-wet		25					
20		11			Gray Brown fine Sandy Silt, trace interbedded Silty Clay layers, medium dense-wet		28					
					Boring Terminated 20'							

TBL 12G192.GPJ SOCALGEO.GDT 10/22/12

TEST BORING LOG

PLATE B-11

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-12

JOB NO.: 12G192
PROJECT: Proposed ProLogis Park
LOCATION: Cypress, California

DRILLING DATE: 9/19/12
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Brett Isen

WATER DEPTH: 6 feet
CAVE DEPTH: 5 feet
READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION SURFACE ELEVATION: 27 feet MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	UNCONFINED SHEAR (TSF)	COMMENTS
		19	4.5+		FILL: Stratified layers of Dark Gray and Gray Brown Silty Clay, Clayey Silt and Silty fine Sand, trace Iron oxide staining, trace fine root fibers, stiff to medium dense-very moist	102	22					
		9	2.5		ALLUVIUM: Gray Brown Silty Clay with interbedded layers of Silty fine Sand and fine Sand, some calcareous nodules, trace Iron oxide staining, medium stiff-very moist	99	21					
5		7	1.75		Interbedded layers of Gray Brown Silty Clay, Silty fine Sand, and fine Sandy Silt, trace calcareous nodules, trace Organic fibers, medium stiff to loose-wet	95	30					
		7			Dark Gray Silty fine Sand, trace Iron oxide staining, trace fine root fibers, loose-wet @ 7 feet, Water encountered during drilling	103	22					
10		9										No Sample Recovered
15		7	0.5		Gray Clayey Silt, little to some fine Sand, some calcareous nodules, trace Organic fibers, loose-wet		28					
20		12	1.75		Dark Gray Silty Clay, stiff-wet		27					
					Boring Terminated 20'							

TBL 12G192.GPJ SOCALGEO.GDT 10/22/12

TEST BORING LOG

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-13

JOB NO.: 12G192
PROJECT: Proposed ProLogis Park
LOCATION: Cypress, California

DRILLING DATE: 9/19/12
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Brett Isen

WATER DEPTH: 8 feet
CAVE DEPTH: 6 feet
READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION SURFACE ELEVATION: 30 feet MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	UNCONFINED SHEAR (TSF)	COMMENTS
		12			FILL: Brown fine Sandy Silt to Silty fine Sand, trace calcareous deposits, medium dense-damp		10					
		10			FILL: Brown Silty fine Sand, little Clay, trace Brick fragments, loose to medium dense-very moist		21					
5												
		6			ALLUVIUM: Gray Brown fine Sandy Silt, trace fine root fibers, loose-very moist to wet		25					
		5	0.75		Gray Brown Silt, little fine Sand, trace Clay, loose-wet @ 8 feet, Water encountered during drilling		54					
10												
		7	1.25		@ 13½ to 15 feet, 2" layer of fine Sandy Silt		31					
15		13	0.75			95	25					
		12			Gray Silty fine Sand, medium dense-wet		26					
20												
					Boring Terminated 20'							

TBL 12G192.GPJ SOCALGEO.GDT 10/22/12

TEST BORING LOG

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-14

JOB NO.: 12G192
PROJECT: Proposed ProLogis Park
LOCATION: Cypress, California

DRILLING DATE: 9/19/12
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Brett Isen

WATER DEPTH: Dry
CAVE DEPTH: 4 feet
READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION SURFACE ELEVATION: 31 feet MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	UNCONFINED SHEAR (TSF)	COMMENTS
	X	14			ALLUVIUM: Dark Brown fine Sandy Silt to Silty fine Sand, trace Clay, trace fine Gravel, little Iron oxide staining, some calcareous veining, medium dense-damp to moist		14					
5	X	9			Dark Gray Brown to Black Silty fine Sand, trace interbeded Silty Clay layers, loose-moist		12					
					Boring Terminated 5'							

TBL 12G192.GPJ SOCALGEO.GDT 10/22/12

TEST BORING LOG

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-15

JOB NO.: 12G192
PROJECT: Proposed ProLogis Park
LOCATION: Cypress, California

DRILLING DATE: 9/19/12
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Brett Isen

WATER DEPTH: 7 feet
CAVE DEPTH: 6 feet
READING TAKEN: At Completion

FIELD RESULTS					DESCRIPTION	LABORATORY RESULTS						COMMENTS
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	SURFACE ELEVATION: 28 feet MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	UNCONFINED SHEAR (TSF)	
					FILL: Dark Gray Silty fine Sand, trace Concrete fragments, loose-damp							
		15			FILL: Orange Brown fine to medium Sand, trace Silt, mottled, loose-damp	110	8					
		11			ALLUVIUM: Dark Gray to Gray Brown Silty fine Sand, loose-very moist	88	22					
5		7			Gray Silty fine Sand to fine Sandy Silt, loose-very moist to wet	105	24					
		8			@ 6 feet, Water encountered during drilling	92	27					
10		12	2.25		Dark Gray to Black Silty Clay, trace Organic fibers, medium stiff-wet	87	32					
15		7	0.75		Gray Brown Silty Clay to Clayey Silt, some Iron oxide staining, trace Organic fiber, medium stiff-wet		26					
20		11			Interbedded layers of Gray Silty fine Sand and Gray Brown Silty Clay, trace Iron oxide staining, trace calcareous nodules, medium dense to stiff-wet		30					
25		11			Dark Gray to Black fine Sandy Silt, trace Clay, medium dense-wet		24					
					Boring Terminated '25							

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-16

JOB NO.: 12G192
PROJECT: Proposed ProLogis Park
LOCATION: Cypress, California

DRILLING DATE: 9/19/12
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Brett Isen

WATER DEPTH: 6 feet
CAVE DEPTH: 7 feet
READING TAKEN: At Completion

SURFACE ELEVATION: 27 feet MSL

DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	UNCONFINED SHEAR (TSF)	COMMENTS
					FILL: Gray Brown Silty fine Sand to fine Sandy Silt, trace fine root fibers, medium dense-very moist							
	X	12					22					
					ALLUVIUM: Gray fine Sandy Silt, trace Clay, trace fine root fibers, loose-wet							
	X	8					30					
5												
					Gray Brown Silty fine Sand, very loose to loose-wet @ 6 feet, Water encountered during drilling							
	X	4					34					
			1.0		Gray fine Sandy Clay, little Silt, trace calcareous veining, soft to meidum stiff-wet		36					
					Gray Brown fine Sandy Silt, trace Clay, little calcareous nodules, loose-wet							
	X	8					29					
10												
					Brown fine Sandy Silt, little Clay, little Iron oxide staining, loose to medium dense-wet							
	X	10					26					
15												
	■	21			@ 19 to 19½ feet, Dark Brown	100	22					
20					Dark Gray Silty fine Sand, medium dense-wet							

Boring Terminated 20'

TBL 12G192.GPJ SOCALGEO.GDT 10/22/12

TEST BORING LOG

PLATE B-16

SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

BORING NO. B-17

JOB NO.: 12G192	DRILLING DATE: 9/19/12	WATER DEPTH: 6 feet
PROJECT: Proposed ProLogis Park	DRILLING METHOD: Hollow Stem Auger	CAVE DEPTH: 3 feet
LOCATION: Cypress, California	LOGGED BY: Brett Isen	READING TAKEN: At Completion

SURFACE ELEVATION: 29 feet MSL

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	UNCONFINED SHEAR (TSF)	COMMENTS
	X	10	2.5		POSSIBLE FILL: Dark Brown Clayey Silt to Silty Clay, trace fine Sand, trace calcareous veining, trace fine root fibers, medium dense to stiff-damp		20					
5	X	13			ALLUVIUM: Interbeded layers of Gray Brown Silty fine Sand and Silty Clay, mottled, trace fine root fibers, medium dense to stiff-very moist		14					
	X	4	0.5		Gray Brown Clayey Silt to Silty Clay, trace fine Sand, some Iron oxide staining, soft to medium stiff-wet @ 6 feet, Water encountered during drilling		37					
10	X	4	1.0		Gray Silty Clay, trace Iron oxide staining, soft to medium stiff-wet		30					
	X	8	1.5		Gray Brown Silty Clay, little fine Sand, medium stiff to stiff-wet		28					
15	X	20	1.75			97	23					

Boring Terminated 16'

TBL 12G192.GPJ SOCALGEO.GDT 10/22/12

TEST BORING LOG

PLATE B-17

SOUTHERN CALIFORNIA GEOTECHNICAL

A California Corporation

BORING NO. B-18

JOB NO.: 12G192
PROJECT: Proposed ProLogis Park
LOCATION: Cypress, California

DRILLING DATE: 9/19/12
DRILLING METHOD: Hollow Stem Auger
LOGGED BY: Brett Isen

WATER DEPTH: 15 feet
CAVE DEPTH: 6 feet
READING TAKEN: At Completion

FIELD RESULTS						LABORATORY RESULTS						
DEPTH (FEET)	SAMPLE	BLOW COUNT	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION SURFACE ELEVATION: 27 feet MSL	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PASSING #200 SIEVE (%)	UNCONFINED SHEAR (TSF)	COMMENTS
					FILL: Brown Silty fine Sand to fine Sandy Silt, trace to little Clay, mottled, meidum dense-damp to moist							
		13					11					
		16					13					
5			4.5+		FILL: Gray Brown Silty Clay to Clayey Silt, little to some fine Sand, little calcareous deposits, stiff to very stiff-damp		16					
		12	4.0		@ 6 to 7½ feet, horizontally laminated, some fine Sand, very moist		21					
		12	2.25		FILL: Dark Gray Clayey Silt, mottled, some Concrete fragments, medium dense-very moist		22					
10												
		11					16					
15					ALLUVIUM: Dark Gray to Dark Gray Brown Silty fine Sand, trace Iron oxide staining, medium dense-wet @ 15 feet, Water encountered during drilling		26					
					Gray Brown fine Sandy Silt to Silty fine Sand, with trace thinly interbedded Silty Clay layers, medium stiff to stiff-wet							
		8					24					
20												
					Gray Clayey Silt, trace fine Sand, trace to little calcareous nodules, loose-wet							
		8	1.75				22					
25												
					Gray Silty Clay, trace Organic fibers, trace calcareous nodules, trace Iron oxide staining, stiff-wet							
		12	1.5				27					
30		34			Gray Silty fine Sand to fine Sandy Silt, trace Clay, medium dense-wet		26					
					Boring Terminated 31'							

TBL 12G192.GPJ SOCALGEO.GDT 10/22/12

TEST BORING LOG

SUMMARY

OF

CONE PENETRATION TEST DATA

Project:

Katella Avenue & Enterprise Drive
Cypress, CA
September 17, 2012

Prepared for:

Mr. Daryl Kas
Southern California Geotechnical, Inc.
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Office (714) 685-1115 / Fax (714) 685-1118

Prepared by:

KTE

KEHOE TESTING & ENGINEERING
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Huntington Beach, CA 92649-1518
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TABLE OF CONTENTS

SUMMARY

OF

CONE PENETRATION TEST DATA

1. INTRODUCTION

This report presents the results of a Cone Penetration Test (CPT) program carried out for the project located at Katella Avenue & Enterprise Drive in Cypress, California. The work was performed by Kehoe Testing & Engineering (KTE) on September 17, 2012. The scope of work was performed as directed by Southern California Geotechnical, Inc. personnel.

2. SUMMARY OF FIELD WORK

The fieldwork consisted of performing CPT soundings at four locations to determine the soil lithology. Groundwater measurements and hole collapse depths provided in **TABLE 2.1** are for information only. The readings indicate the apparent depth to which the hole is open and the apparent water level (if encountered) in the CPT probe hole at the time of measurement upon completion of the CPT. KTE does not warrant the accuracy of the measurements and the reported water levels may not represent the true or stabilized groundwater levels.

LOCATION	DEPTH OF CPT (ft)	COMMENTS/NOTES:
CPT-1	50	Hole open to 5 ft (dry)
CPT-2	50	Hole open to 5 ft (dry)
CPT-3	50	Hole open to 4 ft (dry)
CPT-4	50	Hole open to 5 ft (dry)

TABLE 2.1 - Summary of CPT Soundings

3. FIELD EQUIPMENT & PROCEDURES

The CPT soundings were carried out by **KTE** using an integrated electronic cone system manufactured by Vertek. The CPT soundings were performed in accordance with ASTM standards (D5778). The cone penetrometers were pushed using a 30-ton CPT rig. The cone used during the program was a 15 cm^2 cone and recorded the following parameters at approximately 2.5 cm depth intervals:

- Cone Resistance (qc)
- Sleeve Friction (fs)
- Dynamic Pore Pressure (u)
- Inclination
- Penetration Speed
- Pore Pressure Dissipation (at selected depths)

The above parameters were recorded and viewed in real time using a laptop computer. Data is stored at the KTE office for future analysis and reference. A complete set of baseline readings was taken prior to each sounding to determine temperature shifts and any zero load offsets. Monitoring base line readings ensures that the cone electronics are operating properly.

4. CONE PENETRATION TEST DATA & INTERPRETATION

The Cone Penetration Test data is presented in graphical form in the attached Appendix. Penetration depths are referenced to ground surface. The soil classification on the CPT plots is derived from the CPT Classification Chart (Robertson, 1986) and presents major soil lithologic changes. The stratigraphic interpretation is based on relationships between cone resistance (qc), sleeve friction (fs), and penetration pore pressure (u). The friction ratio (Rf), which is sleeve friction divided by cone resistance, is a calculated parameter that is used to infer soil behavior type. Generally, cohesive soils (clays) have high friction ratios, low cone resistance and generate excess pore water pressures. Cohesionless soils (sands) have lower friction ratios, high cone bearing and generate little (or negative) excess pore water pressures.

Output from the interpretation program CPTINT provides averaged CPT data over one-foot intervals. The CPTINT output includes Soil Classification Zones, SPT N Values and Undrained Shear Strength (Su). A summary of the equations used for the tabulated parameters is provided in the CPTINT Correlation Table in the Appendix.

The interpretation of soils encountered on this project was carried out using correlations developed by Robertson et al, 1986. It should be noted that it is not always possible to clearly identify a soil type based on qc, fs and u. In these situations, experience, judgment and an assessment of the pore pressure data should be used to infer the soil behavior type.

If you have any questions regarding this information, please do not hesitate to call our office at (714) 901-7270.

Sincerely,

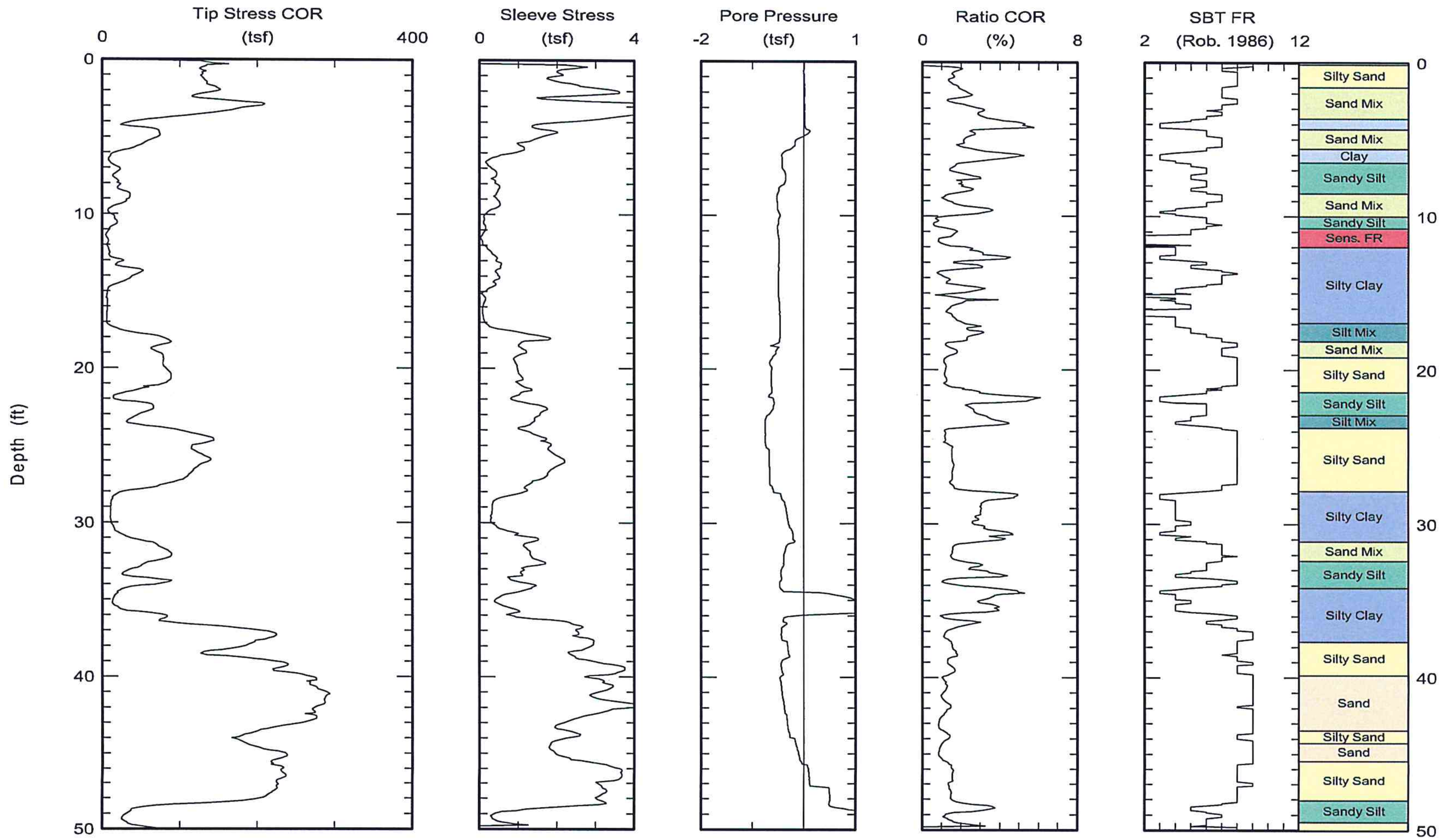
KEHOE TESTING & ENGINEERING

Richard W. Koester, Jr.
General Manager

09/26/12-ds-3085

APPENDIX

Kehoe Testing & Engineering Office: (714) 901-7270 Fax: (714) 901-7289 rich@kehoetesting.com www.kehoetesting.com	CPT Data 30 ton rig	Date: 17/Sep/2012 Test ID: CPT-1 Project: Cypress
	Customer: Southern California Geotechnical, Inc. Job Site: Katella Ave & Enterprise Dr	



Maximum depth: 50.11 (ft)

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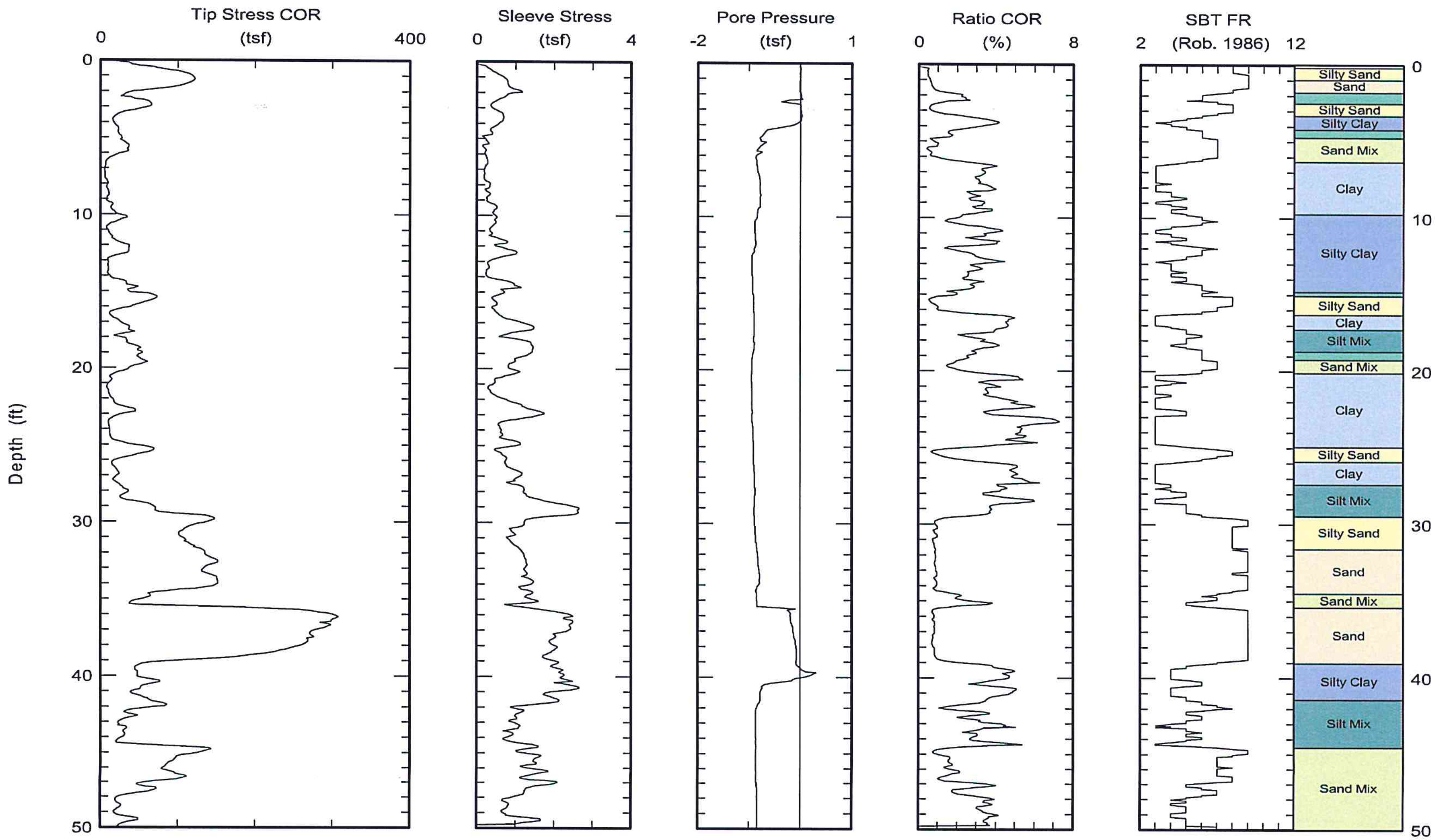
Test ID: CPT-1
File: Z17S1206C.ECP

Kehoe Testing & Engineering Office: (714) 901-7270 Fax: (714) 901-7289 rich@kehoetesting.com www.kehoetesting.com	CPT Data 30 ton rig	Date: 17/Sep/2012 Test ID: CPT-2 Project: Cypress
	Customer: Southern California Geotechnical, Inc. Job Site: Katella Ave & Enterprise Dr	



Maximum depth: 50.13 (ft)

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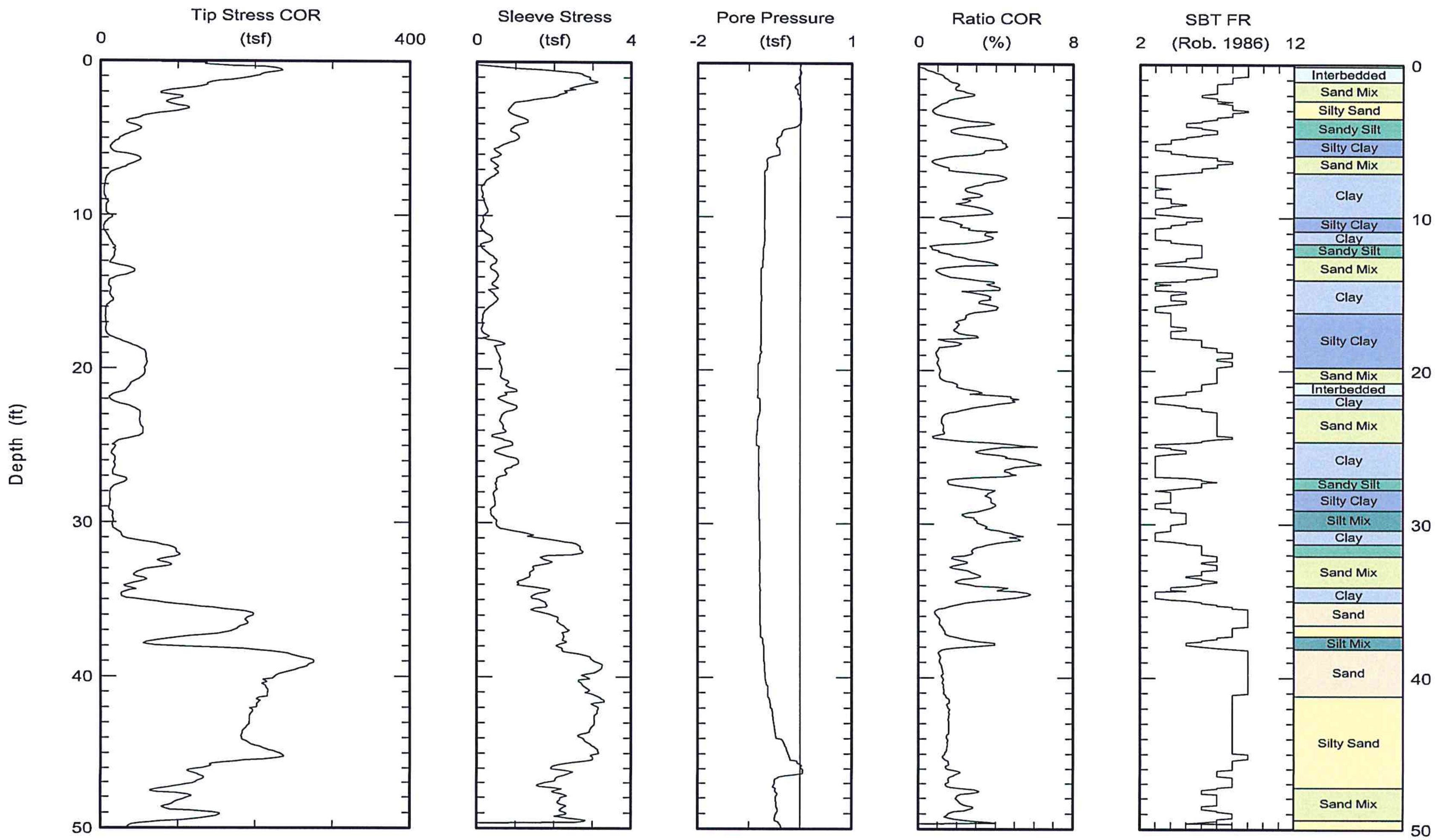
Test ID: CPT-2
File: Z17S1201C.ECP

Kehoe Testing & Engineering Office: (714) 901-7270 Fax: (714) 901-7289 rich@kehoetesting.com www.kehoetesting.com	CPT Data 30 ton rig	Date: 17/Sep/2012 Test ID: CPT-3 Project: Cypress
	Customer: Southern California Geotechnical, Inc. Job Site: Katella Ave & Enterprise Dr	



Maximum depth: 50.01 (ft)

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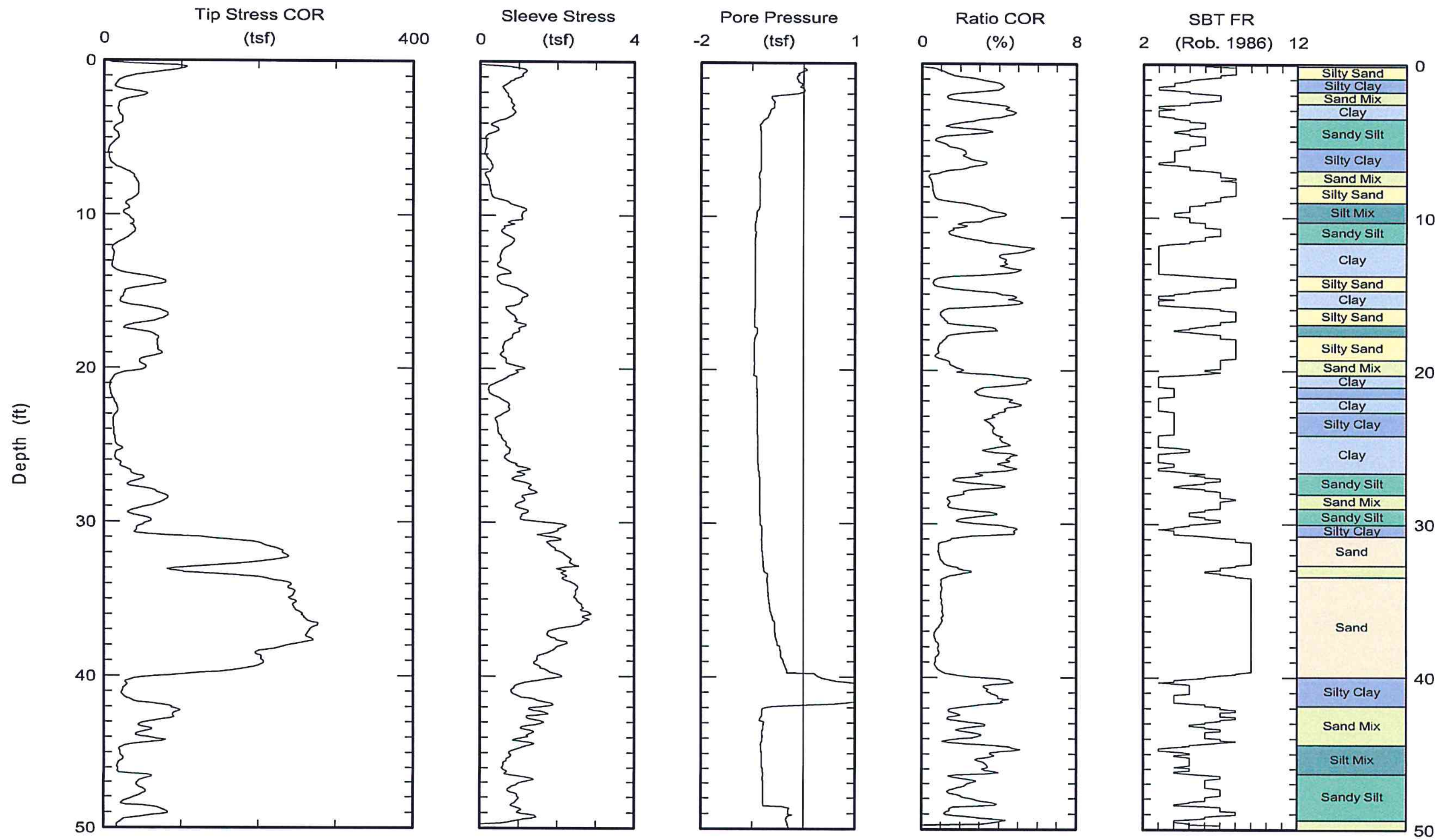
Test ID: CPT-3
File: Z17S1204C.ECP

Kehoe Testing & Engineering Office: (714) 901-7270 Fax: (714) 901-7289 rich@kehoetesting.com www.kehoetesting.com	CPT Data 30 ton rig	Date: 17/Sep/2012 Test ID: CPT-4 Project: Cypress
	Customer: Southern California Geotechnical, Inc. Job Site: Katella Ave & Enterprise Dr	



Maximum depth: 50.05 (ft)

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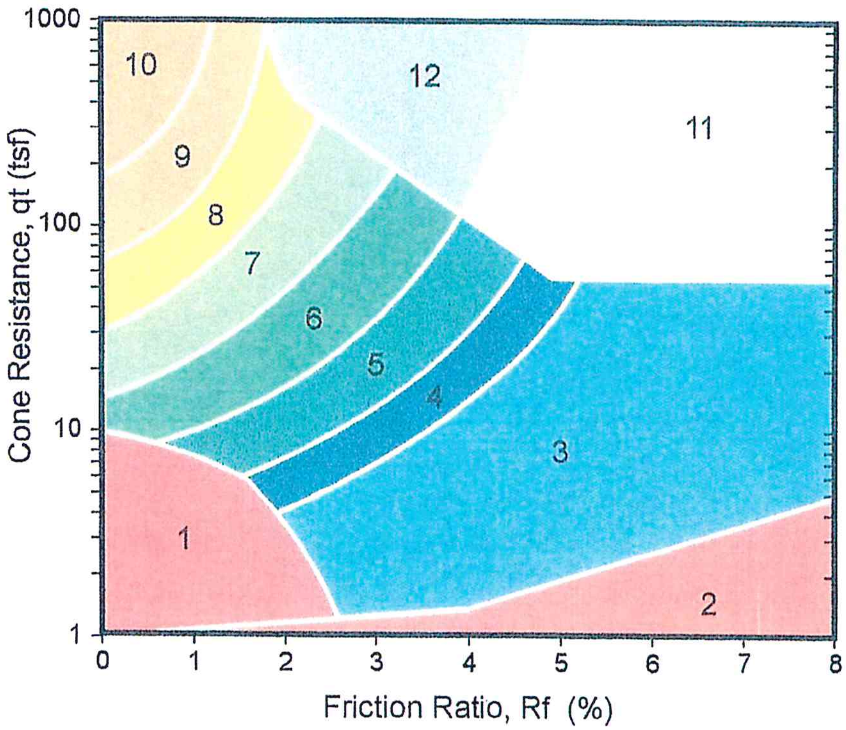
Test ID: CPT-4
File: Z17S1203C.ECP

KEHOE TESTING & ENGINEERING

CPT Classification Chart

(after Robertson and Campanella, 1988)



Zone		q_t / N	Soil Behavior Type	UCSCS
1		2	sensitive fine grained	OL-OH
2		1	organic material	Pt-OH
3		1	clay	CH
4		1.5	silty clay to clay	CL-CH
5		2	clayey silt to silty clay	ML-CL
6		2.5	sandy silt to clayey silt	MH-ML
7		3	silty sand to sandy silt	SM-ML
8		4	sand to silty sand	SP-SM
9		5	sand	SP
10		6	gravelly sand to sand	SW-SP
11		1	very stiff fine grained *	CL-MH
12		2	sand to clayey sand *	SP-SC

* overconsolidated or cemented

APPENDIX B

LABORATORY TEST PROCEDURES

LABORATORY DATA SUMMARY

LABORATORY TEST PROCEDURES

Soil Classification

Soils encountered within the exploratory borings and test pits were classified and described utilizing the visual-manual procedures of the Unified Soil Classification System, and in general accordance with Test Method ASTM D 2488. The assigned group symbols are presented on the exploration logs, Appendix A.

In Situ Moisture and Density

Moisture content and dry density of the in place soils were determined in representative strata in accordance with test method ASTM D-2216. Test data are presented in the exploration logs, Appendix A.

Laboratory Maximum Dry Density/Optimum Moisture

The maximum dry density and optimum moisture content were determined for selected samples of onsite soils in accordance with Method A of ASTM D 1557. The results of these tests are presented on Table B-1.

Expansion Potential

A preliminary expansion index test was performed on a selected sample in accordance with Test Method ASTM 4829. The results of this test are presented on Table B-1.

Atterberg Limits

Atterberg limits tests (liquid limit, plastic limit and plasticity index) were performed on selected samples to verify visual classifications and to aid in building floor slab design. These tests were performed in accordance with Test Method ASTM D 4318. Test results are presented on Table B-1.

Soluble Sulfates and Chlorides

Chemical analyses were previously performed on a selected sample of near-surface soils to determine preliminary soluble sulfate and chloride contents in accordance with California Test Method Nos. 417 and 422, respectively. Test results are presented on Table B-1.

pH and Minimum Resistivity

pH and minimum resistivity tests were performed on a selected sample of near-surface site soils within the Wilson High School site to provide a preliminary evaluation of their corrosive potential to concrete and metal construction materials. These tests were performed in accordance with California Test Method No. 643. The results of these tests are included in Table B-1.

Consolidation

Static settlement predictions under existing loads were made on the basis of a one-dimensional consolidation test. This test was performed in general accordance with Test Method ASTM D 2435. Axial loads were applied in several increments to a laterally restrained, one-inch-high sample. Loads were applied in a geometric progression by doubling the previous load, and the resulting deformations were recorded at selected time intervals. The test sample was inundated at the approximate in-situ overburden pressure in order to evaluate the effect of a sudden increase in moisture content (hydroconsolidation potential). Results of this test are graphically presented on Plates B-2 through B-6.

Grain Size Distribution

Grain size analyses (including hydrometer and percent passing the #200 sieve) were performed on selected soil samples to verify visual classifications and to aid in our engineering analyses. These tests were performed in accordance with Test Method Nos. ASTM D 1140 and D 422. The results of these tests are presented on Table B-1 and Plate B-7.

Direct Shear

The Coulomb shear strength parameters (angle of internal friction and cohesion) were determined for a selected relatively undisturbed sample of on-site soils. This test was performed in general accordance with Test Method No. ASTM D 3080. One specimen was prepared for each phase of the test. The test specimens were artificially saturated, and then sheared under varying normal loads at a maximum constant rate of strain of 0.01 inches per minute. Results are graphically presented on Plate B-8.

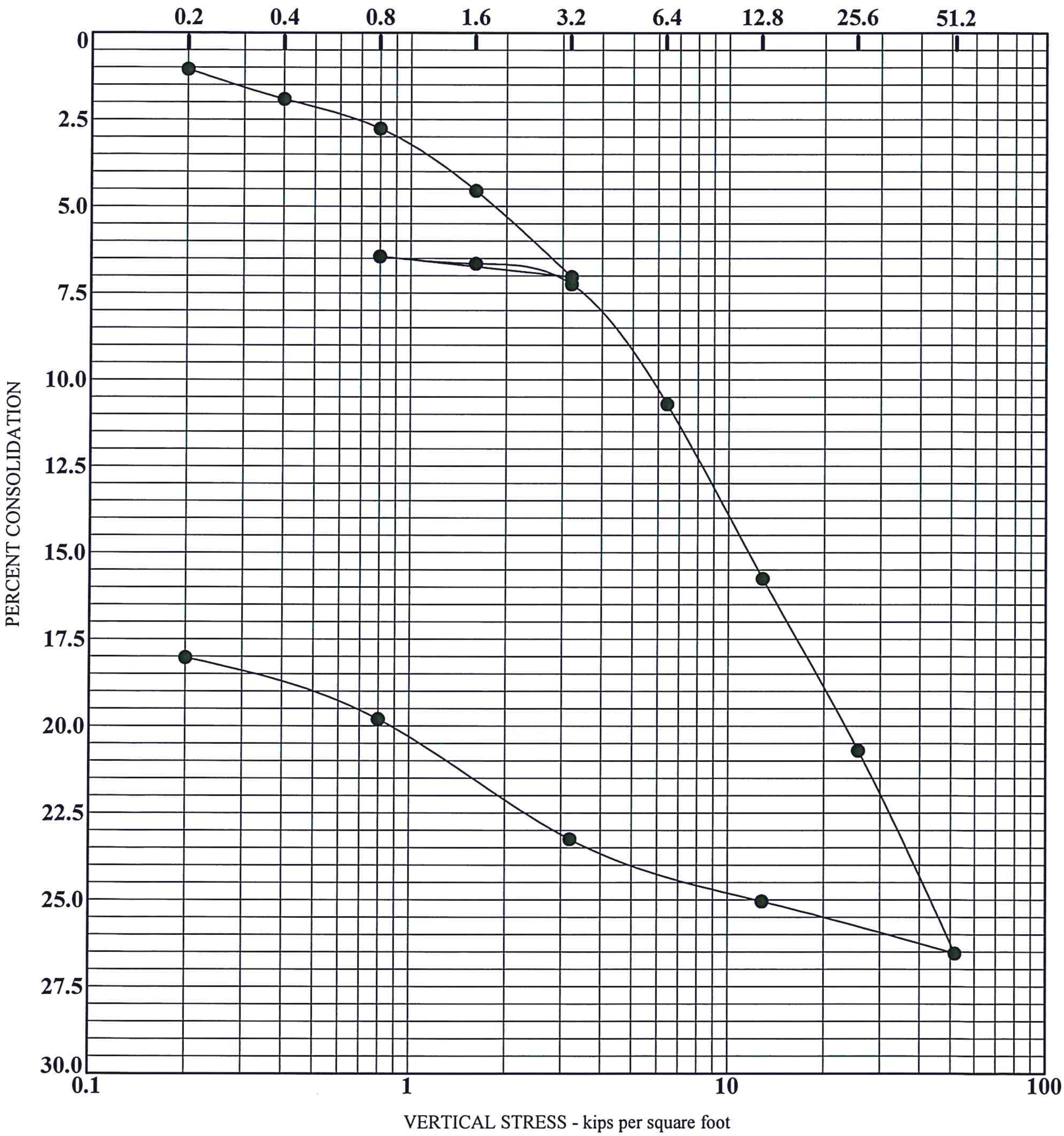
TABLE B-1 - LABORATORY DATA SUMMARY															
Boring Number	Sample Depth (ft)	Soil Description	Max. Dry Density[1] (pcf)	Optimum Moisture[1] (%)	Expansion Index[2]	CBC Soil Classification[3]	Atterberg Limits[4]			Sulfate Content[5] (%)	Chloride Content[6] (ppm)	pH[7]	Minimum Resistivity[7] (Ohm-cm)	Percent Passing No. 200 Sieve[8]	Organic Content[9]
							LL	PL	PI						
B-1	0 - 4	Sandy Clay (CL)	119	11	31	Expansive	36	16	20	2.52	838	7.1	510		
B-1	4	Silt (ML)					30	28	2						
B-1	8	Silt (ML)					33	29	4						
B-1	12.5	Clay/Silt (CL/ML)					28	21	7						
B-1	20	Sandy Silt (ML)					29	27	2						
B-1	27.5	Silty Clay (CL)					31	15	16						1.23
B-2	10	Clay (CL)					32	14	18						
B-4	1 - 5	Silty Sand (SM)	127	11.5											
B-4	10	Silty Clay (CL)					42	19	23						
B-4	15	Silty Clay (CL)					38	18	20						
B-4	20	Silty Sand (SM)												27.8	
B-4	25	Sand with Silt (SP)												19.0	

Test Procedures:

[1] Per ASTM Test Method D 1557
[2] Per ASTM Test Method D 4829
[3] Per 2013 California Building Code Section 1803.5.3
[4] Per ASTM Test Method D 4318
[5] Per Caltrans Test Method 417
[6] Per Caltrans Test Method 422
[7] Per Caltrans Test Method 643
[8] Per ASTM Test Method D 1140
[8] Per ASTM Test Method D 2974

J.N. 14-243
February, 2015

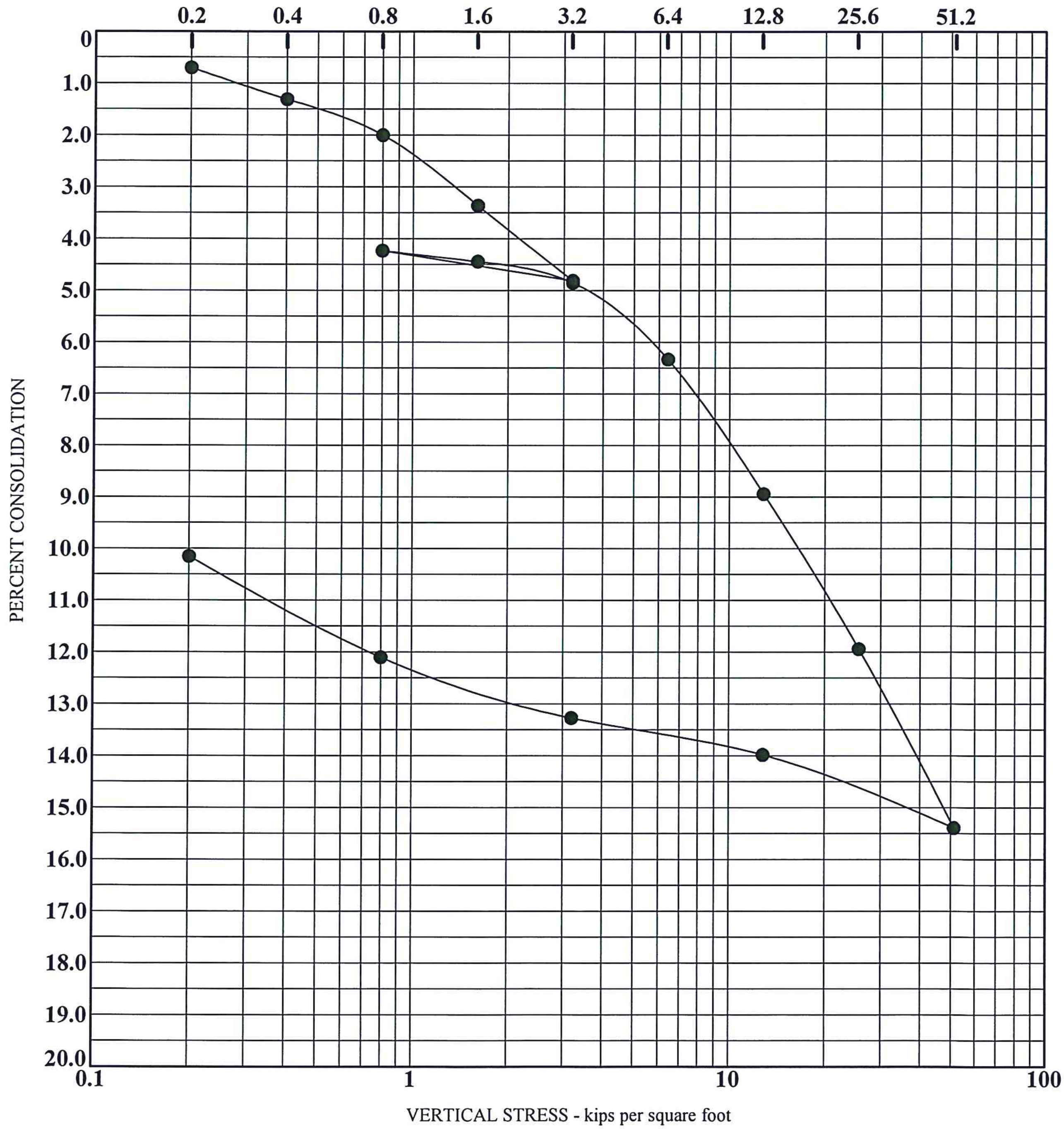
SAMPLE LOCATION	MATERIAL DESCRIPTION	INITIAL DENSITY (pcf)	INITIAL MOISTURE (%)	INITIAL SATURATION (%)	INUNDATED LOAD (ksf)
● B-1 @ 6.0	CL/CH	71.1	41.9	83	1.60



CONSOLIDATION - STRAIN 14-243.GPJ PETRA.GDT 1/7/15

J.N. 14-243	CONSOLIDATION TEST RESULTS	January, 2015
PETRA GEOTECHNICAL, INC.		PLATE B-2

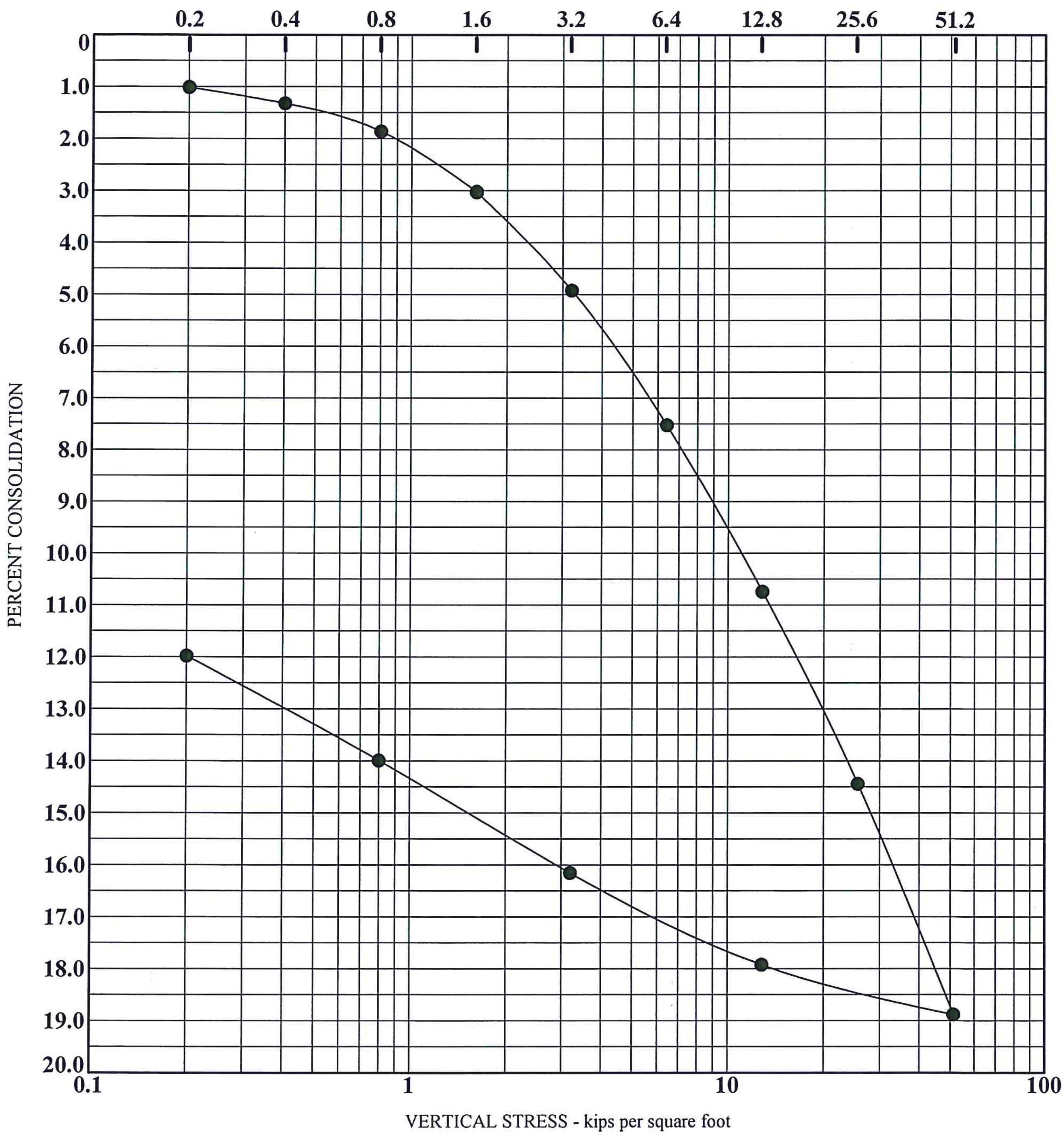
SAMPLE LOCATION	MATERIAL DESCRIPTION	INITIAL			INUNDATED
		DENSITY (pcf)	MOISTURE (%)	SATURATION (%)	LOAD (ksf)
● B-1 @ 10.0	ML	94.4	30.0	103	1.60



CONSOLIDATION - STRAIN 14-243.GPJ PETRA.GDT 1/7/15

J.N. 14-243	CONSOLIDATION TEST RESULTS	January, 2015
PETRA GEOTECHNICAL, INC.		PLATE B-3

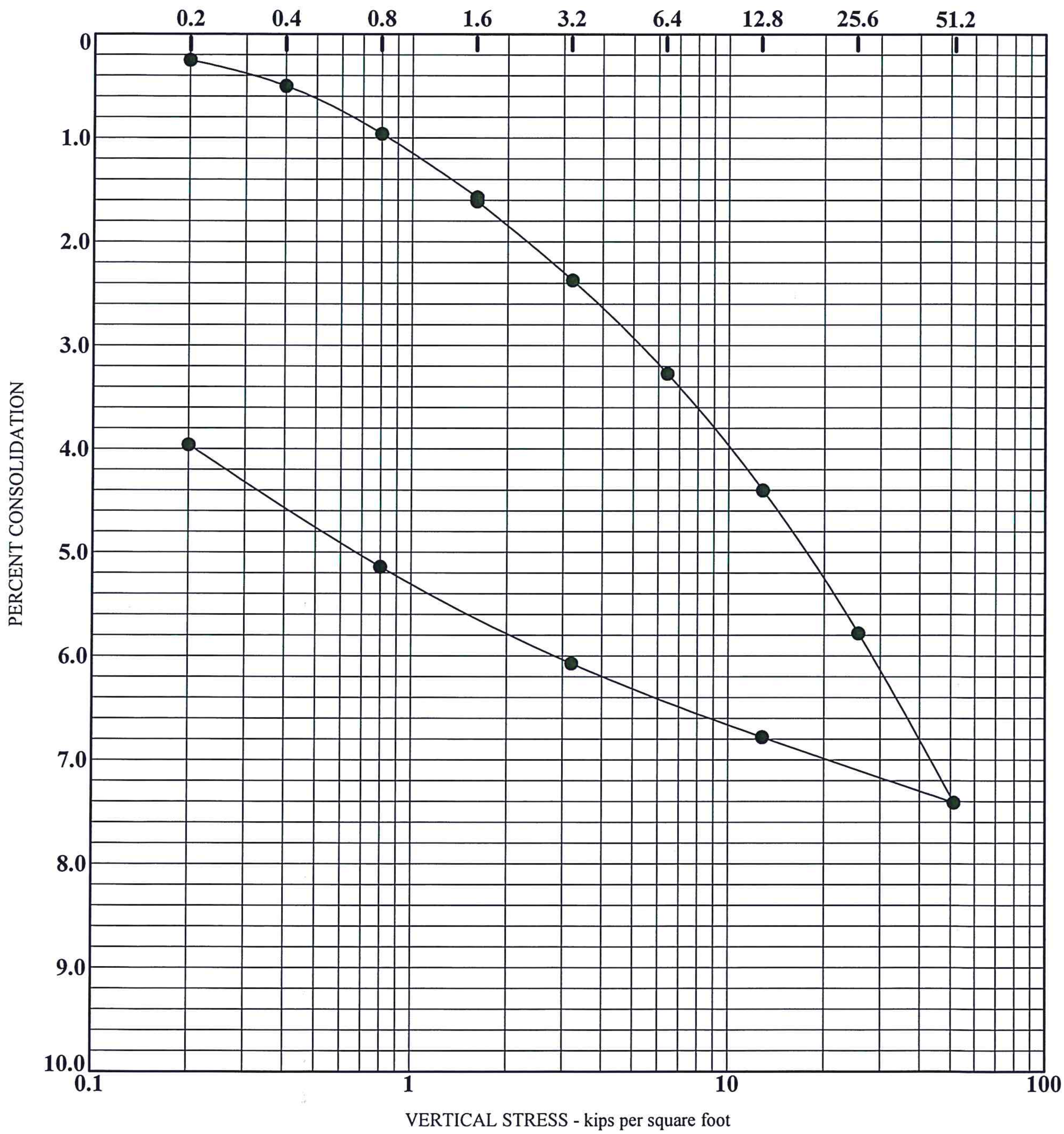
SAMPLE LOCATION	MATERIAL DESCRIPTION	INITIAL DENSITY (pcf)	INITIAL MOISTURE (%)	INITIAL SATURATION (%)	INUNDATED LOAD (ksf)
● B-2 @ 7.0	CH	87.3	31.7	92	1.60



CONSOLIDATION - STRAIN 14-243.GPJ PETRA.GDT 1/7/15

J.N. 14-243	CONSOLIDATION TEST RESULTS	January, 2015
PETRA GEOTECHNICAL, INC.		PLATE B-5

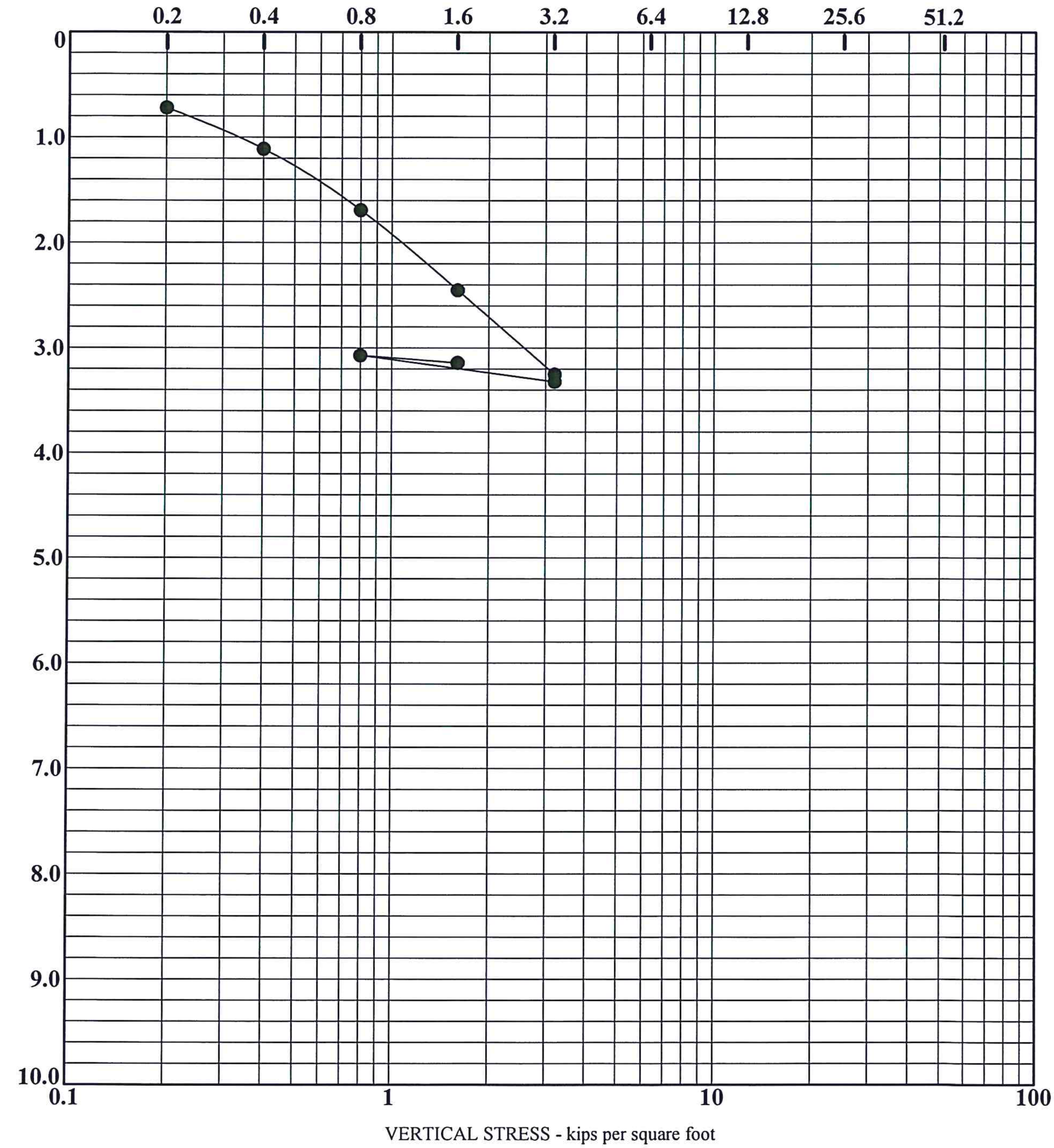
SAMPLE LOCATION	MATERIAL DESCRIPTION	INITIAL			INUNDATED
		DENSITY (pcf)	MOISTURE (%)	SATURATION (%)	LOAD (ksf)
● B-2 @ 3.0	SM	114.3	14.6	83	1.60



CONSOLIDATION - STRAIN 14-243.GPJ PETRA.GDT 1/7/15

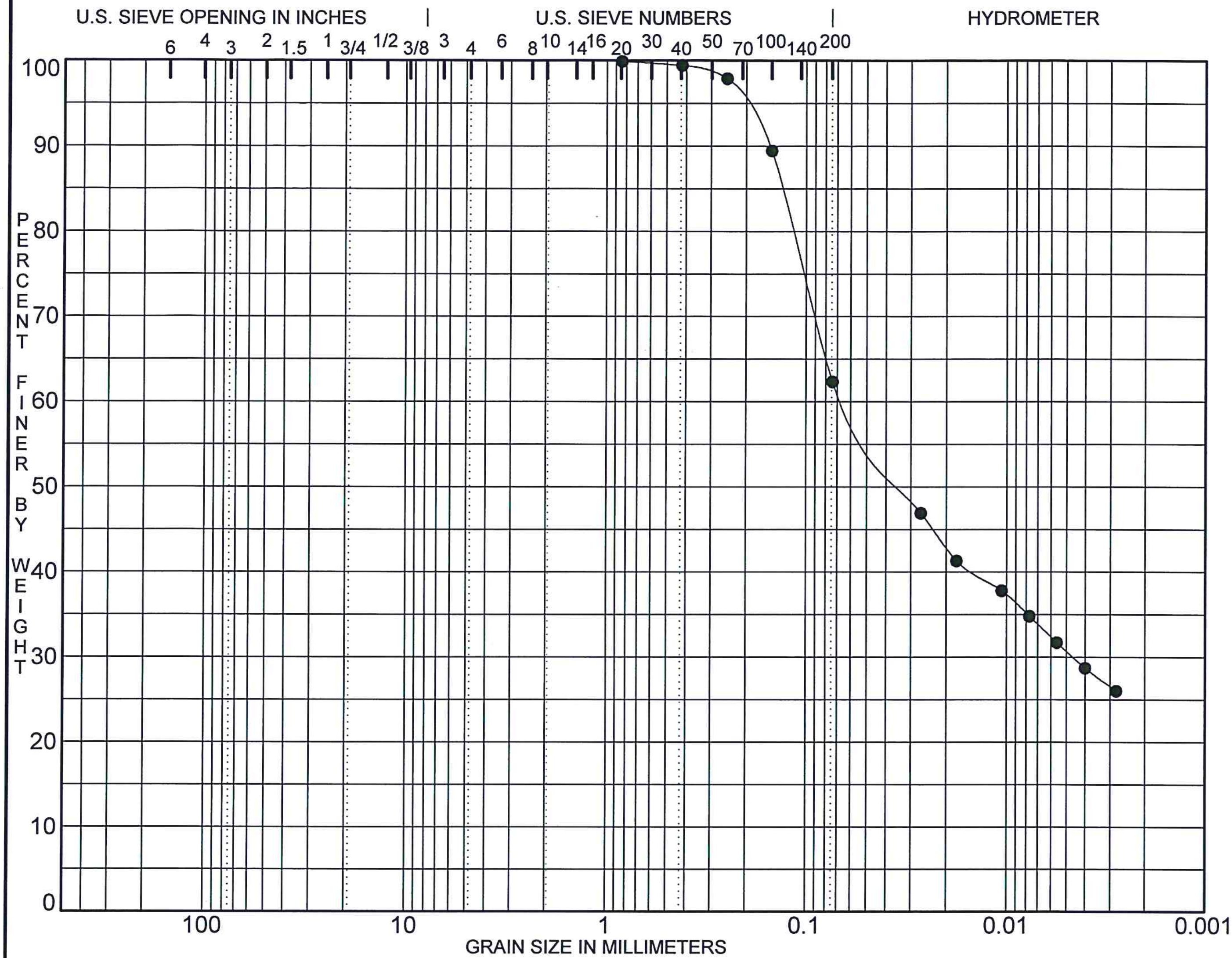
J.N. 14-243	CONSOLIDATION TEST RESULTS	January, 2015
PETRA GEOTECHNICAL, INC.		PLATE B-4

SAMPLE LOCATION	MATERIAL DESCRIPTION	INITIAL			INUNDATED
		DENSITY (pcf)	MOISTURE (%)	SATURATION (%)	LOAD (ksf)
● B-4 @ 7.0	ML	85.0	32.8	90	3.20



CONSOLIDATION - STRAIN 14-243.GPJ PETRA.GDT 1/7/15

J.N. 14-243	CONSOLIDATION TEST RESULTS	January, 2015
PETRA GEOTECHNICAL, INC.		PLATE B-6



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

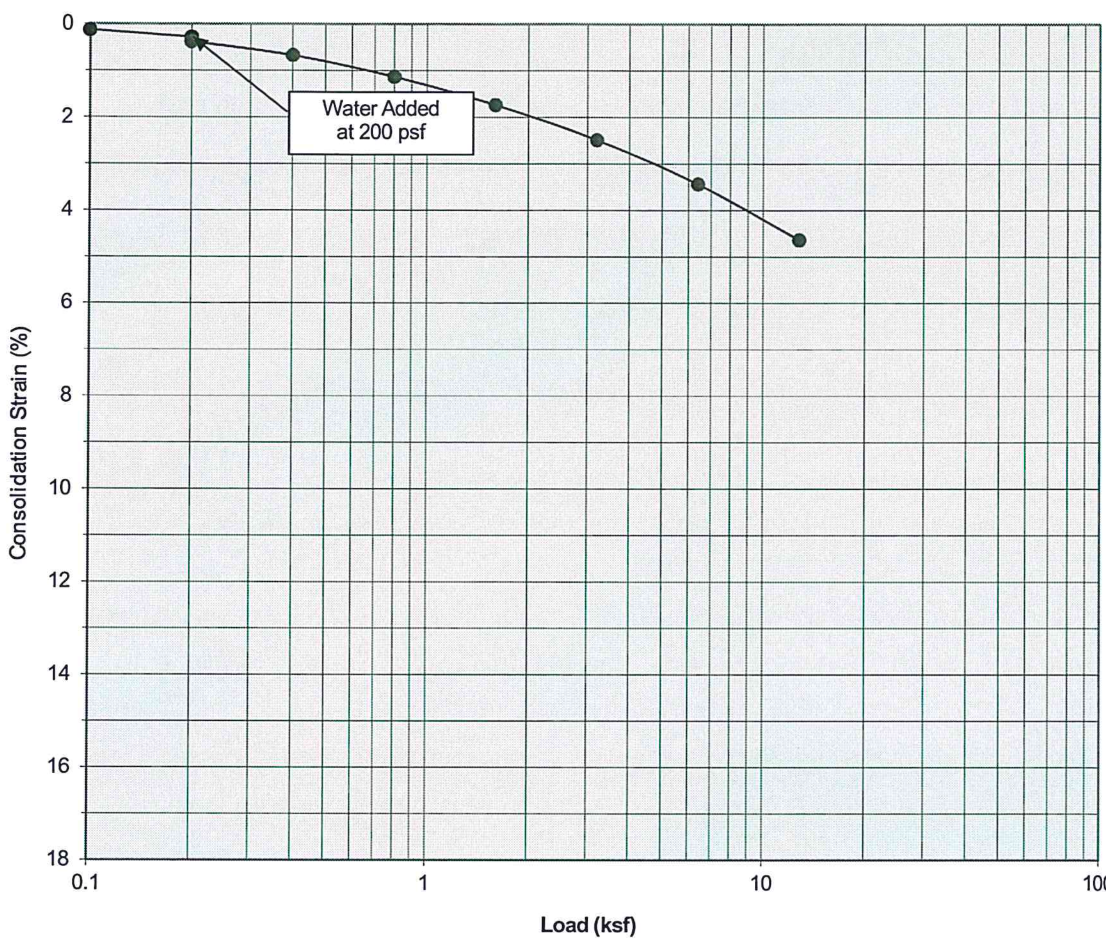
Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
● B-1	0.0	SM/CL						

Specimen Identification		D100	D60	D30	D50	%Gravel	%Sand	%Silt	%Clay
● B-1	0.0	0.84	0.06	0.005	0.0329	0.0			30.7

J.N. 14-243	GRAIN SIZE ANALYSIS	January, 2015
PETRA GEOTECHNICAL, INC.		PLATE B-7

GRAIN SIZE - V1 14-243.GPJ PETRA.GDT 1/6/15

Consolidation/Collapse Test Results



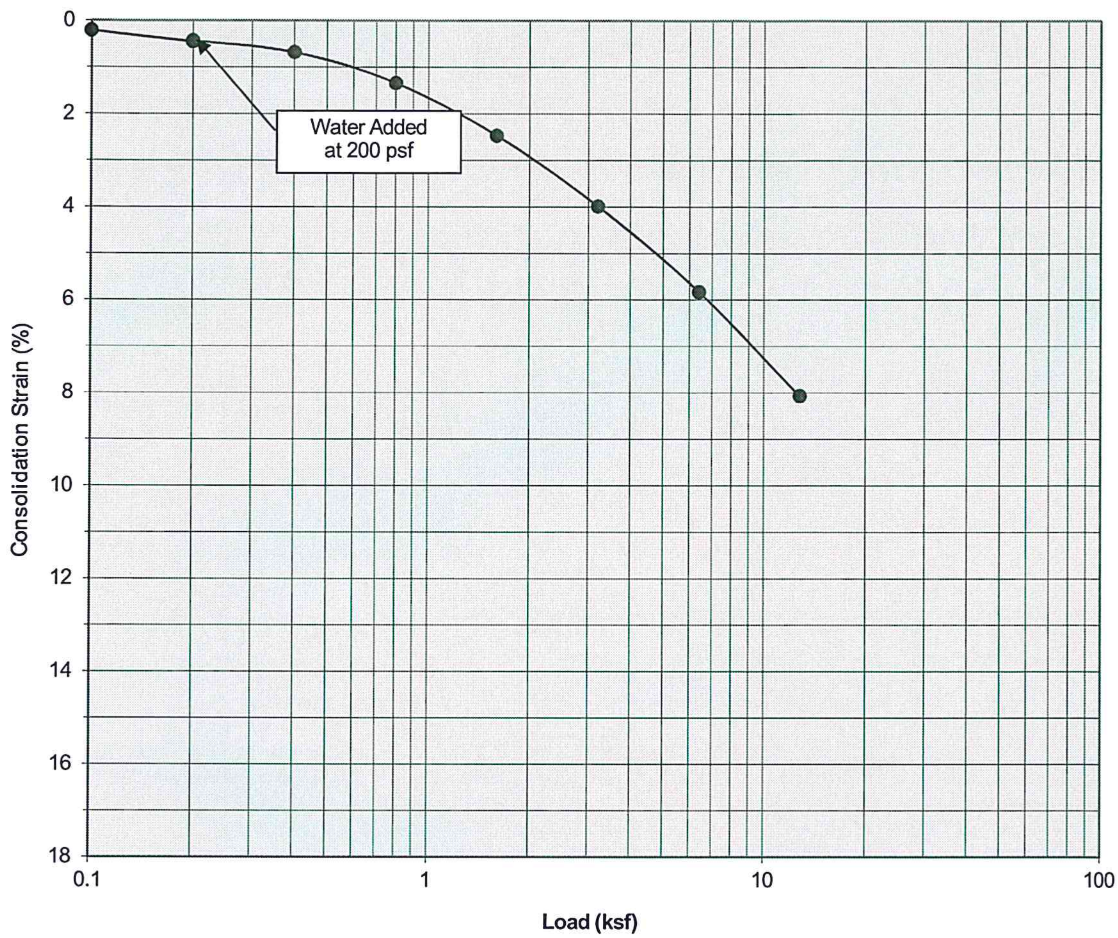
Classification: Dark Gray Brown Clayey Silt

Boring Number:	B-1	Initial Moisture Content (%)	31
Sample Number:	---	Final Moisture Content (%)	29
Depth (ft)	15 to 16	Initial Dry Density (pcf)	91.4
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	97.2
Specimen Thickness (in)	1.0	Percent Collapse (%)	0.10

Proposed ProLogis Park
Cypress, California
Project No. 12G192
PLATE C- 1

SoCalGeo SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

Consolidation/Collapse Test Results



Classification: Brown Silty Clay

Boring Number:	B-6	Initial Moisture Content (%)	27
Sample Number:	---	Final Moisture Content (%)	25
Depth (ft)	7 to 8	Initial Dry Density (pcf)	92.7
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	102.1
Specimen Thickness (in)	1.0	Percent Collapse (%)	-0.02

Proposed ProLogis Park
Cypress, California
Project No. 12G192
PLATE C- 2

SoCalGeo
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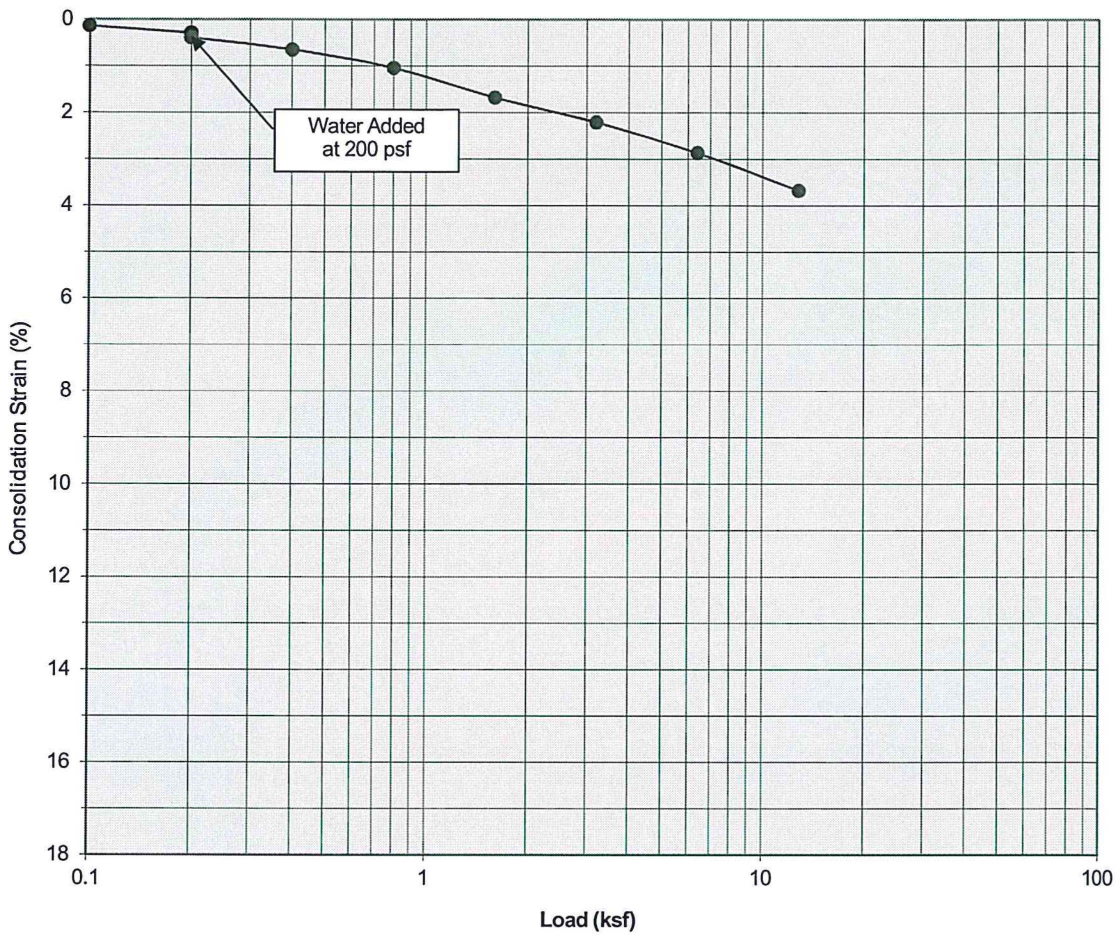
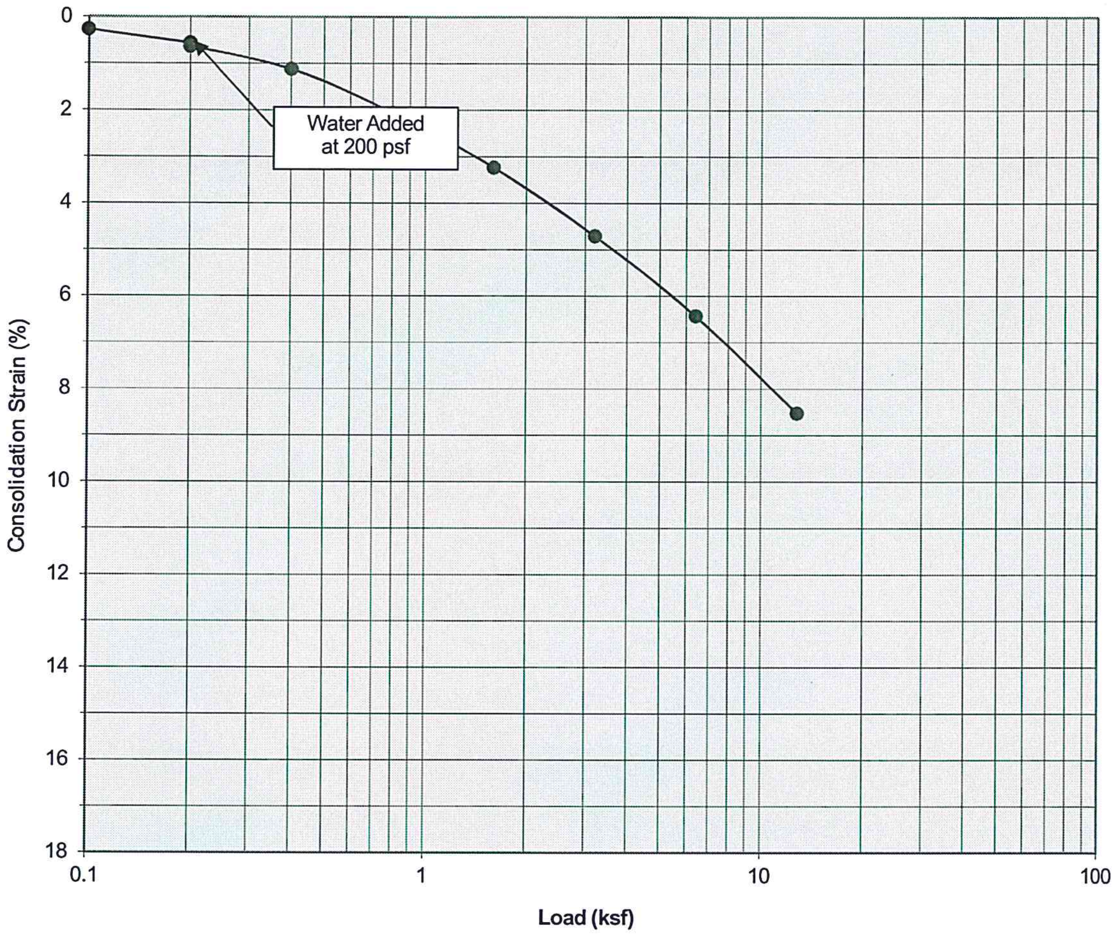
Consolidation/Collapse Test Results



Classification: Gray Brown Silty fine Sand

Boring Number:	B-6	Initial Moisture Content (%)	27
Sample Number:	---	Final Moisture Content (%)	27
Depth (ft)	9 to 10	Initial Dry Density (pcf)	100.4
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	104.0
Specimen Thickness (in)	1.0	Percent Collapse (%)	0.10

Consolidation/Collapse Test Results



Classification: FILL: Dark Gray Silty fine Sand to fine Sandy Silt

Boring Number:	B-11	Initial Moisture Content (%)	25
Sample Number:	---	Final Moisture Content (%)	25
Depth (ft)	3 to 4	Initial Dry Density (pcf)	96.0
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	104.3
Specimen Thickness (in)	1.0	Percent Collapse (%)	0.07

Proposed ProLogis Park
Cypress, California
Project No. 12G192
PLATE C- 4

SoCalGeo
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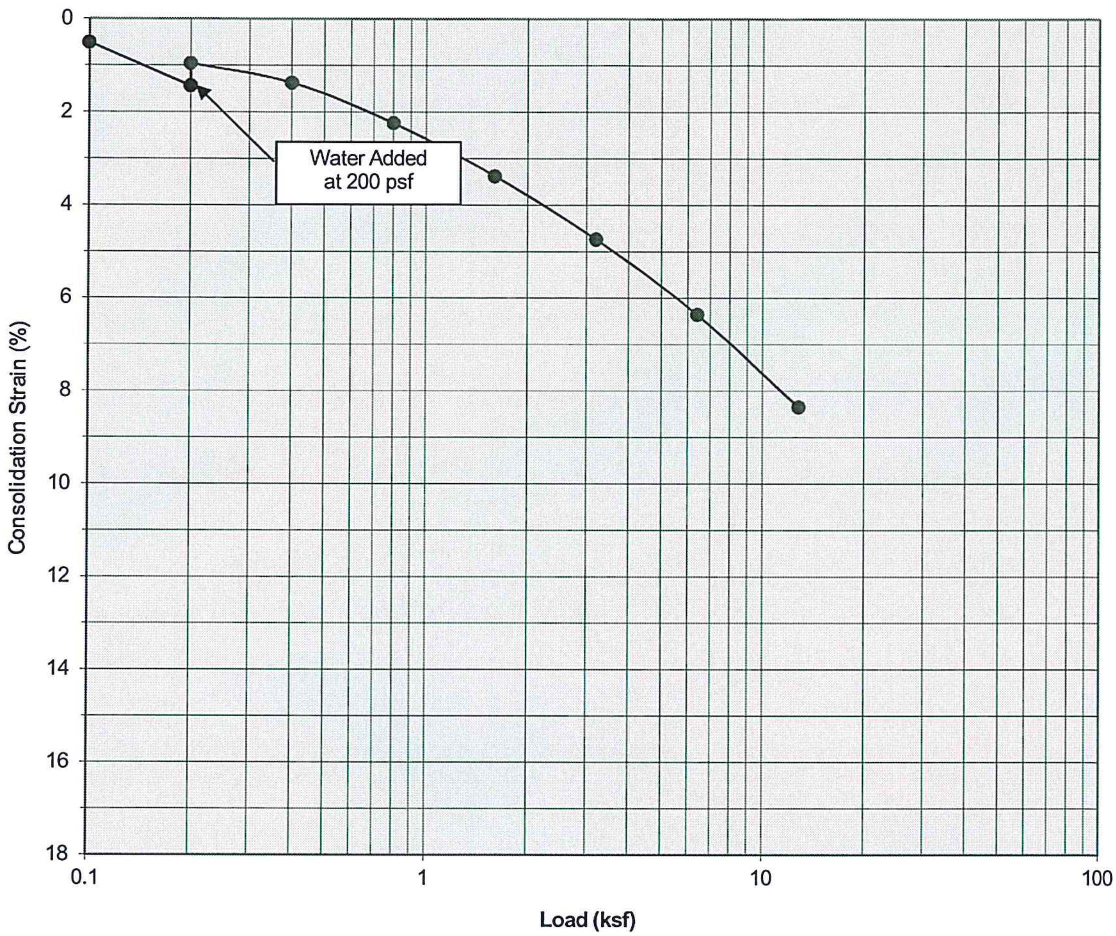
Consolidation/Collapse Test Results



Classification: Dark Brown Silty Clay, little fine Sand

Boring Number:	B-11	Initial Moisture Content (%)	30
Sample Number:	---	Final Moisture Content (%)	29
Depth (ft)	5 to 6	Initial Dry Density (pcf)	93.8
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	99.7
Specimen Thickness (in)	1.0	Percent Collapse (%)	-0.48

Proposed ProLogis Park
Cypress, California
Project No. 12G192
PLATE C- 5

SoCalGeo SOUTHERN CALIFORNIA GEOTECHNICAL
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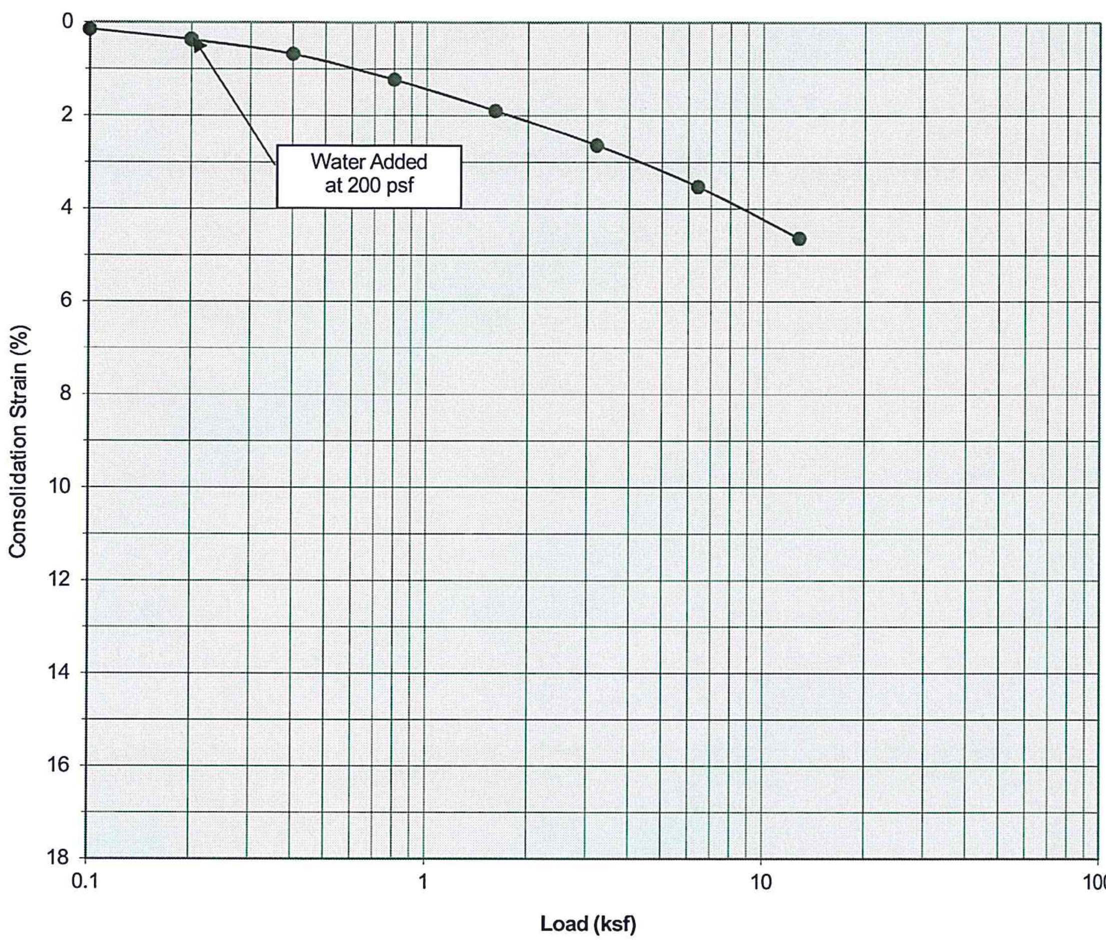
Consolidation/Collapse Test Results



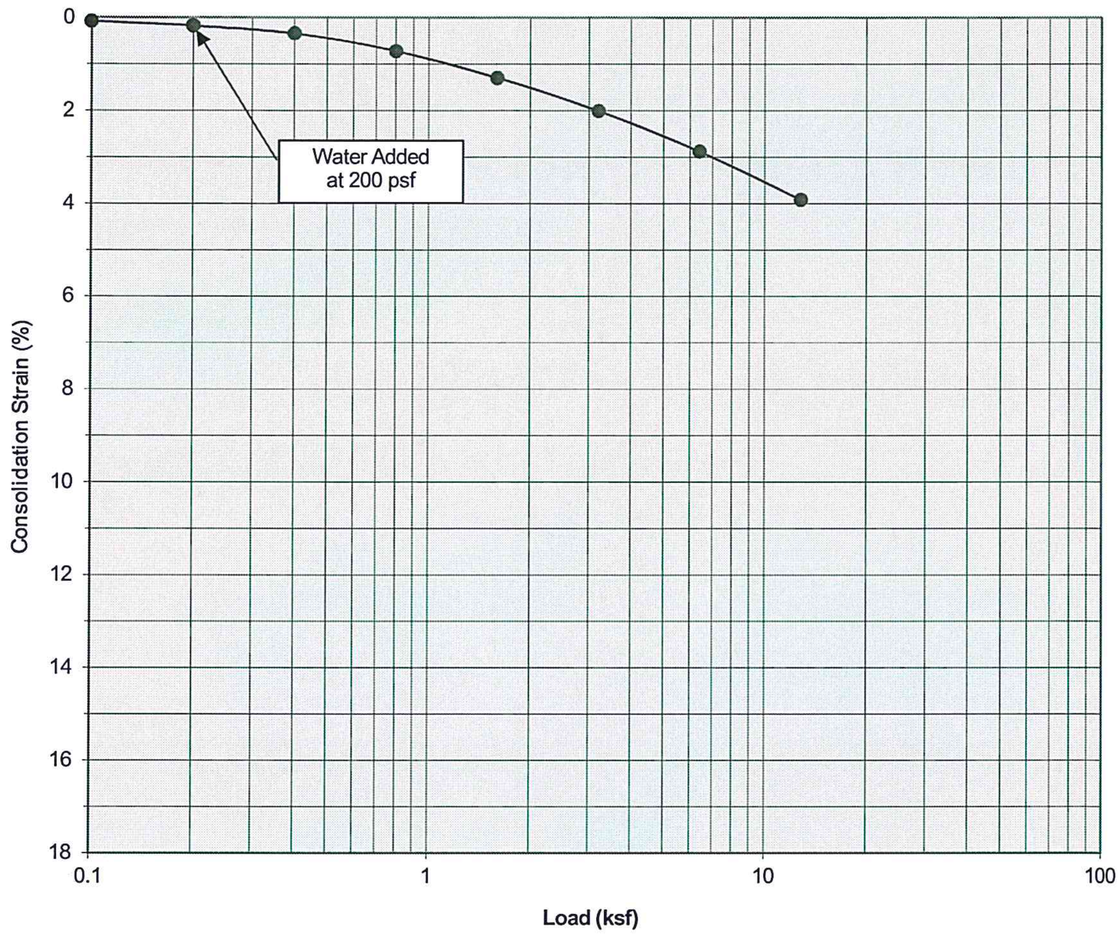
Classification: Brown Silty fine Sand

Boring Number:	B-11	Initial Moisture Content (%)	31
Sample Number:	---	Final Moisture Content (%)	29
Depth (ft)	7 to 8	Initial Dry Density (pcf)	90.5
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	95.2
Specimen Thickness (in)	1.0	Percent Collapse (%)	0.01

Proposed ProLogis Park
Cypress, California
Project No. 12G192
PLATE C- 6

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL
A California Corporation

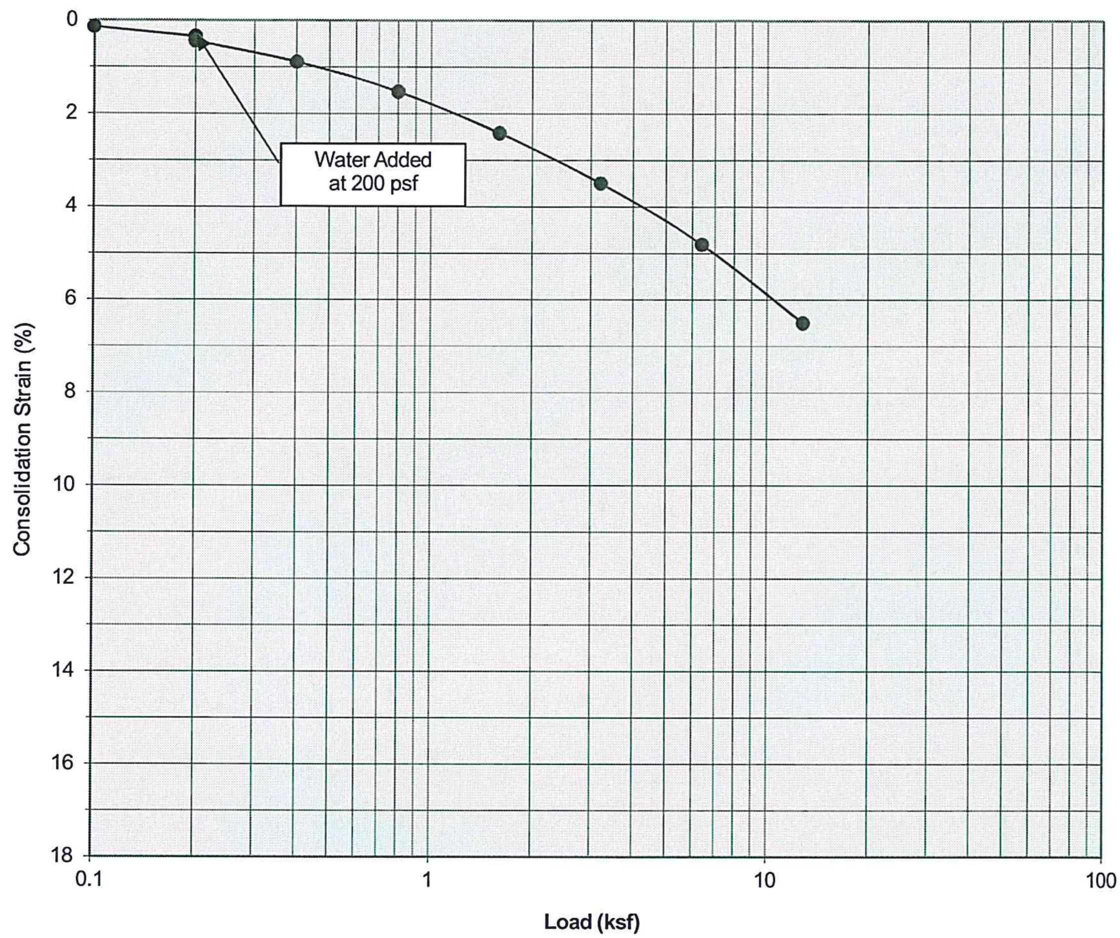
Consolidation/Collapse Test Results



Classification: Light Gray Brown fine to medium Sand, trace to little Silt

Boring Number:	B-11	Initial Moisture Content (%)	30
Sample Number:	---	Final Moisture Content (%)	30
Depth (ft)	9 to 10	Initial Dry Density (pcf)	90.9
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	92.9
Specimen Thickness (in)	1.0	Percent Collapse (%)	0.01

Consolidation/Collapse Test Results



Classification: Dark Gray to Gray Brown Silty fine Sand

Boring Number:	B-15	Initial Moisture Content (%)	23
Sample Number:	---	Final Moisture Content (%)	31
Depth (ft)	3 to 4	Initial Dry Density (pcf)	87.5
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	91.1
Specimen Thickness (in)	1.0	Percent Collapse (%)	0.10

Proposed ProLogis Park
Cypress, California
Project No. 12G192
PLATE C- 8

SOUTHERN CALIFORNIA GEOTECHNICAL
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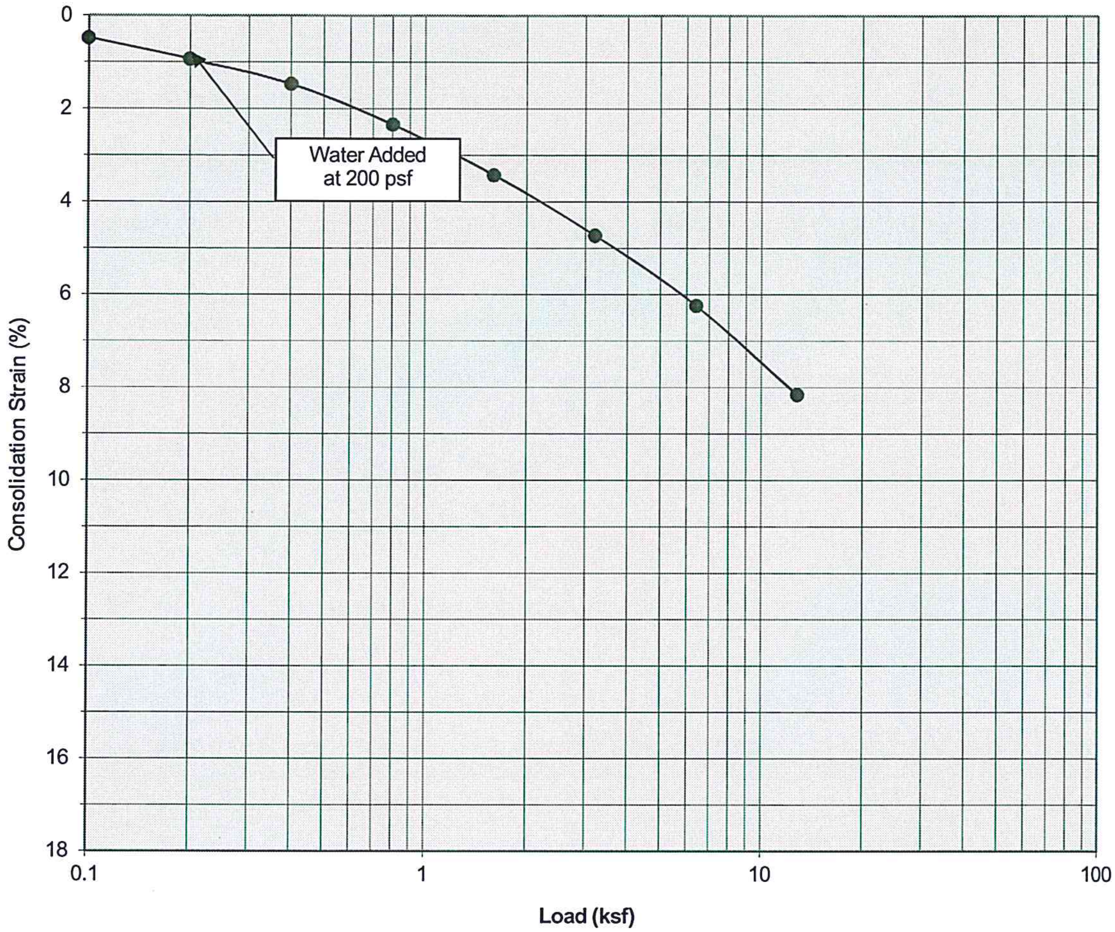
Consolidation/Collapse Test Results



Classification: Gray Silty fine Sand to fine Sandy Silt

Boring Number:	B-15	Initial Moisture Content (%)	25
Sample Number:	---	Final Moisture Content (%)	24
Depth (ft)	5 to 6	Initial Dry Density (pcf)	102.9
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	110.6
Specimen Thickness (in)	1.0	Percent Collapse (%)	0.01

Proposed ProLogis Park
Cypress, California
Project No. 12G192
PLATE C- 9

SoCalGeo SOUTHERN CALIFORNIA GEOTECHNICAL
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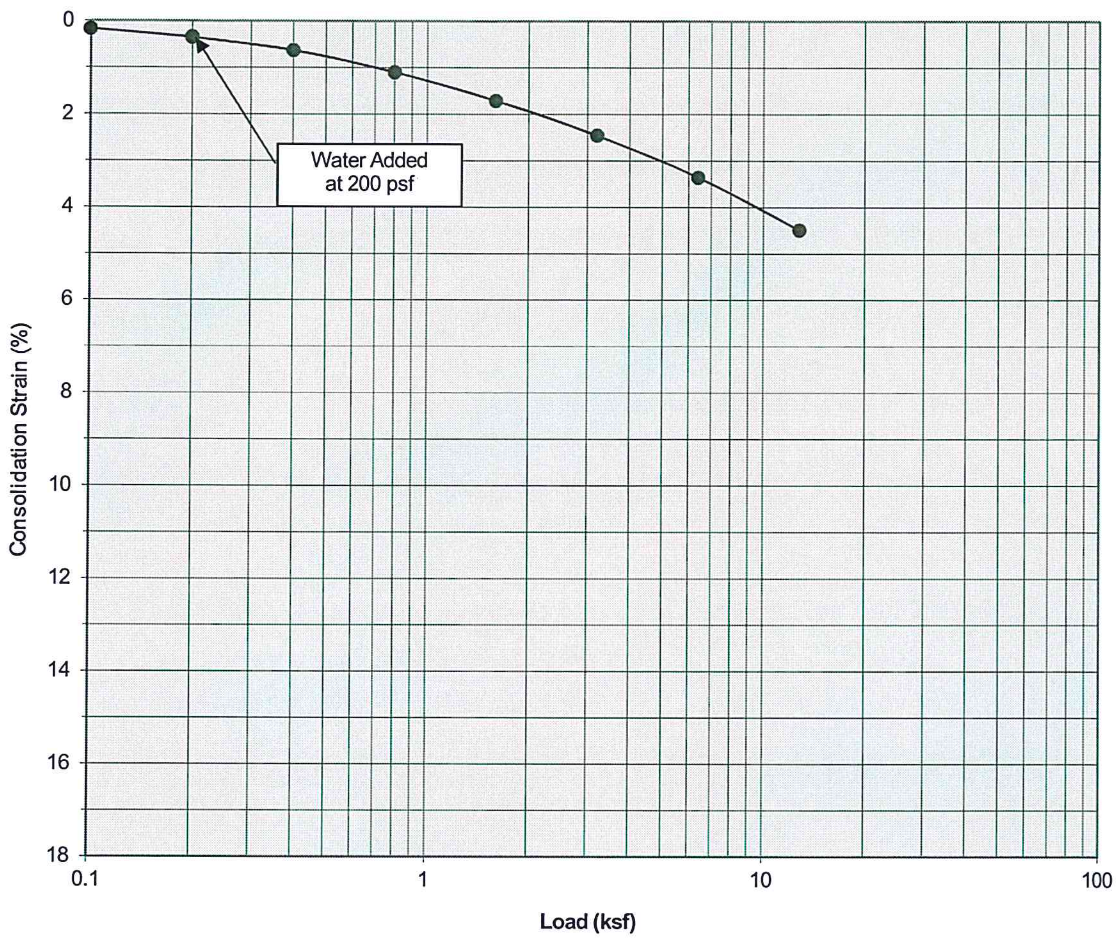
Consolidation/Collapse Test Results



Classification: Dark Gray to Black Silty Clay

Boring Number:	B-15	Initial Moisture Content (%)	33
Sample Number:	---	Final Moisture Content (%)	30
Depth (ft)	7 to 8	Initial Dry Density (pcf)	90.2
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	93.2
Specimen Thickness (in)	1.0	Percent Collapse (%)	0.01

Proposed ProLogis Park
Cypress, California
Project No. 12G192
PLATE C- 10

SoCalGeo
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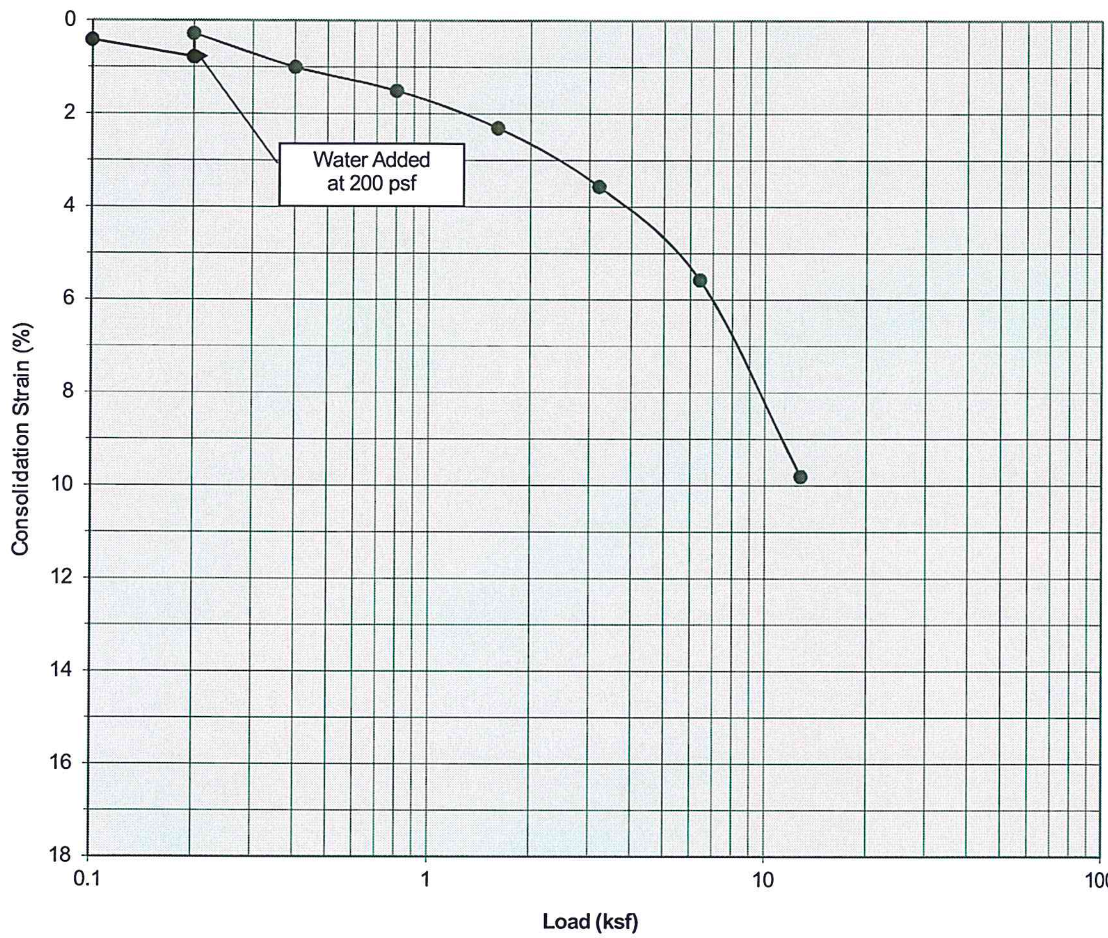
Consolidation/Collapse Test Results



Classification: Dark Gray to Black Silty Clay

Boring Number:	B-15	Initial Moisture Content (%)	33
Sample Number:	---	Final Moisture Content (%)	30
Depth (ft)	9 to 10	Initial Dry Density (pcf)	86.4
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	96.0
Specimen Thickness (in)	1.0	Percent Collapse (%)	-0.50

Proposed ProLogis Park
Cypress, California
Project No. 12G192
PLATE C- 11

SoCalGeo
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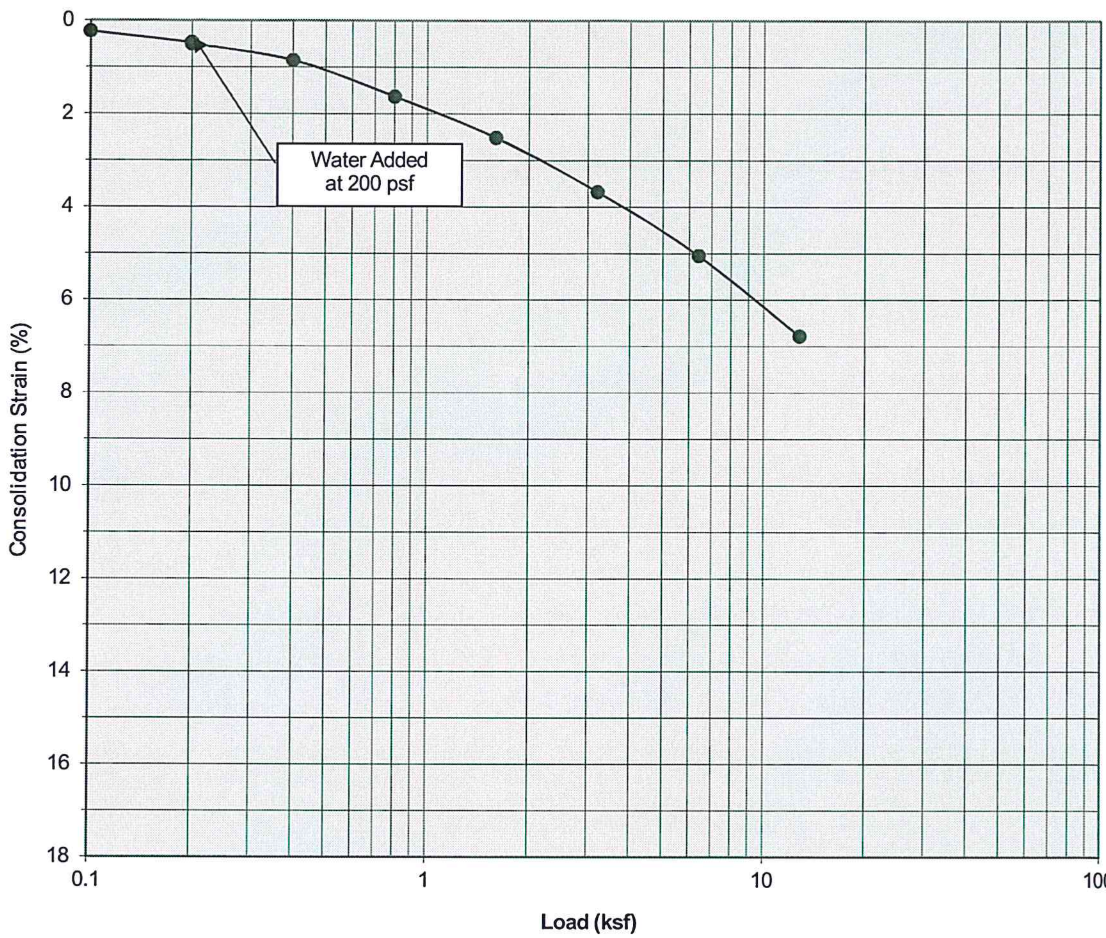
Consolidation/Collapse Test Results



Classification: Dark Gray to Black Silty Clay

Boring Number:	B-16	Initial Moisture Content (%)	23
Sample Number:	---	Final Moisture Content (%)	24
Depth (ft)	19 to 20	Initial Dry Density (pcf)	100.9
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	107.4
Specimen Thickness (in)	1.0	Percent Collapse (%)	0.03

Proposed ProLogis Park
Cypress, California
Project No. 12G192
PLATE C- 12

SoCalGeo
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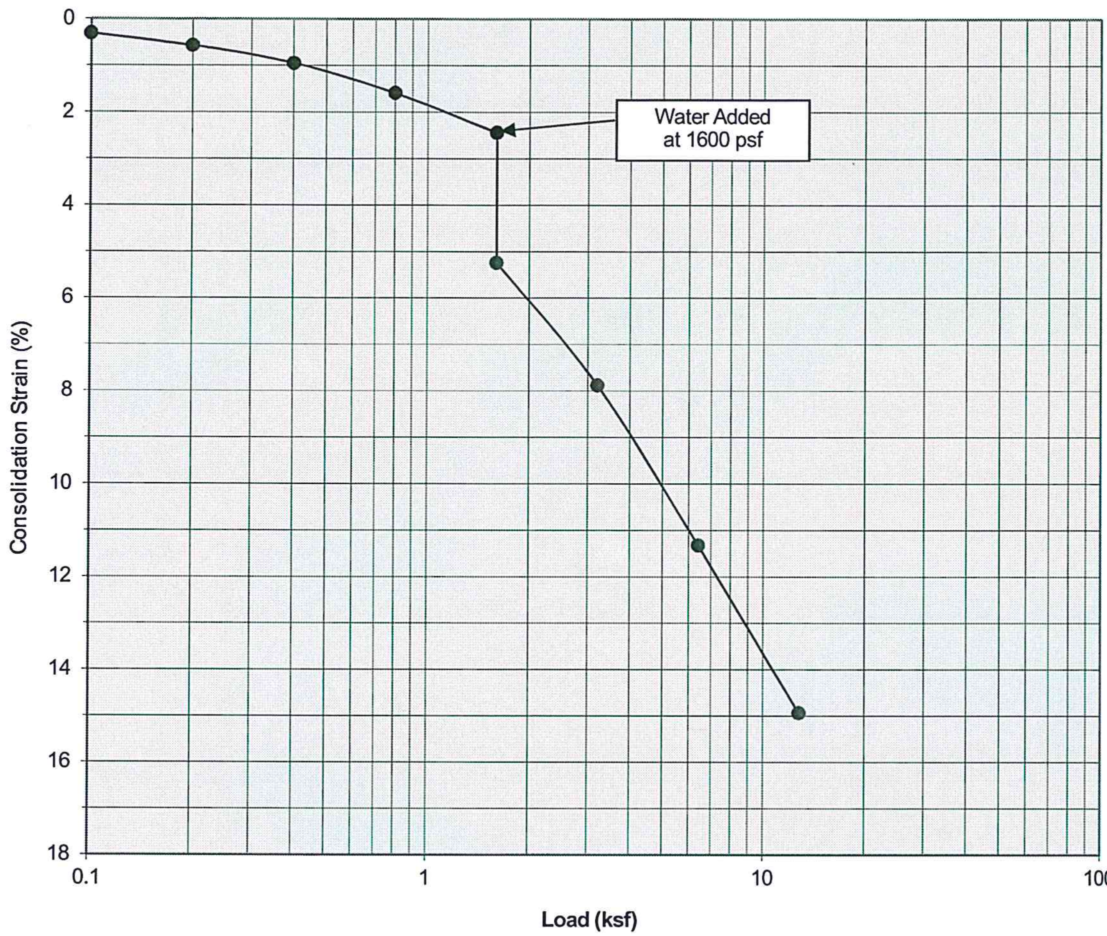
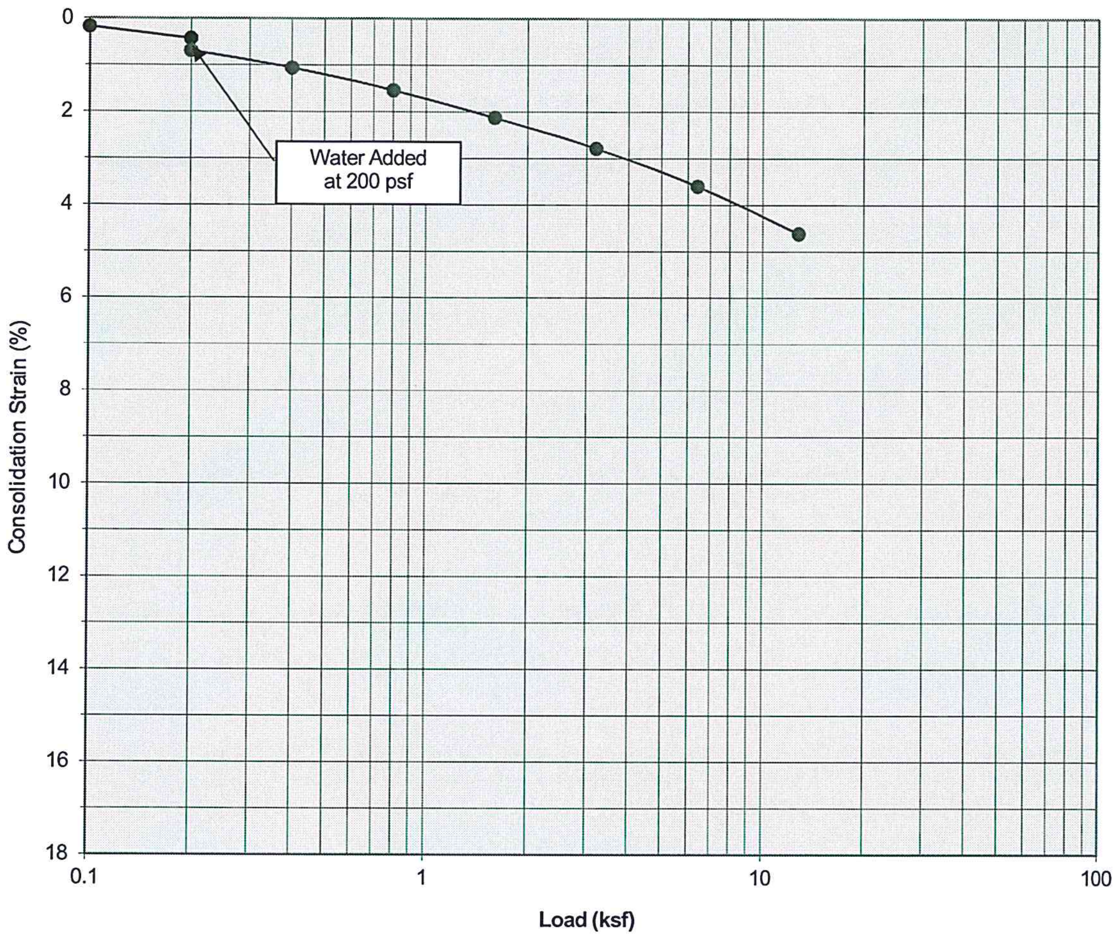
Consolidation/Collapse Test Results



Classification: FILL: Gray Brown Clayey Silt, little to some fine Sand

Boring Number:	B-19	Initial Moisture Content (%)	5
Sample Number:	---	Final Moisture Content (%)	20
Depth (ft)	1 to 2	Initial Dry Density (pcf)	99.7
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	112.9
Specimen Thickness (in)	1.0	Percent Collapse (%)	2.80

Consolidation/Collapse Test Results



Classification: Brown to Gray Brown Silty fine Sand, trace to little Clay

Boring Number:	B-19	Initial Moisture Content (%)	13
Sample Number:	---	Final Moisture Content (%)	23
Depth (ft)	3 to 4	Initial Dry Density (pcf)	91.7
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	97.4
Specimen Thickness (in)	1.0	Percent Collapse (%)	0.26

Proposed ProLogis Park
Cypress, California
Project No. 12G192
PLATE C- 14

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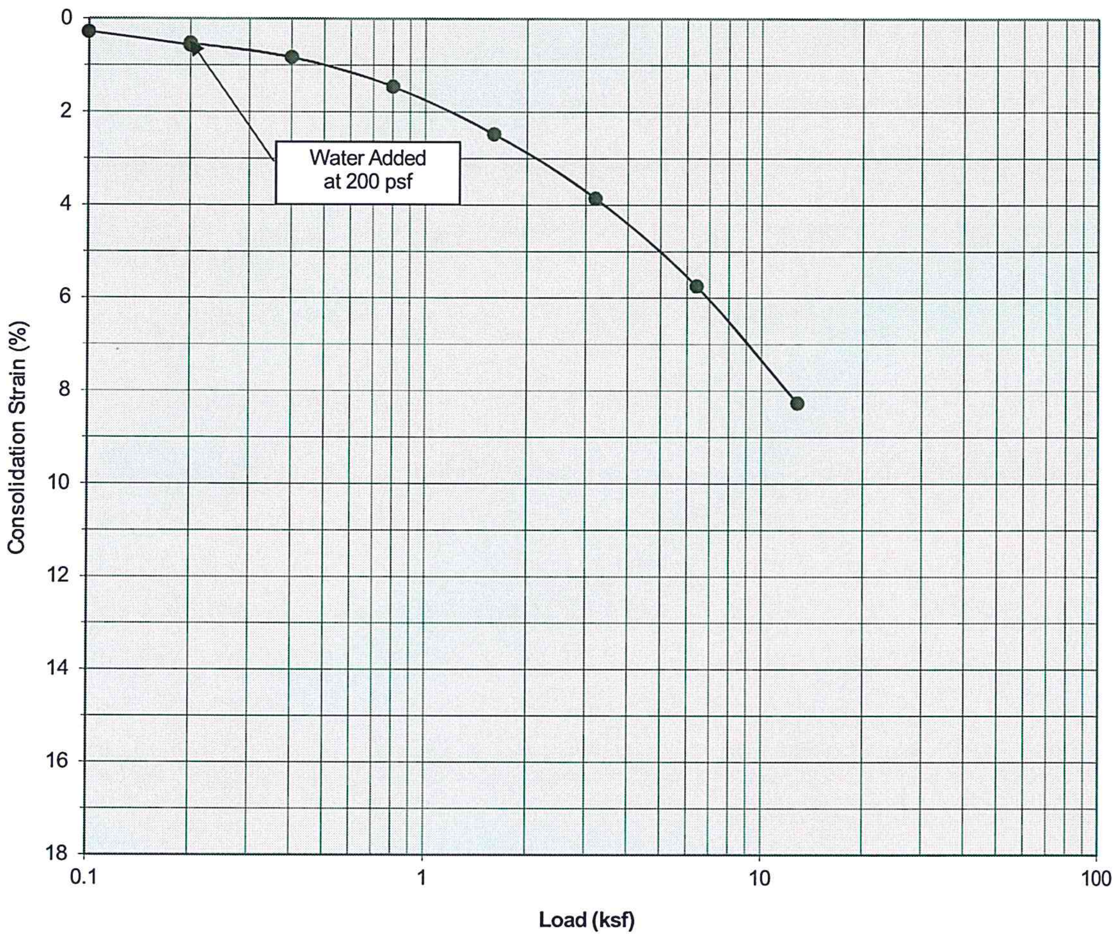
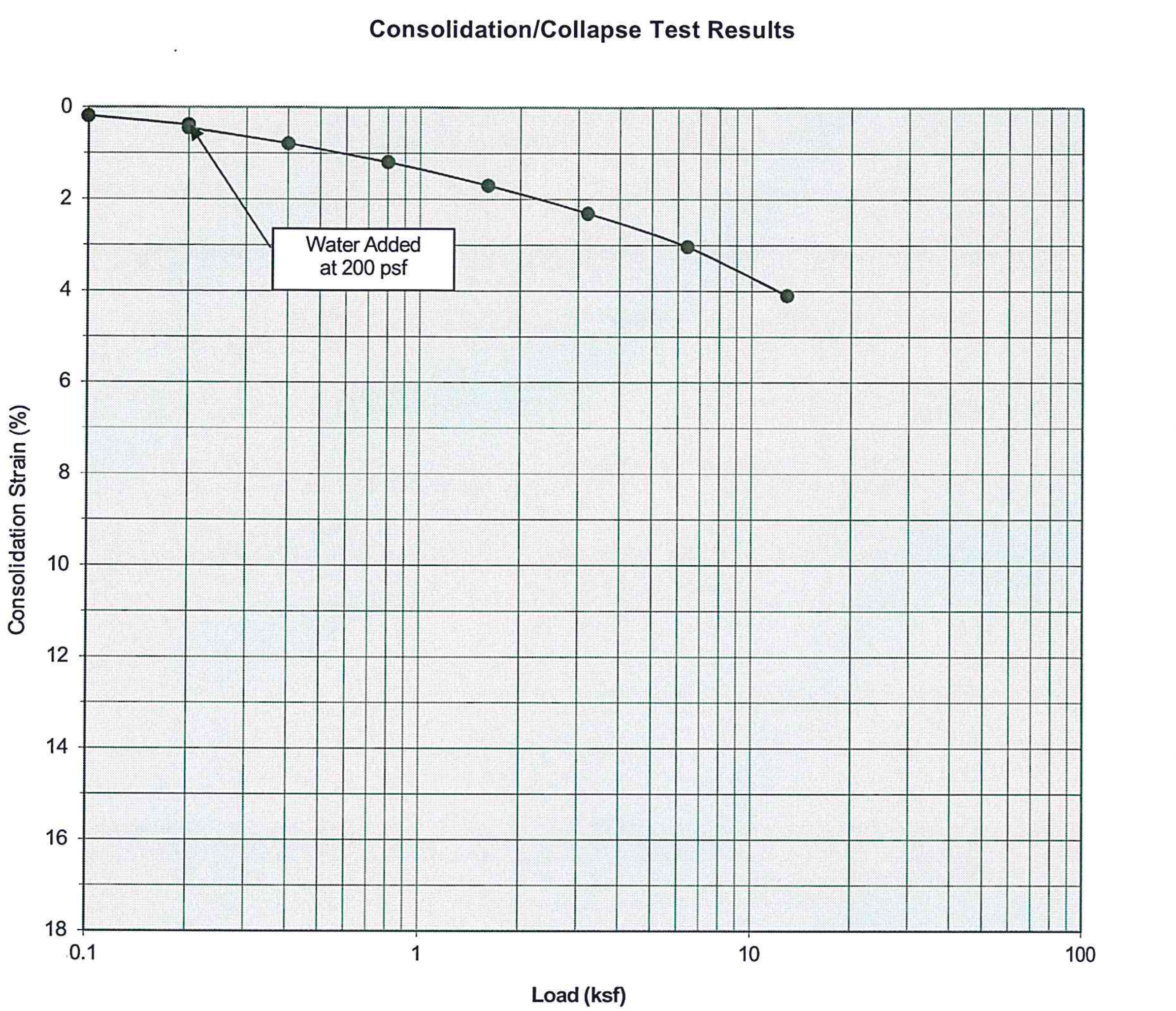
Consolidation/Collapse Test Results



Classification: Gray Brown Silty fine Sand

Boring Number:	B-19	Initial Moisture Content (%)	21
Sample Number:	---	Final Moisture Content (%)	20
Depth (ft)	5 to 6	Initial Dry Density (pcf)	101.3
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	110.2
Specimen Thickness (in)	1.0	Percent Collapse (%)	-0.04



Classification: Gray Brown fine Sandy Silt, trace medium Sand, trace Clay

Boring Number:	B-19	Initial Moisture Content (%)	30
Sample Number:	---	Final Moisture Content (%)	26
Depth (ft)	9 to 10	Initial Dry Density (pcf)	94.4
Specimen Diameter (in)	2.4	Final Dry Density (pcf)	99.9
Specimen Thickness (in)	1.0	Percent Collapse (%)	0.07

Proposed ProLogis Park
Cypress, California
Project No. 12G192
PLATE C- 16

SoCalGeo
SOUTHERN CALIFORNIA GEOTECHNICAL
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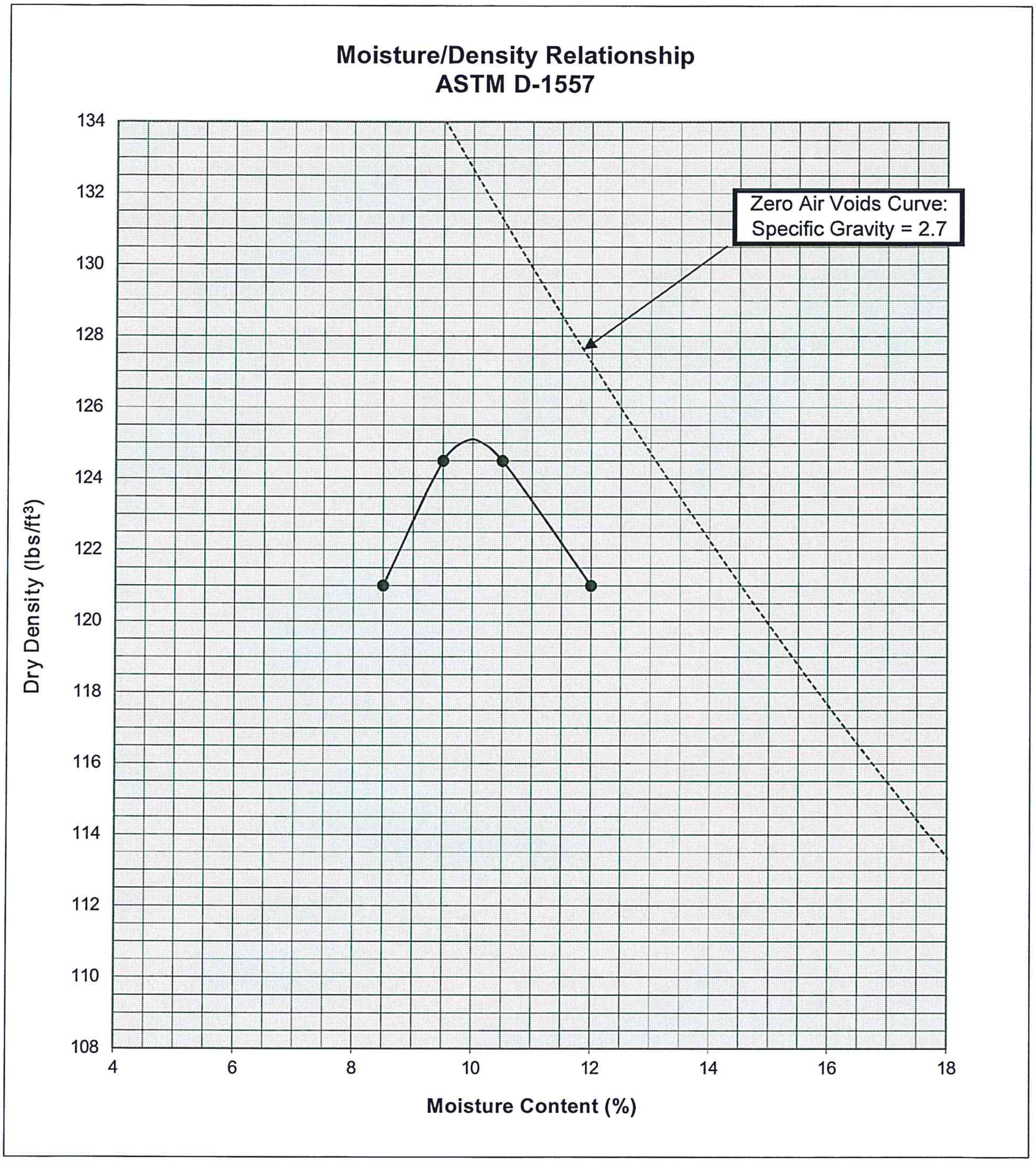

Soil ID Number	B-1 @ 0 to 5'
Optimum Moisture (%)	10
Maximum Dry Density (pcf)	125
Soil Classification	Gray Brown fine Sandy Silt, trace Clay

Proposed ProLogis Park
Cypress, California
Project No. 12G192
PLATE C-17

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SOUTHERN CALIFORNIA GEOTECHNICAL
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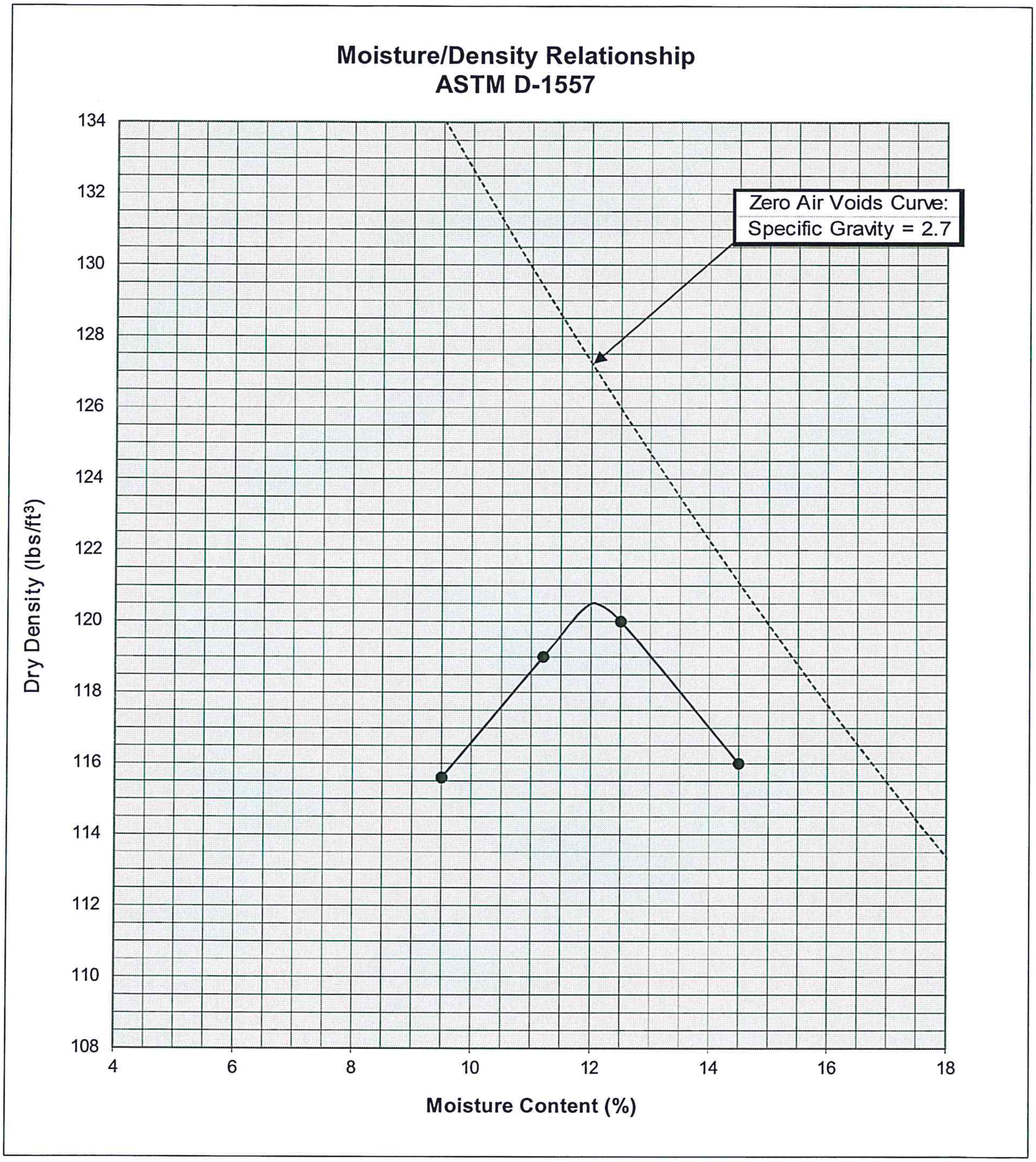

Soil ID Number	B-4 @ 0 to 5'
Optimum Moisture (%)	12
Maximum Dry Density (pcf)	120.5
Soil Classification	Gray Brown fine Sandy Silt

Proposed ProLogis Park
Cypress, California
Project No. 12G192

PLATE C-18

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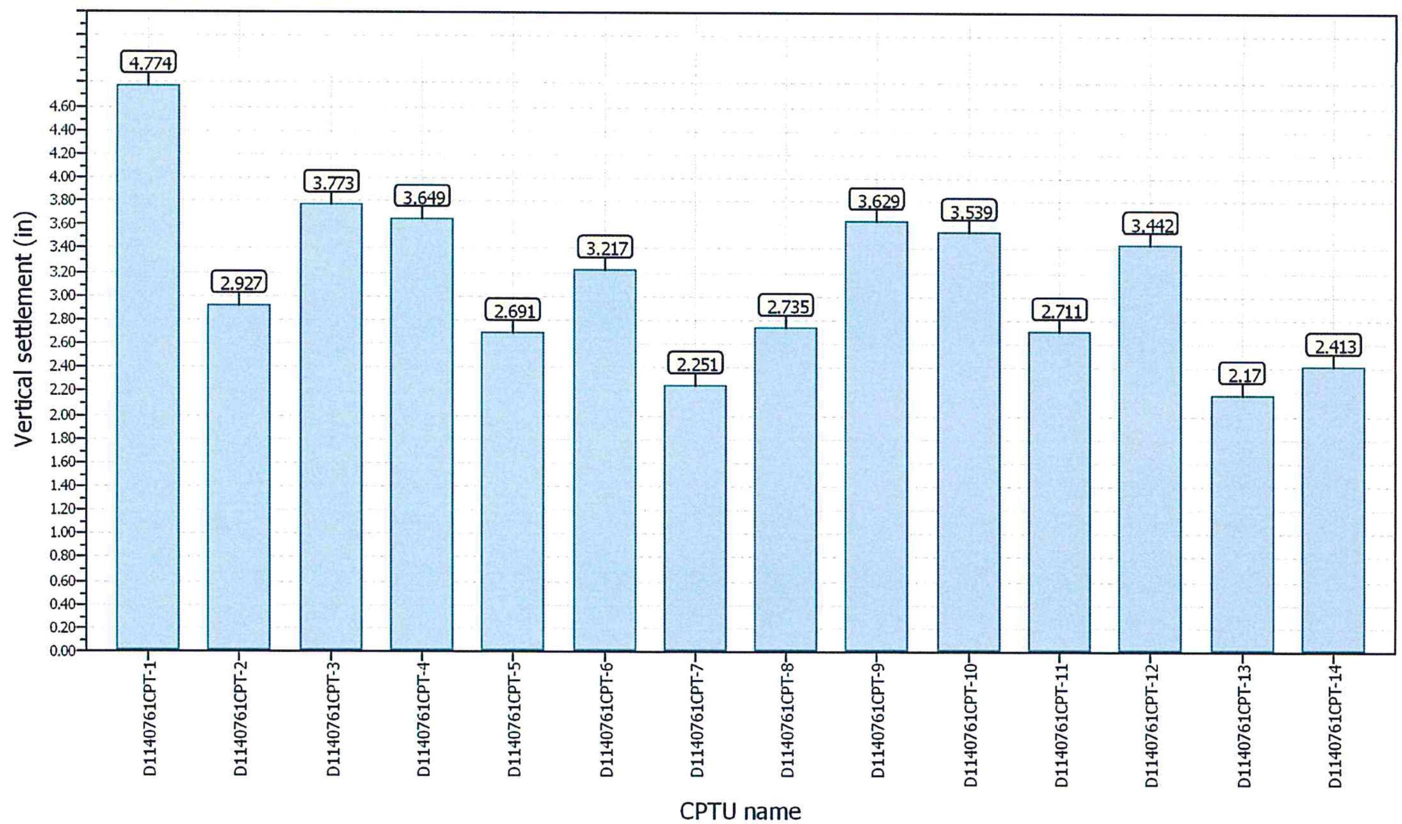
APPENDIX C

LIQUEFACTION ANALYSIS

Project title : Province Group - Cypress

Location : Katella - I & B Method

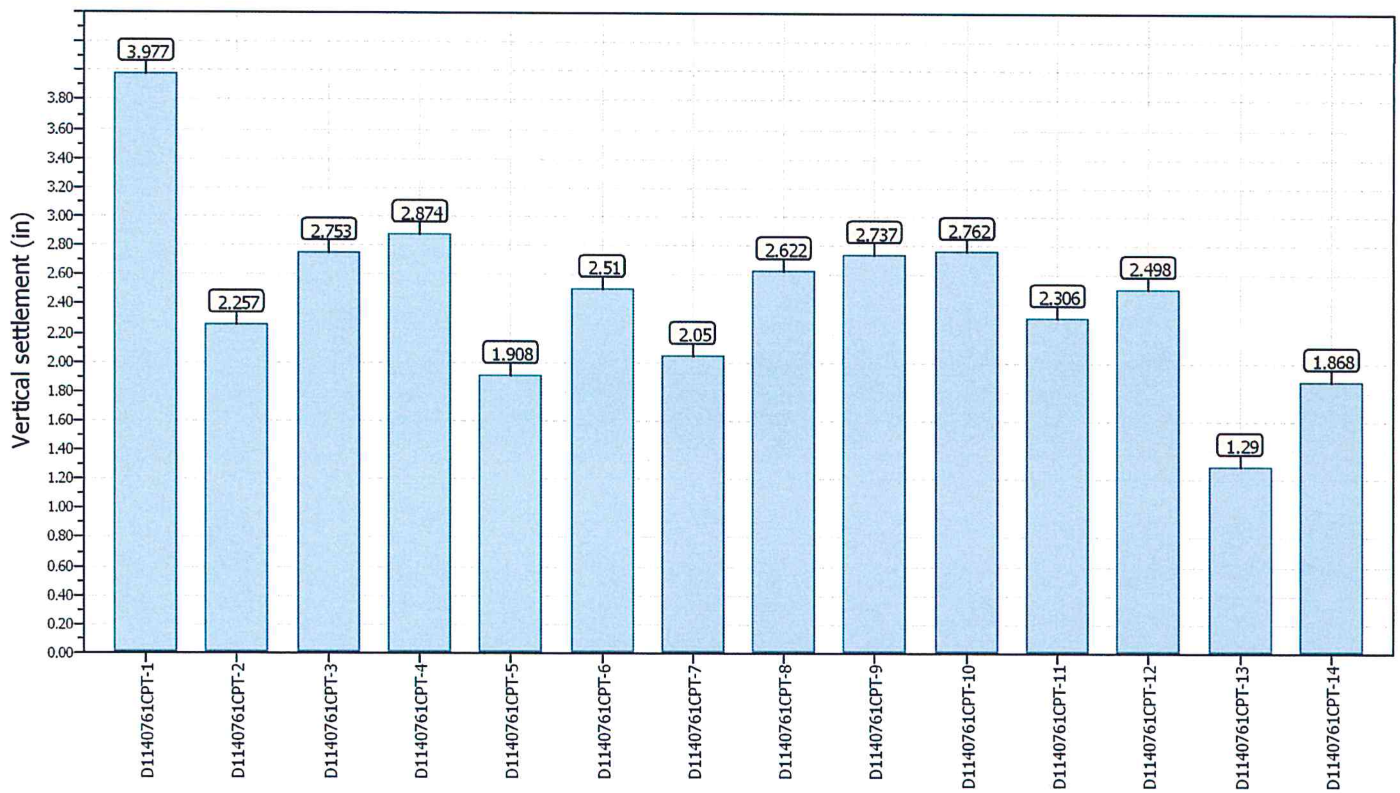
Overall vertical settlements report



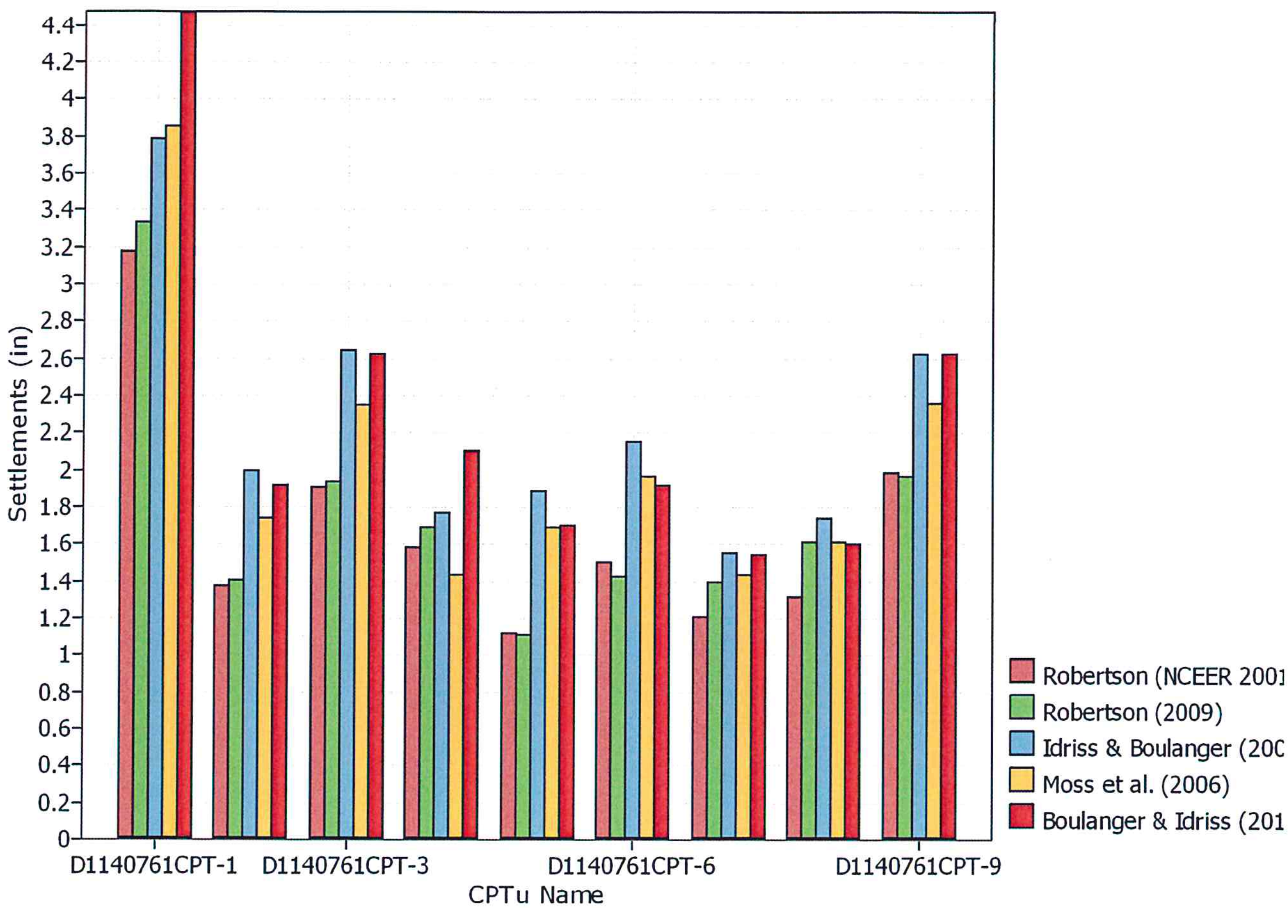
Project title : Province Group - Cypress

Location : Katella - Robertson Method

Overall vertical settlements report

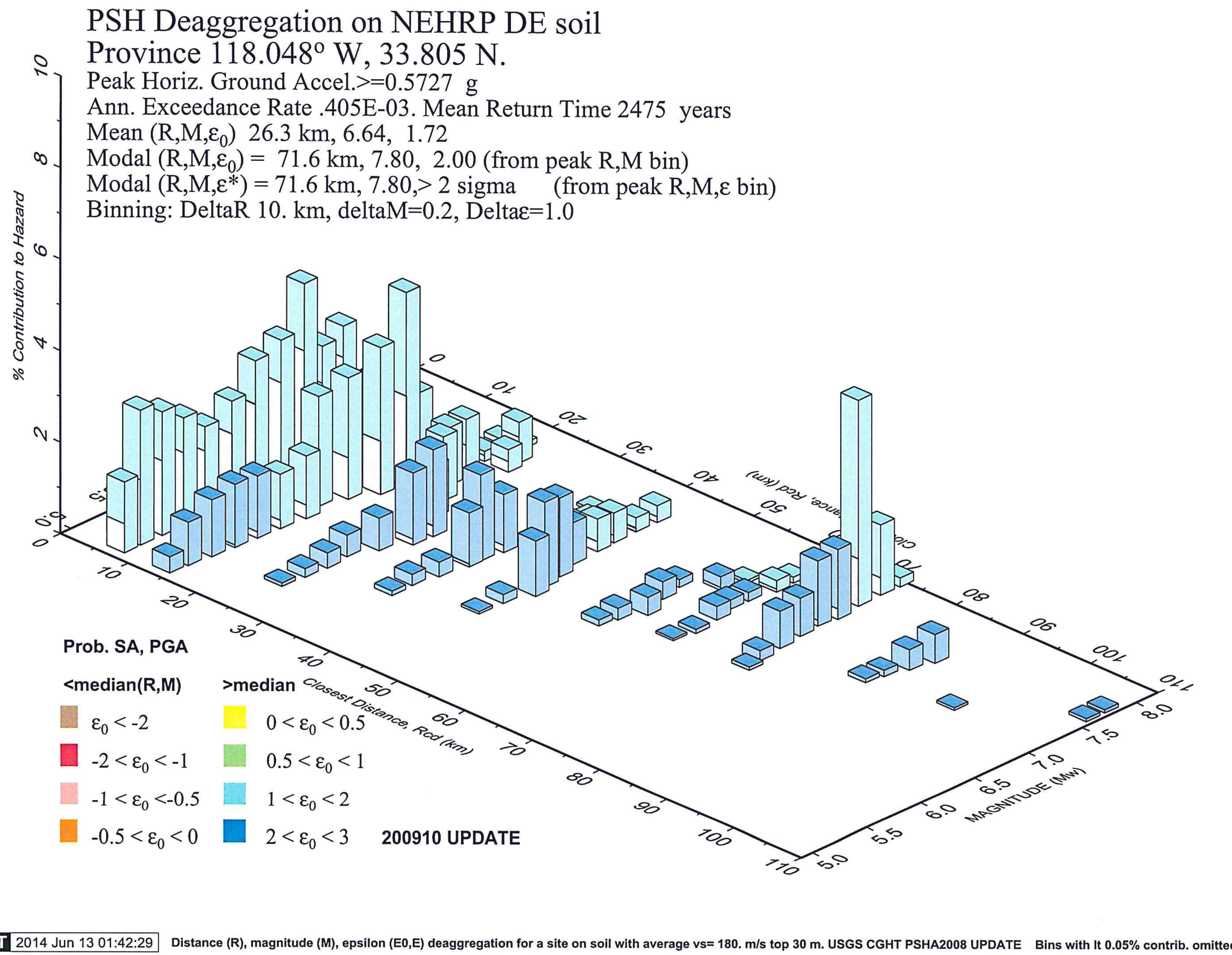


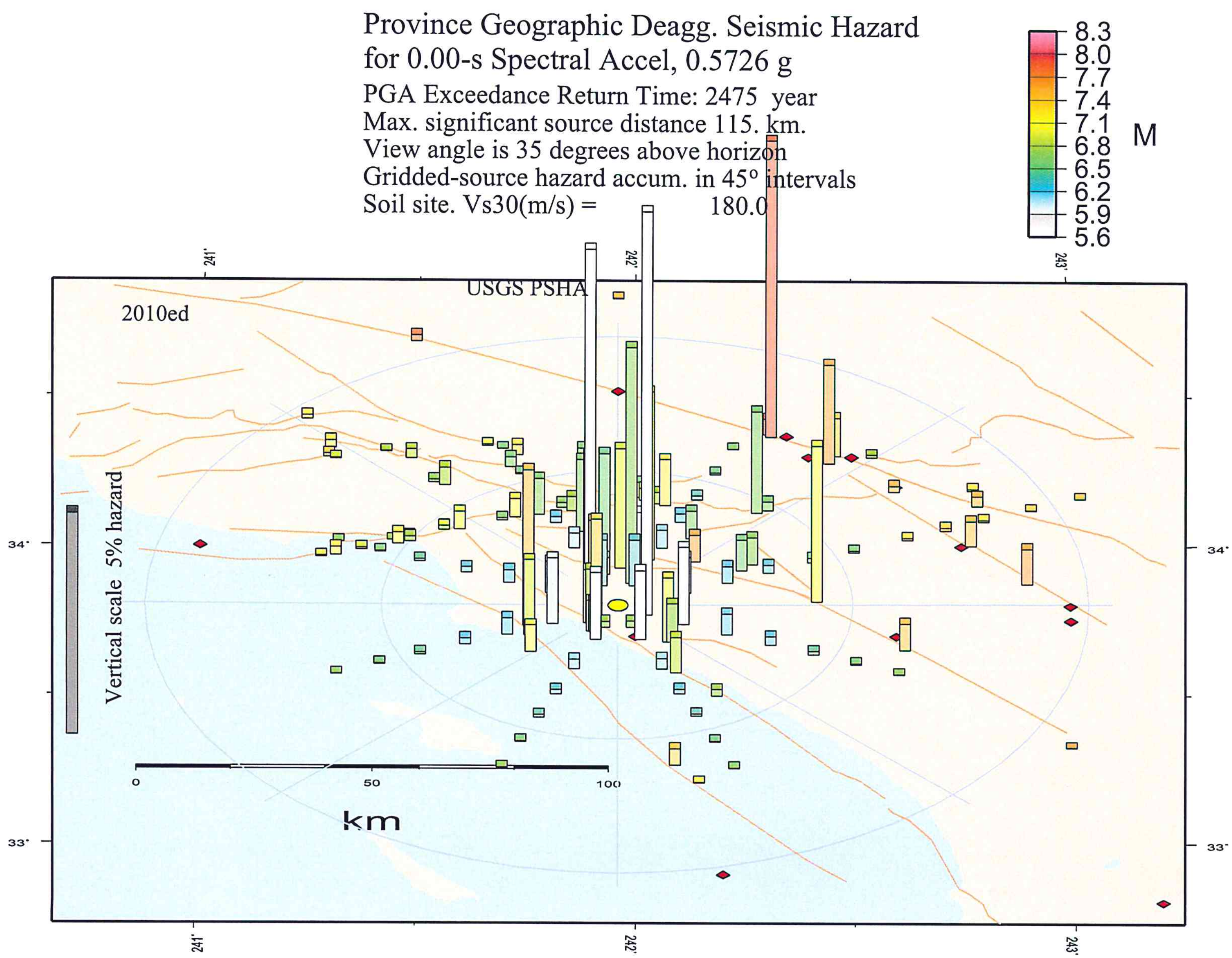
Overall Parametric Assessment Method



:: CPT main liquefaction parameters details ::

CPT Name	Earthquake Mag.	Earthquake Accel.	GWT in situ (ft)	GWT earthq. (ft)
D1140761CPT-1	6.70	0.55	9.00	8.00
D1140761CPT-2	6.70	0.55	9.00	8.00
D1140761CPT-3	6.70	0.55	9.00	8.00
D1140761CPT-4	6.70	0.55	9.00	8.00
D1140761CPT-5	6.70	0.55	9.00	8.00
D1140761CPT-6	6.70	0.55	9.00	8.00
D1140761CPT-7	6.70	0.55	9.00	8.00
D1140761CPT-8	6.70	0.55	9.00	8.00
D1140761CPT-9	6.70	0.55	9.00	8.00


PSH Deaggregation on NEHRP DE soil
Province 118.048° W, 33.805 N.
Peak Horiz. Ground Accel.>=0.5727 g
Ann. Exceedance Rate .405E-03. Mean Return Time 2475 years
Mean (R,M,ε0) 26.3 km, 6.64, 1.72
Modal (R,M,ε0) = 71.6 km, 7.80, 2.00 (from peak R,M bin)
Modal (R,M,ε*) = 71.6 km, 7.80,> 2 sigma (from peak R,M,ε bin)
Binning: DeltaR 10. km, deltaM=0.2, Deltaε=1.0
% Contribution to Hazard
0
2
4
6
8
10
Closest Distance, Rcd (km)
10
20
30
40
50
60
70
80
90
100
110
MAGNITUDE (Mw)
5.0
5.5
6.0
6.5
7.0
7.5
8.0
Prob. SA, PGA
<median(R,M)
>median
ε0 < -2
-2 < ε0 < -1
-1 < ε0 <-0.5
-0.5 < ε0 < 0
0 < ε0 < 0.5
0.5 < ε0 < 1
1 < ε0 < 2
2 < ε0 < 3
200910 UPDATE
GMT 2014 Jun 13 01:42:29
Distance (R), magnitude (M), epsilon (E0,E) deaggregation for a site on soil with average vs= 180. m/s top 30 m. USGS CGHT PSHA2008 UPDATE
Bins with lt 0.05% contrib. omitted



GMT 2014 Jun 13 01:42:29 Site Coords:-118.048 33.8050 (yellow disk) Vs30= 180.0. Max annual ExcdRate .3701E-04 (column height prop. to ExRate). Red diamonds: historical earthquakes, M>6

APPENDIX E

GREENHOUSE GAS TECHNICAL REPORT

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Greenhouse Gas Technical Report

The Barton Place Project
4921 Katella Avenue
Cypress, California

Prepared by:
ENVIRON International Corporation
San Francisco, California

Date:
April 2015

Project Number:
03-36873A

ENVIRON

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Acronyms and Abbreviations

ACC	Advanced Clean Cars
AB	Assembly Bill
ARRA	American Recovery & Reinvestment Act of 2009
BAAQMD	Bay Area Air Quality Management District
BAU	Business-As-Usual
BTU	British Thermal Units
CalEEMod®	California Emission Estimator Model®
CalRecycle	California Department of Resources Recycling and Recovery
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CEUS	Commercial End-Use Survey
CFC	Chlorofluorocarbon
CH_4	Methane
CO_2	Carbon Dioxide
CO_2e	CO_2 equivalents
DOE	Department of Energy
DOT	Department of Transportation
DU	Dwelling Units
EIR	Environmental Impact Report
EISA	Energy Independence and Security Act of 2007
EMFAC	EMission FACtor model
ENVIRON	ENVIRON International Corporation
GHG	Greenhouse Gas
GWP	Global Warming Potential
HFCs	Hydrofluorocarbons
HOA	Home Owner Association
IPCC	Intergovernmental Panel on Climate Change
ITE	Institute of Transportation Engineers
LB	Pound

LCFS	Low Carbon Fuel Standard
LDA	Light-Duty Auto
LDT	Light-Duty Truck
MDV	Medium-Duty vehicle
MXD	Mixed-use Developments
MSW	Municipal solid waste
$MTCO_2e$	Metric Tonnes of CO_2 Equivalent
MWD	Metropolitan Water District
MWh	Megawatt-Hour
N_2O	Nitrous Oxide
NHTSA	National Highway Traffic Safety Administration
OFFROAD	Emissions Inventory Program model
PDF	Project Design Features
PTA	Public Transportation Association
PUP	Power/Utility Protocol
RASS	Residential Appliance Saturation Survey
RFS	Renewable Fuel Standard
ROG	Reactive Organic Gasses
RPS	Renewable Portfolio Standards
SB	Senate Bill
SCAB	South Coast Air Basin
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCE	Southern California Edison
TAC	Toxic Air Contaminants
USEPA	United States Environmental Protection Agency
VMT	Vehicle Miles Traveled
YR	Year

Executive Summary

The Barton Place Project (the "Project") proposes a mixed-use senior community comprised of approximately 33 acres in the northwest portion of Orange County, California, within the City of Cypress (the "City"). The project site is immediately north of the City of Los Alamitos boundary, approximately one mile northwest of the City of Garden Grove, two miles east of the San Gabriel River Freeway (Interstate 605), and approximately three miles north of the Garden Grove Freeway (State Route 22) and the San Diego Freeway (Interstate 405). The project site is located within the Amended and Restated Cypress Business and Professional Center Specific Plan ("Specific Plan") area at 4921 Katella Avenue, at the northeast corner of Katella Avenue and Enterprise Drive. The Los Alamitos Race Course is to the north and east. Hotel and commercial uses are located immediately east of the Project site, closest to Katella Avenue. To the west of the Project site is Enterprise Drive and Cottonwood Church. The southern border of the Project site is Katella Avenue, with commercial, single-family, and multi-family residential uses south of Katella Avenue.

The Project includes two components: a senior residential community and commercial/retail improvements along Katella Avenue. The homes would be for-sale and incorporate a mix of 152 single-family detached homes and 92 single-family attached homes (i.e. paired homes), in one- and two-story configurations. The single-family detached homes would range in size from approximately 1,790 to 2,605 square feet and the paired homes would range in size from approximately 1,532 to 2,080 square feet.

Each home in the senior residential community would require a qualified occupant 55 years of age or older pursuant to recorded covenants, conditions and restrictions. The residents would have access to community amenities that include a clubhouse, pool and landscaped areas. The community would include guest parking areas, landscaped parkways, small pocket parks, and access to the adjacent commercial/retail uses. The architectural elements and features of the proposed residential buildings would incorporate a Santa Barbara style aesthetic. The community would be gated with private streets and all common areas, amenities, and streets would be managed and maintained by a homeowners association.

The proposed commercial/retail improvements would be developed on an approximately five-acre parcel on the southern portion of the project site and would consist of approximately 50,000 square feet of space, most of which would be located in Planning Area 6 and a small portion of which would be located in Planning Area 9. The commercial/retail space would be divided into approximately five buildings, ranging in size from approximately 6,800-16,250 square feet each. The proposed commercial/retail uses would include neighborhood-serving restaurants, retail stores and other commercial uses.

This Project will result in both one-time and annual direct and indirect emissions of greenhouse gases (GHGs). The term, "direct emissions of GHGs" refers to GHGs that are emitted directly as a result of the Project and include land use change and construction emissions. Indirect emissions are those emissions that the Project will enable, but that are not controlled by the Project proponent. This report discusses the scientific and regulatory developments surrounding global climate change and provides an inventory surveying the emissions that would result from the Project.

Residents and the employees and patrons of commercial and municipal buildings and services use electricity, heating, and are transported by motor vehicles. These activities directly or indirectly emit GHGs. The most significant GHG emissions resulting from developments such as the Project are emissions of carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O). GHG emissions are typically measured in terms of tonnes of CO_2 equivalents (CO_2e), calculated as the product of the mass emitted of a given GHG and its specific global warming potential (GWP).

The GHG emissions inventory for this analysis includes the following sources of emissions: energy use associated with residential and non-residential buildings, mobile sources, area sources, solid waste, water and wastewater, construction, and vegetation changes. The ongoing operational emissions consist of the first five categories, while the one-time emissions are associated with the construction and vegetation changes. This report includes the direct emissions associated with the Project as well as the indirect emissions that may result from the Project. These indirect emissions are associated with electricity generation, the energy used in supplying potable water, and emissions associated with solid waste disposal. The electrical power for the Project will be supplied by Southern California Edison (SCE). Accordingly, indirect GHG emissions from electricity usage associated with the Project is calculated using the SCE carbon-intensity factors adjusted for mandated renewable energy requirements.

This analysis utilized the California Emission Estimator Model version 2013.2.2 (CalEEMod®)[1] to assist in quantifying the GHG emissions in the inventories presented in this report for the Project. CalEEMod® is a statewide software program designed to calculate both criteria and GHG emissions from development projects in California.

At this time, the South Coast Air Quality Management District (SCAQMD or "District") does not have an adopted numeric threshold to determine the significance of the Project's GHG emissions. Similarly, SCAQMD has not adopted a methodology to quantitatively analyze GHG emissions for residential mixed-use developments similar to the Project.[2] Therefore, this report uses the industry standard percentage reduction from "Business-As-Usual" (BAU) threshold to determine whether the Project has a significant GHG impact.

The BAU threshold was established in the following manner. The California Global Warming Solutions Act of 2006, also known as Assembly Bill 32 (AB 32), called for the state to achieve 1990 levels of GHG emissions by 2020. Between 2008 and 2014, the California Air Resources Board (CARB) set forth emission calculations and GHG target reduction percentages to achieve the mandates of AB 32. CARB first adopted the Climate Change Scoping Plan: A Framework

1 California Air Pollution Control Officers Association (CAPCOA), 2013, California Emissions Estimator Model. Available at: http://www.CalEEMod.com/.

2 SCAQMD has adopted interim significance thresholds for industrial sources of 10,000 metric tons of carbon dioxide equivalents per year. The Board adopted these December 5, 2008. These thresholds are not applicable to the Project because it is not an industrial source of CO_2e emissions.

for Change ("Scoping Plan") in 2009. The Scoping Plan set a GHG emissions reduction target of approximately 28.5 percent below BAU in year 2020. CARB went through a series of actions that essentially ratchetted down the GHG reduction targets from 28.5 to 21.7 to 15.8 percent below BAU. CARB made these adjustments based on changes in economic conditions and additional scientific information regarding climate change. In May 2014, CARB approved the "First Update to the Climate Change Scoping Plan" ("Updated Scoping Plan"). As further discussed below, the Updated Scoping Plan recalculated GHG emission levels and again reduced the GHG target to approximately 15.3 percent.[3,4,5] Although CARB's approximately 15.3 percent target is the most current threshold, not all agency models have been updated to account for this recent change. Therefore, to present a conservative analysis, this report uses the 15.8 percent threshold to determine whether the Project could have a significant GHG emission impact

Moreover, the analysis in this report uses the Updated Scoping Plan statewide goals as the basis for the GHG significance threshold. In other words, this report's methodology compares the Project's GHG emissions as proposed to the Project's emissions as if the Project were built using a BAU approach in terms of design, methodology, and technology (see Section 3 for additional discussion). This means the Project's emissions were calculated as if the Project was constructed before the regulations that were promulgated to fulfill the goals of AB 32, and then compared to the emissions that would result if the Project was constructed with project design features (PDFs) proposed by the applicant and in compliance with the regulatory measures adopted in furtherance of AB 32.

A summary of the Project emissions are presented in Table ES-1. One-time emissions and reoccurring emissions are expected to occur. One-time emissions from construction and vegetation removal were amortized over a 30-year period because no significance threshold has been adopted for construction GHG emissions.[6] The Project emission reductions are the result of the Project's sustainability commitments, PDFs, and regulatory compliance, the latter of which include the implementation of the Renewables Portfolio Standard for eligible renewable energy resources, the Pavley regulation, and the Advanced Clean Cars program mandating higher fuel efficiency standards for light-duty vehicles, and the Low Carbon Fuel Standard (LCFS).

The total emissions for the Project and its associated BAU scenario are calculated to be 3,771 and 4,515 MT CO_2e per year, respectively. As a result, the Project has a GHG emission

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[3] California Air Resources Board, *Status of Scoping Plan Recommended Measures*, July 25, 2011. (Available at http://www.arb.ca.gov/cc/scopingplan/status_of_scoping_plan_measures.pdf, accessed March 11, 2015.)

[4] California Air Resources Board, *Final Supplement to the AB 32 Scoping Plan Functional Equivalent Document* (Available at http://www.arb.ca.gov/cc/scopingplan/document/final_supplement_to_sp_fed.pdf, accessed March 11, 2015).

[5] California Air Resources Board, *Climate Change Scoping Plan First Update, Discussion Draft for Public Review and Comment*, October 2013 (Available at http://www.arb.ca.gov/cc/scopingplan/2013_update/discussion_draft.pdf, accessed March 11, 2015).

[6] This approach to one-time construction and vegetation change GHG emissions is based on the GHG Threshold Working Group Meeting #13 Minutes from August 26, 2009. Available at: http://www.aqmd.gov/ceqa/handbook/GHG/2009/aug26mtg/wkgp13minutes.pdf.

reduction of 16.5 percent from the BAU scenario. As noted above, this report applies a GHG reduction target of 15.8 percent. The Project reduces GHG emissions by more than (16.5 – 15.8 = 0.7 percent) the applicable threshold of significance set by AB32 and CARB. Therefore, the Project does not have a significant GHG impact.

Table ES-1 Summary of GHG Emissions			
Category[1]	**CO_2e Emissions**[2]		**% Change From BAU**
	Project (MT/yr)	**BAU (MT/yr)**	
Area	63	63	0.0%
Energy Use	878	1,228	-28.5%
Water Use	114	145	-21.6%
Waste Disposed	143	170	-16.0%
Traffic	2,486	2,821	-11.9%
Sub-Total	**3,683**	**4,428**	**-16.8%**
Construction Amortized[3]	99	99	0.0%
Vegetation Amortized[3]	-12	-12	0.0%
Total	**3,771**	**4,515**	**-16.5%**

Notes:
[1] CO_2e emissions were calculated using CalEEMod® version 2013.2.2.
[2] CO_2e includes CO_2, CH_4, and N_2O emissions, which are weighted by their respective global warming potentials.
[3] One-time emissions from construction and vegetation removal were amortized over a 30-year period.

Abbreviations:
BAU – Business as Usual
CalEEMod® - California Emissions Estimator Model
CH_4 - methane
CO_2 - carbon dioxide
CO_2e - carbon dioxide equivalents
GHG - greenhouse gases
MT - metric tons
N_2O - nitrous oxide
yr - year

1 Introduction

The purpose of this technical report is to present the quantitative analyses that were used to evaluate the Project's GHG emissions. Emissions during both construction and operations of the Project were quantified. The analysis and conclusions in this report also support the Environmental Impact Report (EIR) being prepared for the Project.

1.1 Project Description

The Project proposes a mixed-use senior community comprised of approximately 33 acres in the northwest portion of Orange County, California, within the City of Cypress (the "City"). The project site is immediately north of the City of Los Alamitos boundary, approximately one mile northwest of the City of Garden Grove, two miles east of the San Gabriel River Freeway (Interstate 605), and approximately three miles north of the Garden Grove Freeway (State Route 22) and the San Diego Freeway (Interstate 405). The project site is located within the Amended and Restated Cypress Business and Professional Center Specific Plan ("Specific Plan") area at 4921 Katella Avenue, at the northeast corner of Katella Avenue and Enterprise Drive. The Los Alamitos Race Course is to the north and east. Hotel and commercial uses are located immediately east of the Project site, closest to Katella Avenue. To the west of the Project site is Enterprise Drive and Cottonwood Church. The southern border of the Project site is Katella Avenue, with commercial, single-family, and multi-family residential uses south of Katella Avenue.

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Regulatory Compliance

There are several Federal and California regulations that address climate change and GHG emissions. The regulatory measures below are in effect now and apply to the Project. Accordingly, the quantitative analysis in this report assumes the Project will comply with these regulations.

- The CO2e intensity for the Project assumes compliance with the Renewable Portfolio Standards (RPS) set forth in Senate Bill 1078;
- The Pavley regulation that mandates higher fuel efficiency standards for cars and light-duty vehicles, Low Carbon Fuel Standard (LCFS), and the Advanced Clean Cars is applied in the vehicle emissions calculation for the Project[7];
- The Project would comply with applicable California Green Building Standards to reduce indoor potable water use by using water saving fixtures and/or flow restrictors and outdoor water use by installing high efficiency irrigation system;
- The Assembly Bill 341 establishes statewide solid waste diversion goals to achieve by 2020 by reducing, recycling, or composting solid waste; and
- The Project will meet the statewide 2013 Building Energy Efficiency Standards, formally known as Title 24, Part 6.

Project Design Features

The following PDFs were incorporated into the analysis of the Project, which are described in the inventory:

- PDF- 1: Where appliances are offered by homebuilders, Energy Star appliances including clothes washers, dishwashers, and refrigerators shall be installed in the residences; and
- PDF-2: High efficiency light bulbs and lighting fixtures shall be installed in residential and non-residential buildings pursuant to applicable code standards.

These regulatory compliance measures and PDFs are not included in the emissions inventory developed for the BAU scenario consistent with the approach and methodology as established in the Updated Scoping Plan. In other words, complying with these measures and implementing these PDFs as part of the Project reduces GHG emissions and helps achieve GHG percentage reductions from the BAU scenario.

[7] The analysis does not incorporate the potential emission reductions from the USEPA/NHTSA advanced fuel economy and GHG standards for medium and heavy duty trucks for model years 2014-2018 as part of this analysis. If incorporated, it would reduce the estimated emissions further. Available at: http://www.epa.gov/otaq/climate/documents/420f11031.pdf. Accessed: October, 2013.

2 Environmental and Regulatory Setting

2.1 Environmental Setting

2.1.1 Climate and Meteorology

The City is located within the South Coast Air Basin. Climate within the South Coast Air Basin (SCAB) is determined by its terrain and geographical location. The SCAB is a coastal plain characterized by connecting broad valleys and low hills and delineated by the Pacific Ocean as the southwestern border and fringed by high mountains the form the inland portion of the SCAB border. The region lies in the semi-permanent high-pressure zone of the eastern Pacific Ocean. The resulting climate is mild and tempered by cool ocean breezes. It maintains moderate temperatures and comfortable humidity, and typically limits precipitation to a few storms during the winter-wet season. This weather pattern is fairly predictable. However, periods of extremely hot weather, winter storms, or Santa Ana winds do exist.

Although the SCAB has a semi-arid climate, air near the earth surface is generally moist because of the presence of a shallow marine layer. With very low average wind speeds, there is a limited ability to disperse air contaminants horizontally. The typical wind flow pattern fluctuates only with occasional winter storms or strong northeasterly Santa Ana winds from the mountains and deserts northeast of the SCAB. Summer wind flow patterns represent worst-case conditions for air pollution, as this is a period of higher temperatures and more sunlight, which results in ozone formation.

2.1.2 Existing Conditions

The project site was previously part of the Cypress Golf Club, which permanently closed in 2004. Following the closure of the Golf Club, the golf course was demolished and the site was re-graded and all vegetation was removed, except for some eucalyptus and pepper trees and other vegetation along the southerly and easterly boundary of the project site. The project site is unimproved and is not currently utilized for any land use or activity. It is relatively flat, with elevations ranging between approximately 22 feet in the southwest corner and 32 feet in the northeast corner of the site.

2.2 Regulatory Setting

The following regulations relate to GHG emissions and were considered in the GHG analysis for the Project.

2.2.1 Federal

Supreme Court Ruling in Massachusetts et al. v. Environmental Protection Agency

The Bush Administration's approach to addressing climate change was challenged in *Massachusetts et al. v. Environmental Protection Agency*, 549 US 497 (2007). In this decision, the U.S. Supreme Court held that the United States Environmental Protection Agency (USEPA) was authorized by the Clean Air Act to regulate carbon dioxide (CO_2) emissions from new motor vehicles.[8] The Court did not mandate that the USEPA enact regulations to reduce GHG

[8] Massachusetts, et al. v. Environmental Protection Agency (2007). (Available at http://www.law.cornell.edu/supct/html/05-1120.ZS.html, accessed August 22, 2013.)

emissions, but found that the only instances in which the USEPA could avoid taking action were if it found that GHGs do not contribute to climate change or if it offered a "reasonable explanation" for not determining that GHGs contribute to climate change.

On December 7, 2009, the USEPA issued an "endangerment finding" under the Clean Air Act, concluding that GHGs threaten the public health and welfare of current and future generations and that motor vehicles contribute to greenhouse gas pollution.[9] These findings provide the basis for adopting new national regulations to mandate GHG emission reductions under the federal Clean Air Act. The EPA's endangerment finding paves the way for federal regulation of GHGs.

It was expected that Congress would enact GHG legislation, primarily for a cap-and-trade system. However, proposals circulated in both the House of Representative and Senate were controversial and it may be some time before Congress adopts major climate change legislation. Under the Consolidated Appropriations Act of 2008 (HR 2764), Congress has established mandatory GHG reporting requirements for some emitters of GHGs. In addition, on September 22, 2009, the EPA issued the Final Mandatory Reporting of Greenhouse Gases Rule. The rule requires annual reporting to the EPA of GHG emissions from large sources and suppliers of GHGs, including facilities that emit 25,000 metric tons or more per year of GHGs.

2.2.1.1 Mobile Sources

USEPA and NHTSA Joint Rulemaking for Vehicle Standards

In response to the *Massachusetts v. EPA* ruling discussed above, the Bush Administration issued an Executive Order on May 14, 2007, directing the USEPA, the Department of Transportation (DOT), and the Department of Energy (DOE) to establish regulations that reduce GHG emissions from motor vehicles, non-road vehicles, and non-road engines by 2008.

On October 10, 2008, the National Highway Traffic Safety Administration (NHTSA) released a final environmental impact statement analyzing proposed interim standards for passenger cars and light trucks in model years 2011 through 2015. The NHTSA issued a final rule for model year 2011 on March 30, 2009.[10]

On May 7, 2010, the USEPA and the NHTSA issued a final rule regulating fuel efficiency and GHG pollution from motor vehicles for cars and light-duty trucks for model years 2012–2016.[11] On May 21, 2010, President Obama issued a memorandum to the Secretaries of Transportation

[9] United States Environmental Protection Agency, *Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act*. (Available at http://www.epa.gov/climatechange/endangerment/, accessed August 22, 2013.)

[10] National Highway Traffic Safety Administration, Laws & Regulations, *CARE - Fuel Economy, Average Fuel Economy Standards Passenger Cars and Light Trucks Model Year 2011, Final Rule*, March 23, 2009. (Available at http://www.nhtsa.gov/DOT/NHTSA/Rulemaking/Rules/Associated%20Files/CAFE_Updated_Final_Rule_MY2011.pdf, accessed August 22, 2013.)

[11] United States Environmental Protection Agency, *Light Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards, Final Rule*, May 7, 2010. (Available at https://www.federalregister.gov/articles/2010/05/07/2010-8159/light-duty-vehicle-greenhouse-gas-emission-standards-and-corporate-average-fuel-economy-standards, accessed August 22, 2013.)

and Energy, and the Administrators of the USEPA and the NHTSA calling for establishment of additional standards regarding fuel efficiency and GHG reduction, clean fuels, and advanced vehicle infrastructure.[12] In response to this directive, USEPA and NHTSA issued a Supplemental Notice of Intent announcing plans to propose stringent, coordinated federal greenhouse gas and fuel economy standards for model year 2017-2025 light-duty vehicles.[13] The agencies proposed standards projected to achieve 163 grams/mile of CO_2 in model year 2025, on an average industry fleet wide basis, which is equivalent to 54.5 miles per gallon if this level were achieved solely through fuel efficiency. California has announced its support of this national program.[14] The final rule was adopted in October 2012, and NHTSA intends to set standards for model years 2022-2025 in a future rulemaking.[15,16] The GHG benefit of federal vehicle standards is not directly quantified in this report because the more stringent California vehicle standards discussed later in this section are quantified in the report.

Heavy-duty Engines and Vehicles Fuel Efficiency Standards

In addition to the regulations applicable to cars and light-duty trucks, on August 9, 2011, the USEPA and the NHTSA announced fuel economy and GHG standards for medium- and heavy-duty trucks, which applies to vehicles from model year 2014-2018.[17] USEPA and NHTSA have adopted standards for CO_2 emissions and fuel consumption, respectively, tailored to each of three main vehicle categories: combination tractors, heavy-duty pickup trucks and vans, and vocational vehicles. According to USEPA, this program will reduce GHG emissions and fuel consumption for affected vehicles by 9 percent to 23 percent. This federal standard was published after the release of CARB's mobile emissions inventory model (i.e., EMFAC2011)[18] used in this report. This report conservatively did not incorporate the GHG benefit of this federal standard.

[12] Government Printing Office, Federal Register, Vol. 75, No. 101, Presidential Documents, Improving Energy Security, American Competitiveness and Job Creation, and Environmental Protection Through a Transformation of Our Nation's Fleet of Cars and Trucks, May 21, 2010. (Available at http://www.gpo.gov/fdsys/pkg/FR-2010-05-26/html/2010-12757.htm, accessed March 11, 2015.)

[13] Government Printing Office, Federal Register, Vol. 76, No. 153, Proposed Rules, 2017-2025 Model Year Light-Duty Vehicle GHG Emissions and CAFÉ Standards: Supplemental Notice of Intent, August 9, 2011. (Available at http://gpo.gov/fdsys/pkg/FR-2011-08-09/pdf/2011-19905.pdf, accessed March 11, 2015.)

[14] California Air Resource Board, *Commitment Letter to National Program*, July 28, 2011. (Available at http://www.epa.gov/otaq/climate/letters/carb-commitment-ltr.pdf, accessed August 22, 2013.)

[15] National Highway Traffic Safety Administration, Federal Register, Vol. 77, No. 199, Rules & Regulations, 2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards, effective December 14, 2012. (Available at https://federalregister.gov/a/2012-21972, accessed March 11, 2015);

[16] National Highway Traffic Safety Administration, Corporate Average Fuel Economy Standards, Passenger Cars and Light Trucks, Model Years 2017-2025, Final Environmental Impact Statement, July 2012. (Available at http://www.nhtsa.gov/staticfiles/rulemaking/pdf/cafe/FINAL_EIS.pdf, accessed March 11, 2015.)

[17] United States Environmental Protection Agency, Office of Transportation and Air Quality. EPA and NHTSA Adopt First-Ever Program to Reduce Greenhouse Gas Emissions and Improve Fuel Efficiency of Medium-and Heavy-Duty Vehicles, August 2011. (Available at http://www.epa.gov/otaq/climate/documents/420f11031.pdf, accessed March 11, 2015.)

[18] The mobile source emission factors of CalEEMod® are based on EMFAC2011 output.

Energy Independence and Security Act

On December 19, 2007, the Energy Independence and Security Act of 2007 (EISA) was signed into law.[19] Among other key measures, the Act would do the following, which would aid in the reduction of national GHG emissions, both mobile and non-mobile:

1. Increase the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard (RFS) requiring fuel producers to use at least 36 billion gallons of biofuel by 2022.
2. Prescribe or revise standards affecting regional efficiency for heating and cooling products, procedures for new or amended standards for energy conservation, energy efficiency labeling for consumer electronic products, residential boiler efficiency, electric motor efficiency, and home appliances.
3. While superseded by NHTSA and USEPA actions described above, EISA also set miles per gallon targets for cars and light trucks and directed the NHTSA to establish a fuel economy program for medium- and heavy-duty trucks and create a separate fuel economy standard for work trucks.

Additional provisions of the EISA address energy savings in government and public institutions, promoting research for alternative energy, additional research into carbon capture, international energy programs, and the creation of "green jobs." The EISA helps reduce energy-related GHG emissions in general. The GHG benefit of this act, however, is not quantified in this report because the equivalent and more stringent state energy regulations discussed below (e.g., renewable energy portfolio standard) is quantified in this report.

2.2.2 State

Assembly Bill 32 (Statewide GHG Reductions)

The California Global Warming Solutions Act of 2006 (AB 32) was signed into law in September 2006 after considerable study and expert testimony before the Legislature. The law instructs CARB to develop and enforce regulations for the reporting and verifying of statewide GHG emissions. AB 32 directed CARB to set a GHG emission limit based on 1990 levels, to be achieved by 2020. The bill set a timeline for adopting a scoping plan for achieving GHG reductions in a technologically and economically feasible manner.[20]

The heart of AB 32 is the requirement that statewide GHG emissions be reduced to 1990 levels by 2020. Based on CARB's initial calculations, California would be required to reduce GHG emissions by approximately 28.5% below BAU predictions of year 2020 GHG emissions to achieve this goal. The CARB staff calculated 2020 BAU GHG emissions represent the emissions that would be expected to occur in the absence of any GHG reduction actions. AB 32 required CARB to adopt rules and regulations in an open public process to achieve the

[19] Government Printing Office, *Energy Independence and Security Act of 2007*, January 4, 2007. (Available at http://www.gpo.gov/fdsys/pkg/BILLS-110hr6enr/pdf/BILLS-110hr6enr.pdf, accessed March 11, 2015.)

[20] Legislative Counsel of California, *California Assembly Bill 32*, September 2006. (Available at http://www.leginfo.ca.gov/pub/05-06/bill/asm/ab_0001-0050/ab_32_bill_20060927_chaptered.pdf, accessed March 11, 2015.)

maximum technologically feasible and cost-effective GHG reductions. CARB accomplished the key milestones set forth in AB 32 including the following:

- June 30, 2007. Identification of discrete early action GHG emissions reduction measures. On June 21, 2007, CARB satisfied this requirement by approving three early action measures.[21] These were later supplemented by adding six other discrete early action measures designed to reduce GHG emissions.[22]

- January 1, 2008. Identification of the 1990 baseline GHG emissions level and approval of a statewide limit equivalent to that level and adoption of reporting and verification requirements concerning GHG emissions. On December 6, 2007, CARB approved a statewide limit on GHG emissions levels for the year 2020 consistent with the determined 1990 baseline.[23]

- January 1, 2009. Adoption of a scoping plan for achieving GHG emission reductions. On December 11, 2008, CARB adopted Climate Change Scoping Plan: A Framework for Change (Scoping Plan), discussed in more detail below.[24]

- January 1, 2010. Adoption and enforcement of regulations to implement the "discrete" actions. Several early action measures have been adopted and became effective on January 1, 2010.[25, 26]

- January 1, 2011. Adoption of GHG emissions limits and reduction measures by regulation. On October 28, 2010, CARB released its proposed cap-and-trade regulations, which would cover sources of approximately 85 percent of California's GHG emissions.[27] CARB's Board

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21 California Air Resources Board, Summary of Board Meeting, Consideration of Recommendations for Discrete Early Actions for Climate Change Mitigation in California, June 21-22, 2007. (Available at http://www.arb.ca.gov/board/ms/2007/ms062107.pdf, accessed March 11, 2015.)

22 California Air Resources Board, Summary of Board Meeting, Public Meeting to Consider Approval of Additions to Reduce Greenhouse Gas Emissions under the California Global Warming Solutions Act of 2006 and to Discuss Concepts for Promoting and Recognizing Voluntary Early Actions, October 25-26, 2007. (Available at http://www.arb.ca.gov/board/ms/2007/ms102507.pdf, accessed March 11, 2015.)

23 California Air Resources Board, *Staff Report, California 1990 Greenhouse Gas Emissions Level and 2020 Emissions Limit*, November 16, 2007. (Available at http://www.arb.ca.gov/cc/inventory/pubs/reports/staff_report_1990_level.pdf, accessed March 11, 2015.)

24 California Air Resources Board, *Climate Change Scoping Plan*, December 2008. (Available at http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf, accessed March 11, 2015.)

25 California Air Resources Board, Summary of Board Meeting, Consideration of Recommendations for Discrete Early Actions for Climate Change Mitigation in California, June 21-22, 2007. (Available at http://www.arb.ca.gov/board/ms/2007/ms062107.pdf, accessed March 11, 2015.)

26 California Air Resources Board, Summary of Board Meeting, Public Meeting to Consider Approval of Additions to Reduce Greenhouse Gas Emissions under the California Global Warming Solutions Act of 2006 and to Discuss Concepts for Promoting and Recognizing Voluntary Early Actions, October 25-26, 2007. (Available at http://www.arb.ca.gov/board/ms/2007/ms102507.pdf, accessed March 11, 2015.)

27 California Air Resources Board, *Proposed Regulation to Implement the California Cap-and-Trade Program*, December 16, 2010. (Available at http://www.arb.ca.gov/regact/2010/capandtrade10/capandtrade10.htm, accessed March 11, 2015.)

ordered CARB's Executive Director to prepare a final regulatory package for cap-and-trade on December 16, 2010.[28]

- January 1, 2012. GHG emissions limits and reduction measures adopted in 2011 became enforceable.

- On January 1, 2015, cap-and-trade compliance obligations are phased in for suppliers of natural gas, reformulated gasoline blendstock for oxygenate blending (RBOB), distillate fuel oils, and liquefied petroleum gas, requiring emissions that meet or exceed specified emissions thresholds.

On December 11, 2008, CARB adopted the Scoping Plan to achieve the goals of AB 32. The Scoping Plan established an overall framework to reduce California's GHG emissions for various categories of emissions. CARB initially determined that achieving the 1990 emission level would require a reduction of GHG emissions of by approximately 28.5 percent to achieve the 2020 emissions levels requirement in the absence of new laws and regulations. The Scoping Plan evaluated opportunities for sector-specific reductions, integrated all CARB and Climate Action Team early actions and additional GHG reduction measures by both entities, identified additional measures to be pursued as regulations, and outlined the role of a cap-and-trade program. The key elements of the Scoping Plan include:[29]

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;

- Achieving a statewide renewable energy mix of 33 percent;

- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system and caps sources contributing 85 percent of California's GHG emissions;

- Establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets;

- Adopting and implementing measures pursuant to existing state laws and policies, including California's clean car standards, goods movement measures, and the LCFS; and

- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the State of California's long-term commitment to AB 32 implementation.

Next, CARB released revised estimates of the expected 2020 emission reductions in consideration of the economic recession and the availability of updated information from

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[28] California Air Resources Board, *California Cap-and-Trade Program, Resolution 10-42*, December 16, 2010. (Available at http://www.arb.ca.gov/regact/2010/capandtrade10/res1042.pdf, accessed March 11, 2015.)

[29] California Air Resources Board, *Climate Change Scoping Plan*, December 2008. (Available at http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf, accessed March 11, 2015.)

development of measure-specific regulations. Incorporation of revised estimates in consideration of the economic recession reduced the projected 2020 emissions from 596 $MMTCO_2e$ to 545 $MMTCO_2e$.[30] Under this scenario, achieving the 1990 emissions level would require a reduction of GHG emissions of 118 $MMTCO_2e$, or approximately 21.7 percent (down from 28.5 percent), to achieve 2020 emissions levels in the BAU condition. The 2020 AB 32 baseline was also updated to account for measures incorporated into the inventory, including Pavley (vehicle model-years 2009 - 2016) and the renewable portfolio standard (12% - 20%). Inclusion of these measures further reduced the 2020 baseline to 507 $MMTCO_2e$. As a result, based on both the economic recession and the availability of updated information from development of measure-specific regulations, CARB determined in 2011 that achieving the 1990 emission level would require a reduction of GHG emissions of 80 $MMTCO_2e$ or a reduction by approximately 15.8 percent (down further from 21.7 percent) to achieve 2020 emissions levels in the BAU condition.[31,32]

Then, on October 1, 2013, CARB released an update to the Scoping Plan for discussion purposes. On February 10, 2014, CARB released its proposed First Update to the Climate Change Scoping Plan ("Updated Scoping Plan").[33] On May 22, 2014, CARB approved the Updated Scoping Plan. It describes California's progress towards AB32 goals, stating that "California is on track to meet the near-term 2020 greenhouse gas limit and is well positioned to maintain and continue reductions beyond 2020 as required by AB 32." Specifically, "if California realizes the expected benefits of existing policy goals (such as 12,000 megawatts [MW] of renewable distributed generation by 2020, net zero energy homes after 2020, existing building retrofits under AB 758, and others) it could reduce emissions by 2030 to levels squarely in line with those needed in the developed world and to stay on track to reduce emissions to 80 percent below 1990 levels by 2050."[34]

In addition, the Updated Scoping Plan further reduced the GHG emissions reduction target. It recalculated 1990 GHG emissions level using the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report (AR4).[35] Using the AR4 global warming potential (GWPs), the 427 $MMTCO_2e$ 1990 emissions level and 2020 GHG emissions limit would be slightly

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30 California Air Resources Board, *Status of Scoping Plan Recommended Measures*, July 25, 2011. (Available at http://www.arb.ca.gov/cc/scopingplan/status_of_scoping_plan_measures.pdf, accessed March 11, 2015.)

31 California Air Resources Board, *Status of Scoping Plan Recommended Measures*, July 25, 2011. (Available at http://www.arb.ca.gov/cc/scopingplan/status_of_scoping_plan_measures.pdf, accessed March 11, 2015.)

32 California Air Resources Board, *Final Supplement to the AB 32 Scoping Plan Functional Equivalent Document* (Available at http://www.arb.ca.gov/cc/scopingplan/document/final_supplement_to_sp_fed.pdf, accessed March 11, 2015).

33 California Air Resources Board, *Proposed First Update to the Climate Change Scoping Plan: Building on the Framework*, February 2014 (Available at http://www.arb.ca.gov/cc/scopingplan/2013_update/draft_proposed_first_update.pdf, accessed March 11, 2015).

34 California Air Resources Board, First Update to the Climate Change Scoping Plan. May 2014. Available at: http://www.arb.ca.gov/cc/scopingplan/2013_update/first_update_climate_change_scoping_plan.pdf. March 11, 2015

35 The GWP of CH4 was updated to 25 (from previously 21) and that of N2O was updated to 298 (from previously 310)

higher, at 431 $MMTCO_2e$.[36] Based on the revised estimates of expected 2020 emissions identified in the 2011 supplement to the Functional Environmental Document and updated 1990 emissions levels identified in the Updated Scoping Plan, achieving the 1990 emission level would require a reduction of 78 $MMTCO_2e$, which equates to a reduction by approximately 15.3 percent to achieve in 2020 emissions levels in the BAU condition. [37, 38, 39]. Thus, the Updated Scoping Plan essentially establishes a 15.3 percent reduction from BAU threshold of significance for measuring potential GHG impacts.

In certain jurisdictions, the agency models (including CalEEMod®) have not been fully updated to account for the most recently adopted 15.3 percent threshold. Therefore, to present a conservative analysis, this report uses a 15.8 percent threshold to determine whether the Project could have a significant GHG emissions impact.

<u>Senate Bill 375 and SCAG Regional Transportation Plan/Sustainable Community Plan</u>

SB 375 provides for a new planning process to coordinate land use planning, regional transportation plans, and funding priorities in order to help California meet the GHG reduction goals established in AB 32.[40] SB 375 includes provisions for streamlined California Environmental Quality Act (CEQA) review for some infill projects, such as transit oriented development. SB 375 also requires the Metropolitan Planning Organization (MPO) relevant to the Project area (i.e., the Southern California Association of Governments (SCAG) to incorporate a “sustainable communities strategy” (SCS) into its regional transportation plan (RTP) that will achieve GHG emission reduction targets by reducing vehicle miles traveled (VMT) from light-duty vehicles through the development of more compact, complete, and efficient communities.

The Scoping Plan, adopted by CARB in December of 2008, relies on the requirements of SB 375 to implement the carbon emissions reductions anticipated from land use decisions. On September 23, 2010, CARB adopted regional targets for the reduction of GHGs applying to the years 2020 and 2035.[41] For the area under SCAG’s jurisdiction (including the Project area)

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[36] California Air Resources Board, *Climate Change Scoping Plan First Update, Discussion Draft for Public Review and Comment*, October 2013 (Available at http://www.arb.ca.gov/cc/scopingplan/2013_update/discussion_draft.pdf, accessed October 2, 2013).

[37] California Air Resources Board, *Status of Scoping Plan Recommended Measures*, July 25, 2011. (Available at http://www.arb.ca.gov/cc/scopingplan/status_of_scoping_plan_measures.pdf, accessed August 22, 2013.)

[38] California Air Resources Board, *Final Supplement to the AB 32 Scoping Plan Functional Equivalent Document* (Available at http://www.arb.ca.gov/cc/scopingplan/document/final_supplement_to_sp_fed.pdf, accessed September 16, 2013).

[39] California Air Resources Board, *Climate Change Scoping Plan First Update, Discussion Draft for Public Review and Comment*, October 2013 (Available at http://www.arb.ca.gov/cc/scopingplan/2013_update/discussion_draft.pdf, accessed October 2, 2013).

[40] California. 2008. Senate Bill 375 (2007-2008 Reg. Session) Stats. 2008, ch. 728.

[41] CARB. 2010. Notice of Decision: Regional Greenhouse Gas Emissions Reduction Targets for Automobiles and Light Trucks Pursuant to Senate Bill 375. Sacramento, CA: CARB. Available at: http://www.arb.ca.gov/cc/sb375/notice%20of%20decision.pdf. March 11, 2015

CARB adopted Regional Targets for reduction of GHG emissions by 8 percent for 2020 and by 13 percent for 2035. On February 15, 2011, CARB approved the final targets.[42]

SCAG's SCS is included in the SCAG 2012-2035 Regional Transportation Plan Sustainable Communities Strategy (RTP/SCS). The document was adopted by SCAG in April 2012. The goals and policies of the RTP/SCS that reduce VMT focus on transportation and land use planning that include building infill projects, locating residents closer to where they work and play, and designing communities so there is access to high quality transit service. The 2012-2035 RTP/SCS is expected to reduce per capita transportation emissions by 9 percent by 2020 and 16 percent by 2035. In June of 2012, CARB accepted SCAG's determination that the Final RTP/SCS would meet the region's GHG reduction target.

2.2.2.1 Energy-Related Sources

Renewable Portfolio Standards (RPS) (SB 1078, SB 107 and SBX1-2)

Established in 2002 under Senate Bill (SB 1078), and accelerated in 2006 under SB 107 and again in 2011 under SBX1-2, California's RPS requires retail sellers of electric services to increase procurement from eligible renewable energy resources to 33 percent of total retail sales by 2020.[43,44,45] The 33 percent standard is consistent with the RPS goal established in the Scoping Plan.[46] As interim measures, the RPS requires 20 percent of retail sales to be sourced from renewable energy by 2013, and 25 percent by 2016. Initially, the RPS provisions applied to investor-owned utilities, community choice aggregators, and electric service providers. SBX1-2 added, for the first time, publicly owned utilities to the entities subject to RPS.[47] The expected growth in RPS to meet the standards in effect in 2008 is not reflected in the BAU calculation in the AB 32 Scoping Plan, discussed below. In other words, the Scoping Plan's BAU 2020 does not take credit for implementation of RPS that occurred after its adoption.[48] The RPS is quantitatively incorporated into this report's analysis of the Project GHG emissions.

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42 CARB. 2011. Executive Order No. G-11-024: Relating to Adoption of Regional Greenhouse Gas Emission Reduction Targets for Automobiles and Light Trucks Pursuant to Senate Bill 375. Sacramento, CA: CARB. February.

43 Legislative Counsel of California, *Senate Bill 1078*, September 2002. (Available at http://www.energy.ca.gov/portfolio/documents/documents/SB1078.PDF, accessed March 11, 2015.)

44 Legislative Counsel of California, *Senate Bill 1368*, September 2006. (Available at http://www.energy.ca.gov/emission_standards/documents/sb_1368_bill_20060929_chaptered.pdf, accessed March 11, 2015.)

45 California Air Resources Board, et al., v. Association of Irritated Residents, et al., (2011). (Available at http://www.crpe-ej.org/crpe/images/stories/7.25.11_Petition_for_Review_FINAL_with_Exhibits_smaller_version.pdf, accessed March 11, 2015.)

46 California Air Resources Board, *Climate Change Scoping Plan*, December 2008. (Available at http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf, accessed March 11, 2015.)

47 http://leginfo.ca.gov/pub/11-12/bill/sen/sb_0001-0050/sbx1_2_bill_20110412_chaptered.pdf (accessed March 11, 2015).

48 California Air Resources Board, *Climate Change Scoping Plan Appendices, Vol. I*, December 2008. (Available at http://www.arb.ca.gov/cc/scopingplan/document/appendices_volume1.pdf , accessed March 11, 2015.)

GHG Emissions Standard for Baseload Generation (SB 1368)

SB 1368 (September 29, 2006) prohibits any retail seller of electricity in California from entering into a long-term financial commitment for baseload generation if the GHG emissions are higher than those from a combined-cycle natural gas power plant. This performance standard applies to electricity generated both within and outside of California, and to publicly owned as well as investor-owned electric utilities. While SB 1368 is understood to limit long-term investments in baseload generation by the state's utilities to power plants that meet an emissions performance standard, the GHG benefit of this regulation is not quantified in this analysis because it is inapplicable to the Project.

2.2.2.2 Mobile Sources

Mobile Source Reductions (AB 1493)

AB 1493 ("the Pavley Standard" or AB 1493) required CARB to adopt regulations by January 1, 2005, to reduce GHG emissions from non-commercial passenger vehicles and light-duty trucks in model years 2009 through 2016. The bill also required the California Climate Action Registry to develop and adopt protocols for the reporting and certification of GHG emissions reductions from mobile sources for use by CARB in granting emission reduction credits. The bill authorizes CARB to grant emission reduction credits for reductions of GHG emissions prior to the date of enforcement of regulations, using model year 2000 as the baseline for reduction.

In 2004, CARB applied to the USEPA for a waiver under the federal Clean Air Act to authorize implementation of these regulations. The waiver request was formally denied by the USEPA in December 2007 after California filed suit to prompt federal action. In January 2008, the State Attorney General filed a new lawsuit against the USEPA for denying California's request for a waiver to regulate and limit GHG emissions from these vehicles. In January 2009, President Barack Obama issued a directive to the USEPA to reconsider California's request for a waiver. On June 30, 2009, the USEPA granted the waiver to California for its GHG emission standards for motor vehicles. As part of this waiver, USEPA specified the following provision: CARB may not hold a manufacturer liable or responsible for any noncompliance caused by emission debits generated by a manufacturer for the 2009 model year. CARB has adopted a new approach to passenger vehicles (cars and light trucks), by combining the control of smog-causing pollutants and GHG emissions into a single coordinated package of standards. The new approach also includes efforts to support and accelerate the numbers of plug-in hybrids and zero-emission vehicles in California. These standards will apply to all passenger and light duty trucks used by customers, employees of and deliveries to the proposed Project. The Pavley Standard is quantitatively incorporated into this report’s analysis of the Project GHG emissions.

Low Carbon Fuel Standard

Executive Order S-01-07 (January 18, 2007) requires a 10 percent or greater reduction in the average fuel carbon intensity for transportation fuels in California regulated by CARB. CARB identified the LCFS as a Discrete Early Action item under AB 32, and the final resolution (09-31) was issued on April 23, 2009 (CARB 2009).[49] In 2009, CARB approved for adoption the LCFS regulation, which became fully effective in April 2010 and is codified at Title 17, CCR, Sections 95480-95490. The LCFS will reduce GHG emissions by reducing the carbon intensity of transportation fuels used in California by at least 10 percent by 2020. Carbon intensity is a measure of the GHG emissions associated with the various production, distribution, and use steps in the "lifecycle" of a transportation fuel. On December 29, 2011, the U.S. District Court for the Eastern District of California issued several rulings in the federal lawsuits challenging the LCFS. Opponents argued that the LCFS violates the Supremacy Clause (US Constitution, Article VI, Clause 2)[50] and Commerce Clause (US Constitution, Article 1, Section 8, Clause 3)[51] of the U.S. Constitution by discriminating against fuel produced out-of-state. One of the district court's rulings preliminarily enjoined CARB from enforcing the regulation. In January 2012, CARB appealed that decision to the Ninth Circuit Court of Appeals. On September 18, 2013, the Ninth Circuit issued its decision affirming the District Court's conclusion that LCFS ethanol and initial crude-oil provisions are not facially discriminatory, but remanded to the district court to determine whether the LCFS ethanol provisions are discriminatory in purpose and effect. Additionally, the Ninth Circuit remanded to the District Court with instructions to vacate the preliminary injunction against CARB's enforcement of the regulation. In 2014, the United States Supreme Court declined to hear an appeal of the Ninth Circuit's decision, and thus the LCFS regulations remain in full force and effect. The LCFS is quantitatively incorporated into this report's analysis of the Project GHG emissions.

Advanced Clean Cars

In January 2012, CARB approved the Advanced Clean Cars Program, a new emissions-control program for model years 2017 through 2025. The program combines the control of smog, soot, and GHGs with requirements for greater numbers of zero-emission vehicles. By 2025, when the rules will be fully implemented, the new automobiles will emit 34 percent fewer global warming gases and 75 percent fewer smog-forming emissions.

The program also requires car manufacturers to offer for sale an increasing number of zero-emission vehicles (ZEVs) each year, including battery electric, fuel cell, and plug-in hybrid electric vehicles. In December 2012, CARB adopted regulations allowing car manufacturers to comply with California's GHG emissions requirements for model years 2017-2025 through compliance with the EPA GHG requirements for those same model years.[52] The Advanced Clean Cars Program is quantitatively incorporated into this report's analysis of the Project GHG emissions.

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[49] California Air Resources Board, Initial Statement of Reason for Proposed Regulation for The Management of High Global Warming Potential Refrigerant for Stationary Sources, October 23, 2009. (Available at http://www.arb.ca.gov/regact/2009/gwprmp09/isorref.pdf, accessed March 11, 2015.)

[50] The Supremacy Clause establishes the U.S. Constitution, federal statues, and the U.S. Treaties as "the supreme law of the land," establishing that federal laws take precedence over state laws.

[51] The Commerce Clause grants the federal government the authority "To regulate Commerce within foreign Nations, and among the several States and with the Indian Tribes." Case law has determined that pollution and hazardous materials can be considered "commerce" because they can be produced in one state but dispersed or transported to other states.

[52] CARB, Lev III and ZEV Regulation Amendments For Federal Compliance Option, December 31 (Available at http://www.arb.ca.gov/regact/2012/leviiidtc12/leviiidtc12.htm, accessed March 11, 2015)

<u>Transportation Fuel: Phased-In Cap-and-Trade Compliance Obligation</u>

Pursuant to AB 32, CARB was allowed, but not required, to include among mechanisms intended to reduce GHG emissions a "system of market-based declining annual aggregate emission limits." As noted above, CARB developed a Scoping Plan that directed CARB staff to develop, among other programs, a cap-and-trade mechanism that would apply a declining aggregate cap on GHG emissions and provide a flexible compliance system using tradable instruments. On October 20, 2011, CARB adopted the final cap-and-trade regulation (CCR Title 17, Subchapter 10, Article 5). The program will impose a "cap" on the total GHG emissions from covered entities in the state, and the quantity of emissions allowed under the cap will decrease each year, ultimately reaching the goal of returning state-wide GHG emissions to 1990 levels by 2020. The quantity of allowed emissions actually increases between 2014 and 2015, but that is to account for the addition of the fuel importers and distributors and additional electricity importers to the program as discussed below. The net effect is to reduce overall GHG emissions.

The cap and trade program started on January 1, 2012, and will proceed in "compliance phases," the first of which began on January 1, 2013. In the first phase, the program applies to electric utilities, importers of electricity, and specified industries, including refineries. Approximately 350 businesses representing 600 industrial facilities are included in the program. In 2015, importers and distributors of fossil fuels will be added to the program in the second phase. Specifically, on January 1, 2015, cap-and-trade compliance obligations will be phased in for suppliers of natural gas, reformulated gasoline blendstock for oxygenate blending (RBOB), distillate fuel oils, and liquefied petroleum gas that meet or exceed specified emissions thresholds. The threshold that triggers a cap-and-trade compliance obligation for a fuel supplier is 25,000 metric tonnes or more of CO_2e annually from the GHG emissions that would result from full combustion or oxidation of quantities of fuels (including natural gas, RBOB, distillate fuel oil, liquefied petroleum gas, and blended fuels that contain these fuels) imported and/or delivered to California. Phasing in of cap-and-trade compliance obligations for transportation fuel providers further reduces GHG emissions attributable to mobile sources, beyond the GHG emissions reductions achieved by the Pavley Standard, LCFS, and Advanced Clean Cars Program discussed above. This analysis does not incorporate the benefits of GHG emissions reductions based on cap-and-trade compliance obligations applicable to transportation fuel suppliers.

2.2.2.3 Building Standards

<u>Green Building Code ("Code") (California Code of Regulations, Title 24)</u>

Energy Conservation Standards for new residential and commercial buildings were originally adopted by the California Energy Resources Conservation and Development Commission in June 1977 and most recently revised in 2013 (Title 24 CCR Part 6). In general, Title 24 requires the design of building shells and building components to conserve energy. The standards are updated periodically to allow for consideration and possible incorporation of new energy efficiency technologies and methods. The 2012 Appliance Efficiency Regulations (Title 20 CCR §1601-1608), dated October 2012, were adopted by the California Energy Commission (CEC) on January 12, 2012, and became effective February 1, 2013. The regulations include standards for both federally-regulated appliances and non-federally regulated appliances. While these regulations are now often seen as BAU in California, they do exceed the standards imposed by many other states and reduce GHG emissions by reducing energy demand.

On July 17, 2008, the California Building Standards Commission adopted the nation's first green building standards. The California Green Building Standards Code (Part 11, Title 24) was adopted as part of the California Building Standards Code (Title 24 CCR). Part 11 established voluntary standards on planning and design for sustainable site development, energy efficiency (in excess of the California Energy Code requirements), water conservation, material conservation, and internal air contaminants. Some of these standards became mandatory in Part 11 of the 2010 edition of the Code.[53]

The CEC adopted changes to the 2013 Building Energy Efficiency Standards contained in Title 24 CCR Part 6 (also known as the California Energy Code), and associated administrative regulations in Part 1 (collectively referred to here as the Standards). The 2013 Building Energy Efficiency Standards are 25 percent more efficient than previous standards for residential construction and 30 percent better for nonresidential construction.[54] The standards will offer builders better windows, insulation, lighting, ventilation systems and other features that reduce energy consumption in homes and businesses. Title 24 CCR Part 6 was originally scheduled to go into effect on January 1, 2014, but was revised to go into effect on July 1, 2014.[55] The GHG reduction from BAU due to compliance with Title 24 is quantitatively incorporated into this report’s analysis of the Project GHG emissions.

2.2.2.4 Waste Diversion

California Integrated Waste Management Act of 1989

The California Integrated Waste Management Act of 1989 (Public Resources Code Sections 40000 *et seq*.) requires each jurisdiction's source reduction and recycling element to include an implementation schedule that shows (1) diversion of 25 percent of all solid waste by January 1, 1995, through source reduction, recycling, and composting activities; and (2) diversion of 50 percent of all solid waste on and after January 1, 2000, through source reduction, recycling, and composting facilities.[56] Additionally, jurisdictions are not prohibited from implementing source reduction, recycling, and composting activities designed to exceed these requirements.[57]

AB 341 (2011) amended the California Integrated Waste Management Act of 1989 to include a provision declaring that it is the policy goal of the state that not less than 75 percent of solid

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[53] California Building Standards Commission, *2010 California Green Building Standards Code, California Code of Regulations, Title 24, Part 11*, effective January 1, 2011. (Available at http://www.bsc.ca.gov/Home/CALGreen.aspx, accessed March 11, 2015.)

[54] California Building Standards Commission, *Energy Commission Approves More Efficient Buildings for California's Future*, News Release, May 31, 2012. (Available at http://www.energy.ca.gov/releases/2012_releases/2012-05-31_energy_commission_approves_more_efficient_buildings_nr.html, accessed March 11, 2015).

[55] Division of the State Architect, 2014. *Title 24 Overview.* Available at: http://www.dgs.ca.gov/dsa/Programs/progCodes/title24.aspx, accessed March 27, 2015.

[56] Cal. Pub. Res. Code § 41780(a).

[57] Cal. Pub. Res. Code § 41780(b).

waste generated be source reduced, recycled, or composted by the year 2020, and annually thereafter.[58] In addition, AB 341 required the California Department of Resources Recycling and Recovery (CalRecycle) to develop strategies to achieve the state's policy goal.[59] CalRecycle conducted several stakeholder workshops and published a discussion document in May 2012 titled *California's New Goal: 75 Percent Recycling*, which identifies concepts that CalRecycle believes would assist the state in reaching the 75 percent goal by 2020.[60] This report's analysis considers compliance with the applicable portions of AB 341. .

2.2.2.5 Other Potentially Applicable State Regulations or Policies

<u>Executive Order S-3-05</u>

In June 2005, former Governor Schwarzenegger signed Executive Order S-3-05, which established the following GHG emission reduction targets for California: (1) by 2010, reduce GHG emissions to 2000 levels; (2) by 2020, reduce GHG emissions to 1990 levels; and, (3) by 2050, reduce GHG emissions to 80 percent below 1990 levels.

As of 2004, California was emitting 12 percent more GHG emissions than in 1990.[61] For California to emit 80 percent less than it emitted in 1990, the emissions would be only about 18 percent of the 2004 emissions. Accounting for a population growth from 35,840,000 people in 2004 to approximately 55,000,000 people in 2050, the emissions per capita would have to be only about 12 percent of what they were in 2004. This means an 88 percent reduction in per capita GHG emissions from today's emissions intensities must be realized in order to achieve California's 2050 GHG goals. Clearly, energy efficiency and reduced vehicle miles traveled will play important roles in achieving this aggressive goal, but the decarbonization of fuel will also be necessary.

The extent to which GHG emissions from traffic at the Project will change in the future depends on the quantity (e.g. number of vehicles, average daily mileage) and quality (i.e. carbon content) of fuel that will be available and required to meet both regulatory standards and residents' needs. As discussed above, renewable power requirements, the low carbon fuel standard, and vehicle emissions standards will all decrease GHG emissions per unit of energy delivered or per vehicle mile traveled. Future regulated fuel decarbonization will reduce the carbon emissions from the vehicular emissions for the proposed Project.

The CEC published "State Alternative Fuels Plan"[62] in which it noted the existence of "challenging but plausible ways to meet 2050 [transportation] goals." A key finding from this

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[58] Cal. Pub. Res. Code § 41780.01(a).

[59] Cal. Pub. Res. Code § 41780.02.

[60] CalRecycle, 2013. California's 75 Percent Initiative. Available at: http://www.calrecycle.ca.gov/75percent/. Accessed: March 11, 2015.

[61] California Energy Commission. 2006. Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004. October. Available at: http://www.energy.ca.gov/2006publications/CEC-600-2006-013/CEC-600-2006-013-D.PDF. Accessed: March 11, 2015.

[62] California Energy Commission. 2007. State Alternative Fuels Plan. December. CEC-600-2007-011-CMF. Available at: http://www.energy.ca.gov/2007publications/CEC-600-2007-011/CEC-600-2007-011-CMF.PDF. Accessed: March 11, 2015.

analysis is that reducing today's average per capita driving miles by about 5 percent (or back to 1990 levels), in addition to the decarbonization strategies listed below, would achieve S-03-05 goals of 80 percent below 1990 levels. The approach described below is directly[63] from the CEC report and similar to CARB's anticipated path.[64]

An 80 percent reduction in GHG emissions associated with personal transportation can be achieved even with projected population growth to 55 million, an increase of 50 percent. The following set of measures could be combined to achieve this result:

- Lowering the energy needed for personal transportation by tripling the energy efficiency of on-road vehicles in 2050 with:

  a. Conventional gas, diesel, and flexible fuel vehicles (FFVs) averaging more than 40 miles per gallon (mpg).

  b. Hybrid gas, diesel, and FFVs averaging almost 60 miles per gallon.

  c. All electric and plug-in hybrid electric vehicles (PHEVs) averaging well over 100 miles per gallon (on a greenhouse gas equivalents (GGE) basis) on the electricity cycle.

  d. Fuel cell vehicles (FCVs) averaging over 80 miles per gallon (on a GGE basis).

- Moderating growth in per capita driving, reducing today's average per capita driving miles by about 5 percent or back to 1990 levels.

- Changing the energy sources for transportation fuels from the current 96 percent petroleum-based to approximately:

  a. 30 percent from gasoline and diesel from traditional petroleum sources or lower GHG emission fossil fuels such as natural gas.

  b. 30 percent from transportation biofuels.

  c. 40 percent from a mix of electricity and hydrogen.

- Producing transportation biofuels, electricity, and hydrogen from renewable or very low carbon-emitting technologies that result in, on average, at least 80 percent lower life cycle GHG emissions than conventional fuels.

- Encouraging more efficient land uses and greater use of mass transit, public transportation, and other means of moving goods and people.

[63] California Energy Commission. 2007. State Alternative Fuels Plan. December. CEC-600-2007-011-CMF. Available at: http://www.energy.ca.gov/2007publications/CEC-600-2007-011/CEC-600-2007-011-CMF.PDF. Accessed: March 11, 2015.

[64] CARB. 2008. Climate Change Scoping Plan. December. Available at: http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf. Accessed: March 11, 2015.

A recent study[65] has shown that in order to meet the 2050 target, aggressive technologies in the transportation and energy sectors (such as electrification, advanced batteries, and efficient biofuels) would likely be required. Similarly, wholesale shifts in energy technology and more aggressive regulations, both of which are not currently in place, would likely be required to achieve the 2050 goals. Also, there are currently no adopted methods or regional targets for agencies to use for such impact analysis. Moreover, the executive order applies to statewide policymaking and hence analyzing a single residential mixed-use project within that context is not informative. The potential GHG impacts associated with the Project are not analogous to impacts that could result from long-range planning documents or policies. Therefore, analyzing the Project impacts relative to Executive Order S-3-05 is inappropriate for CEQA purposes.

2.2.3 Regional

2.2.3.1 South Coast Air Quality Management District Policies

GHG Thresholds

The SCAQMD is principally responsible for comprehensive air pollution control in the Basin, which includes Los Angeles, Orange, and the urbanized portions of Riverside and San Bernardino Counties, including the Project site. SCAQMD works directly with SCAG, County transportation commissions, and local governments and cooperates actively with all federal and State government agencies to regulate air quality.

In April 2008, SCAQMD convened a Working Group to develop GHG significance thresholds. On December 5, 2008, the SCAQMD Governing Board adopted its staff proposal for an interim CEQA GHG significance threshold for projects where the SCAQMD is the lead agency. As to all other projects, where the SCAQMD is not the lead agency, the Board has, to date, only adopted an interim threshold of 10,000 $MTCO_2E$ per year for industrial stationary source projects.[66] For all other projects, SCAQMD has not adopted a GHG significance threshold for use in the Basin.

Criteria Pollution Regulations

The SCAQMD administers a plethora of air quality regulations that control the emission of criteria pollutants and maintain or seek to achieve air quality standards for criteria pollutant and Toxic Air Contaminants (TAC) set by the federal and state Clean Air Acts. Unlike GHG, criteria pollutants and TACs have localized rather than global impacts. The Basin is home to about half the population of the State of California and is the second most populated area in the United States and one of the worst in the country for air pollution.[67] As such, the SCAQMD undertakes a tremendous effort to control air pollution and improve the air quality for the health of its residents. The goal of reducing criteria and TAC pollutants can sometimes have the co-benefit effect of reducing GHG emissions, for example through zero emission technologies. However,

[65] Lawrence Berkeley National Laboratory (LBL). 2011. California's Energy Future – The View to 2050. May. Available at: http://ccst.us/publications/2011/2011energy.php. Accessed: March 11, 2015.

[66] South Coast Air Quality Management District, *Board Meeting Date: December 5, 2008, Agenda No. 31, Interim CEQA GHG Significance Threshold for Stationary Sources, Rules and Plans for use by the AQMD*, website. (Available at http://www.aqmd.gov/home/governing-board/agendas-minutes, accessed March 11, 2015.)

[67] South Coast Air Quality Management District, *About South Coast AQMD*, website. (Available at http://aqmd.gov/aqmd/index.html, accessed March 11, 2015.)

some methods of reducing criteria and TAC pollutants may in fact increase the amount of GHG emissions because the technologies increase energy use. The SCAQMD is the regional agency which weighs and balances the sometimes competing interests and makes the policy decisions as to prioritizing air quality reductions.

2.3 Threshold of Significance for CEQA Impact Analysis

This section explains which thresholds of significance were used to analyze the Project impacts.

The CEQA Guidelines establish qualitative thresholds for analyzing GHG impacts. In particular, Appendix G of the CEQA Guidelines inquiries whether a project would (1) generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment or (2) conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs.

As noted above, the SCAQMD has not adopted a numeric threshold for determining the significance of construction or operational GHG impacts from a residential/commercial development project. The lead agency (City of Cypress) also has not adopted a GHG threshold of significance. Therefore, as is industry standard, this report uses a conservative 15.8 percent reduction of GHG emissions from BAU (consistent with AB 32 and CARB calculations) to determine whether the Project has a significant GHG emission impact.[68] A detailed discussion of the applicable threshold of significance is provided in the Executive Summary and Section 2.2.2: State Assembly Bill 32 - GHG Reductions above. Accordingly, this report assesses significance of GHG impacts by analyzing consistency with AB 32 and by quantitatively evaluating the Project's GHG emissions reduction compared to a BAU projection.

[68] Because SCAQMD recommended modeling tool for this analysis (i.e., CalEEMod®) does not incorporate the AR4 GWPs, this report uses the more conservative value from CARB (i.e., 15.8%) to determine whether the Project has a significant GHG emission impact.

3 The Analysis of Project Impacts

This section discusses the methodology ENVIRON International Corporation (ENVIRON) used to quantify the emissions from the Project. It also calculates emissions for each source of GHG associated with the Project; and then analyzes whether the total Project emissions exceed any of the adopted GHG emissions thresholds. Finally, this section discusses whether the Project would conflict with any plan, policy, or regulation adopted to reduce GHG emissions.

3.1 GHG Emissions Inventory for Project

As discussed below, ENVIRON developed GHG emissions inventories associated with the Project, which include construction emissions and operational emissions. ENVIRON considered sub-categories of GHG operational emissions including: area sources, energy use, water and wastewater, solid waste, and mobile sources. For each sub-category, this section compares the emissions associated with the Project scenario against those for the BAU scenario. The calculated emissions by sub-category are later summed for the impact analysis that evaluates whether the total emissions reduction of the Project (i.e., difference between the total Project emissions and BAU emissions from all source categories) achieve the applicable GHG reduction target of 15.8 percent.

As demonstrated below, the Project does not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment because it achieves an emission reduction of 16.5% below BAU, which is approximately 0.7% better than the 15.8% emission reduction threshold of significance established by CARB.

3.1.1 Units of measurement: Tonnes of CO_2 and CO_2e

The term “GHGs” includes gases that contribute to the natural greenhouse effect, such as CO_2, methane (CH_4), nitrous oxide (N_2O), and water, as well as gases that are only man-made and that are emitted through the use of modern industrial products, such as hydrofluorocarbons (HFCs) and Chlorofluorocarbons (CFCs). The most important GHG in human-induced global warming is CO_2. While many gases have much higher GWPs than CO_2, CO_2 is emitted in such vastly higher quantities that it accounts for approximately 83.7% of the GWP of all GHGs emitted by the United States.[69]

Water vapor is the most abundant non-anthropogenic GHG and has significant contribution to the natural, background greenhouse effect. However, water vapor produced directly by human activity has a trivial contribution to the water vapor concentration in the atmosphere.[70,71] In addition, according to US EPA:[72] “ . . . [s]ignificant changes to global atmospheric

[69] Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2011, U.S. Environmental Protection Agency. Available online at: http://www.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2013-Main-Text.pdf. Accessed: March 11, 2015.

[70] Intergovernmental Panel on Climate Change (IPCC). 2007. Climate Change 2007: Working Group I – The Physical Science Basis (FAQ). Available at: https://www.ipcc.ch/publications_and_data/ar4/wg1/en/faq-2-1.html

[71] U.S. Energy Information Administration. Energy and the Environment Explained – Greenhouse Gas. Available at: http://www.eia.gov/Energyexplained/?page=environment_about_ghg

[72] U.S. EPA. 2008. Regulating Greenhouse Emissions under the Clean Air Act. Available at:

concentrations of water vapor occur indirectly through human-induced global warming, which then increases the amount of water vapor in the atmosphere because a warmer atmosphere can hold more moisture. Therefore, changes in water vapor concentrations are not an initial driver of climate change, but rather an effect of climate change which then acts as a positive feedback that further enhances warming." Since the anthropogenic water vapor emissions are not a material driver of anthropogenic climate change, water vapor emissions are not counted in U.S. or international GHG inventories and therefore not regulated as other major GHGs (i.e., carbon dioxide, methane, nitrous oxide, and industrial gases).

For the gases that are regulated, the effect each of these gases has on global warming is a combination of the volume of their emissions and their GWP. GWP indicates, on a pound for pound basis, how much a gas will contribute to global warming relative to how much warming would be caused by the same mass of CO_2. CH_4 and N_2O are substantially more potent than CO_2, with GWPs of 21 and 310, respectively. GHG emissions are typically measured in terms of mass of CO_2e. CO_2e are calculated as the product of the mass of a given GHG and its specific GWP.[73]

In many sections of this report, including the final summary sections, emissions are presented in units of CO_2e either because the GWPs of CH_4 and N_2O were accounted for explicitly, or the CH_4 and N_2O are assumed to contribute a negligible amount of GWP when compared to the CO_2 emissions from that particular emissions category.

In this report, a tonne refers to a metric tonne (1,000 kilograms). Exact totals presented in all tables and report sections herein may not equal the sum of components due to independent rounding of numbers.

3.1.2 Methodology and Modeling

CalEEMod®

ENVIRON utilized the California Emission Estimator Model version 2013.2.2 (CalEEMod®)[74] to quantify the GHG emissions for the Project. CalEEMod® is a statewide software program designed to calculate both criteria and GHG emissions from development projects in California. This software model was developed in collaboration with California air districts led by SCAQMD and is currently supported state-wide for use in quantifying the emissions associated with development projects undergoing environmental review. CalEEMod® utilizes widely accepted models for emission estimates combined with appropriate default data that can be used if site-specific information is not available. These models and default calculations use sources such as

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http://www.epa.gov/climatechange/Downloads/anpr/ANPRPreamble.pdf

[73] In the updated Draft Climate Change Scoping Plan published by ARB in 2014, the GWPs for CH_4 and N_2O were updated from 21 to 25 and from 310 to 298, respectively. This change in GWP is not expected to meaningfully change the analysis presented herein due to the relatively small GHG contribution from CH_4 and N_2O. This report relies upon the GWPs assumed in CalEEMod®, not the newly proposed GWPs in the Draft Climate Change Scoping Plan.

[74] SCAQMD, 2013, California Emissions Estimator Model. Available at: http://www.CalEEMod.com/. Accessed: March 11, 2015.

the USEPA AP-42 emission factors,[75] CARB's on-road and off-road equipment emission models such as the EMission FACtor model (EMFAC) and the Emissions Inventory Program model (OFFROAD), and studies commissioned by California agencies such as the CEC and CalRecycle.

CalEEMod® is based upon ARB-approved Off-Road and On-Road Mobile-Source Emission Factor models (OFFROAD and EMFAC, respectively), and is designed to calculate construction and operational emissions for land use development projects and allows for the input of project specific information. OFFROAD2011[76] is an emissions factor model used to calculate emission rates from off-road mobile sources (e.g., construction equipment, agricultural equipment). EMFAC2011[77] is an emissions factor model used to calculate emissions rates from on-road vehicles (e.g., passenger vehicles, haul trucks).

CalEEMod® provides a platform to calculate both construction emissions and operational emissions from a land use project. It calculates both the daily maximum and annual average for criteria pollutants as well as total or annual GHG emissions. The model also provides default values for water and energy use. Specifically the model performs the following calculations:

- Short term construction emissions associated with site preparation, grading, site work, infrastructure, building, architectural coating, and paving from off-road construction equipment, and on-road mobile equipment associated with workers, vendors, and hauling.
- Operational emissions associated with the fully built out land use development, such as on-road mobile vehicle traffic generated by the land uses, fugitive dust associated with roads, volatile emissions of ROG from architectural coating, off-road emissions from landscaping equipment, volatile emissions of ROG from consumer products and cleaning supplies, wood stoves and hearth usage, natural gas usage in the buildings, electricity usage in the buildings, water usage by the land uses, and solid waste disposal by the land uses.
- One-time vegetation sequestration changes, such as permanent vegetation land use changes and new tree plantings.

When applicable, the model allows certain emission reductions for short-term construction and operational emissions as described in California Air Pollution Control Officers Association (CAPCOA)'s Quantifying Greenhouse Gas Mitigation Measures.[78] In addition, CalEEMod® contains default values and existing regulation methodologies to use in each specific local air district region. Appropriate statewide default values can be utilized if regional default values are

75 The USEPA maintains a compilation of Air pollutant Emission Factors and process information for several air pollution source categories. The data is based on source test data, material balance studies, and engineering estimates. Available at: http://epa.gov/ttnchie1/ap42/, Accessed: March 11, 2015.

76 CARB, 2007. Off Road Mobile Source Emission factors. Available at: http://www.arb.ca.gov/msei/msei.htm, Accessed: March 11, 2015.

77 CARB, 2010. EMFAC 2007 Release. Available at: http://www.arb.ca.gov/emfac/. Accessed: February, 2013. Accessed: March 11, 2015.

78 CAPCOA. Quantifying Greenhouse Gas Mitigation Measures. August 2010. Available at: http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf. Accessed March 11, 2015.

not defined. ENVIRON used project-specific inputs for the CalEEMod® when such data were available. Otherwise, CalEEMod® default factors for the Orange County area that is within the SCAQMD jurisdiction for the GHG emission inventory are used. For this Project, the Project-specific-inputs include construction schedule and equipment list, operational traffic trips, and operational PDFs. ENVIRON also relied on data in the Traffic Impact Study prepared by Kimley Horn in April 2015 for the Project.[79]

3.1.3 Methodology for Indirect GHG Emissions from Operational Electricity Use

The indirect GHG emissions created as a result of electricity use are based on the following methodology. Indirect emissions, such as when electricity is used in a building, are typically due to electricity generation from offsite power plant locations. For this Project, electrical power will be supplied to the Project Site by Southern California Edison (SCE).

Using CalEEMod®, the electricity intensities are multiplied by the emission intensity factors for the GHGs and are classified as indirect emissions. Emission intensity factors are GHG emission rates from a given source relative to the intensity of a specific activity in term of the amount of GHG released per megawatt of energy produced. The default electricity intensity for SCE in CalEEMod® for CO_2, CH_4, and N_2O are 630.89, 0.029, and 0.006 pounds (lbs) per megawatt-hour (MWh), respectively. The CO_2 default factor is based on the 2007 SCE Power/Utility Protocol (PUP) report.[80] The CH_4 and N_2O default factors are based on USEPA's E-Grid values.[81]

For this Project, the CalEEMod® CO_2 intensity factor is modified based on the average factor from the 2006 and 2007 PUP Reports to account for the RPS. The intensity factors for total energy delivered were calculated by multiplying the percentage of energy delivered from non-renewable energy by the CO_2 emissions per total non-renewable energy metric calculated. Total energy delivery and total CO_2 emissions are provided in the PUP Reports. The CO_2 intensity factor presented in this analysis is consistent with the 33% RPS for 2020. Based on the PUP reports issued by the Climate Registry, renewable energy sources do not result in net new CO_2 emissions. CalEEMod® emission intensity factors for CH_4 and N_2O were used for this Project as a conservative estimate for these emissions.

For the BAU scenario, the CalEEMod® default CO_2 intensity factor is adjusted to account for the 20% RPS for 2020, which is consistent with the 2020 AB 32 baseline in the 2011 updated Scoping Plan.

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[79] Provided by Kimley-Horn on April, 2015.

[80] SCE Power/Utility Protocol (PUP) Report available at: http://www.climateregistry.org/tools/carrot/carrot-public-reports.html. The 2007 report is the most recent available data. *See also* Appendix B of this report.

[81] USEPA. eGRID2012 Version 1.0. Year 2009 Summary Table. Available at: http://www.epa.gov/cleanenergy/documents/egridzips/eGRID2012V1_0_year09_SummaryTables.pdf. Accessed March 11, 2015.

Details regarding the specific methodologies used by CalEEMod® can be found in the CalEEMod® User's Guide and associated appendices.[82] The CalEEMod® output files are provided for reference in Appendix A to this report.

3.1.4 One-Time Emissions

One-time emissions are those emissions that are not reoccurring over the life of the project. This includes emissions associated with construction and emissions associated with land use changes. The emission estimation methodology for construction, vegetation, and land use (i.e., baseline/existing conditions) changes are described in detail below.

3.1.4.1 Construction Emissions

This section describes the calculation of GHG emissions from construction activities at the Project site. The proposed plan for the Project anticipates construction to happen in nine phases from 2016 through 2018.

The major construction phases included in this analysis are:

- Site Preparation (Phase 1): involves clearing vegetation (grubbing and tree/stump removal) prior to grading.
- Grading (Phase 2): involves the cut and fill of land to ensure the proper base and slope for the construction foundation and installing wet and dry utilities.
- Paving (Phase 2): involves the laying of concrete or asphalt such as in parking lots or roads.
- Building Construction (Phases 3-9): involves the construction of structures and buildings.
- Architectural Coating (Phases 3-9): involves the application of coatings to both the interior and exterior of buildings or structures

GHG emissions from these construction phases are largely attributable to fuel use from construction equipment and worker commuting. ENVIRON used CalEEMod® to calculate construction emissions. The construction schedule, off-road equipment lists and equipment specifications, and daily trip counts for workers, vendors, and haul trucks as identified for the Project are discussed in Sections 3.1.4.1.1 and 3.1.4.1.2. CalEEMod® version 2013.2.2 default values were used for equipment and vehicle emission factors, equipment load factors and vehicle trip lengths.

ENVIRON's analysis was based on a mix of project specific values including the numbers and types of equipment that will be used in the construction of the Project as well as the duration of the different construction phases. The construction specifics (e.g., horsepower and load factor) and number of worker, vendor, and hauling trips were based on CalEEMod® default data. The Project area is assumed to be developed in nine phases over an approximately three-year time frame. The GHG calculations are intended to estimate long-term emissions. To be conservative, each piece of equipment was assumed to be operated for 6 days a week and 6 hours a day

[89] SCAQMD, 2013, California Emissions Estimator Model User's Guide. Version 2013.2.2. July. Available at: http://www.CalEEMod.com/. Accessed March 11, 2015.

during a given phase duration. The construction is assumed to start in 2016 and will be completed in 2018. The construction schedule and equipment lists are shown in Tables 2 and 3, respectively.

3.1.4.1.1 Emissions from Construction Equipment

The emission calculations associated with construction equipment are from off-road equipment engine use based on the equipment list and phase length. The fugitive emissions from off-road equipment performing work are also included in this analysis.

CalEEMod® assumes all of the construction equipment operates on diesel fuel. The calculations associated with this modeling include the running exhaust emissions from off-road equipment. Since the equipment is assumed to be diesel, there are no starting or evaporative emissions associated with the equipment as these are negligible for diesel-fueled equipment. CalEEMod® calculates the exhaust emissions based on CARB's OFFROAD2011 methodology using the equation presented below.[83]

$$Emissions_{Diesel} = \sum_{i}(EF_i \times Pop_i \times AvgHP_i \times Load_i \times Activity_i)$$

Where:

EF = Emission factor in grams per horsepower-hour (g/bhp-hr) as processed from OFFROAD2011

Pop = Population, or the number of pieces of equipment

AvgHp = Maximum rated average horsepower

Load = Load factor

Activity = Hours of operation

i = equipment type

For the Project scenario, the total Project GHG emissions associated with off-road construction equipment are 717 MT CO_2e as shown in Table 4. Most of the emissions occur during the grading and building construction phases. As discussed earlier, the construction emissions for the BAU scenario are assumed to equal those for the Project scenario and therefore also 717 MT CO_2e.

3.1.4.1.2 GHG Emissions from On-Road Trips

Construction generates on-road vehicle exhaust, evaporative, and dust emissions from personal vehicles for worker and vendor commuting, and trucks for soil and material hauling and delivery.

[83] SCAQMD, 2013, California Emissions Estimator Model User's Guide, Appendix A, pages 5-6. Version 2013.2.2. February. Available at: http://www.CalEEMod.com/. Accessed: December, 2013.

These emissions are based on the number of trips and vehicle miles traveled (VMT) along with emission factors from EMFAC2011. The Project specific estimates and CalEEMod® default values were used to calculate construction on-road trips and VMT.

CalEEMod® estimates trips and VMT based on the following assumptions:

- The number of hauling trips during the grading phase is based on the CalEEMod® default methodology, which is calculated from the total of 93,390 cubic yards of material imported during the site preparation and grading phases (i.e. grading phases 1 to 3) and an average haul truck haulage volume of 16 cubic yards. The VMT associated with these hauling trips is based on a CalEEMod® default trip length;
- Worker trips are based on CalEEMod® default methodology, which is calculated from the number of pieces of equipment in each phase, except for building construction and architectural coating, where the trips are based on the number of residential dwelling units (DU) and square footage of non-residential land uses. The VMT associated with these trips is based on the CalEEMod® default trip length;
- Vendor trips are based on CalEEMod® default methodology, which is calculated from the number of residential dwelling units and square footage of non-residential land uses for the building construction phase. The VMT associated with these trips is based on the CalEEMod® default trip length equal to the commercial-non-work trip length;

Running GHG emissions were divided by the VMT of each respective vehicle class from each scenario year and adjusted for unit conversions to derive emission factors in units of grams per VMT. All other emissions (including evaporative) were divided by the number of trips to derive emission factors in units of grams per trip.

For on-road trip CO_2 emissions (running, startup, and idling), emission reductions due to Pavley I were applied to light-duty auto (LDA), light-duty trucks (LDT) including LDT1 (0 - 3,750 lb) and LDT2 (3751 – 5750 lb), and medium-duty trucks (MDV) for each vehicle model year, and summed to arrive at the total CO_2 emissions for each scenario year. Reductions due to LCFSs were further applied to CO_2 emission factors after adjustments from Pavley I for scenario years 2011 and after. The Pavley standard was introduced pursuant to AB 1493, to reduce the GHG emissions in new model passenger vehicles, pick-up trucks, and sports utility vehicles. The reductions from Pavley were applied per the emission factors as included in CalEEMod® and described in Appendix A of the CalEEMod® user’s guide. The LCFS was introduced as pursuant to the California Global Warming Solutions Act of 2006. It imposes fuel requirements on fuel that will be sold in California, which will decrease GHG emissions, by reducing the full fuel-cycle, and the carbon intensity of the transportation fuel pool in California. Reductions due to LCFSs were further applied to CO_2 emission factors after adjustments from Pavley I for scenario years 2011 and after. The reductions from LCFS were applied as included in CalEEMod® and described in Appendix A of the CalEEMod® user’s guide.

In this analysis, because the amortized construction GHG emissions are small compared to the operational emissions discussed later and no specific construction GHG offsets were proposed, the BAU construction emissions were concluded to be same as the Project construction emissions. This conclusion is conservative because the emissions reduction credits from LCFS for construction mobile sources were not accounted for when comparing the Project's construction GHG emissions from on-road trips against the BAU emissions. If the Project's emissions had been compared against a BAU scenario that did not include LCFS reductions, the reduction compared to BAU would be larger than that assumed for this analysis.

The emissions from mobile sources were calculated with the trip rates, trip lengths and emission factors for running from EMFAC2011 as follows:[84]

$$\text{Emissions}_{\text{pollutant}} = \text{VMT} * \text{EF}_{\text{running, pollutant}}$$

Where:

$\text{Emissions}_{\text{pollutant}}$ = emissions from vehicle running for each pollutant

VMT = vehicle miles traveled

$\text{EF}_{\text{running, pollutant}}$ = emission factor for running emissions

Evaporative emissions, starting and idling emissions are multiplied by the number of trips multiplied by the respective emission factor for each pollutant.

For the Project scenario, the GHG emission from on-road vehicles associated with construction are 2,263 MT CO_2e as shown in Table 4. Most of the emissions were generated from the workers' trips. As discussed earlier, the construction on-road vehicle emissions for the BAU scenario are assumed to equal those for the Project scenario and therefore also 2,263 MT CO_2e.

3.1.4.1.3 Total Construction Emissions

As presented in Table 4, the total Project GHG emissions from all construction phases for off-road and on-road emissions are 717 and 2,263 MT CO_2e, respectively. Phase 2 will generate the largest amount of GHG emissions due to a higher level of construction activities. Total GHG emissions from the construction activities are 2,981 MT CO_2e. When amortized over 30-year project lifetime, the construction GHG emissions are 99 MT CO_2e/year.[85] As discussed earlier, the total emissions from the BAU scenario are assumed to be equal to those for the Project scenario. Therefore, there is no a GHG reduction from BAU associated with construction activities. Detailed emission inventory from the CalEEMod® output files are included in Appendix A.

3.1.4.2 Vegetation Changes

This section presents the calculation of the positive and negative GHG emissions associated with vegetation removal and re-vegetation at the Project. Permanent vegetation changes that

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[84] CAPCOA, 2013, California Emissions Estimator Model User's Guide, Appendix A, pages 13-14. Version 2013.2. . Available at: http://www.CalEEMod.com/.

[85] This approach to one-time construction and vegetation change GHG emissions is based on the GHG Threshold Working Group Meeting #13 Minutes from August 26, 2009. Available at: http://www.aqmd.gov/ceqa/handbook/GHG/2009/aug26mtg/wkgp13minutes.pdf. Accessed: March 11, 2015.

occur as a result of development constitute a one-time change in the carbon sequestration capacity of a site. In this case, undeveloped land will be converted to different land uses with landscaped areas and trees. This will result in an overall net gain of carbon sequestration as there will be a net increase in the number of trees. Consequently, vegetation change from the Project results in a GHG emissions decrease.

CalEEMod® was used to calculate GHG emissions associated with the vegetation activities of land use change and the planting of new trees, as according to the IPCC protocol for vegetation. Overall Change in Sequestered CO_2e can be calculated with this equation: [86]

$$\text{Overall Change in Sequestered CO}_2 = \sum_i \left((SeqCO_2)_i \times area_i \right) - \sum_j \left((SeqCO_2)_j \times area_j \right)$$

Where:

$SeqCO_2$ = mass of sequestered CO_2 per unit area [MT CO_2e/acre]

area = area of land for specific land use type [acre]

i = index for final land use type

j = index for initial land use type

Overall change in sequestered CO_2 is the summation of sequestered CO_2 from initial land use type multiplied by area of land for initial land use type subtracted by the summation of sequestered CO_2 from final land use type multiplied by area of land for final land use type. As discussed in the Project description, the Project site was previously a golf club. After the closure of the club, the golf course was demolished and the site was re-graded and all vegetation was removed, except for some eucalyptus and pepper trees and other vegetation along the southerly and easterly boundary of the project site. The project site is unimproved and is not currently utilized for any land use or activity. Therefore, this analysis assumes that there is no loss of carbon sequestration for the both the Project and its associated BAU scenario.

The Project and the BAU scenario are expected to plant 508 new trees (Table 5). The calculation of CO_2e sequestration in CalEEMod® used the miscellaneous tree type, which represents an average of CO_2e sequestration potential for several tree species. As shown in Table 5, the Project and its associated BAU scenario will sequester 360 $MTCO_2e$ through planting new trees.

Overall, the Project will sequester a net of 360 $MTCO_2e$, or 12 $MTCO_2e$ per year if amortized over a 30-year period, as a project lifetime (Table 5). Because the amortized GHG emissions associated with vegetation are small compared to the operational emissions discussed later, and there is no GHG reduction from BAU associated with vegetation, this analysis conservatively considered that the sequestration for the BAU scenarios are same as that for the

[86] CAPCOA, 2013, California Emissions Estimator Model User's Guide, Appendix A, pages 45-48. Version 2013.2. . Available at: http://www.CalEEMod.com/.

Project scenario. Therefore, there is not a GHG reduction from BAU associated with landscaping and vegetation associated with the Project.

3.1.5 Annual Operational Emissions

Direct emissions from mobile and area sources and indirect emissions from energy and water use, wastewater, as well as waste management, would occur every year after build out. This section analyzes the operational GHG emissions.

3.1.5.1 Area Sources

Area sources in CalEEMod® consist of direct sources of air and GHG emissions. Area sources with GHG emissions relevant to the Project include emissions from hearths and landscape maintenance equipment. The area source GHG emissions included in this analysis result from landscaping-related fuel combustion sources, such as lawn mowers, and from natural gas fireplaces.[87] GHG emissions due to natural gas combustion in buildings other than from fireplaces are excluded from this section since they are included in the emissions associated with building energy use. The GHG emissions for the Project and BAU were calculated using CalEEMod® defaults based upon the land uses that will be part of the Project, except all fireplaces were assumed to be natural gas burning, based on SCAQMD Rule 445.

Based on the Project description, all residential dwelling units will contain fireplaces. For the Project scenario, the resulting GHG emissions from hearths and use of landscape maintenance equipment are 63 $MTCO_2e$ per year (Table 6) including 59 $MTCO_2e$ per year from hearths and 4 $MTCO_2e$ per year from use of landscape maintenance equipment. For the BAU scenario, the area source GHG emissions are same as those for the Project scenario. Therefore, there is not a GHG reduction from BAU associated with the operation of hearths or landscaping equipment.

3.1.5.2 Energy Use

GHGs are emitted from buildings as a result of activities for which electricity and natural gas are typically used as energy sources. Combustion of any type of fuel emits CO_2 and other GHGs directly into the atmosphere; these emissions are considered direct emissions associated with a building. GHGs are also emitted during the generation of electricity from fossil fuels; these emissions are considered to be indirect emissions. Table 7 lists the emission factors for electricity used in this analysis and how they were calculated. Climate Zone 10 was selected based on the CEC forecast climate zone map shown in the CalEEMod® User's Guide. The Project and BAU emissions have been calculated using a SCE emission factor that accounts for the 33% and 20% RPS, respectively, as discussed in Section 3.3. The adjusted SCE emission factor is the average factor from 2006 and 2007 PUP Protocol, which reports the mix renewable and non-renewable sources in SCE's energy supply. With this data, the SCE emission factor is adjusted to represent what the emissions from SCE would be in 2020.

The Project will have energy efficient buildings, which will meet the 2013 Title 24 standards and have lower energy usage due to the use of Energy Star appliances and high efficiency lighting.

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[87] Wood-burning fireplaces and stoves are largely prohibited in the South Coast Air District as of March 9, 2009. Rule 445.

The analysis shows that the Project will use approximately 30% less electricity and 10% less natural gas than the BAU scenario. As such, the Project's buildings will be more energy efficient that average residential and nonresidential buildings in the region.

3.1.5.2.1 Emissions Estimation from Energy Use

Energy use in buildings is divided into energy consumed by the built environment and energy consumed by uses that are independent of the construction of the building such as in plug-in appliances (as discussed above). In California, Title 24 governs energy consumed by the built environment, mechanical systems, and some types of fixed lighting.[88] Non-building energy use, or "plug-in" energy use, can be further subdivided by specific end-use (refrigeration, cooking, office equipment, etc.). CalEEMod® was used to calculate the non-building energy use by calculating baseline energy usage from systems not covered by Title 24. To calculate the building energy input for the Project (e.g., electricity, and natural gas), ENVIRON utilized default values provided in CalEEMod®, which are based on CEUS and RASS. The use of Energy Star appliances was incorporated as discussed above.

CalEEMod® converts the resulting energy use quantities to GHG emissions by multiplying by the appropriate emission factors obtained by incorporating information on local electricity production. Unless otherwise noted, CalEEMod® default parameters were used to calculate the Project's GHG emissions associated with energy use.

The Project's GHG emissions calculations reflect that the Project is meeting the 2013 Building Energy Efficiency Standards [89] for residential and nonresidential construction. As a result of compliance with these standards, the residential and non-residential buildings in this Project will be more energy efficient than the average for the region. As noted above, the 2013 Building Energy Efficiency Standards that went into effect on July 1, 2014 are 25 percent more efficient than previous standards for residential construction and 30 percent better for nonresidential construction compared to the 2008 standards. More specifically, based on the California Energy Commission's 2013 Impact Analysis,[90] the improvement of energy efficiency by land use type from 2008 to 2013 Title 24 standards are as follows:

For electricity usage:

- Single-family residential – 36.4%
- Multi-family residential – 23.3%
- Non-residential – 21.8%

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88 Title 24, Part 6, of the California Code of Regulations: California's Energy Efficiency Standards for Residential and Nonresidential Buildings. http://www.energy.ca.gov/title24/

89 The California Energy Commission. 2012. 2013 Building Energy Efficiency Standards. Available at: http://www.energy.ca.gov/2012publications/CEC-400-2012-004/CEC-400-2012-004-CMF-REV2.pdf . Accessed: March 11, 2015.

90 The California Energy Commission's Impact Analysis is available at: http://www.energy.ca.gov/2013publications/CEC-400-2013-008/CEC-400-2013-008.pdf?_sm_au_=iVVvrHfcRRF3MMR7. Accessed March 11, 2015.

And for natural gas usage:

- Single-family residential – 6.5%
- Multi-family residential – 3.8%
- Non-residential – 16.8%

The CalEEMod® default values of building energy intensity (i.e., 2008 Title 24 Standard) were updated based on the above improvement for the Project scenario. The Project's GHG emissions calculation also includes the PDFs for Energy Star appliances and high efficiency lighting bulbs and fixtures. The Energy Star commitment and associated improved energy efficiency is based on CalEEMod® default values. The high efficiency light bulbs and fixtures reduce the lighting energy use by approximately 75%.[91] In addition, the CalEEMod® default emission factors for SCE electricity production were adjusted to incorporate the 33% RPS requirement.

The BAU scenario assumes 2005 Title 24 standards (in effect in 2008) to estimate the energy intensity values associated with energy consumed by the built environment, no Energy Star or high efficiency lighting commitments associated with energy consumed by uses independent of building construction, and CalEEMod® emission factors for the BAU scenario accounts for the 20% RPS.

The Project's CO_2e emissions from electricity and natural gas usages were calculated to be 417 and 461 MTCO_2e/yr, respectively, or 878 MTCO_2e/yr total (Table 8). The BAU scenario is calculated to emit 716 and 511 MTCO_2e/yr from energy and natural gas usage, respectively, or 1,228 MTCO_2e/yr total (Table 9). Accordingly, the Project is calculated to have a 28.5% reduction of GHG emissions as compared to the BAU scenario for this category of emissions. Therefore, there is a substantial GHG reduction from BAU associated with operational energy use.

3.1.5.3 Water Supply, Treatment and Distribution

Indirect GHG emissions result from the production of electricity used to convey, treat and distribute water and wastewater. The amount of electricity required to convey, treat and distribute water depends on the volume of water and wastewater as well as the sources of the water. Additional emissions from wastewater treatment include CH_4 and N_2O, which are emitted directly from the wastewater.

The CalEEMod® default usage values regarding indoor and outdoor water use were combined with a reduction based on the Project's compliance with the California Green Building Code. The California Green Building Code requires that indoor potable water use be reduced by installing water saving fixtures and/or flow restrictors.[92] The California Green Building Code also

[91] U.S. Department of Energy. Guide to Energy-Efficient Lightinghttp://energy.gov/sites/prod/files/guide_to_energy_efficient_lighting.pdf . Accessed: April 6, 2015.

[92] CSBC, 2010. 2010 California Green Building Standards. 4.303.1. Available at: http://www.documents.dgs.ca.gov/bsc/calgreen/2010_ca_green_bldg.pdf. Accessed: March 11, 2015.

requires that the Project include a high-efficiency irrigation system. In addition, ENVIRON used CalEEMod® default values for energy required for water conveyance and distribution for Southern California, which are based on analyses by the CEC. The GHG emissions associated with wastewater treatment were also calculated using CalEEMod® default values. The BAU scenario assumed water usage without the use of water saving fixtures, flow restrictors, or high efficiency irrigation system, and GHG emissions related to the water and wastewater conveyance were based on the utility emission factors consistent with the BAU scenario (i.e., assuming 20% RPS requirement). All other assumptions regarding wastewater treatment for the BAU scenario were assumed to be the same as the Project.

The Project was calculated to have 20 and 11 thousand gallons (Mgal) per year of indoor and outdoor water usages, respectively, which was calculated to result in 114 $MTCO_2e$/yr as shown in Table 10. The associated BAU scenario was calculated to have 23 and 12 Mgal/yr of indoor and outdoor water usages, respectively, which was calculated to result in 145 $MTCO_2e$/yr as shown in Table 11. The GHG emissions associated with the water use and wastewater treatment for the Project is 21.6% below those for BAU scenario. Therefore, the Project has a substantial GHG reduction from BAU associated with water use and wastewater treatment.

3.1.5.4 Solid Waste

Municipal solid waste (MSW) is the amount of material that is disposed of by land filling, recycling, or composting. CalEEMod® calculates the indirect GHG emissions associated with waste that is disposed of at a landfill. The program uses annual waste disposal rates from the CalRecyle data for individual land uses. The emission calculations for this Project were based on CalEEMod® default factors. CalEEMod® uses the overall California Waste Stream composition to generate the necessary types of different waste disposed into landfills. The program quantifies the GHG emissions associated with the decomposition of the waste which generates methane based on the total amount of degradable organic carbon. The program quantifies the CO_2 emissions associated with the combustion of methane, if applicable. Default landfill gas concentrations were used as reported in Section 2.4 of AP-42. The IPCC has a similar method to calculate GHG emissions from MSW in its 2006 Guidelines for National Greenhouse Gas Inventories.

The analysis assumes that waste diversion from the Project will be managed per the applicable requirements of AB 341[93]. The CalEEMod® solid waste module calculates the GHG emissions associated with the disposal of solid waste into landfills, in quantities that are based upon land use type according to waste disposal studies conducted by CalRecycle. For this analysis, CalEEMod® default waste disposal rates were assumed to reflect the City of Cypress's waste diversion rate of 59% reported in 2006,[94] which is assumed to represent the BAU scenario. GHG emissions associated with non-landfill diverted waste streams are not considered, because it is generally assumed that these diversions do not result in any appreciable amounts

93 CalRecycle, 2013. California's 75 Percent Initiative. Available at: http://www.calrecycle.ca.gov/75percent/. Accessed: March 2015.

94 CalRecycle. 2006. Jurisdiction Diversion/Disposal Rate Detail. Available at: http://www.calrecycle.ca.gov/lgcentral/Reports/DiversionProgram/JurisdictionDiversionDetail.aspx?JurisdictionID=116&Year=2006. Accessed: March 2015.

of GHG emissions when operated effectively.[95] These waste diversion alternatives may result in differences in the overall life-cycle emissions of GHGs, but it is not appropriate to combine life-cycle emissions for only one category of waste emissions.[96] As mentioned previously, biogenic CO_2 emissions were not included when CARB analyzed the GHG emissions inventory under AB 32. Therefore, they are not included in the Project emissions inventory.

The BAU scenario assumes a solid waste diversion from the landfills consistent with what was occurring prior to the passing of AB32. Conservatively, this was assumed as 59 percent for Orange County,[97] which is the waste diversion rate reported for the year 2006.

The Project was calculated to generate 314 tons/year of solid waste and was calculated to result in 143 $MTCO_2e$/year as shown in Table 12. The associated BAU scenario was calculated to generate 374 tons/year of solid waste and was calculated to result in 170 $MTCO_2e$/year as shown in Table 13. Accordingly, the Project is calculated to have a 16% reduction of GHG emissions as compared to the BAU scenario for this category of emissions. Therefore, the Project has a substantial GHG reduction from BAU associated with solid waste diversion.

3.1.5.5 Mobile Source Emissions

The GHG emissions associated with on-road mobile sources are generated from residents, workers, customers, and delivery vehicles visiting the land use types in the Project. The emissions associated with on-road mobile sources include running and starting exhaust emissions. Starting and evaporative emissions are associated with the number of starts or time between vehicle uses and the assumptions used in determining these values are described below. All of the other emissions are dependent on VMT. ENVIRON calculated traffic emissions using the trip rates specified in the Traffic Impact Study prepared by Kimley Horn in April 2015,[98] and CalEEMod® default trip lengths and home-based and commercial-based trip breakdown.

As the starting point, Kimley-Horn provided the total number of trips by land use, as presented in Table 14. To convert these total trip numbers to CalEEMod® inputs, the total trips by land use were divided by the appropriate land use size metric – number of residences for residential land uses, and 1,000 square feet for non-residential land uses.[99]

In addition to total trips, Kimley-Horn also adjusted trips for internal capture based on industry standards for the land uses associated with the Project. Internal capture represents trips between land uses on the Project, such as a resident traveling to the retail space, or a retail

[95] CARB. 2010. Local Government Operations Protocol. Chapter 9.4.

[96] This inventory represents scope 1 and 2 emission categories. A life-cycle analysis of waste diversion would be a scope 3 inventory. CARB's Local Government Operations Protocol Version 1.1 (May 2010) clearly states that scope 3 emissions should not be combined with scope 1 and 2 emissions.

[97] CalRecycle. 2006. Riverside-Unincorporated Jurisdiction Diversion / Disposal Rate Detail, Available at: Available at: http://www.calrecycle.ca.gov/lgcentral/Reports/DiversionProgram/JurisdictionDiversionDetail.aspx?JurisdictionID=349&Year=2006. Accessed: March 11, 2015.

[98] Kimley-Horn and Associates, Inc. 2015. Traffic Impact Study for the Barton Place Mixed-Use Project.

[99] Provided by Kimley-Horn on April, 2015.

customer traveling to the restaurant. As reported in the Traffic Impact Study, the internal capture was calculated to be 14% of total trips. Accordingly, vehicle trip rates were reduced by 14% when input to CalEEMod®.

CalEEMod® calculates emissions reductions based on whether a trip is classified as a pass-by or diverted trip. For example, a commercial customer pass-by trip could be a person going from home to shop on his/her way to work. In addition, a commercial customer diverted-link trip could be a person going from home to work, and on its way making a diversion to shop. Pass-by trips generate virtually no additional running emissions but could generate additional resting and startup emissions. Diverted trips generate less running emissions compared to primary trips, and can also generate additional resting and startup emissions. CalEEMod® assigns default splits between primary, diverted, and pass-by trips based on land use type.

The mobile source emissions analysis for the Project includes the benefit of reductions from the regulatory programs such as Pavley, LCFS and Advanced Clean Cars. AB 1493 (“the Pavley Standard”) requires CARB to adopt regulations by January 1, 2005, to reduce GHG emissions from non-commercial passenger vehicles and light-duty trucks of model year 2009 and thereafter. CalEEMod® includes emission reductions for non-commercial passenger vehicles and light-duty trucks of model year 2017 – 2025. Executive Order S-01-07 (January 18, 2007) requires a 10 percent or greater reduction in the average fuel carbon intensity for transportation fuels in California regulated by CARB. The regulation went into effect on April 15, 2010, and requires a reduction in the carbon intensity of transportation fuels used in California by at least 10 percent by 2020. It imposes fuel requirements on fuel that will be sold in California which will decrease GHG emissions, by reducing the full fuel-cycle, and the carbon intensity of the transportation fuel pool in California. Reductions due to LCFSs were further applied to CO_2 emission factors after adjustments from Pavley I for scenario years 2011 and after. This is also included in the CalEEMod® model. The Advanced Clean Cars program, introduced in 2012, combines the control of smog, soot causing pollutants and GHG emissions into a single coordinated package of requirements for model years 2017 through 2025. This regulation has not been incorporated into CalEEMod®, and thus an estimate of the GHG emission reductions from the Advanced Clean Cars program were calculated separately. The emission factors were adjusted for the Advanced Clean Cars regulation based on the CARB’s LEV III database model (LEV3 Tool), which was used to estimate the statewide Advanced Clean Cars emissions reduction factors for 2020.[100] The Advanced Clean Cars emission reduction factors were incorporated into the analysis by multiplying the CalEEMod® emission factors by the Advanced Clean Cars emission reduction factors for the Project emissions inventory.

Consistent with the Updated Scoping Plan, the mobile source emissions analysis for the BAU scenario includes reduction from Pavley I, but does not include reductions from regulatory programs including LCFS and the Advanced Clean Cars program.

The Project was calculated to generate approximately 6,932,578 VMT/year, which would result in 2,486 $MTCO_2e$/year as shown in Table 15. The associated BAU scenario is calculated to

[100] Available at: http://www.arb.ca.gov/msei/categories.htm#onroad_motor_vehicles. Accessed: March 11, 2015.

generate the same VMT/year and was calculated to result in 2,821 $MTCO_2e$/year as shown in Table 16. The Project is calculated to have an 11.9% reduction of GHG emissions as compared to the BAU scenario for this category of emissions. This calculation assumes that the Pavley, LCFS regulations, and Advanced Clean Car Program are in place as required. Therefore, the Project has a substantial GHG reduction from BAU associated with mobile sources.

3.2 Conclusion for Construction and Operational Emissions

As described above, the conservative percentage reduction required to meet the 1990 GHG emissions level is 15.8% according to the AB32 and SCAQMD thresholds of significance applied in this report. The Project is consistent with this reduction goal. Table 17 shows total GHG emissions for construction and operation of the Project and its associated BAU scenario. The Project GHG emissions inventory is 3,771 MT CO_2e per year and the BAU GHG emissions inventory is 4,515 MT CO_2e per year. Consequently, the Project is calculated to provide a 16.5 percent reduction from the BAU scenario. In comparison to the emission reduction target set by AB32 and the numeric threshold of 15.8 percent, the Project reduces GHG emissions by more than the applicable thresholds. Therefore, the Project would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment.

3.3 Consistency with Applicable Plans, Policies and Regulations

As explained in the Regulatory Setting section of this report, there a several plans, policies, and regulations designed to reduce GHG emissions. It is important to note that the climate change issue is inherently a global matter and the regulations geared to address it analyze GHG emissions on a cumulative scale. A project’s GHG emissions typically would be very small in comparison to state or global GHG emissions and, consequently, they would, in isolation, have no significant direct impact on climate change.

Based on the current regulatory setting and relative lack of adopted thresholds, the impact analysis for a project (as presented above in this report) is essentially a quantitative method to demonstrate compliance with applicable GHG plans, policies, and regulations.

Table 17 demonstrates that implementation of the Project’s regulatory compliance measures and PDFs would reduce GHG emissions compared to BAU, which in turn supports State goals for GHG emissions reduction. The methods used to establish this GHG reduction are consistent with the approach used in the Scoping Plan and Updated Scoping Plan prepared by CARB to implement AB 32.

In addition, the Project is consistent with the approaches outlined by CARB to reduce GHG emissions. The Project would comply with the CalGreen Building Code, which was adopted by the City of Cypress. In doing so, the Project improves energy conservation and energy efficiency. It will also comply with applicable regulatory requirements that support renewable energy, more efficient vehicles, and waste diversion goals. The Project’s regulatory compliance measures and PDFs advance objectives of the applicable GHG-reducing regulations. The Project also reduces GHG emissions associated with energy and water usage. Overall, the Project results in an approximately 16.5 percent reduction in GHG emissions from BAU. The Project’s GHG reduction measures make the Project consistent with AB 32 and its related regulations. Therefore, based on the Project’s consistency with State and SCAQMD GHG emission reduction goals and objectives, the Project would not conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing GHG emissions..

Tables

Table 1. Land Uses and Square Footages

Project Entitlement[1]		CalEEMod Analysis			
		CalEEMod Land Use Category	CalEEMod Land Use Subtype	Land Use Unit Amount	Size Metric
Paired Homes	92 DU	Residential	Condo/Townhouse	92	DU
Club House	5,216 sqft	Recreational	Health Club	5.22	1000 sqft
Restaurants	11,380 sqft	Recreational	High Turnover (Sit Down Restaurant)	11.38	1000 sqft
Parking Lot	355 spaces	Parking	Parking Lot	355	spaces
Community Pool & Spa	3,380 sqft	Recreational	Recreational Swimming Pool	3.38	1000 sqft
Shopping Center	36,500 sqft	Retail	Regional Shopping Center	36.5	1000 sqft
Single Family Detached Home	152 DU	Residential	Single Family Housing	152	DU

Notes:
[1] Based on the Project description.

Abbreviations:
sqft - square feet
CalEEMod - California Emissions Estimator Model
DU - dwelling units

Table 2. Construction Phasing Schedule

Phase Name	Sub-Phase	Start Date	End Date
Phase 1	Site Preparation	3/1/2016	3/11/2016
Phase 2	Grading Phase 1	3/12/2016	5/9/2016
	Grading Phase 2	5/10/2016	6/6/2016
	Grading Phase 3	6/7/2016	6/15/2016
	Utilities	6/16/2016	9/16/2016
	Paving	9/1/2016	10/31/2016
Phase 3	Building Construction	8/1/2016	12/31/2016
	Architectural Coatings	11/28/2016	12/31/2016
Phase 4	Building Construction	12/1/2016	4/30/2017
	Architectural Coatings	3/27/2017	4/30/2017
Phase 5	Building Construction	4/1/2017	8/31/2017
	Architectural Coatings	7/28/2017	8/31/2017
Phase 6	Building Construction	8/1/2017	12/31/2017
	Architectural Coatings	11/27/2017	12/31/2017
Phase 7	Building Construction	12/1/2017	4/30/2018
	Architectural Coatings	3/26/2018	4/30/2018
Phase 8	Building Construction	4/1/2018	8/31/2018
	Architectural Coatings	7/28/2018	8/31/2018
Phase 9	Building Construction	8/1/2018	12/31/2018
	Architectural Coatings	11/26/2018	12/31/2018

Notes:

[1] Construction schedule provided by C33, LLC.

Table 3. Construction Equipment List

Phase	Sub-Phase	Equipment Type	Unit Amount	Hours/Day	Horsepower Phase (HP)	Tier
Phase 1	Site Preparation	Rubber Tired Dozer	1	6	315	2
		Loader	1	6	210	2
		Water Truck	1	6	400	3
Phase 2	Grading Phase 1	Water Truck	1	6	400	3
		Paddlewheel Scrapper	5	6	360	2
		Track Dozer	1	6	305	2
	Grading Phase 2	G Blade	1	6	185	3
		Water Truck	1	6	400	3
		Skip Loader	2	6	70	3
		Paddlewheel Scrapper	1	6	360	2
	Grading Phase 3	G Blade	1	6	185	3
		Paddlewheel Scrapper	1	6	360	2
		Water Truck	1	6	400	3
	Utilities	Water Truck	1	6	400	na
		Back Hoe	1	6	150	na
		Skip Loader	2	6	70	3
	Paving	Pavers	2	6	89	na
		Paving Equipment	2	6	82	na
		Rollers	2	6	84	na
Phase 3	Building Construction	Concrete Trucks	1	2	250	na
		Forklifts	1	6	125	na
		Backhoe	2	4	150	na
		Cement/Mortar Mixer	1	4	9	na
	Architectural Coating	Air Compressor	2	3	78	na
Phase 4	Building Construction	Concrete Trucks	1	2	250	na
		Forklifts	1	6	125	na
		Backhoe	2	4	150	na
		Cement/Mortar Mixer	1	4	9	na
	Architectural Coating	Air Compressor	2	3	78	na
Phase 5	Building Construction	Concrete Trucks	1	2	250	na
		Forklifts	1	6	125	na
		Backhoe	2	4	150	na
		Cement/Mortar Mixer	1	4	9	na
	Architectural Coating	Air Compressor	2	3	78	na

Table 3. Construction Equipment List

Phase	Sub-Phase	Equipment Type	Unit Amount	Hours/Day	Horsepower Phase (HP)	Tier
Phase 6	Building Construction	Concrete Trucks	1	2	250	na
		Forklifts	1	6	125	na
		Backhoe	2	4	150	na
		Cement/Mortar Mixer	1	4	9	na
	Architectural Coating	Air Compressor	2	3	78	na
Phase 7	Building Construction	Concrete Trucks	1	2	250	na
		Forklifts	1	6	125	na
		Backhoe	2	4	150	na
		Cement/Mortar Mixer	1	4	9	na
	Architectural Coating	Air Compressor	2	3	78	na
Phase 8	Building Construction	Concrete Trucks	1	2	250	na
		Forklifts	1	6	125	na
		Backhoe	2	4	150	na
		Cement/Mortar Mixer	1	4	9	na
	Architectural Coating	Air Compressor	2	3	78	na
Phase 9	Building Construction	Concrete Trucks	1	2	250	na
		Forklifts	1	6	125	na
		Backhoe	2	4	150	na
		Cement/Mortar Mixer	1	4	9	na
	Architectural Coating	Air Compressor	2	3	78	na

Notes:

[1] Construction equipment list provided by C33, LLC.

Table 4. Summary of GHG Construction Emissions

Construction Phase	Sub-Phase	CO_2e Emissions[1,2]		
		Equipment	Vehicles	Total
		(MT)		
Phase 1	Site Preparation	11	0.4	11
Phase 2	Grading Phase 1	173	245	418
	Grading Phase 2	33	117	150
	Grading Phase 3	10	39	49
	Utilities	63	5	69
	Paving	30	5	35
Phase 3	Building Construction	54	267	321
	Architectural Coatings	4	8	12
Phase 4	Building Construction	53	260	314
	Architectural Coatings	4	8	12
Phase 5	Building Construction	53	259	312
	Architectural Coatings	4	8	12
Phase 6	Building Construction	53	258	312
	Architectural Coatings	4	8	12
Phase 7	Building Construction	52	252	305
	Architectural Coatings	4	8	11
Phase 8	Building Construction	52	251	303
	Architectural Coatings	4	8	11
Phase 9	Building Construction	52	251	303
	Architectural Coatings	4	8	11
Total		**717**	**2,263**	**2,981**
			30-year amortized	**99**

Notes:

[1] Emissions calculated using CalEEMod version 2013.2.2.

[2] CO2e includes CO2, CH4, and N2O emissions, which are weighted by their respective global warming potentials.

Abbreviations:

CalEEMod - California Emissions Estimator Model

CO_2e - carbon dioxide equivalents

GHG - greenhouse gas

MT - metric tons

Table 5. Estimated Number of New Trees

	Number of New Trees[1]	CO_2e Emissions (tonnes)
Project	508	-360
30-year amortized		**-12**

Notes:
[1] The number of trees to be planted for the Project was provided by C33, LLC.

Table 6. GHG Emissions from Area Sources (Project and BAU)

Category[1]	Size Metric	Units	CO_2e Emissions[2,3] (MT/yr)
Hearth[4]	244	Residential Units	59
Landscaping	244	Residential Units	4
	53,100	Non-Residential Building square footage	
		Total	**63**

Notes:

[1] Categories that CalEEMod classifies as "Area Sources." CalEEMod does not associate any CO_2e emissions with Architectural Coating and Consumer Products.

[2] Emissions were estimated using CalEEMod version 2013.2.2. Emissions were estimated assuming that all residences have natural gas fireplaces.

[3] CO2e includes CO2, CH4, and N2O emissions, which are weighted by their respective global warming potentials.

[4] Assumed no wood burning devices as per SCAQMD Rule 445 and project description.

Abbreviations:

CalEEMod - California Emissions Estimator Model
CARB - California Air Resources Board
CO2e - carbon dioxide equivalents
GHG - greenhouse gases
MT - metric tons
SCAQMD - South Coast Air Quality Management District
yr - year

Table 7. Utility GHG Emission Factor Associated with Renewable Power Standard

	2006	2007	Average	Units
Total Energy Delivery[1]	82,776,309	83,958,770		MWh
from renewables[2]	12,670,583	12,476,219		MWh
from non-renewables	70,105,726	71,482,551		MWh
% of Total Energy From Renewables[2]	15%	15%		
Total CO_2 Emissions[1]	24,077,133	24,026,108		metric tonnes CO_2
% of Total Energy From Non-Renewables	85%	85%		
CO_2 Emissions per Total Energy Delivered	641.26	630.89	636.07	lbs CO_2/MWh delivered
CO_2 Emissions per Total Non-Renewable Energy[3]	757.16	741.00		lbs CO_2/MWh delivered
Estimated Emission Factors for Total Energy Delivered[4]				
2020 RPS (33%)	**507.3**	**496.5**	**501.9**	lbs CO_2/MWh delivered

Notes:

[1] Total energy delivery and total CO_2 emissions are provided in SCE Power/Utility Protocol (PUP) Reports available at: http://www.climateregistry.org/tools/carrot/carrot-public-reports.html

[2] Renewable energy delivered is the sum of biogenic, geothermal and other renewable generations in PUP reports.

[3] The emissions metric presented here was calculated based on the total CO_2 emissions divided by the energy delivered from non-renewable sources.

[4] The emission factors for total energy delivered were estimated by multiplying the percentage of energy delivered from non-renewable energy by the CO_2 emissions per total non-renewable energy metric calculated above. The emission factor presented here is the 33% RPS for 2020. The 33% reduction was used for Project emissions in this report.

Abbreviations:

CO_2 - carbon dioxide
GHG - Greenhouse gas
kWh - kilowatt-hour
lbs - pounds
MWh - Megawatt-hour
PUP - Power/Utility Protocol
RPS - Renewables Portfolio Standard
SCE - Southern California Edison

Table 8. GHG Emissions Associated with Electricity and Natural Gas (Project)

CalEEMod Land Use	Project Entitlement	Electricity Use[1]	Natural Gas Use[1]	CO_2e Emissions from Energy Use[2,3]		
				Associated with Electricity Use	Associated with Natural Gas Burning	Total
		(kWh/yr)	(kBTU/yr)	(MT/yr)		
Health Club	Club House	32,574	99,939	7	5	13
High Turnover (Sit Down Restaurant)	Restaurants	347,821	2,838,770	80	152	232
Parking Lot	Parking Lot	31,240	0	7	0	7
Recreational Swimming Pool	Community Pool	0	0	0	0	0
Regional Shopping Center	Shopping Center	262,983	68,620	60	4	64
Single Family Housing	Single Family Detached Homes	837,359	4,162,420	192	223	415
Condo/Townhouse	Paired Homes	311,169	1,410,910	71	76	147
	Total	**1,823,146**	**8,580,659**	**417**	**461**	**878**

Notes:

[1] Energy usage for each land use was based on CalEEMod databases, which were obtained from CEUS or RASS studies on energy use and adjusted to account for 2013 Title 24 building standards. See Appendix A of the CalEEMod user's guide for details.

[2] Emissions were calculated using CalEEMod version 2013.2.2. See report for project design features and assumptions. Energy emissions included regulatory measure for 33% RPS for the utility provider (i.e. Southern California Edison). Emissions also included project design features, such as: Energy Star appliances for residential land uses and installation of high efficiency lighting for both residential and non-residential land uses.

[3] CO_2e includes CO_2, CH_4, and N_2O emissions, which are weighted by their respective global warming potentials.

Abbreviations:

CalEEMod - California Emissions Estimator Model
CAPCOA - California Air Pollution Control Officers Association
CEUS - California Commercial End-Use Survey
CO_2e - carbon dioxide equivalents
GHG - greenhouse gases
kBTU - 1,000 British thermal units
kWh - kilowatt hours
MT - metric tons
RASS - California Statewide Residential Appliance Saturation Study
SCAQMD - South Coast Air Quality Management District
yr - year

References:

CAPCOA. 2013. CalEEMod User's Guide. Available at: http://www.caleemod.com/. Accessed April 2015.

CAPCOA. 2010. Quantifying Greenhouse Gas Mitigation Measures. Available at: http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf. Accessed April 2015.

Table 9. GHG Emissions Associated with Electricity and Natural Gas (BAU)

CalEEMod Land Use	Project Entitlement	Electricity Use[1] (kWh/yr)	Natural Gas Use[1] (kBTU/yr)	CO_2e Emissions from Energy Use[2,3] (MT/yr)		
				Associated with Electricity Use	Associated with Natural Gas Burning	Total
Health Club	Club House	50,334	115,274	14	6	20
High Turnover (Sit Down Restaurant)	Restaurants	461,638	3,008,500	126	162	288
Parking Lot	Parking Lot	124,960	0	34	0	34
Recreational Swimming Pool	Community Pool	0	0	0	0	0
Regional Shopping Center	Shopping Center	490,560	77,015	134	4	138
Single Family Housing	Single Family Detached Homes	1,095,080	4,779,830	299	257	556
Condo/Townhouse	Paired Homes	402,317	1,545,070	110	83	193
	Total	**2,624,889**	**9,525,689**	**716**	**511**	**1,228**

Notes:

[1] Energy usage for each land use was assumed to be consistent with CalEEMod version 2013.2.2 defaults for historical conditions. See Appendix A of the CalEEMod user's guide for details.

[2] Emissions were calculated using CalEEMod version 2013.2.2. The analysis assumes the 2005 Title 24 standard to represent the BAU scenario.

[3] CO_2e includes CO_2, CH_4, and N_2O emissions, which are weighted by their respective global warming potentials.

Abbreviations:

CalEEMod - California Emissions Estimator Model
CARB - California Air Resources Board
CEUS - California Commercial End-Use Survey
CO_2e - carbon dioxide equivalents
GHG - greenhouse gases
kBTU - 1,000 British thermal units
kWh - kilowatt hours
MT - metric tons
RASS - California Statewide Residential Appliance Saturation Study
SCAQMD - South Coast Air Quality Management District
yr - year

References:

CAPCOA. 2013. CalEEMod User's Guide. Available at: http://www.caleemod.com/. Accessed July 2013.

Table 10. GHG Emissions Associated with Water Usage (Project)

CalEEMod Land Use	Project Entitlement	Indoor Water Use[1] (Mgal/yr)	Outdoor Water Use[1] (Mgal/yr)	CO_2e Emissions[2] (MT/yr)
Health Club	Club House	0.3	0.2	2
High Turnover (Sit Down Restaurant)	Restaurants	3	0.2	13
Parking Lot	Parking Lot	0	0	0
Recreational Swimming Pool	Community Pool	0.2	0.1	1
Regional Shopping Center	Shopping Center	2	2	14
Single Family Housing	Single Family Detached Homes	9	6	52
Condo/Townhouse	Paired Homes	5	4	32
	Total	**20**	**11**	**114**

Notes:

[1] Water usage was calculated based on CalEEMod (v.2013.2.2) default indoor and outdoor water split parameters. Emissions from water usage included project design features, such as: installing water saving fixtures and / or flow restrictors to reduce indoor water usage by 20% as required by California Green Building Code.

[2] CO_2e includes CO_2, CH_4, and N_2O emissions, which are weighted by their respective global warming potentials.

Abbreviations:

CalEEMod - California Emissions Estimator Model
CO_2e - carbon dioxide equivalents
GHG - greenhouse gases
Mgal - million gallons
MT - metric tons
yr - year

Table 11. GHG Emissions Associated with Water Usage (BAU)

CalEEMod Land Use	Project Entitlement	Indoor Water Use[1] (Mgal/yr)	Outdoor Water Use[1] (Mgal/yr)	CO_2e Emissions[2] (MT/yr)
Health Club	Club House	0.3	0.2	2
High Turnover (Sit Down Restaurant)	Restaurants	3	0.2	17
Parking Lot	Parking Lot	0	0	0
Recreational Swimming Pool	Community Pool	0.2	0.1	1
Regional Shopping Center	Shopping Center	3	2	18
Single Family Housing	Single Family Detached Homes	10	6	66
Condo/Townhouse	Paired Homes	6	4	40
	Total	**23**	**12**	**145**

Notes:

[1] Water usage was calculated based on CalEEMod (v.2013.2.2) default indoor and outdoor water split parameters.

[2] CO_2e includes CO_2, CH_4, and N_2O emissions, which are weighted by their respective global warming potentials.

Abbreviations:

CalEEMod - California Emissions Estimator Model
CARB - California Air Resources Board
CO_2e - carbon dioxide equivalents
GHG - greenhouse gases
Mgal - million gallons
MT - metric tons
yr - year

Table 12. GHG Emissions Associated with Waste Disposal (Project)

CalEEMod Land Use	Project Entitlement	Waste Disposed[1]	CO_2e Emissions[2]
		(tons/yr)	(MT/yr)
Health Club	Club House	25	11
High Turnover (Sit Down Restaurant)	Restaurants	113.8	52
Parking Lot	Parking Lot	0	0
Recreational Swimming Pool	Community Pool	16	7
Regional Shopping Center	Shopping Center	32	15
Single Family Housing	Single Family Detached Homes	92	42
Condo/Townhouse	Paired Homes	36	16
	Total	**314**	**143**

Notes:

[1] Solid waste disposal emissions were calculated using CalEEMod version 2013.2.2. Solid waste generation and associated emissions for the Project scenario assumes compliance with AB 341 in accordance with the State goal for 2020.

[2] CO_2e includes CO_2, CH_4, and N_2O emissions, which are weighted by their respective global warming potentials.

Abbreviations:

CalEEMod - California Emissions Estimator Model
CARB - California Air Resources Board
CO_2e - carbon dioxide equivalents
GHG - greenhouse gases
MT - metric tons
yr - year

Table 13. GHG Emissions Associated with Waste Disposal (BAU)

CalEEMod Land Use	Project Entitlement	Waste Disposed[1]	CO_2e Emissions[2]
		(tons/yr)	(MT/yr)
Health Club	Club House	30	14
High Turnover (Sit Down Restaurant)	Restaurants	135.4	62
Parking Lot	Parking Lot	0	0
Recreational Swimming Pool	Community Pool	19	9
Regional Shopping Center	Shopping Center	38	17
Single Family Housing	Single Family Detached Homes	109	50
Condo/Townhouse	Paired Homes	42	19
	Total	**374**	**170**

Notes:

[1] Solid waste disposal emissions were calculated using CalEEMod version 2013.2.2. Solid waste generation and associated emissions for the BAU scenario assumes 59 percent waste diversion, based on the 2006 Orange County Diversion / Disposal Rate Detail, available at:
http://www.calrecycle.ca.gov/lgcentral/Reports/DiversionProgram/JurisdictionDiversionDetail.aspx?JurisdictionID=349&Year=2006.
Accessed: March, 2015.

[2] CO2e includes CO2, CH4, and N2O emissions, which are weighted by their respective global warming potentials.

Abbreviations:

CalEEMod - California Emissions Estimator Model

CARB - California Air Resources Board

CO_2e - carbon dioxide equivalents

GHG - greenhouse gases

MT - metric tons

yr - year

Table 14. CalEEMod Model Inputs Associated with Traffic

CalEEMod Land Use	Project Entitlement	Unit	Tripend Rates[1] (trips/day/unit)		
			Weekday	Saturday	Sunday
Condo/Townhouse	Paired Homes	Dwelling Unit	3.0	2.2	2.4
Health Club	Club House[2]	1000sqft	0.0	0.0	0.0
High Turnover (Sit Down Restaurant)	Restaurants	Dwelling Unit	109.3	136.2	113.4
Parking Lot	Parking Lot	Space	0.0	0.0	0.0
Recreational Swimming Pool	Community Pool[2]	1000sqft	0.0	0.0	0.0
Regional Shopping Center	Shopping Center	1000sqft	36.7	43.0	21.7
Single Family Housing	Single Family Detached Homes	Dwelling Unit	3.2	2.4	2.0

Notes:

[1] Trip rates were based on Kimley Horn's Traffic Impact Study and accounted for the trip reduction due to internal capture.

[2] The Project amenities including club house and pool are for Project residents' use only and do not generate trips.

Abbreviations:

CalEEMod - California Emissions Estimator Model

sqft - square feet

Reference:

Kimley-Horn and Associates, Inc. Traffic Impact Study for the Barton Place Mixed-Use Project.

Table 15. GHG Emissions Associated with Traffic (Project)

CalEEMod Land Use	Project Entitlement	Vehicles Miles Travelled	CO_2e Emissions [1,2]
		(VMT/yr)	(MT/yr)
Health Club	Club House	0	0
High Turnover (Sit Down Restaurant)	Restaurants	1,764,217	633
Parking Lot	Parking Lot	0	0
Recreational Swimming Pool	Community Pool	0	0
Regional Shopping Center	Shopping Center	2,800,588	1,004
Single Family Housing	Single Family Detached Homes	1,495,150	536
Condo/Townhouse	Paired Homes	872,623	313
	Total	**6,932,578**	**2,486**

Notes:

[1] Emissions were calculated using CalEEMod version 2013.2.2. Emissions associated with transportation included emissions during running, idling, and startup of vehicles. The emissions also account for the reduction due to the regulatory requirements including the Low Carbon Fuel Standard, Pavley and Advanced Clean Car program.

[2] CO_2e includes CO_2, CH_4, and N_2O emissions, which are weighted by their respective global warming potentials.

Abbreviations:

CalEEMod - California Emissions Estimator Model
CARB - California Air Resources Board
GHG - greenhouse gases
MT - metric tons
TDM - Transportation Demand Management
VMT - vehicle miles traveled
yr - year

Table 16. GHG Emissions Associated with Traffic (BAU)

CalEEMod Land Use	Project Entitlement	Vehicles Miles Travelled	CO_2e Emissions [1,2]
		(VMT/yr)	(MT/yr)
Health Club	Club House	0	0
High Turnover (Sit Down Restaurant)	Restaurants	1,764,217	718
Parking Lot	Parking Lot	0	0
Recreational Swimming Pool	Community Pool	0	0
Regional Shopping Center	Shopping Center	2,800,588	1,140
Single Family Housing	Single Family Detached Homes	1,495,150	608
Condo/Townhouse	Paired Homes	872,623	355
	Total	**6,932,578**	**2,821**

Notes:

[1] Emissions were calculated using CalEEMod version 2013.2.2. Emissions associated with transportation included emissions during running, idling, and startup of vehicles. The emissions do not account for the reduction due to the regulatory requirements including the Low Carbon Fuel Standard, Pavley or Advanced Clean Car program.

[2] CO_2e includes CO_2, CH_4, and N_2O emissions, which are weighted by their respective global warming potentials.

Abbreviations:

CalEEMod - California Emissions Estimator Model
CARB - California Air Resources Board
GHG - greenhouse gases
MT - metric tons
TDM - Transportation Demand Management
VMT - vehicle miles traveled
yr - year

Table 17. Summary of GHG Emissions

Category[1]	CO_2e Emissions[2]		% Change From BAU
	2020 Project (MT/yr)	2020 BAU (MT/yr)	
Area	63	63	0.0%
Energy Use	878	1,228	-28.5%
Water Use	114	145	-21.6%
Waste Disposed	143	170	-16.0%
Traffic	2,486	2,821	-11.9%
Sub-Total	**3,683**	**4,428**	**-16.8%**
Construction Amortized[3]	99	99	0.0%
Vegetation Amortized[3]	-12	-12	0.0%
Total	**3,771**	**4,515**	**-16.5%**

Notes:

[1] CO_2e emissions were calculated using CalEEMod version 2013.2.2.
[2] CO_2e includes CO_2, CH_4, and N_2O emissions, which are weighted by their respective global warming potentials.
[3] One-time emissions from construction and vegetation removal were amortized over a 30-year period.

Abbreviations:

BAU - Business as Usual
CalEEMod - California Emissions Estimator Model
CH_4 - methane
CO_2 - carbon dioxide
CO_2e - carbon dioxide equivalents
GHG - greenhouse gases
MT - metric tons
N_2O - nitrous oxide
yr - year

Appendix A

CalEEMod® Output Files

List of Files:

- **Construction**
  - Tiered Engine Equipment - Annual
  - Non-Tiered Engine Equipment – Annual
  - Paving – Annual
- **Operational**
  - BAU (2020)
  - Project (2020)

Cypress - Tiered Construction Equipment

Orange County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	355.00	Space	0.00	142,000.00	0
Health Club	5.22	1000sqft	0.00	5,220.00	0
High Turnover (Sit Down Restaurant)	11.38	1000sqft	0.00	11,376.00	0
Recreational Swimming Pool	3.38	1000sqft	0.00	3,375.00	0
Condo/Townhouse	92.00	Dwelling Unit	0.00	161,581.00	161
Single Family Housing	152.00	Dwelling Unit	33.00	319,230.00	266
Regional Shopping Center	36.50	1000sqft	0.00	36,500.00	0

1.2 Other Project Characteristics

Urbanization Urban **Wind Speed (m/s)** 2.2 **Precipitation Freq (Days)** 30

Climate Zone 8 **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 - Acreage and number of units provided in data request. Parking lot size from project description. Assumes provided 5 acre value for commercial includes parking

Construction Phase - Phasing provided by client

Off-road Equipment - Provided by client

Off-road Equipment - .

Off-road Equipment - .

Off-road Equipment - .

Off-road Equipment - .

Off-road Equipment - .

Trips and VMT -

Grading - Provided by client

Architectural Coating - Client has committed to low-VOC coatings

Construction Off-road Equipment Mitigation - Provided by client

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	16
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	7.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstructionPhase	NumDays	45.00	50.00
tblConstructionPhase	NumDays	45.00	24.00
tblConstructionPhase	NumDays	45.00	8.00
tblConstructionPhase	NumDays	45.00	80.00
tblConstructionPhase	NumDays	20.00	10.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00

tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblFireplaces	NumberGas	78.20	90.95
tblFireplaces	NumberGas	129.20	116.45
tblFireplaces	NumberNoFireplace	9.20	10.70
tblFireplaces	NumberNoFireplace	15.20	13.70
tblFireplaces	NumberWood	4.60	5.35
tblFireplaces	NumberWood	7.60	6.85
tblGrading	MaterialImported	0.00	56,945.00
tblGrading	MaterialImported	0.00	27,334.00
tblGrading	MaterialImported	0.00	9,111.00
tblLandUse	LandUseSquareFeet	11,380.00	11,376.00
tblLandUse	LandUseSquareFeet	3,380.00	3,375.00
tblLandUse	LandUseSquareFeet	92,000.00	161,581.00
tblLandUse	LandUseSquareFeet	273,600.00	319,230.00
tblLandUse	LotAcreage	3.19	0.00
tblLandUse	LotAcreage	0.12	0.00
tblLandUse	LotAcreage	0.26	0.00
tblLandUse	LotAcreage	0.08	0.00
tblLandUse	LotAcreage	5.75	0.00
tblLandUse	LotAcreage	49.35	33.00
tblLandUse	LotAcreage	0.84	0.00
tblLandUse	Population	263.00	161.00
tblLandUse	Population	435.00	266.00
tblOffRoadEquipment	HorsePower	174.00	185.00
tblOffRoadEquipment	HorsePower	174.00	185.00
tblOffRoadEquipment	HorsePower	255.00	315.00
tblOffRoadEquipment	HorsePower	361.00	360.00
tblOffRoadEquipment	HorsePower	361.00	360.00
tblOffRoadEquipment	HorsePower	361.00	360.00

tblOffRoadEquipment	HorsePower	97.00	305.00
tblOffRoadEquipment	HorsePower	97.00	210.00
tblOffRoadEquipment	HorsePower	199.00	70.00
tblOffRoadEquipment	HorsePower	199.00	70.00
tblOffRoadEquipment	LoadFactor	0.36	0.37
tblOffRoadEquipment	LoadFactor	0.36	0.37
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	5.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblProjectCharacteristics	OperationalYear	2014	2019
tblSolidWaste	SolidWasteGenerationRate	42.32	49.22
tblSolidWaste	SolidWasteGenerationRate	109.06	98.40
tblVehicleTrips	CC_TL	8.40	10.10
tblVehicleTrips	CC_TL	8.40	10.10
tblVehicleTrips	CC_TL	8.40	10.10
tblVehicleTrips	CC_TL	8.40	10.10
tblVehicleTrips	CC_TL	8.40	10.10
tblVehicleTrips	CNW_TL	6.90	7.90
tblVehicleTrips	CNW_TL	6.90	7.90

tblVehicleTrips	CNW_TL	6.90	7.90
tblVehicleTrips	CNW_TL	6.90	7.90
tblVehicleTrips	CNW_TL	6.90	7.90
tblVehicleTrips	CW_TL	16.60	18.50
tblVehicleTrips	CW_TL	16.60	18.50
tblVehicleTrips	CW_TL	16.60	18.50
tblVehicleTrips	CW_TL	16.60	18.50
tblVehicleTrips	CW_TL	16.60	18.50
tblVehicleTrips	HO_TL	8.70	12.90
tblVehicleTrips	HO_TL	8.70	12.90
tblVehicleTrips	HS_TL	5.90	9.60
tblVehicleTrips	HS_TL	5.90	9.60
tblVehicleTrips	HW_TL	14.70	19.80
tblVehicleTrips	HW_TL	14.70	19.80
tblWater	IndoorWaterUseRate	5,994,170.36	6,971,480.74
tblWater	IndoorWaterUseRate	9,903,411.89	8,926,101.51
tblWater	OutdoorWaterUseRate	3,778,933.49	4,395,063.95
tblWater	OutdoorWaterUseRate	6,243,455.32	5,627,324.87
tblWoodstoves	NumberCatalytic	4.60	5.35
tblWoodstoves	NumberCatalytic	7.60	6.85
tblWoodstoves	NumberNoncatalytic	4.60	5.35
tblWoodstoves	NumberNoncatalytic	7.60	6.85

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					
2016	0.3457	4.4807	2.9791	6.9300e-003	0.2561	0.1449	0.4010	0.0560	0.1333	0.1893	0.0000	638.6151	638.6151	0.0750	0.0000	640.1890
Total	**0.3457**	**4.4807**	**2.9791**	**6.9300e-003**	**0.2561**	**0.1449**	**0.4010**	**0.0560**	**0.1333**	**0.1893**	**0.0000**	**638.6151**	**638.6151**	**0.0750**	**0.0000**	**640.1890**

<u>Mitigated Construction</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
Year	tons/yr										MT/yr					
2016	0.1765	3.4622	2.7308	6.9300e-003	0.1640	0.0735	0.2375	0.0397	0.0716	0.1112	0.0000	638.6148	638.6148	0.0750	0.0000	640.1887
Total	**0.1765**	**3.4622**	**2.7308**	**6.9300e-003**	**0.1640**	**0.0735**	**0.2375**	**0.0397**	**0.0716**	**0.1112**	**0.0000**	**638.6148**	**638.6148**	**0.0750**	**0.0000**	**640.1887**

	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	**48.93**	**22.73**	**8.33**	**0.00**	**35.98**	**49.28**	**40.78**	**29.22**	**46.33**	**41.27**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

<u>Unmitigated Operational</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	tons/yr										MT/yr					
Area	3.5901	0.0496	4.0671	2.5700e-003		0.2469	0.2469		0.2468	0.2468	25.9175	53.9250	79.8424	0.0814	1.7600e-003	82.0962

Energy	0.0487	0.4255	0.2458	2.6600e-003		0.0336	0.0336		0.0336	0.0336	0.0000	1,215.4500	1,215.4500	0.0430	0.0158	1,221.2535
Mobile	2.5909	6.4629	28.9925	0.0882	6.3882	0.0938	6.4820	1.7070	0.0865	1.7936	0.0000	6,325.3428	6,325.3428	0.2341	0.0000	6,330.2593
Waste						0.0000	0.0000		0.0000	0.0000	75.1858	0.0000	75.1858	4.4434	0.0000	168.4963
Water						0.0000	0.0000		0.0000	0.0000	7.1585	122.9026	130.0611	0.7409	0.0185	151.3642
Total	**6.2298**	**6.9380**	**33.3053**	**0.0934**	**6.3882**	**0.3743**	**6.7625**	**1.7070**	**0.3670**	**2.0740**	**108.2618**	**7,717.6203**	**7,825.8821**	**5.5427**	**0.0361**	**7,953.4695**

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	3.5901	0.0496	4.0671	2.5700e-003		0.2469	0.2469		0.2468	0.2468	25.9175	53.9250	79.8424	0.0814	1.7600e-003	82.0962
Energy	0.0487	0.4255	0.2458	2.6600e-003		0.0336	0.0336		0.0336	0.0336	0.0000	1,215.4500	1,215.4500	0.0430	0.0158	1,221.2535
Mobile	2.5909	6.4629	28.9925	0.0882	6.3882	0.0938	6.4820	1.7070	0.0865	1.7936	0.0000	6,325.3428	6,325.3428	0.2341	0.0000	6,330.2593
Waste						0.0000	0.0000		0.0000	0.0000	75.1858	0.0000	75.1858	4.4434	0.0000	168.4963
Water						0.0000	0.0000		0.0000	0.0000	7.1585	122.9026	130.0611	0.7408	0.0185	151.3528
Total	**6.2298**	**6.9380**	**33.3053**	**0.0934**	**6.3882**	**0.3743**	**6.7625**	**1.7070**	**0.3670**	**2.0740**	**108.2618**	**7,717.6203**	**7,825.8821**	**5.5425**	**0.0361**	**7,953.4581**

	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**	**0.08**	**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	Site Prep	Site Preparation	3/1/2016	3/11/2016	6	10	
2	Grading-1	Grading	3/12/2016	5/9/2016	6	50	
3	Grading-2	Grading	5/10/2016	6/6/2016	6	24	
4	Grading-3	Grading	6/7/2016	6/15/2016	6	8	
5	Grading-4	Grading	6/16/2016	9/16/2016	6	80	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Prep	Off-Highway Trucks	1	6.00	400	0.38
Site Prep	Rubber Tired Dozers	1	6.00	315	0.40
Site Prep	Tractors/Loaders/Backhoes	1	6.00	210	0.37
Grading-1	Off-Highway Trucks	1	6.00	400	0.38
Grading-1	Scrapers	5	6.00	360	0.48
Grading-1	Tractors/Loaders/Backhoes	1	6.00	305	0.37
Grading-2	Graders	1	6.00	185	0.41
Grading-2	Off-Highway Trucks	1	6.00	400	0.38
Grading-2	Rubber Tired Loaders	2	6.00	70	0.37
Grading-2	Scrapers	1	6.00	360	0.48
Grading-3	Graders	1	6.00	185	0.41
Grading-3	Off-Highway Trucks	1	6.00	400	0.38
Grading-3	Scrapers	1	6.00	360	0.48
Grading-4	Rubber Tired Loaders	2	6.00	70	0.37

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
Site Prep	3	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading-1	7	18.00	0.00	7,118.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading-2	5	13.00	0.00	3,417.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading-3	3	8.00	0.00	1,139.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading-4	2	5.00	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

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Site Prep - 2016

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					0.0226	0.0000	0.0226	0.0124	0.0000	0.0124	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0109	0.1277	0.0745	1.2000e-004		5.2700e-003	5.2700e-003		4.8500e-003	4.8500e-003	0.0000	10.8821	10.8821	3.2800e-003	0.0000	10.9510
Total	**0.0109**	**0.1277**	**0.0745**	**1.2000e-004**	**0.0226**	**5.2700e-003**	**0.0279**	**0.0124**	**4.8500e-003**	**0.0173**	**0.0000**	**10.8821**	**10.8821**	**3.2800e-003**	**0.0000**	**10.9510**

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	1.4000e-004	2.0000e-004	2.1100e-003	1.0000e-005	4.4000e-004	0.0000	4.4000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.3958	0.3958	2.0000e-005	0.0000	0.3962
Total	**1.4000e-004**	**2.0000e-004**	**2.1100e-003**	**1.0000e-005**	**4.4000e-004**	**0.0000**	**4.4000e-004**	**1.2000e-004**	**0.0000**	**1.2000e-004**	**0.0000**	**0.3958**	**0.3958**	**2.0000e-005**	**0.0000**	**0.3962**

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					8.3700e-003	0.0000	8.3700e-003	4.6000e-003	0.0000	4.6000e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.8200e-003	0.0762	0.0612	1.2000e-004		2.0700e-003	2.0700e-003		2.0700e-003	2.0700e-003	0.0000	10.8821	10.8821	3.2800e-003	0.0000	10.9510
Total	**2.8200e-003**	**0.0762**	**0.0612**	**1.2000e-004**	**8.3700e-003**	**2.0700e-003**	**0.0104**	**4.6000e-003**	**2.0700e-003**	**6.6700e-003**	**0.0000**	**10.8821**	**10.8821**	**3.2800e-003**	**0.0000**	**10.9510**

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	1.4000e-004	2.0000e-004	2.1100e-003	1.0000e-005	4.4000e-004	0.0000	4.4000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.3958	0.3958	2.0000e-005	0.0000	0.3962
Total	**1.4000e-004**	**2.0000e-004**	**2.1100e-003**	**1.0000e-005**	**4.4000e-004**	**0.0000**	**4.4000e-004**	**1.2000e-004**	**0.0000**	**1.2000e-004**	**0.0000**	**0.3958**	**0.3958**	**2.0000e-005**	**0.0000**	**0.3962**

3.3 Grading-1 - 2016

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					0.1026	0.0000	0.1026	0.0112	0.0000	0.0112	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1575	1.9898	1.1918	1.8200e-003		0.0789	0.0789		0.0726	0.0726	0.0000	171.6016	171.6016	0.0518	0.0000	172.6885
Total	**0.1575**	**1.9898**	**1.1918**	**1.8200e-003**	**0.1026**	**0.0789**	**0.1815**	**0.0112**	**0.0726**	**0.0838**	**0.0000**	**171.6016**	**171.6016**	**0.0518**	**0.0000**	**172.6885**

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	0.0680	1.0320	0.7929	2.6200e-003	0.0610	0.0148	0.0758	0.0167	0.0136	0.0303	0.0000	239.1145	239.1145	1.7100e-003	0.0000	239.1504
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	1.5400e-003	2.2800e-003	0.0238	6.0000e-005	4.9400e-003	4.0000e-005	4.9800e-003	1.3100e-003	3.0000e-005	1.3400e-003	0.0000	4.4528	4.4528	2.2000e-004	0.0000	4.4574
Total	**0.0695**	**1.0342**	**0.8167**	**2.6800e-003**	**0.0660**	**0.0148**	**0.0808**	**0.0181**	**0.0136**	**0.0317**	**0.0000**	**243.5673**	**243.5673**	**1.9300e-003**	**0.0000**	**243.6078**

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					0.0380	0.0000	0.0380	4.1600e-003	0.0000	4.1600e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0448	1.3409	0.9706	1.8200e-003		0.0329	0.0329		0.0329	0.0329	0.0000	171.6013	171.6013	0.0518	0.0000	172.6883
Total	**0.0448**	**1.3409**	**0.9706**	**1.8200e-003**	**0.0380**	**0.0329**	**0.0709**	**4.1600e-003**	**0.0329**	**0.0370**	**0.0000**	**171.6013**	**171.6013**	**0.0518**	**0.0000**	**172.6883**

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	0.0680	1.0320	0.7929	2.6200e-003	0.0610	0.0148	0.0758	0.0167	0.0136	0.0303	0.0000	239.1145	239.1145	1.7100e-003	0.0000	239.1504
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	1.5400e-003	2.2800e-003	0.0238	6.0000e-005	4.9400e-003	4.0000e-005	4.9800e-003	1.3100e-003	3.0000e-005	1.3400e-003	0.0000	4.4528	4.4528	2.2000e-004	0.0000	4.4574
Total	**0.0695**	**1.0342**	**0.8167**	**2.6800e-003**	**0.0660**	**0.0148**	**0.0808**	**0.0181**	**0.0136**	**0.0317**	**0.0000**	**243.5673**	**243.5673**	**1.9300e-003**	**0.0000**	**243.6078**

3.4 Grading-2 - 2016

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					0.0159	0.0000	0.0159	1.7800e-003	0.0000	1.7800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0323	0.3779	0.1966	3.5000e-004		0.0169	0.0169		0.0156	0.0156	0.0000	33.0750	33.0750	9.9800e-003	0.0000	33.2845
Total	**0.0323**	**0.3779**	**0.1966**	**3.5000e-004**	**0.0159**	**0.0169**	**0.0328**	**1.7800e-003**	**0.0156**	**0.0173**	**0.0000**	**33.0750**	**33.0750**	**9.9800e-003**	**0.0000**	**33.2845**

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	0.0326	0.4954	0.3806	1.2600e-003	0.0293	7.0900e-003	0.0364	8.0400e-003	6.5200e-003	0.0146	0.0000	114.7871	114.7871	8.2000e-004	0.0000	114.8043
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	5.3000e-004	7.9000e-004	8.2300e-003	2.0000e-005	1.7100e-003	1.0000e-005	1.7200e-003	4.5000e-004	1.0000e-005	4.7000e-004	0.0000	1.5436	1.5436	8.0000e-005	0.0000	1.5452
Total	**0.0332**	**0.4962**	**0.3889**	**1.2800e-003**	**0.0310**	**7.1000e-003**	**0.0381**	**8.4900e-003**	**6.5300e-003**	**0.0150**	**0.0000**	**116.3307**	**116.3307**	**9.0000e-004**	**0.0000**	**116.3495**

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					5.8800e-003	0.0000	5.8800e-003	6.6000e-004	0.0000	6.6000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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
Off-Road	8.6200e-003	0.2104	0.1958	3.5000e-004		7.1800e-003	7.1800e-003		7.1800e-003	7.1800e-003	0.0000	33.0749	33.0749	9.9800e-003	0.0000	33.2844
Total	**8.6200e-003**	**0.2104**	**0.1958**	**3.5000e-004**	**5.8800e-003**	**7.1800e-003**	**0.0131**	**6.6000e-004**	**7.1800e-003**	**7.8400e-003**	**0.0000**	**33.0749**	**33.0749**	**9.9800e-003**	**0.0000**	**33.2844**

<u>Mitigated Construction Off-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	tons/yr										MT/yr					
Hauling	0.0326	0.4954	0.3806	1.2600e-003	0.0293	7.0900e-003	0.0364	8.0400e-003	6.5200e-003	0.0146	0.0000	114.7871	114.7871	8.2000e-004	0.0000	114.8043
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	5.3000e-004	7.9000e-004	8.2300e-003	2.0000e-005	1.7100e-003	1.0000e-005	1.7200e-003	4.5000e-004	1.0000e-005	4.7000e-004	0.0000	1.5436	1.5436	8.0000e-005	0.0000	1.5452
Total	**0.0332**	**0.4962**	**0.3889**	**1.2800e-003**	**0.0310**	**7.1000e-003**	**0.0381**	**8.4900e-003**	**6.5300e-003**	**0.0150**	**0.0000**	**116.3307**	**116.3307**	**9.0000e-004**	**0.0000**	**116.3495**

3.5 Grading-3 - 2016

<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	tons/yr										MT/yr					
Fugitive Dust					5.2900e-003	0.0000	5.2900e-003	5.9000e-004	0.0000	5.9000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.5600e-003	0.1079	0.0540	1.0000e-004		4.0900e-003	4.0900e-003		3.7600e-003	3.7600e-003	0.0000	9.7828	9.7828	2.9500e-003	0.0000	9.8448
Total	**8.5600e-003**	**0.1079**	**0.0540**	**1.0000e-004**	**5.2900e-003**	**4.0900e-003**	**9.3800e-003**	**5.9000e-004**	**3.7600e-003**	**4.3500e-003**	**0.0000**	**9.7828**	**9.7828**	**2.9500e-003**	**0.0000**	**9.8448**

<u>Unmitigated Construction Off-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	tons/yr										MT/yr					
Hauling	0.0109	0.1651	0.1269	4.2000e-004	9.7700e-003	2.3600e-003	0.0121	2.6800e-003	2.1700e-003	4.8500e-003	0.0000	38.2624	38.2624	2.7000e-004	0.0000	38.2681
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	1.1000e-004	1.6000e-004	1.6900e-003	0.0000	3.5000e-004	0.0000	3.5000e-004	9.0000e-005	0.0000	1.0000e-004	0.0000	0.3166	0.3166	2.0000e-005	0.0000	0.3170
Total	**0.0110**	**0.1653**	**0.1286**	**4.2000e-004**	**0.0101**	**2.3600e-003**	**0.0125**	**2.7700e-003**	**2.1700e-003**	**4.9500e-003**	**0.0000**	**38.5790**	**38.5790**	**2.9000e-004**	**0.0000**	**38.5851**

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					1.9600e-003	0.0000	1.9600e-003	2.2000e-004	0.0000	2.2000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.5400e-003	0.0626	0.0551	1.0000e-004		1.8700e-003	1.8700e-003		1.8700e-003	1.8700e-003	0.0000	9.7828	9.7828	2.9500e-003	0.0000	9.8448
Total	**2.5400e-003**	**0.0626**	**0.0551**	**1.0000e-004**	**1.9600e-003**	**1.8700e-003**	**3.8300e-003**	**2.2000e-004**	**1.8700e-003**	**2.0900e-003**	**0.0000**	**9.7828**	**9.7828**	**2.9500e-003**	**0.0000**	**9.8448**

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					

	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
Hauling	0.0109	0.1651	0.1269	4.2000e-004	9.7700e-003	2.3600e-003	0.0121	2.6800e-003	2.1700e-003	4.8500e-003	0.0000	38.2624	38.2624	2.7000e-004	0.0000	38.2681
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	1.1000e-004	1.6000e-004	1.6900e-003	0.0000	3.5000e-004	0.0000	3.5000e-004	9.0000e-005	0.0000	1.0000e-004	0.0000	0.3166	0.3166	2.0000e-005	0.0000	0.3170
Total	**0.0110**	**0.1653**	**0.1286**	**4.2000e-004**	**0.0101**	**2.3600e-003**	**0.0125**	**2.7700e-003**	**2.1700e-003**	**4.9500e-003**	**0.0000**	**38.5790**	**38.5790**	**2.9000e-004**	**0.0000**	**38.5851**

3.6 Grading-4 - 2016

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0220	0.1804	0.1155	1.3000e-004		0.0155	0.0155		0.0143	0.0143	0.0000	12.4219	12.4219	3.7500e-003	0.0000	12.5006
Total	**0.0220**	**0.1804**	**0.1155**	**1.3000e-004**	**0.0000**	**0.0155**	**0.0155**	**0.0000**	**0.0143**	**0.0143**	**0.0000**	**12.4219**	**12.4219**	**3.7500e-003**	**0.0000**	**12.5006**

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	6.8000e-004	1.0100e-003	0.0106	3.0000e-005	2.2000e-003	2.0000e-005	2.2100e-003	5.8000e-004	1.0000e-005	6.0000e-004	0.0000	1.9790	1.9790	1.0000e-004	0.0000	1.9811
Total	**6.8000e-004**	**1.0100e-003**	**0.0106**	**3.0000e-005**	**2.2000e-003**	**2.0000e-005**	**2.2100e-003**	**5.8000e-004**	**1.0000e-005**	**6.0000e-004**	**0.0000**	**1.9790**	**1.9790**	**1.0000e-004**	**0.0000**	**1.9811**

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.2900e-003	0.0751	0.1014	1.3000e-004		5.2600e-003	5.2600e-003		5.2600e-003	5.2600e-003	0.0000	12.4219	12.4219	3.7500e-003	0.0000	12.5006
Total	**3.2900e-003**	**0.0751**	**0.1014**	**1.3000e-004**	**0.0000**	**5.2600e-003**	**5.2600e-003**	**0.0000**	**5.2600e-003**	**5.2600e-003**	**0.0000**	**12.4219**	**12.4219**	**3.7500e-003**	**0.0000**	**12.5006**

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	6.8000e-004	1.0100e-003	0.0106	3.0000e-005	2.2000e-003	2.0000e-005	2.2100e-003	5.8000e-004	1.0000e-005	6.0000e-004	0.0000	1.9790	1.9790	1.0000e-004	0.0000	1.9811
Total	**6.8000e-004**	**1.0100e-003**	**0.0106**	**3.0000e-005**	**2.2000e-003**	**2.0000e-005**	**2.2100e-003**	**5.8000e-004**	**1.0000e-005**	**6.0000e-004**	**0.0000**	**1.9790**	**1.9790**	**1.0000e-004**	**0.0000**	**1.9811**

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	2.5909	6.4629	28.9925	0.0882	6.3882	0.0938	6.4820	1.7070	0.0865	1.7936	0.0000	6,325.3428	6,325.3428	0.2341	0.0000	6,330.2593
Unmitigated	2.5909	6.4629	28.9925	0.0882	6.3882	0.0938	6.4820	1.7070	0.0865	1.7936	0.0000	6,325.3428	6,325.3428	0.2341	0.0000	6,330.2593

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Condo/Townhouse	606.28	658.72	558.44	2,949,610	2,949,610
Health Club	171.89	108.94	139.53	395,470	395,470
High Turnover (Sit Down Restaurant)	1,446.97	1,802.25	1500.34	2,416,070	2,416,070
Parking Lot	0.00	0.00	0.00		
Recreational Swimming Pool	111.30	70.54	90.35	287,225	287,225
Regional Shopping Center	1,567.31	1,823.91	921.26	3,821,826	3,821,826
Single Family Housing	1,454.64	1,532.16	1333.04	7,038,698	7,038,698
Total	5,358.40	5,996.52	4,542.96	16,908,899	16,908,899

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
Condo/Townhouse	19.80	9.60	12.90	40.20	19.20	40.60	86	11	3
Health Club	18.50	10.10	7.90	16.90	64.10	19.00	52	39	9
High Turnover (Sit Down Restaurant)	18.50	10.10	7.90	8.50	72.50	19.00	37	20	43
Parking Lot	18.50	10.10	7.90	0.00	0.00	0.00	0	0	0
Recreational Swimming Pool	18.50	10.10	7.90	33.00	48.00	19.00	52	39	9
Regional Shopping Center	18.50	10.10	7.90	16.30	64.70	19.00	54	35	11
Single Family Housing	19.80	9.60	12.90	40.20	19.20	40.60	86	11	3

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.509471	0.056616	0.192725	0.151095	0.041772	0.005913	0.015766	0.015535	0.001447	0.002155	0.004735	0.000502	0.002269

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	733.5335	733.5335	0.0337	6.9800e-003	736.4042
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	733.5335	733.5335	0.0337	6.9800e-003	736.4042
NaturalGas Mitigated	0.0487	0.4255	0.2458	2.6600e-003		0.0336	0.0336		0.0336	0.0336	0.0000	481.9164	481.9164	9.2400e-003	8.8400e-003	484.8493
NaturalGas Unmitigated	0.0487	0.4255	0.2458	2.6600e-003		0.0336	0.0336		0.0336	0.0336	0.0000	481.9164	481.9164	9.2400e-003	8.8400e-003	484.8493

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					
High Turnover (Sit Down Restaurant)	2.99678e+006	0.0162	0.1469	0.1234	8.8000e-004		0.0112	0.0112		0.0112	0.0112	0.0000	159.9196	159.9196	3.0700e-003	2.9300e-003	160.8928
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

Recreational Swimming Pool	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
Regional Shopping Center	74825	4.0000e-004	3.6700e-003	3.0800e-003	2.0000e-005		2.8000e-004	2.8000e-004		2.8000e-004	2.8000e-004	0.0000	3.9930	3.9930	8.0000e-005	7.0000e-005	4.0173
Single Family Housing	4.39029e+006	0.0237	0.2023	0.0861	1.2900e-003		0.0164	0.0164		0.0164	0.0164	0.0000	234.2827	234.2827	4.4900e-003	4.3000e-003	235.7085
Condo/Townhouse	1.45592e+006	7.8500e-003	0.0671	0.0286	4.3000e-004		5.4200e-003	5.4200e-003		5.4200e-003	5.4200e-003	0.0000	77.6932	77.6932	1.4900e-003	1.4200e-003	78.1660
Health Club	112961	6.1000e-004	5.5400e-003	4.6500e-003	3.0000e-005		4.2000e-004	4.2000e-004		4.2000e-004	4.2000e-004	0.0000	6.0280	6.0280	1.2000e-004	1.1000e-004	6.0647
Total		**0.0487**	**0.4255**	**0.2458**	**2.6500e-003**		**0.0336**	**0.0336**		**0.0336**	**0.0336**	**0.0000**	**481.9165**	**481.9165**	**9.2500e-003**	**8.8300e-003**	**484.8493**

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					
High Turnover (Sit Down Restaurant)	2.99678e+006	0.0162	0.1469	0.1234	8.8000e-004		0.0112	0.0112		0.0112	0.0112	0.0000	159.9196	159.9196	3.0700e-003	2.9300e-003	160.8928
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
Recreational Swimming Pool	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
Regional Shopping Center	74825	4.0000e-004	3.6700e-003	3.0800e-003	2.0000e-005		2.8000e-004	2.8000e-004		2.8000e-004	2.8000e-004	0.0000	3.9930	3.9930	8.0000e-005	7.0000e-005	4.0173
Single Family Housing	4.39029e+006	0.0237	0.2023	0.0861	1.2900e-003		0.0164	0.0164		0.0164	0.0164	0.0000	234.2827	234.2827	4.4900e-003	4.3000e-003	235.7085
Condo/Townhouse	1.45592e+006	7.8500e-003	0.0671	0.0286	4.3000e-004		5.4200e-003	5.4200e-003		5.4200e-003	5.4200e-003	0.0000	77.6932	77.6932	1.4900e-003	1.4200e-003	78.1660
Health Club	112961	6.1000e-004	5.5400e-003	4.6500e-003	3.0000e-005		4.2000e-004	4.2000e-004		4.2000e-004	4.2000e-004	0.0000	6.0280	6.0280	1.2000e-004	1.1000e-004	6.0647
Total		**0.0487**	**0.4255**	**0.2458**	**2.6500e-003**		**0.0336**	**0.0336**		**0.0336**	**0.0336**	**0.0000**	**481.9165**	**481.9165**	**9.2500e-003**	**8.8300e-003**	**484.8493**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Condo/Townhouse	397866	113.8561	5.2300e-003	1.0800e-003	114.3016
Health Club	48232.8	13.8026	6.3000e-004	1.3000e-004	13.8567
High Turnover (Sit Down Restaurant)	447418	128.0362	5.8900e-003	1.2200e-003	128.5373
Parking Lot	124960	35.7594	1.6400e-003	3.4000e-004	35.8994
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	467200	133.6972	6.1500e-003	1.2700e-003	134.2204
Single Family Housing	1.07763e+006	308.3820	0.0142	2.9300e-003	309.5888
Total		**733.5335**	**0.0337**	**6.9700e-003**	**736.4042**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Condo/Townhouse	397866	113.8561	5.2300e-003	1.0800e-003	114.3016
Health Club	48232.8	13.8026	6.3000e-004	1.3000e-004	13.8567
High Turnover (Sit Down Restaurant)	447418	128.0362	5.8900e-003	1.2200e-003	128.5373
Parking Lot	124960	35.7594	1.6400e-003	3.4000e-004	35.8994
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000

Regional Shopping Center	467200	133.6972	6.1500e-003	1.2700e-003	134.2204
Single Family Housing	1.07763e+006	308.3820	0.0142	2.9300e-003	309.5888
Total		**733.5335**	**0.0337**	**6.9700e-003**	**736.4042**

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	3.5901	0.0496	4.0671	2.5700e-003		0.2469	0.2469		0.2468	0.2468	25.9175	53.9250	79.8424	0.0814	1.7600e-003	82.0962
Unmitigated	3.5901	0.0496	4.0671	2.5700e-003		0.2469	0.2469		0.2468	0.2468	25.9175	53.9250	79.8424	0.0814	1.7600e-003	82.0962

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	0.2584					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	2.4546					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.7992	0.0203	1.5331	2.4400e-003		0.2330	0.2330		0.2330	0.2330	25.9175	49.8044	75.7219	0.0773	1.7600e-003	77.8903
Landscaping	0.0779	0.0293	2.5341	1.3000e-004		0.0139	0.0139		0.0139	0.0139	0.0000	4.1205	4.1205	4.0600e-003	0.0000	4.2058

Total	3.5901	0.0496	4.0671	2.5700e-003		0.2469	0.2469		0.2468	0.2468	25.9175	53.9250	79.8424	0.0814	1.7600e-003	82.0962

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	0.2584					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	2.4546					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.7992	0.0203	1.5331	2.4400e-003		0.2330	0.2330		0.2330	0.2330	25.9175	49.8044	75.7219	0.0773	1.7600e-003	77.8903
Landscaping	0.0779	0.0293	2.5341	1.3000e-004		0.0139	0.0139		0.0139	0.0139	0.0000	4.1205	4.1205	4.0600e-003	0.0000	4.2058
Total	**3.5901**	**0.0496**	**4.0671**	**2.5700e-003**		**0.2469**	**0.2469**		**0.2468**	**0.2468**	**25.9175**	**53.9250**	**79.8424**	**0.0814**	**1.7600e-003**	**82.0962**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	130.0611	0.7408	0.0185	151.3528
Unmitigated	130.0611	0.7409	0.0185	151.3642

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Condo/Townhouse	6.97148 / 4.39506	42.1620	0.2290	5.7400e-003	48.7516
Health Club	0.308727 / 0.18922	1.8499	0.0101	2.5000e-004	2.1417
High Turnover (Sit Down Restaurant)	3.45421 / 0.220482	14.6679	0.1132	2.7900e-003	17.9085
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0.199904 / 0.122522	1.1978	6.5700e-003	1.6000e-004	1.3867
Regional Shopping Center	2.70365 / 1.65707	16.2004	0.0888	2.2300e-003	18.7553
Single Family Housing	8.9261 / 5.62732	53.9831	0.2932	7.3500e-003	62.4203
Total		**130.0611**	**0.7409**	**0.0185**	**151.3642**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Condo/Townhouse	6.97148 / 4.39506	42.1620	0.2290	5.7400e-003	48.7481
Health Club	0.308727 / 0.18922	1.8499	0.0101	2.5000e-004	2.1415
High Turnover (Sit Down Restaurant)	3.45421 / 0.220482	14.6679	0.1132	2.7800e-003	17.9068
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000

Recreational Swimming Pool	0.199904 / 0.122522	1.1978	6.5600e-003	1.6000e-004	1.3866
Regional Shopping Center	2.70365 / 1.65707	16.2004	0.0888	2.2200e-003	18.7540
Single Family Housing	8.9261 / 5.62732	53.9831	0.2932	7.3400e-003	62.4158
Total		**130.0611**	**0.7408**	**0.0185**	**151.3528**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Unmitigated	75.1858	4.4434	0.0000	168.4963
Mitigated	75.1858	4.4434	0.0000	168.4963

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Condo/Townhouse	49.22	9.9912	0.5905	0.0000	22.3910
Health Club	29.75	6.0390	0.3569	0.0000	13.5338

High Turnover (Sit Down Restaurant)	135.42	27.4890	1.6246	0.0000	61.6047
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	19.27	3.9116	0.2312	0.0000	8.7662
Regional Shopping Center	38.33	7.7806	0.4598	0.0000	17.4369
Single Family Housing	98.4	19.9743	1.1805	0.0000	44.7637
Total		**75.1858**	**4.4434**	**0.0000**	**168.4963**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Condo/Townhouse	49.22	9.9912	0.5905	0.0000	22.3910
Health Club	29.75	6.0390	0.3569	0.0000	13.5338
High Turnover (Sit Down Restaurant)	135.42	27.4890	1.6246	0.0000	61.6047
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	19.27	3.9116	0.2312	0.0000	8.7662
Regional Shopping Center	38.33	7.7806	0.4598	0.0000	17.4369
Single Family Housing	98.4	19.9743	1.1805	0.0000	44.7637
Total		**75.1858**	**4.4434**	**0.0000**	**168.4963**

9.0 Operational Offroad

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

10.0 Vegetation

Cypress - Non-Tiered Construction Equipment

Orange County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	355.00	Space	0.00	142,000.00	0
Health Club	5.22	1000sqft	0.00	5,220.00	0
High Turnover (Sit Down Restaurant)	11.38	1000sqft	0.00	11,376.00	0
Recreational Swimming Pool	3.38	1000sqft	0.00	3,375.00	0
Condo/Townhouse	92.00	Dwelling Unit	0.00	161,581.00	161
Single Family Housing	152.00	Dwelling Unit	33.00	319,230.00	266
Regional Shopping Center	36.50	1000sqft	0.00	36,500.00	0

1.2 Other Project Characteristics

Urbanization Urban **Wind Speed (m/s)** 2.2 **Precipitation Freq (Days)** 30

Climate Zone 8 **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 - Acreage and number of units provided in data request. Parking lot size from project description. Assumes provided 5 acre value for commercial includes parking

Construction Phase - Phasing provided by client

Off-road Equipment - Provided by client

Off-road Equipment - .

Off-road Equipment - Amount and hours provided by client

Off-road Equipment - Provided by client

Off-road Equipment - Provided by client

Off-road Equipment - Provided by client

Off-road Equipment - Provided by client

Off-road Equipment - Provided by client

Off-road Equipment - Provided by client

Off-road Equipment - Provided by client

Off-road Equipment - Provided by client

Off-road Equipment - Provided by client

Off-road Equipment - Provided by client

Off-road Equipment - Provided by client

Off-road Equipment - Provided by client

Off-road Equipment - Provided by client

Off-road Equipment - Provided by client

Trips and VMT - .

Grading - Provided by client

Architectural Coating - Client has committed to low-VOC coatings

Construction Off-road Equipment Mitigation - Provided by client

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	100.00
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	100.00
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	100.00
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tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	100.00
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	100.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	50.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	50.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	50.00

tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	50.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	50.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	50.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	50.00
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	16
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tblConstructionPhase	PhaseEndDate	10/6/2017	8/31/2017
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tblConstructionPhase	PhaseEndDate	2/28/2017	11/14/2016
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tblConstructionPhase	PhaseStartDate	9/2/2018	7/28/2018
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tblConstructionPhase	PhaseStartDate	5/4/2017	3/27/2017
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tblLandUse	LotAcreage	5.75	0.00
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tblLandUse	LotAcreage	0.84	0.00
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tblSolidWaste	SolidWasteGenerationRate	42.32	49.22
tblSolidWaste	SolidWasteGenerationRate	109.06	98.40
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tblVehicleTrips	HS_TL	5.90	9.60
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tblVehicleTrips	HW_TL	14.70	19.80
tblVehicleTrips	HW_TL	14.70	19.80
tblWater	IndoorWaterUseRate	5,994,170.36	6,971,480.74
tblWater	IndoorWaterUseRate	9,903,411.89	8,926,101.51
tblWater	OutdoorWaterUseRate	3,778,933.49	4,395,063.95
tblWater	OutdoorWaterUseRate	6,243,455.32	5,627,324.87
tblWoodstoves	NumberCatalytic	4.60	5.35
tblWoodstoves	NumberCatalytic	7.60	6.85
tblWoodstoves	NumberNoncatalytic	4.60	5.35
tblWoodstoves	NumberNoncatalytic	7.60	6.85

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					
2016	2.3169	2.1232	2.7122	5.8100e-003	0.2927	0.0927	0.3854	0.0784	0.0856	0.1640	0.0000	486.0841	486.0841	0.0559	0.0000	487.2580
2017	6.5755	2.9092	5.0860	0.0121	0.7091	0.1025	0.8116	0.1899	0.0951	0.2850	0.0000	963.5697	963.5697	0.0756	0.0000	965.1572
2018	6.5101	2.3696	4.4809	0.0114	0.6676	0.0810	0.7486	0.1788	0.0752	0.2540	0.0000	881.5857	881.5857	0.0694	0.0000	883.0435
2019	8.1000e-004	5.5300e-003	0.0110	3.0000e-005	1.7300e-003	1.8000e-004	1.9100e-003	4.6000e-004	1.6000e-004	6.3000e-004	0.0000	2.2362	2.2362	1.8000e-004	0.0000	2.2399
Total	**15.4033**	**7.4075**	**12.2901**	**0.0293**	**1.6711**	**0.2764**	**1.9476**	**0.4475**	**0.2560**	**0.7036**	**0.0000**	**2,333.4757**	**2,333.4757**	**0.2011**	**0.0000**	**2,337.6986**

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					
2016	2.3169	2.1232	2.7122	5.8100e-003	0.2529	0.0927	0.3456	0.0686	0.0856	0.1542	0.0000	486.0839	486.0839	0.0559	0.0000	487.2578
2017	6.5755	2.9092	5.0860	0.0121	0.6126	0.1025	0.7151	0.1662	0.0951	0.2613	0.0000	963.5695	963.5695	0.0756	0.0000	965.1570
2018	6.5101	2.3696	4.4809	0.0114	0.5767	0.0810	0.6577	0.1565	0.0752	0.2317	0.0000	881.5855	881.5855	0.0694	0.0000	883.0433
2019	8.1000e-004	5.5300e-003	0.0110	3.0000e-005	1.5000e-003	1.8000e-004	1.6700e-003	4.1000e-004	1.6000e-004	5.7000e-004	0.0000	2.2362	2.2362	1.8000e-004	0.0000	2.2399
Total	**15.4033**	**7.4075**	**12.2901**	**0.0293**	**1.4436**	**0.2764**	**1.7200**	**0.3917**	**0.2560**	**0.6477**	**0.0000**	**2,333.4751**	**2,333.4751**	**0.2011**	**0.0000**	**2,337.6980**

	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**	**13.61**	**0.00**	**11.68**	**12.47**	**0.00**	**7.94**	**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					
Waste						0.0000	0.0000		0.0000	0.0000	75.1858	0.0000	75.1858	4.4434	0.0000	168.4963
Water						0.0000	0.0000		0.0000	0.0000	7.1585	122.9026	130.0611	0.7409	0.0185	151.3642
Area	3.5901	0.0496	4.0671	2.5700e-003		0.2469	0.2469		0.2468	0.2468	25.9175	53.9250	79.8424	0.0814	1.7600e-003	82.0962
Energy	0.0487	0.4255	0.2458	2.6600e-003		0.0336	0.0336		0.0336	0.0336	0.0000	1,215.4500	1,215.4500	0.0430	0.0158	1,221.2535
Mobile	2.5909	6.4629	28.9925	0.0882	6.3882	0.0938	6.4820	1.7070	0.0865	1.7936	0.0000	6,325.3428	6,325.3428	0.2341	0.0000	6,330.2593
Total	**6.2298**	**6.9380**	**33.3053**	**0.0934**	**6.3882**	**0.3743**	**6.7625**	**1.7070**	**0.3670**	**2.0740**	**108.2618**	**7,717.6203**	**7,825.8821**	**5.5427**	**0.0361**	**7,953.4695**

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					
Water						0.0000	0.0000		0.0000	0.0000	7.1585	122.9026	130.0611	0.7408	0.0185	151.3528
Area	3.5901	0.0496	4.0671	2.5700e-003		0.2469	0.2469		0.2468	0.2468	25.9175	53.9250	79.8424	0.0814	1.7600e-003	82.0962

Energy	0.0487	0.4255	0.2458	2.6600e-003		0.0336	0.0336		0.0336	0.0336	0.0000	1,215.4500	1,215.4500	0.0430	0.0158	1,221.2535
Mobile	2.5909	6.4629	28.9925	0.0882	6.3882	0.0938	6.4820	1.7070	0.0865	1.7936	0.0000	6,325.3428	6,325.3428	0.2341	0.0000	6,330.2593
Waste						0.0000	0.0000		0.0000	0.0000	75.1858	0.0000	75.1858	4.4434	0.0000	168.4963
Total	**6.2298**	**6.9380**	**33.3053**	**0.0934**	**6.3882**	**0.3743**	**6.7625**	**1.7070**	**0.3670**	**2.0740**	**108.2618**	**7,717.6203**	**7,825.8821**	**5.5425**	**0.0361**	**7,953.4581**

	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	0.08	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	Grading	Grading	6/16/2016	9/16/2016	6	80	
2	P2-BC	Building Construction	8/1/2016	12/31/2016	6	132	
3	Paving	Paving	9/17/2016	11/14/2016	6	50	
4	P2-AC	Architectural Coating	11/28/2016	12/31/2016	6	30	
5	P3-BC	Building Construction	12/1/2016	5/3/2017	6	132	
6	P3-AC	Architectural Coating	3/27/2017	4/29/2017	6	30	
7	P4-BC	Building Construction	4/1/2017	9/1/2017	6	132	
8	P4-AC	Architectural Coating	7/28/2017	8/31/2017	6	30	
9	P5-BC	Building Construction	8/1/2017	1/1/2018	6	132	
10	P5-AC	Architectural Coating	11/27/2017	12/30/2017	6	30	
11	P6-BC	Building Construction	12/1/2017	5/3/2018	6	132	
12	P6-AC	Architectural Coating	3/26/2018	4/28/2018	6	30	
13	P7-BC	Building Construction	4/1/2018	9/1/2018	6	132	
14	P7-AC	Architectural Coating	7/28/2018	8/31/2018	6	30	
15	P8-BC	Building Construction	8/1/2018	1/1/2019	6	132	

16	P8-AC	Architectural Coating	11/26/2018	12/29/2018	6	30	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 973,642; Residential Outdoor: 324,547; Non-Residential Indoor: 91,097; Non-Residential Outdoor: 30,366

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Off-Highway Trucks	1	6.00	400	0.38
Grading	Tractors/Loaders/Backhoes	1	6.00	150	0.37
P2-BC	Cement and Mortar Mixers	1	4.00	9	0.56
P2-BC	Forklifts	1	6.00	125	0.20
P2-BC	Off-Highway Trucks	1	2.00	250	0.38
P2-BC	Tractors/Loaders/Backhoes	2	4.00	150	0.37
Paving	Pavers	2	6.00	89	0.42
Paving	Paving Equipment	2	6.00	82	0.36
Paving	Rollers	2	6.00	84	0.38
P2-AC	Air Compressors	2	3.00	78	0.48
P3-BC	Cement and Mortar Mixers	1	4.00	9	0.56
P3-BC	Forklifts	1	6.00	125	0.20
P3-BC	Off-Highway Trucks	1	2.00	250	0.38
P3-BC	Tractors/Loaders/Backhoes	2	4.00	150	0.37
P3-AC	Air Compressors	2	3.00	78	0.48
P4-BC	Cement and Mortar Mixers	1	4.00	9	0.56
P4-BC	Forklifts	1	6.00	125	0.20
P4-BC	Off-Highway Trucks	1	2.00	250	0.38
P4-BC	Tractors/Loaders/Backhoes	2	4.00	150	0.37
P4-AC	Air Compressors	2	3.00	78	0.48
P5-BC	Cement and Mortar Mixers	1	4.00	9	0.56

P5-BC	Forklifts	1	6.00	125	0.20
P5-BC	Off-Highway Trucks	1	2.00	250	0.38
P5-BC	Tractors/Loaders/Backhoes	2	4.00	150	0.37
P5-AC	Air Compressors	2	3.00	78	0.48
P6-BC	Cement and Mortar Mixers	1	4.00	9	0.56
P6-BC	Forklifts	1	6.00	125	0.20
P6-BC	Off-Highway Trucks	1	2.00	250	0.38
P6-BC	Tractors/Loaders/Backhoes	2	4.00	150	0.37
P6-AC	Air Compressors	2	3.00	78	0.48
P7-BC	Cement and Mortar Mixers	1	4.00	9	0.56
P7-BC	Forklifts	1	6.00	125	0.20
P7-BC	Off-Highway Trucks	1	2.00	250	0.38
P7-BC	Tractors/Loaders/Backhoes	2	4.00	150	0.37
P7-AC	Air Compressors	2	3.00	78	0.48
P8-BC	Cement and Mortar Mixers	1	4.00	9	0.56
P8-BC	Forklifts	1	6.00	125	0.20
P8-BC	Off-Highway Trucks	1	2.00	250	0.38
P8-BC	Tractors/Loaders/Backhoes	2	4.00	150	0.37
P8-AC	Air Compressors	2	3.00	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
Grading	2	5.00	0.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
P2-BC	5	206.00	59.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
P2-AC	2	41.00	0.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
P3-BC	5	206.00	59.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
P3-AC	2	41.00	0.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
P4-BC	5	206.00	59.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT

P4-AC	2	41.00	0.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
P5-BC	5	206.00	59.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
P5-AC	2	41.00	0.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
P6-BC	5	206.00	59.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
P6-AC	2	41.00	0.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
P7-BC	5	206.00	59.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
P7-AC	2	41.00	0.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
P8-BC	5	206.00	59.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
P8-AC	2	41.00	0.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Grading - 2016

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	0.0397	0.4542	0.2465	5.4000e-004		0.0188	0.0188		0.0173	0.0173	0.0000	50.5895	50.5895	0.0153	0.0000	50.9099
Total	**0.0397**	**0.4542**	**0.2465**	**5.4000e-004**		**0.0188**	**0.0188**		**0.0173**	**0.0173**	**0.0000**	**50.5895**	**50.5895**	**0.0153**	**0.0000**	**50.9099**

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	7.6000e-004	1.3300e-003	0.0137	3.0000e-005	2.9600e-003	2.0000e-005	2.9800e-003	7.9000e-004	2.0000e-005	8.0000e-004	0.0000	2.6511	2.6511	1.3000e-004	0.0000	2.6538
Total	**7.6000e-004**	**1.3300e-003**	**0.0137**	**3.0000e-005**	**2.9600e-003**	**2.0000e-005**	**2.9800e-003**	**7.9000e-004**	**2.0000e-005**	**8.0000e-004**	**0.0000**	**2.6511**	**2.6511**	**1.3000e-004**	**0.0000**	**2.6538**

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	0.0397	0.4542	0.2465	5.4000e-004		0.0188	0.0188		0.0173	0.0173	0.0000	50.5894	50.5894	0.0153	0.0000	50.9099
Total	**0.0397**	**0.4542**	**0.2465**	**5.4000e-004**		**0.0188**	**0.0188**		**0.0173**	**0.0173**	**0.0000**	**50.5894**	**50.5894**	**0.0153**	**0.0000**	**50.9099**

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	7.6000e-004	1.3300e-003	0.0137	3.0000e-005	2.5500e-003	2.0000e-005	2.5700e-003	6.8000e-004	2.0000e-005	7.0000e-004	0.0000	2.6511	2.6511	1.3000e-004	0.0000	2.6538
Total	**7.6000e-004**	**1.3300e-003**	**0.0137**	**3.0000e-005**	**2.5500e-003**	**2.0000e-005**	**2.5700e-003**	**6.8000e-004**	**2.0000e-005**	**7.0000e-004**	**0.0000**	**2.6511**	**2.6511**	**1.3000e-004**	**0.0000**	**2.6538**

3.3 P2-BC - 2016

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	0.0510	0.5524	0.3452	5.8000e-004		0.0273	0.0273		0.0252	0.0252	0.0000	53.5953	53.5953	0.0159	0.0000	53.9285
Total	**0.0510**	**0.5524**	**0.3452**	**5.8000e-004**		**0.0273**	**0.0273**		**0.0252**	**0.0252**	**0.0000**	**53.5953**	**53.5953**	**0.0159**	**0.0000**	**53.9285**

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	0.0380	0.3913	0.4714	9.5000e-004	0.0274	6.1000e-003	0.0335	7.8300e-003	5.6100e-003	0.0134	0.0000	86.5224	86.5224	6.1000e-004	0.0000	86.5353
Worker	0.0516	0.0904	0.9343	2.3700e-003	0.2010	1.3900e-003	0.2024	0.0534	1.2800e-003	0.0547	0.0000	180.2213	180.2213	8.7300e-003	0.0000	180.4046

Total	**0.0897**	**0.4816**	**1.4057**	**3.3200e-003**	**0.2284**	**7.4900e-003**	**0.2359**	**0.0612**	**6.8900e-003**	**0.0681**	**0.0000**	**266.7437**	**266.7437**	**9.3400e-003**	**0.0000**	**266.9399**

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	0.0510	0.5524	0.3452	5.8000e-004		0.0273	0.0273		0.0252	0.0252	0.0000	53.5952	53.5952	0.0159	0.0000	53.9284
Total	**0.0510**	**0.5524**	**0.3452**	**5.8000e-004**		**0.0273**	**0.0273**		**0.0252**	**0.0252**	**0.0000**	**53.5952**	**53.5952**	**0.0159**	**0.0000**	**53.9284**

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	0.0380	0.3913	0.4714	9.5000e-004	0.0242	6.1000e-003	0.0303	7.0400e-003	5.6100e-003	0.0127	0.0000	86.5224	86.5224	6.1000e-004	0.0000	86.5353
Worker	0.0516	0.0904	0.9343	2.3700e-003	0.1731	1.3900e-003	0.1745	0.0465	1.2800e-003	0.0478	0.0000	180.2213	180.2213	8.7300e-003	0.0000	180.4046
Total	**0.0897**	**0.4816**	**1.4057**	**3.3200e-003**	**0.1973**	**7.4900e-003**	**0.2048**	**0.0536**	**6.8900e-003**	**0.0605**	**0.0000**	**266.7437**	**266.7437**	**9.3400e-003**	**0.0000**	**266.9399**

3.4 Paving - 2016

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	0.0415	0.3800	0.2466	3.2000e-004		0.0289	0.0289		0.0266	0.0266	0.0000	30.0279	30.0279	9.0600e-003	0.0000	30.2181
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0415**	**0.3800**	**0.2466**	**3.2000e-004**		**0.0289**	**0.0289**		**0.0266**	**0.0266**	**0.0000**	**30.0279**	**30.0279**	**9.0600e-003**	**0.0000**	**30.2181**

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	1.4200e-003	2.4900e-003	0.0258	7.0000e-005	5.5400e-003	4.0000e-005	5.5800e-003	1.4700e-003	4.0000e-005	1.5100e-003	0.0000	4.9708	4.9708	2.4000e-004	0.0000	4.9759
Total	**1.4200e-003**	**2.4900e-003**	**0.0258**	**7.0000e-005**	**5.5400e-003**	**4.0000e-005**	**5.5800e-003**	**1.4700e-003**	**4.0000e-005**	**1.5100e-003**	**0.0000**	**4.9708**	**4.9708**	**2.4000e-004**	**0.0000**	**4.9759**

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					

	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
Off-Road	0.0415	0.3800	0.2466	3.2000e-004		0.0289	0.0289		0.0266	0.0266	0.0000	30.0279	30.0279	9.0600e-003	0.0000	30.2181
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0415**	**0.3800**	**0.2466**	**3.2000e-004**		**0.0289**	**0.0289**		**0.0266**	**0.0266**	**0.0000**	**30.0279**	**30.0279**	**9.0600e-003**	**0.0000**	**30.2181**

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	1.4200e-003	2.4900e-003	0.0258	7.0000e-005	4.7700e-003	4.0000e-005	4.8100e-003	1.2800e-003	4.0000e-005	1.3200e-003	0.0000	4.9708	4.9708	2.4000e-004	0.0000	4.9759
Total	**1.4200e-003**	**2.4900e-003**	**0.0258**	**7.0000e-005**	**4.7700e-003**	**4.0000e-005**	**4.8100e-003**	**1.2800e-003**	**4.0000e-005**	**1.3200e-003**	**0.0000**	**4.9708**	**4.9708**	**2.4000e-004**	**0.0000**	**4.9759**

3.5 P2-AC - 2016

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	2.0563					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.5300e-003	0.0356	0.0283	4.0000e-005		2.9500e-003	2.9500e-003		2.9500e-003	2.9500e-003	0.0000	3.8299	3.8299	4.5000e-004	0.0000	3.8394
Total	**2.0618**	**0.0356**	**0.0283**	**4.0000e-005**		**2.9500e-003**	**2.9500e-003**		**2.9500e-003**	**2.9500e-003**	**0.0000**	**3.8299**	**3.8299**	**4.5000e-004**	**0.0000**	**3.8394**

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	2.3400e-003	4.0900e-003	0.0423	1.1000e-004	9.0900e-003	6.0000e-005	9.1500e-003	2.4100e-003	6.0000e-005	2.4700e-003	0.0000	8.1521	8.1521	3.9000e-004	0.0000	8.1604
Total	**2.3400e-003**	**4.0900e-003**	**0.0423**	**1.1000e-004**	**9.0900e-003**	**6.0000e-005**	**9.1500e-003**	**2.4100e-003**	**6.0000e-005**	**2.4700e-003**	**0.0000**	**8.1521**	**8.1521**	**3.9000e-004**	**0.0000**	**8.1604**

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	2.0563					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.5300e-003	0.0356	0.0283	4.0000e-005		2.9500e-003	2.9500e-003		2.9500e-003	2.9500e-003	0.0000	3.8299	3.8299	4.5000e-004	0.0000	3.8394
Total	**2.0618**	**0.0356**	**0.0283**	**4.0000e-005**		**2.9500e-003**	**2.9500e-003**		**2.9500e-003**	**2.9500e-003**	**0.0000**	**3.8299**	**3.8299**	**4.5000e-004**	**0.0000**	**3.8394**

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	2.3400e-003	4.0900e-003	0.0423	1.1000e-004	7.8300e-003	6.0000e-005	7.8900e-003	2.1000e-003	6.0000e-005	2.1600e-003	0.0000	8.1521	8.1521	3.9000e-004	0.0000	8.1604
Total	**2.3400e-003**	**4.0900e-003**	**0.0423**	**1.1000e-004**	**7.8300e-003**	**6.0000e-005**	**7.8900e-003**	**2.1000e-003**	**6.0000e-005**	**2.1600e-003**	**0.0000**	**8.1521**	**8.1521**	**3.9000e-004**	**0.0000**	**8.1604**

3.6 P3-BC - 2016

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	0.0104	0.1130	0.0706	1.2000e-004		5.5900e-003	5.5900e-003		5.1500e-003	5.1500e-003	0.0000	10.9627	10.9627	3.2500e-003	0.0000	11.0308
Total	**0.0104**	**0.1130**	**0.0706**	**1.2000e-004**		**5.5900e-003**	**5.5900e-003**		**5.1500e-003**	**5.1500e-003**	**0.0000**	**10.9627**	**10.9627**	**3.2500e-003**	**0.0000**	**11.0308**

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	7.7800e-003	0.0800	0.0964	1.9000e-004	5.6100e-003	1.2500e-003	6.8600e-003	1.6000e-003	1.1500e-003	2.7500e-003	0.0000	17.6978	17.6978	1.3000e-004	0.0000	17.7004
Worker	0.0106	0.0185	0.1911	4.9000e-004	0.0411	2.9000e-004	0.0414	0.0109	2.6000e-004	0.0112	0.0000	36.8635	36.8635	1.7900e-003	0.0000	36.9010

Total	**0.0183**	**0.0985**	**0.2875**	**6.8000e-004**	**0.0467**	**1.5400e-003**	**0.0483**	**0.0125**	**1.4100e-003**	**0.0139**	**0.0000**	**54.5612**	**54.5612**	**1.9200e-003**	**0.0000**	**54.6014**

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	0.0104	0.1130	0.0706	1.2000e-004		5.5900e-003	5.5900e-003		5.1500e-003	5.1500e-003	0.0000	10.9627	10.9627	3.2500e-003	0.0000	11.0308
Total	**0.0104**	**0.1130**	**0.0706**	**1.2000e-004**		**5.5900e-003**	**5.5900e-003**		**5.1500e-003**	**5.1500e-003**	**0.0000**	**10.9627**	**10.9627**	**3.2500e-003**	**0.0000**	**11.0308**

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	7.7800e-003	0.0800	0.0964	1.9000e-004	4.9600e-003	1.2500e-003	6.2100e-003	1.4400e-003	1.1500e-003	2.5900e-003	0.0000	17.6978	17.6978	1.3000e-004	0.0000	17.7004
Worker	0.0106	0.0185	0.1911	4.9000e-004	0.0354	2.9000e-004	0.0357	9.5200e-003	2.6000e-004	9.7800e-003	0.0000	36.8635	36.8635	1.7900e-003	0.0000	36.9010
Total	**0.0183**	**0.0985**	**0.2875**	**6.8000e-004**	**0.0404**	**1.5400e-003**	**0.0419**	**0.0110**	**1.4100e-003**	**0.0124**	**0.0000**	**54.5612**	**54.5612**	**1.9200e-003**	**0.0000**	**54.6014**

3.6 P3-BC - 2017

Unmitigated Construction On-Site

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
	tons/yr										MT/yr					
Off-Road	0.0377	0.3982	0.2710	4.6000e-004		0.0198	0.0198		0.0182	0.0182	0.0000	41.9491	41.9491	0.0126	0.0000	42.2139
Total	**0.0377**	**0.3982**	**0.2710**	**4.6000e-004**		**0.0198**	**0.0198**		**0.0182**	**0.0182**	**0.0000**	**41.9491**	**41.9491**	**0.0126**	**0.0000**	**42.2139**

Unmitigated Construction Off-Site

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
	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	0.0279	0.2827	0.3548	7.6000e-004	0.0218	4.3300e-003	0.0262	6.2300e-003	3.9800e-003	0.0102	0.0000	67.7040	67.7040	4.7000e-004	0.0000	67.7139
Worker	0.0371	0.0653	0.6764	1.8900e-003	0.1599	1.0800e-003	0.1610	0.0425	1.0000e-003	0.0435	0.0000	137.8087	137.8087	6.4500e-003	0.0000	137.9441
Total	**0.0650**	**0.3480**	**1.0313**	**2.6500e-003**	**0.1817**	**5.4100e-003**	**0.1871**	**0.0487**	**4.9800e-003**	**0.0537**	**0.0000**	**205.5126**	**205.5126**	**6.9200e-003**	**0.0000**	**205.6579**

Mitigated Construction On-Site

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
	tons/yr										MT/yr					

	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
Off-Road	0.0377	0.3982	0.2710	4.6000e-004		0.0198	0.0198		0.0182	0.0182	0.0000	41.9490	41.9490	0.0126	0.0000	42.2138
Total	**0.0377**	**0.3982**	**0.2710**	**4.6000e-004**		**0.0198**	**0.0198**		**0.0182**	**0.0182**	**0.0000**	**41.9490**	**41.9490**	**0.0126**	**0.0000**	**42.2138**

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	0.0279	0.2827	0.3548	7.6000e-004	0.0193	4.3300e-003	0.0236	5.6100e-003	3.9800e-003	9.5900e-003	0.0000	67.7040	67.7040	4.7000e-004	0.0000	67.7139
Worker	0.0371	0.0653	0.6764	1.8900e-003	0.1377	1.0800e-003	0.1388	0.0370	1.0000e-003	0.0380	0.0000	137.8087	137.8087	6.4500e-003	0.0000	137.9441
Total	**0.0650**	**0.3480**	**1.0313**	**2.6500e-003**	**0.1570**	**5.4100e-003**	**0.1624**	**0.0426**	**4.9800e-003**	**0.0476**	**0.0000**	**205.5126**	**205.5126**	**6.9200e-003**	**0.0000**	**205.6579**

3.7 P3-AC - 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					
Archit. Coating	2.0563					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.9800e-003	0.0328	0.0280	4.0000e-005		2.6000e-003	2.6000e-003		2.6000e-003	2.6000e-003	0.0000	3.8299	3.8299	4.0000e-004	0.0000	3.8384
Total	**2.0613**	**0.0328**	**0.0280**	**4.0000e-005**		**2.6000e-003**	**2.6000e-003**		**2.6000e-003**	**2.6000e-003**	**0.0000**	**3.8299**	**3.8299**	**4.0000e-004**	**0.0000**	**3.8384**

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	2.1100e-003	3.7100e-003	0.0385	1.1000e-004	9.0900e-003	6.0000e-005	9.1500e-003	2.4100e-003	6.0000e-005	2.4700e-003	0.0000	7.8366	7.8366	3.7000e-004	0.0000	7.8443
Total	**2.1100e-003**	**3.7100e-003**	**0.0385**	**1.1000e-004**	**9.0900e-003**	**6.0000e-005**	**9.1500e-003**	**2.4100e-003**	**6.0000e-005**	**2.4700e-003**	**0.0000**	**7.8366**	**7.8366**	**3.7000e-004**	**0.0000**	**7.8443**

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	2.0563					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.9800e-003	0.0328	0.0280	4.0000e-005		2.6000e-003	2.6000e-003		2.6000e-003	2.6000e-003	0.0000	3.8299	3.8299	4.0000e-004	0.0000	3.8384
Total	**2.0613**	**0.0328**	**0.0280**	**4.0000e-005**		**2.6000e-003**	**2.6000e-003**		**2.6000e-003**	**2.6000e-003**	**0.0000**	**3.8299**	**3.8299**	**4.0000e-004**	**0.0000**	**3.8384**

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	2.1100e-003	3.7100e-003	0.0385	1.1000e-004	7.8300e-003	6.0000e-005	7.8900e-003	2.1000e-003	6.0000e-005	2.1600e-003	0.0000	7.8366	7.8366	3.7000e-004	0.0000	7.8443
Total	**2.1100e-003**	**3.7100e-003**	**0.0385**	**1.1000e-004**	**7.8300e-003**	**6.0000e-005**	**7.8900e-003**	**2.1000e-003**	**6.0000e-005**	**2.1600e-003**	**0.0000**	**7.8366**	**7.8366**	**3.7000e-004**	**0.0000**	**7.8443**

3.8 P4-BC - 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	0.0474	0.5005	0.3407	5.8000e-004		0.0249	0.0249		0.0229	0.0229	0.0000	52.7360	52.7360	0.0159	0.0000	53.0688
Total	**0.0474**	**0.5005**	**0.3407**	**5.8000e-004**		**0.0249**	**0.0249**		**0.0229**	**0.0229**	**0.0000**	**52.7360**	**52.7360**	**0.0159**	**0.0000**	**53.0688**

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	0.0351	0.3554	0.4460	9.5000e-004	0.0274	5.4500e-003	0.0329	7.8300e-003	5.0100e-003	0.0128	0.0000	85.1136	85.1136	5.9000e-004	0.0000	85.1260
Worker	0.0467	0.0821	0.8504	2.3700e-003	0.2010	1.3600e-003	0.2024	0.0534	1.2600e-003	0.0546	0.0000	173.2452	173.2452	8.1100e-003	0.0000	173.4154

Total	**0.0817**	**0.4375**	**1.2964**	**3.3200e-003**	**0.2284**	**6.8100e-003**	**0.2352**	**0.0612**	**6.2700e-003**	**0.0675**	**0.0000**	**258.3587**	**258.3587**	**8.7000e-003**	**0.0000**	**258.5414**

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	0.0474	0.5005	0.3407	5.8000e-004		0.0249	0.0249		0.0229	0.0229	0.0000	52.7359	52.7359	0.0159	0.0000	53.0688
Total	**0.0474**	**0.5005**	**0.3407**	**5.8000e-004**		**0.0249**	**0.0249**		**0.0229**	**0.0229**	**0.0000**	**52.7359**	**52.7359**	**0.0159**	**0.0000**	**53.0688**

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	0.0351	0.3554	0.4460	9.5000e-004	0.0243	5.4500e-003	0.0297	7.0500e-003	5.0100e-003	0.0121	0.0000	85.1136	85.1136	5.9000e-004	0.0000	85.1260
Worker	0.0467	0.0821	0.8504	2.3700e-003	0.1731	1.3600e-003	0.1745	0.0465	1.2600e-003	0.0478	0.0000	173.2452	173.2452	8.1100e-003	0.0000	173.4154
Total	**0.0817**	**0.4375**	**1.2964**	**3.3200e-003**	**0.1974**	**6.8100e-003**	**0.2042**	**0.0536**	**6.2700e-003**	**0.0598**	**0.0000**	**258.3587**	**258.3587**	**8.7000e-003**	**0.0000**	**258.5414**

3.9 P4-AC - 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					
Archit. Coating	2.0563					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.9800e-003	0.0328	0.0280	4.0000e-005		2.6000e-003	2.6000e-003		2.6000e-003	2.6000e-003	0.0000	3.8299	3.8299	4.0000e-004	0.0000	3.8384
Total	**2.0613**	**0.0328**	**0.0280**	**4.0000e-005**		**2.6000e-003**	**2.6000e-003**		**2.6000e-003**	**2.6000e-003**	**0.0000**	**3.8299**	**3.8299**	**4.0000e-004**	**0.0000**	**3.8384**

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	2.1100e-003	3.7100e-003	0.0385	1.1000e-004	9.0900e-003	6.0000e-005	9.1500e-003	2.4100e-003	6.0000e-005	2.4700e-003	0.0000	7.8366	7.8366	3.7000e-004	0.0000	7.8443
Total	**2.1100e-003**	**3.7100e-003**	**0.0385**	**1.1000e-004**	**9.0900e-003**	**6.0000e-005**	**9.1500e-003**	**2.4100e-003**	**6.0000e-005**	**2.4700e-003**	**0.0000**	**7.8366**	**7.8366**	**3.7000e-004**	**0.0000**	**7.8443**

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	2.0563					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.9800e-003	0.0328	0.0280	4.0000e-005		2.6000e-003	2.6000e-003		2.6000e-003	2.6000e-003	0.0000	3.8299	3.8299	4.0000e-004	0.0000	3.8384
Total	**2.0613**	**0.0328**	**0.0280**	**4.0000e-005**		**2.6000e-003**	**2.6000e-003**		**2.6000e-003**	**2.6000e-003**	**0.0000**	**3.8299**	**3.8299**	**4.0000e-004**	**0.0000**	**3.8384**

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	2.1100e-003	3.7100e-003	0.0385	1.1000e-004	7.8300e-003	6.0000e-005	7.8900e-003	2.1000e-003	6.0000e-005	2.1600e-003	0.0000	7.8366	7.8366	3.7000e-004	0.0000	7.8443
Total	**2.1100e-003**	**3.7100e-003**	**0.0385**	**1.1000e-004**	**7.8300e-003**	**6.0000e-005**	**7.8900e-003**	**2.1000e-003**	**6.0000e-005**	**2.1600e-003**	**0.0000**	**7.8366**	**7.8366**	**3.7000e-004**	**0.0000**	**7.8443**

3.10 P5-BC - 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	0.0471	0.4967	0.3381	5.7000e-004		0.0247	0.0247		0.0227	0.0227	0.0000	52.3364	52.3364	0.0157	0.0000	52.6668
Total	**0.0471**	**0.4967**	**0.3381**	**5.7000e-004**		**0.0247**	**0.0247**		**0.0227**	**0.0227**	**0.0000**	**52.3364**	**52.3364**	**0.0157**	**0.0000**	**52.6668**

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	0.0348	0.3527	0.4427	9.4000e-004	0.0272	5.4100e-003	0.0326	7.7700e-003	4.9700e-003	0.0127	0.0000	84.4688	84.4688	5.9000e-004	0.0000	84.4811
Worker	0.0463	0.0815	0.8439	2.3600e-003	0.1995	1.3500e-003	0.2008	0.0530	1.2500e-003	0.0542	0.0000	171.9327	171.9327	8.0400e-003	0.0000	172.1016
Total	**0.0811**	**0.4341**	**1.2866**	**3.3000e-003**	**0.2267**	**6.7600e-003**	**0.2335**	**0.0607**	**6.2200e-003**	**0.0670**	**0.0000**	**256.4015**	**256.4015**	**8.6300e-003**	**0.0000**	**256.5828**

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	0.0471	0.4967	0.3381	5.7000e-004		0.0247	0.0247		0.0227	0.0227	0.0000	52.3364	52.3364	0.0157	0.0000	52.6667
Total	**0.0471**	**0.4967**	**0.3381**	**5.7000e-004**		**0.0247**	**0.0247**		**0.0227**	**0.0227**	**0.0000**	**52.3364**	**52.3364**	**0.0157**	**0.0000**	**52.6667**

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	0.0348	0.3527	0.4427	9.4000e-004	0.0241	5.4100e-003	0.0295	6.9900e-003	4.9700e-003	0.0120	0.0000	84.4688	84.4688	5.9000e-004	0.0000	84.4811
Worker	0.0463	0.0815	0.8439	2.3600e-003	0.1718	1.3500e-003	0.1732	0.0462	1.2500e-003	0.0474	0.0000	171.9327	171.9327	8.0400e-003	0.0000	172.1016
Total	**0.0811**	**0.4341**	**1.2866**	**3.3000e-003**	**0.1959**	**6.7600e-003**	**0.2026**	**0.0532**	**6.2200e-003**	**0.0594**	**0.0000**	**256.4015**	**256.4015**	**8.6300e-003**	**0.0000**	**256.5828**

3.10 P5-BC - 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	3.0000e-004	3.1000e-003	2.4900e-003	0.0000		1.5000e-004	1.5000e-004		1.4000e-004	1.4000e-004	0.0000	0.3934	0.3934	1.2000e-004	0.0000	0.3959
Total	**3.0000e-004**	**3.1000e-003**	**2.4900e-003**	**0.0000**		**1.5000e-004**	**1.5000e-004**		**1.4000e-004**	**1.4000e-004**	**0.0000**	**0.3934**	**0.3934**	**1.2000e-004**	**0.0000**	**0.3959**

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	2.5000e-004	2.4700e-003	3.2300e-003	1.0000e-005	2.1000e-004	4.0000e-005	2.5000e-004	6.0000e-005	4.0000e-005	1.0000e-004	0.0000	0.6339	0.6339	0.0000	0.0000	0.6339
Worker	3.2000e-004	5.7000e-004	5.8900e-003	2.0000e-005	1.5200e-003	1.0000e-005	1.5300e-003	4.0000e-004	1.0000e-005	4.1000e-004	0.0000	1.2632	1.2632	6.0000e-005	0.0000	1.2645

	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
Total	**5.7000e-004**	**3.0400e-003**	**9.1200e-003**	**3.0000e-005**	**1.7300e-003**	**5.0000e-005**	**1.7800e-003**	**4.6000e-004**	**5.0000e-005**	**5.1000e-004**	**0.0000**	**1.8971**	**1.8971**	**6.0000e-005**	**0.0000**	**1.8984**

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	3.0000e-004	3.1000e-003	2.4900e-003	0.0000		1.5000e-004	1.5000e-004		1.4000e-004	1.4000e-004	0.0000	0.3934	0.3934	1.2000e-004	0.0000	0.3959
Total	**3.0000e-004**	**3.1000e-003**	**2.4900e-003**	**0.0000**		**1.5000e-004**	**1.5000e-004**		**1.4000e-004**	**1.4000e-004**	**0.0000**	**0.3934**	**0.3934**	**1.2000e-004**	**0.0000**	**0.3959**

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	2.5000e-004	2.4700e-003	3.2300e-003	1.0000e-005	1.8000e-004	4.0000e-005	2.2000e-004	5.0000e-005	4.0000e-005	9.0000e-005	0.0000	0.6339	0.6339	0.0000	0.0000	0.6339
Worker	3.2000e-004	5.7000e-004	5.8900e-003	2.0000e-005	1.3100e-003	1.0000e-005	1.3200e-003	3.5000e-004	1.0000e-005	3.6000e-004	0.0000	1.2632	1.2632	6.0000e-005	0.0000	1.2645
Total	**5.7000e-004**	**3.0400e-003**	**9.1200e-003**	**3.0000e-005**	**1.4900e-003**	**5.0000e-005**	**1.5400e-003**	**4.0000e-004**	**5.0000e-005**	**4.5000e-004**	**0.0000**	**1.8971**	**1.8971**	**6.0000e-005**	**0.0000**	**1.8984**

3.11 P5-AC - 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					
Archit. Coating	2.0563					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.9800e-003	0.0328	0.0280	4.0000e-005		2.6000e-003	2.6000e-003		2.6000e-003	2.6000e-003	0.0000	3.8299	3.8299	4.0000e-004	0.0000	3.8384
Total	**2.0613**	**0.0328**	**0.0280**	**4.0000e-005**		**2.6000e-003**	**2.6000e-003**		**2.6000e-003**	**2.6000e-003**	**0.0000**	**3.8299**	**3.8299**	**4.0000e-004**	**0.0000**	**3.8384**

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	2.1100e-003	3.7100e-003	0.0385	1.1000e-004	9.0900e-003	6.0000e-005	9.1500e-003	2.4100e-003	6.0000e-005	2.4700e-003	0.0000	7.8366	7.8366	3.7000e-004	0.0000	7.8443
Total	**2.1100e-003**	**3.7100e-003**	**0.0385**	**1.1000e-004**	**9.0900e-003**	**6.0000e-005**	**9.1500e-003**	**2.4100e-003**	**6.0000e-005**	**2.4700e-003**	**0.0000**	**7.8366**	**7.8366**	**3.7000e-004**	**0.0000**	**7.8443**

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					

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
Archit. Coating	2.0563					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.9800e-003	0.0328	0.0280	4.0000e-005		2.6000e-003	2.6000e-003		2.6000e-003	2.6000e-003	0.0000	3.8299	3.8299	4.0000e-004	0.0000	3.8384
Total	**2.0613**	**0.0328**	**0.0280**	**4.0000e-005**		**2.6000e-003**	**2.6000e-003**		**2.6000e-003**	**2.6000e-003**	**0.0000**	**3.8299**	**3.8299**	**4.0000e-004**	**0.0000**	**3.8384**

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	2.1100e-003	3.7100e-003	0.0385	1.1000e-004	7.8300e-003	6.0000e-005	7.8900e-003	2.1000e-003	6.0000e-005	2.1600e-003	0.0000	7.8366	7.8366	3.7000e-004	0.0000	7.8443
Total	**2.1100e-003**	**3.7100e-003**	**0.0385**	**1.1000e-004**	**7.8300e-003**	**6.0000e-005**	**7.8900e-003**	**2.1000e-003**	**6.0000e-005**	**2.1600e-003**	**0.0000**	**7.8366**	**7.8366**	**3.7000e-004**	**0.0000**	**7.8443**

3.12 P6-BC - 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	9.3400e-003	0.0986	0.0671	1.1000e-004		4.9000e-003	4.9000e-003		4.5100e-003	4.5100e-003	0.0000	10.3874	10.3874	3.1200e-003	0.0000	10.4530
Total	**9.3400e-003**	**0.0986**	**0.0671**	**1.1000e-004**		**4.9000e-003**	**4.9000e-003**		**4.5100e-003**	**4.5100e-003**	**0.0000**	**10.3874**	**10.3874**	**3.1200e-003**	**0.0000**	**10.4530**

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	6.9000e-003	0.0700	0.0879	1.9000e-004	5.4000e-003	1.0700e-003	6.4800e-003	1.5400e-003	9.9000e-004	2.5300e-003	0.0000	16.7648	16.7648	1.2000e-004	0.0000	16.7672
Worker	9.1900e-003	0.0162	0.1675	4.7000e-004	0.0396	2.7000e-004	0.0399	0.0105	2.5000e-004	0.0108	0.0000	34.1241	34.1241	1.6000e-003	0.0000	34.1576
Total	**0.0161**	**0.0862**	**0.2554**	**6.6000e-004**	**0.0450**	**1.3400e-003**	**0.0463**	**0.0121**	**1.2400e-003**	**0.0133**	**0.0000**	**50.8888**	**50.8888**	**1.7200e-003**	**0.0000**	**50.9248**

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	9.3400e-003	0.0986	0.0671	1.1000e-004		4.9000e-003	4.9000e-003		4.5100e-003	4.5100e-003	0.0000	10.3874	10.3874	3.1200e-003	0.0000	10.4529
Total	**9.3400e-003**	**0.0986**	**0.0671**	**1.1000e-004**		**4.9000e-003**	**4.9000e-003**		**4.5100e-003**	**4.5100e-003**	**0.0000**	**10.3874**	**10.3874**	**3.1200e-003**	**0.0000**	**10.4529**

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	6.9000e-003	0.0700	0.0879	1.9000e-004	4.7800e-003	1.0700e-003	5.8500e-003	1.3900e-003	9.9000e-004	2.3700e-003	0.0000	16.7648	16.7648	1.2000e-004	0.0000	16.7672
Worker	9.1900e-003	0.0162	0.1675	4.7000e-004	0.0341	2.7000e-004	0.0344	9.1600e-003	2.5000e-004	9.4100e-003	0.0000	34.1241	34.1241	1.6000e-003	0.0000	34.1576
Total	**0.0161**	**0.0862**	**0.2554**	**6.6000e-004**	**0.0389**	**1.3400e-003**	**0.0402**	**0.0106**	**1.2400e-003**	**0.0118**	**0.0000**	**50.8888**	**50.8888**	**1.7200e-003**	**0.0000**	**50.9248**

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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	0.0320	0.3284	0.2637	4.6000e-004		0.0160	0.0160		0.0148	0.0148	0.0000	41.6964	41.6964	0.0127	0.0000	41.9637
Total	**0.0320**	**0.3284**	**0.2637**	**4.6000e-004**		**0.0160**	**0.0160**		**0.0148**	**0.0148**	**0.0000**	**41.6964**	**41.6964**	**0.0127**	**0.0000**	**41.9637**

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	0.0263	0.2616	0.3420	7.6000e-004	0.0220	4.1200e-003	0.0262	6.2900e-003	3.7900e-003	0.0101	0.0000	67.1879	67.1879	4.7000e-004	0.0000	67.1978
Worker	0.0339	0.0602	0.6240	1.9100e-003	0.1614	1.0800e-003	0.1625	0.0429	1.0000e-003	0.0439	0.0000	133.9039	133.9039	6.0800e-003	0.0000	134.0316

	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
Total	**0.0602**	**0.3217**	**0.9660**	**2.6700e-003**	**0.1834**	**5.2000e-003**	**0.1886**	**0.0492**	**4.7900e-003**	**0.0539**	**0.0000**	**201.0918**	**201.0918**	**6.5500e-003**	**0.0000**	**201.2294**

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	0.0320	0.3284	0.2637	4.6000e-004		0.0160	0.0160		0.0148	0.0148	0.0000	41.6963	41.6963	0.0127	0.0000	41.9636
Total	**0.0320**	**0.3284**	**0.2637**	**4.6000e-004**		**0.0160**	**0.0160**		**0.0148**	**0.0148**	**0.0000**	**41.6963**	**41.6963**	**0.0127**	**0.0000**	**41.9636**

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	0.0263	0.2616	0.3420	7.6000e-004	0.0195	4.1200e-003	0.0236	5.6600e-003	3.7900e-003	9.4500e-003	0.0000	67.1879	67.1879	4.7000e-004	0.0000	67.1978
Worker	0.0339	0.0602	0.6240	1.9100e-003	0.1390	1.0800e-003	0.1401	0.0374	1.0000e-003	0.0384	0.0000	133.9039	133.9039	6.0800e-003	0.0000	134.0316
Total	**0.0602**	**0.3217**	**0.9660**	**2.6700e-003**	**0.1585**	**5.2000e-003**	**0.1637**	**0.0430**	**4.7900e-003**	**0.0478**	**0.0000**	**201.0918**	**201.0918**	**6.5500e-003**	**0.0000**	**201.2294**

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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	2.0563					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.4800e-003	0.0301	0.0278	4.0000e-005		2.2600e-003	2.2600e-003		2.2600e-003	2.2600e-003	0.0000	3.8299	3.8299	3.6000e-004	0.0000	3.8375
Total	**2.0608**	**0.0301**	**0.0278**	**4.0000e-005**		**2.2600e-003**	**2.2600e-003**		**2.2600e-003**	**2.2600e-003**	**0.0000**	**3.8299**	**3.8299**	**3.6000e-004**	**0.0000**	**3.8375**

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	1.9100e-003	3.3900e-003	0.0352	1.1000e-004	9.0900e-003	6.0000e-005	9.1500e-003	2.4100e-003	6.0000e-005	2.4700e-003	0.0000	7.5427	7.5427	3.4000e-004	0.0000	7.5499
Total	**1.9100e-003**	**3.3900e-003**	**0.0352**	**1.1000e-004**	**9.0900e-003**	**6.0000e-005**	**9.1500e-003**	**2.4100e-003**	**6.0000e-005**	**2.4700e-003**	**0.0000**	**7.5427**	**7.5427**	**3.4000e-004**	**0.0000**	**7.5499**

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	2.0563					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.4800e-003	0.0301	0.0278	4.0000e-005		2.2600e-003	2.2600e-003		2.2600e-003	2.2600e-003	0.0000	3.8299	3.8299	3.6000e-004	0.0000	3.8375
Total	**2.0608**	**0.0301**	**0.0278**	**4.0000e-005**		**2.2600e-003**	**2.2600e-003**		**2.2600e-003**	**2.2600e-003**	**0.0000**	**3.8299**	**3.8299**	**3.6000e-004**	**0.0000**	**3.8375**

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	1.9100e-003	3.3900e-003	0.0352	1.1000e-004	7.8300e-003	6.0000e-005	7.8900e-003	2.1000e-003	6.0000e-005	2.1600e-003	0.0000	7.5427	7.5427	3.4000e-004	0.0000	7.5499
Total	**1.9100e-003**	**3.3900e-003**	**0.0352**	**1.1000e-004**	**7.8300e-003**	**6.0000e-005**	**7.8900e-003**	**2.1000e-003**	**6.0000e-005**	**2.1600e-003**	**0.0000**	**7.5427**	**7.5427**	**3.4000e-004**	**0.0000**	**7.5499**

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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	0.0399	0.4089	0.3283	5.8000e-004		0.0200	0.0200		0.0184	0.0184	0.0000	51.9238	51.9238	0.0159	0.0000	52.2566
Total	**0.0399**	**0.4089**	**0.3283**	**5.8000e-004**		**0.0200**	**0.0200**		**0.0184**	**0.0184**	**0.0000**	**51.9238**	**51.9238**	**0.0159**	**0.0000**	**52.2566**

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	0.0328	0.3257	0.4259	9.5000e-004	0.0274	5.1300e-003	0.0326	7.8300e-003	4.7200e-003	0.0126	0.0000	83.6679	83.6679	5.9000e-004	0.0000	83.6803
Worker	0.0422	0.0749	0.7770	2.3700e-003	0.2010	1.3400e-003	0.2023	0.0534	1.2500e-003	0.0546	0.0000	166.7483	166.7483	7.5700e-003	0.0000	166.9072
Total	**0.0750**	**0.4006**	**1.2029**	**3.3200e-003**	**0.2284**	**6.4700e-003**	**0.2349**	**0.0612**	**5.9700e-003**	**0.0672**	**0.0000**	**250.4162**	**250.4162**	**8.1600e-003**	**0.0000**	**250.5875**

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	0.0399	0.4089	0.3283	5.8000e-004		0.0200	0.0200		0.0184	0.0184	0.0000	51.9237	51.9237	0.0159	0.0000	52.2566
Total	**0.0399**	**0.4089**	**0.3283**	**5.8000e-004**		**0.0200**	**0.0200**		**0.0184**	**0.0184**	**0.0000**	**51.9237**	**51.9237**	**0.0159**	**0.0000**	**52.2566**

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	0.0328	0.3257	0.4259	9.5000e-004	0.0243	5.1300e-003	0.0294	7.0500e-003	4.7200e-003	0.0118	0.0000	83.6679	83.6679	5.9000e-004	0.0000	83.6803
Worker	0.0422	0.0749	0.7770	2.3700e-003	0.1731	1.3400e-003	0.1745	0.0465	1.2500e-003	0.0478	0.0000	166.7483	166.7483	7.5700e-003	0.0000	166.9072
Total	**0.0750**	**0.4006**	**1.2029**	**3.3200e-003**	**0.1974**	**6.4700e-003**	**0.2038**	**0.0536**	**5.9700e-003**	**0.0595**	**0.0000**	**250.4162**	**250.4162**	**8.1600e-003**	**0.0000**	**250.5875**

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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	2.0563					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.4800e-003	0.0301	0.0278	4.0000e-005		2.2600e-003	2.2600e-003		2.2600e-003	2.2600e-003	0.0000	3.8299	3.8299	3.6000e-004	0.0000	3.8375
Total	**2.0608**	**0.0301**	**0.0278**	**4.0000e-005**		**2.2600e-003**	**2.2600e-003**		**2.2600e-003**	**2.2600e-003**	**0.0000**	**3.8299**	**3.8299**	**3.6000e-004**	**0.0000**	**3.8375**

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	1.9100e-003	3.3900e-003	0.0352	1.1000e-004	9.0900e-003	6.0000e-005	9.1500e-003	2.4100e-003	6.0000e-005	2.4700e-003	0.0000	7.5427	7.5427	3.4000e-004	0.0000	7.5499

Total	**1.9100e-003**	**3.3900e-003**	**0.0352**	**1.1000e-004**	**9.0900e-003**	**6.0000e-005**	**9.1500e-003**	**2.4100e-003**	**6.0000e-005**	**2.4700e-003**	**0.0000**	**7.5427**	**7.5427**	**3.4000e-004**	**0.0000**	**7.5499**

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	2.0563					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.4800e-003	0.0301	0.0278	4.0000e-005		2.2600e-003	2.2600e-003		2.2600e-003	2.2600e-003	0.0000	3.8299	3.8299	3.6000e-004	0.0000	3.8375
Total	**2.0608**	**0.0301**	**0.0278**	**4.0000e-005**		**2.2600e-003**	**2.2600e-003**		**2.2600e-003**	**2.2600e-003**	**0.0000**	**3.8299**	**3.8299**	**3.6000e-004**	**0.0000**	**3.8375**

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	1.9100e-003	3.3900e-003	0.0352	1.1000e-004	7.8300e-003	6.0000e-005	7.8900e-003	2.1000e-003	6.0000e-005	2.1600e-003	0.0000	7.5427	7.5427	3.4000e-004	0.0000	7.5499
Total	**1.9100e-003**	**3.3900e-003**	**0.0352**	**1.1000e-004**	**7.8300e-003**	**6.0000e-005**	**7.8900e-003**	**2.1000e-003**	**6.0000e-005**	**2.1600e-003**	**0.0000**	**7.5427**	**7.5427**	**3.4000e-004**	**0.0000**	**7.5499**

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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	0.0396	0.4058	0.3259	5.7000e-004		0.0198	0.0198		0.0183	0.0183	0.0000	51.5304	51.5304	0.0157	0.0000	51.8607
Total	**0.0396**	**0.4058**	**0.3259**	**5.7000e-004**		**0.0198**	**0.0198**		**0.0183**	**0.0183**	**0.0000**	**51.5304**	**51.5304**	**0.0157**	**0.0000**	**51.8607**

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	0.0325	0.3233	0.4226	9.4000e-004	0.0272	5.0900e-003	0.0323	7.7700e-003	4.6800e-003	0.0125	0.0000	83.0341	83.0341	5.8000e-004	0.0000	83.0464
Worker	0.0419	0.0744	0.7711	2.3600e-003	0.1995	1.3300e-003	0.2008	0.0530	1.2400e-003	0.0542	0.0000	165.4850	165.4850	7.5100e-003	0.0000	165.6428
Total	**0.0745**	**0.3976**	**1.1938**	**3.3000e-003**	**0.2267**	**6.4200e-003**	**0.2331**	**0.0607**	**5.9200e-003**	**0.0667**	**0.0000**	**248.5191**	**248.5191**	**8.0900e-003**	**0.0000**	**248.6891**

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					

	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
Off-Road	0.0396	0.4058	0.3259	5.7000e-004		0.0198	0.0198		0.0183	0.0183	0.0000	51.5303	51.5303	0.0157	0.0000	51.8607
Total	**0.0396**	**0.4058**	**0.3259**	**5.7000e-004**		**0.0198**	**0.0198**		**0.0183**	**0.0183**	**0.0000**	**51.5303**	**51.5303**	**0.0157**	**0.0000**	**51.8607**

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	0.0325	0.3233	0.4226	9.4000e-004	0.0241	5.0900e-003	0.0292	6.9900e-003	4.6800e-003	0.0117	0.0000	83.0341	83.0341	5.8000e-004	0.0000	83.0464
Worker	0.0419	0.0744	0.7711	2.3600e-003	0.1718	1.3300e-003	0.1731	0.0462	1.2400e-003	0.0474	0.0000	165.4850	165.4850	7.5100e-003	0.0000	165.6428
Total	**0.0745**	**0.3976**	**1.1938**	**3.3000e-003**	**0.1959**	**6.4200e-003**	**0.2023**	**0.0532**	**5.9200e-003**	**0.0591**	**0.0000**	**248.5191**	**248.5191**	**8.0900e-003**	**0.0000**	**248.6891**

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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	2.7000e-004	2.7200e-003	2.4500e-003	0.0000		1.3000e-004	1.3000e-004		1.2000e-004	1.2000e-004	0.0000	0.3873	0.3873	1.2000e-004	0.0000	0.3898
Total	**2.7000e-004**	**2.7200e-003**	**2.4500e-003**	**0.0000**		**1.3000e-004**	**1.3000e-004**		**1.2000e-004**	**1.2000e-004**	**0.0000**	**0.3873**	**0.3873**	**1.2000e-004**	**0.0000**	**0.3898**

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	2.3000e-004	2.2900e-003	3.0800e-003	1.0000e-005	2.1000e-004	4.0000e-005	2.4000e-004	6.0000e-005	3.0000e-005	9.0000e-005	0.0000	0.6251	0.6251	0.0000	0.0000	0.6252
Worker	3.0000e-004	5.3000e-004	5.4900e-003	2.0000e-005	1.5200e-003	1.0000e-005	1.5300e-003	4.0000e-004	1.0000e-005	4.1000e-004	0.0000	1.2238	1.2238	5.0000e-005	0.0000	1.2250
Total	**5.3000e-004**	**2.8200e-003**	**8.5700e-003**	**3.0000e-005**	**1.7300e-003**	**5.0000e-005**	**1.7700e-003**	**4.6000e-004**	**4.0000e-005**	**5.0000e-004**	**0.0000**	**1.8489**	**1.8489**	**5.0000e-005**	**0.0000**	**1.8501**

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	2.7000e-004	2.7200e-003	2.4500e-003	0.0000		1.3000e-004	1.3000e-004		1.2000e-004	1.2000e-004	0.0000	0.3873	0.3873	1.2000e-004	0.0000	0.3898
Total	**2.7000e-004**	**2.7200e-003**	**2.4500e-003**	**0.0000**		**1.3000e-004**	**1.3000e-004**		**1.2000e-004**	**1.2000e-004**	**0.0000**	**0.3873**	**0.3873**	**1.2000e-004**	**0.0000**	**0.3898**

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	2.3000e-004	2.2900e-003	3.0800e-003	1.0000e-005	1.8000e-004	4.0000e-005	2.2000e-004	5.0000e-005	3.0000e-005	9.0000e-005	0.0000	0.6251	0.6251	0.0000	0.0000	0.6252
Worker	3.0000e-004	5.3000e-004	5.4900e-003	2.0000e-005	1.3100e-003	1.0000e-005	1.3200e-003	3.5000e-004	1.0000e-005	3.6000e-004	0.0000	1.2238	1.2238	5.0000e-005	0.0000	1.2250
Total	**5.3000e-004**	**2.8200e-003**	**8.5700e-003**	**3.0000e-005**	**1.4900e-003**	**5.0000e-005**	**1.5400e-003**	**4.0000e-004**	**4.0000e-005**	**4.5000e-004**	**0.0000**	**1.8489**	**1.8489**	**5.0000e-005**	**0.0000**	**1.8501**

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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	2.0563					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.4800e-003	0.0301	0.0278	4.0000e-005		2.2600e-003	2.2600e-003		2.2600e-003	2.2600e-003	0.0000	3.8299	3.8299	3.6000e-004	0.0000	3.8375
Total	**2.0608**	**0.0301**	**0.0278**	**4.0000e-005**		**2.2600e-003**	**2.2600e-003**		**2.2600e-003**	**2.2600e-003**	**0.0000**	**3.8299**	**3.8299**	**3.6000e-004**	**0.0000**	**3.8375**

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	1.9100e-003	3.3900e-003	0.0352	1.1000e-004	9.0900e-003	6.0000e-005	9.1500e-003	2.4100e-003	6.0000e-005	2.4700e-003	0.0000	7.5427	7.5427	3.4000e-004	0.0000	7.5499

Total	1.9100e-003	3.3900e-003	0.0352	1.1000e-004	9.0900e-003	6.0000e-005	9.1500e-003	2.4100e-003	6.0000e-005	2.4700e-003	0.0000	7.5427	7.5427	3.4000e-004	0.0000	7.5499

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	2.0563					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.4800e-003	0.0301	0.0278	4.0000e-005		2.2600e-003	2.2600e-003		2.2600e-003	2.2600e-003	0.0000	3.8299	3.8299	3.6000e-004	0.0000	3.8375
Total	**2.0608**	**0.0301**	**0.0278**	**4.0000e-005**		**2.2600e-003**	**2.2600e-003**		**2.2600e-003**	**2.2600e-003**	**0.0000**	**3.8299**	**3.8299**	**3.6000e-004**	**0.0000**	**3.8375**

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	1.9100e-003	3.3900e-003	0.0352	1.1000e-004	7.8300e-003	6.0000e-005	7.8900e-003	2.1000e-003	6.0000e-005	2.1600e-003	0.0000	7.5427	7.5427	3.4000e-004	0.0000	7.5499
Total	**1.9100e-003**	**3.3900e-003**	**0.0352**	**1.1000e-004**	**7.8300e-003**	**6.0000e-005**	**7.8900e-003**	**2.1000e-003**	**6.0000e-005**	**2.1600e-003**	**0.0000**	**7.5427**	**7.5427**	**3.4000e-004**	**0.0000**	**7.5499**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

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
	tons/yr										MT/yr					
Mitigated	2.5909	6.4629	28.9925	0.0882	6.3882	0.0938	6.4820	1.7070	0.0865	1.7936	0.0000	6,325.3428	6,325.3428	0.2341	0.0000	6,330.2593
Unmitigated	2.5909	6.4629	28.9925	0.0882	6.3882	0.0938	6.4820	1.7070	0.0865	1.7936	0.0000	6,325.3428	6,325.3428	0.2341	0.0000	6,330.2593

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Condo/Townhouse	606.28	658.72	558.44	2,949,610	2,949,610
Health Club	171.89	108.94	139.53	395,470	395,470
High Turnover (Sit Down Restaurant)	1,446.97	1,802.25	1500.34	2,416,070	2,416,070
Parking Lot	0.00	0.00	0.00		
Recreational Swimming Pool	111.30	70.54	90.35	287,225	287,225
Regional Shopping Center	1,567.31	1,823.91	921.26	3,821,826	3,821,826
Single Family Housing	1,454.64	1,532.16	1333.04	7,038,698	7,038,698
Total	5,358.40	5,996.52	4,542.96	16,908,899	16,908,899

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
Condo/Townhouse	19.80	9.60	12.90	40.20	19.20	40.60	86	11	3
Health Club	18.50	10.10	7.90	16.90	64.10	19.00	52	39	9
High Turnover (Sit Down Restaurant)	18.50	10.10	7.90	8.50	72.50	19.00	37	20	43
Parking Lot	18.50	10.10	7.90	0.00	0.00	0.00	0	0	0
Recreational Swimming Pool	18.50	10.10	7.90	33.00	48.00	19.00	52	39	9
Regional Shopping Center	18.50	10.10	7.90	16.30	64.70	19.00	54	35	11
Single Family Housing	19.80	9.60	12.90	40.20	19.20	40.60	86	11	3

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.509471	0.056616	0.192725	0.151095	0.041772	0.005913	0.015766	0.015535	0.001447	0.002155	0.004735	0.000502	0.002269

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	733.5335	733.5335	0.0337	6.9800e-003	736.4042
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	733.5335	733.5335	0.0337	6.9800e-003	736.4042
NaturalGas Mitigated	0.0487	0.4255	0.2458	2.6600e-003		0.0336	0.0336		0.0336	0.0336	0.0000	481.9164	481.9164	9.2400e-003	8.8400e-003	484.8493
NaturalGas Unmitigated	0.0487	0.4255	0.2458	2.6600e-003		0.0336	0.0336		0.0336	0.0336	0.0000	481.9164	481.9164	9.2400e-003	8.8400e-003	484.8493

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					
High Turnover (Sit Down Restaurant)	2.99678e+006	0.0162	0.1469	0.1234	8.8000e-004		0.0112	0.0112		0.0112	0.0112	0.0000	159.9196	159.9196	3.0700e-003	2.9300e-003	160.8928

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
Recreational Swimming Pool	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
Regional Shopping Center	74825	4.0000e-004	3.6700e-003	3.0800e-003	2.0000e-005		2.8000e-004	2.8000e-004		2.8000e-004	2.8000e-004	0.0000	3.9930	3.9930	8.0000e-005	7.0000e-005	4.0173
Single Family Housing	4.39029e+006	0.0237	0.2023	0.0861	1.2900e-003		0.0164	0.0164		0.0164	0.0164	0.0000	234.2827	234.2827	4.4900e-003	4.3000e-003	235.7085
Condo/Townhouse	1.45592e+006	7.8500e-003	0.0671	0.0286	4.3000e-004		5.4200e-003	5.4200e-003		5.4200e-003	5.4200e-003	0.0000	77.6932	77.6932	1.4900e-003	1.4200e-003	78.1660
Health Club	112961	6.1000e-004	5.5400e-003	4.6500e-003	3.0000e-005		4.2000e-004	4.2000e-004		4.2000e-004	4.2000e-004	0.0000	6.0280	6.0280	1.2000e-004	1.1000e-004	6.0647
Total		**0.0487**	**0.4255**	**0.2458**	**2.6500e-003**		**0.0336**	**0.0336**		**0.0336**	**0.0336**	**0.0000**	**481.9165**	**481.9165**	**9.2500e-003**	**8.8300e-003**	**484.8493**

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					
High Turnover (Sit Down Restaurant)	2.99678e+006	0.0162	0.1469	0.1234	8.8000e-004		0.0112	0.0112		0.0112	0.0112	0.0000	159.9196	159.9196	3.0700e-003	2.9300e-003	160.8928
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
Recreational Swimming Pool	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
Regional Shopping Center	74825	4.0000e-004	3.6700e-003	3.0800e-003	2.0000e-005		2.8000e-004	2.8000e-004		2.8000e-004	2.8000e-004	0.0000	3.9930	3.9930	8.0000e-005	7.0000e-005	4.0173
Single Family Housing	4.39029e+006	0.0237	0.2023	0.0861	1.2900e-003		0.0164	0.0164		0.0164	0.0164	0.0000	234.2827	234.2827	4.4900e-003	4.3000e-003	235.7085
Condo/Townhouse	1.45592e+006	7.8500e-003	0.0671	0.0286	4.3000e-004		5.4200e-003	5.4200e-003		5.4200e-003	5.4200e-003	0.0000	77.6932	77.6932	1.4900e-003	1.4200e-003	78.1660
Health Club	112961	6.1000e-004	5.5400e-003	4.6500e-003	3.0000e-005		4.2000e-004	4.2000e-004		4.2000e-004	4.2000e-004	0.0000	6.0280	6.0280	1.2000e-004	1.1000e-004	6.0647
Total		**0.0487**	**0.4255**	**0.2458**	**2.6500e-003**		**0.0336**	**0.0336**		**0.0336**	**0.0336**	**0.0000**	**481.9165**	**481.9165**	**9.2500e-003**	**8.8300e-003**	**484.8493**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Condo/Townhouse	397866	113.8561	5.2300e-003	1.0800e-003	114.3016
Health Club	48232.8	13.8026	6.3000e-004	1.3000e-004	13.8567
High Turnover (Sit Down Restaurant)	447418	128.0362	5.8900e-003	1.2200e-003	128.5373
Parking Lot	124960	35.7594	1.6400e-003	3.4000e-004	35.8994
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	467200	133.6972	6.1500e-003	1.2700e-003	134.2204
Single Family Housing	1.07763e+006	308.3820	0.0142	2.9300e-003	309.5888
Total		**733.5335**	**0.0337**	**6.9700e-003**	**736.4042**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Condo/Townhouse	397866	113.8561	5.2300e-003	1.0800e-003	114.3016
Health Club	48232.8	13.8026	6.3000e-004	1.3000e-004	13.8567
High Turnover (Sit Down Restaurant)	447418	128.0362	5.8900e-003	1.2200e-003	128.5373
Parking Lot	124960	35.7594	1.6400e-003	3.4000e-004	35.8994
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000

Regional Shopping Center	467200	133.6972	6.1500e-003	1.2700e-003	134.2204
Single Family Housing	1.07763e+006	308.3820	0.0142	2.9300e-003	309.5888
Total		**733.5335**	**0.0337**	**6.9700e-003**	**736.4042**

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	3.5901	0.0496	4.0671	2.5700e-003		0.2469	0.2469		0.2468	0.2468	25.9175	53.9250	79.8424	0.0814	1.7600e-003	82.0962
Unmitigated	3.5901	0.0496	4.0671	2.5700e-003		0.2469	0.2469		0.2468	0.2468	25.9175	53.9250	79.8424	0.0814	1.7600e-003	82.0962

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	0.2584					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	2.4546					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.7992	0.0203	1.5331	2.4400e-003		0.2330	0.2330		0.2330	0.2330	25.9175	49.8044	75.7219	0.0773	1.7600e-003	77.8903
Landscaping	0.0779	0.0293	2.5341	1.3000e-004		0.0139	0.0139		0.0139	0.0139	0.0000	4.1205	4.1205	4.0600e-003	0.0000	4.2058

Total	**3.5901**	**0.0496**	**4.0671**	**2.5700e-003**		**0.2469**	**0.2469**		**0.2468**	**0.2468**	**25.9175**	**53.9250**	**79.8424**	**0.0814**	**1.7600e-003**	**82.0962**

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	0.2584					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	2.4546					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.7992	0.0203	1.5331	2.4400e-003		0.2330	0.2330		0.2330	0.2330	25.9175	49.8044	75.7219	0.0773	1.7600e-003	77.8903
Landscaping	0.0779	0.0293	2.5341	1.3000e-004		0.0139	0.0139		0.0139	0.0139	0.0000	4.1205	4.1205	4.0600e-003	0.0000	4.2058
Total	**3.5901**	**0.0496**	**4.0671**	**2.5700e-003**		**0.2469**	**0.2469**		**0.2468**	**0.2468**	**25.9175**	**53.9250**	**79.8424**	**0.0814**	**1.7600e-003**	**82.0962**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	130.0611	0.7408	0.0185	151.3528
Unmitigated	130.0611	0.7409	0.0185	151.3642

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Condo/Townhouse	6.97148 / 4.39506	42.1620	0.2290	5.7400e-003	48.7516
Health Club	0.308727 / 0.18922	1.8499	0.0101	2.5000e-004	2.1417
High Turnover (Sit Down Restaurant)	3.45421 / 0.220482	14.6679	0.1132	2.7900e-003	17.9085
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0.199904 / 0.122522	1.1978	6.5700e-003	1.6000e-004	1.3867
Regional Shopping Center	2.70365 / 1.65707	16.2004	0.0888	2.2300e-003	18.7553
Single Family Housing	8.9261 / 5.62732	53.9831	0.2932	7.3500e-003	62.4203
Total		**130.0611**	**0.7409**	**0.0185**	**151.3642**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Condo/Townhouse	6.97148 / 4.39506	42.1620	0.2290	5.7400e-003	48.7481
Health Club	0.308727 / 0.18922	1.8499	0.0101	2.5000e-004	2.1415
High Turnover (Sit Down Restaurant)	3.45421 / 0.220482	14.6679	0.1132	2.7800e-003	17.9068
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000

Recreational Swimming Pool	0.199904 / 0.122522	1.1978	6.5600e-003	1.6000e-004	1.3866
Regional Shopping Center	2.70365 / 1.65707	16.2004	0.0888	2.2200e-003	18.7540
Single Family Housing	8.9261 / 5.62732	53.9831	0.2932	7.3400e-003	62.4158
Total		**130.0611**	**0.7408**	**0.0185**	**151.3528**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	75.1858	4.4434	0.0000	168.4963
Unmitigated	75.1858	4.4434	0.0000	168.4963

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Condo/Townhouse	49.22	9.9912	0.5905	0.0000	22.3910
Health Club	29.75	6.0390	0.3569	0.0000	13.5338

High Turnover (Sit Down Restaurant)	135.42	27.4890	1.6246	0.0000	61.6047
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	19.27	3.9116	0.2312	0.0000	8.7662
Regional Shopping Center	38.33	7.7806	0.4598	0.0000	17.4369
Single Family Housing	98.4	19.9743	1.1805	0.0000	44.7637
Total		**75.1858**	**4.4434**	**0.0000**	**168.4963**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Condo/Townhouse	49.22	9.9912	0.5905	0.0000	22.3910
Health Club	29.75	6.0390	0.3569	0.0000	13.5338
High Turnover (Sit Down Restaurant)	135.42	27.4890	1.6246	0.0000	61.6047
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	19.27	3.9116	0.2312	0.0000	8.7662
Regional Shopping Center	38.33	7.7806	0.4598	0.0000	17.4369
Single Family Housing	98.4	19.9743	1.1805	0.0000	44.7637
Total		**75.1858**	**4.4434**	**0.0000**	**168.4963**

9.0 Operational Offroad

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

10.0 Vegetation

Cypress - Paving

Orange County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	355.00	Space	5.00	142,000.00	0

1.2 Other Project Characteristics

Urbanization Urban **Wind Speed (m/s)** 2.2 **Precipitation Freq (Days)** 30

Climate Zone 8 **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 - Cover all of non-residential space

Construction Phase - specified by client

Off-road Equipment - Specified by client

Construction Off-road Equipment Mitigation - .

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	CleanPavedRoadPercentReduction	0	16
tblConstructionPhase	NumDays	18.00	50.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblLandUse	LotAcreage	3.19	5.00
tblOffRoadEquipment	HorsePower	125.00	89.00

tblOffRoadEquipment	HorsePower	80.00	84.00
tblOffRoadEquipment	HorsePower	130.00	82.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblOffRoadEquipment	UsageHours	8.00	6.00
tblProjectCharacteristics	OperationalYear	2014	2019

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					
2016	0.0493	0.3819	0.2664	3.7000e-004	4.1200e-003	0.0289	0.0330	1.0900e-003	0.0266	0.0277	0.0000	33.7386	33.7386	9.2400e-003	0.0000	33.9326
Total	**0.0493**	**0.3819**	**0.2664**	**3.7000e-004**	**4.1200e-003**	**0.0289**	**0.0330**	**1.0900e-003**	**0.0266**	**0.0277**	**0.0000**	**33.7386**	**33.7386**	**9.2400e-003**	**0.0000**	**33.9326**

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					
2016	0.0493	0.3819	0.2664	3.7000e-004	3.5500e-003	0.0289	0.0325	9.5000e-004	0.0266	0.0275	0.0000	33.7385	33.7385	9.2400e-003	0.0000	33.9326
Total	**0.0493**	**0.3819**	**0.2664**	**3.7000e-004**	**3.5500e-003**	**0.0289**	**0.0325**	**9.5000e-004**	**0.0266**	**0.0275**	**0.0000**	**33.7385**	**33.7385**	**9.2400e-003**	**0.0000**	**33.9326**

	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**	**13.83**	**0.00**	**1.73**	**12.84**	**0.00**	**0.51**	**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	0.5185	4.0000e-005	4.5700e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	8.8100e-003	8.8100e-003	2.0000e-005	0.0000	9.3100e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	35.7594	35.7594	1.6400e-003	3.4000e-004	35.8994
Mobile	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
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.5185**	**4.0000e-005**	**4.5700e-003**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**35.7682**	**35.7682**	**1.6600e-003**	**3.4000e-004**	**35.9087**

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	0.5185	4.0000e-005	4.5700e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	8.8100e-003	8.8100e-003	2.0000e-005	0.0000	9.3100e-003

Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	35.7594	35.7594	1.6400e-003	3.4000e-004	35.8994
Mobile	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
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.5185**	**4.0000e-005**	**4.5700e-003**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**35.7682**	**35.7682**	**1.6600e-003**	**3.4000e-004**	**35.9087**

	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	Paving	Paving	9/17/2016	11/14/2016	6	50	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Paving	Pavers	2	6.00	89	0.42
Paving	Rollers	2	6.00	84	0.38
Paving	Paving Equipment	2	6.00	82	0.36

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
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Soil Stabilizer

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Paving - 2016

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	0.0415	0.3800	0.2466	3.2000e-004		0.0289	0.0289		0.0266	0.0266	0.0000	30.0279	30.0279	9.0600e-003	0.0000	30.2181
Paving	6.5500e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0481**	**0.3800**	**0.2466**	**3.2000e-004**		**0.0289**	**0.0289**		**0.0266**	**0.0266**	**0.0000**	**30.0279**	**30.0279**	**9.0600e-003**	**0.0000**	**30.2181**

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	1.2800e-003	1.9000e-003	0.0198	5.0000e-005	4.1200e-003	3.0000e-005	4.1500e-003	1.0900e-003	3.0000e-005	1.1200e-003	0.0000	3.7107	3.7107	1.8000e-004	0.0000	3.7145
Total	**1.2800e-003**	**1.9000e-003**	**0.0198**	**5.0000e-005**	**4.1200e-003**	**3.0000e-005**	**4.1500e-003**	**1.0900e-003**	**3.0000e-005**	**1.1200e-003**	**0.0000**	**3.7107**	**3.7107**	**1.8000e-004**	**0.0000**	**3.7145**

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	0.0415	0.3800	0.2466	3.2000e-004		0.0289	0.0289		0.0266	0.0266	0.0000	30.0279	30.0279	9.0600e-003	0.0000	30.2181
Paving	6.5500e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0481**	**0.3800**	**0.2466**	**3.2000e-004**		**0.0289**	**0.0289**		**0.0266**	**0.0266**	**0.0000**	**30.0279**	**30.0279**	**9.0600e-003**	**0.0000**	**30.2181**

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	1.2800e-003	1.9000e-003	0.0198	5.0000e-005	3.5500e-003	3.0000e-005	3.5700e-003	9.5000e-004	3.0000e-005	9.8000e-004	0.0000	3.7107	3.7107	1.8000e-004	0.0000	3.7145
Total	**1.2800e-003**	**1.9000e-003**	**0.0198**	**5.0000e-005**	**3.5500e-003**	**3.0000e-005**	**3.5700e-003**	**9.5000e-004**	**3.0000e-005**	**9.8000e-004**	**0.0000**	**3.7107**	**3.7107**	**1.8000e-004**	**0.0000**	**3.7145**

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	0.0000	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
Unmitigated	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

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Parking Lot	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

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
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.509471	0.056616	0.192725	0.151095	0.041772	0.005913	0.015766	0.015535	0.001447	0.002155	0.004735	0.000502	0.002269

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	35.7594	35.7594	1.6400e-003	3.4000e-004	35.8994
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	35.7594	35.7594	1.6400e-003	3.4000e-004	35.8994
NaturalGas Mitigated	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
NaturalGas Unmitigated	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

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					
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
Total		**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**

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
Total		**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**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Parking Lot	124960	35.7594	1.6400e-003	3.4000e-004	35.8994
Total		**35.7594**	**1.6400e-003**	**3.4000e-004**	**35.8994**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Parking Lot	124960	35.7594	1.6400e-003	3.4000e-004	35.8994

Total		**35.7594**	**1.6400e-003**	**3.4000e-004**	**35.8994**

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	0.5185	4.0000e-005	4.5700e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	8.8100e-003	8.8100e-003	2.0000e-005	0.0000	9.3100e-003
Unmitigated	0.5185	4.0000e-005	4.5700e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	8.8100e-003	8.8100e-003	2.0000e-005	0.0000	9.3100e-003

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	4.9400e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.5131					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	4.3000e-004	4.0000e-005	4.5700e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	8.8100e-003	8.8100e-003	2.0000e-005	0.0000	9.3100e-003
Total	**0.5185**	**4.0000e-005**	**4.5700e-003**	**0.0000**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**	**0.0000**	**8.8100e-003**	**8.8100e-003**	**2.0000e-005**	**0.0000**	**9.3100e-003**

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	4.9400e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.5131					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	4.3000e-004	4.0000e-005	4.5700e-003	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	8.8100e-003	8.8100e-003	2.0000e-005	0.0000	9.3100e-003
Total	**0.5185**	**4.0000e-005**	**4.5700e-003**	**0.0000**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**	**0.0000**	**8.8100e-003**	**8.8100e-003**	**2.0000e-005**	**0.0000**	**9.3100e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			

Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

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

10.0 Vegetation

Cypress - Operational GHGs - BAU Scenario

Orange County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	355.00	Space	0.00	142,000.00	0
Health Club	5.22	1000sqft	0.00	5,216.00	0
High Turnover (Sit Down Restaurant)	11.38	1000sqft	0.00	11,376.00	0
Recreational Swimming Pool	3.38	1000sqft	0.00	3,375.00	0
Condo/Townhouse	92.00	Dwelling Unit	0.00	161,581.00	161
Single Family Housing	152.00	Dwelling Unit	33.00	319,230.00	266
Regional Shopping Center	36.50	1000sqft	0.00	36,500.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	30
Climate Zone	8			**Operational Year**	2020
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	599.3	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - 20% RPS by 2013

Land Use - Acreage and number of units provided in data request. Parking lot size from project description. Assumes provided 5 acre value for commercial includes parking

Construction Phase - Phasing provided by client

Off-road Equipment - Provided by client

Off-road Equipment - Amount and hours provided by client

Grading - Provided by client

Architectural Coating - Client has committed to low-VOC coatings

Vehicle Trips - Residential and commercial trip rates provided by client. Assume health club and pool are for residents only, and will generate no external trips

Vechicle Emission Factors - Removal of Pavley and LCFS

Vechicle Emission Factors - ACC adjustment

Vechicle Emission Factors - ACC adjustment

Woodstoves - Provided by client

Area Coating - Provided by client

Energy Use - 2014 Title 24 Standard

Solid Waste -

Land Use Change -

Sequestration -

Construction Off-road Equipment Mitigation - Provided by client

Area Mitigation - .

Energy Mitigation -

Waste Mitigation -

Water And Wastewater -

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_EF_Nonresidential_Exterior	250	100
tblAreaMitigation	UseLowVOCPaintNonresidentialInteriorValue	250	50
tblFireplaces	FireplaceWoodMass	1,019.20	0.00
tblFireplaces	FireplaceWoodMass	1,019.20	0.00
tblFireplaces	NumberGas	78.20	107.00
tblFireplaces	NumberGas	129.20	137.00
tblFireplaces	NumberNoFireplace	9.20	0.00
tblFireplaces	NumberNoFireplace	15.20	0.00
tblFireplaces	NumberWood	4.60	0.00
tblFireplaces	NumberWood	7.60	0.00
tblLandUse	LandUseSquareFeet	5,220.00	5,216.00
tblLandUse	LandUseSquareFeet	11,380.00	11,376.00

tblLandUse	LandUseSquareFeet	3,380.00	3,375.00
tblLandUse	LandUseSquareFeet	92,000.00	161,581.00
tblLandUse	LandUseSquareFeet	273,600.00	319,230.00
tblLandUse	LotAcreage	3.19	0.00
tblLandUse	LotAcreage	0.12	0.00
tblLandUse	LotAcreage	0.26	0.00
tblLandUse	LotAcreage	0.08	0.00
tblLandUse	LotAcreage	5.75	0.00
tblLandUse	LotAcreage	49.35	33.00
tblLandUse	LotAcreage	0.84	0.00
tblLandUse	Population	263.00	161.00
tblLandUse	Population	435.00	266.00
tblProjectCharacteristics	CO2IntensityFactor	630.89	599.3
tblProjectCharacteristics	OperationalYear	2014	2020
tblSequestration	NumberOfNewTrees	0.00	508.00
tblTripsAndVMT	HaulingTripNumber	0.00	10,000.00
tblVehicleEF	HHD	528.22	586.91
tblVehicleEF	HHD	1,528.52	1,698.36
tblVehicleEF	HHD	49.61	55.12
tblVehicleEF	LDA	240.65	267.39
tblVehicleEF	LDA	52.82	58.69
tblVehicleEF	LDT1	294.32	327.02
tblVehicleEF	LDT1	64.02	71.14
tblVehicleEF	LDT2	358.30	398.11
tblVehicleEF	LDT2	77.62	86.24
tblVehicleEF	LHD1	7.68	8.53
tblVehicleEF	LHD1	517.49	574.99
tblVehicleEF	LHD1	41.94	46.60
tblVehicleEF	LHD2	8.40	9.33
tblVehicleEF	LHD2	502.45	558.28

tblVehicleEF	LHD2	29.72	33.02
tblVehicleEF	MCY	139.60	155.11
tblVehicleEF	MCY	38.46	42.73
tblVehicleEF	MDV	481.07	534.53
tblVehicleEF	MDV	103.34	114.82
tblVehicleEF	MH	612.49	680.55
tblVehicleEF	MH	26.81	29.78
tblVehicleEF	MHD	572.02	635.57
tblVehicleEF	MHD	909.97	1,011.08
tblVehicleEF	MHD	49.57	55.08
tblVehicleEF	OBUS	534.88	594.31
tblVehicleEF	OBUS	998.15	1,109.06
tblVehicleEF	OBUS	32.78	36.42
tblVehicleEF	SBUS	547.00	607.77
tblVehicleEF	SBUS	1,018.31	1,131.45
tblVehicleEF	SBUS	115.59	128.44
tblVehicleEF	UBUS	1,780.74	1,978.60
tblVehicleEF	UBUS	34.76	38.62
tblVehicleTrips	ST_TR	7.16	2.24
tblVehicleTrips	ST_TR	20.87	0.00
tblVehicleTrips	ST_TR	158.37	136.20
tblVehicleTrips	ST_TR	20.87	0.00
tblVehicleTrips	ST_TR	49.97	42.97
tblVehicleTrips	ST_TR	10.08	2.35
tblVehicleTrips	SU_TR	6.07	2.44
tblVehicleTrips	SU_TR	26.73	0.00
tblVehicleTrips	SU_TR	131.84	113.38
tblVehicleTrips	SU_TR	26.73	0.00
tblVehicleTrips	SU_TR	25.24	21.71
tblVehicleTrips	SU_TR	8.77	2.00

tblVehicleTrips	WD_TR	6.59	2.95
tblVehicleTrips	WD_TR	32.93	0.00
tblVehicleTrips	WD_TR	127.15	109.34
tblVehicleTrips	WD_TR	32.93	0.00
tblVehicleTrips	WD_TR	42.94	36.73
tblVehicleTrips	WD_TR	9.57	3.16
tblWoodstoves	NumberCatalytic	4.60	0.00
tblWoodstoves	NumberCatalytic	7.60	0.00
tblWoodstoves	NumberNoncatalytic	4.60	0.00
tblWoodstoves	NumberNoncatalytic	7.60	0.00
tblWoodstoves	WoodstoveWoodMass	999.60	0.00
tblWoodstoves	WoodstoveWoodMass	999.60	0.00

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					
2016	0.2428	3.1354	2.2433	5.1200e-003	0.2858	0.1014	0.3873	0.1058	0.0933	0.1991	0.0000	471.3225	471.3225	0.0421	0.0000	472.2070
Total	**0.2428**	**3.1354**	**2.2433**	**5.1200e-003**	**0.2858**	**0.1014**	**0.3873**	**0.1058**	**0.0933**	**0.1991**	**0.0000**	**471.3225**	**471.3225**	**0.0421**	**0.0000**	**472.2070**

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					
2016	0.2428	3.1354	2.2433	5.1200e-003	0.2858	0.1014	0.3873	0.1058	0.0933	0.1991	0.0000	471.3224	471.3224	0.0421	0.0000	472.2068
Total	**0.2428**	**3.1354**	**2.2433**	**5.1200e-003**	**0.2858**	**0.1014**	**0.3873**	**0.1058**	**0.0933**	**0.1991**	**0.0000**	**471.3224**	**471.3224**	**0.0421**	**0.0000**	**472.2068**

	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**

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	2.7857	0.0293	2.5303	1.3000e-004		0.0180	0.0180		0.0180	0.0180	0.0000	62.7140	62.7140	5.1600e-003	1.0700e-003	63.1553
Energy	0.0514	0.4483	0.2558	2.8000e-003		0.0355	0.0355		0.0355	0.0355	0.0000	1,221.8720	1,221.8720	0.0443	0.0165	1,227.9052
Mobile	1.3699	2.6224	12.6514	0.0367	2.6193	0.0389	2.6582	0.7000	0.0359	0.7358	0.0000	2,819.4061	2,819.4061	0.0950	0.0000	2,821.4014
Waste						0.0000	0.0000		0.0000	0.0000	75.9491	0.0000	75.9491	4.4885	0.0000	170.2068
Water						0.0000	0.0000		0.0000	0.0000	7.1585	116.7486	123.9071	0.7409	0.0185	145.2102
Total	**4.2070**	**3.1000**	**15.4375**	**0.0396**	**2.6193**	**0.0923**	**2.7117**	**0.7000**	**0.0893**	**0.7893**	**83.1076**	**4,220.7406**	**4,303.8482**	**5.3738**	**0.0361**	**4,427.8790**

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	2.7435	0.0293	2.5303	1.3000e-004		0.0180	0.0180		0.0180	0.0180	0.0000	62.7140	62.7140	5.1600e-003	1.0700e-003	63.1553
Energy	0.0514	0.4483	0.2558	2.8000e-003		0.0355	0.0355		0.0355	0.0355	0.0000	1,221.8720	1,221.8720	0.0443	0.0165	1,227.9052
Mobile	1.3699	2.6224	12.6514	0.0367	2.6193	0.0389	2.6582	0.7000	0.0359	0.7358	0.0000	2,819.4061	2,819.4061	0.0950	0.0000	2,821.4014
Waste						0.0000	0.0000		0.0000	0.0000	75.9491	0.0000	75.9491	4.4885	0.0000	170.2068
Water						0.0000	0.0000		0.0000	0.0000	7.1585	116.7486	123.9071	0.7408	0.0185	145.1988
Total	**4.1648**	**3.1000**	**15.4375**	**0.0396**	**2.6193**	**0.0923**	**2.7117**	**0.7000**	**0.0893**	**0.7893**	**83.1076**	**4,220.7406**	**4,303.8482**	**5.3737**	**0.0360**	**4,427.8675**

	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	**1.00**	**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**	**0.08**	**0.00**

2.3 Vegetation

<u>Vegetation</u>

	CO2e
Category	MT
New Trees	359.6640
Total	**359.6640**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	1/1/2016	3/3/2016	5	45	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 112.5

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
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

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
Grading	8	20.00	0.00	10,000.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Grading - 2016

Unmitigated Construction On-Site

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
	tons/yr										MT/yr					
Fugitive Dust					0.1952	0.0000	0.1952	0.0809	0.0000	0.0809	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1458	1.6833	1.1056	1.3900e-003		0.0807	0.0807		0.0742	0.0742	0.0000	130.9404	130.9404	0.0395	0.0000	131.7698
Total	**0.1458**	**1.6833**	**1.1056**	**1.3900e-003**	**0.1952**	**0.0807**	**0.2758**	**0.0809**	**0.0742**	**0.1551**	**0.0000**	**130.9404**	**130.9404**	**0.0395**	**0.0000**	**131.7698**

Unmitigated Construction Off-Site

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
	tons/yr										MT/yr					
Hauling	0.0955	1.4498	1.1140	3.6800e-003	0.0857	0.0207	0.1065	0.0235	0.0191	0.0426	0.0000	335.9293	335.9293	2.4000e-003	0.0000	335.9798
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	1.5400e-003	2.2800e-003	0.0238	6.0000e-005	4.9400e-003	4.0000e-005	4.9800e-003	1.3100e-003	3.0000e-005	1.3400e-003	0.0000	4.4528	4.4528	2.2000e-004	0.0000	4.4574
Total	**0.0970**	**1.4521**	**1.1377**	**3.7400e-003**	**0.0907**	**0.0208**	**0.1115**	**0.0248**	**0.0191**	**0.0439**	**0.0000**	**340.3821**	**340.3821**	**2.6200e-003**	**0.0000**	**340.4372**

Mitigated Construction On-Site

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
	tons/yr										MT/yr					
Fugitive Dust					0.1952	0.0000	0.1952	0.0809	0.0000	0.0809	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

	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
Off-Road	0.1458	1.6833	1.1056	1.3900e-003		0.0807	0.0807		0.0742	0.0742	0.0000	130.9402	130.9402	0.0395	0.0000	131.7697
Total	**0.1458**	**1.6833**	**1.1056**	**1.3900e-003**	**0.1952**	**0.0807**	**0.2758**	**0.0809**	**0.0742**	**0.1551**	**0.0000**	**130.9402**	**130.9402**	**0.0395**	**0.0000**	**131.7697**

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	0.0955	1.4498	1.1140	3.6800e-003	0.0857	0.0207	0.1065	0.0235	0.0191	0.0426	0.0000	335.9293	335.9293	2.4000e-003	0.0000	335.9798
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	1.5400e-003	2.2800e-003	0.0238	6.0000e-005	4.9400e-003	4.0000e-005	4.9800e-003	1.3100e-003	3.0000e-005	1.3400e-003	0.0000	4.4528	4.4528	2.2000e-004	0.0000	4.4574
Total	**0.0970**	**1.4521**	**1.1377**	**3.7400e-003**	**0.0907**	**0.0208**	**0.1115**	**0.0248**	**0.0191**	**0.0439**	**0.0000**	**340.3821**	**340.3821**	**2.6200e-003**	**0.0000**	**340.4372**

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					
Unmitigated	1.3699	2.6224	12.6514	0.0367	2.6193	0.0389	2.6582	0.7000	0.0359	0.7358	0.0000	2,819.4061	2,819.4061	0.0950	0.0000	2,821.4014
Mitigated	1.3699	2.6224	12.6514	0.0367	2.6193	0.0389	2.6582	0.7000	0.0359	0.7358	0.0000	2,819.4061	2,819.4061	0.0950	0.0000	2,821.4014

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Condo/Townhouse	271.40	206.08	224.48	872,623	872,623
Health Club	0.00	0.00	0.00		
High Turnover (Sit Down Restaurant)	1,244.29	1,549.96	1290.26	1,764,217	1,764,217
Parking Lot	0.00	0.00	0.00		
Recreational Swimming Pool	0.00	0.00	0.00		
Regional Shopping Center	1,340.65	1,568.41	792.42	2,800,588	2,800,588
Single Family Housing	480.32	357.20	304.00	1,495,150	1,495,150
Total	3,336.65	3,681.64	2,611.16	6,932,578	6,932,578

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
Condo/Townhouse	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Health Club	16.60	8.40	6.90	16.90	64.10	19.00	52	39	9
High Turnover (Sit Down Restaurant)	16.60	8.40	6.90	8.50	72.50	19.00	37	20	43
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Recreational Swimming Pool	16.60	8.40	6.90	33.00	48.00	19.00	52	39	9
Regional Shopping Center	16.60	8.40	6.90	16.30	64.70	19.00	54	35	11
Single Family Housing	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.508857	0.056420	0.193204	0.150829	0.041936	0.005921	0.015893	0.015805	0.001454	0.002159	0.004747	0.000498	0.002277

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: Y

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
	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	713.5455	713.5455	0.0345	7.1400e-003	716.4852
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	713.5455	713.5455	0.0345	7.1400e-003	716.4852
NaturalGas Mitigated	0.0514	0.4483	0.2558	2.8000e-003		0.0355	0.0355		0.0355	0.0355	0.0000	508.3264	508.3264	9.7400e-003	9.3200e-003	511.4200
NaturalGas Unmitigated	0.0514	0.4483	0.2558	2.8000e-003		0.0355	0.0355		0.0355	0.0355	0.0000	508.3264	508.3264	9.7400e-003	9.3200e-003	511.4200

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	tons/yr										MT/yr					
Health Club	115274	6.2000e-004	5.6500e-003	4.7500e-003	3.0000e-005		4.3000e-004	4.3000e-004		4.3000e-004	4.3000e-004	0.0000	6.1514	6.1514	1.2000e-004	1.1000e-004	6.1889
High Turnover (Sit Down Restaurant)	3.0085e+006	0.0162	0.1475	0.1239	8.8000e-004		0.0112	0.0112		0.0112	0.0112	0.0000	160.5449	160.5449	3.0800e-003	2.9400e-003	161.5219
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
Recreational Swimming Pool	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
Regional Shopping Center	77015	4.2000e-004	3.7800e-003	3.1700e-003	2.0000e-005		2.9000e-004	2.9000e-004		2.9000e-004	2.9000e-004	0.0000	4.1098	4.1098	8.0000e-005	8.0000e-005	4.1348
Single Family Housing	4.77983e+006	0.0258	0.2203	0.0937	1.4100e-003		0.0178	0.0178		0.0178	0.0178	0.0000	255.0697	255.0697	4.8900e-003	4.6800e-003	256.6220
Condo/Townhouse	1.54507e+006	8.3300e-003	0.0712	0.0303	4.5000e-004		5.7600e-003	5.7600e-003		5.7600e-003	5.7600e-003	0.0000	82.4506	82.4506	1.5800e-003	1.5100e-003	82.9524
Total		**0.0514**	**0.4484**	**0.2558**	**2.7900e-003**		**0.0355**	**0.0355**		**0.0355**	**0.0355**	**0.0000**	**508.3264**	**508.3264**	**9.7500e-003**	**9.3200e-003**	**511.4200**

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					
Health Club	115274	6.2000e-004	5.6500e-003	4.7500e-003	3.0000e-005		4.3000e-004	4.3000e-004		4.3000e-004	4.3000e-004	0.0000	6.1514	6.1514	1.2000e-004	1.1000e-004	6.1889
High Turnover (Sit Down Restaurant)	3.0085e+006	0.0162	0.1475	0.1239	8.8000e-004		0.0112	0.0112		0.0112	0.0112	0.0000	160.5449	160.5449	3.0800e-003	2.9400e-003	161.5219
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
Recreational Swimming Pool	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
Regional Shopping Center	77015	4.2000e-004	3.7800e-003	3.1700e-003	2.0000e-005		2.9000e-004	2.9000e-004		2.9000e-004	2.9000e-004	0.0000	4.1098	4.1098	8.0000e-005	8.0000e-005	4.1348
Single Family Housing	4.77983e+006	0.0258	0.2203	0.0937	1.4100e-003		0.0178	0.0178		0.0178	0.0178	0.0000	255.0697	255.0697	4.8900e-003	4.6800e-003	256.6220
Condo/Townhouse	1.54507e+006	8.3300e-003	0.0712	0.0303	4.5000e-004		5.7600e-003	5.7600e-003		5.7600e-003	5.7600e-003	0.0000	82.4506	82.4506	1.5800e-003	1.5100e-003	82.9524
Total		**0.0514**	**0.4484**	**0.2558**	**2.7900e-003**		**0.0355**	**0.0355**		**0.0355**	**0.0355**	**0.0000**	**508.3264**	**508.3264**	**9.7500e-003**	**9.3200e-003**	**511.4200**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Condo/Townhouse	402317	109.3650	5.2900e-003	1.0900e-003	109.8156
Health Club	50334.4	13.6828	6.6000e-004	1.4000e-004	13.7392
High Turnover (Sit Down Restaurant)	461638	125.4907	6.0700e-003	1.2600e-003	126.0077
Parking Lot	124960	33.9689	1.6400e-003	3.4000e-004	34.1088

Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	490560	133.3528	6.4500e-003	1.3400e-003	133.9022
Single Family Housing	1.09508e+006	297.6853	0.0144	2.9800e-003	298.9118
Total		**713.5455**	**0.0345**	**7.1500e-003**	**716.4852**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Condo/Townhouse	402317	109.3650	5.2900e-003	1.0900e-003	109.8156
Health Club	50334.4	13.6828	6.6000e-004	1.4000e-004	13.7392
High Turnover (Sit Down Restaurant)	461638	125.4907	6.0700e-003	1.2600e-003	126.0077
Parking Lot	124960	33.9689	1.6400e-003	3.4000e-004	34.1088
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	490560	133.3528	6.4500e-003	1.3400e-003	133.9022
Single Family Housing	1.09508e+006	297.6853	0.0144	2.9800e-003	298.9118
Total		**713.5455**	**0.0345**	**7.1500e-003**	**716.4852**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

	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					
Unmitigated	2.7857	0.0293	2.5303	1.3000e-004		0.0180	0.0180		0.0180	0.0180	0.0000	62.7140	62.7140	5.1600e-003	1.0700e-003	63.1553
Mitigated	2.7435	0.0293	2.5303	1.3000e-004		0.0180	0.0180		0.0180	0.0180	0.0000	62.7140	62.7140	5.1600e-003	1.0700e-003	63.1553

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	0.2479					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	2.4546					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	5.9200e-003	0.0000	3.2000e-004	0.0000		4.0900e-003	4.0900e-003		4.0500e-003	4.0500e-003	0.0000	58.5935	58.5935	1.1200e-003	1.0700e-003	58.9501
Landscaping	0.0774	0.0293	2.5299	1.3000e-004		0.0139	0.0139		0.0139	0.0139	0.0000	4.1205	4.1205	4.0400e-003	0.0000	4.2053
Total	**2.7857**	**0.0293**	**2.5303**	**1.3000e-004**		**0.0180**	**0.0180**		**0.0180**	**0.0180**	**0.0000**	**62.7140**	**62.7140**	**5.1600e-003**	**1.0700e-003**	**63.1553**

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	0.2056					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	2.4546					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	5.9200e-003	0.0000	3.2000e-004	0.0000		4.0900e-003	4.0900e-003		4.0500e-003	4.0500e-003	0.0000	58.5935	58.5935	1.1200e-003	1.0700e-003	58.9501
Landscaping	0.0774	0.0293	2.5299	1.3000e-004		0.0139	0.0139		0.0139	0.0139	0.0000	4.1205	4.1205	4.0400e-003	0.0000	4.2053
Total	**2.7435**	**0.0293**	**2.5303**	**1.3000e-004**		**0.0180**	**0.0180**		**0.0180**	**0.0180**	**0.0000**	**62.7140**	**62.7140**	**5.1600e-003**	**1.0700e-003**	**63.1553**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Unmitigated	123.9071	0.7409	0.0185	145.2102
Mitigated	123.9071	0.7408	0.0185	145.1988

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Condo/Townhouse	5.99417 / 3.77893	34.5315	0.1969	4.9400e-003	40.1973

Health Club	0.308727 / 0.18922	1.7622	0.0101	2.5000e-004	2.0539
High Turnover (Sit Down Restaurant)	3.45421 / 0.220482	13.9883	0.1132	2.7900e-003	17.2290
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0.199904 / 0.122522	1.1410	6.5700e-003	1.6000e-004	1.3299
Regional Shopping Center	2.70365 / 1.65707	15.4321	0.0888	2.2300e-003	17.9871
Single Family Housing	9.90341 / 6.24346	57.0520	0.3253	8.1600e-003	66.4130
Total		**123.9071**	**0.7409**	**0.0185**	**145.2102**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Condo/Townhouse	5.99417 / 3.77893	34.5315	0.1969	4.9300e-003	40.1943
Health Club	0.308727 / 0.18922	1.7622	0.0101	2.5000e-004	2.0538
High Turnover (Sit Down Restaurant)	3.45421 / 0.220482	13.9883	0.1132	2.7800e-003	17.2272
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0.199904 / 0.122522	1.1410	6.5600e-003	1.6000e-004	1.3298
Regional Shopping Center	2.70365 / 1.65707	15.4321	0.0888	2.2200e-003	17.9857
Single Family Housing	9.90341 / 6.24346	57.0520	0.3253	8.1500e-003	66.4080
Total		**123.9071**	**0.7408**	**0.0185**	**145.1988**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	75.9491	4.4885	0.0000	170.2068
Unmitigated	75.9491	4.4885	0.0000	170.2068

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Condo/Townhouse	42.32	8.5906	0.5077	0.0000	19.2520
Health Club	29.75	6.0390	0.3569	0.0000	13.5338
High Turnover (Sit Down Restaurant)	135.42	27.4890	1.6246	0.0000	61.6047
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	19.27	3.9116	0.2312	0.0000	8.7662
Regional Shopping Center	38.33	7.7806	0.4598	0.0000	17.4369
Single Family Housing	109.06	22.1382	1.3083	0.0000	49.6131
Total		**75.9491**	**4.4885**	**0.0000**	**170.2068**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Condo/Townhouse	42.32	8.5906	0.5077	0.0000	19.2520
Health Club	29.75	6.0390	0.3569	0.0000	13.5338
High Turnover (Sit Down Restaurant)	135.42	27.4890	1.6246	0.0000	61.6047
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	19.27	3.9116	0.2312	0.0000	8.7662
Regional Shopping Center	38.33	7.7806	0.4598	0.0000	17.4369
Single Family Housing	109.06	22.1382	1.3083	0.0000	49.6131
Total		**75.9491**	**4.4885**	**0.0000**	**170.2068**

9.0 Operational Offroad

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

10.0 Vegetation

	Total CO2	CH4	N2O	CO2e
Category	MT			

Unmitigated	359.6640	0.0000	0.0000	359.6640

10.2 Net New Trees

Species Class

	Number of Trees	Total CO2	CH4	N2O	CO2e
		MT			
Miscellaneous	508	359.6640	0.0000	0.0000	359.6640
Total		**359.6640**	**0.0000**	**0.0000**	**359.6640**

Cypress - Operational GHGs - Project Scenario

Orange County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	355.00	Space	0.00	142,000.00	0
Health Club	5.22	1000sqft	0.00	5,216.00	0
High Turnover (Sit Down Restaurant)	11.38	1000sqft	0.00	11,376.00	0
Recreational Swimming Pool	3.38	1000sqft	0.00	3,375.00	0
Condo/Townhouse	92.00	Dwelling Unit	0.00	161,581.00	161
Single Family Housing	152.00	Dwelling Unit	33.00	319,230.00	266
Regional Shopping Center	36.50	1000sqft	0.00	36,500.00	0

1.2 Other Project Characteristics

Urbanization Urban **Wind Speed (m/s)** 2.2 **Precipitation Freq (Days)** 30

Climate Zone 8 **Operational Year** 2020

Utility Company Southern California Edison

CO2 Intensity (lb/MWhr) 501.9 **CH4 Intensity (lb/MWhr)** 0.029 **N2O Intensity (lb/MWhr)** 0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - 20% RPS by 2013

Land Use - Acreage and number of units provided in data request. Parking lot size from project description. Assumes provided 5 acre value for commercial includes parking

Construction Phase - Phasing provided by client

Off-road Equipment - Provided by client

Off-road Equipment - Amount and hours provided by client

Grading - Provided by client

Architectural Coating - Client has committed to low-VOC coatings

Vehicle Trips - Residential and commercial trip rates provided by client. Assume health club and pool are for residents only, and will generate no external trips

Vechicle Emission Factors - Removal of Pavley and LCFS

Vechicle Emission Factors - ACC adjustment

Vechicle Emission Factors - ACC adjustment

Woodstoves - Provided by client

Area Coating - Provided by client

Energy Use - 2014 Title 24 Standard

Solid Waste -

Land Use Change -

Sequestration -

Construction Off-road Equipment Mitigation - Provided by client

Area Mitigation - .

Energy Mitigation -

Waste Mitigation -

Water And Wastewater -

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_EF_Nonresidential_Exterior	250	100
tblAreaMitigation	UseLowVOCPaintNonresidentialInteriorValue	250	50
tblEnergyUse	T24E	197.21	151.26
tblEnergyUse	T24E	1.99	1.56
tblEnergyUse	T24E	10.64	8.32
tblEnergyUse	T24E	3.58	2.80
tblEnergyUse	T24E	391.02	248.69
tblEnergyUse	T24NG	12,874.17	12,384.95
tblEnergyUse	T24NG	14.78	12.30
tblEnergyUse	T24NG	82.67	68.78
tblEnergyUse	T24NG	1.00	0.83
tblEnergyUse	T24NG	23,064.50	21,565.31

tblFireplaces	FireplaceWoodMass	1,019.20	0.00
tblFireplaces	FireplaceWoodMass	1,019.20	0.00
tblFireplaces	NumberGas	78.20	107.00
tblFireplaces	NumberGas	129.20	137.00
tblFireplaces	NumberNoFireplace	9.20	0.00
tblFireplaces	NumberNoFireplace	15.20	0.00
tblFireplaces	NumberWood	4.60	0.00
tblFireplaces	NumberWood	7.60	0.00
tblLandUse	LandUseSquareFeet	5,220.00	5,216.00
tblLandUse	LandUseSquareFeet	11,380.00	11,376.00
tblLandUse	LandUseSquareFeet	3,380.00	3,375.00
tblLandUse	LandUseSquareFeet	92,000.00	161,581.00
tblLandUse	LandUseSquareFeet	273,600.00	319,230.00
tblLandUse	LotAcreage	3.19	0.00
tblLandUse	LotAcreage	0.12	0.00
tblLandUse	LotAcreage	0.26	0.00
tblLandUse	LotAcreage	0.08	0.00
tblLandUse	LotAcreage	5.75	0.00
tblLandUse	LotAcreage	49.35	33.00
tblLandUse	LotAcreage	0.84	0.00
tblLandUse	Population	263.00	161.00
tblLandUse	Population	435.00	266.00
tblProjectCharacteristics	CO2IntensityFactor	630.89	501.9
tblProjectCharacteristics	OperationalYear	2014	2020
tblSequestration	NumberOfNewTrees	0.00	508.00
tblTripsAndVMT	HaulingTripNumber	0.00	10,000.00
tblVehicleEF	LDA	240.65	230.37
tblVehicleEF	LDA	52.82	51.22
tblVehicleEF	LDT1	294.32	290.28
tblVehicleEF	LDT1	64.02	63.44

tblVehicleEF	LDT2	358.30	351.97
tblVehicleEF	LDT2	77.62	76.64
tblVehicleEF	MDV	481.07	475.17
tblVehicleEF	MDV	103.34	102.42
tblVehicleTrips	ST_TR	7.16	2.24
tblVehicleTrips	ST_TR	20.87	0.00
tblVehicleTrips	ST_TR	158.37	136.20
tblVehicleTrips	ST_TR	20.87	0.00
tblVehicleTrips	ST_TR	49.97	42.97
tblVehicleTrips	ST_TR	10.08	2.35
tblVehicleTrips	SU_TR	6.07	2.44
tblVehicleTrips	SU_TR	26.73	0.00
tblVehicleTrips	SU_TR	131.84	113.38
tblVehicleTrips	SU_TR	26.73	0.00
tblVehicleTrips	SU_TR	25.24	21.71
tblVehicleTrips	SU_TR	8.77	2.00
tblVehicleTrips	WD_TR	6.59	2.95
tblVehicleTrips	WD_TR	32.93	0.00
tblVehicleTrips	WD_TR	127.15	109.34
tblVehicleTrips	WD_TR	32.93	0.00
tblVehicleTrips	WD_TR	42.94	36.73
tblVehicleTrips	WD_TR	9.57	3.16
tblWoodstoves	NumberCatalytic	4.60	0.00
tblWoodstoves	NumberCatalytic	7.60	0.00
tblWoodstoves	NumberNoncatalytic	4.60	0.00
tblWoodstoves	NumberNoncatalytic	7.60	0.00
tblWoodstoves	WoodstoveWoodMass	999.60	0.00
tblWoodstoves	WoodstoveWoodMass	999.60	0.00

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					
2016	0.2428	3.1354	2.2433	5.1200e-003	0.2858	0.1014	0.3873	0.1058	0.0933	0.1991	0.0000	471.3225	471.3225	0.0421	0.0000	472.2070
Total	**0.2428**	**3.1354**	**2.2433**	**5.1200e-003**	**0.2858**	**0.1014**	**0.3873**	**0.1058**	**0.0933**	**0.1991**	**0.0000**	**471.3225**	**471.3225**	**0.0421**	**0.0000**	**472.2070**

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					
2016	0.2428	3.1354	2.2433	5.1200e-003	0.2858	0.1014	0.3873	0.1058	0.0933	0.1991	0.0000	471.3224	471.3224	0.0421	0.0000	472.2068
Total	**0.2428**	**3.1354**	**2.2433**	**5.1200e-003**	**0.2858**	**0.1014**	**0.3873**	**0.1058**	**0.0933**	**0.1991**	**0.0000**	**471.3224**	**471.3224**	**0.0421**	**0.0000**	**472.2068**

	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**

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	2.7857	0.0293	2.5303	1.3000e-004		0.0180	0.0180		0.0180	0.0180	0.0000	62.7140	62.7140	5.1600e-003	1.0700e-003	63.1553
Energy	0.0463	0.4042	0.2331	2.5200e-003		0.0320	0.0320		0.0320	0.0320	0.0000	1,022.5569	1,022.5569	0.0414	0.0152	1,028.1213
Mobile	1.3699	2.6224	12.6514	0.0367	2.6193	0.0389	2.6582	0.7000	0.0359	0.7358	0.0000	2,483.6182	2,483.6182	0.0950	0.0000	2,485.6135
Waste						0.0000	0.0000		0.0000	0.0000	75.9491	0.0000	75.9491	4.4885	0.0000	170.2068
Water						0.0000	0.0000		0.0000	0.0000	7.1585	97.7743	104.9328	0.7409	0.0185	126.2359
Total	**4.2019**	**3.0559**	**15.4148**	**0.0393**	**2.6193**	**0.0888**	**2.7081**	**0.7000**	**0.0858**	**0.7857**	**83.1076**	**3,666.6633**	**3,749.7709**	**5.3709**	**0.0348**	**3,873.3328**

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	2.7435	0.0293	2.5303	1.3000e-004		0.0180	0.0180		0.0180	0.0180	0.0000	62.7140	62.7140	5.1600e-003	1.0700e-003	63.1553
Energy	0.0463	0.4042	0.2331	2.5200e-003		0.0320	0.0320		0.0320	0.0320	0.0000	872.9499	872.9499	0.0328	0.0134	877.7783
Mobile	1.3699	2.6224	12.6514	0.0367	2.6193	0.0389	2.6582	0.7000	0.0359	0.7358	0.0000	2,483.6182	2,483.6182	0.0950	0.0000	2,485.6135
Waste						0.0000	0.0000		0.0000	0.0000	63.7972	0.0000	63.7972	3.7703	0.0000	142.9737
Water						0.0000	0.0000		0.0000	0.0000	6.3711	88.5325	94.9036	0.6594	0.0165	113.8607
Total	**4.1597**	**3.0559**	**15.4148**	**0.0393**	**2.6193**	**0.0888**	**2.7081**	**0.7000**	**0.0858**	**0.7857**	**70.1683**	**3,507.8145**	**3,577.9829**	**4.5626**	**0.0309**	**3,683.3815**

	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	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.57	4.33	4.58	15.05	11.05	4.90

2.3 Vegetation

Vegetation

	CO2e
Category	MT
New Trees	359.6640
Total	**359.6640**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	1/1/2016	3/3/2016	5	45	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 112.5

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
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

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
Grading	8	20.00	0.00	10,000.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Grading - 2016

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					0.1952	0.0000	0.1952	0.0809	0.0000	0.0809	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1458	1.6833	1.1056	1.3900e-003		0.0807	0.0807		0.0742	0.0742	0.0000	130.9404	130.9404	0.0395	0.0000	131.7698
Total	**0.1458**	**1.6833**	**1.1056**	**1.3900e-003**	**0.1952**	**0.0807**	**0.2758**	**0.0809**	**0.0742**	**0.1551**	**0.0000**	**130.9404**	**130.9404**	**0.0395**	**0.0000**	**131.7698**

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	0.0955	1.4498	1.1140	3.6800e-003	0.0857	0.0207	0.1065	0.0235	0.0191	0.0426	0.0000	335.9293	335.9293	2.4000e-003	0.0000	335.9798
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	1.5400e-003	2.2800e-003	0.0238	6.0000e-005	4.9400e-003	4.0000e-005	4.9800e-003	1.3100e-003	3.0000e-005	1.3400e-003	0.0000	4.4528	4.4528	2.2000e-004	0.0000	4.4574
Total	**0.0970**	**1.4521**	**1.1377**	**3.7400e-003**	**0.0907**	**0.0208**	**0.1115**	**0.0248**	**0.0191**	**0.0439**	**0.0000**	**340.3821**	**340.3821**	**2.6200e-003**	**0.0000**	**340.4372**

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					0.1952	0.0000	0.1952	0.0809	0.0000	0.0809	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1458	1.6833	1.1056	1.3900e-003		0.0807	0.0807		0.0742	0.0742	0.0000	130.9402	130.9402	0.0395	0.0000	131.7697
Total	**0.1458**	**1.6833**	**1.1056**	**1.3900e-003**	**0.1952**	**0.0807**	**0.2758**	**0.0809**	**0.0742**	**0.1551**	**0.0000**	**130.9402**	**130.9402**	**0.0395**	**0.0000**	**131.7697**

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	0.0955	1.4498	1.1140	3.6800e-003	0.0857	0.0207	0.1065	0.0235	0.0191	0.0426	0.0000	335.9293	335.9293	2.4000e-003	0.0000	335.9798
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	1.5400e-003	2.2800e-003	0.0238	6.0000e-005	4.9400e-003	4.0000e-005	4.9800e-003	1.3100e-003	3.0000e-005	1.3400e-003	0.0000	4.4528	4.4528	2.2000e-004	0.0000	4.4574

Total	0.0970	1.4521	1.1377	3.7400e-003	0.0907	0.0208	0.1115	0.0248	0.0191	0.0439	0.0000	340.3821	340.3821	2.6200e-003	0.0000	340.4372

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					
Unmitigated	1.3699	2.6224	12.6514	0.0367	2.6193	0.0389	2.6582	0.7000	0.0359	0.7358	0.0000	2,483.6182	2,483.6182	0.0950	0.0000	2,485.6135
Mitigated	1.3699	2.6224	12.6514	0.0367	2.6193	0.0389	2.6582	0.7000	0.0359	0.7358	0.0000	2,483.6182	2,483.6182	0.0950	0.0000	2,485.6135

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Condo/Townhouse	271.40	206.08	224.48	872,623	872,623
Health Club	0.00	0.00	0.00		
High Turnover (Sit Down Restaurant)	1,244.29	1,549.96	1290.26	1,764,217	1,764,217
Parking Lot	0.00	0.00	0.00		
Recreational Swimming Pool	0.00	0.00	0.00		
Regional Shopping Center	1,340.65	1,568.41	792.42	2,800,588	2,800,588
Single Family Housing	480.32	357.20	304.00	1,495,150	1,495,150
Total	3,336.65	3,681.64	2,611.16	6,932,578	6,932,578

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
Condo/Townhouse	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Health Club	16.60	8.40	6.90	16.90	64.10	19.00	52	39	9

High Turnover (Sit Down	16.60	8.40	6.90	8.50	72.50	19.00	37	20	43
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Recreational Swimming Pool	16.60	8.40	6.90	33.00	48.00	19.00	52	39	9
Regional Shopping Center	16.60	8.40	6.90	16.30	64.70	19.00	54	35	11
Single Family Housing	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.508857	0.056420	0.193204	0.150829	0.041936	0.005921	0.015893	0.015805	0.001454	0.002159	0.004747	0.000498	0.002277

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

Install High Efficiency Lighting

Install Energy Efficient Appliances

	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	415.0538	415.0538	0.0240	4.9600e-003	417.0956
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	564.6608	564.6608	0.0326	6.7500e-003	567.4386
NaturalGas Mitigated	0.0463	0.4042	0.2331	2.5200e-003		0.0320	0.0320		0.0320	0.0320	0.0000	457.8961	457.8961	8.7800e-003	8.3900e-003	460.6827
NaturalGas Unmitigated	0.0463	0.4042	0.2331	2.5200e-003		0.0320	0.0320		0.0320	0.0320	0.0000	457.8961	457.8961	8.7800e-003	8.3900e-003	460.6827

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					
Health Club	99938.6	5.4000e-004	4.9000e-003	4.1200e-003	3.0000e-005		3.7000e-004	3.7000e-004		3.7000e-004	3.7000e-004	0.0000	5.3331	5.3331	1.0000e-004	1.0000e-004	5.3656
High Turnover (Sit Down Restaurant)	2.83877e+006	0.0153	0.1392	0.1169	8.3000e-004		0.0106	0.0106		0.0106	0.0106	0.0000	151.4874	151.4874	2.9000e-003	2.7800e-003	152.4094
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
Recreational Swimming Pool	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
Regional Shopping Center	68620	3.7000e-004	3.3600e-003	2.8300e-003	2.0000e-005		2.6000e-004	2.6000e-004		2.6000e-004	2.6000e-004	0.0000	3.6618	3.6618	7.0000e-005	7.0000e-005	3.6841
Single Family Housing	4.16242e+006	0.0224	0.1918	0.0816	1.2200e-003		0.0155	0.0155		0.0155	0.0155	0.0000	222.1223	222.1223	4.2600e-003	4.0700e-003	223.4741
Condo/Townhouse	1.41091e+006	7.6100e-003	0.0650	0.0277	4.1000e-004		5.2600e-003	5.2600e-003		5.2600e-003	5.2600e-003	0.0000	75.2914	75.2914	1.4400e-003	1.3800e-003	75.7496
Total		**0.0463**	**0.4042**	**0.2331**	**2.5100e-003**		**0.0320**	**0.0320**		**0.0320**	**0.0320**	**0.0000**	**457.8961**	**457.8961**	**8.7700e-003**	**8.4000e-003**	**460.6827**

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					
Health Club	99938.6	5.4000e-004	4.9000e-003	4.1200e-003	3.0000e-005		3.7000e-004	3.7000e-004		3.7000e-004	3.7000e-004	0.0000	5.3331	5.3331	1.0000e-004	1.0000e-004	5.3656
High Turnover (Sit Down Restaurant)	2.83877e+006	0.0153	0.1392	0.1169	8.3000e-004		0.0106	0.0106		0.0106	0.0106	0.0000	151.4874	151.4874	2.9000e-003	2.7800e-003	152.4094
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
Recreational Swimming Pool	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
Regional Shopping Center	68620	3.7000e-004	3.3600e-003	2.8300e-003	2.0000e-005		2.6000e-004	2.6000e-004		2.6000e-004	2.6000e-004	0.0000	3.6618	3.6618	7.0000e-005	7.0000e-005	3.6841

Single Family Housing	4.16242e+006	0.0224	0.1918	0.0816	1.2200e-003		0.0155	0.0155		0.0155	0.0155	0.0000	222.1223	222.1223	4.2600e-003	4.0700e-003	223.4741
Condo/Townhouse	1.41091e+006	7.6100e-003	0.0650	0.0277	4.1000e-004		5.2600e-003	5.2600e-003		5.2600e-003	5.2600e-003	0.0000	75.2914	75.2914	1.4400e-003	1.3800e-003	75.7496
Total		**0.0463**	**0.4042**	**0.2331**	**2.5100e-003**		**0.0320**	**0.0320**		**0.0320**	**0.0320**	**0.0000**	**457.8961**	**457.8961**	**8.7700e-003**	**8.4000e-003**	**460.6827**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Condo/Townhouse	393639	89.6150	5.1800e-003	1.0700e-003	90.0558
Health Club	45953	10.4616	6.0000e-004	1.3000e-004	10.5130
High Turnover (Sit Down Restaurant)	421026	95.8499	5.5400e-003	1.1500e-003	96.3214
Parking Lot	124960	28.4481	1.6400e-003	3.4000e-004	28.5881
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	438730	99.8804	5.7700e-003	1.1900e-003	100.3717
Single Family Housing	1.056e+006	240.4059	0.0139	2.8700e-003	241.5885
Total		**564.6608**	**0.0326**	**6.7500e-003**	**567.4386**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			

Condo/Townhouse	311169	70.8402	4.0900e-003	8.5000e-004	71.1887
Health Club	32573.9	7.4157	4.3000e-004	9.0000e-005	7.4522
High Turnover (Sit Down Restaurant)	347821	79.1843	4.5800e-003	9.5000e-004	79.5738
Parking Lot	31240	7.1120	4.1000e-004	9.0000e-005	7.1470
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	262983	59.8701	3.4600e-003	7.2000e-004	60.1646
Single Family Housing	837359	190.6315	0.0110	2.2800e-003	191.5693
Total		**415.0538**	**0.0240**	**4.9800e-003**	**417.0956**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

Use only Natural Gas Hearths

	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					
Unmitigated	2.7857	0.0293	2.5303	1.3000e-004		0.0180	0.0180		0.0180	0.0180	0.0000	62.7140	62.7140	5.1600e-003	1.0700e-003	63.1553
Mitigated	2.7435	0.0293	2.5303	1.3000e-004		0.0180	0.0180		0.0180	0.0180	0.0000	62.7140	62.7140	5.1600e-003	1.0700e-003	63.1553

6.2 Area by SubCategory

Unmitigated

SubCategory	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
	tons/yr										MT/yr					
Architectural Coating	0.2479					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	2.4546					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	5.9200e-003	0.0000	3.2000e-004	0.0000		4.0900e-003	4.0900e-003		4.0500e-003	4.0500e-003	0.0000	58.5935	58.5935	1.1200e-003	1.0700e-003	58.9501
Landscaping	0.0774	0.0293	2.5299	1.3000e-004		0.0139	0.0139		0.0139	0.0139	0.0000	4.1205	4.1205	4.0400e-003	0.0000	4.2053
Total	**2.7857**	**0.0293**	**2.5303**	**1.3000e-004**		**0.0180**	**0.0180**		**0.0180**	**0.0180**	**0.0000**	**62.7140**	**62.7140**	**5.1600e-003**	**1.0700e-003**	**63.1553**

Mitigated

SubCategory	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
	tons/yr										MT/yr					
Architectural Coating	0.2056					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	2.4546					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	5.9200e-003	0.0000	3.2000e-004	0.0000		4.0900e-003	4.0900e-003		4.0500e-003	4.0500e-003	0.0000	58.5935	58.5935	1.1200e-003	1.0700e-003	58.9501
Landscaping	0.0774	0.0293	2.5299	1.3000e-004		0.0139	0.0139		0.0139	0.0139	0.0000	4.1205	4.1205	4.0400e-003	0.0000	4.2053
Total	**2.7435**	**0.0293**	**2.5303**	**1.3000e-004**		**0.0180**	**0.0180**		**0.0180**	**0.0180**	**0.0000**	**62.7140**	**62.7140**	**5.1600e-003**	**1.0700e-003**	**63.1553**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Unmitigated	104.9328	0.7409	0.0185	126.2359
Mitigated	94.9036	0.6594	0.0165	113.8607

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Condo/Townhouse	5.99417 / 3.77893	29.2284	0.1969	4.9400e-003	34.8942
Health Club	0.308727 / 0.18922	1.4917	0.0101	2.5000e-004	1.7835
High Turnover (Sit Down Restaurant)	3.45421 / 0.220482	11.8930	0.1132	2.7900e-003	15.1336
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0.199904 / 0.122522	0.9659	6.5700e-003	1.6000e-004	1.1548
Regional Shopping Center	2.70365 / 1.65707	13.0635	0.0888	2.2300e-003	15.6184
Single Family Housing	9.90341 / 6.24346	48.2904	0.3253	8.1600e-003	57.6513
Total		**104.9328**	**0.7409**	**0.0185**	**126.2359**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Condo/Townhouse	5.33481 / 3.54842	26.4816	0.1752	4.3900e-003	31.5238
Health Club	0.274767 / 0.177677	1.3511	9.0200e-003	2.3000e-004	1.6107
High Turnover (Sit Down Restaurant)	3.07425 / 0.207032	10.6121	0.1007	2.4800e-003	13.4948
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0.177914 / 0.115048	0.8748	5.8400e-003	1.5000e-004	1.0430
Regional Shopping Center	2.40625 / 1.55599	11.8319	0.0790	1.9800e-003	14.1056
Single Family Housing	8.81404 / 5.8626	43.7522	0.2895	7.2600e-003	52.0828
Total		**94.9036**	**0.6594**	**0.0165**	**113.8607**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	63.7972	3.7703	0.0000	142.9737

Unmitigated	75.9491	4.4885	0.0000	170.2068

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Condo/Townhouse	42.32	8.5906	0.5077	0.0000	19.2520
Health Club	29.75	6.0390	0.3569	0.0000	13.5338
High Turnover (Sit Down Restaurant)	135.42	27.4890	1.6246	0.0000	61.6047
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	19.27	3.9116	0.2312	0.0000	8.7662
Regional Shopping Center	38.33	7.7806	0.4598	0.0000	17.4369
Single Family Housing	109.06	22.1382	1.3083	0.0000	49.6131
Total		**75.9491**	**4.4885**	**0.0000**	**170.2068**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Condo/Townhouse	35.5488	7.2161	0.4265	0.0000	16.1717

Health Club	24.99	5.0727	0.2998	0.0000	11.3684
High Turnover (Sit Down Restaurant)	113.753	23.0908	1.3646	0.0000	51.7480
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	16.1868	3.2858	0.1942	0.0000	7.3636
Regional Shopping Center	32.1972	6.5357	0.3863	0.0000	14.6470
Single Family Housing	91.6104	18.5961	1.0990	0.0000	41.6750
Total		**63.7972**	**3.7703**	**0.0000**	**142.9737**

9.0 Operational Offroad

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

10.0 Vegetation

	Total CO2	CH4	N2O	CO2e
Category	MT			
Unmitigated	359.6640	0.0000	0.0000	359.6640

10.2 Net New Trees

Species Class

	Number of Trees	Total CO2	CH4	N2O	CO2e

		MT			
Miscellaneous	508	359.6640	0.0000	0.0000	359.6640
Total		**359.6640**	**0.0000**	**0.0000**	**359.6640**

2007 Annual Entity Emissions: Electric Power Generation / Electric Utility Sector

Southern California Edison

2244 Walnut Grove Ave
Rosemead Ca 91770
Website: www.sce.com

Legend	
Blue	= required
Green	= required
Orange	= optional

Reporting Year:	**2007**
Direct Baseline Year:	**2002**
Indirect Baseline Year:	**0**
Reporting Scope:	**CA and US**
Reporting Boundaries:	Equity Share
Reporting Protocols:	**General Reporting Protocol Version 3.0 (April 2008)** **Power / Utility Reporting Protocol Version 1.0 (April 2005)**

Contact:	Howard Gollay
Title:	Manager
Telephone:	626 302 4122
Email:	howard.gollay@sce.com
Industry Type:	Electric Power Producer
Entity NAICS Code:	2211 Electric Power Generation, Transmission and Distribution
Facility NAICS Code:	
Entity Description:	Southern California Edison is one of the largest electric utilities in the U.S., and the largest subsidiary of Edison International. On an average day, SCE provides power for 13 million individuals, 430 communities and cities, 5,000 large businesses, and 280,000 small businesses. in Central and Southern California. Delivering that power across a 50,000 mile service area takes 16 utility interconnections, 4,900 transmission and distribution circuits, 365 transmission and distribution crews, the days and nights of 12,642 employees, and over a century of experience.

POWER / UTILITY ENTITY EMISSIONS

Direct Emissions from Owned Facilities	CO_2e	CO_2	CH_4	N_2O	HFCs*	PFCs*	SF_6	Unit
Mobile Combustion	**51,326.00**	51,326.00	0.00	0.00	n.a.	n.a.	n.a.	metric tons
Total Stationary Combustion	**6,868,412.00**	6,827,012.00	820.00	78.00	n.a.	n.a.	n.a.	metric tons
from Electric Power Generation, Transmission & Distributi	6,868,412.00	6,827,012.00	820.00	78.00	n.a.	n.a.	n.a.	metric tons
from Natural Gas-Related Activities	0.00	0.00	0.00	0.00	n.a.	n.a.	n.a.	metric tons
from Other On-Site Combustion	0.00	0.00	0.00	0.00	n.a.	n.a.	n.a.	metric tons
Process Emissions	**0.00**	0.00	0.00	0.00	0.00	0.00	n.a.	metric tons
Fugitive Emissions	**269,329.10**	0.00	0.00	0.00	0.00	0.00	11.27	metric tons
TOTAL DIRECT EMISSIONS	**7,189,067**	6,878,338.00	820.00	78.00	0.00	0.00	11.27	metric tons
% of Net Generation Delivered to CA	100							
% of Net Generation Delivered Outside of CA	0							
Total Direct Emissions from Deliveries to CA	**7,189,067**	6,878,338.00	820.00	78.00	0.00	0.00	11.27	metric tons
Total Direct Emissions from Deliveries outside of CA	**0**	0.00	0.00	0.00	0.00	0.00	0.00	metric tons

** Throughout this report, please note that HFCs and PFCs are classes of greenhouse gases that include many compounds. These columns may reflect the total emissions of multiple HFC and PFC compounds, each with a unique Global Warming Potential (GWP). The values you see in these columns represent the total metric tons of multiple HFC or PFC compounds summed together, not the metric tons of the individual gases.*
Comments:

Indirect Emissions from Owned Facilities	CO_2e	CO_2	CH_4	N_2O	Unit
Electricity Purchased and Consumed	**0.00**	0.00	0.00	0.00	metric tons
Steam Purchased and Consumed	**0.00**	0.00	0.00	0.00	metric tons
Heat Purchased and Consumed	**0.00**	0.00	0.00	0.00	metric tons
Cooling Purchased and Consumed	**0.00**	0.00	0.00	0.00	metric tons
Total Transmission and Distribution Losses	**1,985,658.20**	1,982,911.00	14.20	7.90	metric tons
from Purchased Power	1,454,248.20	1,452,267.00	10.20	5.70	metric tons
from Wheeled Power (excluding Direct Access)	222,461.70	222,147.00	1.70	0.90	metric tons
from Direct Access	308,948.30	308,497.00	2.30	1.30	metric tons
TOTAL INDIRECT EMISSIONS	**1,985,658**	1,982,911.00	14.20	7.90	metric tons

Comments:

De Minimis Emissions	CO_2e	CO_2	CH_4	N_2O	HFCs*	PFCs*	SF_6	Unit
TOTAL DE MINIMIS EMISSIONS	**60,105**	0.00	259.61	8.26	31.51	0.00	0.00	metric tons

Notes: Emissions reported in this section are estimated; these estimates are reviewed by the verifier and found to be less than 5% of the total entity's emissions.

Comments:
These estimates are conservatively estimated per the GRP. For example, although some HFC leakage is assumed for the largest of SCE facilities, the General Office Complex, it in fact had no HFC leaks that required refills in 2007.

GENERATION & PURCHASED POWER INFORMATION	Amount	Unit	CO_2	Unit
Owned Generation Total (Net)	**31,304,073.00**	**MWh**	**6,827,012.00**	**metric tons**
Fossil Generation (Net)	11,339,359.00	MWh	6,827,012.00	metric tons
Biogenic Generation (Net)	0.00	MWh	0.00	metric tons
Geothermal Generation (Net)	0.00	MWh	0.00	metric tons
Other Renewable Generation (Net)	360,138.00	MWh	0.00	metric tons
Zero Emission Generation (Net)	19,604,576.00	MWh	0.00	metric tons
Co-generation (Net)	0.00	MWh	0.00	metric tons
Purchased Generation Total (Net)	**52,654,697.00**	**MWh**	**17,199,096.00**	**metric tons**
Purchased Fossil Generation (Net)	20,658,274.00	MWh	8,755,072.00	metric tons
Purchased Biogenic Generation (Net)	1,241,931.00	MWh	22,534.00	metric tons
Purchased Geothermal Generation (Net)	7,469,380.00	MWh	-	metric tons
Purchased Other Renewable Generation (Net)	3,404,770.00	MWh	0.00	metric tons
Purchased Zero Emission Generation (Net)	1,078,118.00	MWh	0.00	metric tons
Purchased Co-generation (Net)	12,831,457.00	MWh	6,064,179.00	metric tons
Purchased Wholesale Power (Net)	5,970,767.00	MWh	2,379,845.00	metric tons
TOTAL FOSSIL GENERATION / PURCHASES	**31,997,633.00**	**MWh**	**15,582,084.00**	**metric tons**
TOTAL FROM BIOGENIC SOURCES	**1,241,931.00**	**MWh**	**22,534.00**	**metric tons**
TOTAL OTHER GENERATION / PURCHASES	**50,719,206.00**	**MWh**	**8,444,024.00**	**metric tons**
TOTAL FROM ALL GENERATION SOURCES	**83,958,770.00**	**MWh**	**24,026,108.00**	**metric tons**
TOTAL FROM RETAIL SALES	0.00	MWh	0.00	metric tons

Note: CO_2 from biogenic sources (indicated in green) are not included in entity's total CO_2, nor used to calculate efficiency metrics. Biogenic Generation consists of biomass, landfill gas, waste-to-energy. Renewable Generation consists of small hydro, solar, wind. Zero Emission Generation consists of large hydro and nuclear. Co-generation consists of the electricity component only. CO_2 from Geothermal includes anthropogenic process emissions. Purchased Wholesale Power consists of Spot Market purchases.

Comments:
The goethermal CO2 emissions are estimated to be 508,217 metric tons. These emissions are excluded from the worksheet to be consistent with the PUP that states that only emissions from stationary sources should be included in the metric.

OTHER BIOGENIC EMISSIONS	CO_2e	CO_2	CH_4	N_2O	Unit
Stationary Combustion	0.00	0.00	0.00	0.00	metric tons
Mobile Combustion	0.00	0.00	0.00	0.00	metric tons
Process Emissions	0.00	0.00	0.00	0.00	metric tons
Fugitive Emissions	0.00	0.00	0.00	0.00	metric tons
TOTAL OTHER BIOGENIC EMISSIONS	0	0.00	0.00	0.00	metric tons

Note: Other Biogenic Emissions sources include non-generation stationary combustion or mobile combustion (ethanol or biodiesel vehicles).
Comments:

Do you deliver power to an end-user / retail customer?
(Enter yes or no) **Yes**

EMISSIONS EFFICIENCY METRICS	Ratio	
Electricity Deliveries:	630.89	lbs CO_2/MWh delivered *(includes CO_2 from owned and purchased generation)*
Net Generation:	480.80	lbs CO_2/MWh net owned generation *(fossil, geothermal, hydroelectric, nuclear, solar, etc.)*
Net Fossil Generation:	1,327.32	lbs CO_2/MWh net owned fossil generation only

Note: Efficiency metrics are calculated using CO_2 emissions from stationary combustion for purposes of electricity generation. CO_2 emissions from biogenic sources are not included in the Electricity Deliveries metric; however MWh from biogenic and all other generation sources are included. Geothermal generation CO_2 emissions and MWh are included in Net Generation metric but not Net Fossil Generation metric. Combustion sources related to any non-electricity generating natural gas operations are not included.

Comments:

OPTIONAL INFORMATION

Information in this section is voluntarily provided by the participant for public information, but is not required and is not verified under the California Registry protocols.

Optional Emissions	CO_2e	CO_2	CH_4	N_2O	HFCs*	PFCs*	SF_6	Unit
TOTAL OPTIONAL EMISSIONS	**0**	0.00	0.00	0.00	0.00	0.00	0.00	metric tons

Comments:

Information on Environmental Goals and Programs:

Information on GHG Risk and Liability:

Company Activities Related to Renewable Energy

Purchases of Tradable Renewable Certificates: metric tons CO_2e

Sales of Tradable Renewable Certificates: metric tons CO_2e

Purpose of Transaction:

Geographic Origin of Certificates:

Parties Notified of Transaction(s):

Comments:

Company Activities to Offset GHG Emissions

Purchases of GHG Emission Offsets: metric tons CO_2e

Sales of GHG Emission Offsets: metric tons CO_2e

Type of Project(s):

Terms of Purchase/Sale:

Parties Notified of Transaction(s):

Comments:

Company Activities to Improve Energy Efficiency

Description:

Estimated Annual Energy Efficiency Savings: MWh

therms

Reasons for Undertaking Energy Efficiency Programs:

Comments:

Other Company Actions to Reduce GHG Emissions:

Benefits of Actions:

Other Emissions Efficiency Metric(s):

APPENDIX F

PRELIMINARY WATER QUALITY MANAGEMENT PLAN

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FUSCOE
ENGINEERING

PRELIMINARY
WATER QUALITY MANAGEMENT PLAN (PWQMP)

BARTON PLACE

VTTM 17830

Cypress, California

Prepared For

C33, LLC
26 Corporate Plaza, Suite 260
Newport Beach, CA 92660
949.533.4800

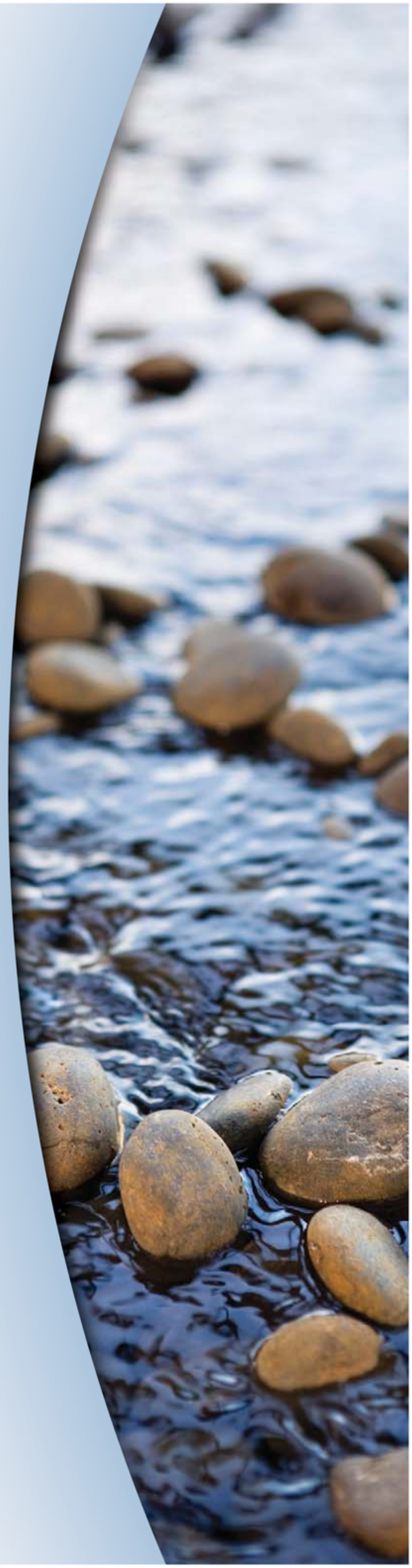
Prepared By

Fuscoe Engineering, Inc.
16795 Von Karman, Suite 100
Irvine, California 92606
949.474.1960
www.fuscoe.com

Project Manager:
Debra Valle-Schales

Date Prepared: December 15, 2014
Date Revised: January 16, 2015
Job Number: 1334-001-01

full circle thinking®



FUSCOE ENGINEERING
full circle thinking

PRELIMINARY WATER QUALITY MANAGEMENT PLAN (PWQMP)

BARTON PLACE

CYPRESS, CA

January 16, 2015

1334-001-01

FUSCOE ENGINEERING
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PRELIMINARY WATER QUALITY MANAGEMENT PLAN (PWQMP)

BARTON PLACE

CYPRESS, CA

January 16, 2015

1334-001-01

FUSCOE ENGINEERING

PRELIMINARY WATER QUALITY MANAGEMENT PLAN (PWQMP)

BARTON PLACE

CYPRESS, CA

January 16, 2015

1334-001-01

PRELIMINARY
WATER QUALITY MANAGEMENT PLAN
(PWQMP)

BARTON PLACE

4921 Katella Avenue
City of Cypress, County of Orange

VESTING TENTATIVE TRACT MAP NO. 17830
PARCEL 1: PORTIONS OF 241-231-51 AND 241-231-54
PARCEL 2: 241-231-46, 241-231-52, 241-231-53, 241-231-55, 241-231-56, 241-231-16 AND PORTIONS OF 241-231-18, 241-231-23, 241-231-36, 241-231-51, 241-231-54 AND 241-231-57

Prepared for:

C33, LLC
26 Corporate Plaza, Suite 260
Newport Beach, CA 92660
949.533.4800

Prepared by:

FUSCOE ENGINEERING, INC.
16795 Von Karman, Suite 100
Irvine, CA 92618
949.474.1960
Debra Valle Schales, PE

Date Prepared: December 15, 2014
Date Revised: January 16, 2015

Planning Manager (checked for site plan consistency only)	Date
Water Quality Manager	Date
Reviewing Engineer	Date
Assistant City Engineer	Date

PROJECT OWNER'S CERTIFICATION			
Permit/Application No.:	Pending	**Grading Permit No.:**	Pending
Vesting Tract/Parcel Map and Lot(s)No.:	VTTM 17830	**Building Permit No.:**	Pending
Address of Project Site and APN:	4921 Katella Avenue, Cypress CA 90720 PARCEL 1: PORTIONS OF 241-231-51 AND 241-231-54 PARCEL 2: 241-231-46, 241-231-52, 241-231-53, 241-231-55, 241-231-56, 241-231-16 AND PORTIONS OF 241-231-18, 241-231-23, 241-231-36, 241-231-51, 241-231-54 AND 241-231-57		

This Preliminary Water Quality Management Plan (PWQMP) has been prepared for C33, LLC by FUSCOE ENGINEERING, INC. The WQMP is intended to comply with the requirements of the County of Orange NPDES Stormwater Program requiring the preparation of the plan.

The undersigned, while it owns the subject property, is responsible for the implementation of the provisions of this plan , including the ongoing operation and maintenance of all best management practices (BMPs), and will ensure that this plan is amended as appropriate to reflect up-to-date conditions on the site consistent with the current Orange County Drainage Area Management Plan (DAMP) and the intent of the non-point source NPDES Permit for Waste Discharge Requirements for the County of Orange, Orange County Flood Control District and the incorporated Cities of Orange County within the Santa Ana Region. Once the undersigned transfers its interest in the property, its successors-in-interest shall bear the aforementioned responsibility to implement and amend the WQMP, and C33, LLC will be released from any further responsibility. An appropriate number of approved and signed copies of this document shall be available on the subject site in perpetuity.

OWNER:	C33, LLC
Name:	Tim Ramm
Title:	Vice President
Company:	C33, LLC
Address:	26 Corporate Plaza, Suite 260, Newport Beach, CA 92660
Email:	tramm@provincegroup.com
Telephone:	949.533.4800
Signature:	**Date:** 3\16\15

PROJECT ENGINEER'S CERTIFICATION			
Permit/Application No.:	Pending	**Grading Permit No.:**	Pending
Tract/Parcel Map and Lot(s)No.:	VTTM 17830	**Building Permit No.:**	Pending
CUP, SUP, and/or APN (specify lot numbers if Portions of Tract)			

I, Debra Valle-Schales certify that this Water Quality Management Plan (WQMP) has been prepared under my responsible charge and as the engineer of record, I have read and understood the requirements of the Regional Board Order R8-2009-0030, Section XII-B, the 2003 and 2007 Drainage Area Management Plan (DAMP), the City of Cypress Local Implementation Plan (LIP), Section 13-23 of the City of Cypress Municipal Code, and prepared this WQMP in compliance with all requirements thereto.

Furthermore, I attest that the WQMP for the development includes, but is not limited to the following:

1) Prioritization of the use of Low Impact Development principles as follows:
   a. Preserves natural features;
   b. Minimizes runoff and reduces impervious surfaces;
   c. Utilizes infiltration of runoff as the method of pollutant treatment.
2) Incorporation of the applicable Routine Source and Structural Control BMPs as defined in the Drainage Area Management Plan (DAMP).
3) Using alternative treatment controls (in lieu of standard) that meet the requirements of section 7.6.5 of the DAMP, and are equally or more effective in pollutant reduction than comparable BMPs.

Additionally, this WQMP contains information that:

1) Describes the long-term operation and maintenance requirements for structural and Treatment Control BMPs.
2) Identifies the entity or employees that will be responsible for long-term operation, maintenance, repair and or replacement of the structural and Treatment Control BMPs, and the training that qualifies such entity or employees to operate and maintain the BMPs.
3) Describes the recordkeeping requirements and contains a copy of the forms to be used in conducting maintenance and inspection activities.
4) Describes the mechanism for funding the long-term operation and maintenance of all structural and Treatment Control BMPs.

ENGINEER:		REGISTERED PROFESSIONAL ENGINEER DEBRA VALLE SCHALES NO. 43101 CIVIL STATE OF CALIFORNIA
Name:	Debra Valle-Schales	
Title:	Project Manager	
Company:	Fuscoe Engineering, Inc.	
Email:	dschales@fuscoe.com	
Telephone:	949.474.1960	
Signature:	Debra V Schales	**Date:**

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APPENDICES

EXHIBITS & BMP DETAILS (INCLUDED IN SECTION VI)

- Vicinity Map
- Preliminary WQMP Exhibit
- Proprietary Biotreatment (BIO-7)
- Modular Wetland System Details
- StormTrap Details

EDUCATIONAL MATERIALS (INCLUDED IN APPENDIX C)

- The Ocean Begins at Your Front Door
- Homeowners Guide for Sustainable Water Use
- Household Tips
- Proper Disposal of Household Hazardous Waste
- Recycle at Your Local Used Oil Collection Center (North County)
- Responsible Pest Control
- Sewer Spill Reference Guide
- Tips for the Home Improvement Projects
- Tips for Landscaping and Gardening
- Tips for Pet Care
- Tips for Pool Maintenance
- Tips for Residential Pool, Landscape and Hardscape Drains
- Tips for the Food Service Industry
- Proper Maintenance Practices for Your Business
- DF-1 Drainage System Operation & Maintenance
- R-3 Automobile Parking

- R-4 Home & Garden Care Activities
- R-5 Disposal of Pet Waste
- R-6 Disposal of Green Waste
- R-7 Household Hazardous Waste
- R-8 Water Conservation
- SD-10 Site Design & Landscape Planning
- SD-11 Roof Runoff Controls
- SD-12 Efficient Irrigation
- SD-13 Storm Drain Signage
- SD-31 Maintenance Bays & Docs
- SD-32 Trash Storage Areas

SECTION I DISCRETIONARY PERMITS AND WATER QUALITY CONDITIONS

<table>
<tr><th colspan="4">PROJECT INFORMATION</th></tr>
<tr><td>Permit/Application No.:</td><td>Pending</td><td>Vesting Tract/Parcel Map No.:</td><td>VTTM 17830</td></tr>
<tr><td>Address of Project Site and APN:</td><td colspan="3">4921 Katella Avenue, Cypress CA 90720
PARCEL 1: PORTIONS OF 241-231-51 AND 241-231-54
PARCEL 2: 241-231-46, 241-231-52, 241-231-53, 241-231-55, 241-231-56, 241-231-16 AND PORTIONS OF 241-231-18, 241-231-23, 241-231-36, 241-231-51, 241-231-54 AND 241-231-57</td></tr>
<tr><th colspan="4">WATER QUALITY CONDITIONS</th></tr>
<tr><td>Discretionary Permit(s):</td><td colspan="3">Pending issuance by the City of Cypress.</td></tr>
<tr><td>Water Quality Conditions:</td><td colspan="3">Pending – to be provided in Final WQMP upon issuance by the City of Cypress.
Copies of the City of Cypress Standard Conditions of Approval for WQMPs are included in Appendix F.
<u>Standard Conditions:</u>
1. Prior to the submittal of any grading plan the applicant shall submit a Preliminary Project WQMP for review and approval to the Public Works Department that:
1.1. Utilizes Low Impact Development principles as follows: preserves natural features, minimizes runoff and reduces impervious surfaces; and utilizes infiltration of runoff as the preferred method of pollutant treatment. Infiltration Best Management Practices (BMPs) to be considered include the use of permeable materials such as pervious concrete and concrete pavers, infiltration trenches and planters and other infiltration BMPs as applicable.
1.2. Incorporates the applicable Routine Source and Structural Control BMPs as defined in the Drainage Area Management Plan (DAMP)
1.3. Maintains the hydrologic characteristics of the site by matching time of concentration, runoff, velocity, volume, and hydrograph for a 2-year storm event.
1.4. Reduces the potential in downstream erosion and avoids downstream impacts to physical structures, aquatic and riparian habitat.
1.5. Thoroughly describes the long-term operation and maintenance requirements for Structural and Treatment Control BMPs.</td></tr>
</table>

	1.6. Identifies the entity or employees that will be responsible for long-term operation, maintenance, repair and or replacement of the Structural and Treatment Control BMPs and the training that qualifies them to operate and maintain the BMPs. 1.7. Describes the mechanism for funding the long-term operation and maintenance of all Structural and Treatment Control BMPs. 1.8. A copy of the forms to be used in conducting maintenance and inspection activities. 1.9. Recordkeeping requirements (forms to be kept for 5 years). 1.10. A copy of the form to be submitted annually by the project owner to the Public Works Department that certifies that the project's Structural and Treatment BMPs are being inspected and maintained in accordance with the project's WQMP. 1.11. A certified copy of the Covenant and Agreement Regarding the O & M Plan to Fund and Maintain Water Quality BMPs, Consent to Inspect, and Indemnification form 2. Prior to the issuance of certificates of occupancy, the applicant shall demonstrate the following to the Public Works Department: 2.1. That all structural and treatment control BMPs described in the Project WQMP have been constructed and installed in conformance with the approved plans and specifications. 2.2. That applicant is prepared to implement all non-structural BMPs described in the Project WQMP. 2.3. That an adequate number of copies of the project's approved final Project WQMP are available for the future occupiers. 3. Prior to the issuance of certificates of occupancy or final signoff by the Public Works Department, the applicant shall demonstrate to the satisfaction of Public Works Director/City Engineer or his/her designee, that the preparer of the WQMP has reviewed the BMP maintenance requirements in Section 4.0 of the Model WQMP with the legally responsible person and that a copy of the WQMP has been provided to that person. A certification letter from the WQMP preparer may be used to satisfy this condition.
WATERSHED-BASED PLAN CONDITIONS	
Applicable conditions from watershed - based plans including WIHMPs and TMDLs:	No approved WIHMP. TMDLs have been established by the Los Angeles RWQCB for the Coyote Creek and larger San Gabriel River watersheds for heavy metals.

SECTION II PROJECT DESCRIPTION

II.1 PROJECT DESCRIPTION

The proposed Barton Place VTTM 17830 project site encompasses approximately 33 acres in the City of Cypress. The project site is bounded by the Los Alamitos Race Course to the north, Katella Avenue to the South, Enterprise Drive to the west, and a hotel, church and parking facility to the east. A Vicinity Map is included in Section VI.

Under existing conditions, the project site is vacant and was a portion of the Cypress Golf Course in the past. Adjacent land uses include equestrian uses to the north, a hotel, church and commercial development to the east, single family residential to the south, and a church to the west.

The table below summarizes the proposed project.

<table>
<tr><th colspan="5">DESCRIPTION OF PROPOSED PROJECT</th></tr>
<tr><td>WQMP Development Category:</td><td colspan="4">1. New development project that creates 10,000 square feet or more of impervious surface. This category includes commercial, industrial, residential housing subdivisions, mixed-use, and public projects on private or public property that falls under the planning and building authority or the Permittees.</td></tr>
<tr><td>Project Area (ft^2):</td><td colspan="4">Parcel 1 (Commercial): 219,482 ft^2 (5.04 acres)
Parcel 2 (Residential): 1,214,465 ft^2 (27.88 acres)</td></tr>
<tr><td># of Dwelling Units:</td><td colspan="4">244</td></tr>
<tr><td>SIC Code:</td><td colspan="4">5812 – Eating Places
Division G – Retail Trade</td></tr>
<tr><td>Planning Area / Community Name:</td><td colspan="4">Barton Place</td></tr>
<tr><td>Narrative Project Description:</td><td colspan="4">The proposed project includes the construction of 244 senior housing units with supporting streets, parking, sidewalks, and landscaping. A recreational area with pool & spa will be located in the northwestern portion of the residential development. Approximately 5 acres of the site will be developed for commercial uses, with commercial/retail and restaurant uses anticipated.</td></tr>
<tr><th>Project Area:</th><th>Pervious Area</th><th>Pervious Area Percentage</th><th>Impervious Area</th><th>Impervious Area Percentage</th></tr>
<tr><td>Pre-Project Conditions:</td><td>32.92 ac</td><td>100%</td><td>0 ac</td><td>0%</td></tr>
<tr><td>Post-Project Conditions:</td><td>4.94 ac</td><td>15%</td><td>27.98 ac</td><td>85%</td></tr>
</table>

DESCRIPTION OF PROPOSED PROJECT	
Drainage Patterns/ Connections:	On site drainage follows the topography of the land, flowing from the northeast corner to the southwest corner. Currently flow is overland and flows to a small depression in the southwest corner of the site. Within this depression is a pump which pumped storm water to an existing storm drain line in Katella Avenue. The existing storm drain line within Katella Ave is shallow and the storm flow can't enter the line without pumping. The proposed development will maintain the historic drainage pattern and drain from the northeast to the southwest. Flows will be directed to an on-site private storm drain / detention system. Catch basins will be located at local low points within the site to catch subarea flows and discharge directly to the storm drain system. The storm drain system flows south to a proposed detention chamber located in the proposed commercial/retail site near Katella Ave. The detention system will be sized to accommodate flows for the 100-year storm event to limit peak flow discharges to the undersized storm drain line within Katella Ave. The detention chamber will discharge via gravity to the existing storm drain line located within Katella Avenue. Prior to runoff discharging into the detention system, low-flow and first-flush runoff from the site will be diverted to Modular Wetland Units for filtration and biotreatment. Treated runoff from the units will then discharge back into the storm drain lines and into the detention system. Refer to Section IV.3.4 for further details on the proposed Modular Wetland Units.

PROJECT FEATURES							
Building Summary:	Plan	Bldg. Area	Stories	Bed/ Bath	Bldg. Coverage	Private Outdoor	Count
	Single-Family Detached						
	1	1,790 SF	1	2 / 2.5	2,398 SF	974 SF	30
	2	1,810 SF	1	3 / 2.5	2,404 SF	974 SF	29
	3	1,900 SF	1	3 / 2.5	2,538 SF	1,138 SF	19
	4	2,605 SF	2	3 / 3.5	2,446 SF	1,220 SF	39
	5	2,450 SF	2	3 / 3.5	2,538 SF	1,138 SF	20
	Total						**137**
	Paired Homes						
	1	1,532 SF	1	2 / 2	2,014 SF	533 SF	31
	2	1,603 SF	1	2 / 2.5	2,090 SF	463 SF	30
	3	1,941 SF	2	2 / 3	2,052 SF	780 SF	24
	4	2,080 SF	2	2 / 3.5	2,136 SF	755 SF	22
	Total						**107**
	Amenity Building						
	Total	**5,216**			**6,530 SF**		
	Commercial						
	Total				**47,710 SF**		

PROJECT FEATURES	
Amenities:	The residential portion of the site will include a recreation area with pool, spa, fireplace, and private and common area landscaping. A fitness center, game room, and club room are also proposed.
Landscaped Areas:	Landscaping will be provided throughout the site within private and common areas, surrounding the proposed buildings, adjacent to sidewalks, as planters within the parking lots, within the recreation area, and along the perimeter of the site. Approximately 15-20% of the site will consist of landscaping. Further details will be provided in the Final WQMP.
Parking Facilities:	Parking will be provided within garages of the residences, adjacent to portions of the private streets, and within surface lots in the commercial/retail portions of the project site. Upon completion of the project, a total of 488 parking spaces will be provided for residences, 78 parallel spaces for guests, and 278 spaces for commercial/retail parking.
Other Project Features:	For the residential portion of the project, trash will be managed by each individual homeowner/tenant within garages. No trash enclosures are proposed within the residential portion of the project. The commercial portion of the project will include three trash enclosures located throughout the parking lot. The trash enclosures will be walled on 3 sides with an access gate comprising the remaining side, and covered to preclude precipitation and runoff consistent with local design standards. A loading dock will be located on the back of the proposed commercial building in the southeastern corner of the site. Restaurant uses are anticipated as part of the commercial development. All food preparation will be handled indoors. A grease interceptor will be located in the sanitary sewer system in accordance with local requirements.
Outdoor Activities:	Outdoor activities are anticipated with passive uses in the common landscaped areas surrounding the proposed buildings. All vehicular parking will be located in the residence garages and in designated surface parking spaces. No outdoor storage of materials is anticipated. All other outdoor areas will be used for walkways, common areas and landscaping, and other residential and commercial purposes.
Materials Stored:	Materials used and stored on site will include those associated with mixed use commercial and residential land uses, such as normal cleaning supplies, pool supplies, maintenance materials, retail inventory and typical office supplies. No outdoor storage of materials is anticipated (materials will be stored indoors).

PROJECT FEATURES	
Wastes Generated:	The project is not anticipated to generate any wastes other than landscape clippings, typical trash, debris and refuse from the residents and tenants. Outdoor trash receptacles will be provided at the amenity center for the residents and tenants to dispose of their refuse in a proper manner, and property maintenance will provide trash and waste material removal to maintain a trash-free property. For the residential portion of the project, trash will be managed by each individual resident within garages. No trash enclosures are proposed within the residential portion of the project. All wastes shall be collected and properly disposed of off-site. Pool water will drain to sewer system, and will not discharge to the storm drain system.

II.2 POTENTIAL STORM WATER POLLUTANTS

The table below, derived from Table 2 of the Countywide Model WQMP Technical Guidance Document (May 2011), summarizes the categories of land use or project features of concern and the general pollutant categories associated with them.

ANTICIPATED & POTENTIAL POLLUTANTS GENERATED BY LAND USE TYPE								
Priority Project Categories and/or Project Features	**General Pollutant Categories**							
	Suspended Solid/ Sediments	**Nutrients**	**Heavy Metals**	**Pathogens (Bacteria/ Virus)**	**Pesticides**	**Oil & Grease**	**Toxic Organic Compounds**	**Trash & Debris**
Detached Residential Development	E	E	N	E	E	E	N	E
Attached Residential Development	E	E	N	E	E	E(2)	N	E
Commercial/Industrial Development	E(1)	E(1)	E(5)	E(3)	E(1)	E	E	E
Automotive Repair Shops	N	N	E	N	N	E	E	E
Restaurants	E(1)(2)	E(1)	E(2)	E	E(1)	E	N	E
Hillside Development >5,000 ft^2	E	E	N	E	E	E	N	E
Parking Lots	E	E(1)	E	E(4)	E(1)	E	E	E
Streets, Highways, & Freeways	E	E(1)	E	E(4)	E(1)	E	E	E
Retail Gasoline Outlets	N	N	E	N	N	E	E	E

ANTICIPATED & POTENTIAL POLLUTANTS GENERATED BY LAND USE TYPE								
Priority Project Categories and/or Project Features	General Pollutant Categories							
	Suspended Solid/ Sediments	Nutrients	Heavy Metals	Pathogens (Bacteria/ Virus)	Pesticides	Oil & Grease	Toxic Organic Compounds	Trash & Debris

Notes:
E = expected to be of concern N = not expected to be of concern
(1) Expected pollutant if landscaping exists on-site, otherwise not expected.
(2) Expected pollutant if the project includes uncovered parking areas, otherwise not expected.
(3) Expected pollutant if land use involves food or animal waste products, otherwise not expected.
(4) Bacterial indicators are routinely detected in pavement runoff.
(5) Expected if outdoor storage or metal roofs, otherwise not expected.
Source: County of Orange. (2011, May 19). Technical Guidance Document for the Preparation of Conceptual/ Preliminary and/or Project Water Quality Management Plans (WQMPs). Table 2.1.

Priority Project Categories and/or Features:

- Detached Residential Development
- Commercial/Industrial Development
- Parking Lots

POLLUTANTS OF CONCERN		
Pollutant	**E = Expected to be of concern N =Not Expected to be of concern**	**Additional Information and Comments**
Suspended Solid/ Sediment	E	
Nutrients	E	303(d) listed impairment for downstream receiving waters.
Heavy Metals	E	303(d) listed impairment for downstream receiving waters; TMDL established for San Gabriel River
Pathogens (Bacteria/Virus)	E	303(d) listed impairment for downstream receiving waters.
Pesticides	E	303(d) listed impairment for downstream receiving waters.
Oil & Grease	E	
Toxic Organic Compounds	E	303(d) listed impairment for downstream receiving waters.
Trash & Debris	E	

II.3 HYDROLOGIC CONDITIONS OF CONCERN

The purpose of this section is to identify any hydrologic conditions of concern (HCOC) with respect to downstream flooding, erosion potential of natural channels downstream, impacts of increased flows on natural habitat, etc. As specified in Section 2.3.3 of the 2011 Model WQMP, projects must identify and mitigate any HCOCs. A HCOC is a combination of upland hydrologic conditions and stream biological and physical conditions that presents a condition of concern for physical and/or biological degradation of streams.

In the North Orange County permit area, HCOCs are considered to exist if any streams located downstream from the project are determined to be potentially susceptible to hydromodification impacts and either of the following conditions exists:

- Post-development runoff volume for the 2-yr, 24-hr storm exceeds the pre-development runoff volume for the 2-yr, 24-hr storm by more than 5 percent

or

- Time of concentration (Tc) of post-development runoff for the 2-yr, 24-hr storm event exceeds the time of concentration of the pre-development condition for the 2-yr, 24-hr storm event by more than 5 percent.

If these conditions do not exist or streams are not potentially susceptible to hydromodification impacts, an HCOC does not exist and hydromodification does not need to be considered further. In the North Orange County permit area, downstream channels are considered not susceptible to hydromodification, and therefore do not have the potential for a HCOC, if all downstream conveyance channels that will receive runoff from the project are engineered, hardened, and regularly maintained to ensure design flow capacity, and no sensitive habitat areas will be affected.

Is the proposed project potentially susceptible to hydromodification impacts?

☐ **Yes** ☒ **No (show map)**

Per TGD Figure XVI-3a, the project site is not located in an area susceptible to hydromodification. Therefore, the Project does not have the potential for a HCOC. A copy of TGD Figure XVI-3a is included in Appendix A.

II.4 POST DEVELOPMENT DRAINAGE CHARACTERISTICS

The proposed development will maintain the historic drainage pattern and drain from the northeast to the southwest. Flows will be directed to an on-site private storm drain / detention system. Catch basins will be located at local low points within the site to catch subarea flows and discharge directly to the storm drain system. Within the residential portion of the project, the proposed storm drains flow generally south to three main locations at the boundary between the residential and commercial portions of the project. At these locations, diversion structures within the three storm drain lines divert low-flow and first-flush runoff to Modular Wetland Units for filtration and biotreatment. Treated flows from the units then flow back into the storm drain systems and into the underground detention system. High flows beyond the first-flush bypass the Modular Wetland Units, and flow into the underground detention system located within the commercial/retail portion of the site. Within the commercial/retail portion of the site, runoff will flow via sheet flow and via ribbon gutters to Modular Wetland Systems placed at the low points throughout the parking lot. Low-flows and first-flush runoff will be treated by the Modular Wetland Systems, and treated flows will drain directly to the underground detention system below the parking lot. Higher flows will bypass the units and drain directly to the detention system.

Due to the lack of capacity of the existing storm drain facility within Katella Ave, project flows must be detained on-site before entering the public storm drain system off-site. The proposed subterranean detention system will restrict the rate of discharge allowed from the project site. The proposed design of the system will regulate all peak flow discharges to no more than 10 cfs into the Katella Ave. The proposed two year and 100-year peak flow discharges are 29 cfs and 91 cfs respectively thereby indicating significant discharge reductions. The proposed subterranean detention chamber will be located in the proposed commercial/retail site near Katella Avenue.

PEAK FLOW DISCHARGE SUMMARY				
Peak Flow Event	**Peak Flow**	**Max Discharge from Detention System**	**Peak Flow Reduction**	**Detention System Capacity Requirement(1)**
2-year	29 cfs	10 cfs	19 cfs	6 ac-ft
100-year	91 cfs	10 cfs	81 cfs	

1. The detention system is sized for the 100-year event with an allowable draw down rate of 10 cfs.

During final design, more advanced calculations including routing and draw down factors will be incorporated to determine the final size and detention volume requirements.

II.5 PROPERTY OWNERSHIP/MANAGEMENT

PROPERTY OWNERSHIP/MANAGEMENT	
Public Streets:	Not-a-part
Private Streets:	C33, LLC; HOA
Landscaped Areas:	C33, LLC; HOA (residential); POA (commercial)
Open Space:	Not-a-part
Parks:	Not-a-part
Buildings:	C33, LLC; HOA (residential); POA (commercial)
Structural BMPs:	C33, LLC; HOA (residential); POA (commercial)

Both a Homeowners Association (HOA) and Property Owners Association (POA) will be formed upon project completion. The HOA will be responsible for inspecting and maintaining all BMPs prescribed for the residential portion of the project, and the POA will be responsible for inspecting and maintaining all BMPs prescribed for the commercial/retail portion of the project. Until a HOA and POA is formally established, C33, LLC shall assume all BMP maintenance and inspection responsibilities for the proposed project. Inspection and maintenance responsibilities are outlined in Section V of this report.

SECTION III SITE DESCRIPTION

III.1 PHYSICAL SETTING

Planning Area/ Community Name:	Barton Place / VTTM 17830
Address:	4921 Katella Avenue, Cypress CA 90720
Project Area Description:	Northeasterly corner of Katella Ave and Enterprise Drive in the City of Cypress.
Land Use:	Former Golf Course Cypress Business & Professional Center Specific Plan
Zoning:	PBP-25A Planned Business Park
Acreage:	Parcel 1 (Commercial): 219,482 ft^2 (5.04 acres) Parcel 2 (Residential): 1,214,465 ft^2 (27.88 acres)
Predominant Soil Type:	C
Impervious Conditions:	Existing Impervious: 0% (100% Pervious) Proposed Impervious: 85% (15% Pervious)

III.2 SITE CHARACTERISTICS

Precipitation Zone:	0.85 inches per TGD Figure XVI-1 (see Appendix A)
Topography:	The site is generally flat and gently slopes downward from a high area at an average elevation of 33-feet in northeast, southwesterly to an existing low point in the southwest corner, at an average elevation of 22-feet. The site is generally clear with scattered weeds throughout. The existing hotel site, adjacent to the southeast corner of the project, is approximately 3 to 4-feet higher than the average project elevation.
Existing Drainage Patterns/ Connections:	On site drainage follows the topography of the land, flowing from the northeast corner to the southwest corner. Currently flow is overland and flows to a small depression in the southwest corner of the site. Within this depression is a pump which pumped storm water to an existing storm drain line in Katella Avenue. The existing storm drain line within Katella Ave is shallow and the storm flow can't enter the line without pumping.

Proposed Drainage Patterns/ Connections:	The proposed development will maintain the historic drainage pattern and drain from the northeast to the southwest. Flows will be directed to an on-site private storm drain / detention system. Catch basins will be located at local low points within the site to catch subarea flows. These catch basins and local storm drain lines will be designed during final precise grading design for the project. Catch basin laterals will discharge directly to the storm drain system. The storm drain system flows to a proposed detention chamber for the entire project located in the proposed commercial site on the southerly side of the site adjacent to Katella Ave. The detention chamber will discharge via gravity to the existing storm drain line located within Katella Avenue. Further details on the detention system are included in Section II.4. Prior to runoff discharging into the detention system, low-flow and first-flush runoff from the site will be diverted to Modular Wetland Units for filtration and biotreatment. Treated runoff from the units will then discharge back into the storm drain lines and into the detention system. Refer to Section IV.3.4 for further details on the proposed Modular Wetland Units.
Soil Type, Geology, and Infiltration Properties:	The project site is generally underlain by alluvial deposits consisting of interlayered silty sand, sand, sandy silt, clayey silt, clay and silty clay.
Hydrogeologic (Groundwater) Conditions:	Within the vicinity of the site, static groundwater levels are generally observed at depths ranging from approximately 8 to 12 feet below ground surface. Historical high groundwater is approximately 10 feet below ground surface.
Geotechnical Conditions (relevant to infiltration):	A total of 8 percolation tests were conducted on the project site in accordance with the procedures outlined in Appendix VII of the Technical Guidance Document (TGD). The locations of the test were selected based on locations where infiltration BMPs could potentially be located based on grading and drainage patterns (e.g., low-points and storm water collection points). The infiltration rates measured ranged from 0.0 to 0.3 inches per hour for tests PT-1 and PT-6 and from 0.09 to 0.57 inches per hour for tests PT-7 and PT-8 (no safety factors applied). None of the infiltration tests met the minimum criteria for infiltration. Infiltration test results are included in Appendix F.
Off-Site Drainage:	None.
Utility and Infrastructure Information:	Dry and wet utilities will be incorporated into the proposed project and will tie into existing facilities associated with the existing surrounding developments.

III.3 WATERSHED DESCRIPTION

Receiving Waters:	Los Alamitos Channel, Coyote Creek & San Gabriel River
303(d) Listed Impairments:	*Per the 2010 USEPA Approved 303(d) List of Water Quality Limited Segments (see Appendix G for detailed list).* ▪ Los Alamitos Channel (Region 8): None ▪ Coyote Creek (Region 4): Ammonia, Dissolved Copper, Diazinon, Indicator Bacteria, Lead, Toxicity, pH ▪ San Gabriel River Reach 1 (Region 4): Coliform Bacteria, pH ▪ San Gabriel River Estuary (Region 4): Copper, Dioxin, Nickel, Dissolved Oxygen ▪ San Pedro Bay Near/Offshore Zones (Region 4): Chlordane, DDT (tissue & sediment), PCBs, Sediment Toxicity
Applicable TMDLs:	*San Gabriel River & Coyote Creek Watersheds (Region 4):* ▪ Metals
Pollutants of Concern for the Project:	*Per Section II.2:* ▪ Suspended Solids/Sediments ▪ Nutrients ▪ Heavy Metals ▪ Pathogens/Bacteria/Virus ▪ Pesticides ▪ Oil & Grease ▪ Toxic Organic Compounds ▪ Trash & Debris
Hydrologic Conditions of Concern (HCOCs):	Not Applicable. Refer to Section III.3 for details.
Environmentally Sensitive and Special Biological Significant Areas:	There are no Environmentally Sensitive Areas (ESAs) or Areas of Special Biological Significance (ASBS) within the project site or within the project's vicinity.
Existing Water Quality Conditions:	None.

SECTION IV BEST MANAGEMENT PRACTICES (BMPs)

IV.1 PROJECT PERFORMANCE CRITERIA

Is there an approved WIHMP or equivalent for the project area that includes more stringent LID feasibility criteria or if there are opportunities identified for implementing LID on regional or sub-regional basis?

☐ Yes ☒ No

PROJECT PERFORMANCE CRITERIA	
Hydromodification Control Performance Criteria: **(Model WQMP Section 7.II-2.4.2.2)**	If a hydrologic condition of concern (HCOC) exists, priority projects shall implement onsite or regional hydromodification controls such that: ▪ Post-development runoff volume for the two-year frequency storm does not exceed that of the predevelopment condition by more than five percent, and ▪ Time of concentration of post-development runoff for the two-year storm event is not less than that for the predevelopment condition by more than five percent. Where the Project WQMP documents that excess runoff volume from the two-year runoff event cannot feasibly be retained and where in-stream controls cannot be used to otherwise mitigate HCOCs, the project shall implement on-site or regional hydromodification controls to: ▪ Retain the excess volume from the two-year runoff event to the MEP, and ▪ Implement on-site or regional hydromodification controls such that the post-development runoff two-year peak flow rate is no greater than 110 percent of the predevelopment runoff two-year peak flow rate.
LID Performance Criteria: **(Model WQMP Section 7.II-2.4.3)**	Infiltrate, harvest and use, evapotranspire, or biotreat/biofilter, the 85th percentile, 24-hour storm event (Design Capture Volume). LID BMPs must be designed to retain, on-site, (infiltrate, harvest and use, or evapotranspire) storm water runoff up to 80 percent average annual capture efficiency
Treatment Control BMP Performance Criteria: **(Model WQMP Section 7.II-3.2.2)**	If it is not feasible to meet LID performance criteria through retention and/or biotreatment provided on-site or at a sub-regional/regional scale, then treatment control BMPs shall be provided on-site or offsite prior to discharge to waters of the US. Sizing of treatment control BMP(s) shall be based on either the unmet volume after claiming applicable water quality credits, if appropriate.

PROJECT PERFORMANCE CRITERIA	
LID Design Storm Capture Volume:	Total Site = 32.92 acres (85% impervious) Simple Method DCV = 80,031.1 ft^3 *Refer to Section IV.2.2 for specific Drainage Manage Area (DMA) breakdown and Appendix A for detailed calculations (Worksheet B).*

IV.2 SITE DESIGN AND DRAINAGE PLAN

The following section describes the site design BMPs used in this project and the methods used to incorporate them. Careful consideration of site design is a critical first step in storm water pollution prevention from new developments and redevelopments.

IV.2.1 Site Design BMPs

Minimize Impervious Area

Impervious surfaces have been minimized by incorporating landscaped areas throughout the site surrounding the proposed building. Landscaping will be provided throughout the site in parkways and within the common areas, within the parking lots, adjacent to sidewalks as well as around the perimeter of the buildings.

Maximize Natural Infiltration Capacity

Infiltration of runoff is considered infeasible due to low infiltration rates. Refer to Section IV.3.2 and Appendix F for further details.

Preserve Existing Drainage Patterns and Time of Concentration

Runoff from the site will continue to flow similar to existing conditions. Time of concentration for peak flows is managed by the proposed underground detention system located in the southern portion of the site.

Disconnect Impervious Areas

Landscaping will be provided adjacent to sidewalks and around perimeters of the proposed buildings. Low-flows and first-flush runoff will drain to bioretention units for water quality treatment via bio-filtration. Following treatment, flows will enter a detention system for flow control to the downstream storm drain system.

Protect Existing Vegetation and Sensitive Areas, and Re-vegetate Disturbed Areas

There are no existing jurisdictional habitat or sensitive areas to preserve on the project site. All disturbed areas will either be paved or landscaped.

Xeriscape Landscaping

Xeriscape landscaping is not proposed for the project. However, native and/or drought tolerant landscaping will be incorporated into the site design consistent with City guidelines.

IV.2.2 Drainage Management Areas

In accordance with the MS4 permit and the 2011 Model WQMP, the project site has been divided into Drainage Management Areas (DMAs) to be utilized for defining drainage areas and sizing LID and other treatment control BMPs. DMAs have been delineated based on the proposed site grading patterns, drainage patterns, storm drain and catch basin locations.

The design capture volumes (DCV) and treatment flow rates (Q_{Design}) for each DMA are summarized in the table below. These have been derived utilizing the "Simple Method" in accordance with the TGD Section III.1.1. Actual BMP sizing requirements, including 80 percent capture design volumes, flow rates, depths, and other design details for the specific BMPs proposed are provided in Section IV.3.4 below. Locations of DMAs and associated LID and treatment BMPs are identified on the exhibits in Section VI. Additional calculations and TGD Worksheets are provided in Appendix A.

DRAINAGE MANAGEMENT AREAS (DMAs)								
DMA/ Drainage Area ID(1)	BMP	Tributary Drainage Area (ac)	% Imp.(2)	Design Storm Depth(3) (in)	2-Year Tc (min)	Rainfall Intensity(4) (in/hr)	Simple Method DCV(5) (ft^3)	Q_{Design} (6) (cfs)
A	MWS #1-3	8.26	85%	0.85	15	0.21	20,083.1	1.386
B	MWS #4-5	3.46	85%	0.85	11.4	0.225	8,412.6	0.692
C	MWS #6-11	15.91	85%	0.85	15.8	0.21	38,683.2	2.656
D1	MWS #12	0.52	90%	0.85	7.5	0.24	1,323.7	0.115
D2	MWS #13	0.45	90%	0.85	6.7	0.25	1,145.5	0.115
D3	MWS #14	0.68	90%	0.85	6.8	0.25	1,731.0	0.144
D4	MWS #15	1.61	90%	0.85	8.5	0.24	4,098.3	0.346
D5	MWS #16	0.92	90%	0.85	7.1	0.24	2,341.9	0.175
F4	Landscape Infiltration	0.17	36%	0.85	6.7	0.25	220.3	0.018
F5	Landscape Infiltration	0.17	36%	0.85	6.7	0.25	220.3	0.018
Site Perimeter	Landscaping (Self-treating)	0.77	15%	0.85	--	--	--	--
TOTAL SITE		**32.92**	**85%**	**0.85**	**N/A**	**N/A**	**78,171.7**	**N/A**

Notes:
1. Refer to exhibits in Section VI for locations of each DMA.
2. Conservative estimate of landscaping used for P-WQMP; under Final WQMP, more precise calculations will be utilized.
3. Per Figure XVI-1 of the Technical Guidance Document, dated May 19, 2011. See also Appendix A.
4. Per Figure III.4 of the Technical Guidance Document, dated May 19, 2011. See also Appendix A.
5. Per Section III.1.1 of the Technical Guidance Document.
6. Per Section III.3.3 and Worksheet D of the Technical Guidance Document.

IV.3 LID BMP SELECTION AND PROJECT CONFORMANCE ANALYSIS

Low Impact Development (LID) BMPs are required in addition to site design measures and source controls to reduce pollutants in storm water discharges. LID BMPs are engineered facilities that are designed to retain or biotreat runoff on the project site. The current MS4 Storm Water Permit (Order R8-2009-0030) requires the evaluation and use of LID features using the following hierarchy of treatment: infiltration, evapotranspiration, harvest/reuse, and biotreatment. The following sections summarize the LID BMPs proposed for the project in accordance with the permit hierarchy and performance criteria outlined in Section IV.1.

IV.3.1 Hydrologic Source Controls (HSCs)

Hydrologic source controls (HSCs) can be considered to be a hybrid between site design practices and LID BMPs. HSCs are distinguished from site design BMPs in that they do not reduce the tributary area or reduce the imperviousness of a drainage area; rather they reduce the runoff volume that would result from a drainage area with a given imperviousness compared to what would result if HSCs were not used.

HYDROLOGIC SOURCE CONTROLS		
ID	Name	Included?
HSC-1	Localized on-lot infiltration	☐
HSC-2	Impervious area dispersion (e.g. roof top disconnection)	☐
HSC-3	Street trees (canopy interception)	☐
HSC-4	Residential rain barrels (not actively managed)	☐
HSC-5	Green roofs/Brown roofs	☐
HSC-6	Blue roofs	☐
HSC-7	Impervious area reduction (e.g. permeable pavers, site design)	☐

The project will utilize self-treating landscaping areas within the southern and western portions of the site. Within these areas, small portions of hardscape areas (sidewalks) will drain to adjacent landscaping. Based on the limited hardscape (<5%), there is sufficient landscaping to meet the self-treating criteria. Areas, calculations and associated worksheets are included in Appendix A.

IV.3.2 Infiltration BMPs

Infiltration BMPs are LID BMPs that capture, store and infiltrate storm water runoff. These BMPs are engineered to store a specified volume of water and have no design surface discharge (underdrain or outlet structure) until this volume is exceeded. Examples of infiltration BMPs include infiltration trenches, bioretention without underdrains, drywells, permeable pavement, and underground infiltration galleries.

INFILTRATION		
ID	**Name**	**Included?**
INF-3 INF-4	Bioretention Without Underdrains	☐
	Rain Gardens	☐
	Porous Landscaping	☐
	Infiltration Planters	☐
	Retention Swales	☐
INF-2	Infiltration Trenches	☐
INF-1	Infiltration Basins	☐
INF-5	Drywells	☐
INF-7	Subsurface Infiltration Galleries	☐
--	French Drains	☐
INF-6	Permeable Asphalt	☐
	Permeable Concrete	☐
	Permeable Concrete Pavers	☐
	Other:	☐

A total of 8 percolation tests were conducted on the project site in accordance with the procedures outlined in Appendix VII of the Technical Guidance Document (TGD). The locations of the test were selected based on locations where infiltration BMPs could potentially be located based on grading and drainage patterns (e.g., low-points and storm water collection points). The infiltration rates measured ranged from 0.0 to 0.3 inches per hour for tests PT-1 and PT-6 and from 0.09 to 0.57 inches per hour for tests PT-7 and PT-8 (no safety factors applied). After applying the minimum safety factor of 2, all results fall below the minimum requirement for feasibly of 0.3 inches per hour. Therefore, direct or concentrated infiltration of runoff is not considered feasible for the project. Infiltration test results are included in Appendix F. However, infiltration within the landscaping will be utilized for DMA Areas E1 and E2 based on the limited hardscape and large area of landscaping available to infiltrate the DCV within the shallow depressed landscaping area (2" ponding depth only).

IV.3.3 Evapotranspiration & Rainwater Harvesting BMPs

Evapotranspiration BMPs are a class of retention BMPs that discharges stored volume predominately to ET, though some infiltration may occur. ET includes both evaporation and transpiration, and ET BMPs may incorporate one or more of these processes. BMPs must be designed to achieve the maximum feasible ET, where required to demonstrate that the maximum amount of water has been retained on-site. Since ET is not the sole process in these BMPs, specific design and sizing criteria have not been developed for ET-based BMPs.

EVAPOTRANSPIRATION		
ID	Name	Included?
--	HSCs, *see Section IV.3.1*	☐
--	Surface-based infiltration BMPs	☐
--	Biotreatment BMPs, *see Section VI.3.4*	☒
	Other:	☐

Bioretention BMPs are proposed which utilize evapotranspiration as physical process for runoff volume reduction. Bioretention BMPs are described further in Section IV.3.4.

Harvest and use (aka. Rainwater Harvesting) BMPs are LID BMPs that capture and store storm water runoff for later use. These BMPs are engineered to store a specified volume of water and have no design surface discharge until this volume is exceeded. Harvest and use BMPs include both above-ground and below-ground cisterns. Examples of uses for harvested water include irrigation, toilet and urinal flushing, vehicle washing, evaporative cooling, industrial processes and other non-potable uses.

HARVEST & REUSE / RAINWATER HARVESTING		
ID	Name	Included?
HU-1	Above-ground cisterns and basins	☐
HU-2	Underground detention	☐
--	Other:	☐

In order to quantify harvested water demand for the common areas of the project, the Modified Estimated Applied Water Use (EAWU) method was used, consistent with Appendix X of the Model WQMP's Technical Guidance Document (TGD), dated May 19, 2011.

The Modified EAWU method is modified from the OC Irrigation Code (County Ordinance No. 09-010) to account for the wet season demand and storm events (assuming that no irrigation would be applied for approximately 30% of the days in the wet season).

The equation used to calculate the Modified EAWU is:

$$Modified\ EAWU = \frac{(ETo_{wet} \times K_L \times LA \times 0.015)}{IE}$$

Where:

- $Modified\ EAWU$ = estimated daily average water use during wet season
- ETo_{wet} = average reference ET from November through April (inches per month) per Table X.2 of the TGD
- K_L = landscape coefficient (Table X.4 of the TGD)
- LA = landscape area irrigated with harvested water (square feet)
- IE = irrigation efficiency (assumed at 90%)

Note: In the equation, the coefficient (0.015) accounts for unit conversions and shut down of irrigation during and for three days following a significant precipitation event.

For a system to be considered "feasible", the system must be designed with a storage volume equal to the DCV from the tributary area and achieve more than 40% capture. The system must also be able to drawdown in 30 days to meet the 40% capture value. In addition, Table X.6 of the Technical Guidance Document sets forth the demand thresholds for minimum partial capture.

TABLE X.6: HARVESTED WATER DEMAND THRESHOLDS FOR MINIMUM PARTIAL CAPTURE	
Design Capture Storm Depth, inches	**Wet Season Demand Required for Minimum Partial Capture, gpd per impervious acre**
0.60	490
0.65	530
0.70	570
0.75	610

TABLE X.6: HARVESTED WATER DEMAND THRESHOLDS FOR MINIMUM PARTIAL CAPTURE	
Design Capture Storm Depth, inches	Wet Season Demand Required for Minimum Partial Capture, gpd per impervious acre
0.80	650
0.85	690
0.90	730
0.95	770
1.00	810

The following table summarizes the estimated applied water use for the common area landscaping of the project. A landscape factor for high-water use landscaping was employed to assume the maximum water demand for the project site. Detailed calculations are provided in Appendix A.

ESTIMATED APPLIED WATER USE (EAWU) FOR COMMON AREA LANDSCAPING									
Landscape Type	Total Area (ac)	% Imp.	Impervious Tributary (ac)	Irrigated LS Area (sf)	ETo_{Wet} (1) (in/mo)	K_L (2)	Modified EAWU (gpd)	Modified EAWU per impervious acre (gpd/ac)	Minimum Capture Threshold (3) (gpd/ac)
Turf	32.92	85%	27.98	4.94	2.93	0.7	7,351.9	262.8	690
Design Capture Volume (gal)				598,633	Drawdown (days)				81.4

Notes:
1 Per Table X.2 for Santa Ana Region (similar climate type), Model WQMP Technical Guidance Document, dated May 19, 2011.
2 Per Table X.4 of the Model WQMP Technical Guidance Document, dated May 19, 2011.
3 Per Table X.6 of Model WQMP Technical Guidance Document, dated May 19, 2011.

As shown above, the project site does not have sufficient water demand during the wet season to support harvest and reuse. The project does not meet the minimum capture threshold of 610 gallons per day/acre with its Modified EAWU or estimated daily average water usage during the wet season. Therefore the DCV will not be fully utilized and emptied for the next storm event. Drawdown of the DCV is anticipated to take approximately 81 days by the landscape's water demand usage, which is greater than the maximum drawdown time of 30 days. Therefore, harvest and use is considered infeasible.

In addition, indoor toilet demand (TUTIA – Toilet Users to Impervious Area) was also briefly evaluated was determined infeasible for several reasons. Due to the nature of product type including single family detached and small cluster units spread out over 28 acres, the opportunity for one large collection, treatment and distribution system of storm water into individual homes is not feasible or practicable. This can be an option for high density developments like multi-story apartments or mixed use but is less feasible for single family residential. In addition, indoor reuse of storm water requires compliance with Title 22 requirements which requires specialized treatment well beyond storm water requirements. Therefore, storm water capture for reuse within the single family residential units is considered infeasible.

IV.3.4 Biotreatment BMPs

Biotreatment BMPs are a broad class of LID BMPs that reduce storm water volume to the maximum extent practicable, treat storm water using a suite of treatment mechanisms characteristic of biologically active systems, and discharge water to the downstream storm drain system or directly to receiving waters. Treatment mechanisms include media filtration (though biologically-active media), vegetative filtration (straining, sedimentation, interception, and stabilization of particles resulting from shallow flow through vegetation), general sorption processes (i.e., absorption, adsorption, ion-exchange, precipitation, surface complexation), biologically-mediated transformations, and other processes to address both suspended and dissolved constituents. Examples of biotreatment BMPs include bioretention with underdrains, vegetated swales, constructed wetlands, and proprietary biotreatment systems.

BIOTREATMENT		
ID	**Name**	**Included?**
BIO-1	Bioretention with underdrains	☐
	Storm Water planter boxes with underdrains	☐
	Rain gardens with underdrains	☐
BIO-5	Constructed wetlands	☐
BIO-2	Vegetated swales	☐
BIO-3	Vegetated filter strips	☐
BIO-7	Proprietary vegetated biotreatment systems	☒
BIO-4	Wet extended detention basin	☐
BIO-6	Dry extended detention basins	☐
--	Other:	☐

Since both infiltration and harvest and reuse are considered infeasible, biotreatment BMPs will be utilized on-site for water quality treatment. The project will implement a series of proprietary biotreatment systems for water quality treatment to treat all pollutants of concern to a medium to high level of effectiveness for low-flow and first-flush runoff from the site. The systems will include the Modular Wetlands Systems developed by Bio Clean Environmental Services, Inc. There are several advantages of the Modular Wetland System over traditional bioretention planters including the following reasons:

- Modular Wetlands are the only proprietary biotreatment device approved through the Washington State University TAPE (Technology Assessment Protocol – Ecology) program for basic storm water treatment and enhanced treatment including sediment, nutrients and heavy metals (all pollutants of concern for the project). TAPE approval is based on a series of independent field studies using strict sampling criteria to validate vendor's claims. TAPE approval is considered one of the most stringent and most reliable in the Country.
- Modular Wetlands have a pre-treatment chamber that is specifically designed to capture fine sediments and particulates through a series of BioMediaGREEN sponges which prohibit the fines and particulates from entering the bioretention chamber and accelerating potential clogging of the bioretention soil. The City of Huntington Beach has installed a Modular Wetland for a residential neighborhood and has monitored the maintenance and functionality of the system for several years. Contact: Mark Birchfield, City of Huntington Beach (714-375-5041; MBirchfield@surfcity-hb.org).
- Modular Wetland systems are specifically designed for higher treatment capacities in a smaller footprint which reduce the potential for nutrient and copper leaching under more stagnant conditions (a common occurrence with planters that are left unmaintained).

Modular Wetlands by Modular Wetlands Systems, Inc. are proprietary biotreatment systems that utilize multi-stage treatment processes including screening media filtration, settling, and biofiltration. The pre-treatment chamber contains the first three stages of treatment, and includes a catch basin inlet filter to capture trash, debris, gross solids and sediments, a settling chamber for separating out larger solids, and a media filter cartridge for capturing fine TSS, metals, nutrients, and bacteria. Runoff then flows through the wetland chamber where treatment is achieved through a variety of physical, chemical, and biological processes. As storm water passes down through the planting soil, pollutants are filtered, adsorbed, biodegraded and sequestered by the soil and plants, functioning similar to bioretention systems. The discharge chamber at the end of the unit collects treated flows and discharges back into the storm drain system.

These systems were selected based on their ability to treat the project's pollutants of concerns to a medium or high effectiveness, in accordance with the Model WQMP and TGD requirements. The table below summarizes the overall treatment effectiveness for Modular Wetlands, derived from Table 4.2 of the Technical Guidance Document and testing data provided by the manufacturer. Additional details for the Modular Wetland units included in Section VI of this WQMP.

POLLUTANTS OF CONCERN AND PERFORMANCE RATINGS		
Pollutant of Concern (1)	**Treatment Effectiveness**	
	Bioretention System (2)	**Modular Wetlands Proprietary Bioretention Units (3)**
Oil & Grease	High	High
Trash & Debris	High	High

POLLUTANTS OF CONCERN AND PERFORMANCE RATINGS		
Pollutant of Concern (1)	Treatment Effectiveness	
	Bioretention System (2)	Modular Wetlands Proprietary Bioretention Units (3)
Oxygen Demanding Substances	N/A	N/A
Suspended Solids/Sediments	High	High
Primary Pollutant of Concern (303d listed impairments & TMDLs)		
Nutrients	Low	Medium-High
Metals	High	Medium-High
Pathogens/Bacteria	Medium	Medium-High
Toxic Organic Compounds	Medium	Medium-High(4)
Pesticides	Medium(5)	Medium(5)

Notes:

1 See Section II.2 of this WQMP.

2 Per Table 4.2 of the Model WQMP's companion Technical Guidance Document dated May 19, 2011.

3 Based on Washington State University Technology Assessment Protocol – Ecology (TAPE) third-party independent field tests for a high-flow biotreatment system with raised under drain (Modular Wetland System-Linear). Refer to manufacturer documentation (attached) for specific removal efficiencies and source references included in Section VI of this report.

4 Field and Lab Testing demonstrates 75-83% removal rates of Chemical Oxygen Demand (COD), a measure of the amount of organic pollutants commonly found in surface water. COD removals of this range would fall within the Medium-High effectiveness category.

5 Per Table 4.2 of TGD, pesticides are grouped with dissolved toxic organic compounds.

Within the residential portion of the project, the proposed storm drains flow generally south to three main locations at the boundary between the residential and commercial portions of the project. At these locations, diversion structures within the three storm drain lines divert low-flow and first-flush runoff to Modular Wetland Units for filtration and biotreatment. Treated flows from the units then flow back into the storm drain systems and into the underground detention system. High flows beyond the first-flush bypass the Modular Wetland Units, and flow into the underground detention system located within the commercial/retail portion of the site. Within the commercial/retail portion of the site, runoff will flow via sheet flow and via ribbon gutters to Modular Wetland Systems placed at the low points throughout the parking lot. Low-flows and first-flush runoff will be treated by the Modular Wetland Systems, and treated flows will drain directly to the underground detention system below the parking lot. Higher flows will bypass the units and drain directly to the detention system.

In accordance with the Model WQMP and TGD, the bioretention/biotreatment BMPs will be sized to treat runoff from the Design Capture Storm (85th percentile, 24-hour). Since Modular Wetlands are sized based on flow rate, they were sized utilizing the methodology for flow based BMPs (TGD Section III.1.2 and Worksheet D). Locations and tributary drainage areas are shown on the WQMP Exhibit included in Section VI. BMP details are also included in Section VI. Detailed calculations and associated TGD Worksheets are included in Appendix A. Operation and maintenance details are included in Section V and Appendix D (O&M Plan).

MODULAR WETLAND SYSTEM DESIGN SUMMARY								
DMA / BMP ID[1]	Area (ac)	% Imp.	2-Year Tc (min)	Rainfall Intensity (in/hr)	Q_{Design}[3] (cfs)	Size / Model[4]	Unit #	Combined Treatment Capacity [5] (cfs)
A	8.26	85%	15	0.21	1.367	3 Units MWS-L-8-16	MWS #1-3	1.386
B	3.46	85%	11.4	0.225	0.613	2 Units MWS-L-8-12	MWS #4-5	0.692
C	15.91	85%	15.8	0.21	2.633	5 Units MWS-L-8-16	MWS #6-10	2.656
						1 Unit MWS-L-8-12	MWS #11	
D1	0.520	90%	7.5	0.24	0.103	1 Unit MWS-L-4-8	MWS #12	0.115
D2	0.450	90%	6.7	0.25	0.093	1 Unit MWS-L-4-8	MWS #13	0.115
D3	0.680	90%	6.8	0.25	0.140	1 Unit MWS-L-4-13	MWS #14	0.144
D4	1.610	90%	8.5	0.24	0.319	1 Unit MWS-L-8-12	MWS #15	0.346
D5	0.920	90%	7.1	0.24	0.182	1 Unit MWS-L-4-17	MWS #16	0.206

Notes:
(1) See also Section IV.2.2.
(2) Refer to WQMP Exhibit in Section VI for locations of each drainage area and BMP.
(3) Detailed calculations and worksheets are included in Appendix A.
(4) Unit details and specifications are included in Section VI.
(5) Treatment capacities of each unit are based on wetland media design loading rate (controlled by downstream orifice) and perimeter surface area of wetland media provided. Individual unit sizing calculations provided by the manufacturer are included on each cut sheet/detail included in Section VI.

IV.3.5 Hydromodification Control BMPs

Not applicable. Refer to Section II.3 for further information.

IV.3.6 Regional/Sub-Regional LID BMPs

Not applicable. LID BMPs will be utilized for water quality treatment on-site in accordance with the MS4 Permit hierarchy identified at the beginning of this Section.

IV.3.7 Treatment Control BMPs

Treatment control BMPs can only be considered if the project conformance analysis indicates that it is not feasible to retain the full design capture volume with LID BMPs.

TREATMENT CONTROL BMPs		
ID	Name	Included?

TREATMENT CONTROL BMPs		
ID	Name	Included?
TRT-1	Sand Filters	☐
TRT-2	Cartridge Media Filter	☐
PRE-1	Hydrodynamic Separation Device	☐
PRE-2	Catch Basin Insert	☐
	Other:	☐

Not applicable. LID BMPs will be utilized for water quality treatment on-site in accordance with the MS4 Permit hierarchy identified at the beginning of this Section.

IV.3.8 Non-Structural Source Control BMPs

The table below indicates all BMPs to be incorporated in the project. For those designated as not applicable (N/A), a brief explanation why is provided.

NON-STRUCTURAL SOURCE CONTROL BMPs				
ID	Name	Included?	Not Applicable?	If Not Applicable, Provide Brief Reason
N1	Education for Property Owners, Tenants and Occupants	☒	☐	
N2	Activity Restrictions	☒	☐	
N3	Common Area Landscape Management	☒	☐	
N4	BMP Maintenance	☒	☐	
N5	Title 22 CCR Compliance (How development will comply)	☐	☒	Not an industrial development.
N6	Local Water Quality Permit Compliance	☐	☒	The City of Cypress does not issue water quality permits.
N7	Spill Contingency Plan	☒	☐	
N8	Underground Storage Tank Compliance	☐	☒	No underground fuel tanks are proposed.
N9	Hazardous Materials Disclosure Compliance	☒	☐	
N10	Uniform Fire Code Implementation	☒	☐	

NON-STRUCTURAL SOURCE CONTROL BMPs				
ID	Name	Included?	Not Applicable?	If Not Applicable, Provide Brief Reason
N11	Common Area Litter Control	☒	☐	
N12	Employee Training	☒	☐	
N13	Housekeeping of Loading Docks	☒	☐	
N14	Common Area Catch Basin Inspection	☒	☐	
N15	Street Sweeping Private Streets and Parking Lots	☒	☐	
N16	Retail Gasoline Outlets	☐	☒	No retail gasoline outlets are proposed.

N1, Education for Property Owners, Tenants and Occupants

Educational materials will be provided to tenants, including brochures and restrictions to reduce pollutants from reaching the storm drain system. Examples include tips for pet care, household tips, and proper household hazardous waste disposal. Tenants will be provided with these materials by the property management prior to occupancy, and periodically thereafter. Refer to Section VII for a list of materials available and attached to this WQMP. Additional materials are available through the County of Orange Stormwater Program website (http://ocwatersheds.com/PublicEd/) and the California Stormwater Quality Association's (CASQA) BMP Handbooks (http://www.cabmphandbooks.com/).

N2, Activity Restrictions

The Owner/HOA/POA shall develop ongoing activity restrictions that include those that have the potential to create adverse impacts on water quality. Activities include, but are not limited to: handling and disposal of contaminants, fertilizer and pesticide application restrictions, litter control and pick-up, and vehicle or equipment repair and maintenance in non-designated areas, as well as any other activities that may potentially contribute to water pollution.

N3, Common Area Landscape Management

Management programs will be designed and implemented by the Owner/HOA/POA to maintain all the common areas within the project site. These programs will cover how to reduce the potential pollutant sources of fertilizer and pesticide uses, utilization of water-efficient landscaping practices and proper disposal of landscape wastes by the owner/developer and/or contractors.

N4, BMP Maintenance

The Owner/HOA/POA will be responsible for the implementation and maintenance of each applicable non-structural BMP, as well as scheduling inspections and maintenance of all applicable structural BMP facilities through its staff, landscape contractor, and/or any other necessary maintenance contractors. Details on BMP maintenance are provided in Section V of this WQMP, and the O&M Plan is included in Appendix D.

N7, Spill Contingency Plan

Any commercial facilities that store liquid materials or wastes shall maintain procedures for spill response and cleanup activities. Emergency spill kits shall be kept on-site at all times. Spill kits shall include, at a minimum, dry adsorbent material such as kitty litter, mats or pillows, containment booms, wipes, goggles, gloves and disposal bags. Minor spills shall be cleaned up immediately using dry methods, consistent with measures identified in the fact sheets attached to this WQMP. Activities will be coordinated between the respective departments and the Police and Fire departments in the event of a spill. Procedures shall be maintained on an ongoing basis.

N9, Hazardous Materials Disclosure Compliance

Any storage or utilization of hazardous wastes, where applicable, shall comply with the County of Orange Fire Authority hazardous material disclosure requirements. Compliance shall be maintained on an ongoing basis.

N10, Uniform Fire Code Implementation

The POA shall ensure all structures comply with Article 80 of the Uniform Fire Code, City of Cypress Municipal Code, County of Orange Fire Authority, and Orange City Fire Department. Compliance shall be maintained on an ongoing basis.

N11, Common Area Litter Control

The Owner/HOA/POA will be responsible for performing trash pickup and sweeping of littered common areas on a weekly basis or whenever necessary. Responsibilities will also include noting improper disposal materials by the public and reporting such violations for investigation.

N12, Employee Training

All employees of the Owner/HOA/POA and any contractors will require training to ensure that employees are aware of maintenance activities that may result in pollutants reaching the storm drain. Training will include, but not be limited to, spill cleanup procedures, proper waste disposal, housekeeping practices, etc.

N13, Housekeeping of Loading Docks

Housekeeping measures will be implemented by the POA to keep the proposed loading dock and delivery areas clean and orderly condition. Includes sweeping, removal of trash & debris on a weekly basis, and use of dry methods for cleanup (e.g., sweeping).

N14, Common Area Catch Basin Inspection

All on-site catch basin inlets and drainage facilities shall be inspected and maintained by the Owner/HOA/POA at least once a year, prior to the rainy season, no later than October 1st of each year.

N15, Street Sweeping Private Streets and Parking Lots

The Owner/HOA/POA shall be responsible for sweeping all on-site private streets, drive aisles, and uncovered parking areas within the project on a quarterly basis and prior to the storm season, prior to October 1st each year.

IV.3.9 Structural Source Control BMPs

The table below indicates all BMPs to be incorporated in the project. For those designated as not applicable (N/A), a brief explanation why is provided.

STRUCTURAL SOURCE CONTROL BMPs				
ID	**Name**	**Included?**	**Not Applicable?**	**If Not Applicable, Provide Brief Reason**
S1 SD-13	Provide storm drain system stenciling and signage	☒	☐	
S2 SD-34	Design and construct outdoor material storage areas to reduce pollution introduction	☐	☒	No outdoor material storage areas are proposed.
S3 SD-32	Design and construct trash and waste storage areas to reduce pollution introduction	☒	☐	
S4 SD-12	Use efficient irrigation systems & landscape design, water conservation, smart controllers, and source control	☒	☐	
S5	Protect slopes and channels and provide energy dissipation	☐	☒	There are no slopes or channels on the project site.
S6 SD-31	Properly Design: Dock areas	☒	☐	
S7 SD-31	Properly Design: Maintenance bays	☐	☒	No maintenance bays are proposed.
S8 SD-33	Properly Design: Vehicle wash areas	☐	☒	No vehicle wash areas are proposed.
S9 SD-36	Properly Design: Outdoor processing areas	☐	☒	No outdoor processing areas are proposed.
S10	Properly Design: Equipment wash areas	☐	☒	No equipment wash areas are proposed.
S11 SD-30	Properly Design: Fueling areas	☐	☒	No fueling areas are proposed.
S12 SD-10	Properly Design: Hillside landscaping	☐	☒	Project site is not located on a hillside.

STRUCTURAL SOURCE CONTROL BMPs				
ID	Name	Included?	Not Applicable?	If Not Applicable, Provide Brief Reason
S13	Properly Design: Wash water control for food preparation areas	☒	☐	
S14	Properly Design: Community car wash racks	☐	☒	No community car wash racks are proposed.

S1/SD-13, Provide storm drain system stenciling and signage

The phrase "NO DUMPING! DRAINS TO OCEAN", or an equally effective phrase approved by the City, will be stenciled on all major storm drain inlets within the project site to alert the public to the destination of pollutants discharged into storm water. Stencils shall be in place prior to release of certificate of occupancy. Stencils shall be inspected for legibility on an annual basis and re-stenciled as necessary.

S3/SD-32, Design and construct trash and waste storage areas to reduce pollution introduction

All trash and waste shall be stored in containers that have lids or tarps to minimize direct precipitation into the containers. Four (4) trash enclosures will be located within the commercial area parking lot. The trash storage areas will be designed to City standards, and will be walled, roofed, have gates and proper drainage per City standards.

S4/SD-12, Use efficient irrigation systems & landscape design, water conservation, smart controllers, and source control

The Owner/HOA/POA will be responsible for the installation and maintenance of all common landscape areas utilizing similar planting materials with similar water requirements to reduce excess irrigation runoff. The Owner/HOA/POA will be responsible for implementing all efficient irrigation systems for common area landscaping including, but not limited to, provisions for water sensors and programmable irrigation cycles. This includes smart timers, rain sensors, and moisture shut-off valves. The irrigation systems shall be in conformance with water efficiency guidelines. Systems shall be tested twice per year, and water used during testing/flushing shall not be discharged to the storm drain system.

S6/SD-31, Properly Design: Dock areas

Runoff from the loading dock will not discharge into the storm drain system. Housekeeping measures shall be implemented in accordance with BMP N13.

S13, Properly Design: Wash water control for food preparation areas

All wash water from food prep areas will be controlled and proper staff training conducted by the site operator. Food preparation facilities shall meet all health and safety, building and safety and any other applicable regulations, codes requirements, including installation of a grease interceptor where required. Sinks shall be contained with sanitary sewer connections for disposal of wash waters containing kitchen and food wastes.

IV.4 ALTERNATIVE COMPLIANCE PLAN

IV.4.1 Water Quality Credits

Local jurisdictions may develop a water quality credit program that applies to certain types of development projects after they first evaluate the feasibility of meeting LID requirements on-site. If it is not feasible to meet the requirements for on-site LID, project proponents for specific project types can apply credits that would reduce project obligations for selecting and sizing other treatment BMPs or participating in other alternative programs.

WATER QUALITY CREDITS	
Credit	Applicable?
Redevelopment projects that reduce the overall impervious footprint of the project site.	☐
Brownfield redevelopment, meaning redevelopment, expansion, or reuse of real property which may be complicated by the presence or potential presence of hazardous substances, pollutants or contaminants, and which have the potential to contribute to adverse ground or surface water quality if not redeveloped.	☐
Higher density development projects which include two distinct categories (credits can only be taken for one category): those with more than seven units per acre of development (lower credit allowance); vertical density developments, for example, those with a Floor to Area Ratio (FAR) of 2 or those having more than 18 units per acre (greater credit allowance)	☐
Mixed use development, such as a combination of residential, commercial, industrial, office, institutional, or other land uses which incorporate design principles that can demonstrate environmental benefits that would not be realized through single use projects (e.g. reduced vehicle trip traffic with the potential to reduce sources of water or air pollution).	☐
Transit-oriented developments, such as a mixed use residential or commercial area designed to maximize access to public transportation; similar to above criterion, but where the development center is within one half mile of a mass transit center (e.g. bus, rail, light rail or commuter train station). Such projects would not be able to take credit for both categories, but may have greater credit assigned	☐
Redevelopment projects in an established historic district, historic preservation area, or similar significant city area including core City Center areas (to be defined through mapping).	☐
Developments with dedication of undeveloped portions to parks, preservation areas and other pervious uses.	☐
Developments in a city center area.	☐
Developments in historic districts or historic preservation areas.	☐

WATER QUALITY CREDITS	
Credit	Applicable?
Live-work developments, a variety of developments designed to support residential and vocational needs together – similar to criteria to mixed use development; would not be able to take credit for both categories.	☐
In-fill projects, the conversion of empty lots and other underused spaces into more beneficially used spaces, such as residential or commercial areas.	☐

Not applicable. Water quality credits will not be applied for the project. LID BMPs will be utilized for water quality treatment on-site in accordance with the MS4 Permit hierarchy identified at the beginning of this Section.

IV.4.2 Alternative Compliance Plan Information

Not applicable. LID BMPs will be utilized for water quality treatment on-site in accordance with the MS4 Permit hierarchy identified at the beginning of this Section.

SECTION V INSPECTION/MAINTENANCE RESPONSIBILITY FOR BMPs

It has been determined that the Owner, C33, LLC shall assume all BMP inspection and maintenance responsibilities for the Barton Place VTTM 17830 project until the HOA and POA are established.

Contact Name:	Tim Ramm
Title:	Vice President
Company:	C33, LLC
Address:	26 Corporate Plaza, Suite 260, Newport Beach, CA 92660
Phone:	949.533.4800
Fax:	949.706.7979
Email:	tramm@provincegroup.com

Should the maintenance responsibility be transferred at any time during the operational life of Barton Place, such as when an HOA or POA is formed for a project, a formal notice of transfer shall be submitted to the City of Cypress at the time responsibility of the property subject to this WQMP is transferred. The transfer of responsibility shall be incorporated into this WQMP as an amendment.

The Owner/HOA/POA shall verify BMP implementation and ongoing maintenance through inspection, self-certification, survey, or other equally effective measure. The certification shall verify that, at a minimum, the inspection and maintenance of all structural BMPs including inspection and performance of any required maintenance in the late summer / early fall, prior to the start of the rainy season. A form that may be used to record implementation, maintenance, and inspection of BMPs is included in Appendix D.

Note: As part of the proposed project, the biotreatment units will be located within the commercial component of the project and used to provide treatment of the residential runoff. As part of the final design and final mapping requirements, a drainage and maintenance easement will be prepared to allow for the drainage and maintenance of the biotreatment unit for residential runoff to occur within the commercial parcel. In addition, additional biotreatment units will be located within the commercial development to treat the commercial development runoff.

The City of Cypress may conduct verifications to assure that implementation and appropriate maintenance of structural and non-structural BMPs prescribed within this WQMP is taking place at the project site. The Owner/HOA/POA shall retain operations, inspections and maintenance records of these BMPs and they will be made available to the City or County upon request. All records must be maintained for at least five (5) years after the recorded inspection date for the lifetime of the project.

Long-term funding for BMP maintenance shall be funded through fees paid into the HOA and POA. Adequate funding for BMP maintenance includes budgeting for on-going maintenance (monthly, pre/post storm event, annual, etc.) and long-term maintenance which includes removal and replacement of the proposed water quality features at specified intervals. The fees paid into the HOA/POA are based on the cumulative total of the on-going maintenance and the long-term maintenance requirements.

The Operations and Maintenance (O&M) Plan can be found in Appendix D.

BMP INSPECTION & MAINTENANCE RESPONSIBILITY MATRIX				
	BMP	Inspection/Maintenance Activities	Minimum Frequency	Responsible Party
BIOTREATMENT BMPs				
BIO-7	Proprietary Biotreatment: Modular Wetland Systems (MWS)	The Modular Wetland units shall be maintained in accordance with manufacturer's specifications. The system shall be inspected at a minimum of once every six months, prior to the start of the rainy season (October 1) each year, and after major storm events. Typical maintenance includes: ▪ Removing trash & debris from the catch basin screening filter (by hand). ▪ Removal of sediment and solids in the settlement chamber (vacuum truck). ▪ Replacement of the BioMediaGREEN™ filter cartridge and drain-down filter (if equipped) ▪ Trim plants within the wetland chamber as needed in conjunction with routine landscape maintenance activities. No fertilizer shall be used. Wetland chamber should be inspected during rain events to verify flow through the system. If little to no flow is observed from the lower valve or orifice plate, the wetland media may require replacement.	2x per year	C33, LLC, HOA, POA

BMP INSPECTION & MAINTENANCE RESPONSIBILITY MATRIX				
	BMP	Inspection/Maintenance Activities	Minimum Frequency	Responsible Party
--	StormTrap Detention System	The underground detention units shall be inspected through the risers annually and after major storm events, and cleaned at a minimum of once per year, prior to the start of the rainy season (October 1st). Cleaning and maintenance will be performed per manufacturer specifications, and will typically include removal of any trash and debris and excess sediment within the pipes. Sediment shall be removed when deposits approach within 6 inches of the invert heights of the connecting pipes between the chamber rows or inlet structures.	Annually	C33, LLC, POA
NON-STRUCTURAL SOURCE CONTROL BMPs				
N1	Education for Property Owners, Tenants and Occupants	Educational materials will be provided to tenants annually. Materials to be distributed are found in Appendix C of the Final WQMP. Tenants will be provided these materials by the HOA prior to occupancy and annually thereafter.	Annually	C33, LLC, HOA
N2	Activity Restrictions	The Owner/HOA/POA will prescribe activity restrictions to protect surface water quality, through lease terms or other equally effective measure, for the property. Restrictions include, but are not limited to, prohibiting vehicle maintenance or vehicle washing.	Ongoing	C33, LLC, HOA, POA

BMP INSPECTION & MAINTENANCE RESPONSIBILITY MATRIX				
	BMP	**Inspection/Maintenance Activities**	**Minimum Frequency**	**Responsible Party**
N3	Common Area Landscape Management	Maintenance shall be consistent with City requirements. Fertilizer and/or pesticide usage shall be consistent with County Management Guidelines for Use of Fertilizers (OC DAMP Section 5.5). Maintenance includes mowing, weeding, and debris removal on a weekly basis. Trimming, replanting, and replacement of mulch shall be performed on an as-needed basis to prevent exposure of erodible surfaces. Trimmings, clippings, and other landscape wastes shall be properly disposed of in accordance with local regulations. Materials temporarily stockpiled during maintenance activities shall be placed away from water courses and storm drains inlets.	Monthly	C33, LLC, HOA, POA
N4	BMP Maintenance	Maintenance of structural BMPs implemented at the project site shall be performed at the frequency prescribed in this WQMP (Appendix D). Records of inspections and BMP maintenance shall be kept by the Owner/HOA/POA and shall be available for review upon request.	Ongoing	C33, LLC, HOA, POA
N7	Spill Contingency Plan	Spill contingency measures shall be implemented on an ongoing basis by the retail tenants/operator. Inspect/verify contingency plan and associated documentation is being followed on an annual basis. Verify spill kits are adequately stocked and placed at key locations in the commercial food preparation areas and storage areas.	Ongoing	C33, LLC, POA

BMP INSPECTION & MAINTENANCE RESPONSIBILITY MATRIX				
	BMP	Inspection/Maintenance Activities	Minimum Frequency	Responsible Party
N9	Hazardous Materials Disclosure Compliance	The Owner/POA shall verify compliance with hazardous materials disclosure requirements in accordance with associated Fire, Health Care, and other appropriate agencies on an annual basis.	Annually	C33, LLC, HOA, POA
N10	Uniform Fire Code Implementation	The Owner/POA shall verify compliance with Article 80 of the Uniform Fire Code enforced by fire protection agency on an annual basis.	Annually	C33, LLC, POA
N11	Common Area Litter Control	Litter patrol, violations investigations, reporting and other litter control activities shall be performed on a weekly basis and in conjunction with routine maintenance activities.	Weekly	C33, LLC, HOA, POA
N12	Employee Training	The Owner/HOA/POA shall educate all new employees/ managers on storm water pollution prevention, particularly good housekeeping practices, prior to the start of the rainy season (October 1). Refresher courses shall be conducted as needed. Materials that may be utilized on BMP maintenance are included in Appendix D.	Annually	C33, LLC, HOA, POA
N13	Housekeeping of Loading Docks	Sweep area routinely and before October 1 each year. Keep area clean of trash and debris at all times. Spills shall be cleaned up immediately using dry methods.	Weekly	C33, LLC, POA
N14	Common Area Catch Basin Inspection	On-site catch basin inlets and other drainage facilities shall be inspected at least once per year, prior to the start of the rainy season (October 1st). Inlets and other facilities shall be cleaned when the sump is 40% full and annually at a minimum.	Annually	C33, LLC, HOA, POA

BMP INSPECTION & MAINTENANCE RESPONSIBILITY MATRIX				
	BMP	**Inspection/Maintenance Activities**	**Minimum Frequency**	**Responsible Party**
N15	Street Sweeping Private Streets and Parking Lots	Private streets, parking areas and drive aisles within the project shall be swept at a minimum frequency quarterly as well as once per year prior to the storm season, no later than October 1 each year.	Quarterly	C33, LLC, HOA, POA
STRUCTURAL SOURCE CONTROL BMPs				
S1 SD-13	Provide storm drain system stenciling and signage	On-site storm drain stencils shall be inspected for legibility, at minimum, once prior to the storm season, no later than October 1 each year. Those determined to be illegible will be re-stenciled as soon as possible.	Annually	C33, LLC, HOA, POA
S3 SD-32	Design and construct trash and waste storage areas to reduce pollution introduction	Sweep trash area at least once per week and before October 1st each year. Maintain area clean of trash and debris at all times.	Weekly	C33, LLC, POA
S4 SD-12	Use efficient irrigation systems & landscape design, water conservation, smart controllers, and source control	In conjunction with routine maintenance, verify that landscape design continues to function properly by adjusting systems to eliminate overspray to hardscape areas and to verify that irrigation timing and cycle lengths are adjusted in accordance to water demands, given the time of year, weather, and day or nighttime temperatures. System testing shall occur once per year. Water from testing/flushing shall be collected and properly disposed to the sewer system and shall not discharge to the storm drain system.	Annually	C33, LLC, HOA, POA
S6 SD-31	Properly Design: Dock areas	Sweep area routinely and before October 1 each year. Keep area clean of trash and debris at all times. Spills shall be cleaned up immediately. See also BMP N13.	Weekly	C33, LLC, POA

BMP INSPECTION & MAINTENANCE RESPONSIBILITY MATRIX				
	BMP	**Inspection/Maintenance Activities**	**Minimum Frequency**	**Responsible Party**
S13	Properly Design: Wash water control for food preparation areas	Inspection / maintenance shall occur a least once in the late summer / early fall, prior to the start of the rainy season. Maintenance includes using dry cleanup methods for cleaning (i.e., sweeping), keeping spill kits on-site and stocked in accordance with BMP N7, use of drip pans, properly storing and hauling used oil and grease, using secondary containment or elevating stored materials, and disposing wash water to sanitary sewer. Wash water shall not discharge to storm drain system. Mats shall be cleaned indoors or with dry cleaning methods only.	Annually	C33, LLC, POA

Any waste generated from maintenance activities will be disposed of properly. Wash water and other waste from maintenance activities is not to be discharged or disposed of into the storm drain system. Clippings from landscape maintenance (i.e. prunings) will be collected and disposed of properly off-site, and will not be washed into the streets, local area drains/conveyances, or catch basin inlets.

SECTION VI SITE PLAN AND DRAINAGE PLAN

The exhibits provided in this section are to illustrate the post construction BMPs prescribed within this WQMP. Drainage flow information of the proposed project, such as general surface flow lines, concrete or other surface drainage conveyances, and storm drain facilities are also depicted. All structural source control and treatment control BMPs are shown as well.

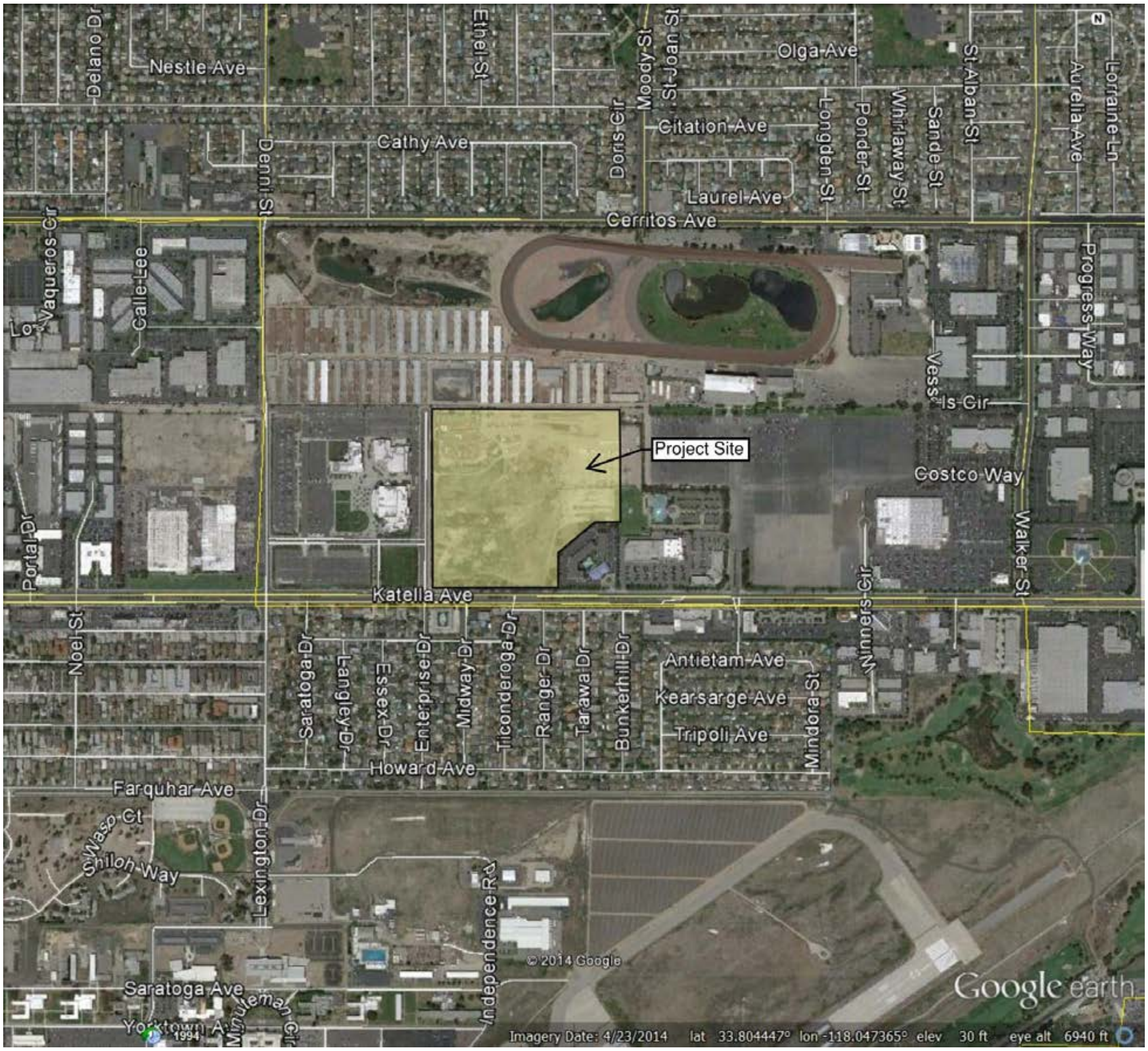
EXHIBITS

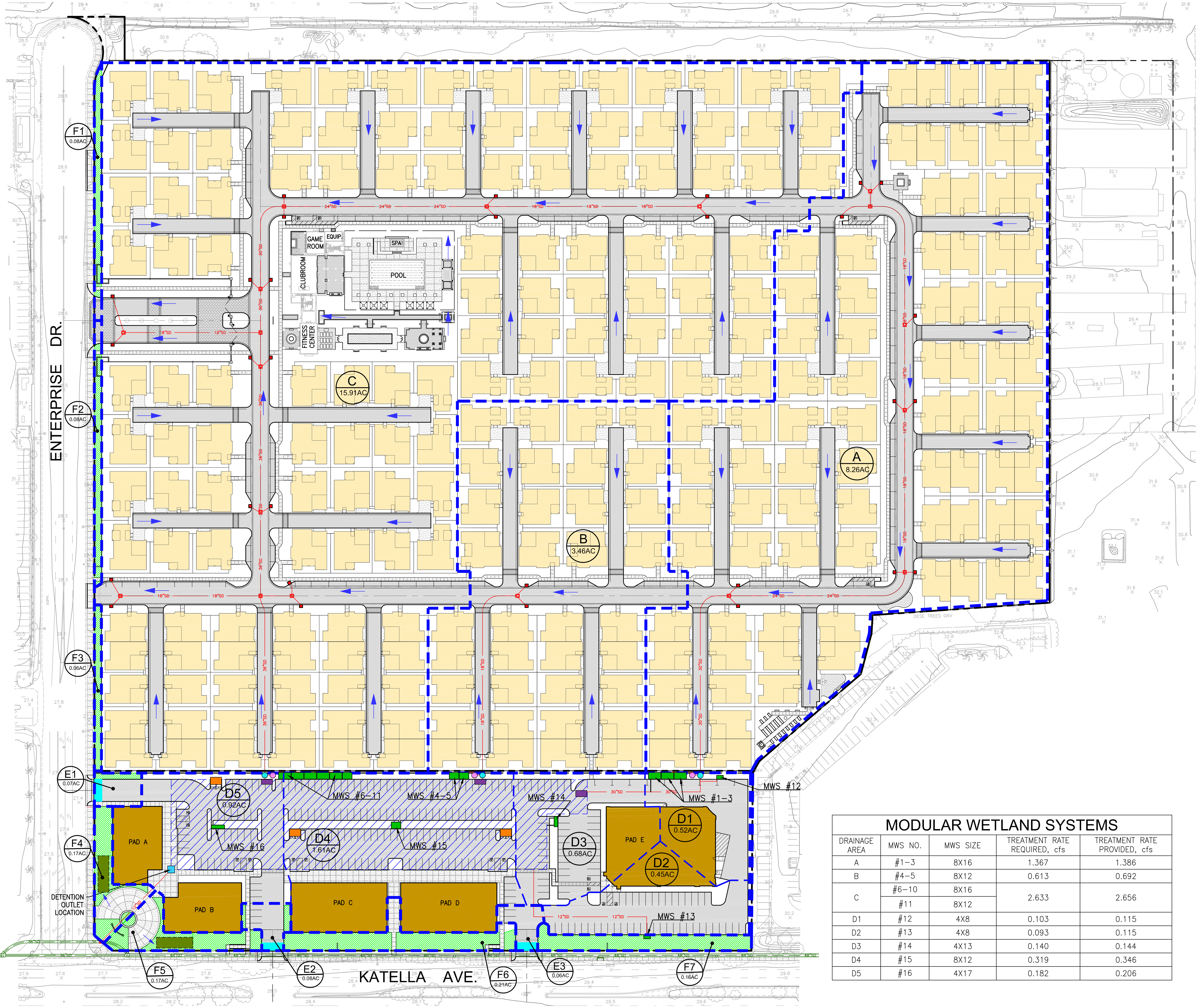
- Vicinity Map
- Preliminary WQMP Exhibit

BMP DETAILS & FACT SHEETS

- Proprietary Biotreatment (BIO-7)
- Modular Wetland Systems
- StormTrap

VICINITY MAP





LEGEND

- PROJECT BOUNDARY
- BMP DRAINAGE BOUNDARY
- EXISTING STORM DRAIN
- PROPOSED STORM DRAIN
- PROPOSED CATCH BASIN STENCILING & SIGNAGE
- PROPOSED PRETREATMENT CHAMBER FOR DETENTION CHAMBERS DETENTION INLET LOCATION
- DETENTION OUTLET LOCATION
- PROPOSED LOADING/DELIVERY AREA
- PROPOSED UNDERGROUND DETENTION SYSTEM SEE STORMTRAP DETAIL ON SHEET 8 PER VESTING TENTATIVE TRACT MAP
- PROPOSED COMMERCIAL BUILDING
- PROPOSED RESIDENTIAL BUILDING
- PROPOSED MODULAR WETLAND UNIT
- PROPOSED TRASH ENCLOSURE
- STREET SWEEPING PRIVATE STREETS, DRIVE AISLES & PARKING LOTS
- PERIMETER LANDSCAPING (SELF TREATING AREA)
- LANDSCAPE DEPRESSION (2" PONDING DEPTH)
- A 1.75AC DRAINAGE MANAGEMENT AREA (DMA) DESIGNATION ACREAGE
- PROPOSED LOW-FLOW DIVERSION MANHOLE
- PROPOSED PUMP TO MODULAR WETLAND SYSTEM
- PROPOSED FLOW DIRECTION
- (ENTIRE SITE) PROPOSED COMMON AREA LANDSCAPING
- TRENCH DRAIN FILTER FOR DRIVE AISLE

MODULAR WETLAND SYSTEMS

DRAINAGE AREA	MWS NO.	MWS SIZE	TREATMENT RATE REQUIRED, cfs	TREATMENT RATE PROVIDED, cfs
A	#1–3	8X16	1.367	1.386
B	#4–5	8X12	0.613	0.692
C	#6–10	8X16	2.633	2.656
	#11	8X12		
D1	#12	4X8	0.103	0.115
D2	#13	4X8	0.093	0.115
D3	#14	4X13	0.140	0.144
D4	#15	8X12	0.319	0.346
D5	#16	4X17	0.182	0.206

60' 0' 30' 60'
SCALE: 1" = 60'

PRELIMINARY WATER QUALITY MANAGEMENT PLAN

BARTON PLACE
CYPRESS, CA

FEBRUARY 13, 2015

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16795 Von Karman, Suite 100
Irvine, California 92606
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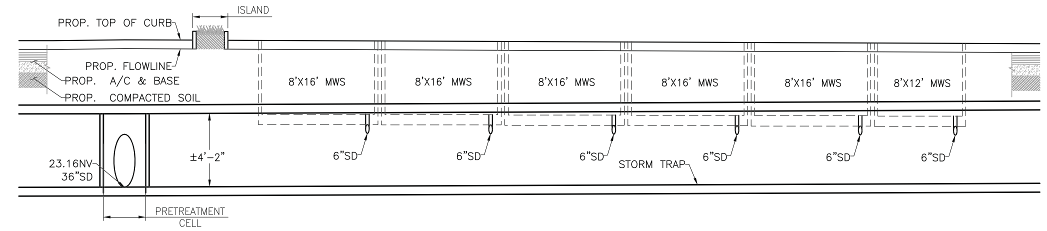
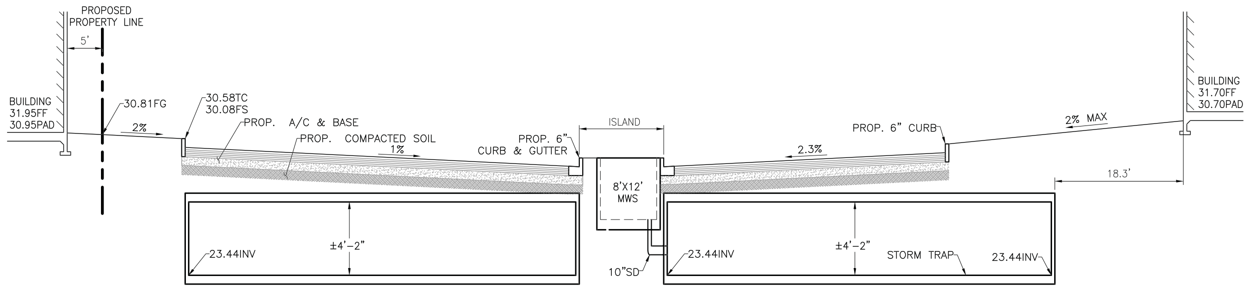
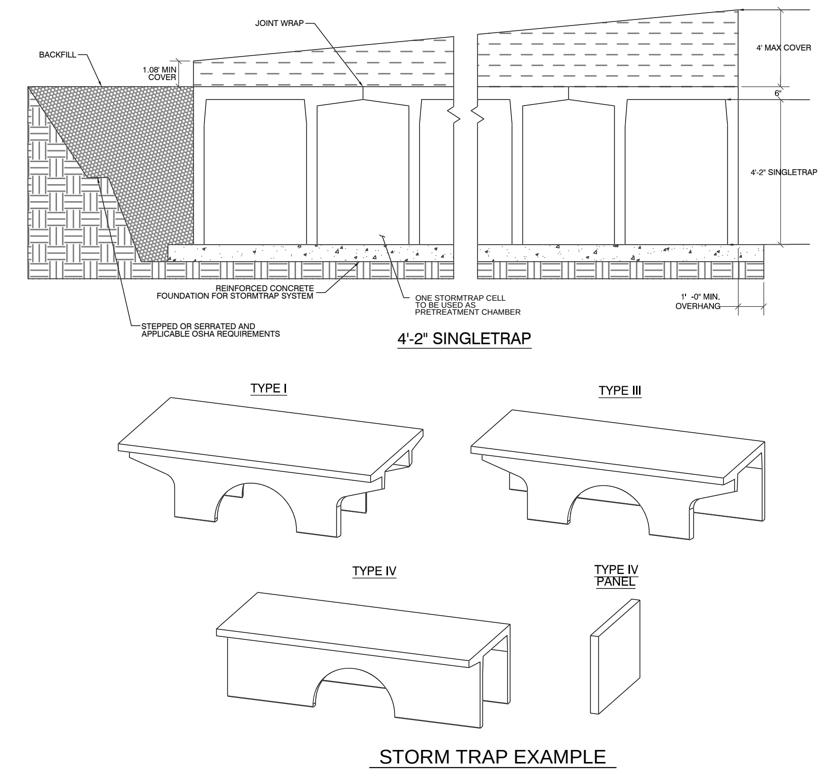
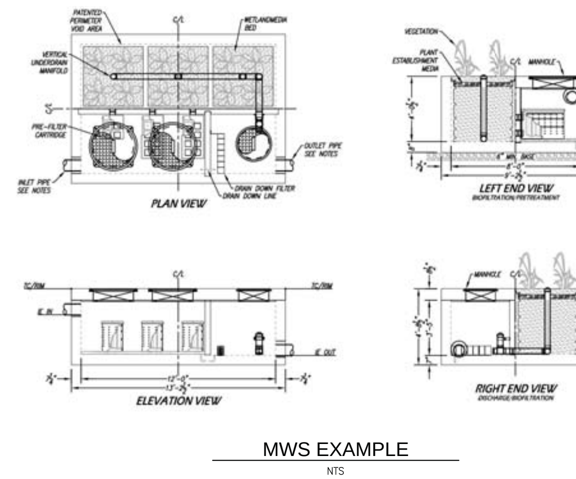
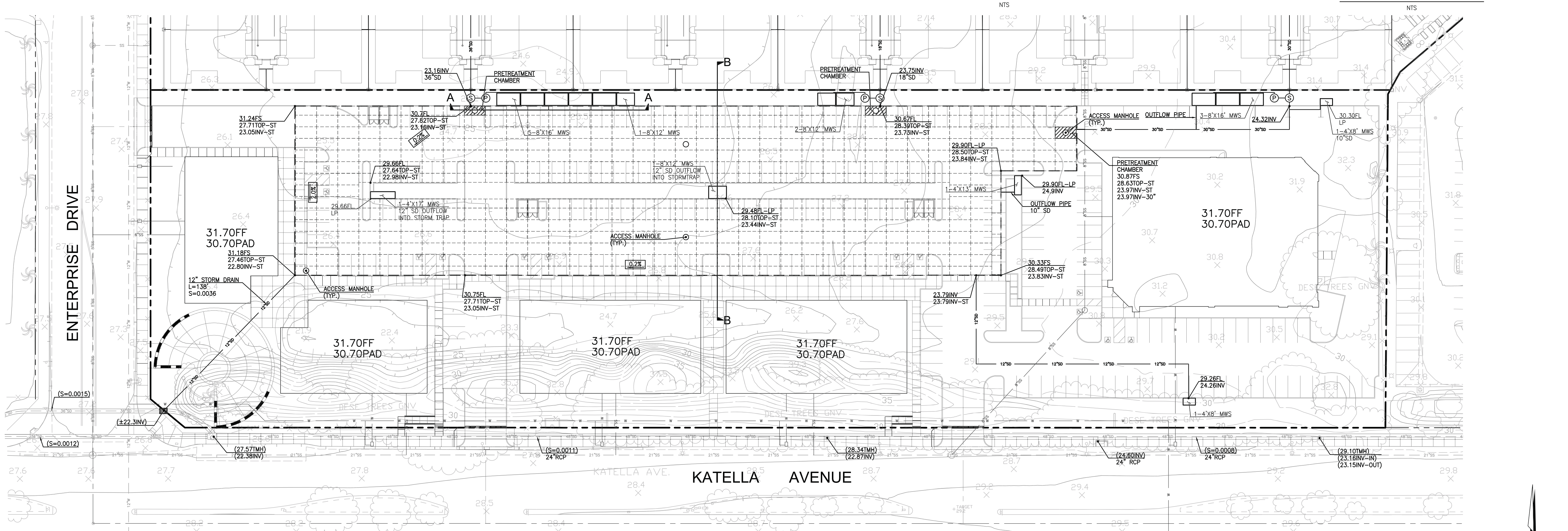
www.fuscoe.com











LEGEND:

BOT-ST	BOTTOM OF STORM TRAP		EXISTING CENTER LINE
FF	FINISH FLOOR		EXISTING PROPERTY LINE
FL	FLOWLINE	SS	EXISTING SANITARY SEWER
INV	INVERT	SD	EXISTING STORM DRAIN
MH	MANHOLE	W	EXISTING WATER
MWS	MODULAR WETLAND SYSTEM	SS	PROPOSED SANITARY SEWER
S	SLOPE	SD	PROPOSED STORM DRAIN
TOP-ST	TOP OF STORM TRAP	IW	PROPOSED IRRIGATION WATER
TMH	TOP OF MANHOLE	W	PROPOSED WATER
0.2%	SLOPE OF STORMTRAP		PROPOSED FIRE HYDRANT
		P	PROPOSED STORM DRAIN PUMP (LOW FLOW ONLY)
		S	PROPOSED STORM DRAIN SPLITTER BOX

100 YEAR STORAGE VOLUME

STORM TRAP	230,868 CF	5.3AC/FT
PIPE STORAGE	10,980 CF	0.25AC/FT
TOTAL STORAGE	241,848 CF	5.55AC/FT
REQUIRED VOLUME*	217,800 CF	5.00AC/FT

*MEETS CITY OF CYPRESS REQUIRED 100YR FLOOD PROTECTION WITH MAX OUTFLOW= 10.1CFS

NO.	DATE	REVISIONS	APP'D.	DATE

PREPARED BY:

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DEBRA V. SCHALES RCE#43101 02/06//2015 DATE

REGISTERED PROFESSIONAL ENGINEER DEBRA VALLE SCHALES NO. 43101 02/06/2015 CIVIL STATE OF CALIFORNIA

CONCEPTUAL DETENTION BASIN PLAN

4921 KATELLA AVE
CYPRESS, CA 90720

VESTING TENTATIVE TRACT MAP 17830

DRAWN:	KC
DESIGN:	DVS
CHECKED:	DVS
SCALE:	AS SHOWN
JOB NO.:	1334-001
DATE:	02/06/2015

SHEET 8 OF 8

BARTON PLACE VESTING TENTATIVE TRACT MAP
02/06/2015
PLAN SET: B

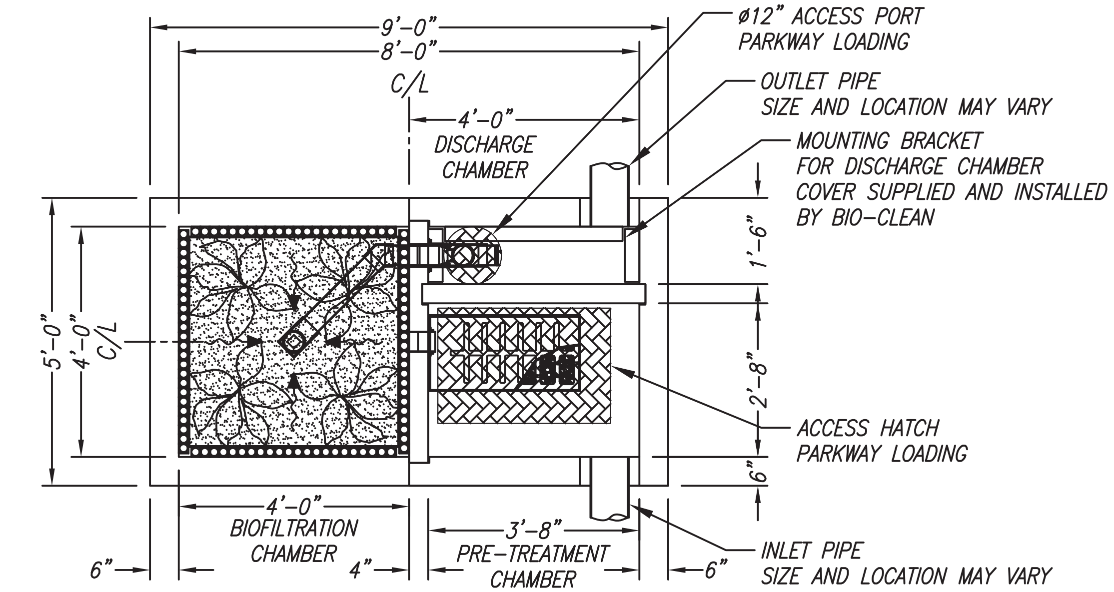
MODULAR WETLAND SYSTEMS - LINEAR 2.0
4-8 VAULT TYPE

MODULAR WETLANDS™

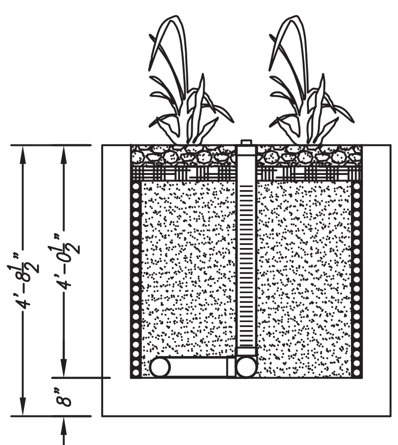
FLOW RATES
PEAK TREATMENT FLOW RATE = .116 CFS OR 52.0 GPM
PEAK BYPASS FLOW RATE = OPTIONAL

SPECIFICATIONS
INSTALL AT SURFACE
O.D. DIMENSIONS = 9' X 5' X 4.7'
TOP OF VAULT TO INVERT OUT = 4.13'
SEDIMENT STORAGE CAPACITY = 1000 LBS OR 23.5 CF

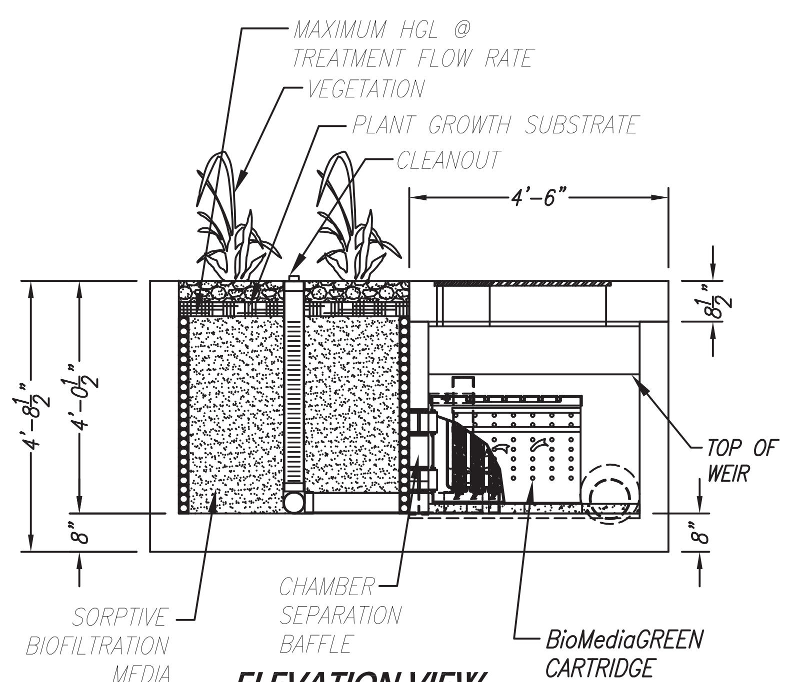
***NOTE:**
MWS UNIT CAN BE CONSTRUCTED WITH INLET ON EITHER SIDE. FOR INLET ON OPPOSITE SIDE ENTIRE UNIT WILL BE MIRRORED.



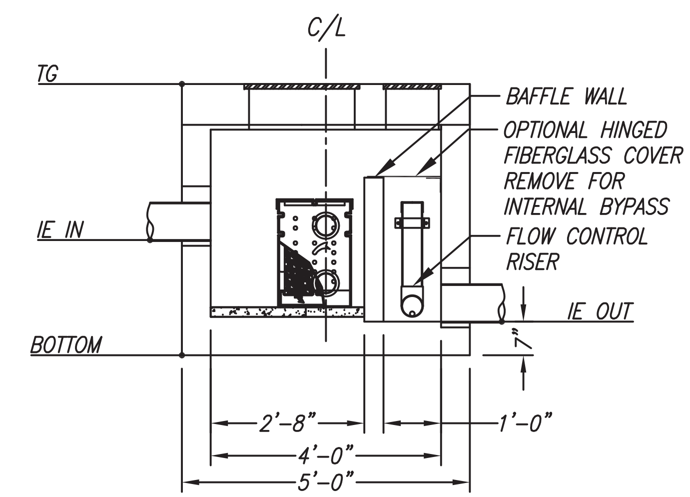
PLAN VIEW



LEFT END VIEW
BIOFILTRATION CHAMBER



ELEVATION VIEW



RIGHT END VIEW
PRETREATMENT/DISCHARGE CHAMBER

BIOFILTRATION CHAMBER SURFACE AREA CALCS
SIDES = 2
3.7' L x 3.4' H = 12.6 SF
SIDE SURFACE AREA = 25.2 SF
ENDS = 2
3.7' L x 3.4' H = 12.6 SF
END SURFACE AREA = 25.2 SF
TOTAL WETLAND MEDIA SURFACE AREA **= 50.4 SF**
WETLAND MEDIA LOADING RATE 52.0 GPM / 50.4 SF **= 1.03 GPM/SF**
PRETREATMENT FILTER SURFACE AREA CALCS
SIDES = 2
0.50' L x 1.67' H = 0.84 SF
SIDE SURFACE AREA = 1.68 SF
ENDS = 2
0.25' L x 1.67' H = 0.42 SF
END SURFACE AREA = 0.84 SF
TOTAL PRETREATMENT SURFACE AREA 2.52 SF x 14 FILTERS **= 35.28 SF**
PRETREATMENT FILTER LOADING RATE 52.0 GPM / 35.28 SF **= 1.47 GPM/SF**

LEGEND

- 2" DRAIN CELL PERIMETER INLET WATER TRANSFER SYSTEM
- WETLAND MEDIA
- PLANT/ROOT MOISTURE RETENTION LAYER
- MANHOLE / ACCESS HATCH

INSTALLATION NOTES:

1. INSTALL UNIT ON LEVEL BED OF GRAVEL OF AT LEAST 6" IN DEPTH.
2. CONCRETE 28 DAY COMPRESSIVE STRENGTH fc=5,000 PSI.
3. REINFORCING: ASTM A-615, GRADE 60.
4. RATED FOR PARKWAY LOADING 300 PSF.
5. JOINT SEALANT: BUTYL RUBBER SS-S-00210
6. PLANTING SUPPLIED AND INSTALLED BY CONTRACTOR PER MANUFACTURES RECOMMENDATIONS UNLESS OTHER WISE STATED ON CONTRACT.

MODULAR WETLAND SYSTEMS INC.
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OCEANSIDE, CA 92049
www.ModularWetlands.com

	NAME	DATE
DRAWN	jrh	1/9/13
REVIEWED		

COMMENTS:

TITLE: MWS LINEAR 2.0 VAULT TYPE

SIZE	DWG. NO.	REV
	MWS-L-4-8-V	

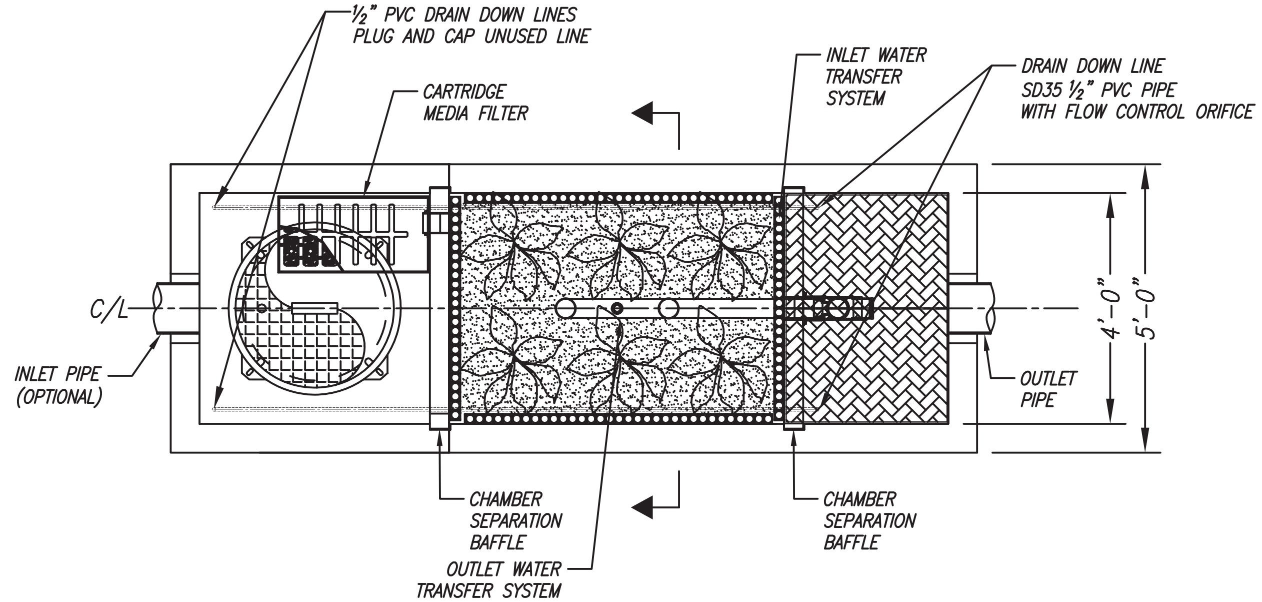
SCALE 1:40 | UNITS = INCHES | SHEET 1 OF 1

MODULAR WETLAND SYSTEMS - LINEAR 2.0
13' VAULT TYPE

MODULAR WETLANDS™

FLOW RATES
PEAK TREATMENT FLOW RATE = .144 CFS OR 64.5 GPM
PEAK BYPASS FLOW RATE = OPTIONAL

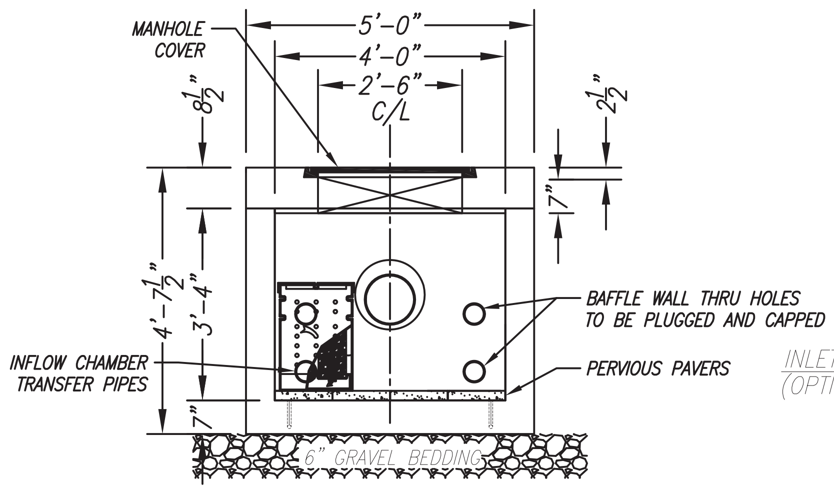
SPECIFICATIONS
INSTALL AT SURFACE
O.D. DIMENSIONS = 14' X 5' X 4.7'
TOP OF CURB TO INVERT OUT = 4.13'
SEDIMENT STORAGE CAPACITY = 1000 LBS OR 23.5 CF



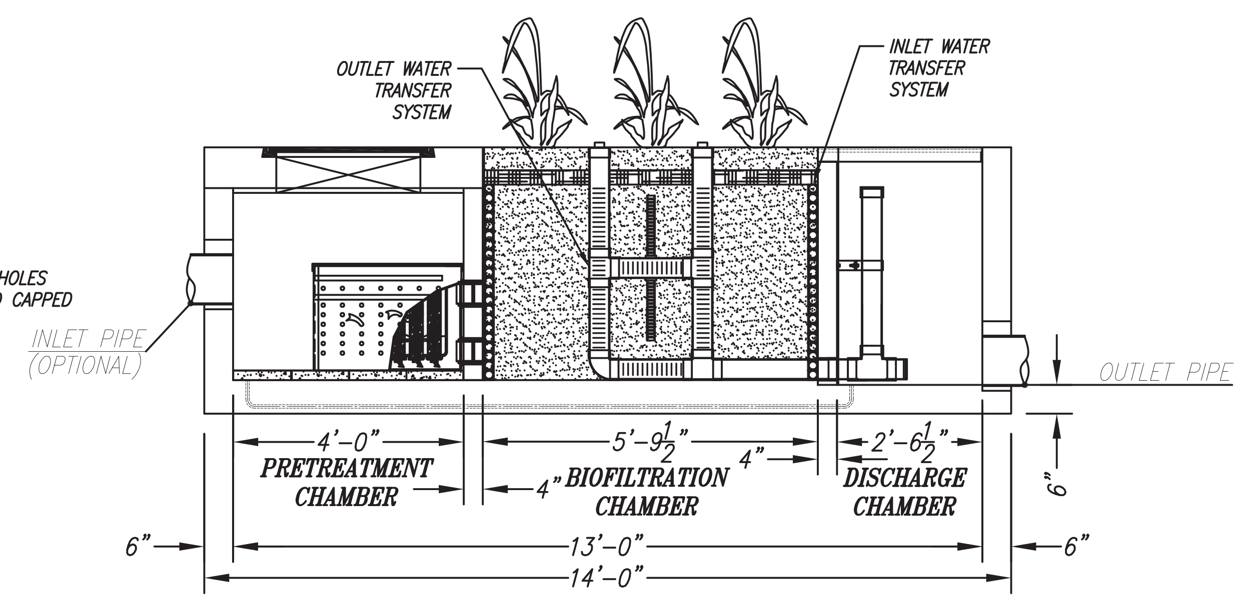
PLAN VIEW

BIOFILTRATION CHAMBER SURFACE AREA CALCS
SIDES = 2
5.5' L x 3.4' H = 18.7 SF
SIDE SURFACE AREA = 37.4 SF
ENDS = 2
3.7' L x 3.4' H = 12.6 SF
END SURFACE AREA = 25.2 SF
TOTAL WETLAND MEDIA SURFACE AREA **= 62.6 SF**
WETLAND MEDIA LOADING RATE 64.5 GPM / 62.6 SF **= 1.03 GPM/SF**

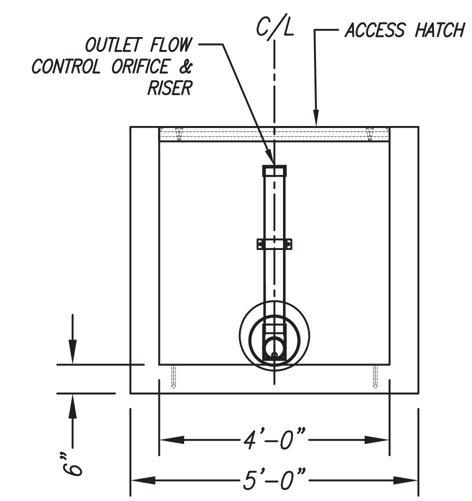
PRETREATMENT FILTER SURFACE AREA CALCS
SIDES = 2
0.50' L x 1.67' H = 0.84 SF
SIDE SURFACE AREA = 1.68 SF
ENDS = 2
0.25' L x 1.67' H = 0.42 SF
END SURFACE AREA = 0.84 SF
TOTAL PRETREATMENT SURFACE AREA 2.52 SF x 14 FILTERS **= 35.28 SF**
PRETREATMENT FILTER LOADING RATE 64.5 GPM / 35.28 SF **= 1.83 GPM/SF**



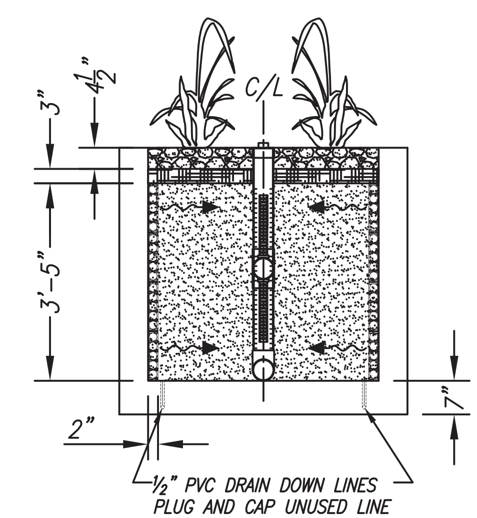
LEFT END VIEW
PRETREATMENT CHAMBER



ELEVATION VIEW



RIGHT END VIEW
DISCHARGE CHAMBER



SECTION
BIOFILTRATION CHAMBER

LEGEND

- 2" DRAIN CELL PERMITER INLET WATER TRANSFER SYSTEM
- WETLAND MEDIA
- PLANT/ROOT MOISTURE RETENTION LAYER
- MANHOLE / ACCESS HATCH

INSTALLATION NOTES:

1. INSTALL UNIT ON LEVEL BED OF GRAVEL OF AT LEAST 6" IN DEPTH.
2. CONCRETE 28 DAY COMPRESSIVE STRENGTH fc=5,000 PSI.
3. REINFORCING: ASTM A-615, GRADE 60.
4. RATED FOR PARKWAY LOADING 300 PSF.
5. JOINT SEALANT: BUTYL RUBBER SS-S-00210

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OCEANSIDE, CA 92049
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	NAME	DATE
DRAWN		
EDITED		

COMMENTS:

TITLE: MWS LINEAR 2.0 VAULT TYPE

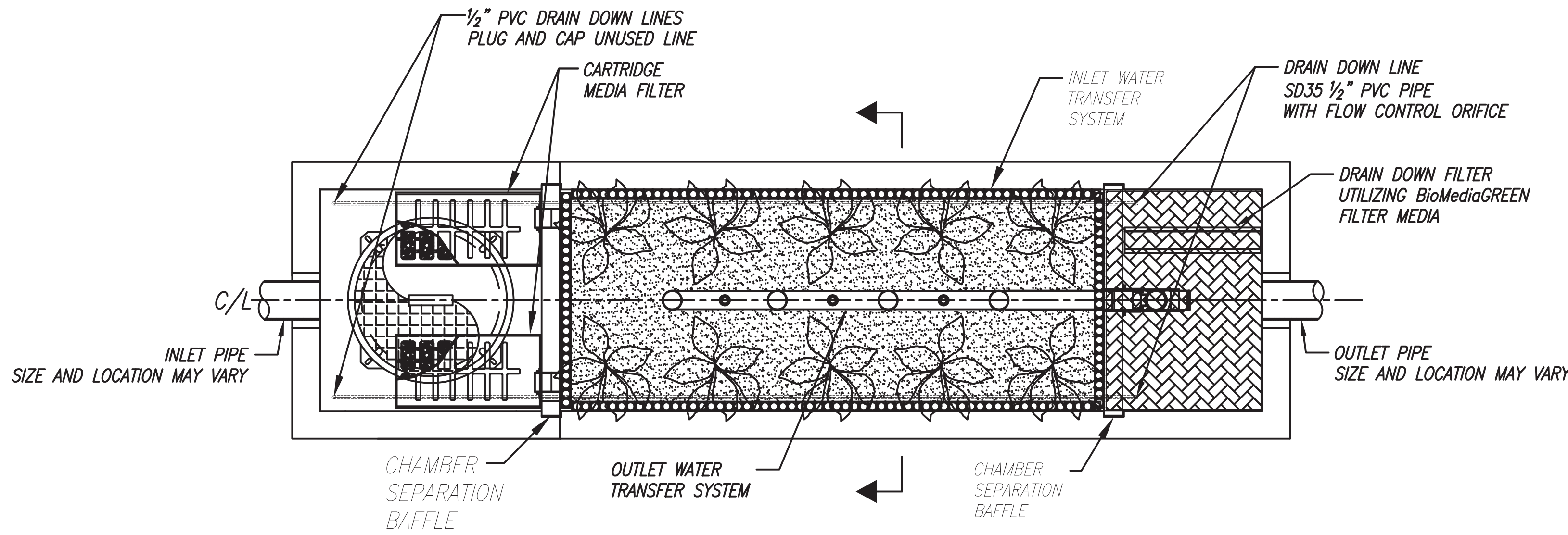
SIZE	DWG. NO.	REV
	MWS-L-4-13-V	

SCALE NTS | UNITS = INCHES | SHEET 1 OF 1

MODULAR WETLAND SYSTEMS - LINEAR 2.0
17' VAULT TYPE

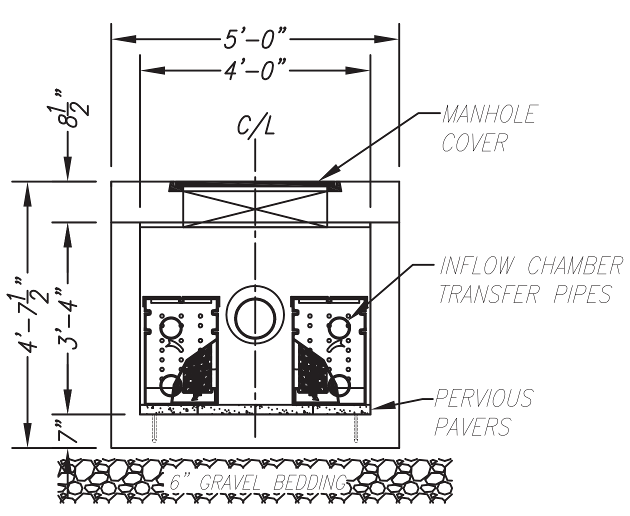
MODULAR WETLANDS™

FLOW RATES
PEAK TREATMENT FLOW RATE = .206 CFS OR 92.45 GPM
PEAK BYPASS FLOW RATE = OPTIONAL BYPASS
SPECIFICATIONS
INSTALL AT SURFACE
O.D. DIMENSIONS = 18' X 5' X 4.7'
TOP OF CURB TO INVERT OUT = 4.13'
SEDIMENT STORAGE CAPACITY = 1000 LBS OR 23.5 CF

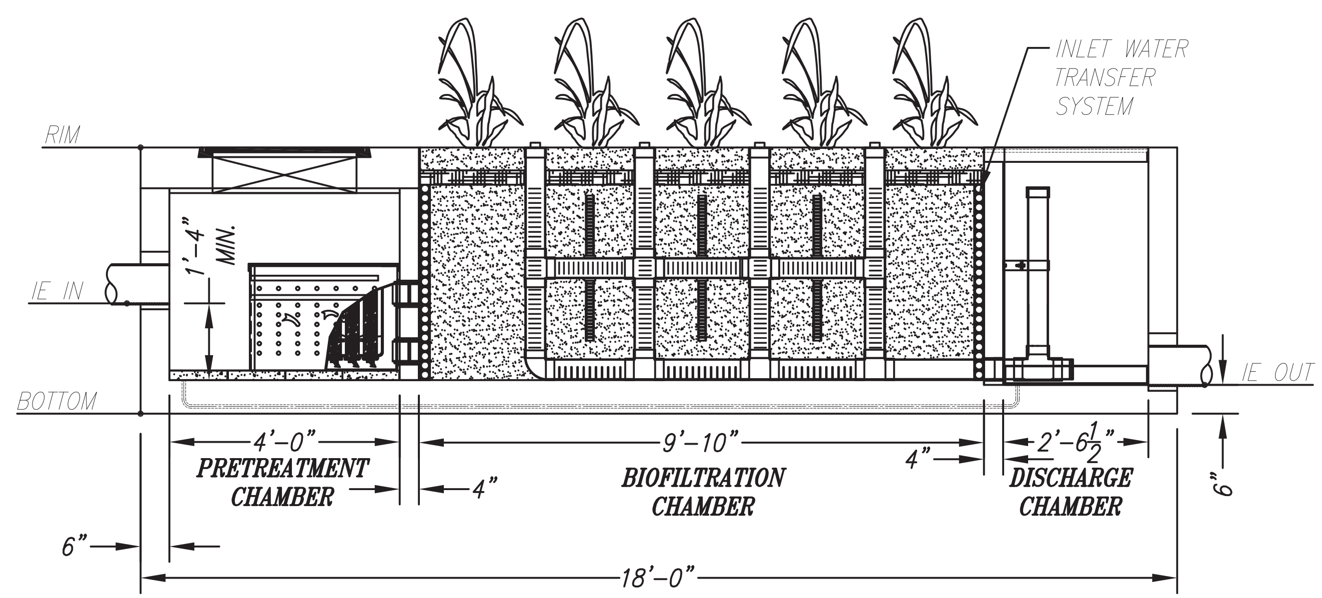


PLAN VIEW

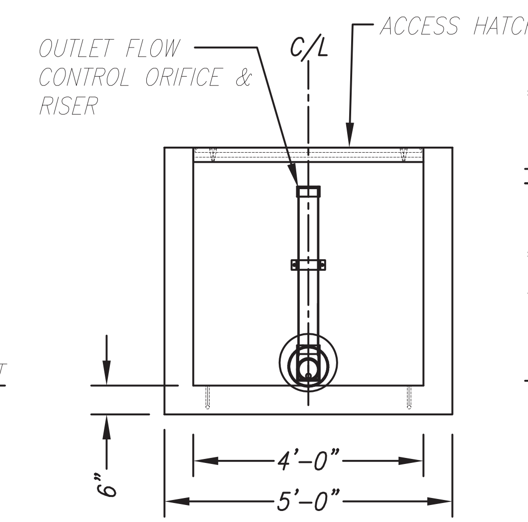
BIOFILTRATION CHAMBER SURFACE AREA CALCS
SIDES = 2
9.5' L x 3.4' H = 32.3 SF
SIDE SURFACE AREA = 64.6 SF
ENDS = 2
3.7' L x 3.4' H = 12.6 SF
END SURFACE AREA = 25.2 SF
TOTAL WETLAND MEDIA SURFACE AREA **= 89.8 SF**
WETLAND MEDIA LOADING RATE 92.45 GPM / 89.8 SF **= 1.03 GPM/SF**
PRETREATMENT FILTER SURFACE AREA CALCS
SIDES = 2
0.50' L x 1.67' H = 0.84 SF
SIDE SURFACE AREA = 1.68 SF
ENDS = 2
0.25' L x 1.67' H = 0.42 SF
END SURFACE AREA = 0.84 SF
TOTAL PRETREATMENT SURFACE AREA 2.52 SF x 28 FILTERS **= 70.56 SF**
PRETREATMENT FILTER LOADING RATE 92.45 GPM / 70.56 SF **= 1.31 GPM/SF**



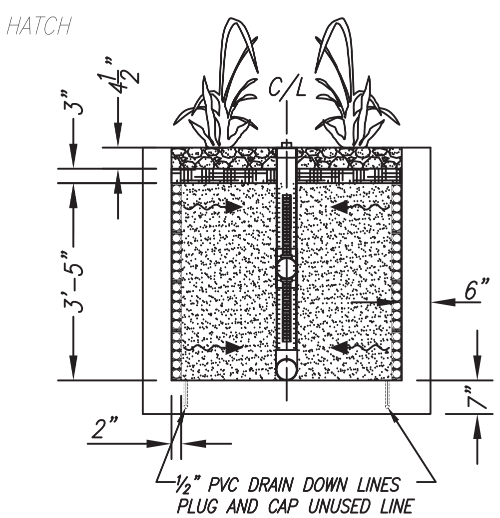
LEFT END VIEW
PRETREATMENT CHAMBER



ELEVATION VIEW



RIGHT END VIEW
DISCHARGE CHAMBER



SECTION
BIOFILTRATION CHAMBER

LEGEND

- 2" DRAIN CELL PERIMETER INLET WATER TRANSFER SYSTEM
- WETLAND MEDIA
- PLANT/ROOT MOISTURE RETENTION LAYER
- MANHOLE / ACCESS HATCH

INSTALLATION NOTES:

1. INSTALL UNIT ON LEVEL BED OF GRAVEL OF AT LEAST 6" IN DEPTH.
2. CONCRETE 28 DAY COMPRESSIVE STRENGTH fc=5,000 PSI.
3. REINFORCING: ASTM A-615, GRADE 60.
4. RATED FOR PARKWAY LOADING 300 PSF.
5. ALL WALLS ARE 6" THICK, BAFFLES ARE 4" THICK, BOTTOM 7" OR 8" THICK, TOP 8.5" THICK.
6. JOINT SEALANT: BUTYL RUBBER SS-S-00210

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	NAME	DATE
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EDITED		

COMMENTS:

TITLE: MWS LINEAR 2.0 VAULT TYPE

SIZE | DWG. NO. MWS-L-4-17-V | REV

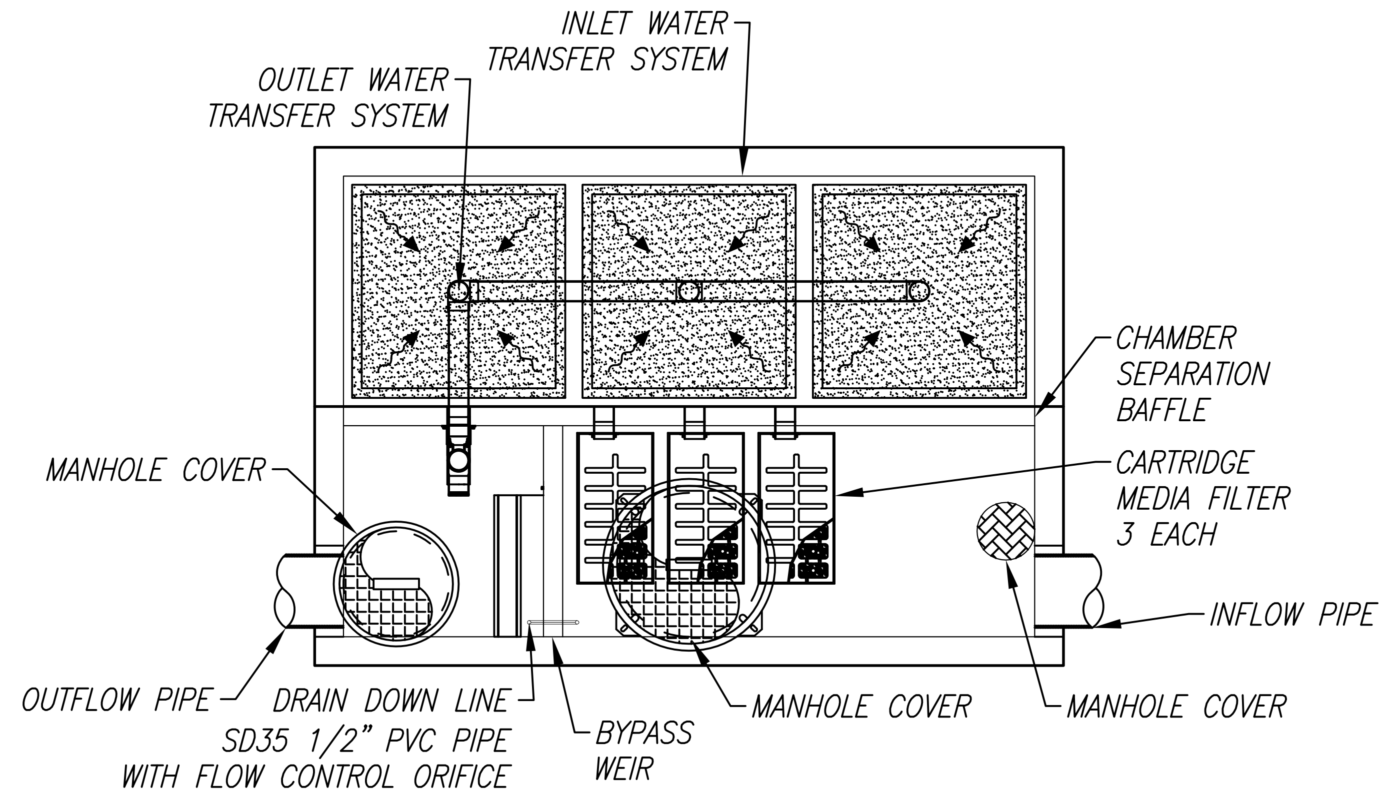
SCALE 1:40 | UNITS = INCHES | SHEET 1 OF 1

MODULAR WETLANDS™

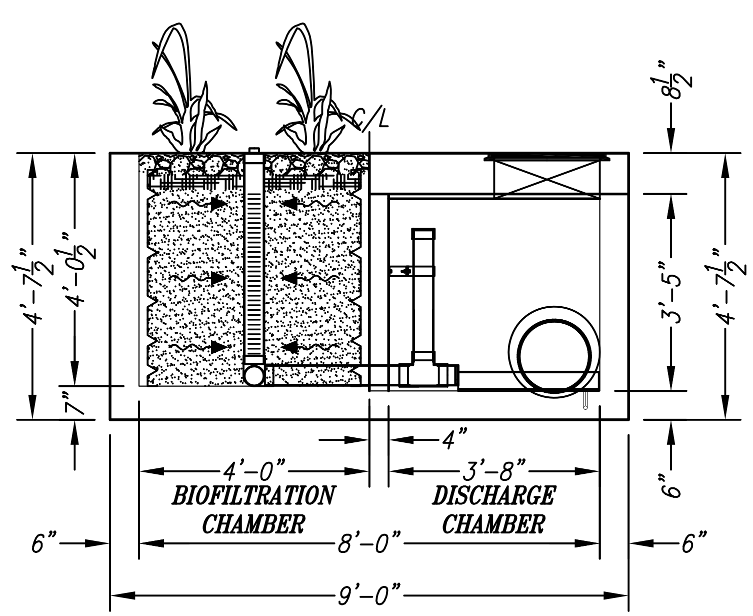
MODULAR WETLAND SYSTEMS LINEAR 2.0
VAULT TYPE

FLOW RATES
PEAK TREATMENT FLOW RATE = 0.35 CFS OR 155.49 GPM
PEAK BYPASS FLOW RATE = N/A
SPECIFICATIONS
INSTALL AT SURFACE
O.D. DIMENSIONS = 13' X 9' X 4.63'
RIM ELEVATION TO IE OUT: = 4.13'

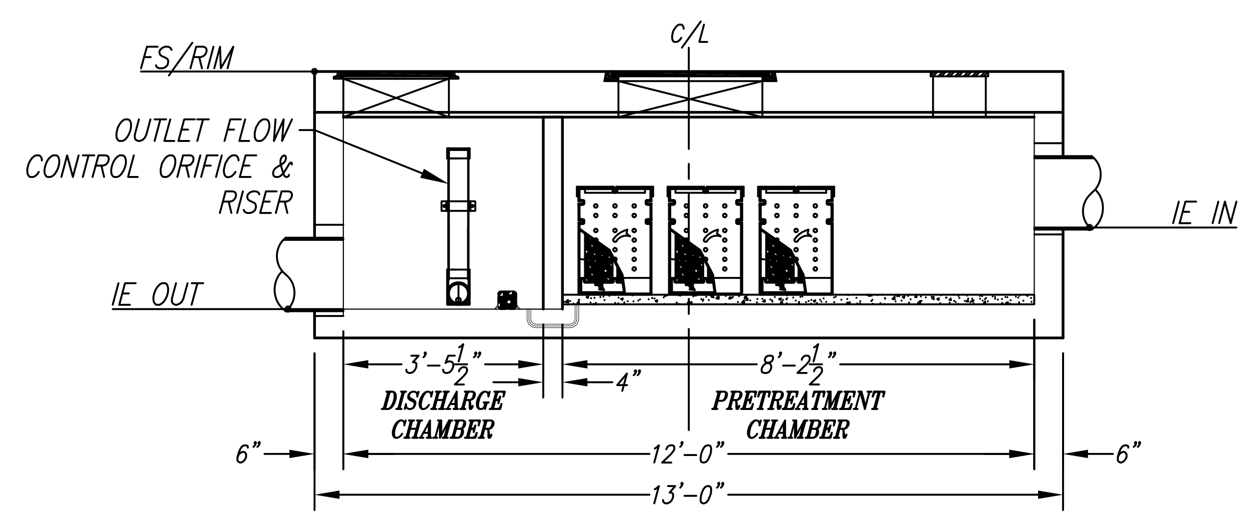
BIOFILTRATION CHAMBER SURFACE AREA CALCS
SIDES = 4
3.7' L x 3.4' H = 12.58 SF
12.58 SF X 4 SIDES = 50.32
CELLS = 3
50.32 X 3 CELLS = 150.96
TOTAL WETLAND MEDIA SURFACE AREA **= 150.96 SF**
WETLAND MEDIA LOADING RATE 155.49 GPM / 150.96 SF **= 1.03 GPM/SF**
PRETREATMENT FILTER SURFACE AREA CALCS
TOTAL PRETREATMENT SURFACE AREA **= 75 SF**
PRETREATMENT FILTER LOADING RATE 155.49 GPM / 75 SF **= 2.07 GPM/SF**



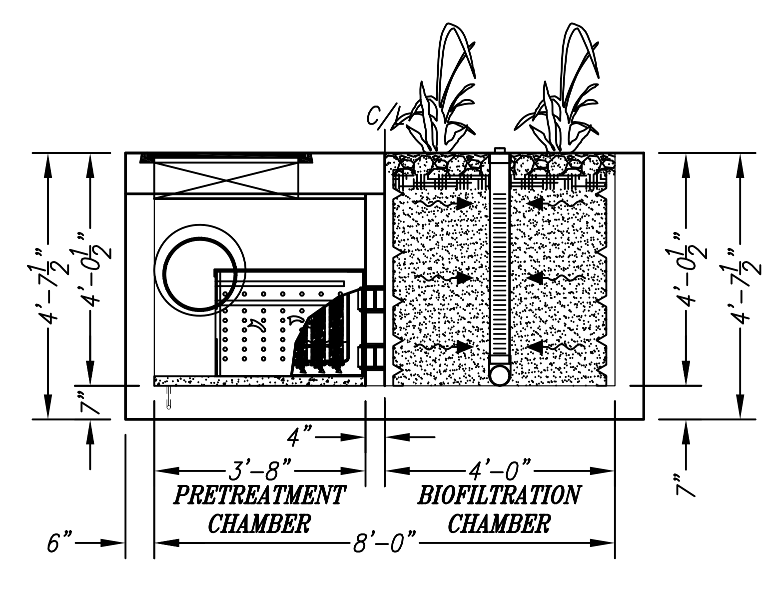
PLAN VIEW



LEFT END VIEW



ELEVATION VIEW



RIGHT END VIEW

LEGEND

- WETLAND MEDIA
- PLANT/ROOT MOISTURE RETENTION LAYER
- MANHOLE / ACCESS HATCH

INSTALLATION NOTES:

1. INSTALL UNIT ON LEVEL BED OF GRAVEL OF AT LEAST 6" IN DEPTH WITH 1' MINIMUM OVER EXCAVATION AROUND ENTIRE UNIT.
2. CONCRETE 28 DAY COMPRESSIVE STRENGTH fc=5,000 PSI.
3. REINFORCING: ASTM A-615, GRADE 60.
4. RATED FOR PARKWAY LOADING 300 PSF.
5. JOINT SEALANT: BUTYL RUBBER SS-S-00210

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P.O. BOX 869
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	NAME	DATE
DRAWN		
REVIEWED		
APPROVED		
COMMENTS:		

TITLE: MWS LINEAR 2.0 VAULT TYPE

SIZE	DWG. NO.	REV
	MWS-L-8-12-UG-V	

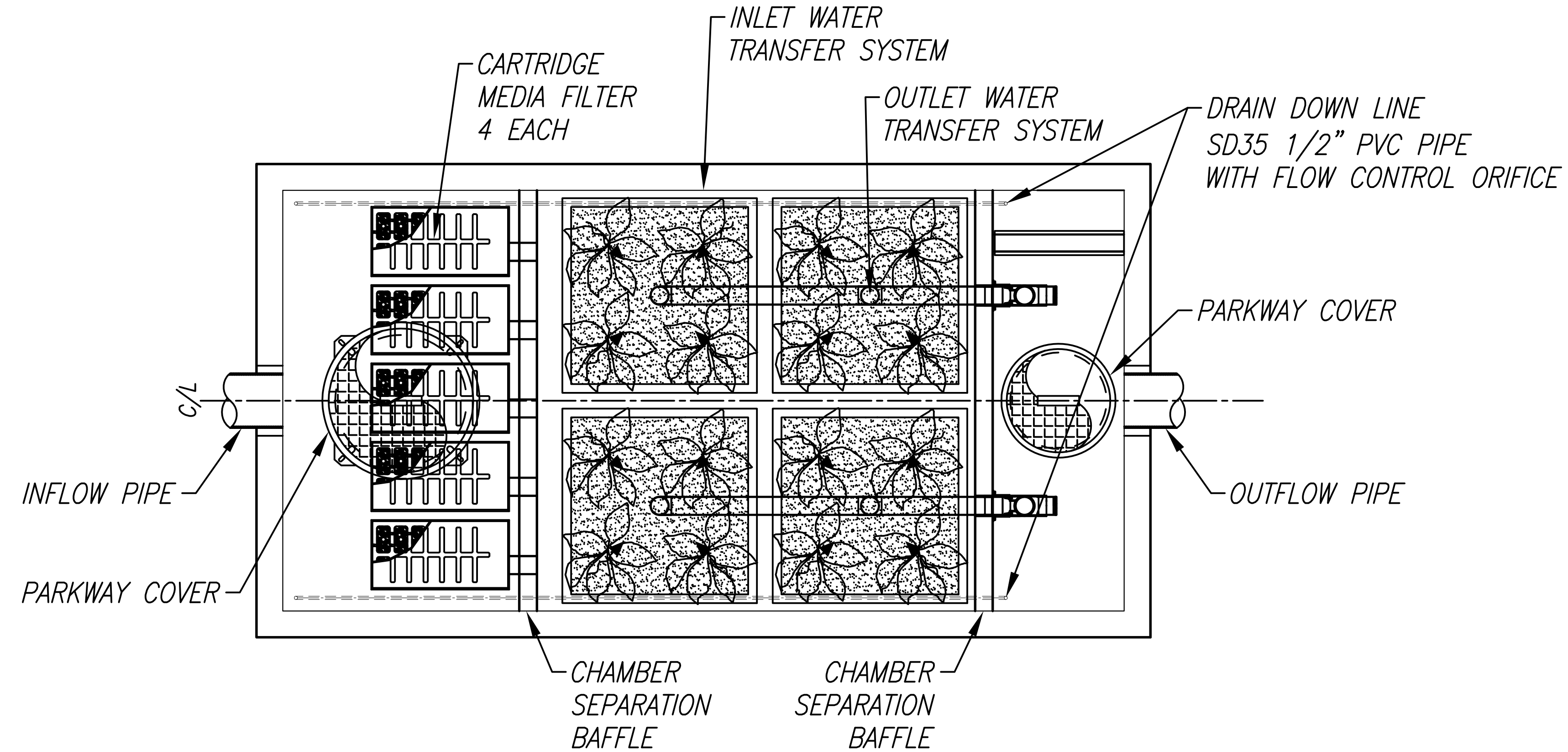
SCALE NTS | UNITS = INCHES | SHEET 1 OF 2

MODULAR WETLAND SYSTEMS LINEAR 2.0 VAULT TYPE

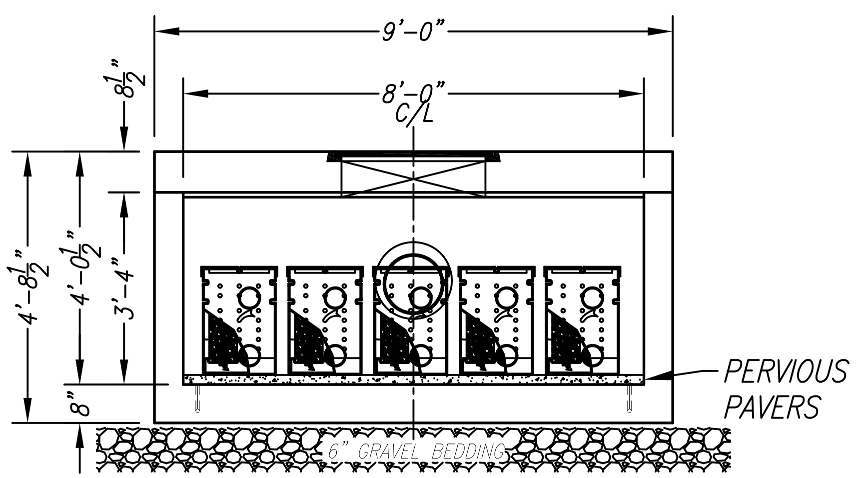
MODULAR WETLANDS™

FLOW RATES
PEAK TREATMENT FLOW RATE = 0.462 CFS OR 207.31 GPM
PEAK BYPASS FLOW RATE = N/A
SPECIFICATIONS
INSTALL AT SURFACE
O.D. DIMENSIONS = 17' X 9' X 4.7'

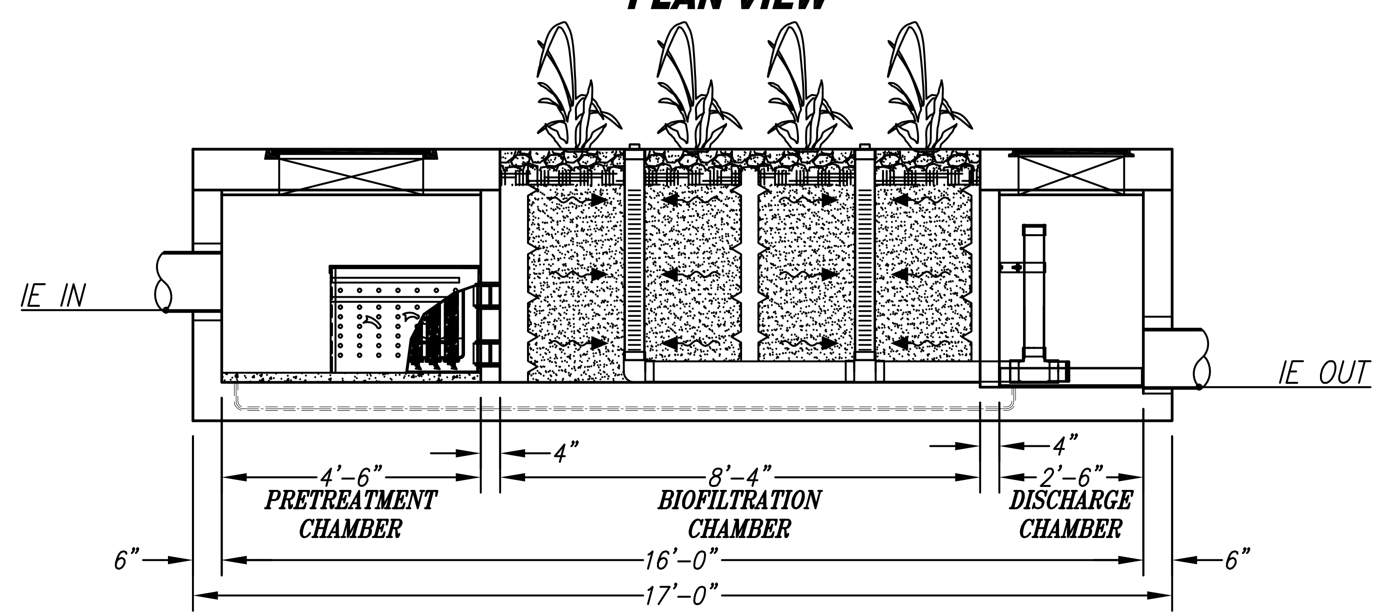
BIOFILTRATION CHAMBER SURFACE AREA CALCS
SIDES = 4
3.7' L x 3.4' H = 12.58 SF
12.58 SF X 4 SIDES = 50.32
CELLS = 4
50.32 X 4 CELLS = 201.28
TOTAL WETLAND MEDIA SURFACE AREA **= 201.28 SF**
WETLAND MEDIA LOADING RATE 207.31 GPM / 201.28 SF **= 1.03 GPM/SF**
PRETREATMENT FILTER SURFACE AREA CALCS
TOTAL PRETREATMENT SURFACE AREA 25 SF x 5 FILTERS **= 125.00 SF**
PRETREATMENT FILTER LOADING RATE 207.31 GPM / 125.00 SF **= 1.66 GPM/SF**



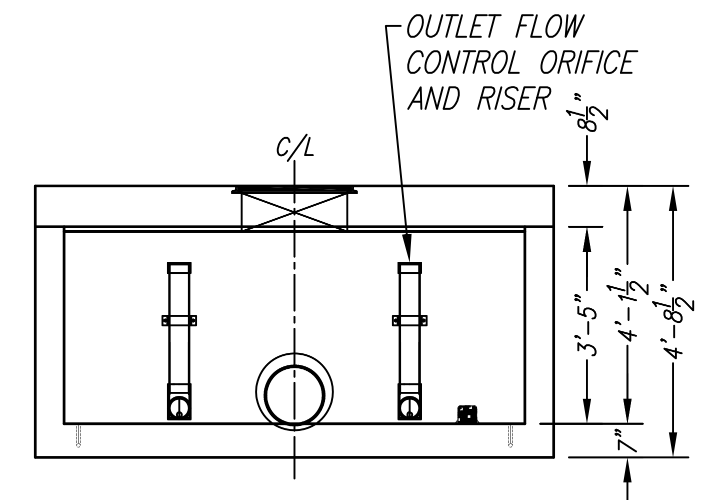
PLAN VIEW



LEFT END VIEW



ELEVATION VIEW



RIGHT END VIEW

LEGEND

- WETLAND MEDIA
- PLANT/ROOT MOISTURE RETENTION LAYER
- MANHOLE / ACCESS HATCH

INSTALLATION NOTES:

1. INSTALL UNIT ON LEVEL BED OF GRAVEL OF AT LEAST 6" IN DEPTH WITH 1' MINIMUM OVER EXCAVATION AROUND ENTIRE UNIT.
2. CONCRETE 28 DAY COMPRESSIVE STRENGTH fc=5,000 PSI.
3. REINFORCING: ASTM A-615, GRADE 60.
4. RATED FOR PARKWAY LOADING 300 PSF.
5. JOINT SEALANT: BUTYL RUBBER SS-S-00210

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P.O. BOX 869
OCEANSIDE, CA 92049
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	NAME	DATE
DRAWN		
REVIEWED		
APPROVED		
COMMENTS:		

TITLE: MWS LINEAR 2.0 CURB TYPE

SIZE | DWG. NO. MWS-L-8-16-V | REV

SCALE NTS | UNITS = INCHES | SHEET 1 OF 1

BIO-7: Proprietary Biotreatment

Proprietary biotreatment devices are devices that are manufactured to mimic natural systems such as bioretention areas by incorporating plants, soil, and microbes engineered to provide treatment at higher flow rates or volumes and with smaller footprints than their natural counterparts. Incoming flows are typically filtered through a planting media (mulch, compost, soil, plants, microbes, etc.) and either infiltrated or collected by an underdrain and delivered to the storm water conveyance system. Tree box filters are an increasingly common type of proprietary biotreatment device that are installed at curb level and filled with a bioretention type soil. For low to moderate flows they operate similarly to bioretention systems and are bypassed during high flows. Tree box filters are highly adaptable solutions that can be used in all types of development and in all types of soils but are especially applicable to dense urban parking lots, street, and roadways.

Also known as:

- *Catch basin planter box*
- *Bioretention vault*
- *Tree box filter*

Proprietary biotreatment
Source: http://www.americastusa.com /index.php/filterra/

Feasibility Screening Considerations

- Proprietary biotreatment devices that are unlined may cause incidental infiltration. Therefore, an evaluation of site conditions should be conducted to evaluate whether the BMP should include an impermeable liner to avoid infiltration into the subsurface.

Opportunity Criteria

- Drainage areas of 0.25 to 1.0 acres.
- Land use may include commercial, residential, mixed use, institutional, and subdivisions. Proprietary biotreatment facilities may also be applied in parking lot islands, traffic circles, road shoulders, and road medians.
- Must not adversely affect the level of flood protection provided by the drainage system.

OC-Specific Design Criteria and Considerations

☐ Frequent maintenance and the use of screens and grates to keep trash out may decrease the likelihood of clogging and prevent obstruction and bypass of incoming flows.

☐ Consult proprietors for specific criteria concerning the design and performance.

☐ Proprietary biotreatment may include specific media to address pollutants of concern. However, for proprietary device to be considered a biotreatment device the media must be capable of supporting rigorous growth of vegetation.

☐ Proprietary systems must be acceptable to the reviewing agency. Reviewing agencies shall have the discretion to request performance information. Reviewing agencies shall have the discretion to deny the use of a proprietary BMP on the grounds of performance, maintenance considerations, or other relevant factors.

☐ In right of way areas, plant selection should not impair traffic lines of site. Local jurisdictions may also limit plant selection in keeping with landscaping themes.

Computing Sizing Criteria for Proprietary Biotreatment Device

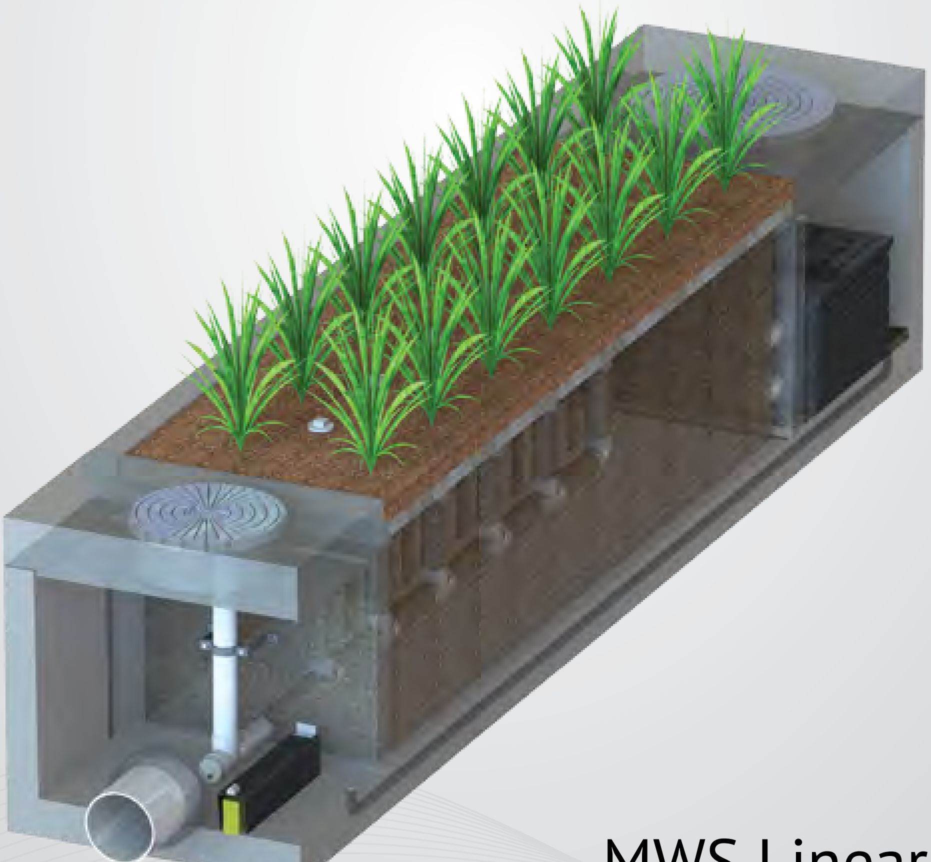
- Proprietary biotreatment devices can be volume based or flow-based BMPs.
- Volume-based proprietary devices should be sized using the Simple Design Capture Volume Sizing Method described in **Appendix** III.3.1 or the Capture Efficiency Method for Volume-Based, Constant Drawdown BMPs described in **Appendix** III.3.2.
- The required design flowrate for flow-based proprietary devices should be computed using the Capture Efficiency Method for Flow-based BMPs described in **Appendix** III.3.3).

Additional References for Design Guidance

- Los Angeles Unified School District (LAUSD) Stormwater Technical Manual, Chapter 4: http://www.laschools.org/employee/design/fs-studies-and-reports/download/white_paper_report_material/Storm_Water_Technical_Manual_2009-opt-red.pdf?version_id=76975850
- Los Angeles County Stormwater BMP Design and Maintenance Manual, Chapter 9: http://dpw.lacounty.gov/DES/design_manuals/StormwaterBMPDesignandMaintenance.pdf
- Santa Barbara BMP Guidance Manual, Chapter 6: http://www.santabarbaraca.gov/NR/rdonlyres/91D1FA75-C185-491E-A882-49EE17789DF8/0/Manual_071008_Final.pdf

MODULAR WETLANDS™

Advanced ***Stormwater*** *Biofiltration*



MWS Linear

Contents

The Urban Impact

For hundreds of years natural wetlands surrounding our shores have played an integral role as nature's stormwater treatment system. But as our cities grow and develop, these natural wetlands have perished under countless roads, rooftops, and parking lots.

Plant A Wetland

Without natural wetlands our cities are deprived of water purification, flood control, and land stability. Modular Wetlands and the MWS Linear re-establish nature's presence and rejuvenate water ways in urban areas.

MWS Linear

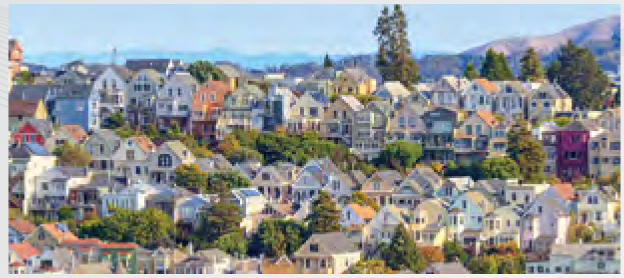
The Modular Wetland System Linear represents a pioneering breakthrough in stormwater technology as the only biofiltration system to utilize patented horizontal flow, allowing for a smaller footprint and higher treatment capacity. While most biofilters use little or no pre-treatment, the MWS Linear incorporates an advanced pre-treatment chamber that includes separation and pre-filter cartridges. In this chamber sediment and hydrocarbons are removed from runoff before it enters the biofiltration chamber, in turn reducing maintenance costs and improving performance.

Applications

The MWS Linear has been successfully used on numerous new construction and retrofit projects. The system's superior versatility makes it beneficial for a wide range of stormwater and waste water applications - treating rooftops, streetscapes, parking lots, and industrial sites.

Industrial

Many states enforce strict regulations for discharges from industrial sites. The MWS Linear has helped various sites meet difficult EPA mandated effluent limits for dissolved metals and other pollutants.



Residential

Low to high density developments can benefit from the versatile design of the MWS Linear. The system can be used in both decentralized LID design and cost-effective end-of-the-line configurations.

Streets

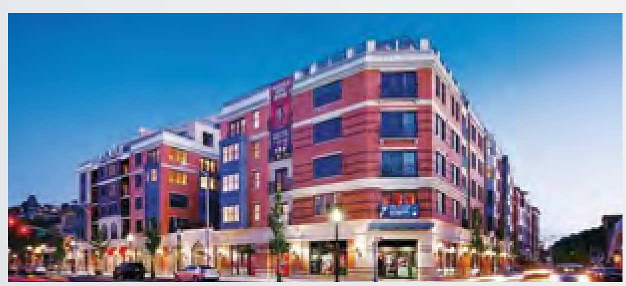
Street applications can be challenging due to limited space. The MWS Linear is very adaptable, and offers the smallest footprint to work around the constraints of existing utilities on retrofit projects.

Parking Lots

Parking lots are designed to maximize space and the MWS Linear's 4 ft. standard planter width allows for easy integration into parking lot islands and other landscape medians.

Commercial

Compared to bioretention systems, the MWS Linear can treat far more area in less space - meeting treatment and volume control requirements.



Mixed Use

The MWS Linear can be installed as a raised planter to treat runoff from rooftops or patios, making it perfect for sustainable "live-work" spaces.

More applications are available on our website: www.ModularWetlands.com/Applications

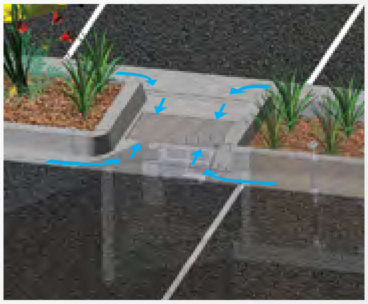
- Agriculture
- Reuse
- Low Impact Development
- Waste Water


Configurations

The MWS Linear is the preferred biofiltration system of Civil Engineers across the country due to its versatile design. This highly versatile system has available "pipe-in" options on most models, along with built-in curb or grated inlets for simple integration into your stormdrain design.

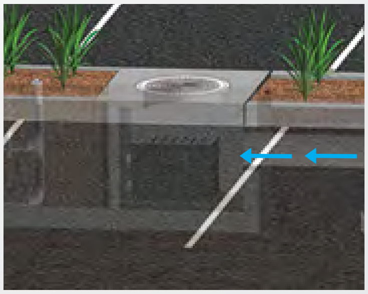
Curb Type

The *Curb Type* configuration accepts sheet flow through a curb opening and is commonly used along road ways and parking lots. It can be used in sump or flow by conditions. Length of curb opening varies based on model and size.



Grate Type

The *Grate Type* configuration offers the same features and benefits as the *Curb Type* but with a grated/drop inlet above the systems pre-treatment chamber. It has the added benefit of allowing for pedestrian access over the inlet. ADA compliant grates are available to assure easy and safe access. The *Grate Type* can also be used in scenarios where runoff needs to be intercepted on both sides of landscape islands.



Vault Type

The system's patented horizontal flow biofilter is able to accept inflow pipes directly into the pre-treatment chamber, meaning the MWS Linear can be used in end-of-the-line installations. This greatly improves feasibility over typical decentralized designs that are required with other biofiltration/bioretention systems. Another benefit of the "pipe in" design is the ability to install the system downstream of underground detention systems to meet water quality volume requirements.

Downspout Type

The *Downspout Type* is a variation of the *Vault Type* and is designed to accept a vertical downspout pipe from roof top and podium areas. Some models have the option of utilizing an internal bypass, simplifying the overall design. The system can be installed as a raised planter and the exterior can be stuccoed or covered with other finishes to match the look of adjacent buildings.

Advantages & Operation

The MWS Linear is the most efficient and versatile biofiltration system on the market, and the only system with horizontal flow which improves performance, reduces footprint, and minimizes maintenance. Figure-1 and Figure-2 illustrate the invaluable benefits of horizontal flow and the multiple treatment stages.

Featured Advantages

- Horizontal Flow Biofiltration
- Greater Filter Surface Area
- Pre-Treatment Chamber
- Patented Perimeter Void Area
- Flow Control
- No Depressed Planter Area

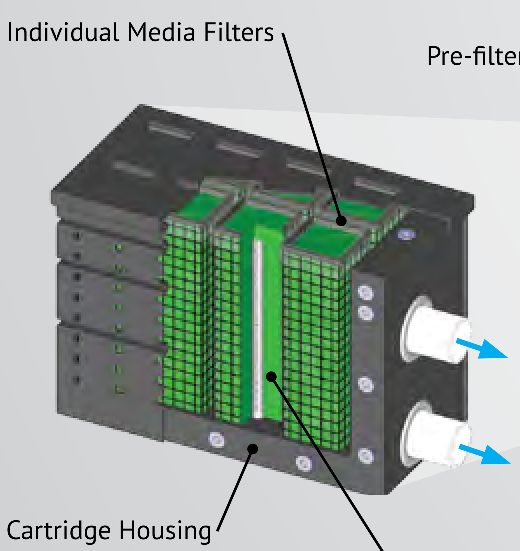
1 Pre-Treatment

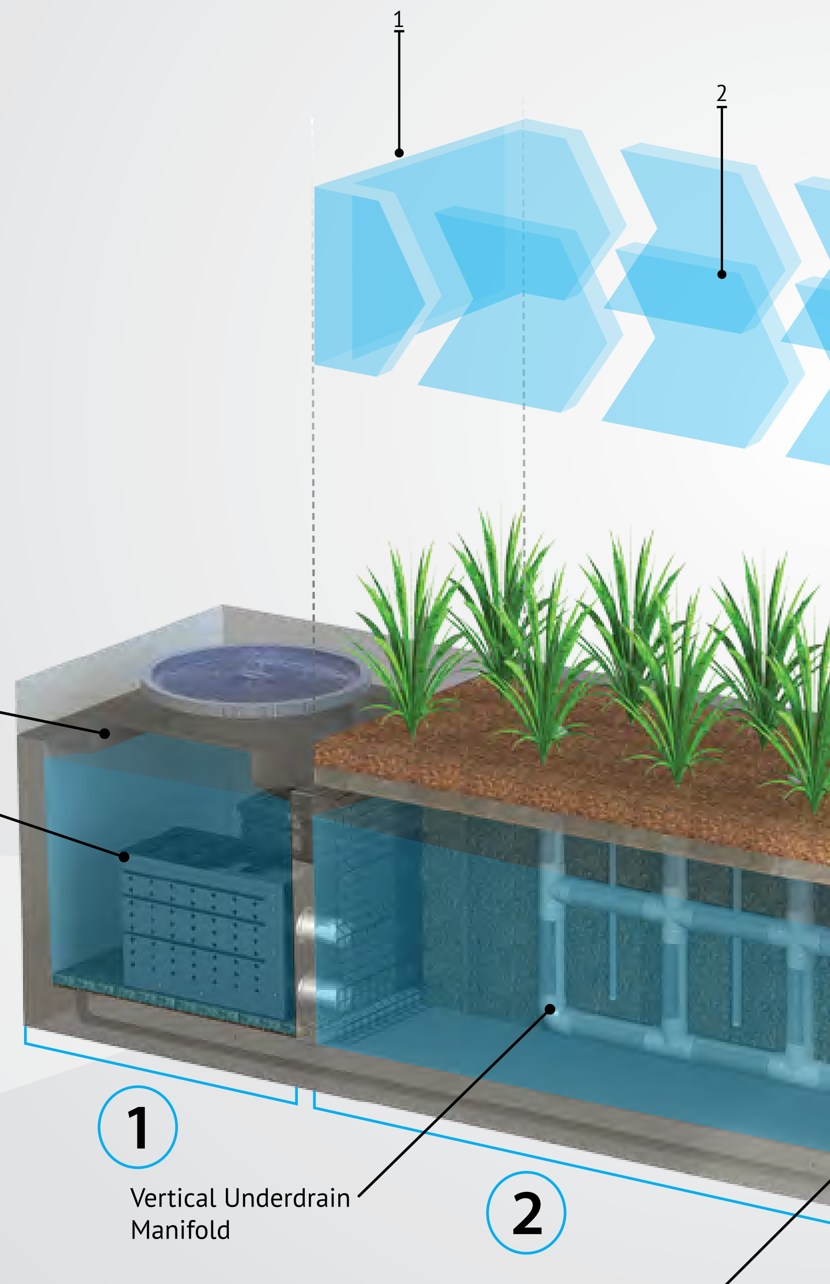
Separation

- Trash, sediment, and debris are separated before entering the pre-filter cartridges
- Designed for easy maintenance access

Pre-Filter Cartridges

- Over 25 ft^2 of surface area per cartridge
- Utilizes BioMediaGREEN filter material
- Removes over 80% of TSS & 90% of hydrocarbons
- Prevents pollutants that cause clogging from migrating to the biofiltration chamber





BioMediaGREEN

WetlandMEDIA™

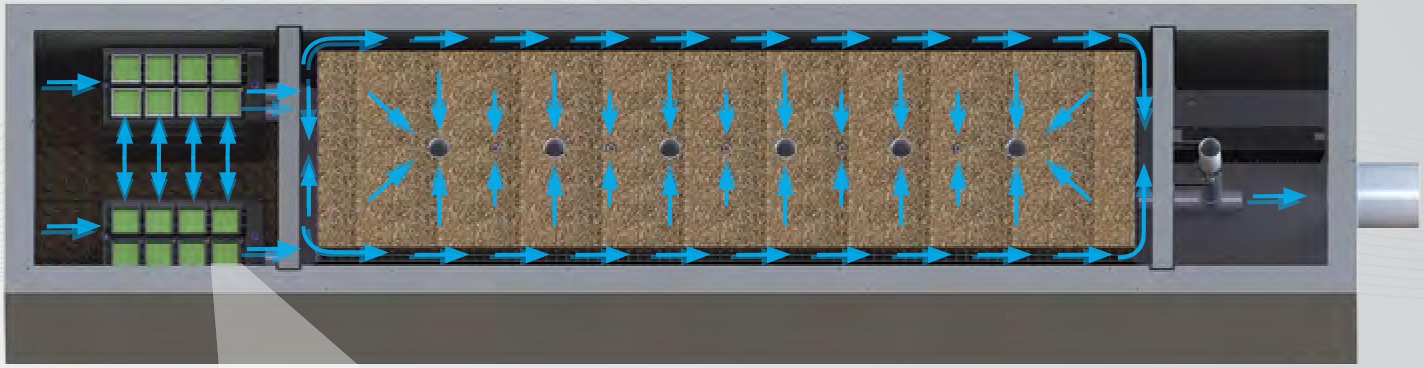


Fig. 2 - Top View

2x to 3x More Surface Area Than Traditional Downward Flow Bioretention Systems.

2 Biofiltration

Horizontal Flow

- Less clogging than downward flow biofilters
- Water flow is subsurface
- Improves biological filtration

Patented Perimeter Void Area

- Vertically extends void area between the walls and the WetlandMEDIA on all four sides.
- Maximizes surface area of the media for higher treatment capacity

WetlandMEDIA

- Contains no organics and removes phosphorus
- Greater surface area and 48% void space
- Maximum evapotranspiration
- High ion exchange capacity and light weight

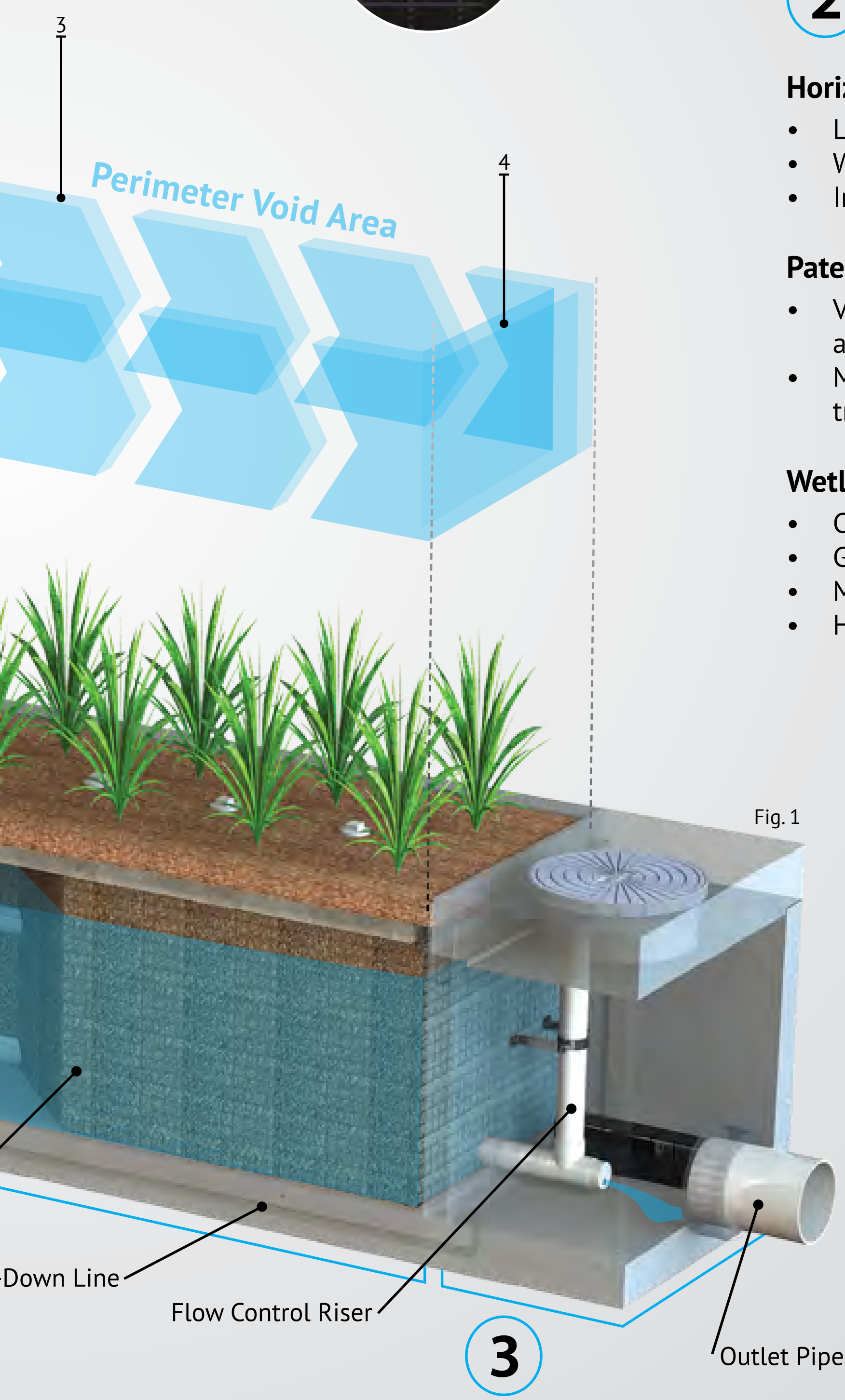


Fig. 1

3 Discharge

Flow Control

- Orifice plate controls flow of water through WetlandMEDIA to a level lower than the media's capacity.
- Extends the life of the media and improves performance

Drain-Down Filter

- The Drain-Down is an optional feature that completely drains the pre-treatment chamber
- Water that drains from the pre-treatment chamber between storm events will be treated

Orientations

Side-By-Side

The *Side-By-Side* orientation places the pre-treatment and discharge chamber adjacent to one another with the biofiltration chamber running parallel on either side. This minimizes the system length, providing a highly compact footprint. It has been proven useful in situations such as streets with directly adjacent sidewalks, as half of the system can be placed under that sidewalk. This orientation also offers internal bypass options as discussed below.

End-To-End

The *End-To-End* orientation places the pre-treatment and discharge chambers on opposite ends of the biofiltration chamber therefore minimizing the width of the system to 5 ft (outside dimension). This orientation is perfect for linear projects and street retrofits where existing utilities and sidewalks limit the amount of space available for installation. One limitation of this orientation is bypass must be external.

Bypass

Internal Bypass Weir (Side-by-Side Only)

The *Side-By-Side* orientation places the pre-treatment and discharge chambers adjacent to one another allowing for integration of internal bypass. The wall between these chambers can act as a bypass weir when flows exceed the system's treatment capacity, thus allowing bypass from the pre-treatment chamber directly to the discharge chamber.

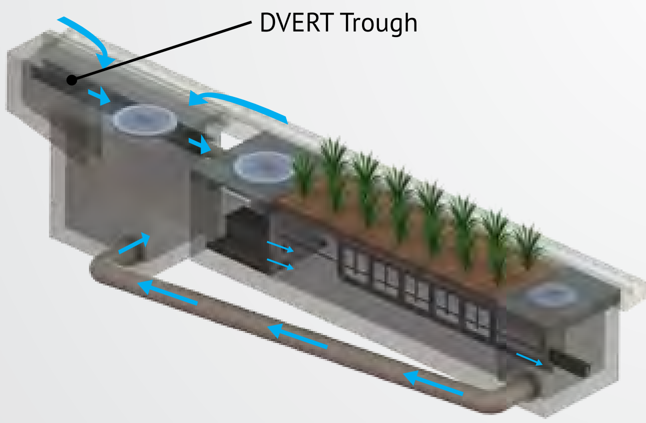
External Diversion Weir Structure

This traditional offline diversion method can be used with the MWS Linear in scenarios where runoff is being piped to the system. These simple and effective structures are generally configured with two outflow pipes. The first is a smaller pipe on the upstream side of the diversion weir - to divert low flows over to the MWS Linear for treatment. The second is the main pipe that receives water once the system has exceeded treatment capacity and water flows over the weir.

Flow By Design

This method is one in which the system is placed just upstream of a standard curb or grate inlet to intercept the first flush. Higher flows simply pass by the MWS Linear and into the standard inlet downstream.

DVERT Low Flow Diversion



This simple yet innovative diversion trough can be installed in existing or new curb and grate inlets to divert the first flush to the MWS Linear via pipe. It works similar to a rain gutter and is installed just below the opening into the inlet. It captures the low flows and channels them over to a connecting pipe exiting out the wall of the inlet and leading to the MWS Linear. The DVERT is perfect for retrofit and green street applications that allows the MWS Linear to be installed anywhere space is available.

Performance

The MWS Linear continues to outperform other treatment methods with superior pollutant removal for TSS, heavy metals, nutrients, hydrocarbons and bacteria. Since 2007 the MWS Linear has been field tested on numerous sites across the country. With it's advanced pre-treatment chamber and innovative horizontal flow biofilter, the system is able to effectively remove pollutants through a combination of physical, chemical, and biological filtration processes. With the same biological processes found in natural wetlands, the MWS Linear harnesses natures ability to process, transform, and remove even the most harmful pollutants.

Approvals

The MWS Linear has successfully met years of challenging technical reviews and testing from some of the most prestigious and demanding agencies in the nation, and perhaps the world.

Washington State DOE Approved

The MWS Linear is approved for General Use Level Designation (GULD) for Basic, Enhanced, and Phosphorus treatment at 1 gpm/ft^2 loading rate. The highest performing BMP on the market for all main pollutant categories.

TSS	Total Phosphorus	Ortho Phosphorus	Nitrogen	Dissolved Zinc	Dissolved Copper	Total Zinc	Total Copper	Motor Oil
85%	64%	67%	45%	66%	38%	69%	50%	95%

DEQ Assignment

The Virginia Department of Environmental Quality assigned the MWS Linear, the highest phosphorus removal rating for manufactured treatment devices to meet the new Virginia Stormwater Management Program (VSMP) Technical Criteria.

MASTEP Evaluation

The University of Massachusetts at Amherst – Water Resources Research Center, issued a technical evaluation report noting removal rates up to 84% TSS, 70% Total Phosphorus, 68.5% Total Zinc, and more.

Rhode Island DEM Approved

Approved as an authorized BMP and noted to achieve the following minimum removal efficiencies: 85% TSS, 60% Pathogens, 30% Total Phosphorus for discharges to freshwater systems, and 30% Total Nitrogen for discharges to saltwater or tidal systems.

Flow Based Sizing

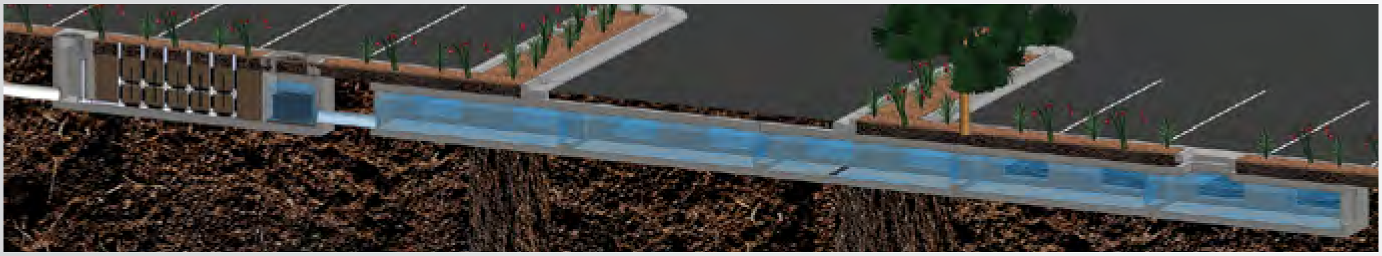
The MWS Linear can be used in stand alone applications to meet treatment flow requirements. Since the MWS Linear is the only biofiltration system that can accept inflow pipes several feet below the surface it can be used not only in decentralized design applications but also as a large central end-of-the-line application for maximum feasibility.

Treatment Flow Sizing Table

Model #	Dimensions	WetlandMedia Surface Area	Treatment Flow Rate (cfs)
MWS-L-4-4	4' x 4'	23 ft^2	0.052
MWS-L-4-6	4' x 6'	32 ft^2	0.073
MWS-L-4-8	4' x 8'	50 ft^2	0.115
MWS-L-4-13	4' x 13'	63 ft^2	0.144
MWS-L-4-15	4' x 15'	76 ft^2	0.175
MWS-L-4-17	4' x 17'	90 ft^2	0.206
MWS-L-4-19	4' x 19'	103 ft^2	0.237
MWS-L-4-21	4' x 21'	117 ft^2	0.268
MWS-L-8-8	8' x 8'	100 ft^2	0.230
MWS-L-8-12	8' x 12'	151 ft^2	0.346
MWS-L-8-16	8' x 16'	201 ft^2	0.462

Volume Based Sizing

Many states require treatment of a water quality volume and do not offer the option of flow based design. The MWS Linear and its unique horizontal flow makes it the only biofilter that can be used in volume based design installed downstream of ponds, detention basins, and underground storage systems.



Treatment Volume Sizing Table

Model #	Treatment Capacity (cu. ft.) @ 24-Hour Drain Down	Treatment Capacity (cu. ft.) @ 48-Hour Drain Down
MWS-L-4-4	1140	2280
MWS-L-4-6	1600	3200
MWS-L-4-8	2518	5036
MWS-L-4-13	3131	6261
MWS-L-4-15	3811	7623
MWS-L-4-17	4492	8984
MWS-L-4-19	5172	10345
MWS-L-4-21	5853	11706
MWS-L-8-8	5036	10072
MWS-L-8-12	7554	15109
MWS-L-8-16	10073	20145

Installation

The MWS Linear is simple, easy to install, and has a space efficient design that offers lower excavation and installation costs compared to traditional tree-box type systems. The structure of the system resembles pre-cast catch basin or utility vaults and is installed in a similar fashion.

The system is delivered fully assembled for quick installation. Generally, the structure can be unloaded and set in place in 15 minutes. Our experienced team of field technicians are available to supervise installations and provide technical support.

Maintenance

Reduce your maintenance costs, man hours, and materials with the MWS Linear. Unlike other biofiltration systems that provide no pre-treatment, the MWS Linear is a self-contained treatment train which incorporates simple and effective pre-treatment.

Maintenance requirements for the biofilter itself are almost completely eliminated, as the pre-treatment chamber removes and isolates trash, sediments, and hydrocarbons. What's left is the simple maintenance of an easily accessible pre-treatment chamber that can be cleaned by hand or with a standard vac truck. Only periodic replacement of low-cost media in the pre-filter cartridges is required for long term operation and there is absolutely no need to replace expensive biofiltration media.

Plant Selection

Abundant plants, trees, and grasses bring value and an aesthetic benefit to any urban setting, but those in the MWS Linear do even more - they increase pollutant removal. What's not seen, but very important, is that below grade the stormwater runoff/flow is being subjected to nature's secret weapon: a dynamic physical, chemical, and biological process working to break down and remove non-point source pollutants. The flow rate is controlled in the MWS Linear, giving the plants more "contact time" so that pollutants are more successfully decomposed, volatilized and incorporated into the biomass of The MWS Linear's micro/macro flora and fauna.

A wide range of plants are suitable for use in the MWS Linear, but selections vary by location and climate. View suitable plants by selecting the list relative to your project location's hardy zone.

Please visit www.ModularWetlands.com/Plants for more information and various plant lists.

MWS Linear 2.0 Flow Based Sizing Calculations - *State of California*

Model #	Physical Depth of Model from TC, FS, TC to INVERT OUT	Wetland Perimiter (ft)	**Wetland Chamber Max HGL Height (ft)	Wetland Surface Area (sq ft)	Treatment Capacity for Flow Based Design **FLOW DESIGN**	
					GPM	CFS
MWS-L-4-4	4.13'	6.7	3.40	22.78	**23.46**	**0.052**
MWS-L-4-6	4.13'	9.4	3.40	31.96	**32.92**	**0.073**
MWS-L-4-8	4.13'	14.8	3.40	50.32	**51.83**	**0.115**
MWS-L-4-13	4.13'	18.4	3.40	62.56	**64.44**	**0.144**
MWS-L-4-15	4.13'	22.4	3.40	76.16	**78.44**	**0.175**
MWS-L-4-17	4.13'	26.4	3.40	89.76	**92.45**	**0.206**
MWS-L-4-19	4.13'	30.4	3.40	103.36	**106.46**	**0.237**
MWS-L-4-21	4.13'	34.4	3.40	116.96	**120.47**	**0.268**
MWS-L-8-12	4.13'	44.4	3.40	150.96	**155.49**	**0.346**
MWS-L-8-16	4.13'	59.2	3.40	201.28	**207.32**	**0.462**

Shallow or Deeper Units Available. Change in Height Will Affect Treatment Capacity

** Not the physical height of the unit but the max HGL in the system at peak treatment flow rate

Based on loading rate of 100 in/hr or 1.03 gpm/sq ft

Modular Wetland Systems, Inc.

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info@modularwetlands.com **P: 760-433-7640** **2972 San Luis Rey Rd, Oceanside CA 92058**

PERFORMANCE SUMMARY

MWS-LINEAR 2.0

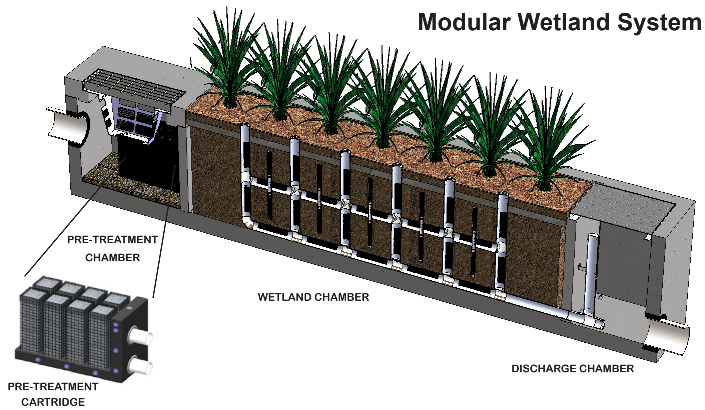
APPROVED BY: DEPARTMENT OF ECOLOGY State of Washington

Application: Stand Alone Stormwater Treatment Best Management Practice
Type of Treatment: High Flow Rate Media Filtration and Biofiltration (dual-stage)

DESCRIPTION

Modular Wetland System Linear 2.0 (MWS-L 2.0) is an advanced dual-stage high flow rate media and biofiltration system for the treatment of urban stormwater runoff. Superior pollutant removal efficiencies are achieved by treating runoff through a pre-treatment chamber containing a screening device for trash and larger debris, a separation chamber for larger TSS and a series of media filter cartridges for removal of fine TSS and other particulate pollutants. Pre-treated runoff is transferred to the biofiltration chamber which contains an engineered ion exchange media designed to support an abundant plant and microbe community that captures, absorbs, transforms and uptakes pollutants through an array of physical, chemical, and biological mechanisms.

MWS-L 2.0 is a self-contained treatment train that is supplied to the job site completely assembled and ready for use. Once installed, stormwater runoff drains directly from impervious surfaces through an built-in curb inlet, drop in, or via pipe from upstream inlets or downspouts. Treated runoff is discharged from the system through an orifice control riser to assure the proper amount of flow is treated. The treated water leaving the system is connected to the storm drain system, infiltration basins, or to be re-used on site for irrigation or other uses.



Modular Wetland System Linear 2.0 (MWS-L 2.0) has been independently tested in laboratory and field conditions since 2008.

Oceanside Test Site

Portland Test Site

HEAVY METALS: Copper / Zinc

Description	Type	Avg. Influent (mg/L)	Avg. Effluent (mg/L)	Removal Efficiency	Notes
Waves Environmental - 1/4 Scale Lab Testing - 2007	Lab	.76 / .95	.06 / .19	92% / 80%	Majority Dissolved Fraction
City of Oceanside Boat Wash / Waves Environmental - 2008	Field	.04 / .24	< .02 / < .05	>50% / >79%	Effluent Concentrations Below Detectable Limits
Recycling Facility, Kileen, TX / CERL - 2011-2012	Field	.058 / .425	.032 / .061	44% / 86%	Test Unit 2
TAPE Field Testing / Portland, OR 2011/2012	Field	.017/ .120	.009 / .038	50% / 69%	Total Metals

TOTAL SUSPENDED SOLIDS:

Description	Type	Avg. Influent (mg/L)	Avg. Effluent (mg/L)	Removal Efficiency	Notes
Waves Environmental - 1/4 Scale Lab Testing - 2007	Lab	270	3	99%	Sil-co-sil 106 - 20 micron mean particle size
City of Oceanside Boat Wash / Waves Environmental - 2008	Field	45.67	8.24	82%	Mean Particle Size by Count < 8 Microns
Recycling Facility, Kileen, TX / CERL - 2011-2012	Field	676	39	94%	Test Unit 2
TAPE Field Testing / Portland, OR 2011/2012	Field	75.0	15.7	85%	Means particle size of 8 microns

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PERFORMANCE SUMMARY
MWS-LINEAR 2.0

PHOSPHORUS:

Description	Type	Avg. Influent (mg/L)	Avg. Effluent (mg/L)	Removal Efficiency	Notes
TAPE Field Testing / Portland, OR 2011/2012	Field	.227	.074	64%	TOTAL P
TAPE Field Testing / Portland, OR 2011/2012	Field	.093	.031	67%	ORTHO P

BACTERIA:

Description	Type	Avg. Influent (MPN)	Avg. Effluent (MPN)	Removal Efficiency	Notes
Waves Environmental - 1/4 Scale Lab Testing - 2007	Lab	1600 / 1600	535 / 637	67% / 60%	Fecal / E. Coli
City of Oceanside Boat Wash / Waves Environmental - 2008	Field	31666 / 6280	8667 / 1058	73% / 83%	Fecal / E. Coli

LEAD:

Description	Type	Avg. Influent (mg/L)	Avg. Effluent (mg/L)	Removal Efficiency	Notes
Waves Environmental - 1/4 Scale Lab Testing - 2007	Lab	.54	.10	82%	Total
Recycling Facility, Kileen, TX / CERL - 2011-2012	Field	.01 / .043	.004 / .014	60% / 68%	Both Test Units
TAPE Field Testing / Portland, OR 2011/2012	Field	.011	.003	70%	Total

NITROGEN:

Description	Type	Avg. Influent (mg/L)	Avg. Effluent (mg/L)	Removal Efficiency	Notes
City of Oceanside Boat Wash / Waves Environmental - 2008	Field	.85	.21	75%	NITRATE
TAPE Field Testing / Portland, OR 2011/2012	Field	1.40	0.77	45%	TKN

HYDROCARBONS:

Description	Type	Avg. Influent (mg/L)	Avg. Effluent (mg/L)	Removal Efficiency	Notes
Waves Environmental - 1/4 Scale Lab Testing - 2007	Lab	10	1.625	84%	Oils & Grease
City of Oceanside Boat Wash / Waves Environmental - 2008	Field	.83	0	100%	TPH Motor Oil
TAPE Field Testing / Portland, OR 2011/2012	Field	24.157	1.133	95%	Motor Oil

TURBIDITY:

Description	Type	Avg. Influent (NTU)	Avg. Effluent (NTU)	Removal Efficiency	Notes
Waves Environmental - 1/4 Scale Lab Testing - 2007	Lab	21	1.575	93%	Field Measurement
City of Oceanside Boat Wash / Waves Environmental - 2008	Field	21	6	71%	Field Measurement

COD:

Description	Type	Avg. Influent (mg/L)	Avg. Effluent (mg/L)	Removal Efficiency	Notes
Recycling Facility, Kileen, TX / CERL - 2011-2012	Field	516 / 1450	90 / 356	83% / 75%	Both Test Units

All removal efficiencies and concentrations rounded up for easy viewing. Please call us for more information, including full copies of the reports reference above.

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TAPE PERFORMANCE SUMMARY

MWS-LINEAR 2.0

APPROVED BY:

DEPARTMENT OF ECOLOGY State of Washington

Application: Stand Alone Stormwater Treatment Best Management Practice
Type of Treatment: High Flow Rate Media Filtration and Biofiltration (dual-stage)

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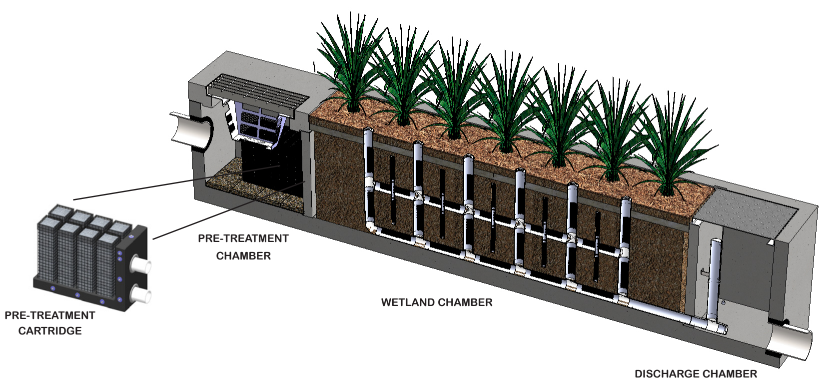

TAPE PERFORMANCE

Modular Wetland System Linear 2.0 (MWS-L 2.0) completed its TAPE field testing in the spring of 2013. The Washington DOE has approved the system under the TAPE protocol. The MWS-Linear has met the performance benchmarks for the three major pollutant categories as defined by TAPE: Basic Treatment (TSS), Phosphorus and Enhanced (dissolved zinc and copper). It is the first system tested under the protocol to meet the benchmarks for all three categories.

Pollutant	Avg. Influent (mg/L)	Avg. Effluent (mg/L)	Removal Efficiency	Notes
Total Suspended Solids	75.0	15.7	85%	Summary of all data meeting TAPE parameters pertaining to this pollutant. Mean of 8 microns.
Total Phosphorus	0.227	0.074	64%	Summary of all data meeting TAPE parameters pertaining to this pollutant.
Ortho Phosphorus	0.093	0.031	67%	Summary of all data meeting TAPE parameters for total phosphorus.
Nitrogen	1.40	0.77	45%	Utilizing the Kjeldahl method (Total Kjeldahl nitrogen). Summary of all data during testing.
Dissolved Zinc	0.062	0.024	66%	Summary of all data meeting TAPE parameters pertaining to this pollutant.
Dissolved Copper	0.0086	0.0059	38%	Summary of all data meeting TAPE parameters pertaining to this pollutant.
Total Zinc	0.120	0.038	69%	Summary of all data during testing.
Total Copper	0.017	0.009	50%	Summary of all data during testing.
Motor Oil	24.157	1.133	95%	Summary of all data during testing.

NOTES:
1. The MWS-Linear was proven effective at infiltration rates of up to 121 in/hr.
2. A minimum of 10 aliquots were collected for each event.
3. Sampling was targeted to capture at least 75 percent of the hydrograph.

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Modular Wetland System - Linear® Plants for Hardy Zone 10

Common Name ***Latin Name***	**Light Exposure**	**Hardy Range**	**Height**	**Flower Color**
canna, canna tropicana, canna lilly *Canna X generalis*	full sun to partial shade	USDA Zones 8-11	2.5 to 8 feet	yellow, orange, red
Lily-of-the-Nile, African Lily, African Blue Lily *Agapanthus spp*	full sun to partial shade	USDA Zones 8-11	2 to 4 feet	blue
Vetiveria zizanioides (L.) Nash Vetiver Grass	full sun	USDA Zones 5-11	2 to 8 feet	green
giant wild rye *Leymus condensatus*	full sun	USDA Zones 3-11	4 to 8 feet	brown
society garlic, pink agapanthus *Tulbaghia violacea*	full sun to full shade	USDA Zones 7-10	1.5 to 3 feet	lavender
Gulf muhlygrass, mist grass, hairawn muhly *Muhlenbergia capillaris*	full sun to partial shade	USDA Zones 5-10	2 to 3 feet	pinkish purple
Lindheimer's muhlygrass, blue muhlygrass *Muhlenbergia lindheimeri*	full sun	USDA Zones 7-11	2 to 4 feet	purple to gray
horsetail, scouring rush, E. prealtum *Equisetum hyemale*	full sun to light shade	USDA Zones 3-11	2 to 4 feet	n/a
cattail, reed-mace *Typha latifolia*	full sun	USDA Zones 2-11	3 to 9 feet	brown
papyrus, Egyptian papyrus, bulrushes *Cyperus papyrus*	full sun to partial shade	USDA Zones 9-11	2 to 10 feet	white
lavender *Lavandula L.*	sun	USDA Zones 5-10	1 to 2 feet	purple

palm sedge *Carex phyllocephala*	full sun to full shade	USDA Zones 7-10	1 to 2 feet	green
lemongrass, oil grass *Cymbopogon citratus*	full sun to partial shade	USDA Zones 10-11	4 to 6 feet	n/a
umbrella sedge, umbrella plant *Cyperus involucratus*	full sun to partial shade	USDA Zones 8-11	2 to 6 feet	green/white
feather grass, Mexican needle grass *Nassella tenuissima*	full sun to partial shade	USDA Zones 7-11	2 to 3 feet	green/brown
sea oats, Chasmanthium paniculatum *Uniola paniculata*	full sun to partial shade	USDA Zones 6-10	3 to 6 feet	golden/brown
Cape lily, Powell's crinum lily *Crinum X powellii*	full sun to partial shade	USDA Zones 6-11	3 to 4 feet	white/pink
African iris, fortnight lily, morea iris *Dietes iridioides*	full sun to partial shade	USDA Zones 8-10	2 to 4 feet	white/purple
whirling butterflies, white gaura *Gaura lindheimeri*	full sun to partial shade	USDA Zones 5-10	2 to 4 feet	white/pink
daylily *Hemerocallis hybrids*	full sun to partial shade	USDA Zones 2-10	1 to 3.5 feet	various
Adam's needle, bear grass, weak-leaf yucca *Yucca filamentosa*	full sun	USDA Zones 5-10	3 to 5 feet	white
brome hummock sedge *carex bromoides*	full sun to partial shade	USDA Zones 2-10	1 ft	green

The Modular Wetland System - Linear® standard 22' long system will require 18 to 20 plants. Different size systems will require different plant quanitities; please contact us for detailed information.

The plants listed are tolerant to drought and have deep roots to allow for ehanced pollutant removal.

These plants are subject to availability in local areas. If you would like to use a different plant please contact us. We will work with you to ensure the chosen plants work with the projects current landscape theme.

The Modular Wetland System - Linear® should be irrigated like any other planter area. The plants in the system must receive adequate irrigation to ensure plant survival during periods of drier weather. As with all landscape areas the plants within the Modular Wetland System - Linear will require more frequent watering during the establishment period.

For more information please contact at: 760-433-7640 or email: info@modularwetlands.com

StormTrap® PATENTED

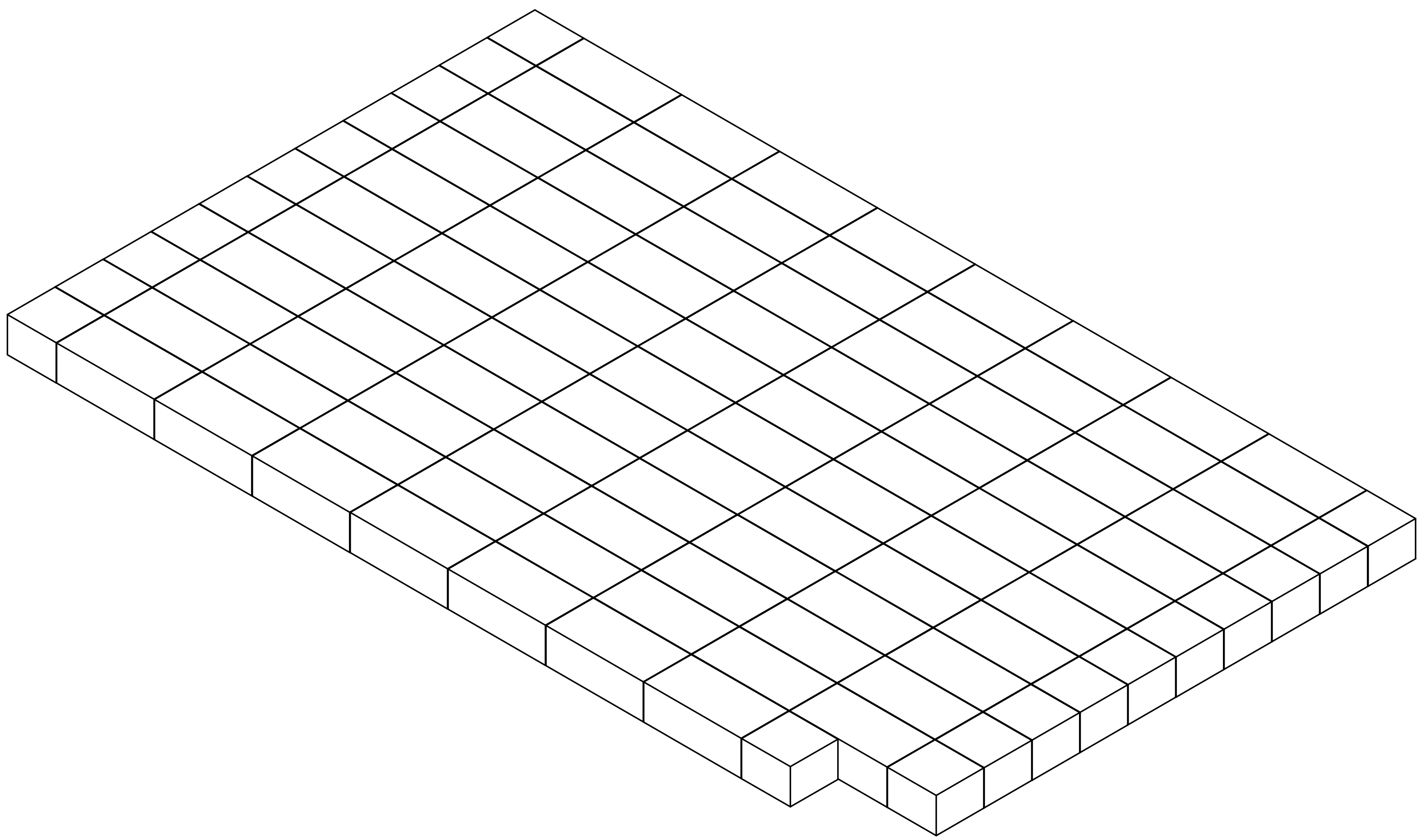
Precast Concrete Modular Storm Water Management Systems

StormTrap's® SingleTrap® system is the ultimate solution for projects requiring storm water management. The SingleTrap's® modular design allows the system to be completely customizable giving it the ability to fit all types of job site parameters. The system's innovative design maximizes the total volume of storm water stored while minimizing the project's footprint and cost. Precast concrete strength exceeds HS-20 loading with only 6″ of cover. Design flexibility allows the SingleTrap® system to accommodate both infiltrative water recharge demands as well as watertight applications.

- Exceeds HS-20 loading with 6″ of cover making it ideal for projects with limited rim to invert
- Durable reinforced high strength concrete available in sizes that are customized from 1′ - 2″ to 5′ - 0″
- Provides a large infiltrative surface area that allows water to recharge back into the soil
- Watertight systems available
- Lifetime Warranty

LIFETIME WARRANTY

PRECAST CONCRETE MODULAR STORM WATER MANAGEMENT SYSTEMS



STORMTRAP USA

ANYTOWN, USA

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JOB SITE INFORMATION

DESCRIPTION

JOB NAME:	STORMTRAP USA
JOB ADDRESS:	ANYTOWN, USA
ENGINEERING CO:	ENGINEERS
CONTACT NAME:	JOHN DOE
CONTACT PHONE:	123-456-7890
CONTACT FAX:	123-456-7891
STORM TRAP SUPPLIER:	STORMTRAP
CONTACT NAME:	ACCOUNT MANAGER
CONTACT PHONE:	815-941-4663
CONTACT FAX:	815-416-1100
WATER STORAGE REQ'D:	43,560.00 CUBIC FEET
WATER STORAGE PROV:	43,660.00 CUBIC FEET
UNIT HEADROOM:	5'-0" SINGLETRAP
UNIT QUANTITY:	109 UNITS - 109 TOTAL PIECES

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1		ISSUED FOR PRELIMINARY	MM

SCALE:

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SHEET TITLE:

COVER SHEET

SHEET NUMBER:

01

STORMTRAP INSTALLATION SPECIFICATION

1. STORMTRAP MODULES SHALL BE MANUFACTURED ACCORDING TO SHOP DRAWINGS APPROVED BY THE INSTALLING CONTRACTOR AND ENGINEER. THE SHOP DRAWINGS SHALL INDICATE SIZE AND LOCATION OF ROOF OPENINGS AND INLET/ OUTLET PIPE OPENINGS.

2. STORMTRAP SHALL BE INSTALLED IN ACCORDANCE WITH ASTM C891-90, STANDARD PRACTICE FOR INSTALLATION OF UNDERGROUND PRECAST CONCRETE UTILITY STRUCTURES. THE FOLLOWING ADDITIONS AND/OR EXCEPTIONS SHALL APPLY:

   A. SPECIFICATIONS ON THE ENGINEER'S DRAWINGS SHALL TAKE PRECEDENCE.

   B. STORMTRAP MODULES SHALL BE PLACED ON LEVEL FOUNDATION (SEE SHEET 3.1) WITH A 1'-0" OVERHANG ON ALL SIDES THAT SHALL BE POURED IN PLACE BY INSTALLING CONTRACTOR.

   C. THE STORMTRAP MODULES SHALL BE PLACED SUCH THAT THE MAXIMUM SPACE BETWEEN ADJACENT MODULES DOES NOT EXCEED 3/4". IF THE SPACE EXCEEDS 3/4", THE MODULES SHALL BE RESET WITH APPROPRIATE ADJUSTMENT MADE TO LINE AND GRADE TO BRING THE SPACE INTO SPECIFICATION.

   D. THE PERIMETER HORIZONTAL JOINT OF THE STORMTRAP MODULES SHALL BE SEALED TO THE FOOTINGS WITH PREFORMED MASTIC JOINT SEALER ACCORDING TO ASTM C891-90, 8.8 AND 8.12.

   E. ALL EXTERIOR JOINTS BETWEEN ADJACENT STORMTRAP MODULES SHALL BE SEALED WITH 1'-0" PRE-FORMED, COLD-APPLIED, SELF-ADHERING ELASTOMERIC RESIN BONDED TO A WOVEN HIGHLY PUNCTURE RESISTANT POLYMER WRAP CONFORMING TO ASTM C891-90 AND SHALL BE 1'-0" INTEGRATED PRIMER SEALANT AS APPROVED BY STORMTRAP. THE ADHESIVE EXTERIOR JOINT WRAP SHALL BE INSTALLED ACCORDING TO THE FOLLOWING INSTALLATION INSTRUCTIONS:

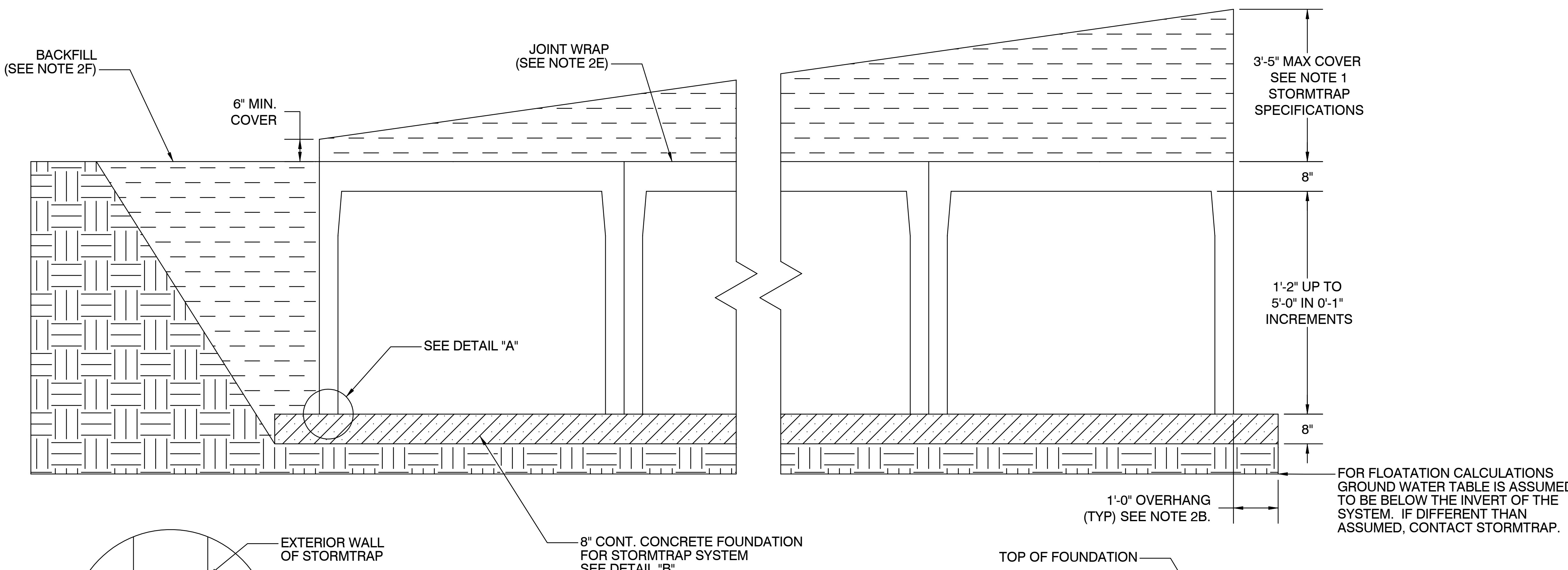
      i. USE A BRUSH OR WET CLOTH TO THOROUGHLY CLEAN THE OUTSIDE SURFACE AT THE POINT WHERE THE JOINT WRAP IS TO BE APPLIED.

      ii. A RELEASE PAPER PROTECTS THE ADHESIVE SIDE OF THE JOINT WRAP. PLACE THE ADHESIVE TAPE (ADHESIVE SIDE DOWN) AROUND THE STRUCTURE, REMOVING THE RELEASE PAPER AS YOU GO. PRESS THE JOINT WRAP FIRMLY AGAINST THE STORMTRAP MODULE SURFACE WHEN APPLYING.

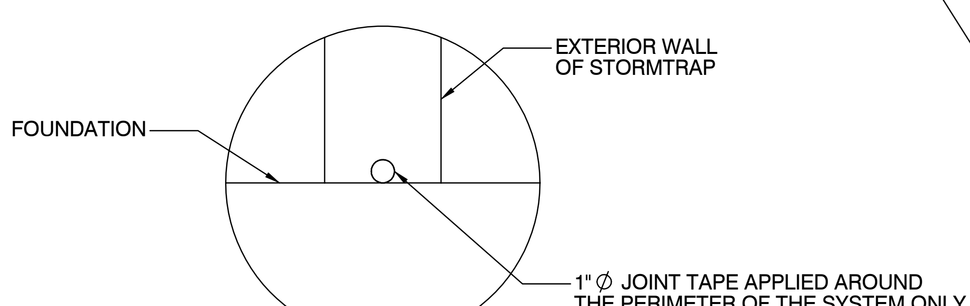
   F. THE FILL PLACED AROUND THE STORMTRAP UNITS MUST BE DEPOSITED ON BOTH SIDES AT THE SAME TIME AND TO APPROXIMATELY THE SAME ELEVATION. AT NO TIME SHALL THE FILL BEHIND ONE SIDE WALL BE MORE THAN 2'-0" HIGHER THAN THE FILL ON THE OPPOSITE SIDE. BACKFILL SHALL BE COMPACTED TO 95% STANDARD PROCTOR DENSITY OR OTHERWISE SPECIFIED BY ENGINEER. CARE SHALL BE TAKEN TO PREVENT ANY WEDGING ACTION AGAINST THE STRUCTURE, AND ALL SLOPES BOUNDING OR WITHIN THE AREA TO BE BACKFILLED MUST BE STEPPED OR SERRATED TO PREVENT WEDGE ACTION. (REFERENCE ARTICLE 502.10 I.D.O.T. S.S.R.B.C.) CARE SHALL ALSO BE TAKEN AS NOT TO DISRUPT THE JOINT WRAP FROM THE JOINT DURING THE BACKFILL PROCESS. BACKFILL MATERIAL NOT TO EXCEED 120 PCF SOIL DENSITY OR 80 LBS PER FOOT OF LATERAL SATURATED PRESSURE. RECOMMENDED BACKFILL TO CONSIST OF 3/4" AGGREGATE STONE (CA-7) OR APPROVED EQUAL AND SHALL CONFORM TO THE ABOVE DENSITY/LATERAL SATURATED PRESSURE REQUIREMENTS.

STORMTRAP SPECIFICATION

1. TOTAL COVER: MIN. 0'-6" MAX. 3'-5" CONSULT STORMTRAP FOR ADDITIONAL COVER OPTIONS.
2. CONCRETE CHAMBER DESIGNED FOR AASHTO HS-20 WHEEL LOAD & APPLICABLE IMPACT. MIN. SOIL PRESSURE 1,500 PSF.
3. ALL DIMENSIONS AND SOIL CONDITIONS, INCLUDING BUT NOT LIMITED TO GROUNDWATER AND SOIL BEARING CAPACITY ARE TO BE VERIFIED IN THE FIELD BY OTHERS PRIOR TO STORMTRAP INSTALLATION.
4. FOR STRUCTURAL CALCULATIONS THE SOIL DENSITY IS ASSUMED TO BE 120 PCF.
5. FOR STRUCTURAL CALCULATIONS THE WATER TABLE IS ASSUMED TO BE 3'-0" BELOW GRADE. IF WATER TABLE IS LESS THAN 3'-0" BELOW GRADE, CONTACT STORMTRAP.
6. STORMTRAP IS NOT WATERTIGHT - PLEASE ADVISE IF A WATERTIGHT SOLUTION IS NEEDED.

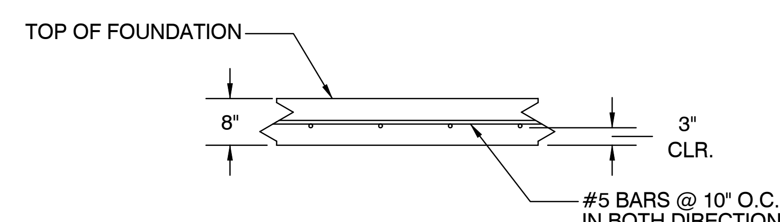


5'-0" SINGLETRAP



DETAIL "A"

JOINT TAPE INSTALLATION



DETAIL "B"

STORM TRAP FOUNDATION

NOTES:
1. 4,000 PSI @ 28 DAYS, 5%-8% ENTRAINED AIR, 4" MAX. SLUMP.
2. NET ALLOWABLE SOIL PRESSURE GREATER THAN OR EQUAL TO 1,500 PSF
3. SOIL CONDITIONS TO BE VERIFIED ON SITE BY OTHERS.
4. 1'-0" OVERHANG AROUND OUTSIDE OF SYSTEM.
5. REBAR: ASTM A-615 GRADE 60. BLACK BAR.

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ANYTOWN, USA

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SHEET TITLE:

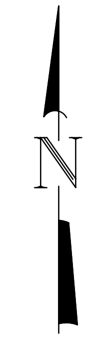
SINGLETRAP INSTALLATION SPECIFICATIONS

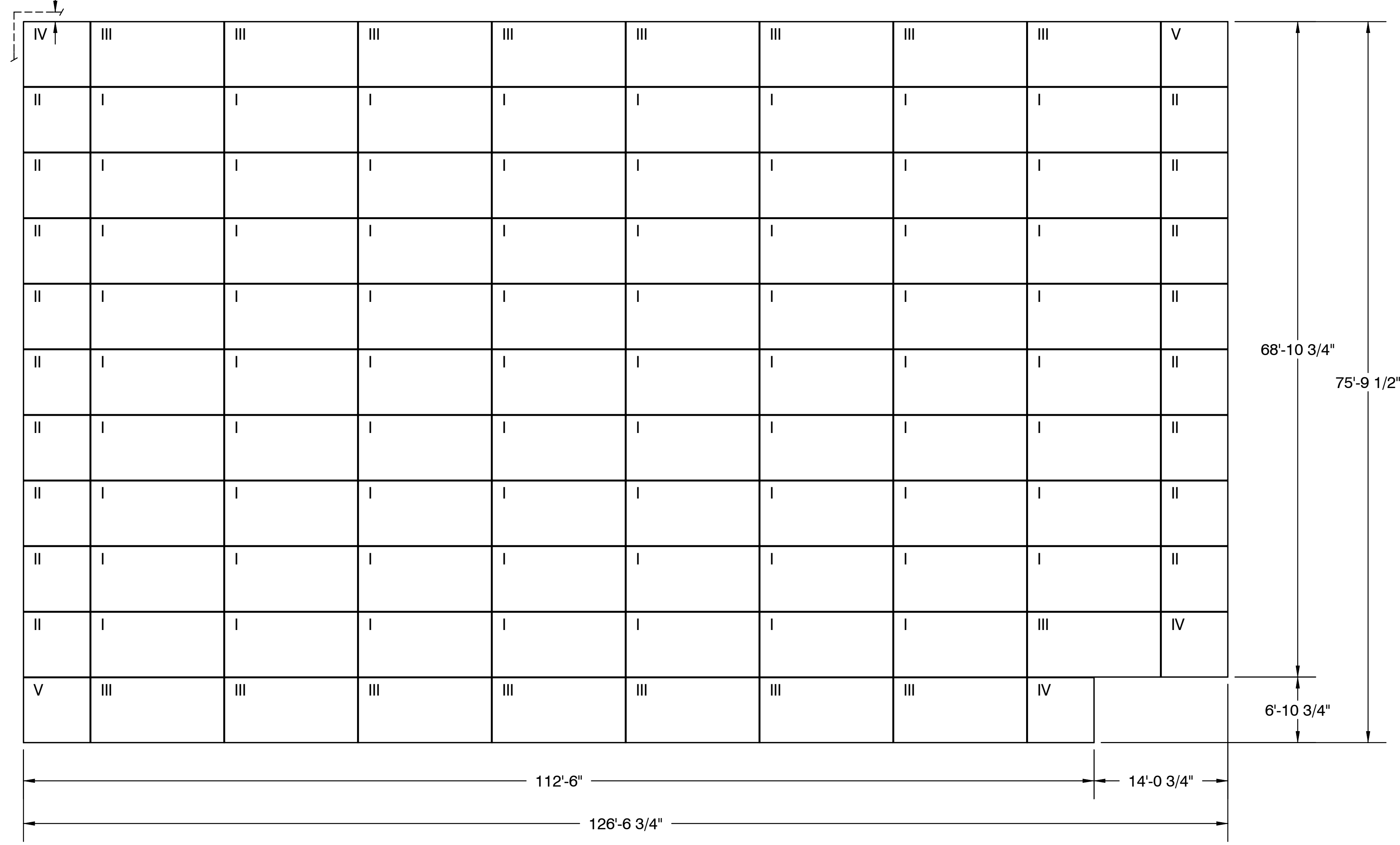
SHEET NUMBER:

02

BILL OF MATERIALS

QTY.	PART NO.	DESCRIPTION
71	TYPE I	5'-0" SINGLETRAP TYPE I
17	TYPE II	5'-0" SINGLETRAP TYPE II
16	TYPE III	5'-0" SINGLETRAP TYPE III
3	TYPE IV	5'-0" SINGLETRAP TYPE IV
2	TYPE V	5'-0" SINGLETRAP TYPE V
31	JOINT TAPE	JOINT TAPE - 14.5' PER ROLL
18	JOINT WRAP	JOINT WRAP - 150' PER ROLL





NOTES:

1. DIMENSION OF STORMTRAP SYSTEM ALLOW FOR A 3/4" GAP BETWEEN EACH UNIT.
2. ALL DIMENSIONS TO BE VERIFIED IN THE FIELD BY OTHERS.
3. SEE SHEET 2 FOR INSTALLATION SPECIFICATIONS.

LAYOUT DETAIL

STORMTRAP®
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SHEET TITLE:

LAYOUT DETAIL

SHEET NUMBER:

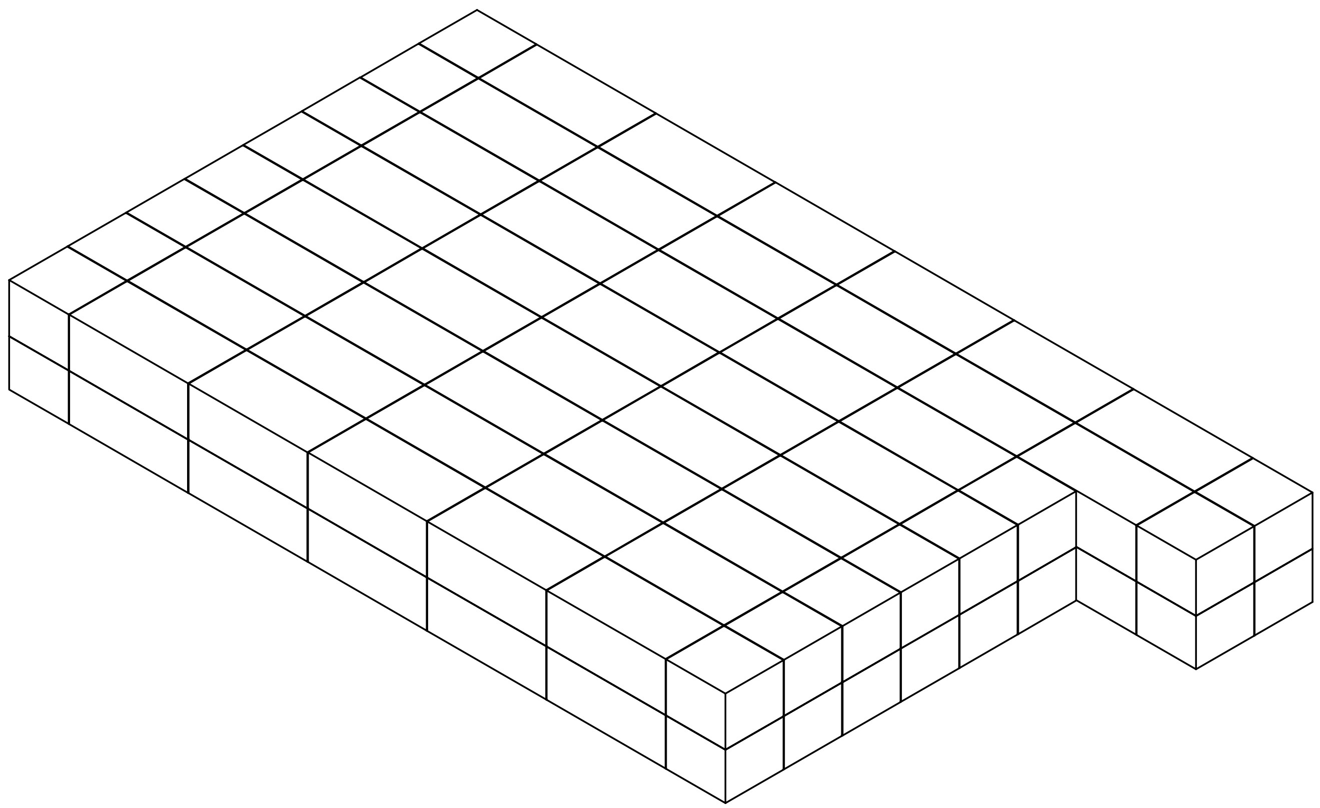
03

StormTrap's® DoubleTrap® system is the premier total void storm water management system. The precast concrete system maximizes total storage volume while minimizing project footprint. The DoubleTrap® is quick and efficient to install thus reducing labor costs and liabilities. The system's modular design means it is adaptable to almost any application from 2'- 4" to 10'- 0" depths. Reduced costs combined with maximum land use makes the DoubleTrap® system the obvious choice.

- Lowest overall installed costs
- Innovative design allows for quick and efficient installations and the smallest overall footprint
- Durable reinforced high strength concrete available in sizes that are customized from 2' - 4" to 10' - 0"
- Flexible design allows for the infiltration of storm water or a completely contained system
- Watertight systems available
- Lifetime Warranty

LIFETIME WARRANTY

STORMTRAP®
PATENTED
PRECAST CONCRETE MODULAR STORM WATER MANAGEMENT SYSTEMS



STORMTRAP USA

ANYTOWN, USA

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5	STANDARD - 10'-0" DOUBLETRAP TYPE II	1
6	STANDARD - 10'-0" DOUBLETRAP TYPE III	1
7	STANDARD - 10'-0" DOUBLETRAP TYPE IV	1
8	STANDARD - 10'-0" DOUBLETRAP TYPE V	1

JOB SITE INFORMATION	
DESCRIPTION	
JOB NAME:	STORMTRAP USA
JOB ADDRESS:	ANYTOWN, USA
ENGINEERING CO:	ENGINEERS
CONTACT NAME:	JOHN DOE
CONTACT PHONE:	123-456-7890
CONTACT FAX:	123-456-7891
STORM TRAP SUPPLIER:	STORMTRAP
CONTACT NAME:	ACCOUNT MANAGER
CONTACT PHONE:	815-941-4663
CONTACT FAX:	815-416-1100
WATER STORAGE REQ'D:	43,560.00 CUBIC FEET
WATER STORAGE PROV:	44,284.50 CUBIC FEET
UNIT HEADROOM:	10'-0" DOUBLETRAP
UNIT QUANTITY:	58 UNITS - 116 TOTAL PIECES

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PROJECT INFORMATION:

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SHEET TITLE:

COVER SHEET

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01

STORMTRAP INSTALLATION SPECIFICATION

1. STORMTRAP MODULES SHALL BE MANUFACTURED ACCORDING TO SHOP DRAWINGS APPROVED BY THE INSTALLING CONTRACTOR AND ENGINEER. THE SHOP DRAWINGS SHALL INDICATE SIZE AND LOCATION OF ROOF OPENINGS AND INLET/ OUTLET PIPE OPENINGS.

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   A. SPECIFICATIONS ON THE ENGINEER'S DRAWINGS SHALL TAKE PRECEDENCE.

   B. STORMTRAP MODULES SHALL BE PLACED ON A LEVEL, 6" PAD OF 3/4" COARSE AGGREGATE (GRADATION CA 7) THAT EXTENDS 2'-0" PAST THE OUTSIDE OF THE SYSTEM, PER ASTM C891-90, STANDARD PRACTICE FOR INSTALLATION OF UNDERGROUND PRECAST CONCRETE UTILITY STRUCTURES.

   C. THE STORMTRAP MODULES SHALL BE PLACED SUCH THAT THE MAXIMUM SPACE BETWEEN ADJACENT MODULES DOES NOT EXCEED 3/4". IF THE SPACE EXCEEDS 3/4", THE MODULES SHALL BE RESET WITH APPROPRIATE ADJUSTMENT MADE TO LINE AND GRADE TO BRING THE SPACE INTO SPECIFICATION.

   D. THE PERIMETER HORIZONTAL JOINT OF THE STORMTRAP MODULES SHALL BE SEALED WITH PREFORMED MASTIC JOINT SEALER ACCORDING TO ASTM C891-90, 8.8 AND 8.12.

   E. ALL EXTERIOR JOINTS BETWEEN ADJACENT STORMTRAP MODULES SHALL BE SEALED WITH 1'-0" PRE-FORMED, COLD-APPLIED, SELF-ADHERING ELASTOMERIC RESIN BONDED TO A WOVEN HIGHLY PUNCTURE RESISTANT POLYMER WRAP CONFORMING TO ASTM C891-90 AND SHALL BE 1'-0" INTEGRATED PRIMER SEALANT AS APPROVED BY STORMTRAP. THE ADHESIVE EXTERIOR JOINT WRAP SHALL BE INSTALLED ACCORDING TO THE FOLLOWING INSTALLATION INSTRUCTIONS:

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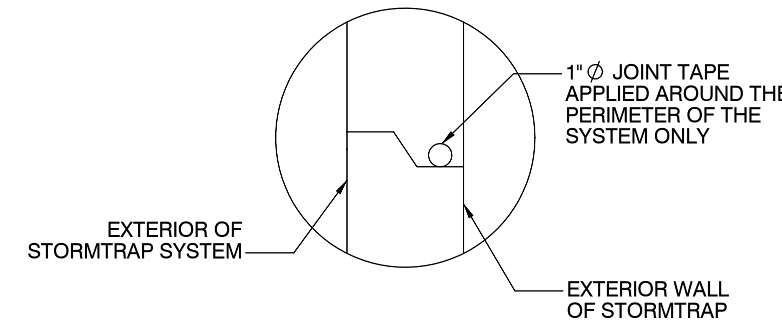
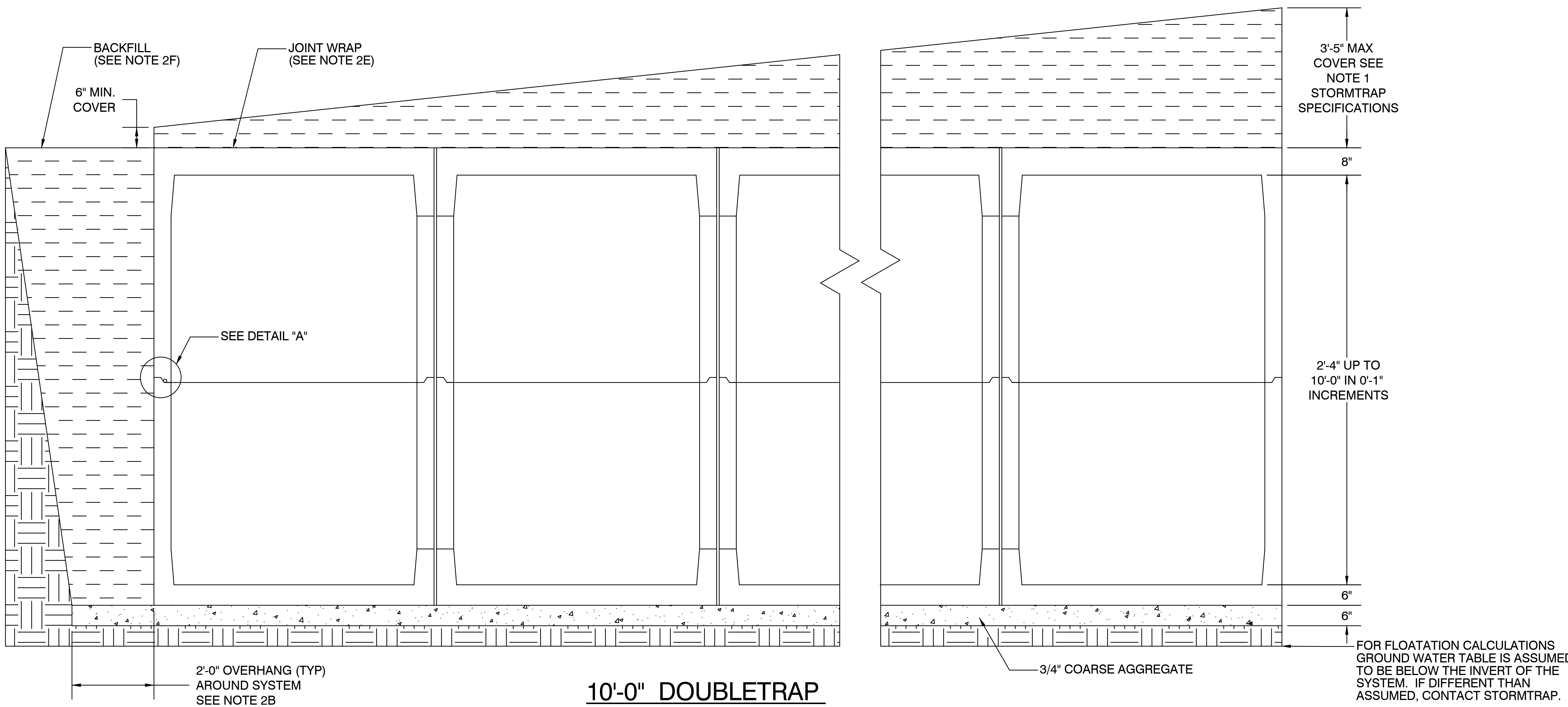
STORMTRAP SPECIFICATION

1. TOTAL COVER: MIN. 6" MAX. 3'-5" CONSULT STORMTRAP FOR ADDITIONAL COVER OPTIONS.
2. CONCRETE CHAMBER DESIGNED FOR AASHTO HS-20 WHEEL LOAD & APPLICABLE IMPACT. MIN. SOIL PRESSURE 2,000 PSF.
3. ALL DIMENSIONS AND SOIL CONDITIONS, INCLUDING BUT NOT LIMITED TO GROUNDWATER AND SOIL BEARING CAPACITY ARE TO BE VERIFIED IN THE FIELD BY OTHERS PRIOR TO STORMTRAP INSTALLATION.
4. FOR STRUCTURAL CALCULATIONS THE SOIL DENSITY IS ASSUMED TO BE 120 PCF.
5. STORMTRAP IS NOT WATER TIGHT - PLEASE ADVISE STORMTRAP IF A WATER TIGHT OPTION IS REQUIRED.
6. FOR STRUCTURAL CALCULATIONS THE WATER TABLE IS ASSUMED TO BE 3'-0" BELOW GRADE. IF WATER TABLE IS LESS THAN 3'-0" BELOW GRADE, CONTACT STORMTRAP.



DETAIL "A"



10'-0" DOUBLETRAP

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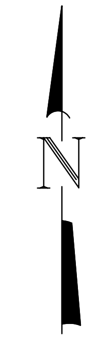
DOUBLETRAP INSTALLATION SPECIFICATIONS

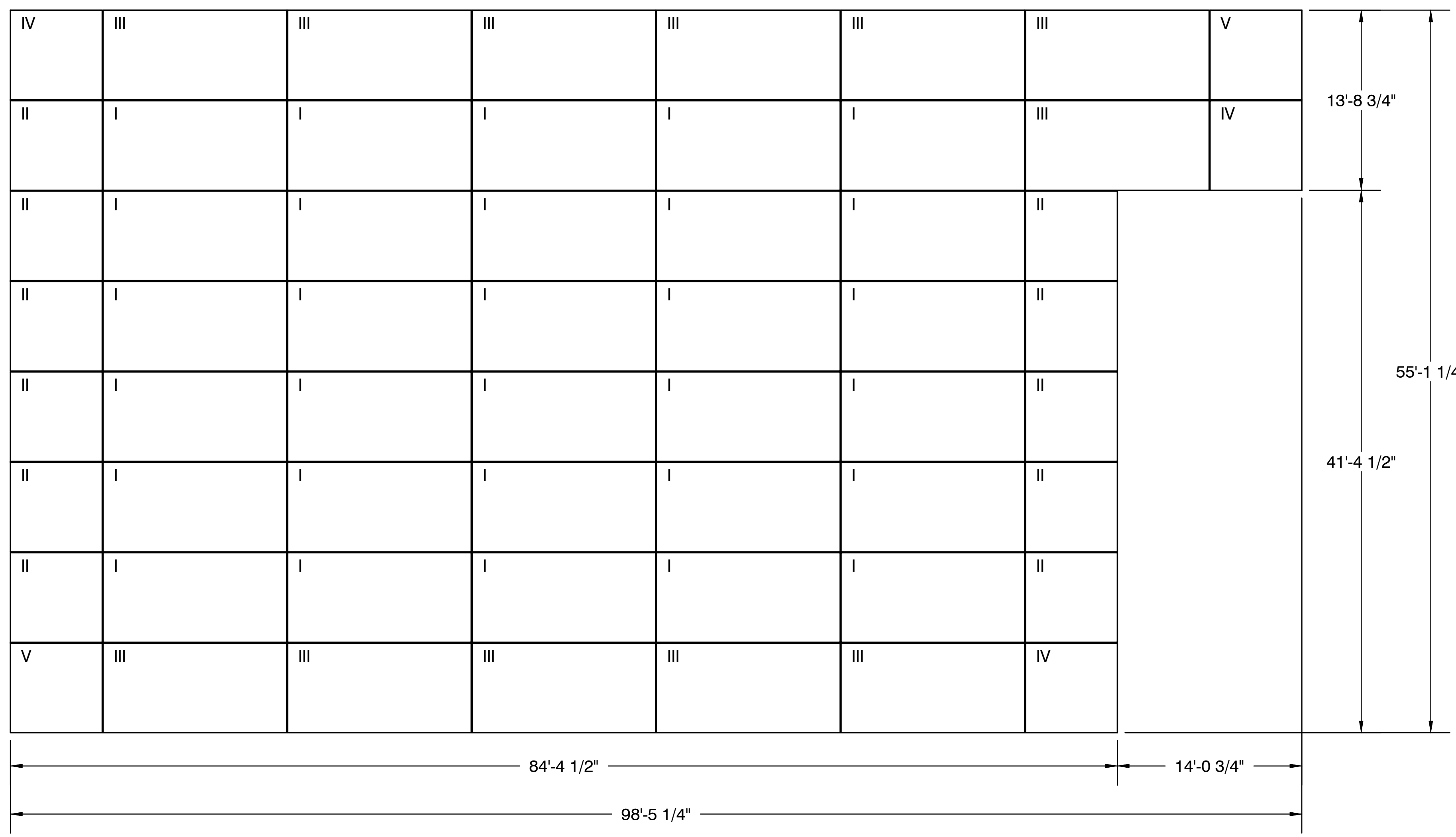
SHEET NUMBER:

02

BILL OF MATERIALS

QTY.	PART NO.	DESCRIPTION
30	TYPE I	10'-0" DOUBLETRAP TYPE I
11	TYPE II	10'-0" DOUBLETRAP TYPE II
12	TYPE III	10'-0" DOUBLETRAP TYPE III
3	TYPE IV	10'-0" DOUBLETRAP TYPE IV
2	TYPE V	10'-0" DOUBLETRAP TYPE V
24	JOINT TAPE	JOINT TAPE - 14.5' PER ROLL
11	JOINT WRAP	JOINT WRAP - 150' PER ROLL





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SHEET TITLE: LAYOUT DETAIL

SHEET NUMBER: 03

NOTES:

1. DIMENSION OF STORMTRAP SYSTEM ALLOW FOR A 3/4" GAP BETWEEN EACH UNIT.
2. ALL DIMENSIONS TO BE VERIFIED IN THE FIELD BY OTHERS.
3. SEE SHEET 2 FOR INSTALLATION SPECIFICATIONS.

LAYOUT DETAIL

StormTrap® PATENTED

Water Quality Management

StormTrap® is on the cutting edge of sustainable storm water quality management. Integration of water quality control functions are inherently easy due to the modular format of the SingleTrap® and DoubleTrap® systems. Whether your project requires attention to a specific water quality issue or a combination of issues, the design engineers at StormTrap® can provide a solution.

FILTRATION

Designed to remove pollutants utilizing various media

INFILTRATION

Recharge/infiltration needs

OIL / WATER SEPARATOR

Eliminates oil, grease, fats & other hydrocarbons

SEDIMENTATION

Designed to your specific particle size removal efficiencies

STORMTRAP LEED CONTRIBUTION

StormTrap may contribute toward LEED certification with one or more of the following credits.

SUSTAINABLE SITES

Credit 5.1 Site Development: Protect or Restore Habitat
* Conserve existing natural areas and restore damaged areas to provide habitat and promote biodiversity.

Credit 5.2 Maximize Open Space
* Provide a high ratio of space to development footprint to promote biodiversity.

Credit 6.1 Storm Water: Quantity Control
* Limit disruption of natural hydrology by reducing impervious cover, increasing on-site infiltration, and managing storm water runoff.

Credit 6.2 Storm Water Quality Control
* Reduce or eliminate water pollution by reducing impervious cover, increasing on-site infiltration, eliminating sources of contaminants, and removing pollutants from storm water runoff.

WATER EFFICIENCY

Credit 1.1 Water Efficient Landscaping : Reduce by 50 %
* Limit or eliminate the use of potable water, or other natural surface or subsurface water resources available on or near the project site, for landscape irrigation.

Credit 1.2 Water Efficient Landscaping: No Potable Water Use or No Irrigation
* Eliminate the use of potable water, or other natural surface or subsurface water resources available on or near the project site, for landscape irrigation.

Credit 3.1 Water Use Reduction: 20% Reduction
* Maximize water efficiency within buildings to reduce the burden on municipal water supply and wastewater systems.

Credit 3.2 Water Use Reduction: 30% Reduction
* Maximize water efficiency within buildings to reduce the burden on municipal water supply and wastewater systems.

MATERIALS & RESOURCES

Credit 4.1 Recycled Content: 10% (post-consumer + 1/2 pre-consumer)
* Increase demand for building products that incorporate recycled content materials, thereby reducing impacts resulting from extraction and processing of virgin materials.

Credit 4.2 Recycled Content: 20% (post-consumer + 1/2 pre-consumer)
* Increase demand for building products that incorporate recycled content materials, thereby reducing impacts resulting from extraction and processing of virgin materials.

Credit 5.1 Regional Materials: 10% Extracted, Processed & Manufactured Regionally
* Increase demand for building materials and products that are extracted and manufactured within the region, thereby supporting the use of indigenous resources and reducing the environmental impacts resulting from transportation.

Credit 5.2 Regional Materials: 20% Extracted, Processed & Manufactured Regionally
* Increase demand for building materials and products that are extracted and manufactured within the region, thereby supporting the use of indigenous resources and reducing the environmental impacts resulting from transportation.

CREDITS BASED ON U.S. GREEN BUILDING COUNCIL NEW CONSTRUCTION & MAJOR RENOVATION VERSION 2.2 REFERENCE GUIDE. THIRD EDITION OCTOBER 2007.

U.S. Patent No's: 6,991,402 B2 ; 7,160,058 B2 ; 7,344,335

1-87-STORMTRAP • 1-877-867-6872
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StormTrap®

PATENTED

Precast Concrete Modular Storm Water Management Systems

Lifetime Warranty

StormTrap, the precast concrete modular storm water detention system, carries a Lifetime Guarantee to the original purchaser on its structural integrity.

If StormTrap proves defective in normal use and service when installed in accordance with our recommended guidelines, it will be replaced.

See the StormTrap, LLC contract for complete warranty terms and limitations.

GET THE PRECAST ADVANTAGE!

SECTION VII EDUCATIONAL MATERIALS

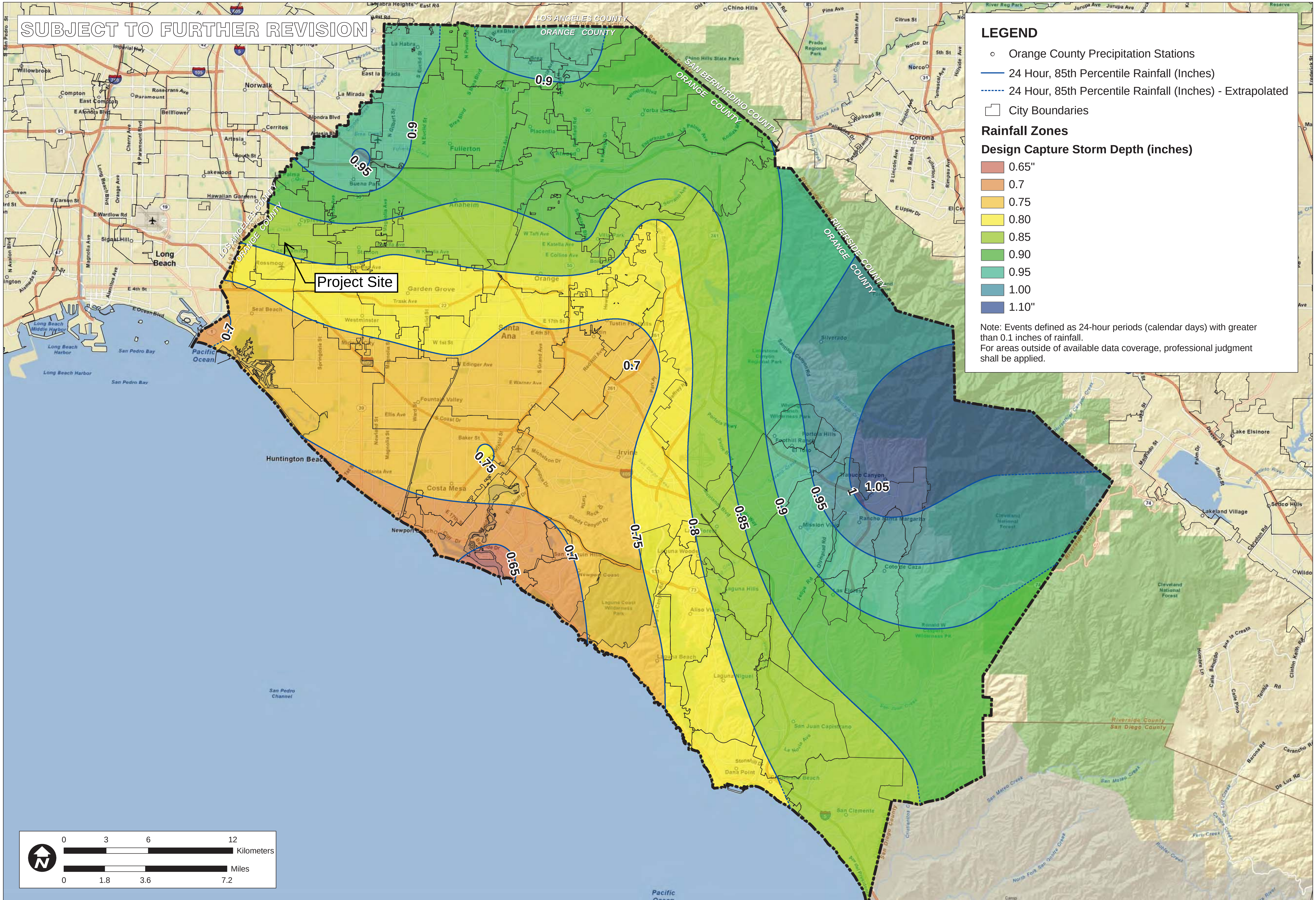
The educational materials included in this WQMP are provided to inform people involved in future uses, activities, or ownership of the site about the potential pitfalls associated with careless storm water management. "The Ocean Begins at Your Front Door" provides users with information about storm water that is/will be generated on site, what happens when water enters a storm drain, and its ultimate fate, discharging into the ocean. Also included are activities guidelines to educate anyone who is or will be associated with activities that have a potential to impact storm water runoff quality, and provide a menu of BMPs to effectively reduce the generation of storm water runoff pollutants from a variety of activities. The educational materials that may be used for the proposed project are included in Appendix C of this WQMP and are listed below.

EDUCATION MATERIALS			
Residential Materials (http://www.ocwatersheds.com)	**Check If Attached**	**Business Materials (http://www.ocwatersheds.com)**	**Check If Attached**
The Ocean Begins at Your Front Door	☒	Tips for the Automotive Industry	☐
Tips for Car Wash Fund-raisers	☐	Tips for Using Concrete and Mortar	☐
Tips for the Home Mechanic	☐	Tips for the Food Service Industry	☒
Homeowners Guide for Sustainable Water Use	☒	Proper Maintenance Practices for Your Business	☒
Household Tips	☒	**Other Materials (http://www.ocwatersheds.com) (http://www.cabmphandbooks.com)**	**Check If Attached**
Proper Disposal of Household Hazardous Waste	☒		
Recycle at Your Local Used Oil Collection Center (North County)	☒	DF-1 Drainage System Operation & Maintenance	☒
Recycle at Your Local Used Oil Collection Center (Central County)	☐	R-1 Automobile Repair & Maintenance	☐
Recycle at Your Local Used Oil Collection Center (South County)	☐	R-2 Automobile Washing	☐
Tips for Maintaining Septic Tank Systems	☐	R-3 Automobile Parking	☒
Responsible Pest Control	☒	R-4 Home & Garden Care Activities	☒
Sewer Spill	☒	R-5 Disposal of Pet Waste	☒
Tips for the Home Improvement Projects	☒	R-6 Disposal of Green Waste	☒
Tips for Horse Care	☐	R-7 Household Hazardous Waste	☒
Tips for Landscaping and Gardening	☒	R-8 Water Conservation	☒
Tips for Pet Care	☒	SD-10 Site Design & Landscape Planning	☒
Tips for Pool Maintenance	☒	SD-11 Roof Runoff Controls	☒
Tips for Residential Pool, Landscape and Hardscape Drains	☒	SD-12 Efficient Irrigation	☒
Tips for Projects Using Paint	☐	SD-13 Storm Drain Signage	☒
Tips for Protecting Your Watershed	☐	SD-31 Maintenance Bays & Docs	☒
Other: Children's Brochure	☐	SD-32 Trash Storage Areas	☒

APPENDICES

APPENDIX A

SUPPORTING CALCULATIONS



TITLE
RAINFALL ZONES

JOB
ORANGE COUNTY TECHNICAL GUIDANCE DOCUMENT

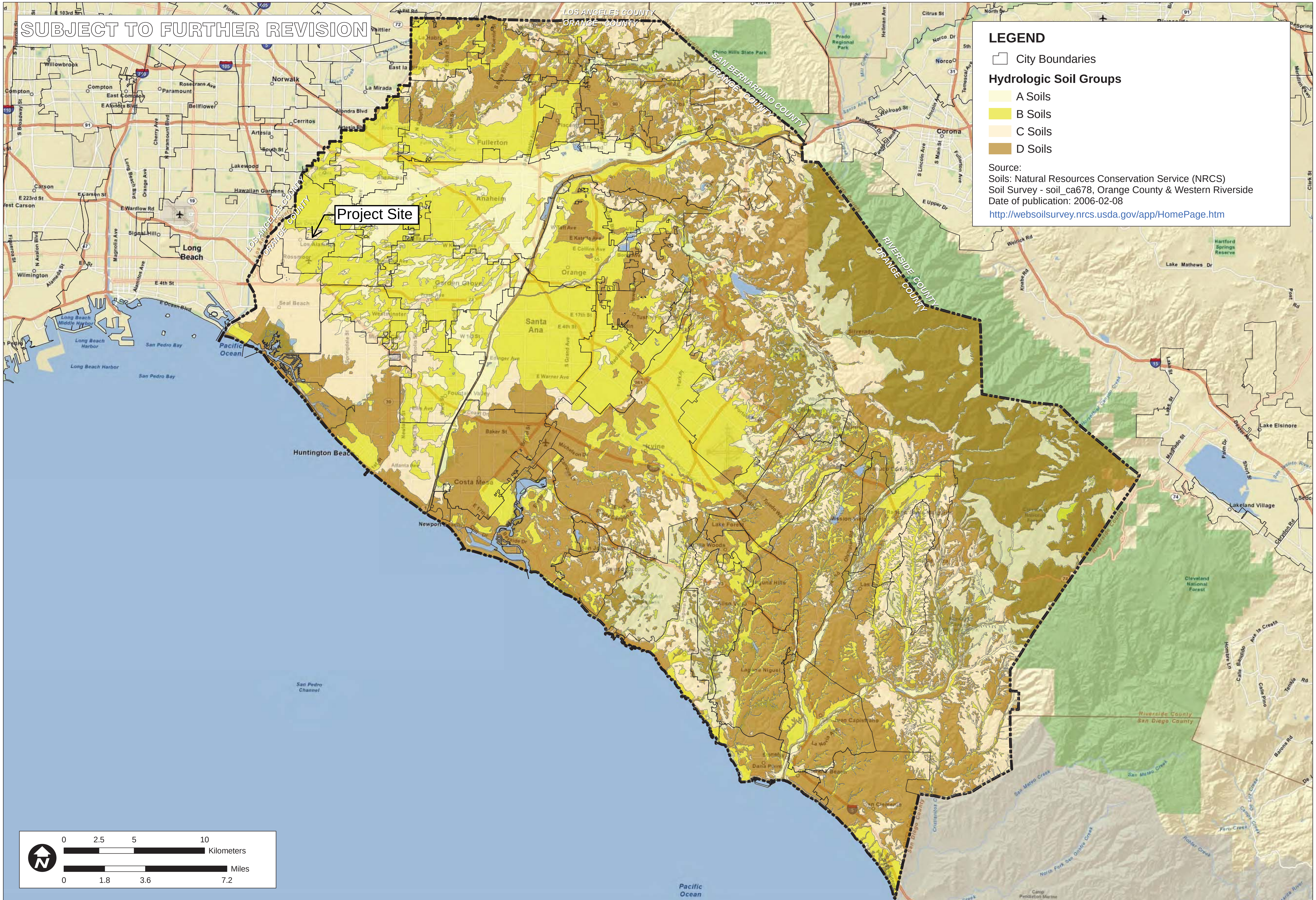
ORANGE CO. CA

SCALE 1" = 1.8 miles
DESIGNED TH
DRAWING TH
CHECKED BMP
DATE 04/22/10
JOB NO. 9526-E

PACE Advanced Water Engineering

FIGURE
XVI-1

P:\9526E\6-GIS\Mxds\Reports\InfiltrationFeasability_20110215\9526E_FigureXVI-1_RainfallZones_20110215.mxd



P:\9526E\6-GIS\Mxds\Reports\InfiltrationFeasability_20110215\9526E_FigureXVI-2a_HydroSoils_20110215.mxd

TITLE

NRCS HYDROLOGIC SOILS GROUPS

JOB

ORANGE COUNTY INFILTRATION STUDY

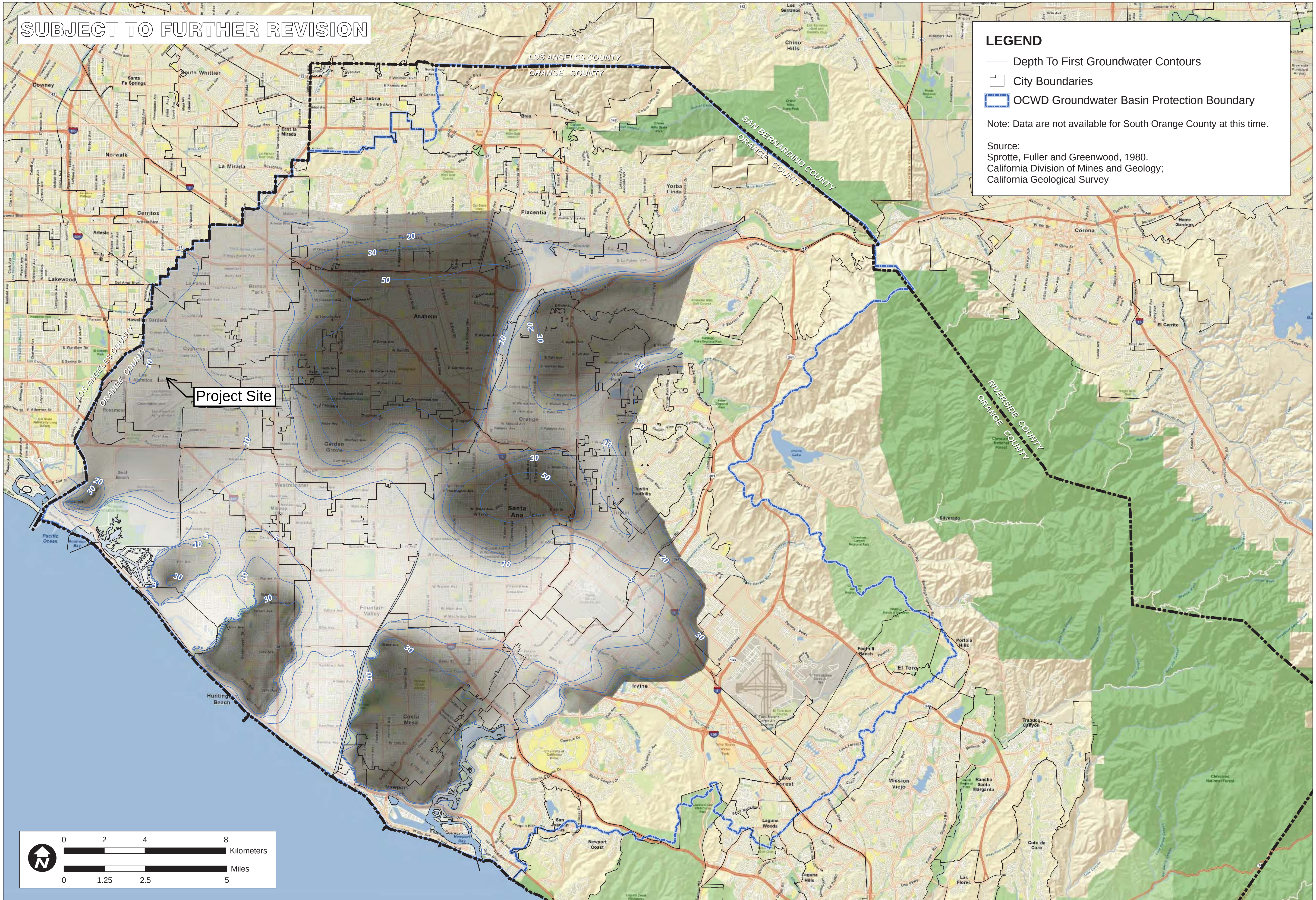
ORANGE CO. CA

SCALE	1" = 1.8 miles
DESIGNED	TH
DRAWING	TH
CHECKED	BMP
DATE	02/09/11
JOB NO.	9526-E

PACE
Advanced Water Engineering

FIGURE

XVI-2a



TITLE
NORTH ORANGE COUNTY MAPPED DEPTH TO FIRST GROUNDWATER

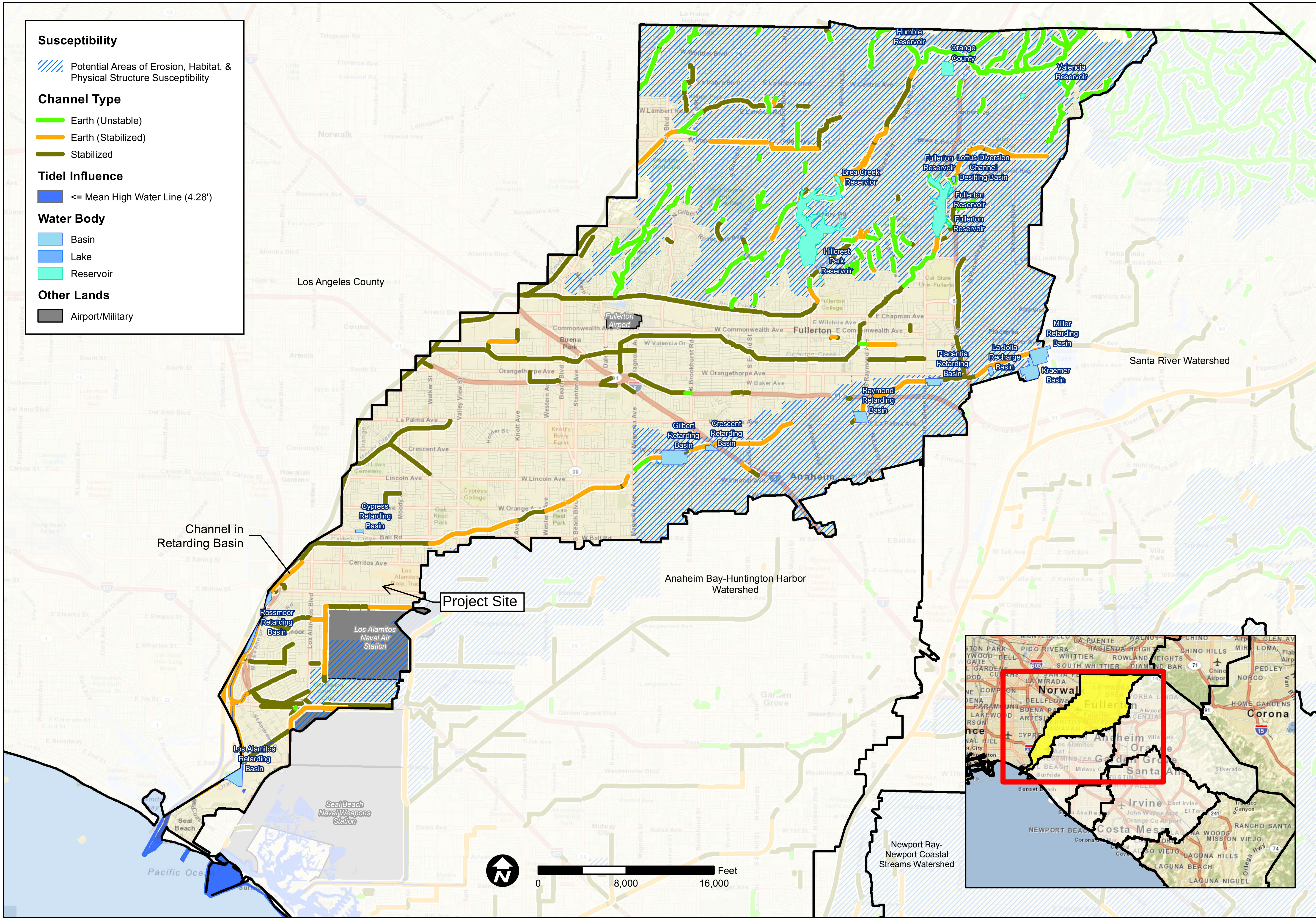
JOB
ORANGE COUNTY INFILTRATION STUDY
ORANGE CO. CA

SCALE	1" = 1.25 miles
DESIGNED	TH
DRAWING	TH
CHECKED	BMP
DATE	02/09/11
JOB NO.	9526-E

PACE Advanced Water Engineering

FIGURE
XVI-2d

P:\9526E16-GIS\Mxds\Reports\InfiltrationFeasability_20110215\9526E_FigureXVI-2d_DepthToGroundwaterOverview_20110215.mxd



TITLE
SUSCEPTIBILITY ANALYIS
SAN GABRIEL-COYOTE CREEK

JOB
ORANGE COUNTY
WATERSHED
MASTER PLANNING
ORANGE CO. CA

SCALE	1" = 8000'
DESIGNED	TH
DRAWING	TH
CHECKED	BMP
DATE	04/30/10
JOB NO.	9526-E

PACE
Advanced Water Engineering

1

P:\9526E\6-GIS\Mxds\SusceptibilityMaps_20100505\9526E_SanGabrielCoyoteCreekSusceptibility_20100430.mxd

Table 2.7: Infiltration BMP Feasibility Worksheet

<table>
<tr><th></th><th>Infeasibility Criteria</th><th>Yes</th><th>No</th></tr>
<tr><td>1</td><td>Would Infiltration BMPs pose significant risk for groundwater related concerns? Refer to Appendix VII (Worksheet I) for guidance on groundwater-related infiltration feasibility criteria.</td><td></td><td>X</td></tr>
<tr><td colspan="4">Provide basis:

Summarize findings of studies provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</td></tr>
<tr><td>2</td><td>Would Infiltration BMPs pose significant risk of increasing risk of geotechnical hazards that cannot be mitigated to an acceptable level? (Yes if the answer to any of the following questions is yes, as established by a geotechnical expert):
The BMP can only be located less than 50 feet away from slopes steeper than 15 percent
The BMP can only be located less than eight feet from building foundations or an alternative setback.
A study prepared by a geotechnical professional or an available watershed study substantiates that stormwater infiltration would potentially result in significantly increased risks of geotechnical hazards that cannot be mitigated to an acceptable level.</td><td></td><td>X</td></tr>
<tr><td colspan="4">Provide basis:

Summarize findings of studies provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</td></tr>
<tr><td>3</td><td>Would infiltration of the DCV from drainage area violate downstream water rights?</td><td></td><td>X</td></tr>
<tr><td colspan="4">Provide basis:

Summarize findings of studies provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</td></tr>
</table>

Table 2.7: Infiltration BMP Feasibility Worksheet (continued)

<table>
<tr><th></th><th>Partial Infeasibility Criteria</th><th>Yes</th><th>No</th></tr>
<tr><td>4</td><td>Is proposed infiltration facility located on HSG D soils or the site geotechnical investigation identifies presence of soil characteristics which support categorization as D soils?</td><td></td><td>X</td></tr>
<tr><td colspan="4">Provide basis:

Summarize findings of studies provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</td></tr>
<tr><td>5</td><td>Is measured infiltration rate below proposed facility less than 0.3 inches per hour? This calculation shall be based on the methods described in Appendix VII.</td><td>X</td><td></td></tr>
<tr><td colspan="4">Provide basis:

All rates after applying a safety factor of 2 are below 0.3 inches per hour. See Appendix F for results of the infiltration testing.

Summarize findings of studies provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</td></tr>
<tr><td>6</td><td>Would reduction of over predeveloped conditions cause impairments to downstream beneficial uses, such as change of seasonality of ephemeral washes or increased discharge of contaminated groundwater to surface waters?</td><td></td><td>X</td></tr>
<tr><td colspan="4">Provide citation to applicable study and summarize findings relative to the amount of infiltration that is permissible:

Summarize findings of studies provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</td></tr>
<tr><td>7</td><td>Would an increase in infiltration over predeveloped conditions cause impairments to downstream beneficial uses, such as change of seasonality of ephemeral washes or increased discharge of contaminated groundwater to surface waters?</td><td></td><td>X</td></tr>
<tr><td colspan="4">Provide citation to applicable study and summarize findings relative to the amount of infiltration that is permissible:

Summarize findings of studies provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</td></tr>
</table>

Table 2.7: Infiltration BMP Feasibility Worksheet (continued)

Infiltration Screening Results (check box corresponding to result):		
8	Is there substantial evidence that infiltration from the project would result in a significant increase in I&I to the sanitary sewer that cannot be sufficiently mitigated? (See Appendix XVII) Provide narrative discussion and supporting evidence: Summarize findings of studies provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.	No
9	If any answer from row 1-3 is yes: infiltration of any volume is **not feasible** within the DMA or equivalent. Provide basis: *See Row #10.* Summarize findings of infeasibility screening	Infiltration Not Feasible
10	If any answer from row 4-7 is yes, infiltration is **permissible but is not presumed to be feasible for the entire DCV.** Criteria for designing biotreatment BMPs to achieve the maximum feasible infiltration and ET shall apply. Provide basis: *Answer to Row #5 is "Yes".* Summarize findings of infeasibility screening	Infiltration Not Feasible
11	If all answers to rows 1 through 11 are no, infiltration of the full DCV is potentially feasible, BMPs must be designed to infiltrate the full DCV to the maximum extent practicable. *See Row #10*	Infiltration Not Feasible

Worksheet B: Simple Design Capture Volume Sizing Method

Project: Barton Place, Cypress CA

Date: 2/18/2015

			Total Site	A-Total	B-Total	C-Total	D1	D2	D3	D4	D5	F4	F5	
Step 1: Determine the design capture storm depth used for calculating volume														
1	Enter design capture storm depth from Figure III.1, *d* (inches)	d=	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	inches
2	Enter the effect of provided HSCs, d_{HSC} (inches) (Worksheet A)	d_{HSC}=	0	0	0	0	0	0	0	0	0	0	0	inches
3	Calculate the remainder of the design capture storm depth, $d_{remainder}$ (inches) (Line 1 – Line 2)	$d_{remainder}$=	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	inches
Step 2: Calculate the DCV														
1	Enter Project area tributary to BMP(s), *A* (acres)	A=	32.916	8.260	3.460	15.910	0.520	0.450	0.680	1.610	0.920	0.170	0.170	acres
2	Enter Project Imperviousness, *imp* (unitless)	imp=	85.0%	85.0%	85.0%	85.0%	90.0%	90.0%	90.0%	90.0%	90.0%	36.0%	36.0%	%
3	Calculate runoff coefficient, $C = (0.75 \times imp) + 0.15$	C=	0.788	0.788	0.788	0.788	0.825	0.825	0.825	0.825	0.825	0.420	0.420	
4	Calculate runoff volume, $V_{design} = (C \times d_{remainder} \times A \times 43560 \times (1/12))$	V_{design}=	80,031.1	20,083.1	8,412.6	38,683.2	1,323.7	1,145.5	1,731.0	4,098.3	2,341.9	220.3	220.3	cu-ft
Step 3: Design BMPs to ensure full retention of the DCV														
Step 3a: Determine design infiltration rate														
1	Enter measured infiltration rate, $K_{measured}$ (in/hr) (Appendix VII)	$K_{measured}$=	--	0.16	0.03	0.58	--	0.30	--	--	0.22	0.20	0.20	in/hr
2	Enter combined safety factor from Worksheet H, S_{final} (unitless)	S_{final}=	--	2.00	2.00	2.00	--	2.00	--	--	2.00	2.00	2.00	
3	Calculate design infiltration rate, $K_{design} = K_{measured} / S_{final}$	K_{design}=	--	0.08	0.01	0.29	--	0.15	--	--	0.11	0.10	0.10	in/hr
Step 3b: Determine minimum BMP footprint														
4	Enter drawdown time, *T* (max 48 hours)	T=												hours
5	Calculate max retention depth that can be drawn down within the drawdown time (feet), $D_{max} = K_{design} \times T \times (1/12)$	D_{max}=	*Infiltration is infeasible. Biotreatment BMPs will be utilized - see Workhseet D*											feet
6	Calculate minimum area required for BMP (sq-ft), $A_{min} = V_{design} / d_{max}$	A_{min}=												sq-ft

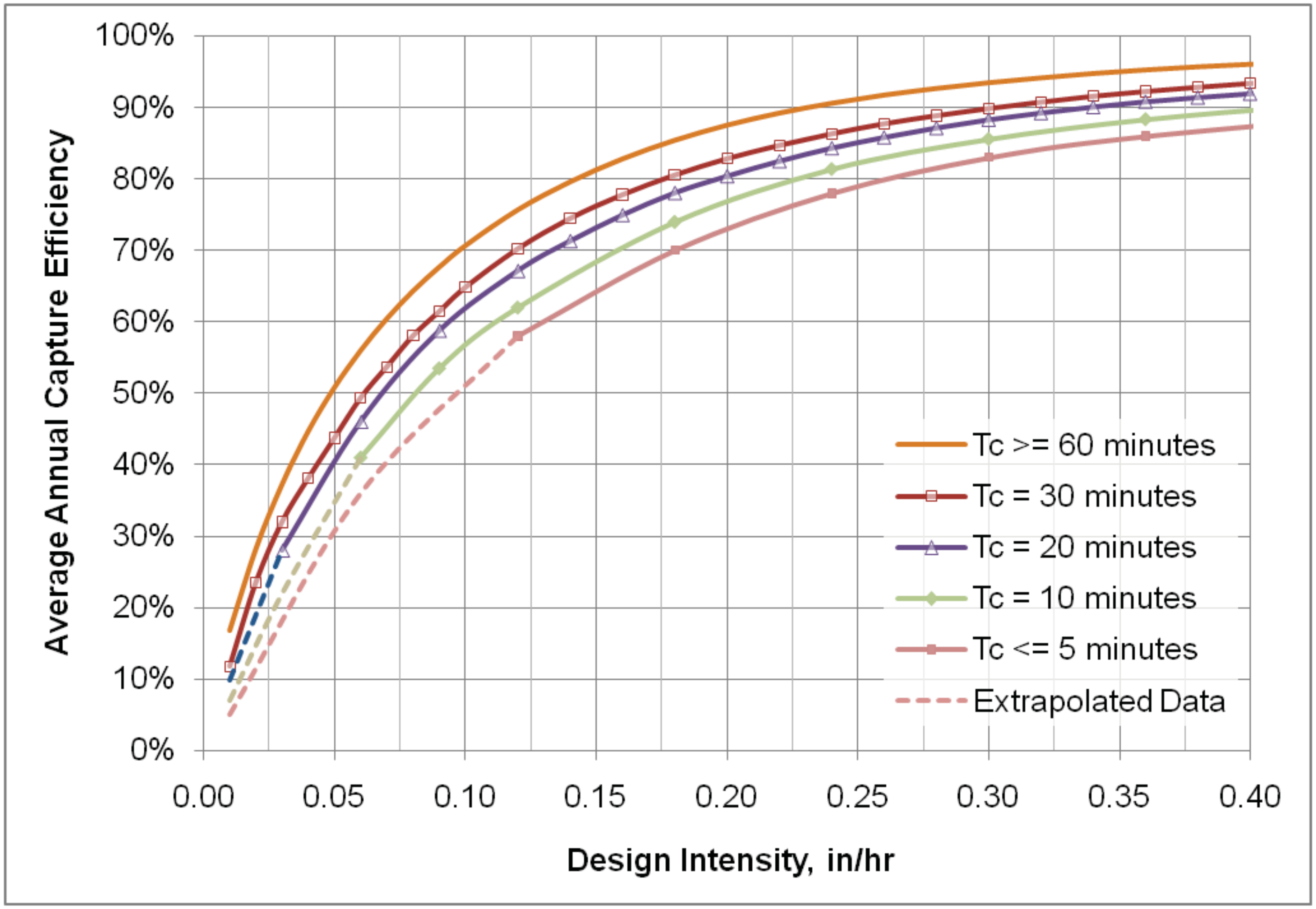
Worksheet D: Capture Efficiency Method for Flow-Based BMPs

Project: Barton Place, Cypress CA

Date: 2/13/2015

			A-Total	B-Total	C-Total	D1	D2	D3	D4	D5	
Step 1: Determine the design capture storm depth used for calculating volume											
1	Enter the time of concentration, T_c (min) (See Appendix IV.2)	T_c=	15.0	11.4	15.8	7.5	6.7	6.8	8.5	7.1	min
2	Using Figure III.4, determine the design intensity at which the estimated time of concentration (T_c) achieves 80% capture efficiency, I_1	I_1=	0.210	0.225	0.210	0.240	0.250	0.250	0.240	0.240	in/hr
3	Enter the effect depth of provided HSCs upstream, d_{HSC} (inches) (Worksheet A)	d_{HSC}=	0	0	0	0	0	0	0	0	inches
4	Enter capture efficiency corresponding to d_{HSC}, Y_2 (Worksheet A)	Y_2=	0%	0%	0%	0%	0%	0%	0%	0%	%
5	Using Figure III.4, determine the design intensity at which the time of concentration (T_c) achieves the upstream capture efficiency (Y_2), I_2	I_2=	0	0	0	0	0	0	0	0	in/hr
6	Determine the design intensity that must be provided by BMP, $I_{design} = I_1 - I_2$	I_{design}=	0.210	0.225	0.210	0.240	0.250	0.250	0.240	0.240	in/hr
Step 2: Calculate the design flowrate											
1	Enter Project area tributary to BMP(s), *A* (acres)	A=	8.260	3.460	15.910	0.520	0.450	0.680	1.610	0.920	acres
2	Enter Project Imperviousness, *imp* (unitless)	imp=	85.0%	85.0%	85.0%	90.0%	90.0%	90.0%	90.0%	90.0%	%
3	Calculate runoff coefficient, $C = (0.75 \times imp) + 0.15$	C=	0.788	0.788	0.788	0.825	0.825	0.825	0.825	0.825	
4	Calculate design flowrate, $Q_{design} = (C \times i_{design} \times A)$	Q_{design}=	1.367	0.613	2.633	0.103	0.093	0.140	0.319	0.182	cfs
Supporting Calculations											
Describe System:											
		Proprietary BioTreatment (BIO-7):									
		Unit Size / Model =	*MWS-L-8-16*	*MWS-L-8-12*	*MWS-L-8-16*	*MWS-L-4-8*	*MWS-L-4-8*	*MWS-L-4-13*	*MWS-L-8-12*	*MWS-L-4-17*	
		Unit Size / Model Treatment Capacity =	*0.462*	*0.346*	*0.462*	*0.115*	*0.115*	*0.144*	*0.346*	*0.206*	cfs
		Number of Units Needed =	*3*	*2*	*5*	*1*	*1*	*1*	*1*	*1*	
		Second Unit Size / Model =	*0*	*0*	*MWS-L-8-12*	*0*	*0*	*0*	*0*	*0*	
		Second Unit Size / Model Treatment Capacity =	*0*	*0*	*0.346*	*0*	*0*	*0*	*0*	*0*	
		Second Number of Units Needed =	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*0*	
		Total Bio-treatment Provided =	*1.386*	*0.692*	*2.656*	*0.115*	*0.115*	*0.144*	*0.346*	*0.206*	cfs
Provide time of concentration assumptions:											
	See Hydrology Map in Appendix A		*15.0*	*11.4*	*15.8*	*7.5*	*6.7*	*6.8*	*8.5*	*7.1*	min

Figure III.4. Capture Efficiency Nomograph for Off-line Flow-based Systems in Orange County



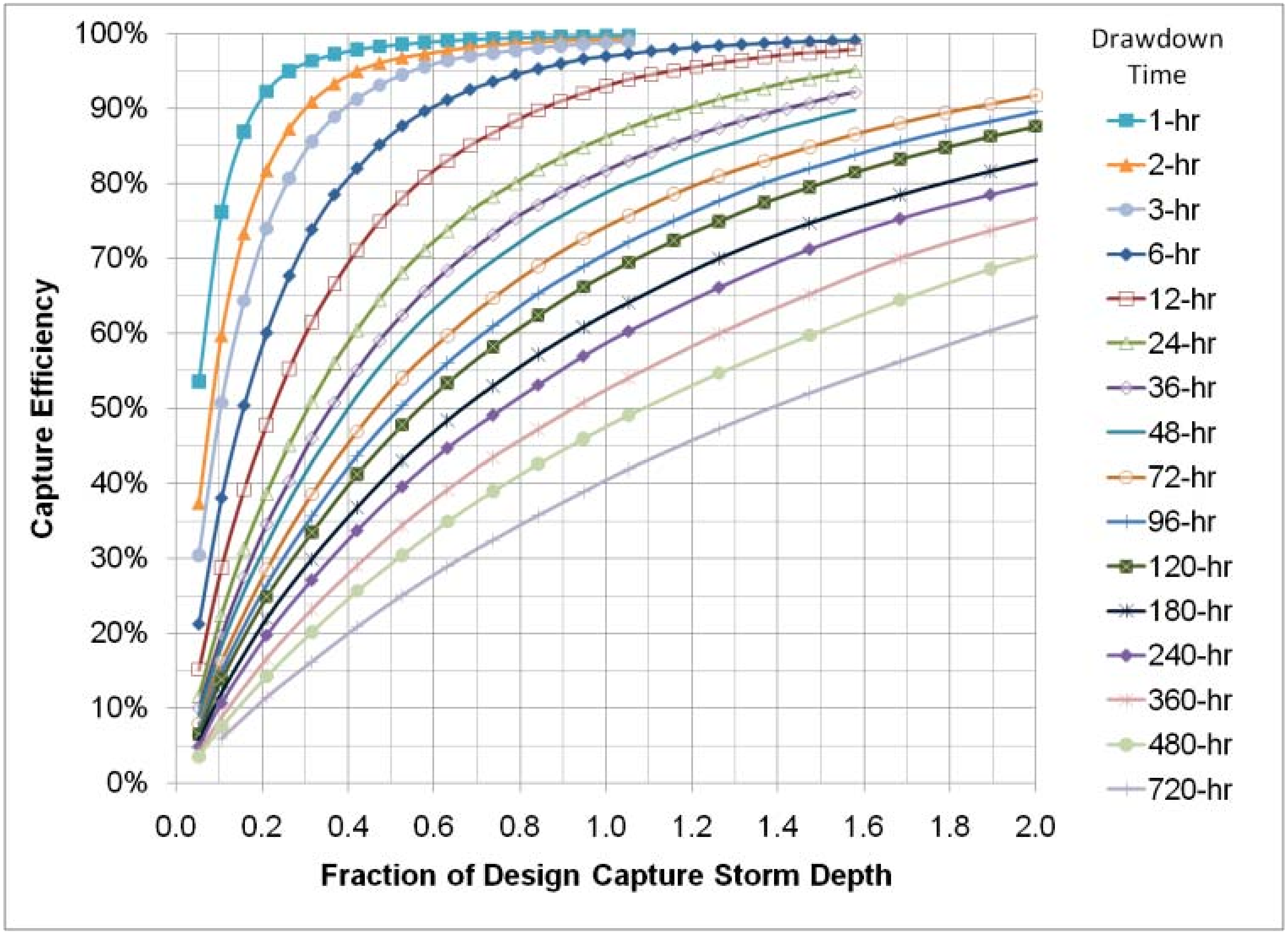
Worksheet C: Capture Efficiency Method for Volume-Based, Constant Drawdown BMPs

Project: Barton Place, Cypress CA

Date: 2/18/2015

			F4	F5	
Step 1: Determine the design capture storm depth used for calculating volume					
1	Enter design capture storm depth from Figure III.1, *d* (inches)	d=	0.85	0.85	inches
2	Enter calculated drawdown time of the proposed BMP based on equation provided in applicable BMP Fact Sheet, *T* (hours)	T=	20.04	20.04	hours
3	Using Figure III.2, determine the "fraction of design capture storm depth" at which the BMP drawdown time (T) line achieves 80% capture efficiency, X_1	X_1=	0.72	0.72	
4	Enter the effect depth of provided HSCs upstream, d_{HSC} (inches) (Worksheet A)	d_{HSC}=	0	0	inches
5	Enter capture efficiency corresponding to d_{HSC}, Y_2 (Worksheet A)	Y_2=	0%	0%	%
6	Using Figure III.2, determine the fraction of "design capture storm depth" at which the drawdown time (T) achieves the equivalent of the upstream capture efficiency (Y_2), X_2	X_2=	0	0	
7	Calculate the fraction of design volume that must be provided by BMP, *fraction* = $X_1 - X_2$	fraction=	0.72	0.72	
8	Calculate the resultant design capture storm depth (inches), $d_{fraction}$ = *fraction* × *d*	$d_{fraction}$=	0.6120	0.6120	inches
Step 2: Calculate the DCV					
1	Enter Project area tributary to BMP(s), *A* (acres)	A=	0.170	0.170	acres
2	Enter Project Imperviousness, *imp* (unitless)	imp=	36.0%	36.0%	%
3	Calculate runoff coefficient, *C= (0.75 x imp) + 0.15*	C=	0.420	0.420	
4	Calculate runoff volume, V_{design} = (C x $d_{rfraction}$ x A x 43560 x (1/12))	V_{design}=	158.6	158.6	cu-ft
Supporting Calculations					
Describe System:					
		Bioretention with Underdrains (BIO-1):			
		Ponding Depth (d_P) =	*2.0*	*2.0*	inches
		Media Filtration Rate (K_{Design}) =	*0.1*	*0.1*	in/hr
		Surface Area Needed (Amin) =	*949.8*	*949.8*	ft^2
		Surface Area Provided (A) =	*950.0*	*950.0*	ft^2
		Total Volume Bio-Treated (V) =	*158.7*	*158.7*	ft^3
Provide drawdown time calculations per applicable BMP Fact Sheet:					
	Per Fact Sheet BIO-1, Drawdown (T) = (d_P / K_{Design}) x 12				
		Drawdown (T) =	*20.04*	*20.04*	hours

Figure III.2. Capture Efficiency Nomograph for Constant Drawdown Systems in Orange County



Harvest & Reuse Irrigation Demand Calculations

3/12/2015

Storm Water Design Caputre Volume (SQDV)

Drainage Area / Land Use Type	Impervious Area (ac)	Irrigated Area (ac)	% impervious	Runoff Coefficient	Design Storm Depth (in)	Drainage Area (acres)	DCV (ft^3)	DCV (gal)
Total Site	27.98	4.94	85%	0.788	0.85	32.916	**80,031.1**	**598,633**

	Eto
Irvine	3.00
Laguna Beach	2.75
Santa Ana	2.93

$$\text{Modified EAWU} = \frac{(\text{Eto} \times \text{KL} \times \text{LA} \times 0.015)}{\text{IE}}$$

$$\text{EIATA} = \frac{\text{LA} \times \text{KL}}{(\text{IE} \times \text{Tributary Imp. Area})}$$

High-use Turf Landscaping

Drainage Area / Land Use Type	Total Area (ac)	Total Area (sf)	% Impervious	Impervious (sf)	Pervious / LA (sf)	Eto	KL	Modified EAWU	EAWU/ Impervious Acre	Minimum EAWU/ Impervious Acre (Table X.6)	Feasible?	EIATA	Minimum EIATA (Table X.8)	Drawdown (days)	Drawdown (hours)	% Capture (Fig. III.2)
Total Site	32.9160	1,433,821	85%	1,218,748	215,073	2.93	0.7	7,351.92	262.77	690	No	0.14		81.4	1,954	<40%

Low Water Use Landscaping

Drainage Area / Land Use Type	Total Area (ac)	Total Area (sf)	% Impervious	Impervious (sf)	Pervious / LA (sf)	Eto	KL	Modified EAWU	EAWU/ Impervious Acre	Minimum EAWU/ Impervious Acre (Table X.6)	Feasible?	EIATA	Minimum EIATA (Table X.8)	Drawdown (days)	Drawdown (hours)	% Capture (Fig. III.2)
Total Site	32.916	1,433,821	85%	1,218,748	215,073	2.93	0.35	3,675.96	131.38	690	No	0.07		162.9	3,908	<40%

Blend of High-Use and Low-Use Landscaping

Drainage Area / Land Use Type	Total Area (ac)	Total Area (sf)	% Impervious	Impervious (sf)	Pervious / LA (sf)	Eto	KL	Modified EAWU	EAWU/ Impervious Acre	Minimum EAWU/ Impervious Acre (Table X.6)	Feasible?	EIATA	Minimum EIATA (interpo-lated)	Drawdown (days)	Drawdown (hours)	% Capture (Fig. III.2)
Total Site	32.916	1,433,821	85%	1,218,748	215,073	2.93	0.55	5,776.51	206.46	690	No	0.11	0.00	103.6	2,487	<40%

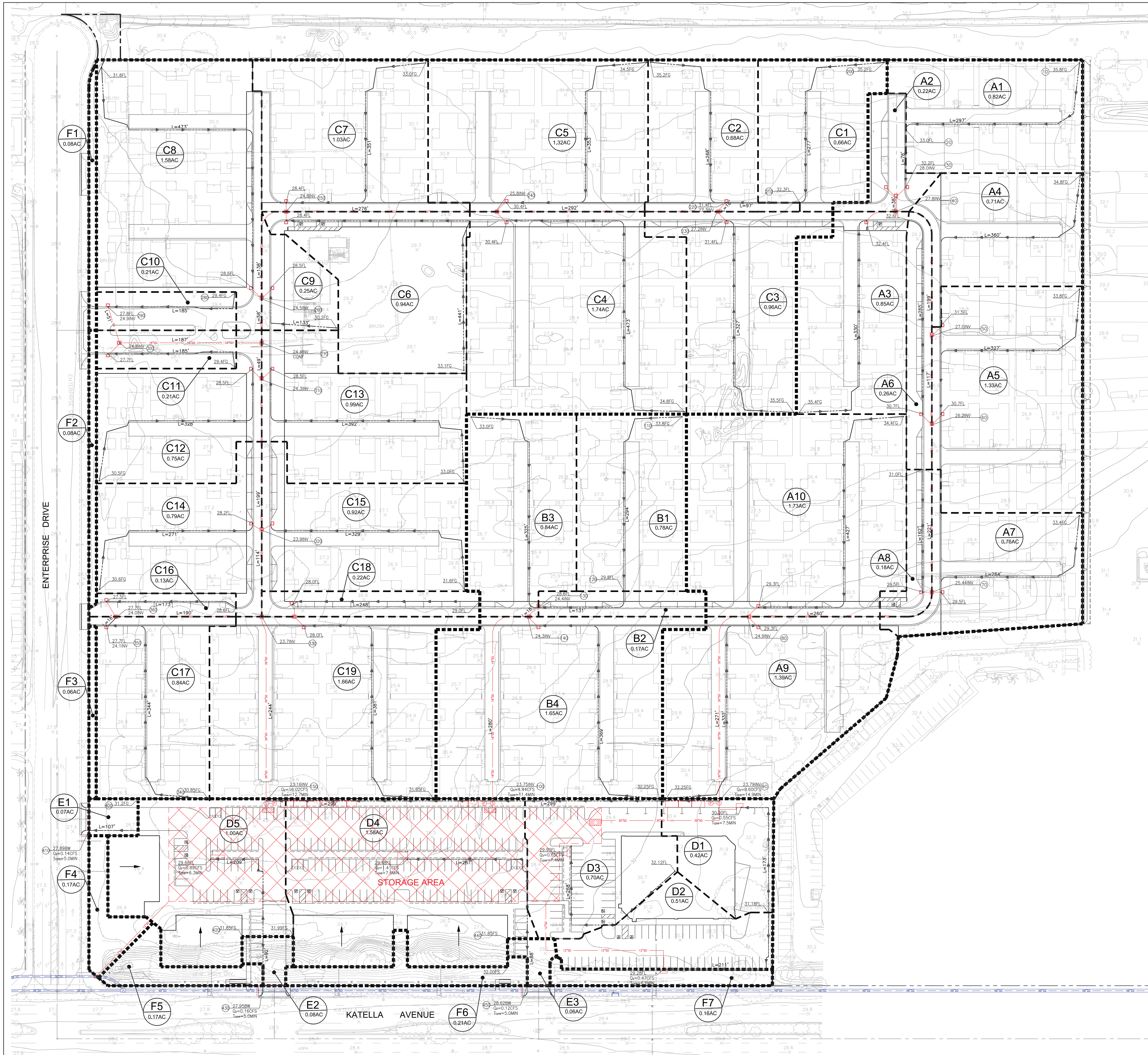
TABLE X.6: HARVESTED WATER DEMAND THRESHOLDS FOR MINIMUM PARTIAL CAPTURE

Design Capture Storm Depth, inches	Wet Season Demand Required for Minimum Partial Capture, gpd per impervious acre
0.60	490
0.65	530
0.70	570
0.75	610
0.80	650
0.85	690
0.90	730
0.95	770
1.00	810

TABLE X.8: MINIMUM IRRIGATED AREA FOR POTENTIAL PARTIAL CAPTURE FEASIBILITY

General Landscape Type	Conservation Design: KL = 0.35			Active Turf Areas: KL = 0.7		
Closest ET Station	Irvine	Santa Ana	Laguna	Irvine	Santa Ana	Laguna
Design Capture Storm Depth, inches	Minimum Required Irrigated Area per Tributary Impervious Acre for Potential Partial Capture, ac/ac					
0.60	0.66	0.68	0.72	0.33	0.34	0.36
0.65	0.72	0.73	0.78	0.36	0.37	0.39
0.70	0.77	0.79	0.84	0.39	0.39	0.42
0.75	0.83	0.84	0.9	0.41	0.42	0.45
0.80	0.88	0.9	0.96	0.44	0.45	0.48
0.85	0.93	0.95	1.02	0.47	0.48	0.51
0.90	0.99	1.01	1.08	0.49	0.51	0.54
0.95	1.04	1.07	1.14	0.52	0.53	0.57
1.00	1.1	1.12	1.2	0.55	0.56	0.6

Source: Technical Guidance Document for the Preparation of Conceptual/Preliminary and/or Project Water Quality Management Plans (WQMPs). March 22, 2011. Appendix X.



2 YEAR FLOW SUMMARY

AREA DESIGNATION	AREA (ACRES)	Q2 (CFS)	TREATMENT	OUTLET LOCATION
A1 TO A9	8.25	8.60	MWS	DETENTION BASIN
B1 TO B4	3.44	4.44	MWS	DETENTION BASIN
C1 TO C19	15.88	16.02	MWS	DETENTION BASIN
D1	0.42	0.55	MWS	DETENTION BASIN
D2	0.51	0.47	MWS	DETENTION BASIN
D3	0.70	0.65	MWS	DETENTION BASIN
D4	1.58	1.41	MWS	DETENTION BASIN
D5	1.00	0.89	MWS	DETENTION BASIN
E1	0.07	0.14	TRENCH DRAIN FILTER	STREET CURB
E2	0.08	0.16	TRENCH DRAIN FILTER	STREET CURB
E3	0.06	0.12	TRENCH DRAIN FILTER	STREET CURB
LANDSCAPE AREA (F1 TO F7)	0.93	-	SELF TREATMENT	N/A
TOTAL	32.92	33.45		

SOIL CLASS = C

LEGEND

MAJOR BOUNDARY
MINOR BOUNDARY
FLOW PATH
EXISTING STORM DRAIN
PROPOSED STORM DRAIN
A 1.75AC — DRAINAGE AREA DESIGNATION, ACRES
STORAGE AREA

N

40' 0' 20' 40'
SCALE: 1" = 40'

PREPARED BY:

FUSCOE ENGINEERING
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PROPOSED 2 YEAR HYDROLOGY MAP

BARTON PLACE
CYPRESS, CA

FEBRUARY 6, 2015

```
****************************************************************************
              RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
             (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
          (c) Copyright 1983-2014 Advanced Engineering Software (aes)
              Ver. 21.0  Release Date: 06/01/2014  License ID 1355

                            Analysis prepared by:

                           FUSCOE ENGINEERING, INC
                               16795 VON KARMAN
                                  SUITE 100
                               IRVINE, CA 92606

 ************************** DESCRIPTION OF STUDY **************************
* BARTON PLACE - C33                                                       *
* PROPOSED 2 YEAR HYDROLOGY                                                *
* JOB NO. 1334.01   FILE NAMES: PC3302.INP   PC3302.OUT                    *
 **************************************************************************

  FILE NAME: PC3302.INP
  TIME/DATE OF STUDY: 09:39 02/03/2015
============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
============================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   6.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *DATA BANK RAINFALL USED*
  *ANTECEDENT MOISTURE CONDITION (AMC) I ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

****************************************************************************
  FLOW PROCESS FROM NODE     10.00 TO NODE     20.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   297.00
  ELEVATION DATA: UPSTREAM(FEET) =     35.80  DOWNSTREAM(FEET) =     33.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.270
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.588
```

```
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      C        0.82      0.25     0.400    50    9.27
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.400
  SUBAREA RUNOFF(CFS) =      1.10
  TOTAL AREA(ACRES) =      0.82   PEAK FLOW RATE(CFS) =      1.10

****************************************************************************
  FLOW PROCESS FROM NODE     20.00 TO NODE     30.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =   33.00  DOWNSTREAM ELEVATION(FEET) =   32.20
  STREET LENGTH(FEET) =    76.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 12.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   6.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.24
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.27
    HALFSTREET FLOOD WIDTH(FEET) =    7.17
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.96
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.53
  STREET FLOW TRAVEL TIME(MIN.) =   0.65   Tc(MIN.) =    9.92
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.528
  SUBAREA LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      C        0.22      0.25     0.400    50
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.400
  SUBAREA AREA(ACRES) =    0.22      SUBAREA RUNOFF(CFS) =    0.28
  EFFECTIVE AREA(ACRES) =      1.04    AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.40
  TOTAL AREA(ACRES) =        1.0        PEAK FLOW RATE(CFS) =       1.34

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.28   HALFSTREET FLOOD WIDTH(FEET) =   7.45
  FLOW VELOCITY(FEET/SEC.) =  1.98   DEPTH*VELOCITY(FT*FT/SEC.) =   0.55
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     30.00 =     373.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     30.00 TO NODE     40.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =    28.00  DOWNSTREAM(FEET) =    27.80
  FLOW LENGTH(FEET) =    38.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.19
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.34
  PIPE TRAVEL TIME(MIN.) =   0.20    Tc(MIN.) =   10.12
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     40.00 =     411.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     40.00 TO NODE     40.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =     35.40  DOWNSTREAM(FEET) =     32.40

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.740
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.544
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      C        0.85      0.25     0.400    50    9.74
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.400
  SUBAREA AREA(ACRES) =    0.85   INITIAL SUBAREA RUNOFF(CFS) =    1.10

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =   10.12
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.511
  SUBAREA AREA(ACRES) =    0.85      SUBAREA RUNOFF(CFS) =    1.08
  EFFECTIVE AREA(ACRES) =      1.89   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.40
  TOTAL AREA(ACRES) =       1.9       PEAK FLOW RATE(CFS) =      2.40

****************************************************************************
  FLOW PROCESS FROM NODE     40.00 TO NODE     50.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    27.80  DOWNSTREAM(FEET) =    27.00
  FLOW LENGTH(FEET) =   199.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   8.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.34
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.40
  PIPE TRAVEL TIME(MIN.) =   0.99    Tc(MIN.) =   11.11
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     50.00 =     610.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     50.00 TO NODE     50.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   360.00
```

```
  ELEVATION DATA: UPSTREAM(FEET) =     34.80  DOWNSTREAM(FEET) =     31.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.068
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.515
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      C        0.71      0.25     0.400    50   10.07
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.400
  SUBAREA AREA(ACRES) =    0.71   INITIAL SUBAREA RUNOFF(CFS) =    0.90

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =   11.11
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.432
  SUBAREA AREA(ACRES) =    0.71      SUBAREA RUNOFF(CFS) =    0.85
  EFFECTIVE AREA(ACRES) =      2.60   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.40
  TOTAL AREA(ACRES) =        2.6       PEAK FLOW RATE(CFS) =       3.12

****************************************************************************
  FLOW PROCESS FROM NODE     50.00 TO NODE     60.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    27.00  DOWNSTREAM(FEET) =    26.20
  FLOW LENGTH(FEET) =   117.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   8.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.34
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.12
  PIPE TRAVEL TIME(MIN.) =   0.45    Tc(MIN.) =   11.56
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     60.00 =     727.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     60.00 TO NODE     60.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   327.00
  ELEVATION DATA: UPSTREAM(FEET) =     33.80  DOWNSTREAM(FEET) =     30.70

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.623
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.555
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      C        1.33      0.25     0.400    50    9.62
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.400
  SUBAREA AREA(ACRES) =    1.33   INITIAL SUBAREA RUNOFF(CFS) =    1.74

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =   11.56
```

```
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.399
  SUBAREA AREA(ACRES) =    1.33      SUBAREA RUNOFF(CFS) =    1.56
  EFFECTIVE AREA(ACRES) =      3.93   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.40
  TOTAL AREA(ACRES) =        3.9       PEAK FLOW RATE(CFS) =       4.60

****************************************************************************
  FLOW PROCESS FROM NODE     60.00 TO NODE     60.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   265.00
  ELEVATION DATA: UPSTREAM(FEET) =     32.60  DOWNSTREAM(FEET) =     30.70

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.356
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.580
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      C        0.26      0.25     0.400    50    9.36
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.400
  SUBAREA AREA(ACRES) =    0.26   INITIAL SUBAREA RUNOFF(CFS) =    0.35

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =   11.56
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.399
  SUBAREA AREA(ACRES) =    0.26      SUBAREA RUNOFF(CFS) =    0.30
  EFFECTIVE AREA(ACRES) =      4.19   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.40
  TOTAL AREA(ACRES) =        4.2       PEAK FLOW RATE(CFS) =       4.90

****************************************************************************
  FLOW PROCESS FROM NODE     60.00 TO NODE     70.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    26.20  DOWNSTREAM(FEET) =    25.44
  FLOW LENGTH(FEET) =   221.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.71
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.90
  PIPE TRAVEL TIME(MIN.) =   0.99    Tc(MIN.) =   12.55
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     70.00 =     948.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     70.00 TO NODE     70.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   264.00
  ELEVATION DATA: UPSTREAM(FEET) =     33.40  DOWNSTREAM(FEET) =     29.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
```

```
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.084
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.718
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      C        0.76      0.25     0.400    50    8.08
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.400
  SUBAREA AREA(ACRES) =    0.76   INITIAL SUBAREA RUNOFF(CFS) =    1.11

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =   12.55
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.335
  SUBAREA AREA(ACRES) =    0.76      SUBAREA RUNOFF(CFS) =    0.84
  EFFECTIVE AREA(ACRES) =      4.95   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.40
  TOTAL AREA(ACRES) =        4.9       PEAK FLOW RATE(CFS) =       5.50

****************************************************************************
  FLOW PROCESS FROM NODE     70.00 TO NODE     70.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   162.00
  ELEVATION DATA: UPSTREAM(FEET) =     31.00  DOWNSTREAM(FEET) =     29.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.301
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.822
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      C        0.18      0.25     0.400    50    7.30
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.400
  SUBAREA AREA(ACRES) =    0.18   INITIAL SUBAREA RUNOFF(CFS) =    0.28

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =   12.55
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.335
  SUBAREA AREA(ACRES) =    0.18      SUBAREA RUNOFF(CFS) =    0.20
  EFFECTIVE AREA(ACRES) =      5.13   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.40
  TOTAL AREA(ACRES) =        5.1       PEAK FLOW RATE(CFS) =       5.70

****************************************************************************
  FLOW PROCESS FROM NODE     70.00 TO NODE     80.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    25.44  DOWNSTREAM(FEET) =    24.90
  FLOW LENGTH(FEET) =   260.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  14.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.19
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.70
```

```
  PIPE TRAVEL TIME(MIN.) =   1.36    Tc(MIN.) =   13.91
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     80.00 =    1208.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     80.00 TO NODE     80.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   332.00
  ELEVATION DATA: UPSTREAM(FEET) =     32.25  DOWNSTREAM(FEET) =     29.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.808
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.538
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      C        1.39      0.25     0.400    50    9.81
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.400
  SUBAREA AREA(ACRES) =    1.39   INITIAL SUBAREA RUNOFF(CFS) =    1.80

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =   13.91
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.258
  SUBAREA AREA(ACRES) =    1.39      SUBAREA RUNOFF(CFS) =    1.45
  EFFECTIVE AREA(ACRES) =      6.52   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.40
  TOTAL AREA(ACRES) =       6.5       PEAK FLOW RATE(CFS) =      6.80

****************************************************************************
  FLOW PROCESS FROM NODE     80.00 TO NODE     80.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   427.00
  ELEVATION DATA: UPSTREAM(FEET) =     34.40  DOWNSTREAM(FEET) =     29.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.224
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.501
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      C        1.73      0.25     0.400    50   10.22
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.400
  SUBAREA AREA(ACRES) =    1.73   INITIAL SUBAREA RUNOFF(CFS) =    2.18

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =   13.91
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.258
  SUBAREA AREA(ACRES) =    1.73      SUBAREA RUNOFF(CFS) =    1.80
  EFFECTIVE AREA(ACRES) =      8.25   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.40
  TOTAL AREA(ACRES) =       8.2       PEAK FLOW RATE(CFS) =      8.60
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     80.00 TO NODE     90.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    24.90  DOWNSTREAM(FEET) =    23.79
  FLOW LENGTH(FEET) =   271.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  15.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.52
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       8.60
  PIPE TRAVEL TIME(MIN.) =   1.00    Tc(MIN.) =   14.91
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     90.00 =    1479.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     90.00 TO NODE     90.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   173.00
  ELEVATION DATA: UPSTREAM(FEET) =     31.18  DOWNSTREAM(FEET) =     30.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.868
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.887
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp        Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 C       0.42      0.25     0.100    50    6.87
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.42   INITIAL SUBAREA RUNOFF(CFS) =    0.70

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =   14.91
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.209
  SUBAREA AREA(ACRES) =    0.42      SUBAREA RUNOFF(CFS) =    0.45
  EFFECTIVE AREA(ACRES) =      8.67   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.39
  TOTAL AREA(ACRES) =        8.7       PEAK FLOW RATE(CFS) =      8.68

****************************************************************************
  FLOW PROCESS FROM NODE     90.00 TO NODE    100.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    23.79  DOWNSTREAM(FEET) =    23.75
  FLOW LENGTH(FEET) =   299.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  30.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   1.24
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       8.68
  PIPE TRAVEL TIME(MIN.) =   4.01    Tc(MIN.) =   18.92
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE    100.00 =    1778.00 FEET.

****************************************************************************
```

```
  FLOW PROCESS FROM NODE    100.00 TO NODE    100.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   211.00
  ELEVATION DATA: UPSTREAM(FEET) =     31.18  DOWNSTREAM(FEET) =     29.28

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.633
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.925
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 C       0.51      0.25     0.100    50    6.63
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.51   INITIAL SUBAREA RUNOFF(CFS) =    0.87

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =   18.92
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.055
  SUBAREA AREA(ACRES) =    0.51      SUBAREA RUNOFF(CFS) =    0.47
  EFFECTIVE AREA(ACRES) =      9.18   AREA-AVERAGED Fm(INCH/HR) =  0.09
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.37
  TOTAL AREA(ACRES) =       9.2       PEAK FLOW RATE(CFS) =       8.68
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    100.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   268.00
  ELEVATION DATA: UPSTREAM(FEET) =     32.12  DOWNSTREAM(FEET) =     29.90

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.421
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.805
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 C       0.70      0.25     0.100    50    7.42
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.70   INITIAL SUBAREA RUNOFF(CFS) =    1.12

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =   18.92
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.055
  SUBAREA AREA(ACRES) =    0.70      SUBAREA RUNOFF(CFS) =    0.65
  EFFECTIVE AREA(ACRES) =      9.88   AREA-AVERAGED Fm(INCH/HR) =  0.09
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.35
  TOTAL AREA(ACRES) =       9.9       PEAK FLOW RATE(CFS) =       8.68
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    100.00 IS CODE =  10
----------------------------------------------------------------------------
```

```
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    120.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   294.00
  ELEVATION DATA: UPSTREAM(FEET) =     33.80  DOWNSTREAM(FEET) =     29.80

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.580
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.660
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      C        0.78      0.25     0.400    50    8.58
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.400
  SUBAREA RUNOFF(CFS) =      1.10
  TOTAL AREA(ACRES) =      0.78   PEAK FLOW RATE(CFS) =      1.10

****************************************************************************
  FLOW PROCESS FROM NODE    120.00 TO NODE    130.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =   29.80  DOWNSTREAM ELEVATION(FEET) =   28.60
  STREET LENGTH(FEET) =   131.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 12.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   6.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.21
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.27
    HALFSTREET FLOOD WIDTH(FEET) =    7.36
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.83
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.50
  STREET FLOW TRAVEL TIME(MIN.) =   1.19   Tc(MIN.) =    9.77
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.541
  SUBAREA LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      C        0.17      0.25     0.400    50
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.400
  SUBAREA AREA(ACRES) =    0.17      SUBAREA RUNOFF(CFS) =    0.22
```

```
  EFFECTIVE AREA(ACRES) =      0.95    AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.40
  TOTAL AREA(ACRES) =        0.9        PEAK FLOW RATE(CFS) =       1.23

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.27   HALFSTREET FLOOD WIDTH(FEET) =   7.36
  FLOW VELOCITY(FEET/SEC.) =  1.87   DEPTH*VELOCITY(FT*FT/SEC.) =   0.51
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    130.00 =     425.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    130.00 TO NODE    130.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   325.00
  ELEVATION DATA: UPSTREAM(FEET) =     33.00  DOWNSTREAM(FEET) =     28.60

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.939
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.622
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp        Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      C        0.84      0.25     0.400    50    8.94
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.400
  SUBAREA AREA(ACRES) =    0.84   INITIAL SUBAREA RUNOFF(CFS) =    1.15

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =    9.77
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.541
  SUBAREA AREA(ACRES) =    0.84      SUBAREA RUNOFF(CFS) =    1.09
  EFFECTIVE AREA(ACRES) =      1.79   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.40
  TOTAL AREA(ACRES) =        1.8       PEAK FLOW RATE(CFS) =       2.32

****************************************************************************
  FLOW PROCESS FROM NODE    130.00 TO NODE    140.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    24.40  DOWNSTREAM(FEET) =    24.30
  FLOW LENGTH(FEET) =    18.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   9.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.64
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.32
  PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =    9.86
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    140.00 =     443.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    140.00 TO NODE    140.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   369.00
```

```
  ELEVATION DATA: UPSTREAM(FEET) =     32.25  DOWNSTREAM(FEET) =     28.60

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.014
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.519
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      C        1.65      0.25     0.400    50   10.01
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.400
  SUBAREA AREA(ACRES) =    1.65   INITIAL SUBAREA RUNOFF(CFS) =    2.11

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =    9.86
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.533
  SUBAREA AREA(ACRES) =    1.65      SUBAREA RUNOFF(CFS) =    2.13
  EFFECTIVE AREA(ACRES) =      3.44   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.40
  TOTAL AREA(ACRES) =        3.4       PEAK FLOW RATE(CFS) =       4.44

****************************************************************************
  FLOW PROCESS FROM NODE    140.00 TO NODE    100.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    24.30  DOWNSTREAM(FEET) =    23.70
  FLOW LENGTH(FEET) =   280.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  14.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.97
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.44
  PIPE TRAVEL TIME(MIN.) =   1.57    Tc(MIN.) =   11.43
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    100.00 =     723.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    100.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        4.44   11.43    1.409  0.25( 0.10) 0.40       3.4     110.00
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    100.00 =     723.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        8.68   18.92    1.055  0.25( 0.09) 0.35       9.9      10.00
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE    100.00 =    1778.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       11.60   11.43    1.409  0.25( 0.09) 0.37       9.4     110.00
      2       11.92   18.92    1.055  0.25( 0.09) 0.36      13.3      10.00
```

```
    TOTAL AREA(ACRES) =        13.3

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       11.92  Tc(MIN.) =   18.918
  EFFECTIVE AREA(ACRES) =     13.32  AREA-AVERAGED Fm(INCH/HR) =  0.09
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.36
  TOTAL AREA(ACRES) =      13.3
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE    100.00 =    1778.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    150.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    23.75  DOWNSTREAM(FEET) =    23.16
  FLOW LENGTH(FEET) =   299.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  20.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.72
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      11.92
  PIPE TRAVEL TIME(MIN.) =   1.34    Tc(MIN.) =   20.26
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE    150.00 =    2077.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    150.00 TO NODE    150.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   287.00
  ELEVATION DATA: UPSTREAM(FEET) =     31.85  DOWNSTREAM(FEET) =     29.48

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.632
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.776
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 C       1.58      0.25     0.100    50    7.63
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    1.58   INITIAL SUBAREA RUNOFF(CFS) =    2.49

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =   20.26
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.014
  SUBAREA AREA(ACRES) =    1.58      SUBAREA RUNOFF(CFS) =    1.41
  EFFECTIVE AREA(ACRES) =     14.90   AREA-AVERAGED Fm(INCH/HR) =  0.08
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.34
  TOTAL AREA(ACRES) =      14.9       PEAK FLOW RATE(CFS) =      12.47

****************************************************************************
  FLOW PROCESS FROM NODE    150.00 TO NODE    150.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   209.00
  ELEVATION DATA: UPSTREAM(FEET) =     31.99  DOWNSTREAM(FEET) =     29.66
```

```
  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.331
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.977
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                  C       1.00      0.25     0.100    50    6.33
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    1.00   INITIAL SUBAREA RUNOFF(CFS) =    1.76

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =   20.26
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.014
  SUBAREA AREA(ACRES) =    1.00      SUBAREA RUNOFF(CFS) =    0.89
  EFFECTIVE AREA(ACRES) =     15.90   AREA-AVERAGED Fm(INCH/HR) =  0.08
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.32
  TOTAL AREA(ACRES) =       15.9       PEAK FLOW RATE(CFS) =      13.36

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       13.42   12.77    1.321  0.25( 0.08) 0.31      12.0     110.00
      2       13.36   20.26    1.014  0.25( 0.08) 0.32      15.9      10.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =      13.42  Tc(MIN.) =   12.77
  AREA-AVERAGED Fm(INCH/HR) =  0.08  AREA-AVERAGED Fp(INCH/HR) =  0.25
  AREA-AVERAGED Ap =  0.31  EFFECTIVE AREA(ACRES) =      11.99

****************************************************************************
  FLOW PROCESS FROM NODE    150.00 TO NODE    150.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    200.00 TO NODE    210.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   277.00
  ELEVATION DATA: UPSTREAM(FEET) =     35.20  DOWNSTREAM(FEET) =     32.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.828
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.633
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"       C       0.66      0.25     0.400    50    8.83
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.400
  SUBAREA RUNOFF(CFS) =      0.91
  TOTAL AREA(ACRES) =      0.66   PEAK FLOW RATE(CFS) =      0.91

****************************************************************************
  FLOW PROCESS FROM NODE    210.00 TO NODE    220.00 IS CODE =  61
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =   32.30  DOWNSTREAM ELEVATION(FEET) =   31.40
  STREET LENGTH(FEET) =    97.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 12.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   6.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.93
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.25
    HALFSTREET FLOOD WIDTH(FEET) =    6.42
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.75
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.45
  STREET FLOW TRAVEL TIME(MIN.) =   0.92   Tc(MIN.) =    9.75
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.543
  SUBAREA LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      C        0.03      0.25     0.400    50
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.400
  SUBAREA AREA(ACRES) =    0.03      SUBAREA RUNOFF(CFS) =    0.04
  EFFECTIVE AREA(ACRES) =      0.69    AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.40
  TOTAL AREA(ACRES) =        0.7        PEAK FLOW RATE(CFS) =       0.91
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.25   HALFSTREET FLOOD WIDTH(FEET) =   6.33
  FLOW VELOCITY(FEET/SEC.) =  1.76   DEPTH*VELOCITY(FT*FT/SEC.) =   0.44
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    220.00 =     374.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    220.00 TO NODE    220.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   268.00
  ELEVATION DATA: UPSTREAM(FEET) =     35.20  DOWNSTREAM(FEET) =     31.40

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.200
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.704
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      C        0.65      0.25     0.400    50    8.20
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.400
  SUBAREA AREA(ACRES) =    0.65   INITIAL SUBAREA RUNOFF(CFS) =    0.94

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =    9.75
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.543
  SUBAREA AREA(ACRES) =    0.65      SUBAREA RUNOFF(CFS) =    0.84
  EFFECTIVE AREA(ACRES) =      1.34   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.40
  TOTAL AREA(ACRES) =        1.3       PEAK FLOW RATE(CFS) =       1.74

****************************************************************************
  FLOW PROCESS FROM NODE    220.00 TO NODE    230.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    27.30  DOWNSTREAM(FEET) =    27.20
  FLOW LENGTH(FEET) =    18.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   7.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.46
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.74
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =    9.84
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    230.00 =     392.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    230.00 TO NODE    230.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   327.00
  ELEVATION DATA: UPSTREAM(FEET) =     35.50  DOWNSTREAM(FEET) =     31.40

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.100
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.605
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      C        0.96      0.25     0.400    50    9.10
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.400
  SUBAREA AREA(ACRES) =    0.96   INITIAL SUBAREA RUNOFF(CFS) =    1.30

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =    9.84
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.535
  SUBAREA AREA(ACRES) =    0.96      SUBAREA RUNOFF(CFS) =    1.24
  EFFECTIVE AREA(ACRES) =      2.30   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.40
  TOTAL AREA(ACRES) =        2.3       PEAK FLOW RATE(CFS) =       2.97

****************************************************************************
  FLOW PROCESS FROM NODE    230.00 TO NODE    240.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    27.20  DOWNSTREAM(FEET) =    25.80
  FLOW LENGTH(FEET) =   292.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   9.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.74
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.97
  PIPE TRAVEL TIME(MIN.) =   1.30    Tc(MIN.) =   11.14
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    240.00 =     684.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    240.00 TO NODE    240.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   473.00
  ELEVATION DATA: UPSTREAM(FEET) =     34.80  DOWNSTREAM(FEET) =     30.40

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.197
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.425
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      C        1.74      0.25     0.400    50   11.20
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.400
  SUBAREA AREA(ACRES) =    1.74   INITIAL SUBAREA RUNOFF(CFS) =    2.08

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =   11.14
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.429
  SUBAREA AREA(ACRES) =    1.74      SUBAREA RUNOFF(CFS) =    2.08
  EFFECTIVE AREA(ACRES) =      4.04   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.40
  TOTAL AREA(ACRES) =        4.0       PEAK FLOW RATE(CFS) =       4.83

****************************************************************************
  FLOW PROCESS FROM NODE    240.00 TO NODE    240.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   353.00
  ELEVATION DATA: UPSTREAM(FEET) =     34.50  DOWNSTREAM(FEET) =     30.40

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.528
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.563
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      C        1.32      0.25     0.400    50    9.53
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.400
  SUBAREA AREA(ACRES) =    1.32   INITIAL SUBAREA RUNOFF(CFS) =    1.74
```

```
  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =   11.14
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.429
  SUBAREA AREA(ACRES) =    1.32      SUBAREA RUNOFF(CFS) =    1.58
  EFFECTIVE AREA(ACRES) =      5.36   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.40
  TOTAL AREA(ACRES) =        5.4       PEAK FLOW RATE(CFS) =       6.41

****************************************************************************
  FLOW PROCESS FROM NODE    240.00 TO NODE    250.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    25.80  DOWNSTREAM(FEET) =    24.80
  FLOW LENGTH(FEET) =   276.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  13.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.08
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.41
  PIPE TRAVEL TIME(MIN.) =   1.13    Tc(MIN.) =   12.27
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    250.00 =     960.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    250.00 TO NODE    250.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   441.00
  ELEVATION DATA: UPSTREAM(FEET) =     33.10  DOWNSTREAM(FEET) =     28.40

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.595
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.471
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      C        0.94      0.25     0.400    50   10.60
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.400
  SUBAREA AREA(ACRES) =    0.94   INITIAL SUBAREA RUNOFF(CFS) =    1.16

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =   12.27
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.352
  SUBAREA AREA(ACRES) =    0.94      SUBAREA RUNOFF(CFS) =    1.06
  EFFECTIVE AREA(ACRES) =      6.30   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.40
  TOTAL AREA(ACRES) =        6.3       PEAK FLOW RATE(CFS) =       7.10

****************************************************************************
  FLOW PROCESS FROM NODE    250.00 TO NODE    250.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   351.00
```

```
  ELEVATION DATA: UPSTREAM(FEET) =     33.00  DOWNSTREAM(FEET) =     28.40

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.279
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.587
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      C        1.03      0.25     0.400    50    9.28
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.400
  SUBAREA AREA(ACRES) =    1.03   INITIAL SUBAREA RUNOFF(CFS) =    1.38

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =   12.27
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.352
  SUBAREA AREA(ACRES) =    1.03      SUBAREA RUNOFF(CFS) =    1.16
  EFFECTIVE AREA(ACRES) =      7.33   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.40
  TOTAL AREA(ACRES) =        7.3       PEAK FLOW RATE(CFS) =       8.26

****************************************************************************
  FLOW PROCESS FROM NODE    250.00 TO NODE    260.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    24.80  DOWNSTREAM(FEET) =    24.50
  FLOW LENGTH(FEET) =   138.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  16.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.56
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       8.26
  PIPE TRAVEL TIME(MIN.) =   0.65    Tc(MIN.) =   12.91
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    260.00 =    1098.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    260.00 TO NODE    260.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   473.00
  ELEVATION DATA: UPSTREAM(FEET) =     31.80  DOWNSTREAM(FEET) =     28.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.860
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.379
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      C        1.58      0.25     0.400    50   11.86
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.400
  SUBAREA AREA(ACRES) =    1.58   INITIAL SUBAREA RUNOFF(CFS) =    1.82

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =   12.91
```

```
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.313
 SUBAREA AREA(ACRES) =    1.58      SUBAREA RUNOFF(CFS) =    1.73
 EFFECTIVE AREA(ACRES) =      8.91   AREA-AVERAGED Fm(INCH/HR) =  0.10
 AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.40
 TOTAL AREA(ACRES) =        8.9       PEAK FLOW RATE(CFS) =       9.73

****************************************************************************
 FLOW PROCESS FROM NODE    260.00 TO NODE    260.00 IS CODE =  82
----------------------------------------------------------------------------
 >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
 >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   133.00
 ELEVATION DATA: UPSTREAM(FEET) =     30.20  DOWNSTREAM(FEET) =     28.50

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.325
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.978
 SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE"      C        0.25      0.25     0.400    50    6.33
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.400
 SUBAREA AREA(ACRES) =    0.25   INITIAL SUBAREA RUNOFF(CFS) =    0.42

 ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
 MAINLINE Tc(MIN.) =   12.91
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.313
 SUBAREA AREA(ACRES) =    0.25      SUBAREA RUNOFF(CFS) =    0.27
 EFFECTIVE AREA(ACRES) =      9.16   AREA-AVERAGED Fm(INCH/HR) =  0.10
 AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.40
 TOTAL AREA(ACRES) =        9.2       PEAK FLOW RATE(CFS) =      10.00

****************************************************************************
 FLOW PROCESS FROM NODE    260.00 TO NODE    270.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    24.50  DOWNSTREAM(FEET) =    24.40
 FLOW LENGTH(FEET) =    58.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  27.0 INCH PIPE IS  18.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   3.42
 ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      10.00
 PIPE TRAVEL TIME(MIN.) =   0.28    Tc(MIN.) =   13.19
 LONGEST FLOWPATH FROM NODE    200.00 TO NODE    270.00 =    1156.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    270.00 TO NODE    270.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   13.19
 RAINFALL INTENSITY(INCH/HR) =   1.30
 AREA-AVERAGED Fm(INCH/HR) =  0.10
```

```
  AREA-AVERAGED Fp(INCH/HR) =  0.25
  AREA-AVERAGED Ap =  0.40
  EFFECTIVE STREAM AREA(ACRES) =       9.16
  TOTAL STREAM AREA(ACRES) =       9.16
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      10.00

****************************************************************************
  FLOW PROCESS FROM NODE    280.00 TO NODE    290.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   185.00
  ELEVATION DATA: UPSTREAM(FEET) =     29.40  DOWNSTREAM(FEET) =     27.80

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.805
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.753
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      C        0.21      0.25     0.400    50    7.80
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.400
  SUBAREA RUNOFF(CFS) =      0.31
  TOTAL AREA(ACRES) =      0.21   PEAK FLOW RATE(CFS) =      0.31

****************************************************************************
  FLOW PROCESS FROM NODE    290.00 TO NODE    300.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    24.90  DOWNSTREAM(FEET) =    24.80
  FLOW LENGTH(FEET) =    51.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   4.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   1.55
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.31
  PIPE TRAVEL TIME(MIN.) =   0.55    Tc(MIN.) =    8.35
  LONGEST FLOWPATH FROM NODE    280.00 TO NODE    300.00 =     236.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE    300.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   185.00
  ELEVATION DATA: UPSTREAM(FEET) =     29.40  DOWNSTREAM(FEET) =     27.70

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.711
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.765
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      C        0.21      0.25     0.400    50    7.71
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.400
  SUBAREA AREA(ACRES) =    0.21   INITIAL SUBAREA RUNOFF(CFS) =    0.31

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =    8.35
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.686
  SUBAREA AREA(ACRES) =    0.21      SUBAREA RUNOFF(CFS) =    0.30
  EFFECTIVE AREA(ACRES) =      0.42   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.40
  TOTAL AREA(ACRES) =       0.4       PEAK FLOW RATE(CFS) =       0.60

****************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE    270.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    24.80  DOWNSTREAM(FEET) =    24.40
  FLOW LENGTH(FEET) =   187.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   6.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   1.84
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.60
  PIPE TRAVEL TIME(MIN.) =   1.69    Tc(MIN.) =   10.05
  LONGEST FLOWPATH FROM NODE    280.00 TO NODE    270.00 =     423.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    270.00 TO NODE    270.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.05
  RAINFALL INTENSITY(INCH/HR) =   1.52
  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.25
  AREA-AVERAGED Ap =  0.40
  EFFECTIVE STREAM AREA(ACRES) =       0.42
  TOTAL STREAM AREA(ACRES) =       0.42
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.60

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       10.00   13.19    1.297  0.25( 0.10) 0.40       9.2     200.00
      2        0.60   10.05    1.516  0.25( 0.10) 0.40       0.4     280.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        9.61   10.05    1.516  0.25( 0.10) 0.40       7.4     280.00
      2       10.51   13.19    1.297  0.25( 0.10) 0.40       9.6     200.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
```

```
  PEAK FLOW RATE(CFS) =      10.51    Tc(MIN.) =    13.19
  EFFECTIVE AREA(ACRES) =       9.58   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.40
  TOTAL AREA(ACRES) =        9.6
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    270.00 =    1156.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    270.00 TO NODE    310.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    24.40  DOWNSTREAM(FEET) =    24.30
  FLOW LENGTH(FEET) =    49.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  18.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.70
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      10.51
  PIPE TRAVEL TIME(MIN.) =   0.22    Tc(MIN.) =   13.41
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    310.00 =    1205.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    310.00 TO NODE    310.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   328.00
  ELEVATION DATA: UPSTREAM(FEET) =     30.50  DOWNSTREAM(FEET) =     28.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.524
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.477
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      C        0.75      0.25     0.400    50   10.52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.400
  SUBAREA AREA(ACRES) =    0.75   INITIAL SUBAREA RUNOFF(CFS) =    0.93

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =   13.41
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.285
  SUBAREA AREA(ACRES) =    0.75      SUBAREA RUNOFF(CFS) =    0.80
  EFFECTIVE AREA(ACRES) =     10.33   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.40
  TOTAL AREA(ACRES) =       10.3       PEAK FLOW RATE(CFS) =      11.01

****************************************************************************
  FLOW PROCESS FROM NODE    310.00 TO NODE    310.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   392.00
  ELEVATION DATA: UPSTREAM(FEET) =     33.00  DOWNSTREAM(FEET) =     28.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
```

```
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.959
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.524
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      C        0.99      0.25     0.400    50    9.96
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.400
  SUBAREA AREA(ACRES) =    0.99   INITIAL SUBAREA RUNOFF(CFS) =    1.27

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =   13.41
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.285
  SUBAREA AREA(ACRES) =    0.99      SUBAREA RUNOFF(CFS) =    1.06
  EFFECTIVE AREA(ACRES) =     11.32   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.40
  TOTAL AREA(ACRES) =       11.3       PEAK FLOW RATE(CFS) =      12.07

****************************************************************************
  FLOW PROCESS FROM NODE    310.00 TO NODE    320.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    24.30  DOWNSTREAM(FEET) =    23.90
  FLOW LENGTH(FEET) =   199.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  20.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.76
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      12.07
  PIPE TRAVEL TIME(MIN.) =   0.88    Tc(MIN.) =   14.30
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    320.00 =    1404.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    320.00 TO NODE    320.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   271.00
  ELEVATION DATA: UPSTREAM(FEET) =     30.60  DOWNSTREAM(FEET) =     28.20

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.049
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.610
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      C        0.79      0.25     0.400    50    9.05
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.400
  SUBAREA AREA(ACRES) =    0.79   INITIAL SUBAREA RUNOFF(CFS) =    1.07

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =   14.30
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.239
  SUBAREA AREA(ACRES) =    0.79      SUBAREA RUNOFF(CFS) =    0.81
  EFFECTIVE AREA(ACRES) =     12.11   AREA-AVERAGED Fm(INCH/HR) =  0.10
```

```
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.40
  TOTAL AREA(ACRES) =       12.1       PEAK FLOW RATE(CFS) =      12.41

****************************************************************************
  FLOW PROCESS FROM NODE    320.00 TO NODE    320.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   329.00
  ELEVATION DATA: UPSTREAM(FEET) =     31.60  DOWNSTREAM(FEET) =     28.20

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.482
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.568
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      C        0.92      0.25     0.400    50    9.48
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.400
  SUBAREA AREA(ACRES) =    0.92   INITIAL SUBAREA RUNOFF(CFS) =    1.22

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =   14.30
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.239
  SUBAREA AREA(ACRES) =    0.92      SUBAREA RUNOFF(CFS) =    0.94
  EFFECTIVE AREA(ACRES) =     13.03   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.40
  TOTAL AREA(ACRES) =       13.0       PEAK FLOW RATE(CFS) =      13.35

****************************************************************************
  FLOW PROCESS FROM NODE    320.00 TO NODE    330.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    23.90  DOWNSTREAM(FEET) =    23.70
  FLOW LENGTH(FEET) =   114.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  20.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.70
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      13.35
  PIPE TRAVEL TIME(MIN.) =   0.51    Tc(MIN.) =   14.81
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    330.00 =    1518.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    330.00 TO NODE    330.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   248.00
  ELEVATION DATA: UPSTREAM(FEET) =     29.00  DOWNSTREAM(FEET) =     28.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.222
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.502
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
```

```
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE"      C        0.22      0.25     0.400    50   10.22
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.400
 SUBAREA AREA(ACRES) =    0.22   INITIAL SUBAREA RUNOFF(CFS) =    0.28

 ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
 MAINLINE Tc(MIN.) =   14.81
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.214
 SUBAREA AREA(ACRES) =    0.22      SUBAREA RUNOFF(CFS) =    0.22
 EFFECTIVE AREA(ACRES) =     13.25   AREA-AVERAGED Fm(INCH/HR) =  0.10
 AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.40
 TOTAL AREA(ACRES) =       13.2       PEAK FLOW RATE(CFS) =      13.35
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
 FLOW PROCESS FROM NODE    330.00 TO NODE    330.00 IS CODE =  82
----------------------------------------------------------------------------
 >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
 >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   381.00
 ELEVATION DATA: UPSTREAM(FEET) =     31.95  DOWNSTREAM(FEET) =     28.00

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.049
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.516
 SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE"      C        1.66      0.25     0.400    50   10.05
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.400
 SUBAREA AREA(ACRES) =    1.66   INITIAL SUBAREA RUNOFF(CFS) =    2.12

 ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
 MAINLINE Tc(MIN.) =   14.81
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.214
 SUBAREA AREA(ACRES) =    1.66      SUBAREA RUNOFF(CFS) =    1.66
 EFFECTIVE AREA(ACRES) =     14.91   AREA-AVERAGED Fm(INCH/HR) =  0.10
 AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.40
 TOTAL AREA(ACRES) =       14.9       PEAK FLOW RATE(CFS) =      14.94

****************************************************************************
 FLOW PROCESS FROM NODE    330.00 TO NODE    330.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   14.81
 RAINFALL INTENSITY(INCH/HR) =   1.21
 AREA-AVERAGED Fm(INCH/HR) =  0.10
 AREA-AVERAGED Fp(INCH/HR) =  0.25
 AREA-AVERAGED Ap =  0.40
 EFFECTIVE STREAM AREA(ACRES) =      14.91
 TOTAL STREAM AREA(ACRES) =      14.91
```

```
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      14.94

****************************************************************************
  FLOW PROCESS FROM NODE    340.00 TO NODE    350.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   344.00
  ELEVATION DATA: UPSTREAM(FEET) =     30.85  DOWNSTREAM(FEET) =     27.70

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.889
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.530
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      C        0.84      0.25     0.400    50    9.89
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.400
  SUBAREA RUNOFF(CFS) =      1.08
  TOTAL AREA(ACRES) =      0.84   PEAK FLOW RATE(CFS) =      1.08

****************************************************************************
  FLOW PROCESS FROM NODE    350.00 TO NODE    360.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    24.10  DOWNSTREAM(FEET) =    24.00
  FLOW LENGTH(FEET) =    18.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   6.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.01
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.08
  PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =    9.99
  LONGEST FLOWPATH FROM NODE    340.00 TO NODE    360.00 =     362.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    360.00 TO NODE    360.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   173.00
  ELEVATION DATA: UPSTREAM(FEET) =     28.60  DOWNSTREAM(FEET) =     27.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.080
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.719
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      C        0.13      0.25     0.400    50    8.08
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.400
  SUBAREA AREA(ACRES) =    0.13   INITIAL SUBAREA RUNOFF(CFS) =    0.19
```

** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
MAINLINE Tc(MIN.) = 9.99
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.522
SUBAREA AREA(ACRES) = 0.13 SUBAREA RUNOFF(CFS) = 0.17
EFFECTIVE AREA(ACRES) = 0.97 AREA-AVERAGED Fm(INCH/HR) = 0.10
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.40
TOTAL AREA(ACRES) = 1.0 PEAK FLOW RATE(CFS) = 1.24

****

FLOW PROCESS FROM NODE 360.00 TO NODE 330.00 IS CODE = 31

>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<

==

ELEVATION DATA: UPSTREAM(FEET) = 24.00 DOWNSTREAM(FEET) = 23.70
FLOW LENGTH(FEET) = 190.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 12.0 INCH PIPE IS 9.1 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 1.94
ESTIMATED PIPE DIAMETER(INCH) = 12.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 1.24
PIPE TRAVEL TIME(MIN.) = 1.63 Tc(MIN.) = 11.62
LONGEST FLOWPATH FROM NODE 340.00 TO NODE 330.00 = 552.00 FEET.

****

FLOW PROCESS FROM NODE 330.00 TO NODE 330.00 IS CODE = 1

>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<

==

TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 11.62
RAINFALL INTENSITY(INCH/HR) = 1.40
AREA-AVERAGED Fm(INCH/HR) = 0.10
AREA-AVERAGED Fp(INCH/HR) = 0.25
AREA-AVERAGED Ap = 0.40
EFFECTIVE STREAM AREA(ACRES) = 0.97
TOTAL STREAM AREA(ACRES) = 0.97
PEAK FLOW RATE(CFS) AT CONFLUENCE = 1.24

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	14.78	11.68	1.391	0.25(0.10)	0.40	12.7	280.00
1	14.94	14.81	1.214	0.25(0.10)	0.40	14.9	200.00
2	1.24	11.62	1.395	0.25(0.10)	0.40	1.0	340.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	15.99	11.62	1.395	0.25(0.10)	0.40	13.6	340.00
2	16.02	11.68	1.391	0.25(0.10)	0.40	13.7	280.00
3	16.01	14.81	1.214	0.25(0.10)	0.40	15.9	200.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 16.02 Tc(MIN.) = 11.68
EFFECTIVE AREA(ACRES) = 13.70 AREA-AVERAGED Fm(INCH/HR) = 0.10

```
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.40
  TOTAL AREA(ACRES) =       15.9
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    330.00 =    1518.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    330.00 TO NODE    150.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    23.70  DOWNSTREAM(FEET) =    23.20
  FLOW LENGTH(FEET) =   244.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  22.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.07
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      16.02
  PIPE TRAVEL TIME(MIN.) =   1.00    Tc(MIN.) =   12.69
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    150.00 =    1762.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    150.00 TO NODE    150.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       15.99   12.62    1.331  0.25( 0.10) 0.40      13.6     340.00
      2       16.02   12.69    1.327  0.25( 0.10) 0.40      13.7     280.00
      3       16.01   15.81    1.169  0.25( 0.10) 0.40      15.9     200.00
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    150.00 =    1762.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       13.42   12.77    1.321  0.25( 0.08) 0.31      12.0     110.00
      2       13.36   20.26    1.014  0.25( 0.08) 0.32      15.9      10.00
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE    150.00 =    2077.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       29.35   12.62    1.331  0.25( 0.09) 0.36      25.5     340.00
      2       29.40   12.69    1.327  0.25( 0.09) 0.36      25.6     280.00
      3       29.44   12.77    1.321  0.25( 0.09) 0.36      25.7     110.00
      4       29.41   15.81    1.169  0.25( 0.09) 0.36      29.5     200.00
      5       27.05   20.26    1.014  0.25( 0.09) 0.36      31.8      10.00
    TOTAL AREA(ACRES) =       31.8

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       29.44  Tc(MIN.) =   12.771
  EFFECTIVE AREA(ACRES) =     25.74  AREA-AVERAGED Fm(INCH/HR) =  0.09
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.36
  TOTAL AREA(ACRES) =       31.8
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE    150.00 =    2077.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       31.8  TC(MIN.) =     12.77
  EFFECTIVE AREA(ACRES) =     25.74  AREA-AVERAGED Fm(INCH/HR)=  0.09
```

AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.358
PEAK FLOW RATE(CFS) = 29.44

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	29.35	12.62	1.331	0.25(0.09)	0.36	25.5	340.00
2	29.40	12.69	1.327	0.25(0.09)	0.36	25.6	280.00
3	29.44	12.77	1.321	0.25(0.09)	0.36	25.7	110.00
4	29.41	15.81	1.169	0.25(0.09)	0.36	29.5	200.00
5	27.05	20.26	1.014	0.25(0.09)	0.36	31.8	10.00

==
==

END OF RATIONAL METHOD ANALYSIS

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****************************************************************************
                     SMALL AREA UNIT HYDROGRAPH MODEL
============================================================================
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                          Analysis prepared by:

                         FUSCOE ENGINEERING, INC
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                                SUITE 100
                             IRVINE, CA 92606

****************************************************************************
----------------------------------------------------------------------------

 Problem Descriptions:
  BARTON PLACE - C33
  PROPOSED 2 YEAR
  JOB NO. 1334.01
----------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.75
    TOTAL CATCHMENT AREA(ACRES) =   31.80
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.089
    LOW LOSS FRACTION = 0.429
    TIME OF CONCENTRATION(MIN.) = 12.77
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    ORANGE COUNTY "VALLEY" RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) =   2
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.19
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.40
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  0.53
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  0.89
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  1.22
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  2.05

----------------------------------------------------------------------------

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     2.60
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     2.83

****************************************************************************
  TIME     VOLUME       Q    0.        7.5      15.0      22.5      30.0
 (HOURS)    (AF)      (CFS)
----------------------------------------------------------------------------
  0.04      0.0000      0.00  Q         .         .         .         .
  0.25      0.0039      0.44  Q         .         .         .         .
  0.46      0.0116      0.44  Q         .         .         .         .
  0.68      0.0194      0.45  Q         .         .         .         .
```

0.89	0.0273	0.45	Q	.	.	.	.
1.10	0.0352	0.45	Q	.	.	.	.
1.31	0.0433	0.46	Q	.	.	.	.
1.53	0.0514	0.46	Q	.	.	.	.
1.74	0.0595	0.47	Q	.	.	.	.
1.95	0.0678	0.47	Q	.	.	.	.
2.17	0.0761	0.48	Q	.	.	.	.
2.38	0.0845	0.48	Q	.	.	.	.
2.59	0.0930	0.49	Q	.	.	.	.
2.80	0.1015	0.49	Q	.	.	.	.
3.02	0.1102	0.50	Q	.	.	.	.
3.23	0.1189	0.50	Q	.	.	.	.
3.44	0.1277	0.51	Q	.	.	.	.
3.66	0.1367	0.51	Q	.	.	.	.
3.87	0.1457	0.52	Q	.	.	.	.
4.08	0.1548	0.52	Q	.	.	.	.
4.29	0.1640	0.53	Q	.	.	.	.
4.51	0.1733	0.53	Q	.	.	.	.
4.72	0.1828	0.54	Q	.	.	.	.
4.93	0.1923	0.54	Q	.	.	.	.
5.15	0.2019	0.55	Q	.	.	.	.
5.36	0.2117	0.56	Q	.	.	.	.
5.57	0.2216	0.57	Q	.	.	.	.
5.78	0.2316	0.57	Q	.	.	.	.
6.00	0.2418	0.58	Q	.	.	.	.
6.21	0.2520	0.59	Q	.	.	.	.
6.42	0.2624	0.60	Q	.	.	.	.
6.64	0.2730	0.60	Q	.	.	.	.
6.85	0.2837	0.61	Q	.	.	.	.
7.06	0.2946	0.62	Q	.	.	.	.
7.27	0.3056	0.63	Q	.	.	.	.
7.49	0.3168	0.64	Q	.	.	.	.
7.70	0.3281	0.65	Q	.	.	.	.
7.91	0.3397	0.66	Q	.	.	.	.
8.13	0.3514	0.67	Q	.	.	.	.
8.34	0.3633	0.68	Q	.	.	.	.
8.55	0.3754	0.70	Q	.	.	.	.
8.76	0.3878	0.71	Q	.	.	.	.
8.98	0.4003	0.72	Q	.	.	.	.
9.19	0.4131	0.73	Q	.	.	.	.
9.40	0.4262	0.75	.Q	.	.	.	.
9.61	0.4395	0.76	.Q	.	.	.	.
9.83	0.4531	0.78	.Q	.	.	.	.
10.04	0.4669	0.79	.Q	.	.	.	.
10.25	0.4811	0.82	.Q	.	.	.	.
10.47	0.4956	0.83	.Q	.	.	.	.
10.68	0.5104	0.86	.Q	.	.	.	.
10.89	0.5256	0.87	.Q	.	.	.	.
11.10	0.5412	0.90	.Q	.	.	.	.
11.32	0.5572	0.92	.Q	.	.	.	.
11.53	0.5736	0.95	.Q	.	.	.	.
11.74	0.5905	0.97	.Q	.	.	.	.

```
11.96      0.6080      1.01  .Q        .         .         .         .
12.17      0.6264      1.08  .Q        .         .         .         .
12.38      0.6473      1.31  .Q        .         .         .         .
12.59      0.6706      1.34  .Q        .         .         .         .
12.81      0.6947      1.40  .Q        .         .         .         .
13.02      0.7195      1.43  .Q        .         .         .         .
13.23      0.7453      1.51  . Q       .         .         .         .
13.45      0.7722      1.55  . Q       .         .         .         .
13.66      0.8002      1.64  . Q       .         .         .         .
13.87      0.8296      1.69  . Q       .         .         .         .
14.08      0.8605      1.82  . Q       .         .         .         .
14.30      0.8938      1.96  . Q       .         .         .         .
14.51      0.9298      2.13  . Q       .         .         .         .
14.72      0.9682      2.24  . Q       .         .         .         .
14.94      1.0099      2.50  .  Q      .         .         .         .
15.15      1.0554      2.67  .  Q      .         .         .         .
15.36      1.1087      3.39  .   Q     .         .         .         .
15.57      1.1685      3.42  .   Q     .         .         .         .
15.79      1.2467      5.48  .      Q  .         .         .         .
16.00      1.3688      8.40  .         .Q        .         .         .
16.21      1.7016     29.44  .         .         .         .        Q.
16.43      1.9959      4.03  .    Q    .         .         .         .
16.64      2.0570      2.92  .  Q      .         .         .         .
16.85      2.1034      2.36  .  Q      .         .         .         .
17.06      2.1421      2.04  . Q       .         .         .         .
17.28      2.1755      1.75  . Q       .         .         .         .
17.49      2.2049      1.59  . Q       .         .         .         .
17.70      2.2318      1.47  .Q        .         .         .         .
17.92      2.2567      1.37  .Q        .         .         .         .
18.13      2.2800      1.28  .Q        .         .         .         .
18.34      2.3000      0.99  .Q        .         .         .         .
18.55      2.3169      0.93  .Q        .         .         .         .
18.77      2.3329      0.89  .Q        .         .         .         .
18.98      2.3481      0.84  .Q        .         .         .         .
19.19      2.3626      0.81  .Q        .         .         .         .
19.41      2.3765      0.77  .Q        .         .         .         .
19.62      2.3898      0.74  Q         .         .         .         .
19.83      2.4026      0.71  Q         .         .         .         .
20.04      2.4150      0.69  Q         .         .         .         .
20.26      2.4269      0.67  Q         .         .         .         .
20.47      2.4384      0.65  Q         .         .         .         .
20.68      2.4496      0.63  Q         .         .         .         .
20.90      2.4605      0.61  Q         .         .         .         .
21.11      2.4710      0.59  Q         .         .         .         .
21.32      2.4813      0.58  Q         .         .         .         .
21.53      2.4913      0.56  Q         .         .         .         .
21.75      2.5011      0.55  Q         .         .         .         .
21.96      2.5106      0.54  Q         .         .         .         .
22.17      2.5199      0.52  Q         .         .         .         .
22.39      2.5291      0.51  Q         .         .         .         .
22.60      2.5380      0.50  Q         .         .         .         .
22.81      2.5467      0.49  Q         .         .         .         .
```

```
 23.02      2.5553      0.48  Q          .         .         .         .
 23.24      2.5637      0.47  Q          .         .         .         .
 23.45      2.5719      0.46  Q          .         .         .         .
 23.66      2.5800      0.46  Q          .         .         .         .
 23.87      2.5880      0.45  Q          .         .         .         .
 24.09      2.5958      0.44  Q          .         .         .         .
 24.30      2.5997      0.00  Q          .         .         .         .
-----------------------------------------------------------------------------
--------------------------------------------------------------------------------
```

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1443.0
10%	76.6
20%	25.5
30%	12.8
40%	12.8
50%	12.8
60%	12.8
70%	12.8
80%	12.8
90%	12.8

```
****************************************************************************
            NON-HOMOGENEOUS WATERSHED AREA-AVERAGED LOSS RATE (Fm)
                      AND LOW LOSS FRACTION ESTIMATIONS
============================================================================
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                          Analysis prepared by:

                         FUSCOE ENGINEERING, INC
                             16795 VON KARMAN
                                SUITE 100
                             IRVINE, CA 92606

****************************************************************************
----------------------------------------------------------------------------

 Problem Descriptions:
  BARTON PLACE - C33
  PROPOSED 2 YEAR
  JOB NO. 1334.01
============================================================================
*** NON-HOMOGENEOUS WATERSHED AREA-AVERAGED LOSS RATE (Fm)
    AND LOW LOSS FRACTION ESTIMATIONS FOR AMC I:

    TOTAL 24-HOUR DURATION RAINFALL DEPTH =     2.05 (inches)

    SOIL-COVER     AREA      PERCENT OF    SCS CURVE    LOSS RATE
       TYPE      (Acres)   PERVIOUS AREA    NUMBER    Fp(in./hr.)    YIELD
         1        31.80        35.80      69.(AMC II)    0.250       0.571

    TOTAL AREA (Acres) =     31.80
                              _
    AREA-AVERAGED LOSS RATE, Fm (in./hr.) =  0.089
                                    _
    AREA-AVERAGED LOW LOSS FRACTION, Y = 0.429
============================================================================
```

```
****************************************************************************
                     SMALL AREA UNIT HYDROGRAPH MODEL
============================================================================
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             Ver. 21.0  Release Date: 06/01/2014  License ID 1355

                          Analysis prepared by:

                         FUSCOE ENGINEERING, INC
                             16795 VON KARMAN
                                SUITE 100
                             IRVINE, CA 92606

****************************************************************************
----------------------------------------------------------------------------

 Problem Descriptions:
  BARTON PLACE - C33
  PROPOSED 100 YEAR
  JOB NO. 1334.01
----------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.87
    TOTAL CATCHMENT AREA(ACRES) =   31.80
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.090
    LOW LOSS FRACTION = 0.128
    TIME OF CONCENTRATION(MIN.) = 14.19
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    ORANGE COUNTY "VALLEY" RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) = 100
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.52
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  1.09
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  1.45
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  2.43
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  3.36
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  5.63

----------------------------------------------------------------------------

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =    11.40
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     3.52

****************************************************************************
  TIME     VOLUME       Q    0.       25.0      50.0      75.0     100.0
 (HOURS)    (AF)      (CFS)
----------------------------------------------------------------------------
  0.15      0.0134      2.10  Q         .         .         .         .
  0.39      0.0545      2.11  Q         .         .         .         .
  0.63      0.0960      2.14  Q         .         .         .         .
  0.86      0.1379      2.15  Q         .         .         .         .
```

```
  1.10       0.1801       2.18  Q         .         .         .         .
  1.34       0.2228       2.19  Q         .         .         .         .
  1.57       0.2660       2.22  Q         .         .         .         .
  1.81       0.3095       2.24  Q         .         .         .         .
  2.05       0.3535       2.27  Q         .         .         .         .
  2.28       0.3980       2.28  Q         .         .         .         .
  2.52       0.4430       2.32  Q         .         .         .         .
  2.76       0.4884       2.33  Q         .         .         .         .
  2.99       0.5344       2.37  Q         .         .         .         .
  3.23       0.5809       2.39  Q         .         .         .         .
  3.47       0.6279       2.42  Q         .         .         .         .
  3.70       0.6754       2.44  Q         .         .         .         .
  3.94       0.7236       2.48  Q         .         .         .         .
  4.18       0.7723       2.50  .Q        .         .         .         .
  4.41       0.8216       2.54  .Q        .         .         .         .
  4.65       0.8715       2.57  .Q        .         .         .         .
  4.88       0.9221       2.61  .Q        .         .         .         .
  5.12       0.9734       2.63  .Q        .         .         .         .
  5.36       1.0253       2.68  .Q        .         .         .         .
  5.59       1.0780       2.71  .Q        .         .         .         .
  5.83       1.1314       2.76  .Q        .         .         .         .
  6.07       1.1856       2.79  .Q        .         .         .         .
  6.30       1.2406       2.84  .Q        .         .         .         .
  6.54       1.2964       2.87  .Q        .         .         .         .
  6.78       1.3531       2.93  .Q        .         .         .         .
  7.01       1.4107       2.96  .Q        .         .         .         .
  7.25       1.4692       3.03  .Q        .         .         .         .
  7.49       1.5287       3.06  .Q        .         .         .         .
  7.72       1.5892       3.13  .Q        .         .         .         .
  7.96       1.6508       3.17  .Q        .         .         .         .
  8.20       1.7135       3.25  .Q        .         .         .         .
  8.43       1.7774       3.29  .Q        .         .         .         .
  8.67       1.8425       3.38  .Q        .         .         .         .
  8.90       1.9089       3.42  .Q        .         .         .         .
  9.14       1.9767       3.52  .Q        .         .         .         .
  9.38       2.0459       3.57  .Q        .         .         .         .
  9.61       2.1167       3.67  .Q        .         .         .         .
  9.85       2.1890       3.73  .Q        .         .         .         .
 10.09       2.2631       3.85  .Q        .         .         .         .
 10.32       2.3390       3.91  .Q        .         .         .         .
 10.56       2.4169       4.05  .Q        .         .         .         .
 10.80       2.4968       4.13  .Q        .         .         .         .
 11.03       2.5790       4.28  .Q        .         .         .         .
 11.27       2.6635       4.37  .Q        .         .         .         .
 11.51       2.7507       4.55  .Q        .         .         .         .
 11.74       2.8406       4.65  .Q        .         .         .         .
 11.98       2.9336       4.87  .Q        .         .         .         .
 12.22       3.0346       5.46  . Q       .         .         .         .
 12.45       3.1519       6.54  . Q       .         .         .         .
 12.69       3.2813       6.70  . Q       .         .         .         .
 12.93       3.4155       7.04  . Q       .         .         .         .
 13.16       3.5549       7.23  . Q       .         .         .         .
```

```
  13.40      3.7004      7.66  .  Q      .         .         .         .
  13.63      3.8524      7.90  .  Q      .         .         .         .
  13.87      4.0123      8.46  .  Q      .         .         .         .
  14.11      4.1809      8.79  .  Q      .         .         .         .
  14.34      4.3609      9.62  .  Q      .         .         .         .
  14.58      4.5537     10.10  .   Q     .         .         .         .
  14.82      4.7628     11.30  .   Q     .         .         .         .
  15.05      4.9912     12.08  .   Q     .         .         .         .
  15.29      5.2484     14.24  .    Q    .         .         .         .
  15.53      5.5379     15.38  .     Q   .         .         .         .
  15.76      5.8842     20.05  .       Q .         .         .         .
  16.00      6.3576     28.38  .         .Q        .         .         .
  16.24      7.5204     90.61  .         .         .         .     Q   .
  16.47      8.5629     16.06  .     Q   .         .         .         .
  16.71      8.8472     13.03  .    Q    .         .         .         .
  16.95      9.0786     10.65  .   Q     .         .         .         .
  17.18      9.2725      9.19  .  Q      .         .         .         .
  17.42      9.4422      8.17  .  Q      .         .         .         .
  17.66      9.5947      7.43  . Q       .         .         .         .
  17.89      9.7344      6.86  . Q       .         .         .         .
  18.13      9.8640      6.40  . Q       .         .         .         .
  18.36      9.9730      4.76  .Q        .         .         .         .
  18.60     10.0630      4.46  .Q        .         .         .         .
  18.84     10.1477      4.20  .Q        .         .         .         .
  19.07     10.2276      3.98  .Q        .         .         .         .
  19.31     10.3036      3.79  .Q        .         .         .         .
  19.55     10.3760      3.62  .Q        .         .         .         .
  19.78     10.4452      3.47  .Q        .         .         .         .
  20.02     10.5117      3.33  .Q        .         .         .         .
  20.26     10.5756      3.21  .Q        .         .         .         .
  20.49     10.6372      3.10  .Q        .         .         .         .
  20.73     10.6967      2.99  .Q        .         .         .         .
  20.97     10.7543      2.90  .Q        .         .         .         .
  21.20     10.8101      2.81  .Q        .         .         .         .
  21.44     10.8643      2.73  .Q        .         .         .         .
  21.68     10.9170      2.66  .Q        .         .         .         .
  21.91     10.9683      2.59  .Q        .         .         .         .
  22.15     11.0182      2.52  .Q        .         .         .         .
  22.39     11.0669      2.46  Q         .         .         .         .
  22.62     11.1145      2.41  Q         .         .         .         .
  22.86     11.1610      2.35  Q         .         .         .         .
  23.09     11.2064      2.30  Q         .         .         .         .
  23.33     11.2509      2.25  Q         .         .         .         .
  23.57     11.2945      2.21  Q         .         .         .         .
  23.80     11.3372      2.16  Q         .         .         .         .
  24.04     11.3791      2.12  Q         .         .         .         .
  24.28     11.3998      0.00  Q         .         .         .         .
 ----------------------------------------------------------------------------
--------------------------------------------------------------------------------
    TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
    (Note: 100% of Peak Flow Rate estimate assumed to have
    an instantaneous time duration)
```

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1447.4
10%	184.5
20%	42.6
30%	28.4
40%	14.2
50%	14.2
60%	14.2
70%	14.2
80%	14.2
90%	14.2

```
****************************************************************************
           NON-HOMOGENEOUS WATERSHED AREA-AVERAGED LOSS RATE (Fm)
                     AND LOW LOSS FRACTION ESTIMATIONS
============================================================================
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             Ver. 21.0  Release Date: 06/01/2014  License ID 1355

                           Analysis prepared by:

                          FUSCOE ENGINEERING, INC
                              16795 VON KARMAN
                                 SUITE 100
                              IRVINE, CA 92606

****************************************************************************
----------------------------------------------------------------------------

 Problem Descriptions:
  BARTON PLACE - C33
  PROPOSED 100 YEAR
  JOB NO. 1334.01
============================================================================
*** NON-HOMOGENEOUS WATERSHED AREA-AVERAGED LOSS RATE (Fm)
    AND LOW LOSS FRACTION ESTIMATIONS FOR AMC III:

    TOTAL 24-HOUR DURATION RAINFALL DEPTH =     5.63 (inches)

    SOIL-COVER     AREA      PERCENT OF    SCS CURVE    LOSS RATE
       TYPE      (Acres)   PERVIOUS AREA     NUMBER    Fp(in./hr.)    YIELD
        1         31.80       36.10       69.(AMC II)     0.250       0.872

    TOTAL AREA (Acres) =     31.80
                                  _
    AREA-AVERAGED LOSS RATE, Fm (in./hr.) =  0.090
                                          _
    AREA-AVERAGED LOW LOSS FRACTION, Y = 0.128
============================================================================
```

APPENDIX B

NOTICE OF TRANSFER OF RESPONSIBILITY

NOTICE OF TRANSFER OF RESPONSIBILITY

WATER QUALITY MANAGEMENT PLAN

Barton Place
4921 Katella Avenue, Cypress, CA

Submission of this Notice Of Transfer of Responsibility constitutes notice to the City of Cypress that responsibility for the Water Quality Management Plan ("WQMP") for the subject property identified below, and implementation of that plan, is being transferred from the Previous Owner (and his/her agent) of the site (or a portion thereof) to the New Owner, as further described below.

I. Previous Owner/ Previous Responsible Party Information

Company/ Individual Name:		Contact Person:	
Street Address:		Title:	
City:	State:	ZIP:	Phone:

II. Information about Site Transferred

Name of Project (if applicable):	
Title of WQMP Applicable to site:	
Street Address of Site (if applicable):	
Planning Area (PA) and/ or Tract Number(s) for Site:	Lot Numbers (if Site is a portion of a tract):
Date WQMP Prepared (and revised if applicable):	

III. New Owner/ New Responsible Party Information

Company/ Individual Name:		Contact Person:	
Street Address:		Title:	
City:	State:	ZIP:	Phone:

IV. Ownership Transfer Information

General Description of Site Transferred to New Owner:	General Description of Portion of Project/ Parcel Subject to WQMP Retained by Owner (if any):

Lot/ Tract Numbers of Site Transferred to New Owner:
Remaining Lot/ Tract Numbers Subject to WQMP Still Held by Owner (if any):
Date of Ownership Transfer:

Note: When the Previous Owner is transferring a Site that is a portion of a larger project/ parcel addressed by the WQMP, as opposed to the entire project/parcel addressed by the WQMP, the General Description of the Site transferred and the remainder of the project/ parcel no transferred shall be set forth as maps attached to this notice. These maps shall show those portions of a project/ parcel addressed by the WQMP that are transferred to the New Owner (the Transferred Site), those portions retained by the Previous Owner, and those portions previously transferred by Previous Owner. Those portions retained by Previous Owner shall be labeled as "Previously Transferred".

V. Purpose of Notice of Transfer

The purposes of this Notice of Transfer of Responsibility are: 1) to track transfer of responsibility for implementation and amendment of the WQMP when property to which the WQMP is transferred from the Previous Owner to the New Owner, and 2) to facilitate notification to a transferee of property subject to a WQMP that such New Order is now the Responsible Party of record for the WQMP for those portions of the site that it owns.

VI. Certifications

A. Previous Owner

I certify under penalty of law that I am no longer the owner of the Transferred Site as described in Section II above. I have provided the New Owner with a copy of the WQMP applicable to the Transferred Site that the New Owner is acquiring from the Previous Owner.

Printed Name of Previous Owner Representative:	Title:
Signature of Previous Owner Representative:	Date:

B. New Owner

I certify under penalty of law that I am the owner of the Transferred Site, as described in Section II above, that I have been provided a copy of the WQMP, and that I have informed myself and understand the New Owner's responsibilities related to the WQMP, its implementation, and Best Management Practices associated with it. I understand that by signing this notice, the New Owner is accepting all ongoing responsibilities for implementation and amendment of the WQMP for the Transferred Site, which the New Owner has acquired from the Previous Owner.

Printed Name of New Owner Representative:	Title:
Signature:	Date:

APPENDIX C

EDUCATIONAL MATERIALS

The Ocean Begins at Your Front Door

PROJECT POLLUTION PREVENTION

For More Information

California Environmental Protection Agency
www.calepa.ca.gov

- **Air Resources Board**
  www.arb.ca.gov
- **Department of Pesticide Regulation**
  www.cdpr.ca.gov
- **Department of Toxic Substances Control**
  www.dtsc.ca.gov
- **Integrated Waste Management Board**
  www.ciwmb.ca.gov
- **Office of Environmental Health Hazard Assessment**
  www.oehha.ca.gov
- **State Water Resources Control Board**
  www.waterboards.ca.gov

Earth 911 - Community-Specific Environmental Information 1-800-cleanup or visit www.1800cleanup.org

Health Care Agency's Ocean and Bay Water Closure and Posting Hotline
(714) 433-6400 or visit www.ocbeachinfo.com

Integrated Waste Management Dept. of Orange County (714) 834-6752 or visit www.oclandfills.com for information on household hazardous waste collection centers, recycling centers and solid waste collection

O.C. Agriculture Commissioner
(714) 447-7100 or visit www.ocagcomm.com

Stormwater Best Management Practice Handbook
Visit www.cabmphandbooks.com

UC Master Gardener Hotline
(714) 708-1646 or visit www.uccemg.com

The Orange County Stormwater Program has created and moderates an electronic mailing list to facilitate communications, take questions and exchange ideas among its users about issues and topics related to stormwater and urban runoff and the implementation of program elements. To join the list, please send an email to ocstormwaterinfo-join@list.ocwatersheds.com

Orange County Stormwater Program

Aliso Viejo	(949)	425-2535
Anaheim Public Works Operations	(714)	765-6860
Brea Engineering	(714)	990-7666
Buena Park Public Works	(714)	562-3655
Costa Mesa Public Services	(714)	754-5323
Cypress Public Works	(714)	229-6740
Dana Point Public Works	(949)	248-3584
Fountain Valley Public Works	(714)	593-4441
Fullerton Engineering Dept.	(714)	738-6853
Garden Grove Public Works	(714)	741-5956
Huntington Beach Public Works	(714)	536-5431
Irvine Public Works	(949)	724-6315
La Habra Public Services	(562)	905-9792
La Palma Public Works	(714)	690-3310
Laguna Beach Water Quality	(949)	497-0378
Laguna Hills Public Services	(949)	707-2650
Laguna Niguel Public Works	(949)	362-4337
Laguna Woods Public Works	(949)	639-0500
Lake Forest Public Works	(949)	461-3480
Los Alamitos Community Dev.	(562)	431-3538
Mission Viejo Public Works	(949)	470-3056
Newport Beach, Code & Water Quality Enforcement	(949)	644-3215
Orange Public Works	(714)	532-6480
Placentia Public Works	(714)	993-8245
Rancho Santa Margarita	(949)	635-1800
San Clemente Environmental Programs	(949)	361-6143
San Juan Capistrano Engineering	(949)	234-4413
Santa Ana Public Works	(714)	647-3380
Seal Beach Engineering	(562)	431-2527 x317
Stanton Public Works	(714)	379-9222 x204
Tustin Public Works/Engineering	(714)	573-3150
Villa Park Engineering	(714)	998-1500
Westminster Public Works/Engineering	(714)	898-3311 x446
Yorba Linda Engineering	(714)	961-7138
Orange County Stormwater Program	(877)	897-7455

Orange County 24-Hour Water Pollution Problem Reporting Hotline
1-877-89-SPILL (1-877-897-7455)

On-line Water Pollution Problem Reporting Form
www.ocwatersheds.com

Printed on Recycled Paper

Even if you live miles from the Pacific Ocean, you may be unknowingly polluting it.

Dumping one quart of motor oil into a storm drain can contaminate 250,000 gallons of water.

Did You Know?

- Most people believe that the largest source of water pollution in urban areas comes from specific sources such as factories and sewage treatment plants. In fact, the largest source of water pollution comes from city streets, neighborhoods, construction sites and parking lots. This type of pollution is sometimes called "non-point source" pollution.
- There are two types of non-point source pollution: stormwater and urban runoff pollution.
- Stormwater runoff results from rainfall. When rainstorms cause large volumes of water to rinse the urban landscape, picking up pollutants along the way.
- Urban runoff can happen any time of the year when excessive water use from irrigation, vehicle washing and other sources carries trash, lawn clippings and other urban pollutants into storm drains.

Where Does It Go?

- Anything we use outside homes, vehicles and businesses – like motor oil, paint, pesticides, fertilizers and cleaners – can be blown or washed into storm drains.
- A little water from a garden hose or rain can also send materials into storm drains.
- Storm drains are separate from our sanitary sewer systems; unlike water in sanitary sewers (from sinks or toilets), water in storm drains is not treated before entering our waterways.

Sources of Non-Point Source Pollution

- Automotive leaks and spills.
- Improper disposal of used oil and other engine fluids.
- Metals found in vehicle exhaust, weathered paint, rust, metal plating and tires.
- Pesticides and fertilizers from lawns, gardens and farms.
- Improper disposal of cleaners, paint and paint removers.
- Soil erosion and dust debris from landscape and construction activities.
- Litter, lawn clippings, animal waste, and other organic matter.
- Oil stains on parking lots and paved surfaces.

The Effect on the Ocean

Non-point source pollution can have a serious impact on water quality in Orange County. Pollutants from the storm drain system can harm marine life as well as coastal and wetland habitats. They can also degrade recreation areas such as beaches, harbors and bays.

Stormwater quality management programs have been developed throughout Orange County to educate and encourage the public to protect water quality, monitor runoff in the storm drain system, investigate illegal dumping and maintain storm drains.

Support from Orange County residents and businesses is needed to improve water quality and reduce urban runoff pollution. Proper use and disposal of materials will help stop pollution before it reaches the storm drain and the ocean.

The Ocean Begins at Your Front Door

Never allow pollutants to enter the street, gutter or storm drain!

Follow these simple steps to help reduce water pollution:

Household Activities

- Do not rinse spills with water. Use dry cleanup methods such as applying cat litter or another absorbent material, sweep and dispose of in the trash. Take items such as used or excess batteries, oven cleaners, automotive fluids, painting products and cathode ray tubes, like TVs and computer monitors, to a Household Hazardous Waste Collection Center (HHWCC).
- For a HHWCC near you call (714) 834-6752 or visit www.oclandfills.com.
- Do not hose down your driveway, sidewalk or patio to the street, gutter or storm drain. Sweep up debris and dispose of it in the trash.

Automotive

- Take your vehicle to a commercial car wash whenever possible. If you wash your vehicle at home, choose soaps, cleaners, or detergents labeled non-toxic, phosphate- free or biodegradable. Vegetable and citrus-based products are typically safest for the environment.
- Do not allow washwater from vehicle washing to drain into the street, gutter or storm drain. Excess washwater should be disposed of in the sanitary sewer (through a sink or toilet) or onto an absorbent surface like your lawn.
- Monitor your vehicles for leaks and place a pan under leaks. Keep your vehicles well maintained to stop and prevent leaks.
- Never pour oil or antifreeze in the street, gutter or storm drain. Recycle these substances at a service station, a waste oil collection center or used oil recycling center. For the nearest Used Oil Collection Center call 1-800-CLEANUP or visit www.1800cleanup.org.

Pool Maintenance

- Pool and spa water must be dechlorinated and free of excess acid, alkali or color to be allowed in the street, gutter or storm drain.
- When it is not raining, drain dechlorinated pool and spa water directly into the sanitary sewer.
- Some cities may have ordinances that do not allow pool water to be disposed of in the storm drain. Check with your city.

Landscape and Gardening

- Do not over-water. Water your lawn and garden by hand to control the amount of water you use or set irrigation systems to reflect seasonal water needs. If water flows off your yard onto your driveway or sidewalk, your system is over-watering. Periodically inspect and fix leaks and misdirected sprinklers.
- Do not rake or blow leaves, clippings or pruning waste into the street, gutter or storm drain. Instead, dispose of waste by composting, hauling it to a permitted landfill, or as green waste through your city's recycling program.
- Follow directions on pesticides and fertilizer, (measure, do not estimate amounts) and do not use if rain is predicted within 48 hours.
- Take unwanted pesticides to a HHWCC to be recycled. For locations and hours of HHWCC, call (714) 834-6752 or visit www.oclandfills.com.

Trash

- Place trash and litter that cannot be recycled in securely covered trash cans.
- Whenever possible, buy recycled products.
- Remember: Reduce, Reuse, Recycle.

Pet Care

- Always pick up after your pet. Flush waste down the toilet or dispose of it in the trash. Pet waste, if left outdoors, can wash into the street, gutter or storm drain.
- If possible, bathe your pets indoors. If you must bathe your pet outside, wash it on your lawn or another absorbent/permeable surface to keep the washwater from entering the street, gutter or storm drain.
- Follow directions for use of pet care products and dispose of any unused products at a HHWCC.

Common Pollutants

Home Maintenance

- Detergents, cleaners and solvents
- Oil and latex paint
- Swimming pool chemicals
- Outdoor trash and litter

Lawn and Garden

- Pet and animal waste
- Pesticides
- Clippings, leaves and soil
- Fertilizer

Automobile

- Oil and grease
- Radiator fluids and antifreeze
- Cleaning chemicals
- Brake pad dust

The Pollution Solution

Several residential activities can result in water pollution. Among these activities are car washing and hosing off driveways and sidewalks. Both activities can waste water and result in excess runoff. Water conservation methods described in this pamphlet can prevent considerable amounts of runoff and conserve water. By taking your car to a commercial car wash and by sweeping driveways and sidewalks, you can further prevent the transport of pollutants to Orange County waterways. Here are some of the common pollutants for which you can be part of the solution:

1 Pesticides and Fertilizer

- **Pollution:** The same pesticides that are designed to be toxic to pests can have an equally lethal impact on our marine life. The same fertilizer that promotes plant growth in lawns and gardens can also create nuisance algae blooms, which remove oxygen from the water and clog waterways when it decomposes.
- **Solution:** Never use pesticides or fertilizer within 48 hours of an anticipated rainstorm. Use only as much as is directed on the label and keep it off driveways and sidewalks.

2 Dirt and Sediment

- **Pollution:** Dirt or sediment can impede the flow of the stormwater and negatively impact stream habitat as it travels through waterways and deposits downstream. Pollutants can attach to sediment, which can then be transported through our waterways.
- **Solution:** Protect dirt stockpiles by covering them with tarps or secure plastic sheets to prevent wind or rain from allowing dirt or sediment to enter the storm drain system.

3 Metals

- **Pollution:** Metals and other toxins present in car wash water can harm important plankton, which forms the base of the aquatic food chain.
- **Solution:** Take your car to a commercial car wash where the wash water is captured and treated at a local wastewater treatment plant.

DID YOU KNOW?

Did you know that most of the pollution found in our waterways is not from a single source, but from a "non-point" source meaning the accumulation of pollution from residents and businesses throughout the community

4 Pet Waste

- **Pollution:** Pet waste carries bacteria through our watersheds and eventually will be washed out to the ocean. This can pose a health risk to swimmers and surfers.
- **Solution:** Pick up after your pets!

5 Trash and Debris

- **Pollution:** Trash and debris can enter waterways by wind, littering and careless maintenance of trash receptacles. Street sweeping collects some of this trash; however, much of what isn't captured ends up in our storm drain system where it flows untreated out to the ocean.
- **Solution:** Don't litter and make sure trash containers are properly covered. It is far more expensive to clean up the litter and trash that ends up in our waterways than it is to prevent it in the first place. Come out to one of Orange County's many locations for Coastal and Inner-Coastal Cleanup Day, which is held in September.

6 Motor Oil / Vehicle Fluids

- **Pollution:** Oil and petroleum products from our vehicles are toxic to people, wildlife and plants.
- **Solution:** Fix any leaks from your vehicle and keep the maintenance up on your car. Use absorbent material such as cat litter on oil spills, then sweep it up and dispose of it in the trash. Recycle used motor oil at a local Household Hazardous Waste Collection Center.

A TEAM EFFORT

The Orange County Stormwater Program has teamed with the Municipal Water District of Orange County (MWDOC) and the University of California Cooperative Extension Program (UCCE) to develop this pamphlet.

Low Impact Development (LID) and sustainable water use prevents water pollution and conserves water for drinking and reuse. Reducing your water use and the amount of water flowing from your home protects the environment and saves you money.

Thank you for making water protection a priority!

For more information, please visit www.ocwatersheds.com/publiced/

www.mwdoc.com

www.uccemg.com

To report a spill, call the Orange County 24-Hour Water Pollution Prevention Reporting Hotline at 1-877-89-SPILL \ (1-877-897-7455)

Special Thanks to

The City of Los Angeles Stormwater Program for the use of its artwork

The Metropolitan Water District of Southern California for the use of the California-Friendly Plant and Native Habitat photos

PROJECT POLLUTION PREVENTION · UCCE University of California Cooperative Extension · MUNICIPAL WATER DISTRICT OF ORANGE COUNTY

Homeowners Guide for Sustainable Water Use

Low Impact Development, Water Conservation & Pollution Prevention

The Ocean Begins at Your Front Door

PROJECT POLLUTION PREVENTION · UCCE University of California Cooperative Extension · MUNICIPAL WATER DISTRICT OF ORANGE COUNTY

RUNOFF, RAINWATER AND REUSE

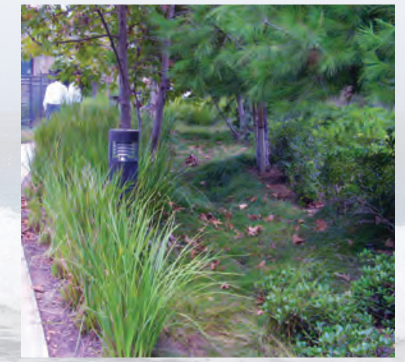
Where Does Water Runoff Go?

Stormwater, or water from rainfall events, and runoff from outdoor water use such as sprinklers and hoses flows from homes directly into catch basins and the storm drain system. After entering the storm drain, the water flows untreated into streams, rivers, bays and ultimately the Pacific Ocean. Runoff can come from lawns, gardens, driveways, sidewalks and roofs. As it flows over hard, impervious surfaces, it picks up pollutants. Some pollutants carried by the water runoff include trash, pet waste, pesticides, fertilizer, motor oil and more.

Water Conservation

Pollution not only impairs the water quality for habitat and recreation, it can also reduce the water available for reuse. Runoff allowed to soak into the ground is cleaned as it percolates through the soil, replenishing depleted groundwater supplies. Groundwater provides at least 50% of the total water for drinking and other indoor household activities in north and central Orange County. When land is covered with roads, parking lots, homes, etc., there is less land to take in the water and more hard surfaces over which the water can flow.

In Orange County, 60-70% of water used by residents and businesses goes to irrigation and other outdoor uses. Reusing rainwater to irrigate our lawn not only reduces the impact of water pollution from runoff, but it also is a great way to conserve our precious water resources and replenish our groundwater basin.



What is Low Impact Development (LID)?

Low Impact Development (LID) is a method of development that seeks to maintain the natural hydrologic character of an area. LID provides a more sustainable and pollution-preventative approach to water management.

New water quality regulations require implementation of LID in larger new developments and encourage implementation of LID and other sustainable practices in existing residential areas. Implementing modifications to your lawn or garden can reduce pollution in our environment, conserve water and reduce your water bill.

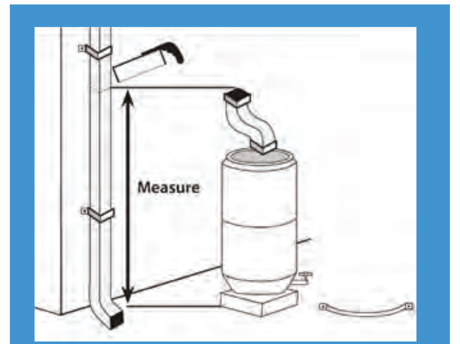
Permeable pavement allows water runoff to infiltrate through the soil and prevents most pollutants from reaching the storm drain system.

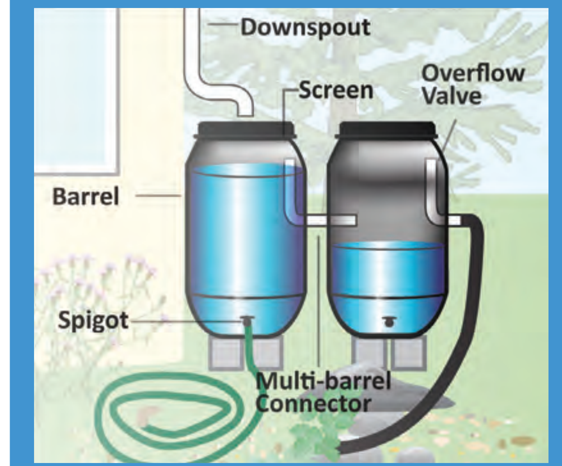
OPTIONS FOR RAINWATER HARVESTING AND REUSE

Rainwater harvesting is a great way to save money, prevent pollution and reduce potable water use. To harvest your rainwater, simply redirect the runoff from roofs and downspouts to rain barrels. Rain gardens are another option; these reduce runoff as well as encourage infiltration.

Downspout Disconnection/Redirection

Disconnecting downspouts from pipes running to the gutter prevents runoff from transporting pollutants to the storm drain. Once disconnected, downspouts can be redirected to rain gardens or other vegetated areas, or be connected to a rain barrel.





Rain Barrels

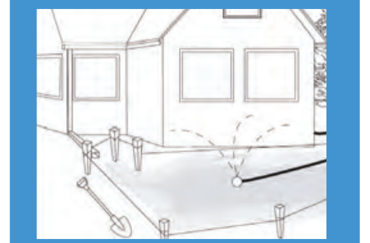
Rain barrels capture rainwater flow from roofs for reuse in landscape irrigation. Capacity of rain barrels needed for your home will depend on the amount of roof area and rainfall received. When purchasing your rain barrel, make sure it includes a screen, a spigot to siphon water for use, an overflow tube to allow for excess water to run out and a connector if you wish to connect multiple barrels to add capacity of water storage.

Mosquito growth prevention is very important when installing a rain barrel. The best way to prevent mosquito breeding is to eliminate entry points by ensuring all openings are sealed tightly. If these methods are unsuccessful, products are available to kill mosquito larvae, but that are harmless to animals and humans. Regular application of these products is essential. Please visit the Orange County Vector Control website for more information at www.ocvcd.org/mosquitoes3.php.

Rain Gardens

Rain gardens allow runoff to be directed from your roof downspout into a landscaped area. Vegetation and rocks in the garden will slow the flow of water to allow for infiltration into the soil. Plants and soil particles will absorb pollutants from the roof runoff. By utilizing a native plant palate, rain gardens can be maintained all year with minimal additional irrigation. These plants are adapted to the semi-arid climate of Southern California, require less water and can reduce your water bill.

Before modifying your yard to install a rain garden, please consult your local building and/or planning departments to ensure your garden plan follows pertinent building codes and ordinances. Besides codes and ordinances, some home owner associations also have guidelines for yard modifications. If your property is in hill areas or includes engineered slopes, please seek professional advice before proceeding with changes.



For information on how to disconnect a downspout or to install and maintain a rain barrel or rain garden at your home, please see the Los Angeles Rainwater Harvesting Program, A Homeowner's "How-To" Guide, November 2009 at www.larainwaterharvesting.org/

OTHER WATER CONSERVATION AND POLLUTION PREVENTION TECHNIQUES

Native Vegetation and Maintenance

"California Friendly" plants or native vegetation can significantly reduce water use. These plants often require far less fertilizers and pesticides, which are two significant pollutants found in Orange County waterways. Replacing water "thirsty" plants and grass types with water efficient natives is a great way to save water and reduce the need for potentially harmful pesticides and fertilizer.

Please see the California Friendly Garden Guide produced by the Metropolitan Water District of Southern California and associated Southern California Water Agencies for a catalog of California friendly plants and other garden resources at www.bewaterwise.com/Gardensoft.

Weed Free Yards

Weeds are water thieves. They often reproduce quickly and rob your yard of both water and nutrients. Weed your yard by hand if possible. If you use herbicides to control the weeds, use only the amount recommended on the label and never use it if rain is forecast within the next 48 hours.

Soil Amendments

Soil amendments such as green waste (e.g. grass clippings, compost, etc.) can be a significant source of nutrients and can help keep the soil near the roots of plants moist. However, they can cause algal booms if they get into our waterways, which reduces the amount of oxygen in the water and impacts most aquatic organisms. It is important to apply soil amendments more than 48 hours prior to predicted rainfall.

IRRIGATE EFFICIENTLY

Water runoff from sprinklers left on too long will carry pollutants into our waterways.

Smart Irrigation Controllers

Smart Irrigation Controllers have internal clocks as well as sensors that will turn off the sprinklers in response to environmental changes. If it is raining, too windy or too cold, the smart irrigation control sprinklers will automatically shut off.

Check with your local water agency for available re-bates on irrigation controllers and smart timers.

- Aim your sprinklers at your lawn, not the sidewalk – By simply adjusting the direction of your sprinklers you can save water, prevent water pollution from runoff, keep your lawn healthy and save money.
- **Set a timer for your sprinklers** – lawns absorb the water they need to stay healthy within a few minutes of turning on the sprinklers. Time your sprinklers; when water begins running off your lawn, you can turn them off. Your timer can be set to water your lawn for this duration every time.
- **Water at Sunrise** – Watering early in the morning will reduce water loss due to evaporation. Additionally, winds tend to die down in the early morning so the water will get to the lawn as intended.
- **Water by hand** – Instead of using sprinklers, consider watering your yard by hand. Hand-watering ensures that all plants get the proper amount of water and you will prevent any water runoff, which wastes water and carries pollutants into our waterways.
- **Fix leaks** - Nationwide, households waste one trillion gallons of water a year to leaks – that is enough water to serve the entire state of Texas for a year. If your garden hose is leaking, replace the nylon or rubber hose washer and ensure a tight connection. Fix broken sprinklers immediately.

Help Prevent Ocean Pollution:

Household Tips

The Ocean Begins at Your Front Door

PROJECT POLLUTION PREVENTION

Do your part to prevent water pollution in our creeks, rivers, bays and ocean.

Clean beaches and healthy creeks, rivers, bays, and ocean are important to Orange County. However, many common household activities can lead to water pollution if you're not careful.

REMEMBER THE WATER IN YOUR STORM DRAIN IS NOT TREATED BEFORE IT ENTERS OUR WATERWAYS

Litter, oil, chemicals and other substances that are left on your yard or driveway can be blown or washed into storm drains that flow to the ocean. Over-watering your lawn and washing your car can also flush materials into the storm drains. Unlike water in sanitary sewers (from sinks and toilets), water in storm drains is not treated.

You would never pour soap, fertilizers or oil into the ocean, so don't let them enter streets, gutters or storm drains. Follow the easy tips in this brochure to help prevent water pollution.

For more information,
please call the
Orange County Stormwater Program
at **1-877-89-SPILL** (1-877-897-7455)
or visit
www.ocwatersheds.com

To report a spill,
call the
Orange County 24-Hour Water Pollution Problem Reporting Hotline
1-877-89-SPILL (1-877-897-7455).

For emergencies, dial 911.

The tips contained in this brochure provide useful information to help prevent water pollution while performing everyday household activities. If you have other suggestions, please contact your city's stormwater representatives or call the Orange County Stormwater Program.

GENUINE RECYCLED PAPER
50% PRE-CONSUMER AND 15% POST-CONSUMER

RECYCLE USED OIL

Pollution Prevention

Household Activities

- **Do not rinse spills with water!** Sweep outdoor spills and dispose of in the trash. For wet spills like oil, apply cat litter or another absorbent material, then sweep and bring to a household hazardous waste collection center (HHWCC).
- Securely cover trash cans.
- Take household hazardous waste to a household hazardous waste collection center.
- Store household hazardous waste in closed, labeled containers inside or under a cover.
- Do not hose down your driveway, sidewalk or patio. Sweep up debris and dispose of in trash.
- Always pick up after your pet. Flush waste down the toilet or dispose of in the trash.
- Bathe pets indoors or have them professionally groomed.

Household Hazardous Wastes include:

- **Batteries**
- **Paint thinners, paint strippers and removers**
- **Adhesives**
- **Drain openers**
- **Oven cleaners**
- **Wood and metal cleaners and polishes**
- **Herbicides and pesticides**
- **Fungicides/wood preservatives**
- **Automotive fluids and products**
- **Grease and rust solvents**
- **Thermometers and other products containing mercury**
- **Fluorescent lamps**
- **Cathode ray tubes, e.g. TVs, computer monitors**
- **Pool and spa chemicals**

Gardening Activities

- Follow directions on pesticides and fertilizers, (measure, do not estimate amounts) and do not use if rain is predicted within 48 hours.
- Water your lawn and garden by hand to control the amount of water you use. Set irrigation systems to reflect seasonal water needs. If water flows off your yard and onto your driveway or sidewalk, your system is over-watering.
- Mulch clippings or leave them on the lawn. If necessary, dispose in a green waste container.
- Cultivate your garden often to control weeds.

Washing and Maintaining Your Car

- Take your car to a commercial car wash whenever possible.
- Choose soaps, cleaners, or detergents labeled "non-toxic," "phosphate free" or "biodegradable." Vegetable and citrus-based products are typically safest for the environment, **but even these should not be allowed into the storm drain.**
- Shake floor mats into a trash can or vacuum to clean.
- Do not use acid-based wheel cleaners and "hose off" engine degreasers at home. They can be used at a commercial facility, which can properly process the washwater.
- **Do not dump washwater onto your driveway, sidewalk, street, gutter or storm drain.** Excess washwater should be disposed of in the sanitary sewers (through a sink, or toilet) or onto an absorbent surface like your lawn.
- Use a nozzle to turn off water when not actively washing down automobile.
- Monitor vehicles for leaks and place pans under leaks. Keep your car well maintained to stop and prevent leaks.
- Use cat litter or other absorbents and sweep to remove any materials deposited by vehicles. Contain sweepings and dispose of at a HHWCC.
- Perform automobile repair and maintenance under a covered area and use drip pans or plastic sheeting to keep spills and waste material from reaching storm drains.
- **Never pour oil or antifreeze in the street, gutter or storm drains.** Recycle these substances at a service station, HHWCC, or used oil recycling center. For the nearest Used Oil Collection Center call 1-800-CLEANUP or visit www.ciwmb.ca.gov/UsedOil.

For locations and hours of Household Hazardous Waste Collection Centers in Anaheim, Huntington Beach, Irvine and San Juan Capistrano, call (714)834-6752 or visit www.oclandfills.com.

Do your part to prevent water pollution in our creeks, rivers, bays and ocean.

Clean beaches and healthy creeks, rivers, bays and ocean are important to Orange County. However, not properly disposing of household hazardous waste can lead to water pollution. Batteries, electronics, paint, oil, gardening chemicals, cleaners and other hazardous materials cannot be thrown in the trash. They also must never be poured or thrown into yards, sidewalks, driveways, gutters or streets. Rain or other water could wash the materials into the storm drain and eventually into our waterways and the ocean. In addition, hazardous waste must not be poured in the sanitary sewers (sinks and toilets).

NEVER DISPOSE OF HOUSEHOLD HAZARDOUS WASTE IN THE TRASH, STREET, GUTTER, STORM DRAIN OR SEWER.

For more information, please call the **Orange County Stormwater Program** at **1-877-89-SPILL** (1-877-897-7455) or visit **www.ocwatersheds.com**

To Report Illegal Dumping of Household Hazardous Waste call 1-800-69-TOXIC

To report a spill, call the **Orange County 24-Hour Water Pollution Problem Reporting Hotline 1-877-89-SPILL** (1-877-897-7455).

For emergencies, dial 911.

RECYCLE USED OIL

Printed on Recycled Paper

Help Prevent Ocean Pollution:

Proper Disposal of Household Hazardous Waste

The Ocean Begins at Your Front Door

PROJECT Pollution PREVENTION

ORANGE COUNTY

Pollution Prevention

Leftover household products that contain corrosive, toxic, ignitable, or reactive ingredients are considered to be “household hazardous waste” or “HHW.” HHW can be found throughout your home, including the bathroom, kitchen, laundry room and garage.

WHEN POSSIBLE, USE NON-HAZARDOUS OR LESS-HAZARDOUS PRODUCTS.

Disposal of HHW down the drain, on the ground, into storm drains, or in the trash is illegal and unsafe.

Proper disposal of HHW is actually easy. Simply drop them off at a Household Hazardous Waste Collection Center (HHWCC) for free disposal and recycling. Many materials including anti-freeze, latex-based paint, motor oil and batteries can be recycled. Some centers have a “Stop & Swap” program that lets you take partially used home, garden, and automobile products free of charge. There are four HHWCCs in Orange County:

Anaheim:..................1071 N. Blue Gum St
Huntington Beach:.........17121 Nichols St
Irvine:........................... 6411 Oak Canyon
San Juan Capistrano:... 32250 La Pata Ave

Centers are open Tuesday-Saturday, 9 a.m.-3 p.m. Centers are closed on rainy days and major holidays. For more information, call **(714) 834-6752** or visit **www.oclandfills.com.**

Common household hazardous wastes

- Batteries
- Paint and paint products
- Adhesives
- Drain openers
- Household cleaning products
- Wood and metal cleaners and polishes
- Pesticides
- Fungicides/wood preservatives
- Automotive products (antifreeze, motor oil, fluids)
- Grease and rust solvents
- Fluorescent lamps
- Mercury (thermometers & thermostats)
- All forms of electronic waste including computers and microwaves
- Pool & spa chemicals
- Cleaners
- Medications
- Propane (camping & BBQ)
- Mercury-containing lamps
- Television & monitors (CRTs, flatscreens)

Tips for household hazardous waste

- Never dispose of HHW in the trash, street, gutter, storm drain or sewer.
- Keep these materials in closed, labeled containers and store materials indoors or under a cover.
- When possible, use non-hazardous products.
- Reuse products whenever possible or share with family and friends.
- Purchase only as much of a product as you’ll need. Empty containers may be disposed of in the trash.
- HHW can be harmful to humans, pets and the environment. Report emergencies to 911.

Did you know that just one quart of oil can pollute 250,000 gallons of water?

A clean ocean and healthy creeks, rivers, bays and beaches are important to Orange County. However, not properly disposing of used oil can lead to water pollution. If you pour or drain oil onto driveways, sidewalks or streets, it can be washed into the storm drain. Unlike water in sanitary sewers (from sinks and toilets), water in storm drains is not treated before entering the ocean. Help prevent water pollution by taking your used oil to a used oil collection center.

Included in this brochure is a list of locations that will accept up to five gallons of used motor oil at no cost. Many also accept used oil filters. Please contact the facility before delivering your used oil. This listing of companies is for your reference and does not constitute a recommendation or endorsement of the company.

Please note that used oil filters may not be disposed of with regular household trash. They must be taken to a household hazardous waste collection or recycling center in Anaheim, Huntington Beach, Irvine or San Juan Capistrano. For information about these centers, visit www.oclandfills.com.

Please do not mix your oil with other substances!

For more information, please call the Orange County Stormwater Program at 1-877-89-SPILL (1-877-897-7455) or visit www.watersheds.com.

For information about the proper disposal of household hazardous waste, call the Household Waste Hotline at (714) 834-6752 or visit www.oclandfills.com.

RECYCLE USED OIL

For additional information about the nearest oil recycling center, call the Used Oil Program at 1-800-CLEANUP or visit www.cleanup.org.

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Help Prevent Ocean Pollution:

Recycle at Your Local Used Oil Collection Center

The Ocean Begins at Your Front Door

PROJECT POLLUTION PREVENTION

NORTH COUNTY

Used Oil Collection Centers

Anaheim

All Seasons Tire and Auto Center, Inc.
817 S Brookhurst St., Anaheim, CA 92804
(714)772-6090( )
CIWMB#: 30-C-03177

AutoZone #3317
423 N Anaheim Blvd., Anaheim, CA 92805
(714)776-0787( )
CIWMB#: 30-C-05263

AutoZone #5226
2145 W Lincoln Ave., Anaheim, CA 92801
(714)533-6599( )
CIWMB#: 30-C-04604

Bedard Automotive
3601 E Miraloma Ave., Anaheim, CA 92806
(714)528-1380( )
CIWMB#: 30-C-02205

Classic Chevrolet
1001 Weir Canyon Rd., Anaheim, CA 92807
(714)283-5400( )
CIWMB#: 30-C-05223

Econo Lube N' Tune #4
3201 W Lincoln Ave., Anaheim, CA 92801
(714)821-0128( )
CIWMB#: 30-C-01485

EZ Lube Inc - Savi Ranch #43
985 N Weir Canyon Rd., Anaheim, CA 92807
(714)556-1312( )
CIWMB#: 30-C-06011

Firestone Store #71C7
1200 S Magnolia Ave., Anaheim, CA 92804
(949)598-5520( )
CIWMB#: 30-C-05743

Great Western Lube Express
125 N Brookhurst St., Anaheim, CA 92801
(714)254-1300( )
CIWMB#: 30-C-05542

HR Pro Auto Service Center
3180 W Lincoln Ave., Anaheim, CA 92801
(714)761-4343( )
CIWMB#: 30-C-05927

Ira Newman Automotive Services
1507 N State College Blvd., Anaheim, CA 92806
(714)635-2392( )
CIWMB#: 30-C-01482

Jiffy Lube #1028
2400 W Ball Rd., Anaheim, CA 92804
(714)761-5211( )
CIWMB#: 30-C-00870

Jiffy Lube #1903
2505 E Lincoln Ave., Anaheim, CA 92806
(714)772-4000( )
CIWMB#: 30-C-05511

Jiffy Lube #2340
2181 W Lincoln Ave., Anaheim, CA 92801
(714)533-1000( )
CIWMB#: 30-C-04647

Kragen Auto Parts #1303
1088 N State College Blvd., Anaheim, CA 92806
(714)956-7351( )
CIWMB#: 30-C-03438

Kragen Auto Parts #1399
2245 W Ball Rd., Anaheim, CA 92804
(714)490-1274( )
CIWMB#: 30-C-04094

Kragen Auto Parts #1565
2072 Lincoln Ave., Anaheim, CA 92806
(714)502-6992( )
CIWMB#: 30-C-04078

Kragen Auto Parts #1582
3420 W Lincoln Ave., Anaheim, CA 92801
(714)828-7977( )
CIWMB#: 30-C-04103

Pep Boys #613
10912 Katella Ave., Anaheim, CA 92804
(714)638-0863( )
CIWMB#: 30-C-01756

Pep Boys #663
3030 W Lincoln Anaheim, CA 92801
(714)826-4810( )
CIWMB#: 30-C-03417

Pep Boys #809
8205 E Santa Ana Cyn Rd., Anaheim, CA 92808
(714)974-0105( )
CIWMB#: 30-C-03443

Pick Your Part
1235 S Beach Blvd., Anaheim, CA 92804
(714)527-1645( )
CIWMB#: 30-C-03744

PK Auto Performance
3106 W. Lincoln Ave., Anaheim, CA 92801
(714)826-2141( )
CIWMB#: 30-C-05628

Quick Change Lube and Oil
2731 W Lincoln Ave., Anaheim, CA 92801
(714)821-4464( )
CIWMB#: 30-C-04363

Saturn of Anaheim
1380 S Auto Center Dr., Anaheim, CA 92806
(714)648-2444( )
CIWMB#: 30-C-06332

Sun Tech Auto Service
105 S State College Blvd., Anaheim, CA 92806
(714)956-1389( )
CIWMB#: 30-C-06455

Vonic Truck Services
515 S Rose St., Anaheim, CA 92805
(714)533-3333( )
CIWMB#: 30-C-01142

Anaheim Hills

Anaheim Hills Car Wash & Lube
5810 E La Palma Ave., Anaheim Hills, CA 92807
(714)777-6605( )
CIWMB#: 30-C-01387

Brea

Firestone Store #27A9
891 E Imperial Hwy., Brea, CA 92821
(714)529-8404( )
CIWMB#: 30-C-01221

Oil Can Henry's
230 N Brea Blvd., Brea, CA 92821
(714)990-1900( )
CIWMB#: 30-C-04273

Buena Park

Firestone Store #71F7
6011 Orangethorpe Buena Park, CA 90620
(714)670-7912( )
CIWMB#: 30-C-01218

Firestone Store #71T8
8600 Beach Blvd., Buena Park, CA 90620
(714)827-5300( )
CIWMB#: 30-C-02121

Kragen Auto Parts #1204
5303 Beach Blvd., Buena Park, CA 90621
(714)994-1320( )
CIWMB#: 30-C-02623

Cypress

AutoZone #5521
5471 Lincoln Ave., Cypress, CA 90630
(714)995-4644( )
CIWMB#: 30-C-00836

Big O Tires
6052 Cerritos Ave., Cypress, CA 90630
(714)826-6334( )
CIWMB#: 30-C-04245

Econo Lube N' Tune #213
5497 Cerritos Ave., Cypress, CA 90630
(714)761-0456( )
CIWMB#: 30-C-06240

Jiffy Lube #851
4942 Lincoln Ave., Cypress, CA 90630
(626)965-9689( )
CIWMB#: 30-C-06182

M & N Coastline Auto & Tire Service
4005 Ball Rd., Cypress, CA 90630
(714)826-1001( )
CIWMB#: 30-C-04387

Masterlube #103
5904 Lincoln Cypress, CA 90630
(714)826-2323( )
CIWMB#: 30-C-01071

Masterlube #104
5971 Ball Rd., Cypress, CA 90630
(714)220-1555( )
CIWMB#: 30-C-04682

Metric Motors of Cypress
6042 Cerritos Ave., Cypress, CA 90630
(714)821-4702( )
CIWMB#: 30-C-05157

Fullerton

AutoZone #2898
146 N. Raymond Ave., Fullerton, CA 92831
(714)870-9772( )
CIWMB#: 30-C-04488

AutoZone #5522
1801 Orangethorpe W. Fullerton, CA 92833
(714)870-8286( )
CIWMB#: 30-C-06062

AutoZone #5523
102 N Euclid Fullerton, CA 92832
(714)870-8286( )
CIWMB#: 30-C-04755

EZ Lube #17
4002 N Harbor Blvd., Fullerton, CA 92835
(714)871-9980( )
CIWMB#: 30-C-03741

Firestone Store #27EH
1933 N Placentia Ave., Fullerton, CA 92831
(714)993-7100( )
CIWMB#: 30-C-02122

Fox Service Center
1018 W Orangethorpe Fullerton, CA 92833
(714)879-1430( )
CIWMB#: 30-C-02318

Fullerton College Automotive Technology
321 E Chapman Ave., Fullerton, CA 92832
(714)992-7275( )
CIWMB#: 30-C-03165

Kragen Auto Parts #0731
2978 Yorba Linda Fullerton, CA 92831
(714)996-4780( )
CIWMB#: 30-C-02628

Kragen Auto Parts #4133
904 W Orangethorpe Ave., Fullerton, CA 92832
(714)526-3570( )
CIWMB#: 30-C-06256

Pep Boys #642
1530 S Harbor Blvd., Fullerton, CA 92832
(714)870-0700( )
CIWMB#: 30-C-01755

Sunnyside 76 Car Care Center
2701 N Brea Blvd., Fullerton, CA 92835
(714)256-0773( )
CIWMB#: 30-C-01381

Garden Grove

76 Pro Lube Plus
9001 Trask Ave., Garden Grove, CA 92844
(714)393-0590( )
CIWMB#: 30-C-05276

AutoZone #5527
13190 Harbor Blvd., Garden Grove, CA 92843
(714)636-5665( )
CIWMB#: 30-C-04760

David Murray Shell
12571 Vly View St., Garden Grove, CA 92845
(714)898-0170( )
CIWMB#: 30-C-00547

Express Lube & Wash
8100 Lampson Ave., Garden Grove, CA 92841
(909)316-8261( )
CIWMB#: 30-C-06544

Firestone Store #7180
10081 Chapman Ave., Garden Grove, CA 92840
(714)530-4630( )
CIWMB#: 30-C-01224

Firestone Store #71W3
13961 Brookhurst St., Garden Grove, CA 92843
(714)590-2741( )
CIWMB#: 30-C-03690

Jiffy Lube #1991
13970 Harbor Blvd., Garden Grove, CA 92843
(714)554-0610( )
CIWMB#: 30-C-05400

Kragen Auto Parts #1251
13933 N Harbor Blvd., Garden Grove, CA 92843
(714)554-3780( )
CIWMB#: 30-C-02663

Kragen Auto Parts #1555
9851 Chapman Ave., Garden Grove, CA 92841
(714)741-8030( )
CIWMB#: 30-C-04079

Nissan of Garden Grove
9670 Trask Ave., Garden Grove, CA 92884
(714)537-0900( )
CIWMB#: 30-C-06553

Toyota of Garden Grove
9444 Trask Ave., Garden Grove, CA 92844
(714)895-5595( )
CIWMB#: 30-C-06555

La Habra

AutoZone #5532
1200 W Imperial Hwy., La Habra, CA 90631
(562)694-5337( )
CIWMB#: 30-C-04784

Burch Ford
201 N Harbor Blvd., La Habra, CA 90631
(562)691-3225( )
CIWMB#: 30-C-05179

Firestone Store #2736
1071 S Beach Blvd., La Habra, CA 90631
(562)691-1731( )
CIWMB#: 30-C-01169

Kragen Auto Parts #1569
1621 W Whittier Blvd., La Habra, CA 90631
(562)905-2538( )
CIWMB#: 30-C-04076

Pep Boys #997
125 W Imperial Hwy., La Habra, CA 90631
(714)447-0601( )
CIWMB#: 30-C-04026

SpeeDee Oil Change & Tune-Up
1580 W Imperial Hwy., La Habra, CA 90631
(562)697-3513( )

Los Alamitos

Jiffy Lube #1740
3311 Katella Ave., Los Alamitos, CA 90720
(562)596-1827( )
CIWMB#: 30-C-03529

Midway City

Bolsa Transmission
8331 Bolsa Ave., Midway City, CA 92655
(714)799-6158( )
CIWMB#: 30-C-05768

Placentia

Advanced Auto & Diesel
144 S Bradford Placentia, CA 92870
(714)996-8222( )
CIWMB#: 30-C-06242

Castner's Auto Service
214 S. Bradford Ave., Placentia, CA 92870
(714)528-1311( )
CIWMB#: 30-C-06452

Econo Lube N' Tune
100 W Chapman Ave., Placentia, CA 92870
(714)524-0424( )
CIWMB#: 30-C-06454

Fairway Ford
1350 E Yorba Linda Blvd., Placentia, CA 92870
(714)524-1200( )
CIWMB#: 30-C-01863

Seal Beach

M & N Coastline Auto & Tire Service
12239 Seal Beach Blvd., Seal Beach, CA 90740
(714)826-1001( )
CIWMB#: 30-C-04433

Seal Beach Chevron
12541 Seal Beach Blvd., Seal Beach, CA 90740
(949)495-0774(14)
CIWMB#: 30-C-06425

Stanton

AutoZone #2806
11320 Beach Blvd., Stanton, CA 90680
(714)895-7665( )
CIWMB#: 30-C-04563

Joe's Auto Clinic
11763 Beach Blvd., Stanton, CA 90680
(714)891-7715( )
CIWMB#: 30-C-03253

Kragen Auto Parts #1742
11951 Beach Blvd., Stanton, CA 90680
(714)799-7574( )
CIWMB#: 30-C-05231

Scher Tire #20
7000 Katella Ave., Stanton, CA 90680
(714)892-9924( )
CIWMB#: 30-C-05907

USA 10 Minute Oil Change
8100 Lampson Ave., Stanton, CA 92841
(714)373-4432( )
CIWMB#: 30-C-05909

Westminster

AutoZone #5543
6611 Westminster Blvd., Westminster, CA 92683
(714)898-2898( )
CIWMB#: 30-C-04964

AutoZone #5544
8481 Westminster Blvd., Westminster, CA 92683
(714)891-3511( )
CIWMB#: 30-C-04966

City of Westminster Corporate Yard
14381 Olive St., Westminster, CA 92683
(714)895-2876(292)
CIWMB#: 30-C-02008

Honda World
13600 Beach Blvd., Westminster, CA 92683
(714)890-8900( )
CIWMB#: 30-C-03639

Jiffy Lube #1579
6011 Westminster Blvd., Westminster, CA 92683
(714)899-2727( )
CIWMB#: 30-C-02745

John's Brake & Auto Repair
13050 Hoover St., Westminster, CA 92683
(714)379-2088( )
CIWMB#: 30-C-05617

Kragen Auto Parts #0762
6562 Westminster Blvd., Westminster, CA 92683
(714)898-0810( )
CIWMB#: 30-C-02590

Midway City Sanitary District
14451 Cedarwood St., Westminster, CA 92683
(714)893-3553( )
CIWMB#: 30-C-01626

Pep Boys #653
15221 Beach Blvd., Westminster, CA 92683
(714)893-8544( )
CIWMB#: 30-C-03415

Yorba Linda

AutoZone #5545
18528 Yorba Linda Blvd., Yorba Linda, CA 92886
(714)970-8933( )
CIWMB#: 30-C-04971

Econo Lube N' Tune
22270 La Palma Ave., Yorba Linda, CA 92887
(714)692-8394( )
CIWMB#: 30-C-06513

EZ Lube Inc. #41
17511 Yorba Linda Blvd., Yorba Linda, CA 92886
(714)556-1312( )
CIWMB#: 30-C-05739

Firestone Store #27T3
18500 Yorba Linda Blvd., Yorba Linda, CA 92886
(714)779-1966( )
CIWMB#: 30-C-01222

Jiffy Lube #1532
16751 Yorba Linda Blvd., Yorba Linda, CA 92886
(714)528-2800( )
CIWMB#: 30-C-03777

Mike Schultz Import Service
4832 Eureka Ave., Yorba Linda, CA 92886
(714)528-4411( )
CIWMB#: 30-C-04313

This information was provided by the County of Orange Integrated Waste Management Department and the California Integrated Waste Management Board (CIWMB).

Clean beaches and healthy creeks, rivers, bays and ocean are important to Orange County. However, many common activities such as pest control can lead to water pollution if you're not careful. Pesticide treatments must be planned and applied properly to ensure that pesticides do not enter the street, gutter or storm drain. Unlike water in sanitary sewers (from sinks and toilets), water in storm drains is not treated before entering our waterways.

You would never dump pesticides into the ocean, so don't let it enter the storm drains. Pesticides can cause significant damage to our environment if used improperly. If you are thinking of using a pesticide to control a pest, there are some important things to consider.

For more information,
please call
University of California Cooperative Extension Master Gardeners at
(714) 708-1646
or visit these Web sites:
www.uccemg.org
www.ipm.ucdavis.edu

For instructions on collecting a specimen sample visit the Orange County Agriculture Commissioner's website at:
http://www.ocagcomm.com/ser_lab.asp

To report a spill, call the
Orange County 24-Hour Water Pollution Problem Reporting Hotline at 1-877-89-SPILL (1-877-897-7455).

For emergencies, dial 911.

Information From:
Cheryl Wilen, Area IPM Advisor; Darren Haver, Watershed Management Advisor; Mary Louise Flint, IPM Education and Publication Director; Pamela M. Geisel, Environmental Horticulture Advisor; Carolyn L. Unruh, University of California Cooperative Extension staff writer. Photos courtesy of the UC Statewide IPM Program and Darren Haver.

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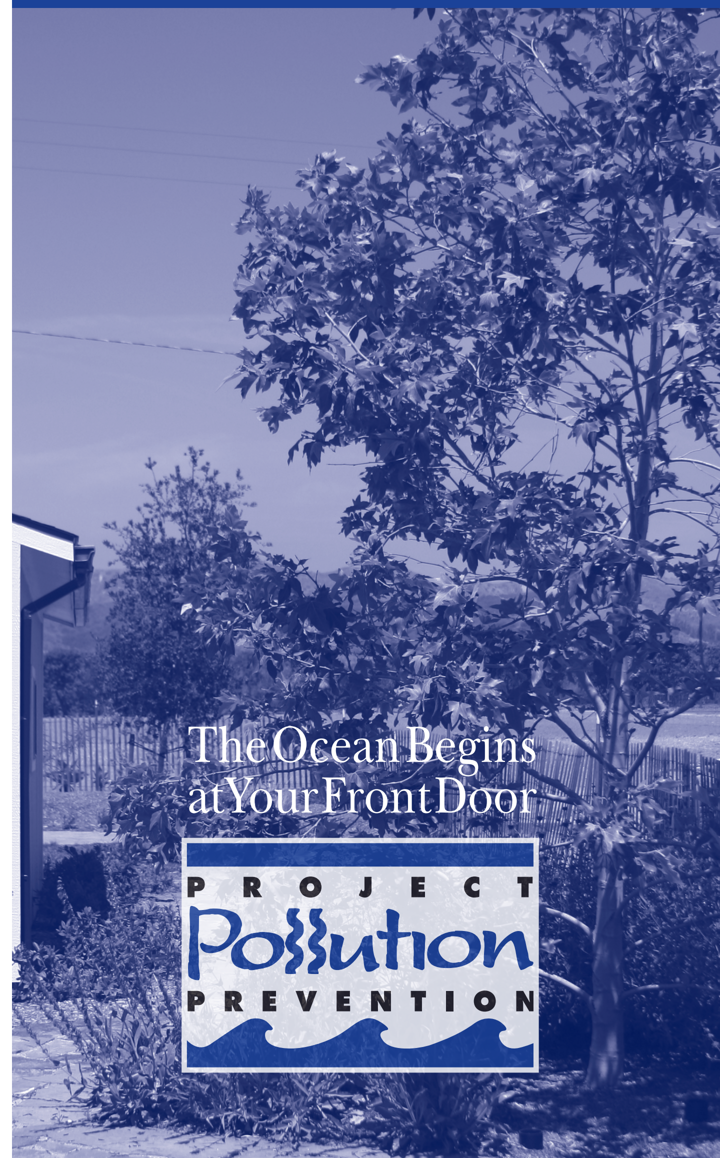
Help Prevent Ocean Pollution:

Responsible Pest Control



Tips for Pest Control

Key Steps to Follow:

Step 1: **Correctly identify the pest (insect, weed, rodent, or disease) and verify that it is actually causing the problem.**

Three life stages of the common lady beetle, a beneficial insect.

This is important because beneficial insects are often mistaken for pests and sprayed with pesticides needlessly.

Consult with a Certified Nursery Professional at a local nursery or garden center or send a sample of the pest to the Orange County Agricultural Commissioner's Office.

Determine if the pest is still present – even though you see damage, the pest may have left.

Step 2: **Determine how many pests are present and causing damage.**

Small pest populations may be controlled more safely using non-pesticide techniques. These include removing food sources, washing off leaves with a strong stream of water, blocking entry into the home using caulking and replacing problem plants with ones less susceptible to pests.

Integrated Pest Management (IPM) usually combines several least toxic pest control methods for long-term prevention and management of pest problems without harming you, your family, or the environment.

UC CE University of California Cooperative Extension

Step 3: **If a pesticide must be used, choose the least toxic chemical.**

Obtain information on the least toxic pesticides that are effective at controlling the target pest from the UC Statewide Integrated Pest Management (IPM) Program's Web site at www.ipm.ucdavis.edu.

Seek out the assistance of a Certified Nursery Professional at a local nursery or garden center when selecting a pesticide. Purchase the smallest amount of pesticide available.

Apply the pesticide to the pest during its most vulnerable life stage. This information can be found on the pesticide label.

Step 4: **Wear appropriate protective clothing.**

Follow pesticide labels regarding specific types of protective equipment you should wear. Protective clothing should always be washed separately from other clothing.

Step 5: **Continuously monitor external conditions when applying pesticides such as weather, irrigation, and the presence of children and animals.**

Never apply pesticides when rain is predicted within the next 48 hours. Also, do not water after applying pesticides unless the directions say it is necessary.

Apply pesticides when the air is still; breezy conditions may cause the spray or dust to drift away from your targeted area.

In case of an emergency call 911 and/or the regional poison control number at (714) 634-5988 or (800) 544-4404 (CA only).

For general questions you may also visit www.calpoison.org.

Step 6: **In the event of accidental spills, sweep up or use an absorbent agent to remove any excess pesticides. Avoid the use of water.**

Be prepared. Have a broom, dust pan, or dry absorbent material, such as cat litter, newspapers or paper towels, ready to assist in cleaning up spills.

Contain and clean up the spill right away. Place contaminated materials in a doubled plastic bag. All materials used to clean up the spill should be properly disposed of according to your local Household Hazardous Waste Disposal site.

Step 7: **Properly store and dispose of unused pesticides.**

Purchase Ready-To-Use (RTU) products to avoid storing large concentrated quantities of pesticides.

Store unused chemicals in a locked cabinet.

Unused pesticide chemicals may be disposed of at a Household Hazardous Waste Collection Center.

Empty pesticide containers should be triple rinsed prior to disposing of them in the trash.

Household Hazardous Waste Collection Center
(714) 834-6752
www.oclandfills.com

PROJECT POLLUTION PREVENTION

Sewage Spill Regulatory Requirements

Allowing sewage to discharge to a gutter or storm drain may subject you to penalties and/or out-of-pocket costs to reimburse cities or public agencies for clean-up efforts.

Here are the pertinent codes, fines, and agency contact information that apply.

Orange County Stormwater Program
24 Hour Water Pollution Reporting Hotline
1-877-89-SPILL (1-877-897-7455)

- County and city water quality ordinances prohibit discharges containing pollutants.

Orange County Health Care Agency Environmental Health
(714) 433-6419

California Health and Safety Code, Sections 5410-5416

- No person shall discharge raw or treated sewage or other waste in a manner that results in contamination, pollution or a nuisance.
- Any person who causes or permits a sewage discharge to any state waters:
  - must immediately notify the local health agency of the discharge.
  - shall reimburse the local health agency for services that protect the public's health and safety (water-contact receiving waters).
  - who fails to provide the required notice to the local health agency is guilty of a misdemeanor and shall be punished by a fine (between $500–$1,000) and/or imprisonment for less than one year.

Regional Water Quality Control Board
Santa Ana Region (951) 782-4130
San Diego Region (858) 467-2952

- Requires the prevention, mitigation, response to and reporting of sewage spills.

California Office of Emergency Services
(800) 852-7550

California Water Code, Article 4, Chapter 4, Sections 13268-13271
California Code of Regulations, Title 23, Division 3, Chapter 9.2, Article 2, Sections 2250-2260

- Any person who causes or permits sewage in excess of 1,000 gallons to be discharged to state waters **shall immediately notify the Office of Emergency Services.**
- Any person who fails to provide the notice required by this section is **guilty of a misdemeanor** and shall be punished by a fine (less than $20,000) and/or imprisonment for not more than one year.

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Sewage Spill

Reference Guide

Your Responsibilities as a Private Property Owner

Residences
Businesses
Homeowner/Condominium Associations
Federal and State Complexes
Military Facilities

Orange County Sanitation District

Health Care Agency Environmental Health

PROJECT Pollution PREVENTION
www.ocwatersheds.com

This brochure was designed courtesy of the Orange County Sanitation District (OCSD). For additional information, call (714) 962-2411, or visit their website at www.ocsd.com

What is a Sewage Spill?

Sewage spills occur when the wastewater being transported via underground pipes overflows through a manhole, cleanout or broken pipe. Sewage spills can cause health hazards, damage to homes and businesses, and threaten the environment, local waterways and beaches.

Common Causes of Sewage Spills

Grease builds up inside and eventually blocks sewer pipes. Grease gets into the sewer from food establishments, household drains, as well as from poorly maintained commercial grease traps and interceptors.

Structure problems caused by tree roots in the lines, broken/cracked pipes, missing or broken cleanout caps or undersized sewers can cause blockages.

Infiltration and inflow (I/I) impacts pipe capacity and is caused when groundwater or rainwater enters the sewer system through pipe defects and illegal connections.

You Are Responsible for a Sewage Spill Caused by a Blockage or Break in Your Sewer Lines!

Time is of the essence in dealing with sewage spills. You are required to **immediately**:

Control and minimize the spill. Keep spills contained on private property and out of gutters, storm drains and public waterways by shutting off or not using the water.

Use sandbags, dirt and/or plastic sheeting to prevent sewage from entering the storm drain system.

Clear the sewer blockage. Always wear gloves and wash your hands. It is recommended that a plumbing professional be called for clearing blockages and making necessary repairs.

Always notify your city sewer/public works department or public sewer district of sewage spills. If the spill enters the storm drains also notify the Health Care Agency. In addition, if it exceeds 1,000 gallons notify the Office of Emergency Services. Refer to the numbers listed in this brochure.

Overflowing cleanout pipe located on private property

You Could Be Liable

Allowing sewage from your home, business or property to discharge to a gutter or storm drain may subject you to penalties and/or out-of-pocket costs to reimburse cities or public agencies for clean-up and enforcement efforts. See Regulatory Codes & Fines section for pertinent codes and fines that apply.

What to Look For

Sewage spills can be a very noticeable gushing of water from a manhole or a slow water leak that may take time to be noticed. Don't dismiss unaccounted-for wet areas.

Look for:

- Drain backups inside the building.
- Wet ground and water leaking around manhole lids onto your street.
- Leaking water from cleanouts or outside drains.
- Unusual odorous wet areas: sidewalks, external walls or ground/landscape around a building.

Caution

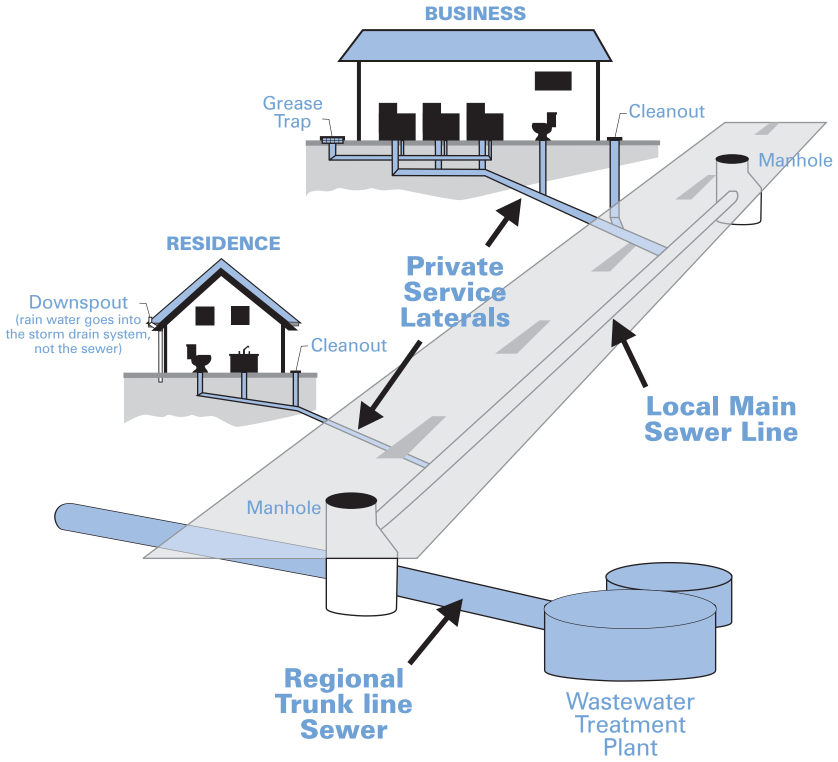
Keep people and pets away from the affected area. Untreated sewage has high levels of disease-causing viruses and bacteria. Call your local health care agency listed on the back for more information.

If You See a Sewage Spill Occurring, Notify Your City Sewer/Public Works Department or Public Sewer District IMMEDIATELY!

How a Sewer System Works

A property owner's sewer pipes are called service laterals and are connected to larger local main and regional trunk lines. Service laterals run from the connection at the home to the connection with the public sewer (including the area under the street). These laterals are the responsibility of the property owner and must be maintained by the property owner. Many city agencies have adopted ordinances requiring maintenance of service laterals. Check with your city sewer/local public works department for more information.

Operation and maintenance of **local and regional sewer lines** are the responsibility of the city sewer/public works departments and public sewer districts.



How You Can Prevent Sewage Spills

1 **Never put grease down garbage disposals, drains or toilets.**

2 **Perform periodic cleaning to eliminate grease, debris and roots in your service laterals.**

3 **Repair any structural problems in your sewer system and eliminate any rainwater infiltration/inflow leaks into your service laterals.**

Preventing Grease Blockages

The drain is not a dump! Recycle or dispose of grease properly and never pour grease down the drain.

Homeowners should mix fats, oils and grease with absorbent waste materials such as paper, coffee grounds, or kitty litter and place it in the trash. Wipe food scraps from plates and pans and dump them in the trash.

Restaurants and commercial food service establishments should always use “Kitchen Best Management Practices.” These include:

- Collecting all cooking grease and liquid oil from pots, pans and fryers in covered grease containers for recycling.
- Scraping or dry-wiping excess food and grease from dishes, pots, pans and fryers into the trash.
- Installing drain screens on all kitchen drains.
- Having spill kits readily available for cleaning up spills.
- Properly maintaining grease traps or interceptors by having them serviced regularly. Check your local city codes.

Orange County Agency Responsibilites

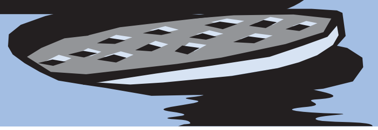
- **City Sewer/Public Works Departments—** Responsible for protecting city property and streets, the local storm drain system, sewage collection system and other public areas.
- **Public Sewer/Sanitation District—** Responsible for collecting, treating and disposing of wastewater.
- **County of Orange Health Care Agency—** Responsible for protecting public health by closing ocean/bay waters and may close food-service businesses if a spill poses a threat to public health.
- **Regional Water Quality Control Boards—** Responsible for protecting State waters.
- **Orange County Stormwater Program—** Responsible for preventing harmful pollutants from being discharged or washed by stormwater runoff into the municipal storm drain system, creeks, bays and the ocean.

You Could Be Liable for Not Protecting the Environment

Local and state agencies have legal jurisdiction and enforcement authority to ensure that sewage spills are remedied.

They may respond and assist with containment, relieving pipe blockages, and/or clean-up of the sewage spill, especially if the spill is flowing into storm drains or onto public property.

A property owner may be charged for costs incurred by these agencies responding to spills from private properties.



Report Sewage Spills!

City Sewer/Public Works Departments

Aliso Viejo	(949) 425-2500
Anaheim	(714) 765-6860
Brea	(714) 990-7691
Buena Park	(714) 562-3655
Costa Mesa	(949) 645-8400
Cypress	(714) 229-6760
Dana Point	(949) 248-3562
Fountain Valley	(714) 593-4600
Fullerton	(714) 738-6897
Garden Grove	(714) 741-5375
Huntington Beach	(714) 536-5921
Irvine	(949) 453-5300
Laguna Beach	(949) 497-0765
Laguna Hills	(949) 707-2650
Laguna Niguel	(949) 362-4337
Laguna Woods	(949) 639-0500
La Habra	(562) 905-9792
Lake Forest	(949) 461-3480
La Palma	(714) 690-3310
Los Alamitos	(562) 431-3538
Mission Viejo	(949) 831-2500
Newport Beach	(949) 644-3011
Orange	(714) 532-6480
Orange County	(714) 567-6363
Placentia	(714) 993-8245
Rancho Santa Margarita	(949) 635-1800
San Clemente	(949) 366-1553
San Juan Capistrano	(949) 443-6363
Santa Ana	(714) 647-3380
Seal Beach	(562) 431-2527
Stanton	(714) 379-9222
Tustin	(714) 962-2411
Villa Park	(714) 998-1500
Westminster	(714) 893-3553
Yorba Linda	(714) 961-7170

Public Sewer/Water Districts

Costa Mesa Sanitary District	(714) 393-4433/ (949) 645-8400
El Toro Water District	(949) 837-0660
Emerald Bay Service District	(949) 494-8571
Garden Grove Sanitary District	(714) 741-5375
Irvine Ranch Water District	(949) 453-5300
Los Alamitos/Rossmoor Sewer District	(562) 431-2223
Midway City Sanitary District (Westminster)	(714) 893-3553
Moulton Niguel Water District	(949) 831-2500
Orange County Sanitation District	(714) 962-2411
Santa Margarita Water District	(949) 459-6420
South Coast Water District	(949) 499-4555
South Orange County Wastewater Authority	(949) 234-5400
Sunset Beach Sanitary District	(562) 493-9932
Trabuco Canyon Sanitary District	(949) 858-0277
Yorba Linda Water District	(714) 777-3018

Other Agencies

Orange County Health Care Agency	(714) 433-6419
Office of Emergency Services	(800) 852-7550

Clean beaches and healthy creeks, rivers, bays and ocean are important to Orange County. However, many common activities can lead to water pollution if you're not careful. Home improvement projects and work sites must be maintained to ensure that building materials do not enter the street, gutter or storm drain. Unlike water in sanitary sewers (from sinks and toilets), water in storm drains is not treated before entering our waterways.

You would never dump building materials into the ocean, so don't let them enter the storm drains. Follow these tips to help prevent water pollution.

For more information,
please call the
Orange County Stormwater Program
at **1-877-89-SPILL** (1-877-897-7455)
or visit
www.ocwatersheds.com

To report a spill,
call the
Orange County 24-Hour Water Pollution Problem Reporting Hotline
at **1-877-89-SPILL** (1-877-897-7455).

For emergencies, dial 911.

The tips contained in this brochure provide useful information to help prevent water pollution while performing home improvement projects. If you have other suggestions, please contact your city's stormwater representatives or call the Orange County Stormwater Program.

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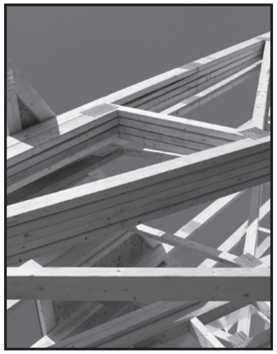
Help Prevent Ocean Pollution:

Tips for Home Improvement Projects

Tips for Home Improvement Projects

Home improvement projects can cause significant damage to the environment. Whether you hire a contractor or work on the house yourself, it is important to follow these simple tips while renovating, remodeling or improving your home:

General Construction



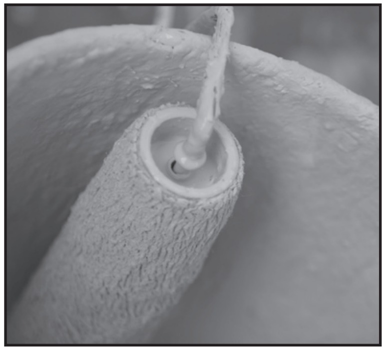
- Schedule projects for dry weather.
- Keep all construction debris away from the street, gutter and storm drain.
- Store materials under cover with temporary roofs or plastic sheets to eliminate or reduce the possibility that rainfall, runoff or wind will carry materials from the project site to the street, storm drain or adjacent properties.

Building Materials

- Never hose materials into a street, gutter or storm drain.
- Exposed piles of construction material should not be stored on the street or sidewalk.
- Minimize waste by ordering only the amount of materials needed to complete the job.
- Do not mix more fresh concrete than is needed for each project.
- Wash concrete mixers and equipment in a designated washout area where the water can flow into a containment area or onto dirt.
- Dispose of small amounts of dry excess materials in the trash. Powdery waste, such as dry concrete, must be properly contained within a box or bag prior to disposal. Call your local trash hauler for weight and size limits.

Paint

- Measure the room or object to be painted, then buy only the amount needed.
- Place the lid on firmly and store the paint can upside-down in a dry location away from the elements.
- Tools such as brushes, buckets and rags should never be washed where excess water can drain into the street, gutter or storm drain. All tools should be rinsed in a sink connected to the sanitary sewer.
- When disposing of paint, never put wet paint in the trash.
- Dispose of water-based paint by removing the lid and letting it dry in the can. Large amounts must be taken to a Household Hazardous Waste Collection Center (HHWCC).



- Oil-based paint is a household hazardous waste. All leftover paint should be taken to a HHWCC.
- For HHWCC locations and hours, call **(714) 834-6752** or visit **www.oclandfills.com**.

Erosion Control

- Schedule grading and excavation projects for dry weather.
- When temporarily removing soil, pile it in a contained, covered area where it cannot spill into the street, or obtain the required temporary encroachment or street closure permit and follow the conditions instructed by the permit.
- When permanently removing large quantities of soil, a disposal location must be found prior to excavation. Numerous businesses are available to handle disposal needs. For disposal options, visit **www.ciwmb.ca.gov/SWIS**.
- Prevent erosion by planting fast-growing annual and perennial grasses. They will shield and bind the soil.

Recycle

- Use a construction and demolition recycling company to recycle lumber, paper, cardboard, metals, masonry (bricks, concrete, etc.), carpet, plastic, pipes (plastic, metal and clay), drywall, rocks, dirt and green waste.

- For a listing of construction and demolition recycling locations in your area, visit **www.ciwmb.ca.gov/recycle.**

Spills

- Clean up spills immediately by using an absorbent material such as cat litter, then sweep it up and dispose of it in the trash.
- Immediately report spills that have entered the street, gutter or storm drain to the County's 24-Hour Water Pollution Problem Reporting Hotline at **(714) 567-6363** or visit **www.ocwatersheds.com** to fill out an incident reporting form.

PROJECT Pollution PREVENTION

Clean beaches and healthy creeks, rivers, bays and ocean are important to Orange County. However, many common activities can lead to water pollution if you're not careful. Pet waste and pet care products can be washed into the storm drains that flow to the ocean. Unlike water in sanitary sewers (from sinks and toilets), water in storm drains is not treated before entering our waterways.

You would never put pet waste or pet care products into the ocean, so don't let them enter the storm drains. Follow these easy tips to help prevent water pollution.

For more information,
please call the
Orange County Stormwater Program
at **1-877-89-SPILL** (1-877-897-7455)
or visit
www.ocwatersheds.com

To report a spill,
call the
Orange County 24-Hour Water Pollution Problem Reporting Hotline
1-877-89-SPILL (1-877-897-7455).

For emergencies, dial 911.

The tips contained in this brochure provide useful information to help prevent water pollution while caring for your pet. If you have other suggestions, please contact your city's stormwater representatives or call the Orange County Stormwater Program.

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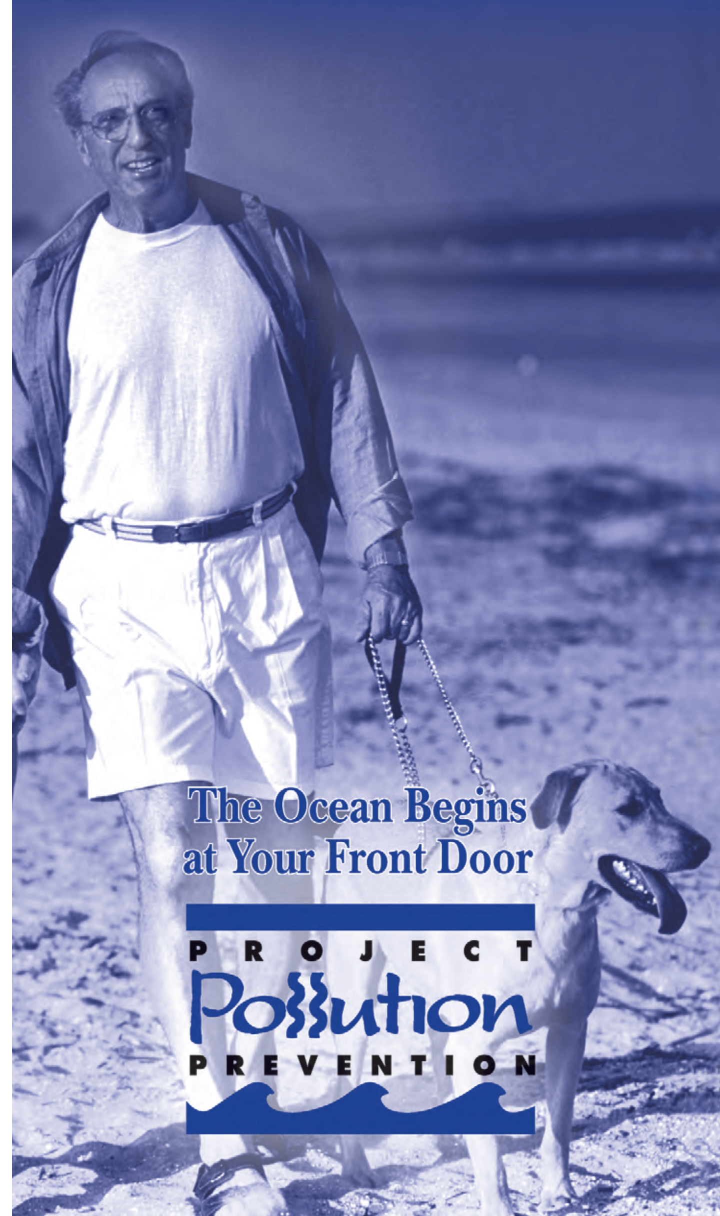
Help Prevent Ocean Pollution:

Tips for Pet Care



The Ocean Begins at Your Front Door

PROJECT POLLUTION PREVENTION

Tips for Pet Care

Never let any pet care products or washwater run off your yard and into the street, gutter or storm drain.

Washing Your Pets

Even biodegradable soaps and shampoos can be harmful to marine life and the environment.

- If possible, bathe your pets indoors using less-toxic shampoos or have your pet professionally groomed. Follow instructions on the products and clean up spills.

- If you bathe your pet outside, wash it on your lawn or another absorbent/ permeable surface to keep the washwater from running into the street, gutter or storm drain.

Flea Control

- Consider using oral or topical flea control products.

- If you use flea control products such as shampoos, sprays or collars, make sure to dispose of any unused products at a Household Hazardous Waste Collection Center. For location information, call **(714) 834-6752**.

Why You Should Pick Up After Your Pet

It's the law! Every city has an ordinance requiring you to pick up after your pet. Besides being a nuisance, pet waste can lead to water pollution, even if you live inland. During rainfall, pet waste left outdoors can wash into storm drains. This waste flows directly into our waterways and the ocean where it can harm human health, marine life and the environment.

As it decomposes, pet waste demands a high level of oxygen from water. This decomposition can contribute to killing marine life by reducing the amount of dissolved oxygen available to them.

Have fun with your pets, but please be a responsible pet owner by taking care of them and the environment.

- Take a bag with you on walks to pick up after your pet.

- Dispose of the waste in the trash or in a toilet.

PROJECT Pollution PREVENTION

Clean beaches and healthy creeks, rivers, bays, and ocean are important to Orange County. However, many common activities can lead to water pollution if you're not careful. Swimming pools and spas are common in Orange County, but they must be maintained properly to guarantee that chemicals aren't allowed to enter the street, where they can flow into the storm drains and then into the waterways. Unlike water in sanitary sewers (from sinks and toilets), water in storm drains is not treated before entering our waterways.

You would never dump pool chemicals into the ocean, so don't let it enter the storm drains. Follow these easy tips to help prevent water pollution.

For more information,
please call the
Orange County Stormwater Program
at **1-877-89-SPILL** (1-877-897-7455)
or visit
www.ocwatersheds.com

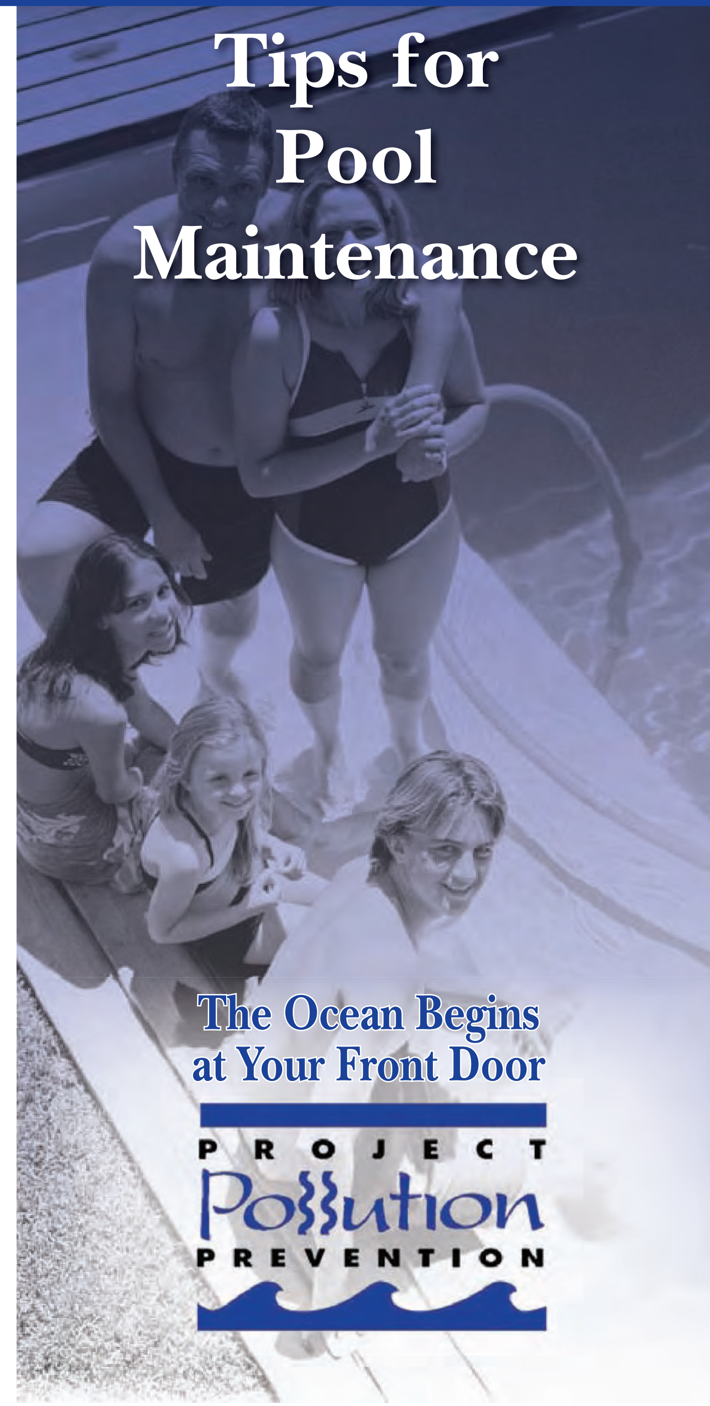
To report a spill,
call the
Orange County 24-Hour
Water Pollution Reporting Hotline
1-877-89-SPILL (1-877-897-7455).

For emergencies, dial 911.

The tips contained in this brochure provide useful information to help prevent water pollution while maintaining your pool. If you have other suggestions, please contact your city's stormwater representatives or call the Orange County Stormwater Program.

Help Prevent Ocean Pollution:

Tips for Pool Maintenance



The Ocean Begins at Your Front Door

PROJECT
Pollution
PREVENTION

Tips for Pool Maintenance

Many pools are plumbed to allow the pool to drain directly to the sanitary sewer. If yours is not, follow these instructions for disposing of pool and spa water.

Acceptable and Preferred Method of Disposal

When you cannot dispose of pool water in the sanitary sewer, the release of dechlorinated swimming pool water is allowed if all of these tips are followed:

- The residual chlorine does not exceed 0.1 mg/l (parts per million).
- The pH is between 6.5 and 8.5.
- The water is free of any unusual coloration, dirt or algae.
- There is no discharge of filter media.
- There is no discharge of acid cleaning wastes.
- Some cities may have ordinances that do not allow pool water to be disposed into a storm drain. Check with your city.

How to Know if You're Following the Standards

You can find out how much chlorine is in your water by using a pool testing kit. Excess chlorine can be removed by discontinuing the use of chlorine for a few days prior to discharge or by purchasing dechlorinating chemicals from a local pool supply company. Always make sure to follow the instructions that come with any products you use.

Doing Your Part

By complying with these guidelines, you will make a significant contribution toward keeping pollutants out of Orange County's creeks, streams, rivers, bays and the ocean. This helps to protect organisms that are sensitive to pool chemicals, and helps to maintain the health of our environment.

PROJECT Pollution PREVENTION

For more information,
please call the
Orange County Stormwater Program
at **1-877-89-SPILL** (1-877-897-7455)
or visit
www.ocwatersheds.com

To report a spill,
call the
Orange County 24-Hour
Water Pollution Problem
Reporting Hotline
at **1-877-89-SPILL** (1-877-897-7455).

For emergencies, dial 911.

The tips contained in this brochure provide useful information to help prevent water pollution. If you have other suggestions, please contact your city's stormwater representatives or call the Orange County Stormwater Program.

Printed on Recycled Paper

Help Prevent Ocean Pollution:

Tips for Residential Pool, Landscape and Hardscape Drains

The Ocean Begins at Your Front Door

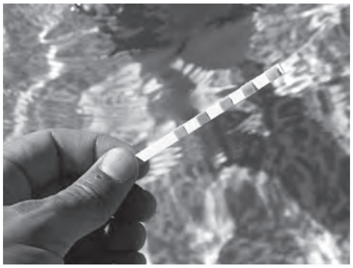
PROJECT POLLUTION PREVENTION

Tips for Residential Pool, Landscape and Hardscape Drains

Pool Maintenance

All pool water discharged to the curb, gutter or permitted pool drain from your property must meet the following water quality criteria:

- The residual chlorine does not exceed 0.1 mg/L (parts per million).
- The pH is between 6.5 and 8.5.
- The water is free of any unusual coloration.
- There is no discharge of filter media or acid cleaning wastes.



Some cities have ordinances that do not allow pool water to be discharged to the storm drain. Check with your city.

Landscape and Hardscape Drains

The following recommendations will help reduce or prevent pollutants from your landscape and hardscape drains from entering the street, gutter or storm drain. Unlike water that enters the sewer (from sinks and toilets), water that enters a landscape or hardscape drain is not treated before entering our creeks, rivers, bays and ocean.

Household Activities

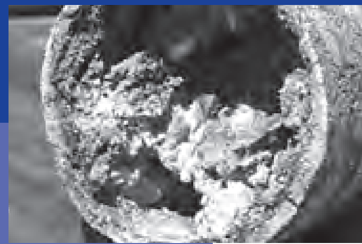
- Do not rinse spills of materials or chemicals to any drain.
- Use dry cleanup methods such as applying cat litter or another absorbent material, then sweep it up and dispose of it in the trash. If the material is hazardous, dispose of it at a Household Hazardous Waste Collection Center (HHWCC). For locations, call **(714) 834-6752** or visit **www.oclandfills.com**.
- Do not hose down your driveways, sidewalks or patios to your landscape or hardscape drain. Sweep up debris and dispose of it in the trash.
- Always pick up after your pet. Flush waste down the toilet or dispose of it in the trash.
- Do not store items such as cleaners, batteries, automotive fluids, paint products, TVs, or computer monitors uncovered outdoors. Take them to a HHWCC for disposal.

Yard Maintenance

- Do not overwater. Water by hand or set automated irrigation systems to reflect seasonal water needs.
- Follow directions on pesticides and fertilizers (measure, do not estimate amounts) and do not use if rain is predicted within 48 hours.
- Cultivate your garden often to control weeds and reduce the need to use chemicals.

Vehicle Maintenance

- Never pour oil or antifreeze down your landscape or hardscape drain. Recycle these substances at a service station, a waste collection center or used oil recycling center. For locations, contact the Used Oil Program at **1-800-CLEANUP** or visit **www.CLEANUP.org**.
- Whenever possible, take your vehicle to a commercial car wash.
- If you do wash your vehicle at home, do not allow the washwater to go down your landscape or hardscape drain. Instead, dispose of it in the sanitary sewer (a sink or toilet) or onto an absorbent surface such as your lawn.
- Use a spray nozzle that will shut off the water when not in use.



Clean beaches and healthy creeks, rivers, bays and ocean are important to Orange County. Fats, oils and grease from restaurants and food service facilities can cause sewer line blockages that may result in sewage overflow into your facility and into storm drains. Unlike water in sanitary sewers (from sinks and toilets), water in storm drains is not treated before entering our waterways and should never contain washwater, trash, grease or other materials.

You would never dump oil and trash into the ocean, so don't let it enter the storm drains. Follow these tips to help prevent water pollution.

For more information,
please call the
Orange County Stormwater Program
at **1-877-89-SPILL** (1-877-897-7455)
or visit
www.ocwatersheds.com

Report sewage spills and discharges that are not contained to your site to the **Orange County 24-Hour Water Pollution Problem Reporting Hotline** at **1-877-89-SPILL** (1-877-897-7455)

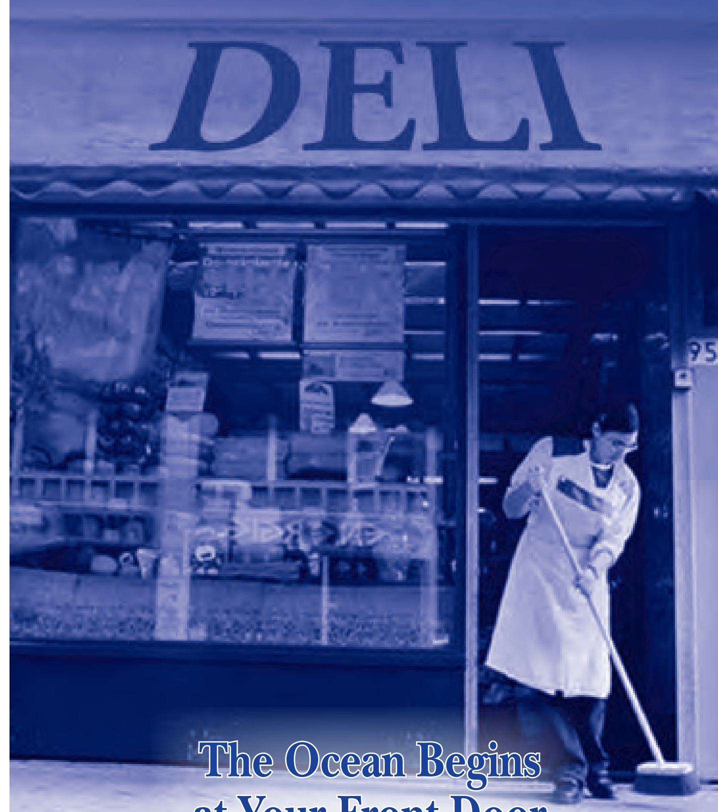
For emergencies, dial 911.

California Restaurant Association Since 1906

Printed on Recycled Paper

Help Prevent Ocean Pollution:

Tips for the Food Service Industry



The Ocean Begins at Your Front Door

Project Pollution Prevention

Best Kitchen Practices

Food Waste Disposal

- Scrape food waste off of plates, utensils, pots, food preparation and cooking areas and dispose of it in the trash.
- Never put food waste down the drain. Food scraps often contain grease, which can clog sewer pipes and result in sewage backups and overflows.

Grease & Oil Disposal

- Never put oil or grease down the drain. Contain grease and oil by using covered grease storage containers or installing a grease interceptor.
- Never overfill your grease storage container or transport it without a cover.
- Grease control devices must be emptied and cleaned by permitted companies.
- Keep maintenance records on site.

- For a list of oil/grease recycling companies, contact the CIWMB at **www.ciwmb.ca.gov/foodwaste/render.htm** or contact your local sanitation district.

Minor Spill Cleanup

- Always use dry cleanup methods, such as a rag, damp mop or broom.
- Never hose a spill into the street, gutter or storm drain.

Major Spill Cleanup

- Have spill containment and clean-up kits readily available, and train all employees on how to use them.
- Immediately contain and clean the spill using dry methods.
- If the spill leaves your site, call **(714) 567-6363**.

Dumpster Cleanup

- Pick up all debris around the dumpster.
- Always keep the lid on the dumpster closed.

- Never pour liquids into the dumpster or hose it out.

Floor Mat Cleaning

- Sweep the floor mats regularly, discarding the debris into the trash.
- Hose off the mats in a mop sink, at a floor drain, or in an outdoor area that can contain the water.

- Never hose the mats in an area where the wastewater can flow to the street, gutter or storm drain.

Washwater Disposal

- Dispose of washwater in a mop sink or an area with a floor drain.
- Never dispose of washwater in the street, gutter or storm drain.

PROJECT POLLUTION PREVENTION

Preventing water pollution at your commercial/industrial site

Clean beaches and healthy creeks, rivers, bays and ocean are important to Orange County. However, many landscape and building maintenance activities can lead to water pollution if you're not careful. Paint, chemicals, plant clippings and other materials can be blown or washed into storm drains that flow to the ocean. Unlike water in sanitary sewers (from sinks and toilets), water in storm drains is not treated before entering our waterways.

You would never pour soap or fertilizers into the ocean, so why would you let them enter the storm drains? Follow these easy tips to help prevent water pollution.

Some types of industrial facilities are required to obtain coverage under the State General Industrial Permit. For more information visit: **www.swrcb.ca.gov/stormwater/industrial.html**

For more information, please call the **Orange County Stormwater Program** at **1-877-89-SPILL** (1-877-897-7455) or visit **www.ocwatersheds.com**

To report a spill, call the **Orange County 24-Hour Water Pollution Problem Reporting Hotline** at **1-877-89-SPILL** (1-877-897-7455).

For emergencies, dial 911.

RECYCLE USED OIL

Printed on Recycled Paper

Help Prevent Ocean Pollution:

Proper Maintenance Practices for Your Business

Proper Maintenance Practices for your Business

Landscape Maintenance

- Compost grass clippings, leaves, sticks and other vegetation, or dispose of it at a permitted landfill or in green waste containers. Do not dispose of these materials in the street, gutter or storm drain.
- Irrigate slowly and inspect the system for leaks, overspraying and runoff. Adjust automatic timers to avoid overwatering.
- Follow label directions for the use and disposal of fertilizers and pesticides.
- Do not apply pesticides or fertilizers if rain is expected within 48 hours or if wind speeds are above 5 mph.
- Do not spray pesticides within 100 feet of waterways.
- Fertilizers should be worked into the soil rather than dumped onto the surface.
- If fertilizer is spilled on the pavement or sidewalk, sweep it up immediately and place it back in the container.

Building Maintenance

- Never allow washwater, sweepings or sediment to enter the storm drain.
- Sweep up dry spills and use cat litter, towels or similar materials to absorb wet spills. Dispose of it in the trash.
- If you wash your building, sidewalk or parking lot, you **must** contain the water. Use a shop vac to collect the water and contact your city or sanitation agency for proper disposal information. Do not let water enter the street, gutter or storm drain.
- Use drop cloths underneath outdoor painting, scraping, and sandblasting work, and properly dispose of materials in the trash.
- Use a ground cloth or oversized tub for mixing paint and cleaning tools.
- Use a damp mop or broom to clean floors.
- Cover dumpsters to keep insects, animals, rainwater and sand from entering. Keep the area around the dumpster clear of trash and debris. Do not overfill the dumpster.
- Call your trash hauler to replace leaking dumpsters.
- Do not dump any toxic substance or liquid waste on the pavement, the ground, or near a storm drain. Even materials that seem harmless such as latex paint or biodegradable cleaners can damage the environment.

Never Dispose of Anything in the Storm Drain.

- Recycle paints, solvents and other materials. For more information about recycling and collection centers, visit **www.oclandfills.com**.
- Store materials indoors or under cover and away from storm drains.
- Use a construction and demolition recycling company to recycle lumber, paper, cardboard, metals, masonry, carpet, plastic, pipes, drywall, rocks, dirt, and green waste. For a listing of construction and demolition recycling locations in your area, visit **www.ciwmb.ca.gov/recycle.**
- Properly label materials. Familiarize employees with Material Safety Data Sheets.

Project Pollution Prevention

DF-1

DRAINAGE FACILITY OPERATION AND MAINTENANCE

As a consequence of its function, the stormwater conveyance system collects and transports urban runoff and storm water that may contain certain pollutants. Consequently these pollutants may accumulate in the system and must be removed periodically. In addition, the systems must also be maintained to function properly hydraulically to avoid flooding. Maintaining the system may involve the following activities:

1. Inspection and Cleaning of Stormwater Conveyance Structures
2. Controlling Illicit Connections and Discharges
3. Controlling Illegal Dumping

This list of Model Maintenance Procedures can be utilized as an inspection checklist to determine where better compliance with Designated Minimum Best Management Practices (notated with checkmarks and capital letters) is needed, and to recommend Additional Best Management Practices (notated with bullet points and lower case letters) that may be applicable under certain circumstances, especially where there are certain Pollutant Constituents of Concern. BMPs applicable to certain constituents are notated as:

Bacteria (BACT) *Sediment (SED)* *Nutrients (NUT)* *Oil and Grease (O&G)* *Pesticides (PEST)*
OtherToxic Compounds (TOX) *Trash (TRASH)* *Hydrological Impacts (HYD)* *Any/All or General (ANY)*

Program/Facility Being Inspected: ______________________________

Date: ____________________ Inspector Name: ____________________

When completed, the checklist should be attached to the General Inspection Form Cover Sheet and copies should be provided to the Supervisor of the Facility/Program being inspected.

MAINTENANCE PROCEDURES:

1. Inspection and Cleaning of Drainage Facilities

Unsatisfactory / OK	General Guidelines
☐ ________ ☐	T 1A. Annually inspect and clean drainage structures as needed.
☐ ________ ☐	T 1B. Maintain appropriate records of cleaning and inspections.
☐ ________ ☐	T 1C. Properly dispose of removed materials at a landfill or recycling facility.
☐ ________ ☐	T 1D. Conduct intermittent supplemental visual inspections during the wet season to determine if there are problem inlets where sediment/trash or other pollutants accumulate, and provide for additional cleanouts as appropriate.
☐ ________ ☐	T 1E. Prevent or clean up any discharges that may occur during the course of maintenance and cleaning procedures.
☐ ________ ☐	T 1F. Verify that appropriate employees or subcontractors are trained in proper conductance of maintenance activities, including record keeping and disposal.
☐ ________ ☐	T 1G. Annually inspect and clean v-ditches as needed, prior to the wet season. On shrub-covered slopes, vegetative debris may be placed on the downhill side of the ditch. Trash should be bagged and disposed at a landfill.

Unsatisfactory / OK	General Guidelines (cont.)
☐ ☐	• 1a. Remove trash or debris as needed from open channels. It should be noted that major vegetative debris removal may require other regulatory permits prior to completing the work. (TRASH)
☐ ☐	• 1b. Consider retrofitting energy dissipaters (e.g. riprap) below culvert outfalls to minimize potential for erosion. (SED)
☐ ☐	• 1c. Repair any v-ditches that have cracked or displaced in a manner that accelerates erosion. (SED)
☐ ☐	• 1d. If suspicious conditions appear to exist, test selected samples of the removed wastes for compliance with hazardous waste regulations prior to disposal. (TOX)
☐ ☐	• 1e. Consider more frequent regular cleaning of selected drainage structures to help address ongoing specific impairments. (SED, BACT, NUT, TRASH)
☐ ☐	• 1f. Consider structural retrofits to the MS4 to help address ongoing specific impairments (SED, BACT, NUT, TRASH, O&G)
☐ ☐	• 1g. Consider cleaning out pipes at gradient breaks or other in-pipe debris accumulation points as identified/needed. (ANY, BACT, NUT, TRASH)
	Storm Drain Flushing
☐ ☐	• 1h. Flushing of storm drains or storm drain inlets should only be done when critically necessary and no other solution is practical. (SED, BACT, TRASH).
☐ ☐	• 1i. If flushed, to the extent practical the material should be collected (vacuumed), treated with an appropriate filtering device to remove sand and debris and disposed of properly. (SED)
	Waste Management
☐ ☐	T 1H. Store wastes collected from cleaning activities of the drainage facilities in appropriate containers or temporary storage sites in a manner that prevents discharge to the storm drain.
☐ ☐	• 1j. Dewater the wastes if necessary with outflow into the sanitary sewer if permitted. Water should be treated with an appropriate filtering device to remove the sand and debris prior to discharge to the sanitary sewer. If discharge to the sanitary sewer is not permitted, water should be pumped or vacuumed to a tank and properly disposed of. Do not dewater near a storm drain or stream. (SED, TRASH)
☐ ☐	• 1k. Provide for laboratory analysis of at least one randomly collected sediment (less the debris) sample per year from the storm drain inlet leaning program to ensure that it does not meet the EPA criteria for hazardous waste. If the sample is determined to be hazardous, the sediment must be disposed of as hazardous waste and the source should be investigated. (TOX).

2. Controlling Illicit Connections and Discharges

Unsatisfactory	OK	General Guidelines
☐	☐	T 2A. Report prohibited discharges such as dumping, paint spills, abandoned oil containers, etc. observed during the course of normal daily activities so they can be investigated, contained, and cleaned up.
☐	☐	T 2B. Where field observations and/or monitoring data indicate significant problems, conduct field investigations to detect and eliminate existing illicit connections and improper disposal of pollutants into the storm drain (i.e. identify problem areas where discharges or illegal connections may occur and follow up stream to determine the source(s)). (Refer to Appendices A-10 and A-11.)
☐	☐	T 2C. Report all observed illicit connections and discharges to the 24-hour water pollution problem reporting hotline (714) 567-6363.
☐	☐	T 2D. Encourage public reporting of improper waste disposal by distributing public education materials and advertising the 24-hour water pollution problem reporting hotline.
		Storm Drain Stenciling ("No Dumping—Drains to Ocean")
☐	☐	T 2E. Implement and maintain a storm drain stenciling program.
☐	☐	• 2a. Consider adding the hotline number to the storm drain stencils (BACT, TOX, TRASH).

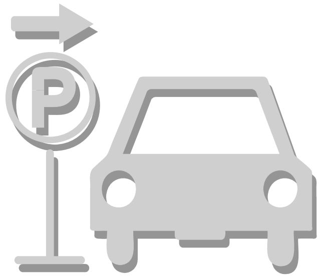
3. Controlling Illegal Dumping

Unsatisfactory	OK	Field Investigation
☐	☐	T 3A. Report prohibited discharges such as dumpings observed during the course of normal daily activities so they can be investigated, contained and cleaned up.
☐	☐	T 3B. Conduct field investigations to detect and eliminate improper disposal of pollutants into the storm drain (i.e. identify problem areas where discharges or illegal connections may occur and follow up stream to determine the source(s)).
☐	☐	T 3C. Report all observed illegal dumping to the 24-hour water pollution problem reporting hotline (714) 567-6363.
☐	☐	T 3D. Encourage public reporting of improper waste disposal by distributing public education materials and advertising the 24-hour water pollution problem reporting hotline.
☐	☐	T 3E. If perpetrator can be identified, take appropriate enforcement action.
☐	☐	• 3a. Consider posting "No Dumping" signs in problem areas with a phone number for reporting dumping and disposal. Signs could also indicate fines and penalties for illegal dumping. (ANY)

Unsatisfactory / OK	Training/Education/Outreach
☐ ____ ☐	T 3F. Verify that appropriate employees and subcontractors are trained to recognize and report illegal dumping.
☐ ____ ☐	T 3G. Encourage public reporting of illegal dumping by advertising the 24-hour water pollution problem reporting hotline (714) 567-6363.
☐ ____ ☐	• 3b. Take extra steps to educate the public in neighborhoods where illegal dumping has occurred to inform them why illegal dumping is a problem, and that illegal dumping carries a significant financial penalty. (ANY)

LIMITATIONS:

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.



R-3
AUTOMOBILE PARKING

Parked automobiles may contribute pollutants to the storm drain because poorly maintained vehicles may leak fluids containing hydrocarbons, metals, and other pollutants. In addition, heavily soiled automobiles may drop clods of dirt onto the parking surface, contributing to the sediment load when runoff is present. During rain events, or wash-down activities, the pollutants may be carried into the storm drain system. The pollution prevention activities outlined in this fact sheets are used to prevent the discharge of pollutants to the storm drain system.

The activities outlined in this fact sheet target the following pollutants:	
Sediment	x
Nutrients	
Bacteria	
Foaming Agents	
Metals	X
Hydrocarbons	X
Hazardous Materials	x
Pesticides and Herbicides	
Other	

Think before parking your car. Remember - The ocean starts at your front door.

Required Activities

- If required, vehicles have to be removed from the street during designated street sweeping/cleaning times.
- If the automobile is leaking, place a pan or similar collection device under the automobile, until such time as the leak may be repaired.
- Use dry cleaning methods to remove any materials deposited by vehicles (e.g. adsorbents for fluid leaks, sweeping for soil clod deposits).

Recommended Activities

- Park automobiles over permeable surfaces (e.g. gravel, or porous cement).
- Limit vehicle parking to covered areas.
- Perform routine maintenance to minimize fluid leaks, and maximize fuel efficiency.

For additional information contact:
County of Orange, OC Watershed
Main: (714) 955-0600/ 24hr Water Pollution Discharge Hotline 1-877-89-SPILL
or visit our website at: www.ocwatersheds.com

R-4
HOME AND GARDEN CARE ACTIVITIES

The activities outlined in this fact sheet target the following pollutants:	
Sediment	x
Nutrients	
Bacteria	x
Foaming Agents	x
Metals	x
Hydrocarbons	x
Hazardous Materials	x
Pesticides and Herbicides	
Other	x

HOME CARE

Many hazardous materials may be used in and around residences during routine maintenance activities (such as: oils, paints, cleaners, bleaches, pesticides, glues, solvents, and other products). Improper or excessive use of these products can increase the potential for pollutants to be transported to the storm drain by runoff. The pollution prevention activities outlined in this fact sheets are used to prevent the discharge of pollutants to the storm drain system.

Think before conducting home care activities. Remember - The ocean starts at your front door.

Required Activities

- Clean out painting equipment in an area where the waste can be contained and properly disposed of (latex – sewer, oil based – household hazardous waste center).

- Rinse off cement mixers and cement laden tools in a contained washout area. Dispose of dried concrete waste in household trash.

- If safe, contain, clean up, and properly dispose all household hazardous waste spills. If an unsafe condition exists, call 911 to activate the proper response team.

- Household hazardous materials must be stored indoors or under cover, and in closed and labeled containers. Dispose of them at a household hazardous waste center.

- Household wash waters (e.g. washer machine effluent, mop water, etc.) must be disposed of in the sanitary sewer.

- Pool and spa water may be discharged to the storm drain if residual chlorine is less than 0.1 mg/L, the pH is between 6.5 and 8.5, and the water is free from any unusual coloration. (Call 714-834-6107 to obtain information on a pool drain permit). Pool filter media must be contained and disposed of properly.

Recommended Activities

- Only purchase the types and amounts of materials needed.
- Share unused portions of products with neighbors or community programs (latex paint)

GARDEN CARE

The activities outlined in this fact sheet target the following pollutants:	
Sediment	x
Nutrients	x
Bacteria	x
Foaming Agents	
Metals	
Hydrocarbons	
Hazardous Materials	
Pesticides and Herbicides	x
Other	x

Garden activities may contribute pollutants via soil erosion, green waste, fertilizer and pesticide use. Plant and garden care activities such as landscape maintenance, fertilization, and pesticide application have the potential to discharge significant quantities of pollutants to the storm drain system. Nonvegetated surfaces may allow for significant erosion leading to high sediment loads. Other pollutants such as pesticides may adsorb onto the soil particles and be transported off site. Excess fertilizer and pesticide pollutants from over application may be carried to the storm drain by dissolving in irrigation runoff or rainwater. Green wastes may also contain organic matter and may have adsorbed fertilizers and pesticides.

Excessive irrigation is often the most significant factor in home and garden care activities. Pollutants may dissolve in irrigation water and then be transported to the storm drain, or particles and materials coated with fertilizers and pesticides may be suspended in the irrigation flow and carried to the storm drain. The pollution prevention activities outlined in this fact sheets are used to prevent the discharge of pollutants to the storm drain system.

Think before conducting garden care activities. Remember - The ocean starts at your front door.

Required Activities

- Irrigation systems must be properly adjusted to reflect seasonal water needs.

- Minimize the use of pesticides and fertilizers. Read the labels and follow directions to avoid improper use. Do not apply chemicals if it is windy or about to rain.

- Properly clean up and dispose of spills of gardening chemicals, fertilizes, or soils. If possible, return the spilled material to the container for future use.

- Lawn and garden care products must be stored in closed labeled containers, in covered areas, or off-ground and under protective tarps.

- Household hazardous waste must be properly disposed at a household hazardous waste center.

- Cover nonvegetated surfaces to prevent erosion.

Recommended Activities

- Utilize xeroscaping and use of drought and insect resistant landscaping.
- Cultivate garden often to control weeds
- Use integrated pest management (IPM). Planting pest repelling plants (e.g. Marigolds) or using pest eating insects (e.g. ladybugs) may reduce the need for pesticides.
- Do not leave food (human or pet) outside overnight
- Remove fruit and garden waste

For additional information contact:
County of Orange, OC Watershed
Main: (714) 955-0600/ 24hr Water Pollution Discharge Hotline 1-877-89-SPILL
or visit our website at: www.ocwatersheds.com

R-5
DISPOSAL OF PET WASTES

Pet wastes left in the environment may introduce solids, bacteria, and nutrients to the storm drain. The type and quantity of waste will dictate the proper disposal method. Small quantities of waste are best disposed with regular trash or flushed down a toilet. Large quantities of wastes from herbivore animals may be composted for subsequent use or disposal to landfill.

Pick up after your pet! It's as easy as 1-2-3. 1) Bring a bag. 2) Clean it up. 3) Dispose of it properly (toilet or trash). The pollution prevention activities outlined in this fact sheets are used to prevent the discharge of pollutants to the storm drain system.

The activities outlined in this fact sheet target the following pollutants:	
Sediment	x
Nutrients	x
Bacteria	x
Foaming Agents	
Metals	
Hydrocarbons	
Hazardous Materials	
Pesticides and Herbicides	
Other	

Think before you dispose of any pet wastes. Remember - The ocean starts at your front door.

Required Activities

- All pet wastes must be picked up and properly disposed of. Pet waste should be disposed of in the regular trash, flushed down a toilet, or composted as type and quantities dictate.

- Properly dispose of unused flea control products (shampoo, sprays, or collars).

- Manure produced by livestock in uncovered areas should be removed at least daily for composting, or storage in water-tight container prior to disposal. Never hose down to stream or storm drain. Composting or storage areas should be configured and maintained so as not to allow contact with runoff. Compost may be donated to greenhouses, nurseries, and botanical parks. Topsoil companies and composting centers may also accept composted manure.

- Line waste pits or trenches with an impermeable layer, such as thick plastic sheeting.

- When possible, allow wash water to infiltrate into the ground, or collect in an area that is routed to the sanitary sewer.

- Confine livestock in fenced in areas except during exercise and grazing times. Restrict animal access to creeks and streams, preferably by fencing.

- Install gutters that will divert roof runoff away from livestock areas.

Recommended Activities

- In order to properly dispose of pet waste, carry bags, pooper-scooper, or equivalent to safely pick up pet wastes while walking with pets.

- Bathe pets indoors and use less toxic shampoos. When possible, have pets professionally groomed.

- Properly inoculate your pet in order to maintain their health and reduce the possibility of pathogens in pet wastes.

- Maintain healthy and vigorous pastures with at least three inches of leafy material.

- Consider indoor feeding of livestock during heavy rainfall, to minimize manure exposed to potential runoff.

- Locate barns, corrals, and other high use areas on portions of property that either drain away from or are located distant form nearby creeks or storm drains.

R-6
DISPOSAL OF GREEN WASTES

The activities outlined in this fact sheet target the following pollutants:	
Sediment	x
Nutrients	x
Bacteria	x
Foaming Agents	
Metals	
Hydrocarbons	
Hazardous Materials	x
Pesticides and Herbicides	x
Other	

Green wastes entering the storm drain may clog the system creating flooding problems. Green wastes washed into receiving waters create an oxygen demand as they are decomposed, reducing the available oxygen for aquatic life. Pesticide and nutrient residues may be carried to the receiving water with the green wastes. The pollution prevention activities outlined in this fact sheets are used to prevent the discharge of pollutants to the storm drain system.

Think before disposing of any green wastes – Remember - The ocean starts at your front door.

Required Activities

- Green wastes can not be disposed of in the street, gutter, public right-of-way, storm drain, or receiving water. Dispose of green wastes as a part of the household trash. If the quantities are too large, arrange a pick up with the local waste hauler.

- After conducting yard or garden activities sweep the area and properly dispose of the clippings and waste. Do not sweep or blow out into the street or gutter.

Recommended Activities

- Utilize a commercial landscape company to conduct the landscape activities and waste disposal.

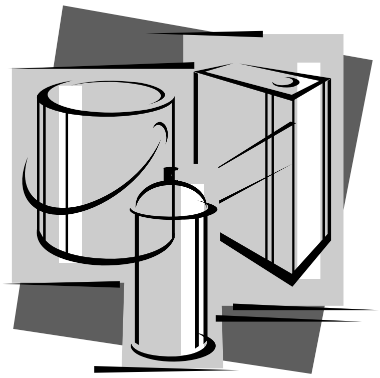
- Utilize native plants and drought tolerant species to reduce the water use and green waste produced.

- Use a lawn mower that has a mulcher so that the grass clippings remain on the lawn and do not have to be collected and disposed of.

- Compost materials in a designated area within the yard.

- Recycle lawn clippings and greenery waste through local programs if available.

For additional information contact:
County of Orange, OC Watershed
Main: (714) 955-0600/ 24hr Water Pollution Discharge Hotline 1-877-89-SPILL
or visit our website at: www.ocwatersheds.com



R-7
HOUSEHOLD HAZARDOUS WASTE

Household hazardous wastes (HHW) are defined as waste materials which are typically found in homes or similar sources, which exhibit characteristics such as: corrosivity, ignitability, reactivity, and/or toxicity, or are listed as hazardous materials by EPA.

The activities outlined in this fact sheet target the following pollutants:	
Sediment	
Nutrients	
Bacteria	
Foaming Agents	x
Metals	x
Hydrocarbons	x
Hazardous Materials	x
Pesticides and Herbicides	x
Other	x

List of most common HHW products:

- Drain openers
- Oven cleaners
- Wood and metal cleaners and polishes
- Automotive oil and fuel additives
- Grease and rust solvents
- Carburetor and fuel injection cleaners
- Starter fluids
- Batteries
- Paint Thinners
- Paint strippers and removers
- Adhesives
- Herbicides
- Pesticides
- Fungicides/wood preservatives

Many types of waste can be recycled, however options for each waste type are limited. Recycling is always preferable to disposal of unwanted materials. All gasoline, antifreeze, waste oil, and lead-acid batteries can be recycled. Latex and oil-based paint can be reused, as well as recycled. Materials that cannot be reused or recycled should be disposed of at a properly permitted landfill.

Think before disposing of any household hazardous waste. Remember - The ocean starts at your front door.

Required Activities

- Dispose of HHW at a local collection facility. Call (714) 834-6752 for the household hazardous waste center closest to your area.

- Household hazardous materials must be stored indoors or under cover, and in closed and labeled containers.

- If safe, contain, clean up, and properly dispose all household hazardous waste spills. If an unsafe condition exists, call 911 to activate the proper response team.

Recommended Activities

- Use non-hazardous or less-hazardous products.
- Participate in HHW reuse and recycling. Call (714) 834-6752 for the participating household hazardous waste centers.

The California Integrated Waste Management Board has a Recycling Hotline (800) 553-2962, that provides information and recycling locations for used oil.

For additional information contact:
County of Orange, OC Watershed
Main: (714) 955-0600/ 24hr Water Pollution Discharge Hotline 1-877-89-SPILL
or visit our website at: www.ocwatersheds.com

R-8
WATER CONSERVATION

Excessive irrigation and/or the overuse of water is often the most significant factor in transporting pollutants to the storm drain system. Pollutants from a wide variety of sources including automobile repair and maintenance, automobile washing, automobile parking, home and garden care activities and pet care may dissolve in the water and be transported to the storm drain. In addition, particles and materials coated with fertilizers and pesticides may be suspended in the flow and be transported to the storm drain.

The activities outlined in this fact sheet target the following pollutants:	
Sediment	x
Nutrients	x
Bacteria	x
Foaming Agents	x
Metals	x
Hydrocarbons	x
Hazardous Materials	x
Pesticides and Herbicides	x
Other	x

Hosing off outside areas to wash them down not only consumes large quantities of water, but also transports any pollutants, sediments, and waste to the storm drain system. The pollution prevention activities outlined in this fact sheets are used to prevent the discharge of pollutants to the storm drain system.

Think before using water. Remember - The ocean starts at your front door.

Required Activities

- Irrigation systems must be properly adjusted to reflect seasonal water needs.
- Do not hose off outside surfaces to clean, sweep with a broom instead.

Recommended Activities

- Fix any leaking faucets and eliminate unnecessary water sources.
- Use xeroscaping and drought tolerant landscaping to reduce the watering needs.
- Do not over watering lawns or gardens. Over watering wastes water and promotes diseases.
- Use a bucket to re-soak sponges/rags while washing automobiles and other items outdoors. Use hose only for rinsing.
- Wash automobiles at a commercial car wash employing water recycling.

Site Design & Landscape Planning SD-10

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.

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.

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 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.

- 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

– 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).

- 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.

- 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.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

APPENDIX D

BMP MAINTENANCE SUPPLEMENT / O&M PLAN

OPERATIONS AND MAINTENANCE (O&M) PLAN

Water Quality Management Plan

For

Barton Place – VTTM 17830

4921 Katella Avenue,
Cypress CA 90720

Parcel 1:
Portions of 241-231-51 and 241-231-54

Parcel 2:
241-231-46, 241-231-52, 241-231-53, 241-231-55, 241-231-56, 241-231-16 and portions of 241-231-18, 241-231-23, 241-231-36, 241-231-51, 241-231-54 and 241-231-57

BMP INSPECTION & MAINTENANCE RESPONSIBILITY MATRIX			
BMP Applicable? Yes/No	**BMP Name and BMP Implementation, Maintenance and Inspection Procedures**	**Implementation, Maintenance, and Inspection Frequency and Schedule**	**Person or Entity with Operation & Maintenance Responsibility**
NON-STRUCTURAL SOURCE CONTROL BMPs			
Yes	N1. Education for Property Owners, Tenants and Occupants Educational materials will be provided to tenants, including brochures and restrictions to reduce pollutants from reaching the storm drain system. Examples include tips for pet care, household tips, and proper household hazardous waste disposal. Tenants will be provided with these materials by the property management prior to occupancy, and periodically thereafter.	Educational materials will be provided to tenants annually. Materials to be distributed are found in Appendix C of the Final WQMP. Tenants will be provided these materials by the HOA prior to occupancy and annually thereafter. Frequency: Annually	C33, LLC, HOA
Yes	N2. Activity Restrictions The Owner/HOA/POA shall develop ongoing activity restrictions that include those that have the potential to create adverse impacts on water quality. Activities include, but are not limited to: handling and disposal of contaminants, fertilizer and pesticide application restrictions, litter control and pick-up, and vehicle or equipment repair and maintenance in non-designated areas, as well as any other activities that may potentially contribute to water pollution.	The Owner/HOA/POA will prescribe activity restrictions to protect surface water quality, through lease terms or other equally effective measure, for the property. Restrictions include, but are not limited to, prohibiting vehicle maintenance or vehicle washing. Frequency: Ongoing	C33, LLC, HOA, POA

BMP INSPECTION & MAINTENANCE RESPONSIBILITY MATRIX			
BMP Applicable? Yes/No	**BMP Name and BMP Implementation, Maintenance and Inspection Procedures**	**Implementation, Maintenance, and Inspection Frequency and Schedule**	**Person or Entity with Operation & Maintenance Responsibility**
Yes	N3. Common Area Landscape Management Management programs will be designed and implemented by the Owner/HOA/POA to maintain all the common areas within the project site. These programs will cover how to reduce the potential pollutant sources of fertilizer and pesticide uses, utilization of water-efficient landscaping practices and proper disposal of landscape wastes by the owner/developer and/or contractors.	Maintenance shall be consistent with City requirements. Fertilizer and/or pesticide usage shall be consistent with County Management Guidelines for Use of Fertilizers (OC DAMP Section 5.5). Maintenance includes mowing, weeding, and debris removal on a weekly basis. Trimming, replanting, and replacement of mulch shall be performed on an as-needed basis to prevent exposure of erodible surfaces. Trimmings, clippings, and other landscape wastes shall be properly disposed of in accordance with local regulations. Materials temporarily stockpiled during maintenance activities shall be placed away from water courses and storm drains inlets. Frequency: Monthly	C33, LLC, HOA, POA
Yes	N4. BMP Maintenance The Owner/HOA/POA will be responsible for the implementation and maintenance of each applicable non-structural BMP, as well as scheduling inspections and maintenance of all applicable structural BMP facilities through its staff, landscape contractor, and/or any other necessary maintenance contractors.	Maintenance of structural BMPs implemented at the project site shall be performed at the frequency prescribed in this WQMP (Appendix D). Records of inspections and BMP maintenance shall be kept by the Owner/HOA/POA and shall be available for review upon request. Frequency: Ongoing	C33, LLC, HOA, POA
No	N5. Title 22 CCR Compliance (How development will comply)	Not Applicable	
No	N6. Local Industrial Permit Compliance	Not Applicable	

BMP INSPECTION & MAINTENANCE RESPONSIBILITY MATRIX			
BMP Applicable? Yes/No	**BMP Name and BMP Implementation, Maintenance and Inspection Procedures**	**Implementation, Maintenance, and Inspection Frequency and Schedule**	**Person or Entity with Operation & Maintenance Responsibility**
Yes	N7. Spill Contingency Plan Any commercial facilities that store liquid materials or wastes shall maintain procedures for spill response and cleanup activities. Emergency spill kits shall be kept on-site at all times. Spill kits shall include, at a minimum, dry adsorbent material such as kitty litter, mats or pillows, containment booms, wipes, goggles, gloves and disposal bags.	Spill contingency measures shall be implemented on an ongoing basis by the retail tenants/operator. Inspect/verify contingency plan and associated documentation is being followed on an annual basis. Verify spill kits are adequately stocked and placed at key locations in the commercial food preparation areas and storage areas. Frequency: Ongoing	C33, LLC, POA
No	N8. Underground Storage Tank Compliance	Not Applicable	
Yes	N9. Hazardous Materials Disclosure Compliance Any storage or utilization of hazardous wastes, where applicable, shall comply with the County of Orange Fire Authority hazardous material disclosure requirements.	The Owner/POA shall verify compliance with hazardous materials disclosure requirements in accordance with associated Fire, Health Care, and other appropriate agencies on an annual basis. Frequency: Annually	C33, LLC, HOA, POA
Yes	N10. Uniform Fire Code Implementation The POA shall ensure all structures comply with Article 80 of the Uniform Fire Code, City of Cypress Municipal Code, County of Orange Fire Authority, and Orange City Fire Department.	The Owner/POA shall verify compliance with Article 80 of the Uniform Fire Code enforced by fire protection agency on an annual basis. Frequency: Annually	C33, LLC, POA

BMP INSPECTION & MAINTENANCE RESPONSIBILITY MATRIX			
BMP Applicable? Yes/No	BMP Name and BMP Implementation, Maintenance and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
Yes	N11. Common Area Litter Control The Owner/HOA/POA will be responsible for performing trash pickup and sweeping of littered common areas on a weekly basis or whenever necessary. Responsibilities will also include noting improper disposal materials by the public and reporting such violations for investigation.	Litter patrol, violations investigations, reporting and other litter control activities shall be performed on a weekly basis and in conjunction with routine maintenance activities. Frequency: Weekly	C33, LLC, HOA, POA
Yes	N12. Employee Training All employees of the Owner/HOA/POA and any contractors will require training to ensure that employees are aware of maintenance activities that may result in pollutants reaching the storm drain. Training will include, but not be limited to, spill cleanup procedures, proper waste disposal, housekeeping practices, etc.	The Owner/HOA/POA shall educate all new employees/ managers on storm water pollution prevention, particularly good housekeeping practices, prior to the start of the rainy season (October 1). Refresher courses shall be conducted as needed. Materials that may be utilized on BMP maintenance are included in Appendix D. Frequency: Annually	C33, LLC, HOA, POA
Yes	N13. Housekeeping of Loading Docks Housekeeping measures will be implemented to keep the proposed loading dock clean and orderly condition. Includes sweeping, removal of trash & debris, and use of dry methods for cleanup (e.g., sweeping).	Sweep area routinely and before October 1 each year. Keep area clean of trash and debris at all times. Spills shall be cleaned up immediately using dry methods. Frequency: Weekly	C33, LLC, POA

BMP INSPECTION & MAINTENANCE RESPONSIBILITY MATRIX			
BMP Applicable? Yes/No	BMP Name and BMP Implementation, Maintenance and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
Yes	N14. Common Area Catch Basin Inspection All on-site catch basin inlets and drainage facilities shall be inspected and maintained by the Owner/HOA/POA quarterly and, prior to the rainy season, no later than October 1st of each year.	On-site catch basin inlets and other drainage facilities shall be inspected at least once per year prior to the start of the rainy season. Inlets and other facilities shall be cleaned when the sump is 40% full and annually at a minimum. Frequency: Annually	C33, LLC, HOA, POA
Yes	N15. Street Sweeping Private Streets and Parking Lots The Owner/HOA/POA shall be responsible for sweeping all on-site private streets, drive aisles, and uncovered parking areas within the project on a quarterly basis.	Private streets, parking areas and drive aisles within the project shall be swept at a minimum frequency quarterly as well as once per year prior to the storm season, no later than October 1 each year. Frequency: Quarterly	C33, LLC, HOA, POA
No	N16. Retail Gasoline Outlets	Not Applicable	
STRUCTURAL SOURCE CONTROL BMPs			
Yes	S1. Provide storm drain system stenciling and signage The phrase "NO DUMPING! DRAINS TO OCEAN", or an equally effective phrase approved by the City, will be stenciled on all major storm drain inlets within the project site to alert the public to the destination of pollutants discharged into storm water. Stencils shall be in place prior to release of certificate of occupancy.	On-site storm drain stencils shall be inspected for legibility, at minimum, once prior to the storm season, no later than October 1 each year. Those determined to be illegible will be re-stenciled as soon as possible. Frequency: Annually	C33, LLC, HOA, POA
No	S2. Design and construct outdoor material storage areas to reduce pollution introduction	Not Applicable	

BMP INSPECTION & MAINTENANCE RESPONSIBILITY MATRIX			
BMP Applicable? Yes/No	**BMP Name and BMP Implementation, Maintenance and Inspection Procedures**	**Implementation, Maintenance, and Inspection Frequency and Schedule**	**Person or Entity with Operation & Maintenance Responsibility**
Yes	**S3. Design and construct trash and waste storage areas to reduce pollution introduction** All trash and waste shall be stored in containers that have lids or tarps to minimize direct precipitation into the containers. Four (4) trash enclosures will be located within the commercial area parking lot. The trash storage areas will be designed to City standards, and will be walled, roofed, have gates and proper drainage per City standards.	Sweep trash area at least once per week and before October 1st each year. Maintain area clean of trash and debris at all times. Frequency: Weekly	C33, LLC, POA
Yes	**S4. Use efficient irrigation systems & landscape design, water conservation, smart controllers, and source control** The Owner/HOA/POA will be responsible for the installation and maintenance of all common landscape areas utilizing similar planting materials with similar water requirements to reduce excess irrigation runoff. The Owner/HOA/POA will be responsible for implementing all efficient irrigation systems for common area landscaping including, but not limited to, provisions for water sensors and programmable irrigation cycles. This includes smart timers, rain sensors, and moisture shut-off valves. The irrigation systems shall be in conformance with water efficiency guidelines.	In conjunction with routine maintenance, verify that landscape design continues to function properly by adjusting systems to eliminate overspray to hardscape areas and to verify that irrigation timing and cycle lengths are adjusted in accordance to water demands, given the time of year, weather, and day or nighttime temperatures. System testing shall once per year. Water from testing/flushing shall be collected and properly disposed to the sewer system and shall not discharge to the storm drain system. Frequency: Annually	C33, LLC, HOA, POA
No	**S5. Protect slopes and channels and provide energy dissipation**	Not Applicable	

BMP INSPECTION & MAINTENANCE RESPONSIBILITY MATRIX			
BMP Applicable? Yes/No	BMP Name and BMP Implementation, Maintenance and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
Yes	S6. Dock areas Runoff from the loading dock will not discharge into the storm drain system. Housekeeping measures shall be implemented in accordance with BMP N13.	Sweep area routinely and before October 1 each year. Keep area clean of trash and debris at all times. Spills shall be cleaned up immediately. See also BMP N13. Frequency: Weekly	C33, LLC, POA
No	S7. Maintenance bays	Not Applicable	
No	S8. Vehicle wash areas	Not Applicable	
No	S9. Outdoor processing areas	Not Applicable	
No	S10. Equipment wash areas	Not Applicable	
No	S11. Fueling areas	Not Applicable	
No	S12. Hillside landscaping	Not Applicable	
Yes	S13. Wash water control for food preparation areas All wash water from food prep areas will be controlled and proper staff training conducted by the site operator. Food preparation facilities shall meet all health and safety, building and safety and any other applicable regulations, codes requirements, including installation of a grease interceptor where required. Sinks shall be contained with sanitary sewer connections for disposal of wash waters containing kitchen and food wastes.	Inspection / maintenance shall occur a least once in the late summer / early fall, prior to the start of the rainy season. Maintenance includes using dry cleanup methods for cleaning (i.e., sweeping), keeping spill kits on-site and stocked in accordance with BMP N7, use of drip pans, properly storing and hauling used oil and grease, using secondary containment or elevating stored materials, and disposing wash water to sanitary sewer. Wash water shall not discharge to storm drain system. Mats shall be cleaned indoors or with dry cleaning methods only. Frequency: Annually	C33, LLC, POA

BMP INSPECTION & MAINTENANCE RESPONSIBILITY MATRIX			
BMP Applicable? Yes/No	BMP Name and BMP Implementation, Maintenance and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
No	S14. Community car wash racks	Not Applicable	

<table>
<tr><th colspan="3">BMP INSPECTION & MAINTENANCE RESPONSIBILITY MATRIX</th></tr>
<tr><th>BMP Name and BMP Implementation, Maintenance and Inspection Procedures</th><th>Implementation, Maintenance, and Inspection Frequency and Schedule</th><th>Person or Entity with Operation & Maintenance Responsibility</th></tr>
<tr><td colspan="3">LOW IMPACT DEVELOPMENT BMPs</td></tr>
<tr><td>Biotreatment BMP # 1: Modular Wetland Systems (MWS)
Modular Wetlands by Modular Wetlands Systems, Inc. are proprietary biotreatment systems that utilize multi-stage treatment processes including screening media filtration, settling, and biofiltration. The pre-treatment chamber contains the first three stages of treatment, and includes a catch basin inlet filter to capture trash, debris, gross solids and sediments, a settling chamber for separating out larger solids, and a media filter cartridge.</td><td>The Modular Wetland units shall be maintained in accordance with manufacturer's specifications. The system shall be inspected at a minimum of once every six months, prior to the start of the rainy season (October 1) each year, and after major storm events. Typical maintenance includes:
▪ Removing trash & debris from the catch basin screening filter (by hand).
▪ Removal of sediment and solids in the settlement chamber (vacuum truck).
▪ Replacement of the BioMediaGREEN™ filter cartridge and drain-down filter (if equipped)
▪ Trim plants within the wetland chamber as needed in conjunction with routine landscape maintenance activities. No fertilizer shall be used.
Wetland chamber should be inspected during rain events to verify flow through the system. If little to no flow is observed from the lower valve or orifice plate, the wetland media may require replacement.
<u>Frequency</u>: 2x per year</td><td>C33, LLC,
HOA, POA</td></tr>
</table>

BMP INSPECTION & MAINTENANCE RESPONSIBILITY MATRIX		
BMP Name and BMP Implementation, Maintenance and Inspection Procedures	**Implementation, Maintenance, and Inspection Frequency and Schedule**	**Person or Entity with Operation & Maintenance Responsibility**
OTHER BMPs		
StormTrap Detention System An underground detention system will be located below the proposed parking lot within the commercial area of the project site.	The underground detention units shall be inspected through the risers annually and after major storm events, and cleaned at a minimum of once per year, prior to the start of the rainy season (October 1st). Cleaning and maintenance will be performed per manufacturer specifications, and will typically include removal of any trash and debris and excess sediment within the pipes. Sediment shall be removed when deposits approach within 6 inches of the invert heights of the connecting pipes between the chamber rows or inlet structures. Frequency: Annually	C33, LLC, POA

Required Permits

Permits are not required for the implementation, operation, and maintenance of the BMPs.

As part of the proposed project, the biotreatment units will be located within the commercial component of the project and used to provide treatment of the residential runoff. As part of the final design and final mapping requirements, a drainage and maintenance easement will be prepared to allow for the drainage and maintenance of the biotreatment unit for residential runoff to occur within the commercial parcel. In addition, additional biotreatment units will be located within the commercial development to treat the commercial development runoff.

Forms to Record BMP Implementation, Maintenance, and Inspection

The form that will be used to record implementation, maintenance, and inspection of BMPs is attached.

Recordkeeping

All records must be maintained for at least five (5) years and must be made available for review upon request.

Waste Management

Any waste generated from maintenance activities will be disposed of properly. Wash water and other waste from maintenance activities is not to be discharged or disposed of into the storm drain system. Clippings from landscape maintenance (i.e. prunings) will be collected and disposed of properly off-site, and will not be washed into the streets, local area drains/conveyances, or catch basin inlets.

RECORD OF BMP IMPLEMENTATION, MAINTENANCE, AND INSPECTION

Today's Date: ______________________________

Name of Person Performing Activity (Printed): ______________________________

Signature: ______________________________

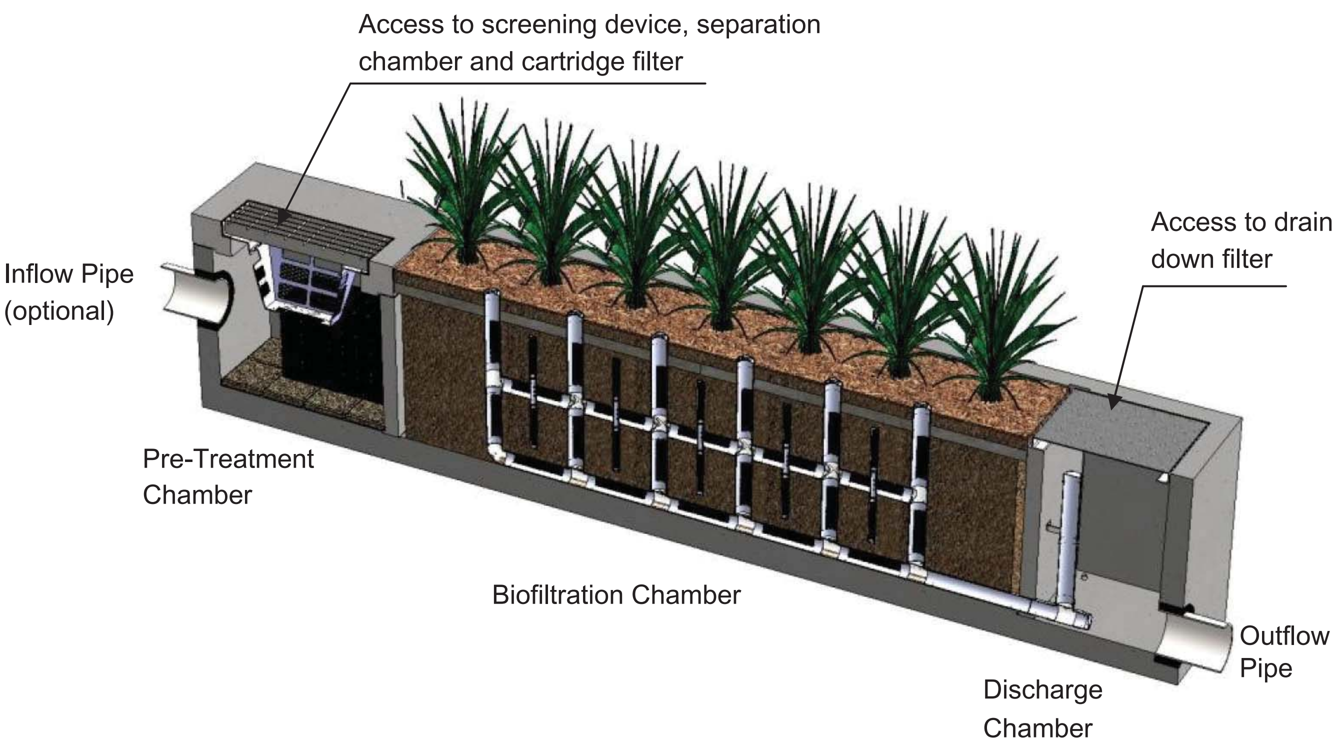
BMP Name (As Shown in O&M Plan)	Brief Description of Implementation, Maintenance, and Inspection Activity Performed

Maintenance Guidelines for Modular Wetland System - Linear

Maintenance Summary

- Remove Trash from Screening Device – average maintenance interval is 6 to 12 months.
  - (*5 minute average service time*).
- Remove Sediment from Separation Chamber – average maintenance interval is 12 to 24 months.
  - (*10 minute average service time*).
- Replace Cartridge Filter Media – average maintenance interval 12 to 24 months.
  - (*10-15 minute per cartridge average service time*).
- Replace Drain Down Filter Media – average maintenance interval is 12 to 24 months.
  - (*5 minute average service time*).
- Trim Vegetation – average maintenance interval is 6 to 12 months.
  - (*Service time varies*).

System Diagram



Maintenance Procedures

Screening Device

1. Remove grate or manhole cover to gain access to the screening device in the Pre-Treatment Chamber. Vault type units do not have screening device. Maintenance can be performed without entry.
2. Remove all pollutants collected by the screening device. Removal can be done manually or with the use of a vacuum truck. The hose of the vacuum truck will not damage the screening device.
3. Screening device can easily be removed from the Pre-Treatment Chamber to gain access to separation chamber and media filters below. Replace grate or manhole cover when completed.

Separation Chamber

1. Perform maintenance procedures of screening device listed above before maintaining the separation chamber.
2. With a pressure washer spray down pollutants accumulated on walls and cartridge filters.
3. Vacuum out Separation Chamber and remove all accumulated pollutants. Replace screening device, grate or manhole cover when completed.

Cartridge Filters

1. Perform maintenance procedures on screening device and separation chamber before maintaining cartridge filters.
2. Enter separation chamber.
3. Unscrew the two bolts holding the lid on each cartridge filter and remove lid.
4. Remove each of 4 to 8 media cages holding the media in place.
5. Spray down the cartridge filter to remove any accumulated pollutants.
6. Vacuum out old media and accumulated pollutants.
7. Reinstall media cages and fill with new media from manufacturer or outside supplier. Manufacturer will provide specification of media and sources to purchase.
8. Replace the lid and tighten down bolts. Replace screening device, grate or manhole cover when completed.

Drain Down Filter

1. Remove hatch or manhole cover over discharge chamber and enter chamber.
2. Unlock and lift drain down filter housing and remove old media block. Replace with new media block. Lower drain down filter housing and lock into place.
3. Exit chamber and replace hatch or manhole cover.

Maintenance Notes

1. Following maintenance and/or inspection, it is recommended the maintenance operator prepare a maintenance/inspection record. The record should include any maintenance activities performed, amount and description of debris collected, and condition of the system and its various filter mechanisms.

2. The owner should keep maintenance/inspection record(s) for a minimum of five years from the date of maintenance. These records should be made available to the governing municipality for inspection upon request at any time.

3. Transport all debris, trash, organics and sediments to approved facility for disposal in accordance with local and state requirements.

4. Entry into chambers may require confined space training based on state and local regulations.

5. No fertilizer shall be used in the Biofiltration Chamber.

6. Irrigation should be provided as recommended by manufacturer and/or landscape architect. Amount of irrigation required is dependent on plant species. Some plants may require irrigation.

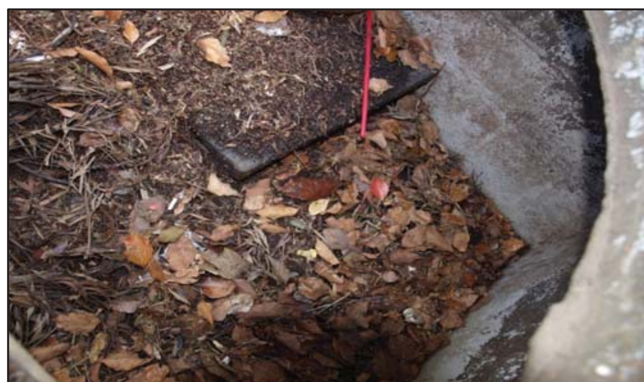
Maintenance Procedure Illustration

Screening Device

The screening device is located directly under the manhole or grate over the Pre-Treatment Chamber. It's mounted directly underneath for easy access and cleaning. Device can be cleaned by hand or with a vacuum truck.

Separation Chamber

The separation chamber is located directly beneath the screening device. It can be quickly cleaned using a vacuum truck or by hand. A pressure washer is useful to assist in the cleaning process.



Cartridge Filters

The cartridge filters are located in the Pre-Treatment chamber connected to the wall adjacent to the biofiltration chamber. The cartridges have removable tops to access the individual media filters. Once the cartridge is open media can be easily removed and replaced by hand or a vacuum truck.

Drain Down Filter

The drain down filter is located in the Discharge Chamber. The drain filter unlocks from the wall mount and hinges up. Remove filter block and replace with new block.

Trim Vegetation

Vegetation should be maintained in the same manner as surrounding vegetation and trimmed as needed. No fertilizer shall be used on the plants. Irrigation per the recommendation of the manufacturer and or landscape architect. Different types of vegetation requires different amounts of irrigation.

Inspection Form

Modular Wetland System, Inc.
P. 760.433-7640
F. 760-433-3176
E. Info@modularwetlands.com

www.modularwetlands.com

BIO CLEAN ENVIRONMENTAL SERVICES, INC.

Inspection Report
Modular Wetlands System

MODULAR WETLANDS

For Office Use Only
(Reviewed By)
(Date) Office personnel to complete section to the left.

Project Name ____________________

Project Address ____________________ (city) (Zip Code)

Owner / Management Company ____________________

Contact ____________________ Phone ( ) –

Inspector Name ____________________ Date ___/___/_____ Time __________ AM / PM

Type of Inspection ☐ Routine ☐ Follow Up ☐ Complaint ☐ Storm Storm Event in Last 72-hours? ☐ No ☐ Yes

Weather Condition ____________________ Additional Notes ____________________

Inspection Checklist

Modular Wetland System Type (Curb, Grate or UG Vault): __________ Size (22', 14' or etc.): __________

Structural Integrity:	Yes	No	Comments
Damage to pre-treatment access cover (manhole cover/grate) or cannot be opened using normal lifting pressure?			
Damage to discharge chamber access cover (manhole cover/grate) or cannot be opened using normal lifting pressure?			
Does the MWS unit show signs of structural deterioration (cracks in the wall, damage to frame)?			
Is the inlet/outlet pipe or drain down pipe damaged or otherwise not functioning properly?			
Working Condition:			
Is there evidence of illicit discharge or excessive oil, grease, or other automobile fluids entering and clogging the unit?			
Is there standing water in inappropriate areas after a dry period?			
Is the filter insert (if applicable) at capacity and/or is there an accumulation of debris/trash on the shelf system?			
Does the depth of sediment/trash/debris suggest a blockage of the inflow pipe, bypass or cartridge filter? If yes, specify which one in the comments section. Note depth of accumulation in in pre-treatment chamber.			Depth:
Does the cartridge filter media need replacement in pre-treatment chamber and/or discharge chamber?			Chamber:
Any signs of improper functioning in the discharge chamber? Note issues in comments section.			
Other Inspection Items:			
Is there an accumulation of sediment/trash/debris in the wetland media (if applicable)?			
Is it evident that the plants are alive and healthy (if applicable)? Please note Plant Information below.			
Is there a septic or foul odor coming from inside the system?			

Waste:	Yes	No
Sediment / Silt / Clay		
Trash / Bags / Bottles		
Green Waste / Leaves / Foliage		

Recommended Maintenance	
No Cleaning Needed	
Schedule Maintenance as Planned	
Needs Immediate Maintenance	

Plant Information	
Damage to Plants	
Plant Replacement	
Plant Trimming	

Additional Notes: ____________________

Maintenance Report

Modular Wetland System, Inc.
P. 760.433-7640
F. 760-433-3176
E. Info@modularwetlands.com

www.modularwetlands.com

Cleaning and Maintenance Report
Modular Wetlands System

For Office Use Only
(Reviewed By)
(Date)
Office personnel to complete section to the left.

Project Name ______________________________

Project Address ______________________________
(city) (Zip Code)

Owner / Management Company ______________________________

Contact ______________________________ Phone ( ) –

Inspector Name ______________________________ Date ___ / ___ / ______ Time __________ AM / PM

Type of Inspection ☐ Routine ☐ Follow Up ☐ Complaint ☐ Storm Storm Event in Last 72-hours? ☐ No ☐ Yes

Weather Condition ______________________________ Additional Notes ______________________________

Site Map #	GPS Coordinates of Insert	Manufacturer / Description / Sizing	Trash Accumulation	Foliage Accumulation	Sediment Accumulation	Total Debris Accumulation	Condition of Media 25/50/75/100 (will be changed @ 75%)	Operational Per Manufactures' Specifications (If not, why?)
	Lat: Long:	MWS Catch Basins						
		MWS Sedimentation Basin						
		Media Filter Condition						
		Plant Condition						
		Drain Down Media Condition						
		Discharge Chamber Condition						
		Drain Down Pipe Condition						
		Inlet and Outlet Pipe Condition						

Comments:

Maintenance Procedure

The following procedures are for the maintenance of StormTrap as suggested by StormTrap, LLC. All regulations set by governing bodies retain precedence over the subsequent instructions.

1. Do not enter the StormTrap system unless properly trained, equipped, and qualified to enter a confined space as identified by local occupational safety and health regulations.

2. StormTrap recommends an annual inspection. Frequency of cleaning will vary due to site conditions and storage capacity. StormTrap recommends maintenance when the sediment occupies more than one-tenth of the system's volume. Also refer to local municipality regulations for their maintenance requirements and schedules. Inspections should be a part of your standard operating procedure.

3. Maintenance is typically preformed using a vacuum truck. Remove manhole cover at grade and lower vac hose into StormTrap system (or sump pit within system if applicable). Sediment should be flushed towards vac hose to provide for thorough removal. When finished, replace all covers that were removed.

Appendix E

Conditions of Approval

Placeholder – Pending Issuance
To Be Included in Final WQMP

APPENDIX F

INFILTRATION TEST RESULTS

PETRA GEOTECHNICAL, INC.
ORANGE COUNTY

3190 Airport Loop Drive, Suite J1
Costa Mesa, CA 92626
T: 714.549.8921 F: 714.549.1438

PETRA

past + present + futur
it's in our scienc

Engineers, Geologist
Environmental Scientist

Mr. Tim Ramm
NEWPORT EQUITIES LLC
26 Corporate Plaza, Suite 260
Newport Beach, California 92660

June 19, 2014
P.N. 14-243

Subject: Soil Infiltration Test Results, 33-Acre Parcel Located Northeast of the Intersection of Katella Avenue and Enterprise Drive, City of Cypress, California

Reference: Santa Ana Regional Water Quality Control Board, 2011, Technical Guidance Document for the Preparation of Conceptual/Preliminary and/or Project Water Quality Management Plans (WQMPs), with Appendices, For Santa Ana Regional Board Consideration, dated March 22, 2011.

Dear Mr. Ramm:

Petra Geotechnical, Inc. is pleased to present the results of our recent soil percolation testing for the subject property. This testing was conducted in order to evaluate the feasibility of onsite WQMP infiltration systems for storm water dissipation. A total of six percolation tests (identified herein as PT-1 through PT-6) were performed in general conformance with Section VII.3.4. (Open Pit Falling Head Procedure) of the County of Orange Technical Guidance Document Appendix VII, prepared by the Santa Ana Regional Water Quality Control Board (reference). Two additional tests (PT-7 and PT-8) were performed at the request of Mr. Tim Simpson of GSI Environmental, Inc. in general conformance with Section VII.2.2 (Simple Open Pit Infiltration Test) of the referenced document. The locations of the tests as determined by the project civil engineer (Fuscoe Engineering, Inc.) are shown on the attached graphic (Plate 1).

It should be noted that the referenced guidance document states that the simple open pit infiltration test method is used to provide "preliminary screening values" and that "This approach cannot be used to find a design infiltration rate." All the rectangular test areas were converted to equivalent radiuses by means of the equation provided at the bottom of page 29 of the referenced document. The percolation rates acquired were converted to infiltration rates by means of the Porchet Method. The infiltration rates calculated from the percolation tests range from 0.00 to 0.30 inches/hour for tests PT-1 through PT-6 and from 0.09 to 0.57 for tests PT-7 and PT-8. Details of these tests are shown on the attached Figure 1. It should be noted that test pit PT-2 was rendered unusable due to the presence of an abandoned buried pipe that was encountered during excavation at this location.

It should be noted that further testing may be required by the reviewing agency once preliminary design is completed to determine final infiltration rates. The test data provided herein are subject to review by the controlling agencies for the project.

This opportunity to be of service is sincerely appreciated. Should you have any questions, please do not hesitate to contact us.

Respectfully submitted,

PETRA GEOTECHNICAL, INC.

6/19/12

Scott Winslow
Senior Associate Geologist
CEG 2009

PROFESSIONAL GEOLOGIST
SCOTT WINSLOW
NO. 2009
CERTIFIED
ENGINEERING
GEOLOGIST
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6/19/14

J. Montgomery Schultz
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GE 2941

REGISTERED PROFESSIONAL ENGINEER
JOHN MONTGOMERY SCHULTZ
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GEOTECHNICAL
STATE OF CALIFORNIA

SHW/SW/MS/kg

S:\2014\Projects\200s\14-243 Province Group (Katella Ave Cypress)\Infiltration Test Results.doc

JN 14-243
Test Date: 6-16-14

ABSORPTION RATE CALCULATIONS
Uncased Test Pit

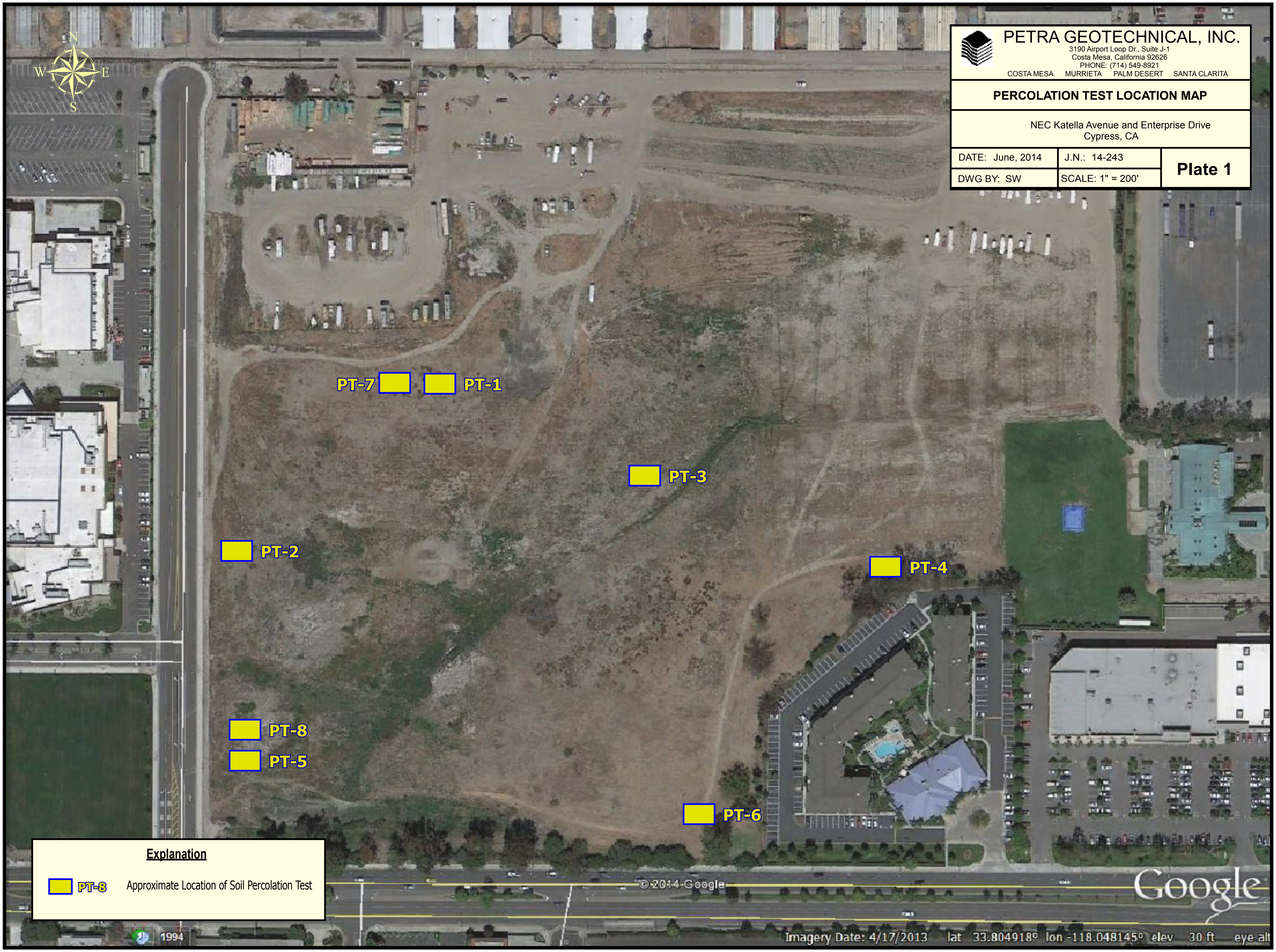
By: S.Wilkins

Test No.	Equivalent Boring Diameter (in)	Equivalent Boring Depth (ft)	Initial Depth to Water (ft)	Final Depth to Water (ft)	Time Interval (min)	Water Loss (cu ft)	Wetted Area (sq ft)	Percolation Rate (in/hr)	Infiltration Rate (in/hr)*
PT-1 (Trial 1)	38.3	5.30	4.30	4.30	120	0.000	18.018	0.000	0.000
PT-1 (Trial 2)	38.3	5.30	4.30	4.30	120	0.000	18.018	0.000	0.000
PT-1 (Trial 3)	38.3	5.30	4.30	4.30	120	0.000	18.018	0.000	0.000
PT-2		Test Abandoned Due to Presence of Pipe							
PT-3 (Trial 1)	38.3	5.50	4.50	4.51	120	0.080	17.968	0.060	0.027
PT-3 (Trial 2)	38.3	5.50	4.50	4.51	120	0.080	17.968	0.060	0.027
PT-3 (Trial 3)	38.3	5.50	4.50	4.51	120	0.080	17.968	0.060	0.027
PT-4 (Trial 1)	38.3	5.50	4.50	4.55	120	0.400	17.768	0.300	0.135
PT-4 (Trial 2)	38.3	5.50	4.50	4.57	120	0.560	17.668	0.420	0.190
PT-4 (Trial 3)	38.3	5.50	4.50	4.56	120	0.480	17.718	0.360	0.162
PT-5 (Trial 1)	38.3	6.00	5.00	5.08	120	0.640	17.618	0.480	0.218
PT-5 (Trial 2)	38.3	6.00	5.00	5.09	120	0.720	17.567	0.540	0.246
PT-5 (Trial 3)	38.3	6.00	5.00	5.08	120	0.640	17.618	0.480	0.218
PT-6 (Trial 1)	38.3	5.50	4.50	4.63	120	1.040	17.367	0.780	0.359
PT-6 (Trial 2)	38.3	5.50	4.50	4.61	120	0.880	17.467	0.660	0.302
PT-6 (Trial 3)	38.3	5.50	4.50	4.61	120	0.880	17.467	0.660	0.302
PT-7	44.9	4.80	0.71	1.20	120	5.385	56.164	2.940	0.575
PT-8	46.9	5.00	0.67	0.75	120	0.959	64.639	0.480	0.089

* Based on Porchet Method

Figure 1

PETRA



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COSTA MESA MURRIETA PALM DESERT SANTA CLARITA
PERCOLATION TEST LOCATION MAP
NEC Katella Avenue and Enterprise Drive
Cypress, CA
DATE: June, 2014
J.N.: 14-243
Plate 1
DWG BY: SW
SCALE: 1" = 200'
N
S
E
W
PT-7
PT-1
PT-3
PT-2
PT-4
PT-8
PT-5
PT-6
Explanation
PT-8 Approximate Location of Soil Percolation Test
© 2014 Google
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Imagery Date: 4/17/2013 lat 33.804918° lon -118.048145° elev 30 ft eye alt