U C S B

OFFICE OF CAMPUS PLANNING & DESIGN

March, 2019

Draft

Initial Study/ Mitigated Negative Declaration

Classroom Building Project

University of California at Santa Barbara

Classroom Building Project

Draft
Initial Study and Mitigated Negative Declaration

Prepared For

University of California, Santa Barbara
Office of Campus Planning and Design
Santa Barbara, California 93106-2032

Prepared By
Rodriguez Consulting, Inc.
Santa Barbara, California

March, 2019

UNIVERSITY OF CALIFORNIA at SANTA BARBARA

CLASSROOM BUILDING PROJECT

INITIAL STUDY and MITIGATED NEGATIVE DECLARATION

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1.0 INTRODUCTION

This Initial Study (IS) and proposed Mitigated Negative Declaration (MND) has been prepared for the University of California Santa Barbara (UCSB) Classroom Building Project (the "Project" or "Classroom Building") in compliance with the California Environmental Quality Act (CEQA) Statute and Guidelines (Public Resources Code Section 21000 et. seq. and California Code of Regulations Title 14, Chapter 3 Sections 15000–15387, respectively. This Initial Study tiers from the 2010 LRDP EIR (SCH No. 2007051128) pursuant to CEQA Guidelines (Code of Regulations, Title 14) Section 15152.

In January 2018, the California Office of Planning and Research transmitted its proposal for a comprehensive update to the CEQA Guidelines to the California Natural Resources Agency. In late 2018, the Natural Resources Agency finalized the CEQA Guidelines updates. The changes to the Guidelines have been approved by the Office of Administrative Law, were filed with the Secretary of State, and became effective on December 28, 2018**.** This IS/MND incorporates the newly adopted changes to the CEQA Guidelines and the Appendix G Environmental Checklist form.

1.1 PROJECT OVERVIEW

Proposed Project. The Classroom Building Project would result in the construction of a four-story building with 53,700 assignable square feet and 95,250 gross square feet of floor area. The building would provide lecture halls and classrooms of various sizes, and associated support and accessory uses. Other elements of the Project include the removal of Temporary Building No. 408, the relocation of a bicycle path that crosses the project site, and the construction of new bicycle parking areas.

Project Location. The Classroom Building Project site is located on the central portion of the UCSB Main Campus (Figure 1.1-1).

1.2 PROJECT INFORMATION

Project Title:	Classroom Building Project
Lead Agency Name and Address:	The Regents of the University of California 1111 Franklin Street Oakland, CA 94607
Contact Person:	Ms. Shari Hammond, (805) 893-3796
Project	The Project site is located on the Main Campus of UC Santa

Location:	Barbara
Project Sponsor:	University of California, Santa Barbara Santa Barbara, CA 93106-2030
Custodian of Administrative Record:	University of California, Santa Barbara Office of Campus Planning and Design
Previous EIRs from which this Initial Study Tiers:	This IS/MND tiers from the UCSB 2010 LRDP Final EIR (SCH#2007051128), which is also incorporated into this IS/MND by reference. The EIR may be downloaded from the following Internet address: http://www.facilities.ucsb.edu/departments-campus-planning-design/2010-long-range-development-plan-lrdp/documents-and-materials

1.3 PROJECT BACKGROUND

Land use planning requirements for the UCSB campus are included in the 2010 Long Range Development Plan (LRDP), which was approved by the Regents in September 2010 and certified by the California Coastal Commission in November, 2014. The 2010 LRDP identifies and describes the physical development needed to achieve the campus's academic goals through 2025.

Section D (Land Use and Development) of the 2010 LRDP states:

"The LRDP proposes to create nearly 1.8 million assignable square feet (ASF) (3.6 million gross square feet [GSF]) of net new space needed by UC Santa Barbara, as well as allow for the replacement of buildings and facilities that are in poor repair, outdated, or need to be demolished to make room for new facilities. Over half of the project development need (930,000 ASF) is for additional instructional and research facilities, including classrooms."

There has been almost no change in the UCSB campus classroom inventory and seating capacity since 2005 when the campus had a student population of 21,016. The three-quarter average student population in 2016-17 was 23,560. This increase has resulted in additional demands for classroom space. Table 1.3-1 summarizes the existing (Fall 2017) demand for on-campus classroom space. As shown, classroom facility use is currently near or above capacity. The Classroom Building Project has been proposed to meet existing demands for additional general classroom facilities. Providing additional on-campus classrooms would not expand any existing UCSB academic programs or result in any additional students, faculty, or staff on the UCSB campus. Table 1.3-1 also depicts the projected on-campus demand for classroom space that would result from the full implementation of the 2010 LRDP. As shown, the demand for on-campus classroom facilities will continue to increase throughout the LRDP planning period, and the proposed Project would accommodate existing students address classroom space needs anticipated by the 2010 LRDP.

Table 1.3-1
Utilization of General Assignment Classrooms

Classroom Seating Capacity	Fall 2017 Utilization	Fall 2024 Utilization - With Proposed Project	Fall 2024 Utilization - Without Proposed Project
16-25	89.3%	95.3%	95.3%
26-50	82.5%	64.4%	88.1%
51-100	75.0%	70.0%	80.1%
101-200	100.3%	80.9%	107.1%
201-300	95.9%	67.9%	102.3%
300+	116.2%	81.1%	124.0%

Note: Classroom utilization rates over 100 percent reflect extended hours of instruction
Source: UCSB Office of Budget and Planning, 2018

1.4 ENVIRONMENTAL SETTING

1.4.1 Regional Setting

The UCSB campus is located in an unincorporated area of Santa Barbara County, near the City of Goleta and the community of Isla Vista, and approximately 10 miles west of the City of Santa Barbara. This general area is referred to as the South Coast region of the County and occupies a coastal plain about three miles wide between the Pacific Ocean and the foothills of the Santa Ynez Mountains.

The UCSB campus encompasses a total of approximately 1,055 acres. The campus is comprised of four areas known as the Main Campus, Storke Campus, West Campus, and North Campus (Figure 1.4-1).

- The Main Campus contains most of the UCSB academic and support buildings and facilities, and the Classroom Building Project would be located on the central portion of the Main Campus. The Pacific Ocean borders the Main Campus to the south and east, and the Goleta Slough and the Santa Barbara Municipal Airport are to the north. Most of the Main Campus is located on a marine terrace that is approximately 35-50 feet above sea level, and there are steep bluffs that descend to sandy beaches along the eastern and southern sides of the campus. A bluff approximately 30 to 40 feet in height is located along the northern edge of the Main Campus and separates the campus from the Goleta Slough. The Santa Ynez Mountains are located approximately five miles to the north of the Main Campus, and are a prominent visual feature throughout the region.

- The Storke Campus has been used for the development of housing, parking facilities, athletic fields, and contains natural areas including the Storke Wetlands and the San Clemente Habitat Restoration Area and Stormwater Management System. Housing projects on the Storke Campus include the Santa Catalina and San Joaquin Residence Halls, Storke Family Apartments, Santa Ynez Apartments, and the San Clemente Villages student housing.

- The West Campus is largely devoted to a UCSB natural reserve that includes the Devereux Slough and Coal Oil Point Reserve. The West Campus also includes the West Campus Bluffs with a trail and beach access, the former Devereux School property, student family and faculty housing, and a child care center.

- The North Campus is located west of Storke Road, south of a residential neighborhood in the City of Goleta, and north of the UCSB West Campus. Land uses on the North Campus are mostly open space with some student and faculty housing and facilities associated with the former Ellwood Marine Terminal. Open space on the North Campus includes the 136-acre North Campus Open Space Restoration Area, which is part of the 652-acre Ellwood-Devereux Open Space Plan area. Housing projects on the North Campus include the 151-unit Sierra Madre student housing project and the 154-unit Ocean Walk faculty housing project.

1.4.2 Project Site and Surrounding Land Uses

Existing land uses and development characteristics of the project site and areas adjacent to the project site are described below and depicted on Figure 1.4-2. Figures 1.4-3 and 1.4-4 provide photographs of the Classroom Building Project site.

Project Site. The Classroom Building Project site is approximately 2.4 acres and located in the central portion of the Main Campus. The site is south of adjacent to the Davidson Library and the Bio Engineering Building, and north of and adjacent to the Psychology Building. Vehicle access to the project site is from UCen Road, which is approximately 400 feet south of the project site, and then northward along a service driveway that was formerly Parking Lot No. 7. The site is also accessed from Parking Lot No. 3

Temporary Building 408 (Ergonomics Lab) is located on the northeastern corner of the project site and is a two-story, World War II-era barracks building that was constructed when the UCSB Main Campus site was used as a Marine Corps base. A small area of soil and groundwater contamination is located north of and adjacent to Building 408. This contamination resulted from the use of an underground heating oil storage tank that was associated with Building 408. The tank was removed in 1989 and on February 3, 2016, the contamination site was granted closure by the Central Coast Regional Water Quality Control Board (RWQCB).

Bicycle parking areas on the project site are located adjacent to the Library building and along the southern perimeter of the site adjacent to the Psychology Building. A bicycle path extends diagonally across the project site from its southeast corner to its northwest corner. This path connects to a bicycle path located adjacent to the project site's eastern perimeter, and to a bicycle path located along the western side of Parking Lot No. 3. A pedestrian path is located in the southwestern corner of the project site and extends between Parking Lot No. 3 and the Davidson Library bicycle parking area.

Temporary construction fencing has been erected on the western portion of the project site and this area is being used as a staging area for the Multi-Building Boiler Replacement Project. The boiler replacement project will replace 20 existing boilers in 16 Main Campus buildings. The boilers are being replaced to comply with Santa Barbara County Air Pollution Control District Rule 361 (Small Boilers, Steam Generators, and Process Heaters).

The project site is level with elevations ranging from approximately 48 and 51 feet above sea level. Landscaping on the site consists of a variety of ground covers, shrubs, and trees. The trees generally consist of small- to moderately-sized ornamental landscape trees, however, two large sycamore trees are located on the western portion of the project site, and four sycamore trees and two oak trees that are in poor health are located in the northwestern corner of the site near the Library building.

Nighttime lighting on the project site consists of pole-mounted lights along the bicycle path that extends across the site, and lights along the walkway located adjacent to the Bio Engineering Building. Light fixtures located near the project site include pole-mounted lights in Parking Lot No. 3, and along a pedestrian walkway that is east of and adjacent to the project site.

Surrounding Land Uses. Land uses in the vicinity of the Classroom Building Project site are generally academic and related uses. Land uses adjacent to the project site are described below and depicted on Figures 1.4-2 through 1.4-4.

North. Buildings north of the project site are the Davidson Library, which is a four story building adjacent to the site, and the three-story Bio Engineering Building.

South. The Psychology Building is adjacent to the project site to the south. The Psychology Building is a one- and three-story structure. Buildings 383 and 387 are small portable buildings used as offices and are located near the southwest corner of the project site.

East. A bicycle path that extends northward from UCen Road is adjacent to the project site's eastern perimeter. East of and adjacent to the bicycle path is a service vehicle driveway that was formerly Parking Lot No. 7. East of and adjacent to the driveway is a pedestrian pathway known as "Science Walk." This walkway extends northward from UCen Road to Phelps Hall in the northern portion of the Main Campus. The two-story Noble Hall building is located east of and adjacent to Science Walk pedestrian path.

West. Parking Lot No. 3 provides 107 faculty and staff parking spaces and is west of and adjacent to the project site. A bicycle path is west of and adjacent to Parking Lot No. 3.

Off-Site Staging Area. A proposed temporary staging area that would be used to store project-related building materials is located on the Storke Campus near the intersection of Los Carneros Road and Mesa Road. The location of the temporary staging area is depicted on Figure 1.4-1. The proposed staging area has been previously used for material storage, is extensively disturbed, and devoid of vegetation. Land uses adjacent to the staging area site are depicted on Figure 1.4-5 and include the Goleta Slough to the north; the UCSB Main Campus and Storke Wetlands to the east; the Storke Wetlands to the south; and the Storke Family Housing Apartments to the west.

1.5 2010 LONG RANGE DEVELOPMENT PLAN

The 2010 LRDP is a plan for UCSB campus development through 2025, and the 2010 LRDP Final EIR analyzes the environmental impacts of implementing the Plan. Pursuant to Code of Regulations, Title 14, Section 15152, this Initial Study tiers from the 2010 LRDP EIR, which was a program-level analysis of campus development as required by Public Resources Code section 21080.09.

The 2010 LRDP (Figure D.1, Land Uses) shows that the Classroom Building project site and adjacent areas have an "Academic and Support" land use designation. The proposed Storke Campus temporary staging area has a "Housing" land use designation.

1.6 REQUIRED PERMITS AND APPROVALS

The University of California is the Lead Agency for the Classroom Building Project and is responsible for complying with the requirements of CEQA. The University of California Regents are the decision-makers for the Project.

The Coastal Commission will review the Classroom Building Project and approval by the Commission is required. UCSB will seek the Coastal Commission's approval of the Classroom Building Project by filing a Notice of Impending Development.

Prior to the start of construction activities, the Project must also obtain coverage by filing a Notice of Intent with the Water Resources Control Board under the General Permit for Discharges of Stormwater Associated with Construction Activity.

An Authority to Construct permit will be required from the Santa Barbara County Air Pollution Control District (APCD) for any water heaters/boilers that exceed size thresholds specified by the APCD.

1.7 PROJECT OBJECTIVES

The Classroom Building Project would have three major objectives:

- Create a variety of classroom types and sizes to meet the existing demand for classrooms and instruction facilities.

- Develop a building using sustainable and energy efficient design and construction.

- Minimize environmental impacts to resources and land uses located on the Main Campus.

1.8 CUMULATIVE DEVELOPMENT

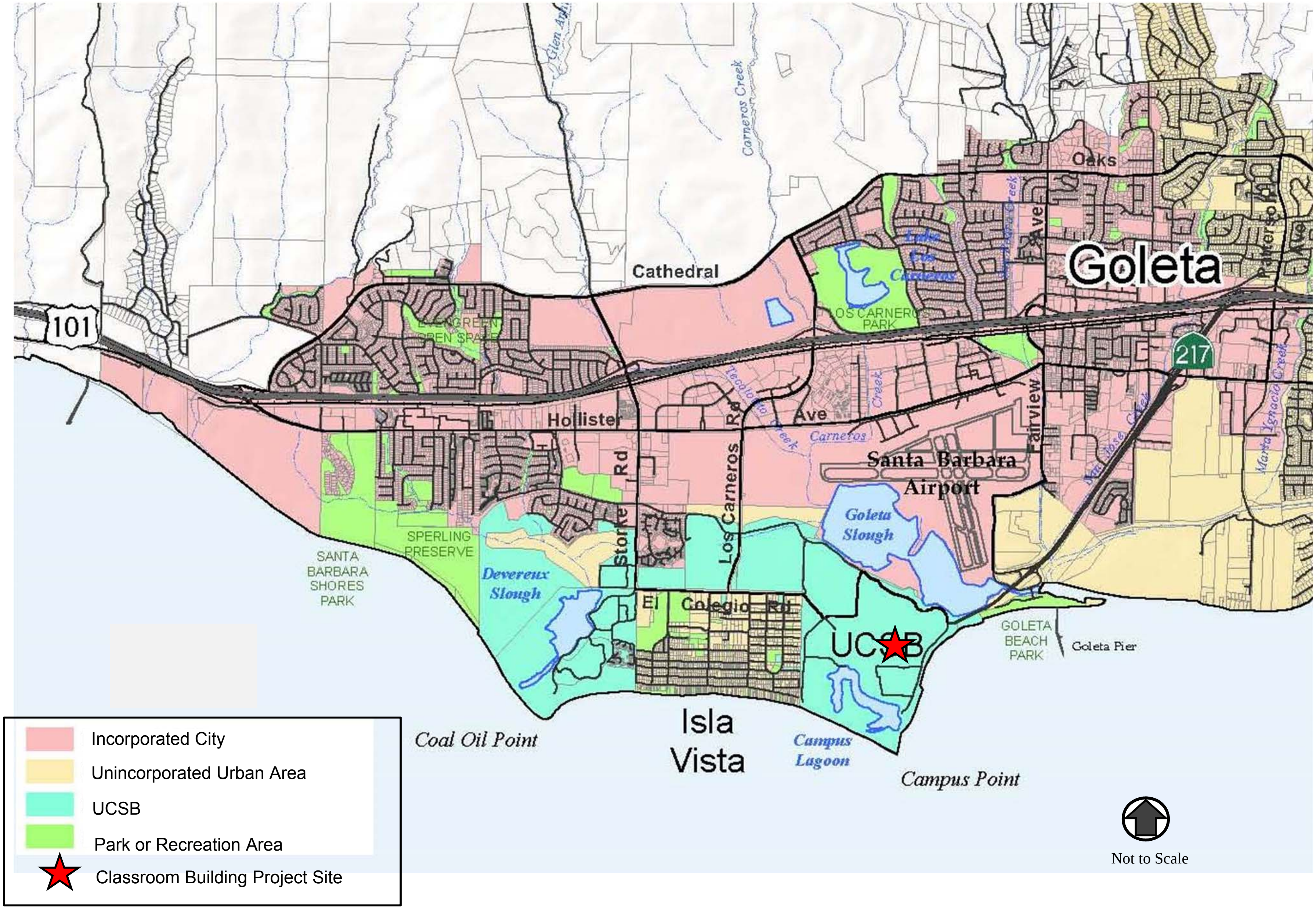
A list of reasonably foreseeable cumulative development projects on the UCSB campus is provided in Table 1.8-1. Some of the identified projects are unfunded and not approved. Project locations, building sizes, and project schedules are subject to change.

In addition to the development projects listed in Table 1.8-1, the 2010 LRDP proposes a comprehensive framework for the physical development of the UCSB campus to accommodate an on-campus enrollment of up to a three-quarter average of 25,000 full-time equivalent students, and a total of approximately 6,400 faculty and staff. The 2010 LRDP also includes the addition of approximately 1.8 million assignable square feet (ASF) of academic and support building space; 5,443 additional student bed spaces, 1,874 additional units of faculty and staff housing, and 239 additional units of housing for students with families.

Table 1.8-1
UCSB Cumulative Development Projects
(February, 2019)

Campus Project	Description/Location	Status
North Campus Faculty Housing	161 faculty housing units adjacent to Phelps Road north of Ocean Meadows Golf Course.	90 units in Phases I, II, and III are complete. Phases IV and V are proposed to be under construction in April 2019. Coastal Commission approval of project in November 2006; EIR, SCH#2003071178.
Henley Hall	31,538 ASF building located north of Phelps Hall and south of Mesa Road. The building includes laboratories, offices, and a lecture hall.	Under construction Coastal Commission approval of project in February, 2018. MND adopted October, 2017 SCH#2017071069
Main Campus Infrastructure Renewal Project	Planned throughout the Main Campus, the project is proposed to correct critical infrastructure deficiencies. The project will address storm drainage, sanitary sewer, potable and reclaimed water and natural gas pipelines.	Phases 1a, 1b and 1c are complete. Phase 2 is awaiting funding and construction MND adopted November 2007 SCH#2007101108
Ocean Road Drainage Project	This project would address existing storm water drainage deficiencies along the western perimeters of the Main Campus and would eliminate five bluff-top storm drain outfalls that discharge to the Pacific Ocean. The proposed drainage system would convey storm water to the Campus Lagoon.	Planning stages
Ocean Road Faculty and Staff Housing	543 housing units located on the east and west sides of Ocean Road.	Planning stages
New Physics Building	64,000 ASF building located northwest of Broida Hall.	Planning Stages
Engineering III Building	75,000 ASF building located south of and adjacent to Mesa Road and east of Phelps Hall	Planning Stages
Multi Building Boiler Replacement Project	Replace 20 existing boilers in 16 Main Campus buildings. A temporary staging area for this project is located on the Classroom Building Project site.	This project is on-going through 2019

Source: Office of Campus Planning & Design and Office of Budget and Planning, 2019.
ASF = Assignable Square Footage



University of California, Santa Barbara

Classroom Building Project

Figure 1.1-1

Regional Location

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University of California, Santa Barbara

Classroom Building Project

Figure 1.4-1

UCSB Campus Map

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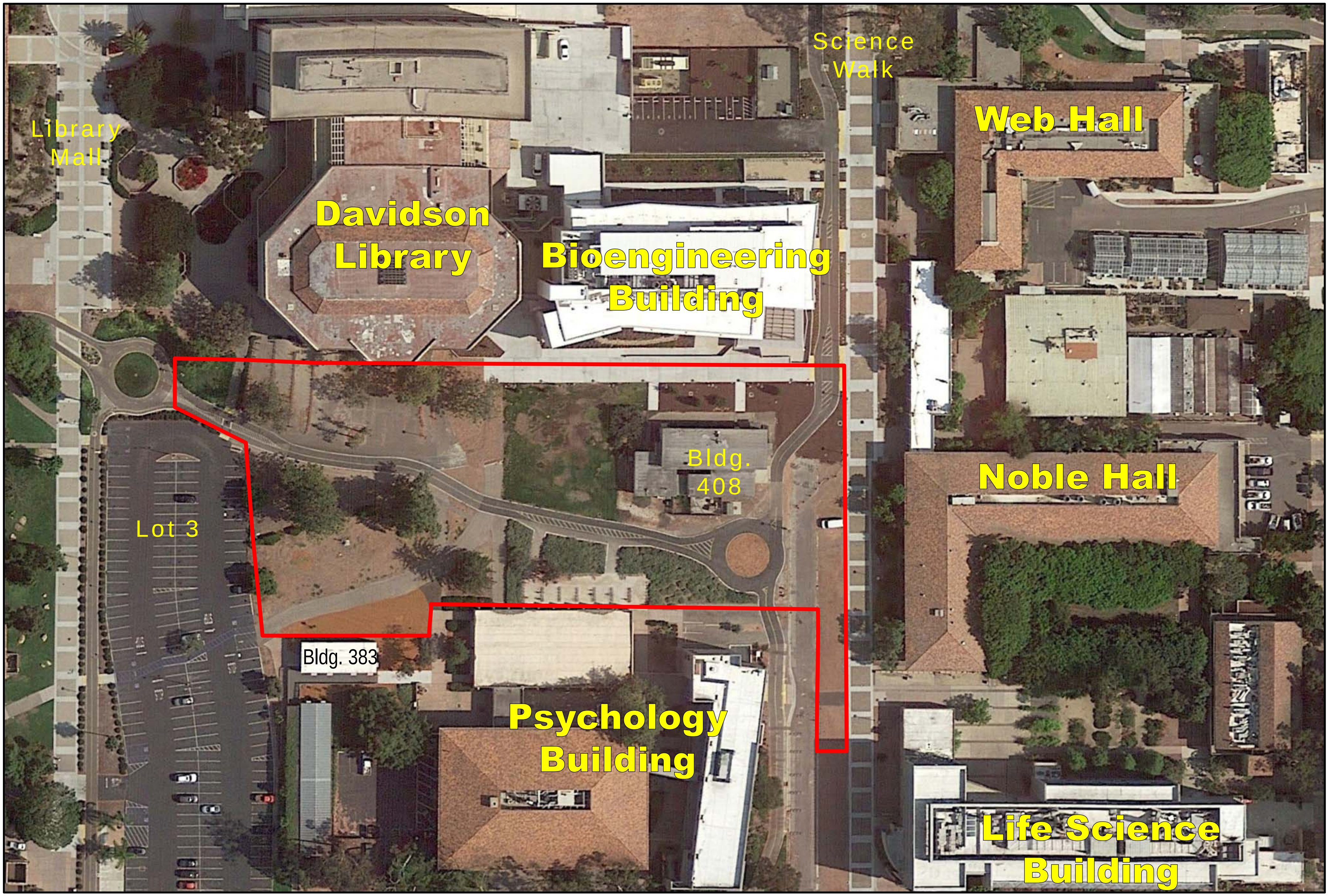

Aerial Photo: Google Earth, 2019

University of California, Santa Barbara

Classroom Building Project

Project Site

1 in. = approx. 110 ft.

Figure 1.4-2

Project Area

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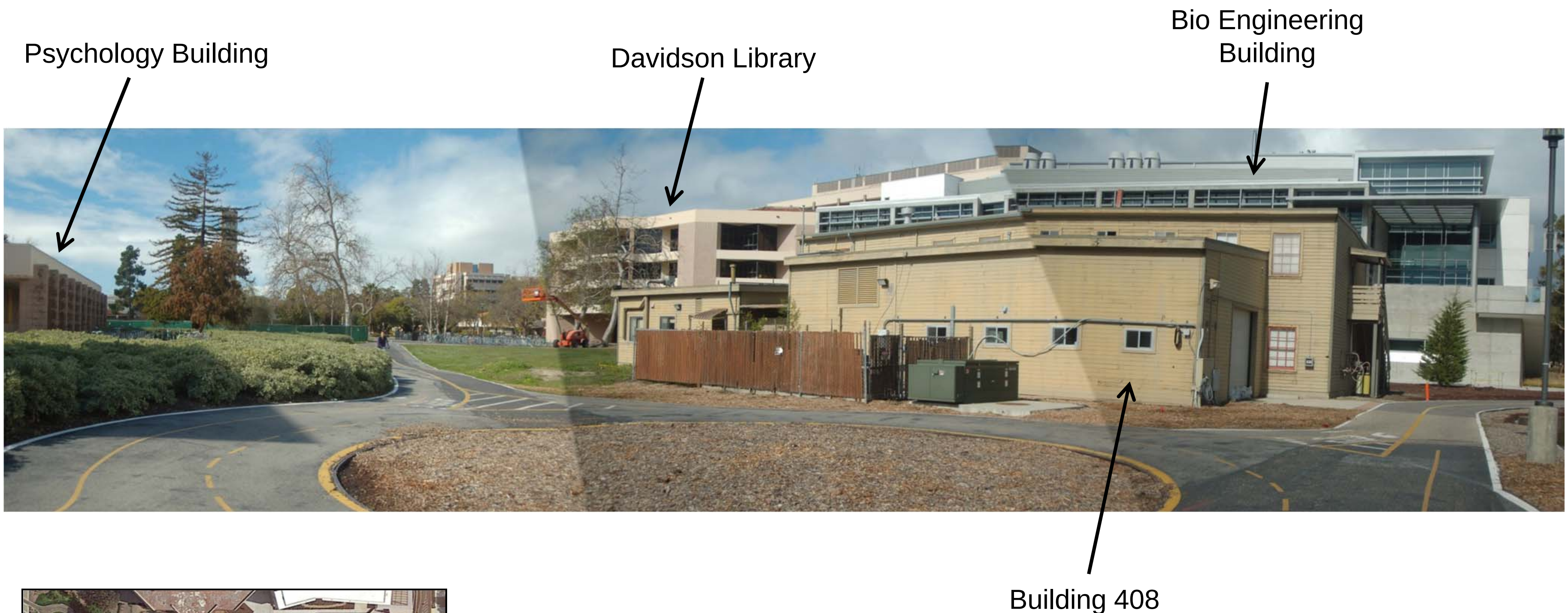

Figure 1.4-3

Project Site - View From the Southeast

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University of California, Santa Barbara

Classroom Building Project

Figure 1.4-4

Project Site - View From the Northwest

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Aerial Photo: Google Earth, 2019

UCSB Campus Boundary

University of California, Santa Barbara

Classroom Building Project

Proposed Staging Site

Figure 1.4-5

Storke Campus Temporary Staging Area

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2.0 PROJECT DESCRIPTION

This section describes the design and use characteristics of the proposed Classroom Building Project.

2.1 PROJECT LOCATION

The Classroom Building Project site is located in the central portion of the Main Campus. The site is south of adjacent to the Davidson Library and the Bio Engineering Building, north of and adjacent to the Psychology Building, and east of and adjacent to Parking Lot No. 3.

2.2 BUILDING SIZE AND USE CHARACTERISTICS

The Classroom Building Project would provide new lecture halls, classrooms, and related facilities. The four-story building would have approximately 95,250 gross square feet (GSF) of floor area and 53,700 assignable square feet (ASF). ASF is a measure of the usable area within a building available to occupants. The proposed building would have a footprint area of approximately 24,000 square feet. The classrooms and support facilities to be included in the Project, along with their associated ASF, are summarized on Table 2.2-1. Other project-related facilities not included in the building's ASF are uses such as an elevator and machine room, fire pump and sprinkler control rooms, restrooms, recycle/trash storage rooms, and janitor closets.

The Classroom Building Project has been proposed to meet existing demands for additional general classroom facilities. Providing additional on-campus classrooms would not expand any existing UCSB academic programs or result in any additional students, faculty, or staff on the UCSB campus. The Project would also address classroom space needs anticipated by the 2010 LRDP.

2.3 PROJECT DESIGN FEATURES

Building Design. As shown on Figure 2.3-1 (Site Plan), the Classroom Building would be located on the western portion of the project site, and new bicycle parking areas would be located along the eastern and northern portions of the site. The existing bicycle path that crosses diagonally across the project site would be removed and relocated to the eastern and northern perimeters of the site.

Table 2.2-1
Classroom Building Area Summary

Space Description	Seat Count	Quantity	Total Seats	ASF	Total ASF
Classrooms					
Large Hall	350	1	350	7,000	7,000
Mid-Size Hall	250	2	500	5,250	10,500
Small Hall	175	2	350	3,900	7,800
Large Classroom	100	1	100	2,800	2,800
Medium Classroom	50	2	100	1,400	2,800
Discussion Classroom	30	20	600	728	14,560
Classrooms Subtotal	--	--	*2,000*	--	*45,460*
Building Support					
Lobby		1		1,500	1,500
Enclosed Study Space		2		1,000	2,000
Technical Offices		3		125	375
Lactation Room		1		140	140
Equipment Storage		2		500	1,000
Building Storage		3		625	1,875
Sound and Light Lock		10		75	750
Projection Room		4		150	600
Building Support Subtotal		--		--	*8,240*
TOTAL	--	--	**2,000**	--	**53,700**

Source: LMN, 2019

Aerial views depicting the design of the Classroom Building design are shown on Figures 2.3-2 through 2.3-5. As depicted on Figures 2.2-6 and 2.2-9 (Building Floor Plans), three lecture halls would be located on the building's first level. The building's second level would have two lecture halls, one large classroom and two medium-sized classrooms. Smaller classrooms would be located on the building's third and fourth levels. The building's primary teaching facilities would be arranged around a central linear space, or "street corridor" that connects major building access points. The open-air "street" space would be mostly exposed to the sun and daylight throughout the day. The Classroom Building would have a maximum height of 70 feet above grade measured at the building roof line, and would include three 15-foot tall roof-top "penthouses" that would screen roof-mounted equipment such as building heat pumps and air handling units for building ventilation.

Vehicle Access. Vehicle access to the project site is from UCen Road, which is approximately 400 feet south of the project site, and then northward along a service driveway that was formerly Parking Lot No. 7. Vehicle access is also from Parking Lot No. 3.

Bicycle Path Relocation. The existing on-site bicycle path would be removed and replaced with new pathways located along the eastern and northern perimeters of the project site. The new path along the site's eastern perimeter would connect to an existing path located east of the Psychology Building, and would extend northward approximately 150 feet to a new bicycle circulation roundabout in the northeastern corner of the project site. The roundabout would connect to an existing path that extends northward from the project site, and would also provide a connection to the relocated path along the northern perimeter of the project site. The new path on the northern portion of the project site would intersect with an existing bicycle roundabout located near the northwestern corner of the site.

Bicycle Parking. The Classroom Building Project would remove approximately 986 bicycle parking spaces located adjacent to the Library and Psychology Building. Approximately 2,106 new bicycle parking spaces would be provided on the project site to replace the removed spaces and to accommodate the additional demand created by the Project. The new bicycle parking spaces would be distributed along the Project site's northern and eastern edges.

Pedestrian Circulation. A new pedestrian walkway would be located along the northwestern perimeter of the project site. The western end of the new path would connect to the Library Mall, and would also serve as an extension of the Pardall Mall, which is located west of the project site. The Pardall Mall is the main east-west thoroughfare across the Main Campus. The eastern end of the new pedestrian walkway would connect to the existing walkway that is south of an adjacent to the Bio Engineering Building.

Pedestrian access to the Library and Library Mall from Parking Lot 3 would continue to be provided by a new at grade crossing across the proposed new bicycle path located along the northern perimeter of the project site. The proposed pedestrian crossing would be located in the northwestern corner of the project site and would replace an existing crossing that connects Parking Lot 3 with the bicycle parking area that is adjacent to the Davidson Library. The Project would also relocate an existing pedestrian path that crosses Parking Lot No. 3 by shifting the path northward approximately 100 feet.

Landscaping and Lighting. Proposed landscape planting would include new trees located throughout proposed bicycle parking areas, and a variety of drought-tolerant trees, shrubs and ground covers distributed throughout the site. Landscape irrigation would use efficient irrigations systems and recycled water. New hardscape areas would include various plazas, walkways, and seating areas.

Exterior lighting would consist primarily of safety and security lighting adjacent to the proposed building, along the new bicycle path, and in pedestrian areas. All lighting would be shielded and directed downward, and provide the minimum amount of light needed for adequate safety and security.

Sustainable Design Features. The Classroom Building Project would incorporate a variety of sustainable design features to reduce the building's water and energy use, and associated direct and indirect air emissions. The Project design supports the University's sustainability goals by seeking a LEED[1] "Gold" Certification while striving to achieve a "Platinum" certification. In accordance with the UC Sustainable Practice Policy, the goal of the proposed building's design is to outperform the energy-efficiency standards of California Code of Regulations Title 24, Part 6, which is also known as the California Energy Code, by at least 20 percent. The Project would also comply with California Green Building Standards Code (Part 11 of Title 24, the California Building Standards Code). The purpose of the Green Building Standards Code is to improve public health, safety, and general welfare by enhancing the design and construction of buildings by using design strategies that reduce negative environmental impacts and applying sustainable construction practices.

Design elements included in the Project to minimize energy and water use include features such as:

- The use of a light colored roofing material to reduce the cooling load of the building
- The open-air central "street" would provide passive lighting and ventilation
- Occupant sensors in ventilated spaces
- Efficient lighting and advanced controls
- Heat pump water heaters that pull heat from the surrounding air
- Use of natural daylight and daytime dimming systems
- Proximity of bicycle parking
- Low flow plumbing fixtures
- Use of recycled water for irrigation

2.4 CONSTRUCTION CHARACTERISTICS

Construction Schedule. It is anticipated that construction of the Classroom Building Project would begin in January 2021, with construction operations occurring over approximately 26 months. During project construction, interim pedestrian/bicycle circulation routes would be designated along with appropriate directional signs. Also during construction, temporary bicycle parking would be provided in the vicinity of the project site to accommodate temporarily displaced bicycle parking facilities. Throughout the Project's construction period, appropriate traffic, pedestrian, and bicycle safety control measures would be implemented when and where needed, and would typically include measures such as the use of temporary fencing around the construction site and staging areas, barriers, signage, flag persons, traffic control persons, and detours.

[1] The Leadership for Energy and Environmental Design (LEED) rating system was developed by the U.S. Green Building Council, the Congress for the New Urbanism, and the Natural Resources Defense Council, and integrates the principles of smart growth, new urbanism and green building practices. Projects are evaluated using the LEED rating system by determining that the development meets certain prerequisite criteria, and then by assigning "credits" prescribed for the various evaluation criteria. Based on the point total earned, development projects may be "certified" or awarded silver, gold or platinum ratings. Points are awarded based on criteria related to subjects such as indoor and outdoor water use, storm water management, water reuse, building operation and passive design, energy use, and building material sources.

Temporary Building 408 Demolition and Soil Remediation. Temporary Building 408 is a former military barracks building located near the northeastern corner of the project site. Construction of the Classroom Building Project would require the demolition and removal of Building 408.

The Classroom Building would be west of an area in the northeast corner of the project site that contains contaminated soil associated with the former use of Temporary Building 408. A bicycle parking area would be located in the area that contains the impacted soil. Construction of the bicycle parking area would not require the disturbance or removal of the contaminated soil. However, if the installation of utilities or drainage systems to serve the Project would have the potential to encounter impacted soil, all disturbed contaminated soil on the project site would be removed consistent with state and federal regulations, and under the direction of UCSB Environmental Health and Safety. It is estimated that approximately 200 cubic yards of contaminated soil is located on the project site, and that approximately 2,500 cubic yards of soil overly the impacted soil.

Staging Areas and Construction Parking. A fenced construction material storage and staging area would be located on the eastern portion of the project site during the Project's construction period. An additional material storage area would be located on the UCSB Storke Campus near the northwest corner of the Los Carneros Road/Mesa Road intersection (Figures 1.4-1 and 1.4-5). This site is currently being used by UCSB for material storage and is approximately one acre in size. The site is at least 200 feet north of the UCSB Storke Wetlands, at least 200 feet from the western extent of the Goleta Slough, and approximately 230 feet from the nearest residences in the Storke Family Housing Apartments. No lighting would be provided in the off-site staging area. Upon the completion of construction activities, construction materials and equipment would be removed from the project site, the off-site staging area would be removed, and all areas disturbed by staging activities would be restored to existing conditions or restored consistent with approved building and landscape plans.

Construction site workers would be required to park their vehicles on the UCSB Main Campus in Parking Lot No. 30, which is located near the northwest corner of the Main Campus adjacent to Stadium Road. From the parking lot, workers would be transported to the project site using shuttle vehicles.

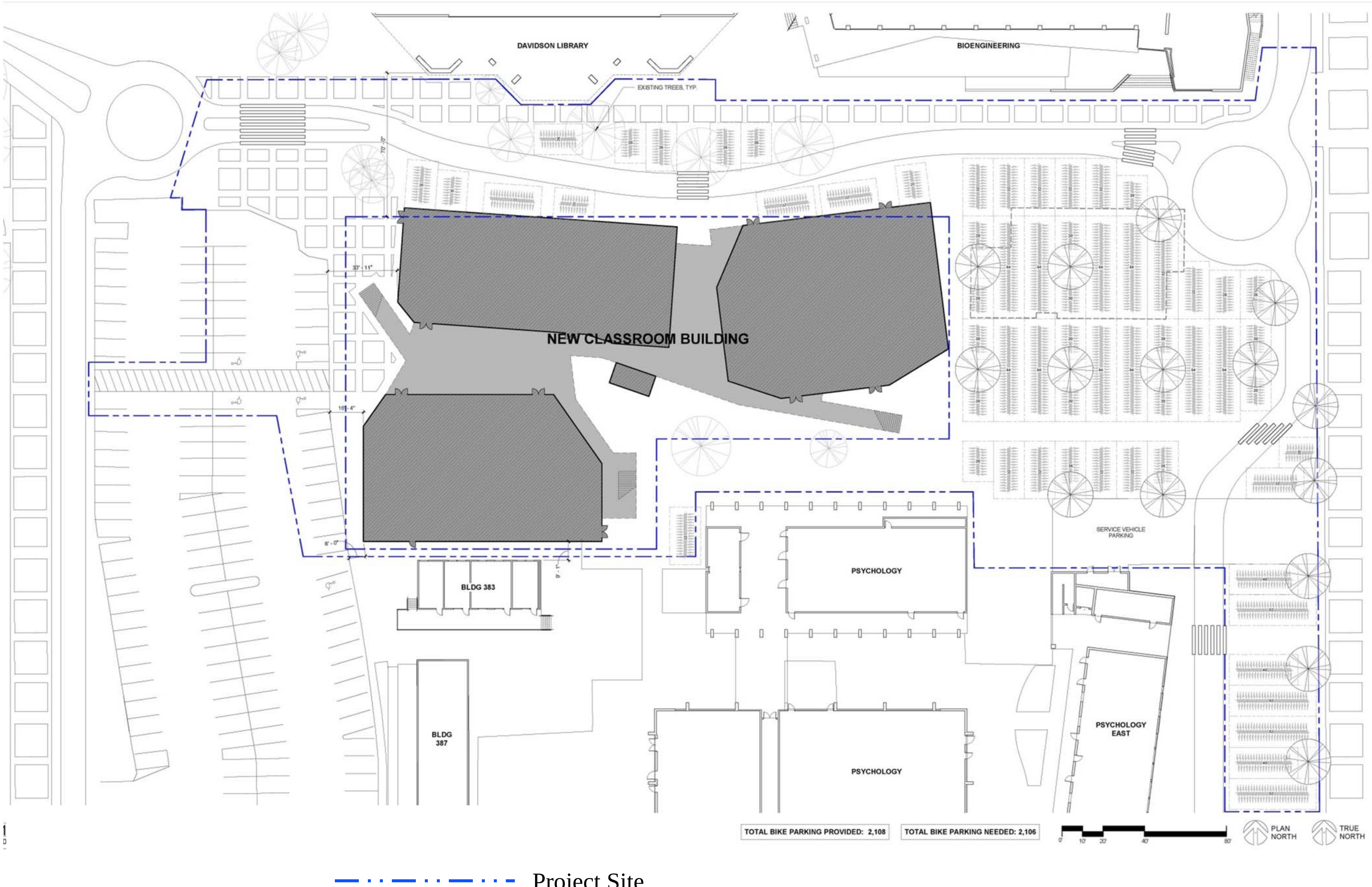
Project Site Grading. Grading at the project site would be primarily for the excavation of unsuitable soils to prepare the building foundation, and for minor utility trenching. The construction of the foundation would require the excavation of approximately 13,900 cubic yards of soil from beneath the proposed building footprint, and the recompaction of approximately the same volume of soil. If the Classroom Building were to be constructed using a cast-in-place drilled pile foundation, only minor site grading would be required.

Drainage. Prior to the start of construction a Notice of Intent to comply with the NPDES General Construction permit would be filed with the State Water Resources Control Board. All project-related construction activities would occur in accordance with the requirements of a

Stormwater Pollution Prevention Plan that has been reviewed by the UCSB Environmental Health and Safety office and filed with the Central Coast Regional Water Quality Control Board.

Two possible storm water treatment systems are being considered for the proposed Project. The first treatment option would be a retention/detention system consisting of a ground surface detention pond with an underground water infiltration chamber. The second option would be retention/detention system consisting of a subsurface excavation filled with rocks and chambers encased in the fill material to increase water storage capacity. Either of the storm water management options could be installed at one of three potential sites, which include: Site A) the northern portion of Parking Lot 3, which is west of and adjacent to the Project site; Site B) a vacant area south of the Psychology Building and north of Ucen Road, approximately 300 feet south of the Project site; and Site C) an area on the eastern portion of the Project site. Runoff that is collected from the project site and that does not infiltrate into the ground would continue to be directed to the Main Campus storm drain system and discharged to the Campus Lagoon similar to existing conditions.

Utilities. Utility service for the Classroom Building Project, including potable water and fire flow water, recycled water, electricity, gas, sanitary sewer, chilled water, and storm water drainage would be provided by connecting to existing utilities located on or adjacent to the project site. Existing utility lines located beneath the proposed building footprint would be relocated or abandoned in-place. Emergency electrical power for the Classroom Building would be provided using a battery backup system.



Source: LMN, 2019

University of California, Santa Barbara

Classroom Building Project

Figure 2.3-1

Site Plan

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Source: LMN, 2019

University of California, Santa Barbara

Classroom Building Project

Figure 2.3-2

Northwest Aerial View

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Source: LMN, 2019

University of California, Santa Barbara

Classroom Building Project

Figure 2.3-3

Northeast Aerial View

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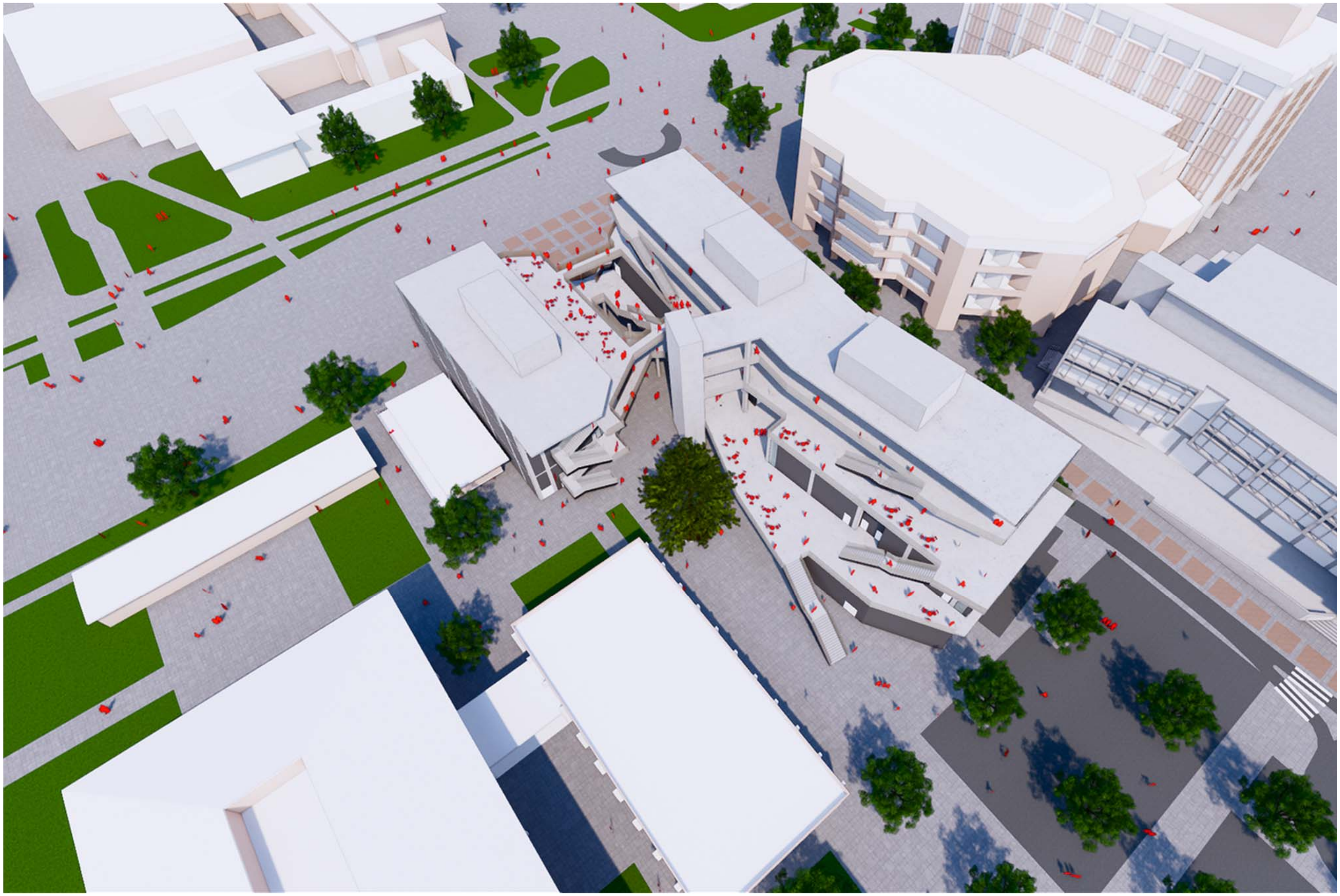

Source: LMN, 2019

University of California, Santa Barbara

Classroom Building Project

Figure 2.3-4

Southeast Aerial View

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Source: LMN, 2019

University of California, Santa Barbara

Classroom Building Project

Figure 2.3-5

Level 1 Floor Plan

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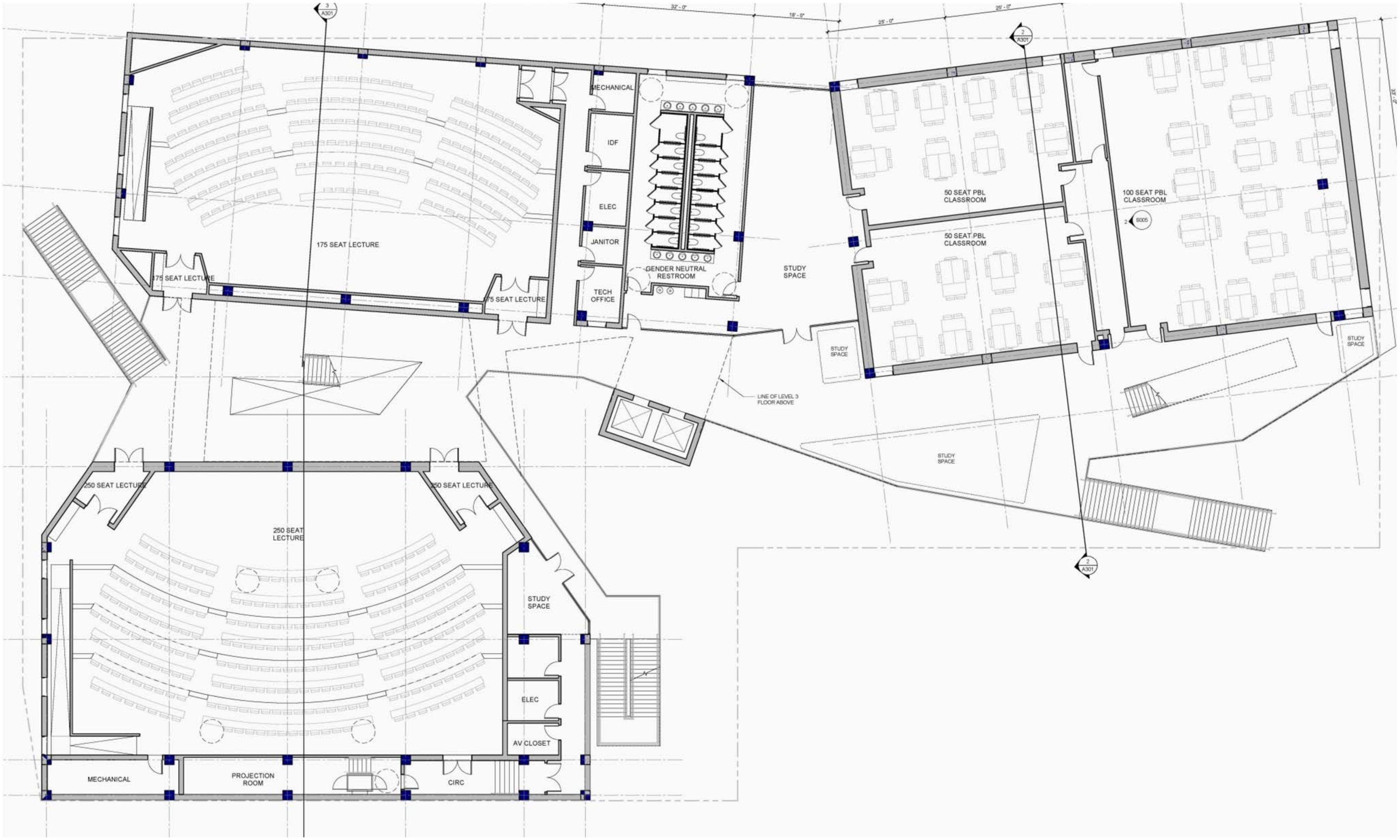

Source: LMN, 2019

University of California, Santa Barbara

Classroom Building Project

Figure 2.3-6

Level 2 Floor Plan

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Source: LMN, 2019

University of California, Santa Barbara

Classroom Building Project

Figure 2.3-7

Level 3 Floor Plan

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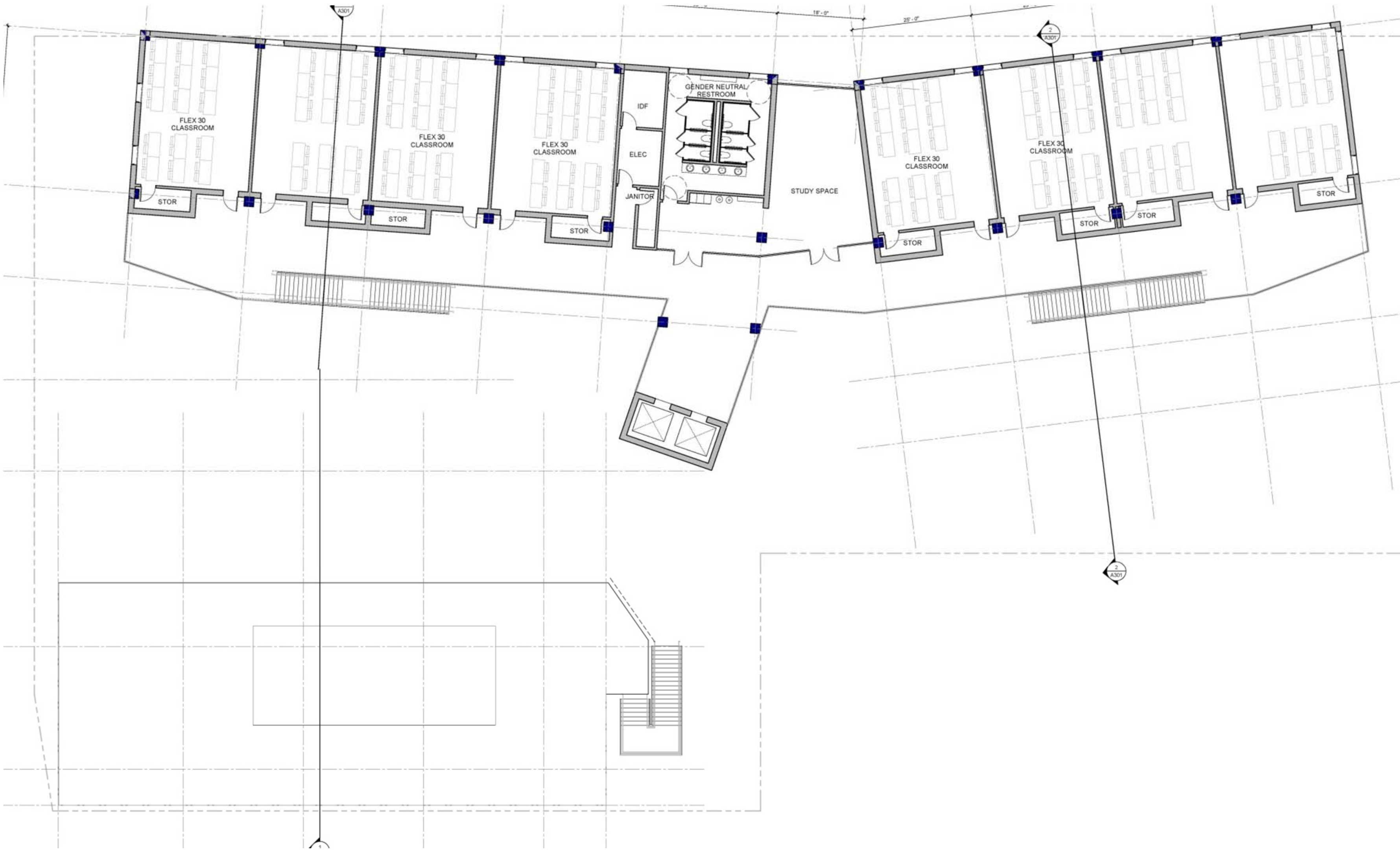

Source: LMN, 2019

University of California, Santa Barbara

Classroom Building Project

Figure 2.3-8

Level 4 Floor Plan

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3.0 ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

Descriptions of project-specific and cumulative impacts that have the potential to be significant, or that have been determined to be less than significant, are provided in the narrative of Section 5.0 of this IS/MND.

If this Initial Study evaluation of potential environmental impacts concludes that the Classroom Building Project would not result in an impact regarding a specific environmental issue area, that issue area is denoted with an "NI" (no impact) in the table provided below. Environmental issue areas denoted by an "LS" were determined to have less than significant impacts. Environmental issue areas denoted with an "M" would have impacts that can be feasibly reduced to a less than significant level with the implementation of mitigation measures identified by this IS/MND. The mitigation measures included in this IS/MND consist of measures provided by the 2010 LRDP Final EIR and measures developed specifically for the Classroom Building Project. The analysis provided by this IS/MND indicates if individual mitigation measures required to reduce project-related impacts to a less than significant level are from the 2010 LRDP, a modified LRDP mitigation measure, or developed specifically for the proposed project. The Classroom Building Project would not result in any "Potentially Significant Impacts" that cannot be reduced to a less than significant level.

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

NI: No impact
LS: Less than significant impact
M: Less than significant with the implementation of proposed mitigation

4.0 ENVIRONMENTAL DETERMINATION

On the basis of the initial evaluation that follows:

☐ I find that the proposed project WOULD 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, the project impacts were adequately addressed in an earlier document or there will not be a significant effect in this case because revisions in the project have been made that will avoid or reduce any potential significant effects to a less than significant level. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment. An ENVIRONMENTAL IMPACT REPORT will be prepared.

Shari Hammond	3·18·2019
Signature	Date
Shari Hammond	UC Santa Barbara
Printed Name	For

5.0. EVALUATION OF ENVIRONMENTAL IMPACTS

The University has defined the column headings in the Initial Study checklist as follows:

A) "**Potentially Significant Impact**" is appropriate if there is substantial evidence that the project's effect may be significant. If there are one or more "Potentially Significant Impacts" a Project EIR will be prepared.

B) "**Project Impact Adequately Addressed in LRDP EIR**" applies where the potential impacts of the proposed project were adequately addressed in the LRDP EIR and mitigation measures identified in the LRDP EIR will mitigate any impacts of the proposed project to the extent feasible. All applicable LRDP EIR mitigation measures are incorporated into the project as proposed. The impact analysis in this document summarizes and cross references (including section/page numbers) the relevant analysis in the LRDP EIR.

C) "**Less Than Significant With Project-level Mitigation Incorporated**" applies where the incorporation of project specific mitigation measures will reduce an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." All project-level mitigation measures must be described, including a brief explanation of how the measures reduce the effect to a less than significant level.

D) "**Less Than Significant Impact**" applies where the project will not result in any significant effects. The project impact is less than significant without the incorporation of LRDP or project-level mitigation.

E) "**No Impact**" applies where a project would not result in any impact in the category or the category does not apply. "No Impact" answers need to be adequately supported by the information sources cited, which show that the impact 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).

Issues	(A) Potentially Significant Impact	(B) Project Impact Adequately Addressed in LRDP EIR	(C) Less Than Significant with Project-level Mitigation Incorporated	(D) Less Than Significant Impact	(E) No Impact
5.1 AESTHETICS – Except as provided in Public Resources Code Section 21099, 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) In nonurbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	✓	☐	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	✓	☐

5.1.1 Setting

The UCSB Main Campus is predominately an urban environment and views throughout most of the campus interior consist of buildings, roadways, and ornamental landscaping. Most of the landscaping on the Main Campus is comprised of non-native species, although some native tree species are also on the campus. Scenic views from the Main Campus are generally of the Pacific Ocean to the east and south, the Santa Ynez Mountains and Goleta Slough to the north, and the Campus Lagoon in the southern portion of the Main Campus.

Project Site Conditions. The Classroom Building Project site is a mostly vacant area located near the center of the Main Campus. Development on the project site includes Temporary Building 408, a small two-story World War II era barracks building, and a bicycle path that extends diagonally across the site from east to west. Temporary construction fencing delineating the perimeter of a short-term staging area for the Multi Building Boiler Replacement Project was recently erected on the project site. Nighttime lighting on the project site consists of pole-mounted lights along the bicycle path that extends across the site. Photos that depict existing visual conditions at the project site are provided on Figures 1.4-3 and 1.4-4.

Buildings adjacent to the project site include the four-story portion of the Davidson Library and the three-story Bio Engineering Building to the north; and the one- to three-story Psychology Building and portable building 383 to the south. Other development near the project site includes Parking Lot No. 3, which is west of and adjacent to the site; and a pedestrian walkway known as “Science Walk” to the east.

Views of the Santa Ynez Mountains from the Main Campus are often obscured by intervening buildings and landscaping, and views of the mountains that are provided are often through narrow view corridors. Due to the presence of intervening structures (the Davidson Library and the Bio Engineering Building) views of the Santa Ynez Mountains are not available from viewpoints located on the project site. Limited views of the mountains are available from locations adjacent to the project site, such as Science Walk to the east, and Parking Lot 3 and the Library Mall to the west. Other scenic resources, including the Goleta Slough, Campus Lagoon and Pacific Ocean, cannot be seen from the project site or locations adjacent to the site.

Landscaping on the project site consists of consists predominately of ornamental ground covers, shrubs and trees. The on-site native trees were likely planted as landscape trees and include: two oak trees that are in poor health located in the northwest corner of the project site near the Library building; four sycamore trees located on the north side of the on-site bicycle path; and two sycamore trees on the south side of the on-site bicycle path. All of the oak and sycamore trees on the project site have trunk diameters greater than six inches measured at breast height. Two ornamental trees located on the project site that have trunks greater than six inches in diameter include a coast redwood tree that is near the northwest corner of the Psychology Building; and a multi-trunk New Zealand tea tree located near Building 408. Other ornamental trees on the project site have trunk diameters less than six inches and are not visually prominent.

2010 LRDP Requirements. Building height limitations for the UCSB campus are specified by the 2010 LRDP and building height limits for the Main Campus range from 45 feet to 85 feet. 2010 LRDP Figure D.4 (Certified Building Heights) shows that the maximum building height at the project site is 85 feet.

2010 LRDP Figure F.4 (Scenic and Visual Resources) identifies scenic view points and view corridors on Main Campus. The view corridors provide a visual connection between natural areas around the perimeter of the Main Campus (i.e., the ocean and Campus Lagoon) and interior areas of the campus. The identified view corridors generally exist along pedestrian walkways and bicycle paths. The 2010 LRDP identifies three "Primary View Corridors" in the vicinity of the project site:

- The Library Mall. This corridor is west and the project site and extends between Channel Islands Road in the southern portion of the Main Campus to Mesa Road on the northern portion of the Main Campus.

- Science Walk. This corridor is east of the project site and also extends between Channel Islands Road and Mesa Road.

- Pardall Mall. This corridor is the main east-west thoroughfare across the Main Campus and contains the primary pedestrian and bicycle connections with Isla Vista. In the vicinity of the project site, the Davidson Library and Bio Engineering Building are located north of and adjacent to Pardall Corridor. The Classroom Building site is south of and adjacent to the corridor.

2010 LRDP Appendix 2 (Campus Tree Trimming and Removal Program) applies to trees measuring six inches in diameter at breast height and oak trees of any size. Appendix 2 requires that removed native trees or breeding/nesting tree for which a Notice of Impending Development was required are to be replaced with native trees at a 3:1 ratio. Any ornamental tree that is removed is to be replaced with a native or ornamental tree at a 1:1 ratio.

2010 LRDP Appendix 4 (Outdoor Lighting Replacement and Retrofit Program) describes methods that will be used to implement LRDP Policy ESH-15, which reduces the potential for lighting-related impacts on the UCSB campus. Policy ESH-15c requires that all outdoor lighting be designed to avoid, or minimize to the maximum extent feasible, all forms of light pollution, including light trespass, glare and sky glow.

5.1.2 Checklist Responses

a. *Would the proposed project have a substantial adverse effect on a scenic vista?*

Scenic views from the Main Campus are generally of the Pacific Ocean to the east and south, the Santa Ynez Mountains and Goleta Slough to the north, and the Campus Lagoon in the southern portion of the Main Campus. The proposed Classroom Building would be located near the center of the Main Campus and as described in Section 5.1.1, the ocean, Goleta Slough, and Campus Lagoon are not visible from the project site or from viewpoints adjacent to the site. Views of the Santa Ynez Mountains are not available from the project site due to the presence of the Davidson Library and the Bio Engineering Building, and only limited views of the mountains are available from viewpoints adjacent to the project site. The Project would not obstruct or reduce any mountain views from the project site, and would not interfere with existing mountain views available from viewpoints along the Pardall Mall, Science Walk, the Library Mall, or Parking Lot No 3. In addition, the Classroom Building Project would not adversely affect any scenic views identified by the 2010 LRDP. The proposed building would not be visible from off-campus locations and would not interfere with any scenic vistas available from off-campus view locations. Therefore, the Classroom Building Project would have **no impact** to scenic vistas.

The 2010 LRDP EIR evaluated the potential for development on the Main Campus to result in impacts to scenic vistas, and determined that the buildout of the 2010 LRDP would result in a less than significant impact. The Classroom Building Project's impacts to scenic vistas would not be cumulatively considerable and the Project would result in **less than significant** cumulative impacts to scenic views.

b. *Would the proposed project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?*

Scenic Trees. Scenic trees on the project site are considered to be large, unique, or visually prominent trees that are in good health. Scenic trees on the project site include the two sycamore trees located on the south side of the on-site bicycle path; two of the four sycamore trees located on the north side of the bicycle path; and the redwood tree located near the Psychology Building. The two oak trees near the Library are in poor health and not considered to be scenic trees. Two of the sycamore trees on the north side of the on-site bicycle path have been pruned substantially and are not considered to visually prominent. The New Zealand tea tree located near Building 408 is not unique or visually prominent.

<u>Removed Trees</u>. The two scenic sycamore trees located on the south side of the on-site bicycle path would be removed by the Project. Due to their location near the center of the proposed building site it would not be feasible to retain the trees. Consistent with 2010 LRDP Policy ESH-28c/LRDP Appendix 2: *Campus Tree Trimming and Removal Program* the two removed sycamore trees would be replaced with native trees at a 3:1 ratio. As depicted on Figure 2.3-1 (Site Plan), adequate area on the project site would be available to plant the required replacement trees. By providing six replacement native trees on the project site in compliance with 2010 LRDP Policy ESH-28, the Project's long-term impacts to on-campus scenic trees would be **less than significant.**

<u>Retained Trees</u>. As described in IS/MND Section 5.4.2e, the two scenic sycamore trees on the north side of the existing bicycle path and the scenic on-site redwood tree would be retained, however, those trees could be impacted by project-related construction activities. Potential construction-related impacts to the on-site scenic trees that are to be retained can be **reduced to a less than significant level** with the implementation of proposed mitigation BIO-2a, which requires the implementation of tree protection measures throughout the Project's construction period, and if necessary the replacement of trees that do not survive more than five years after the conclusion of project-related construction activities.

Historic Buildings. Implementation of the proposed Project would result in the demolition of Temporary Building 408, which is a World War II-era Marine Corps barracks building. Please refer to Section 5.6, Cultural Resources, for an evaluation of the historical significance of the building. Building 408 is a small two-story building with few architectural features and a utilitarian appearance. Due to its "non-descript" appearance the building is not a significant visual resource. As a result, there would be a **less than significant** impact to visual conditions on the Main Campus due to the removal of Temporary Building 408.

c. *In nonurbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?*

The Classroom Building Project site is in an urbanized area near the center of the UCSB Main Campus. As described in item "a" above, the Classroom Building Project would not adversely affect any scenic views identified by the 2010 LRDP, or adversely affect existing visual conditions along the designated Library Mall, Science Walk, or Pardall Mall primary view corridors that are adjacent to the project site. The proposed building would have a maximum height of 70 feet measured at the roofline, which would be substantially below the maximum building height of 85 feet established for the project site by the 2010 LRPD. Please refer to Table 5.11-1 in the Land Use section of this IS/MND for an evaluation of the Classroom Building Project's consistency with other applicable visual resource protection policies of the 2010 LRDP. That analysis concludes that the Project would be consistent with the applicable visual resource protection policies, or would be consistent with the implementation of proposed mitigation measures to protect scenic trees that are to be retained on the project site (Mitigation Measure BIO-2a). Therefore, the Project's impacts to the existing scenic quality conditions on the Main Campus would be **reduced to a less than significant level.**

The proposed Storke Campus temporary material storage area would be located on a vacant site approximately 160 feet west of Los Carneros Road, north of and adjacent to Mesa Road, and east of the Storke Family Apartments. This staging area would be visible to the public from those and other public locations, however, the area would be fenced and temporary views of the facility would not substantially degrade the visual quality of the surrounding area. Upon the completion of construction activities, construction materials and equipment would be removed from the site, and all areas disturbed by staging activities or other project-related activities would be restored to existing conditions. Therefore, short-term construction operations associated with the Project would result in **less than significant** visual impacts.

d. *Would the project have the potential to create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?*

Project-related exterior lighting would consist of low-level safety and security lighting provided primarily near building entrances and in courtyard areas. All proposed light fixtures would be oriented downward and shielded to minimize light intrusion onto adjoining areas, and the minimum amount of light needed for adequate safety and security would be provided consistent with the requirements of 2010 LRDP Policy ESH-15 and LRDP Appendix 4, *Outdoor Lighting Replacement and Retrofit Program.* No new lighting would be installed at the Storke Road temporary staging area site. Therefore, the Project would not be a substantial source of nighttime lighting and would result in **less than significant** lighting-related impacts on the project site and in adjacent off-site areas.

5.1.3 Mitigation Measures

Impacts Reduced to a Less Than Significant Level with Proposed Mitigation

The Classroom Building Project would have the potential to result in significant impacts to the scenic trees that are to be retained on the project site. This potential impact can be reduced to a less than significant level with the implementation of the tree protection requirements of proposed mitigation measure BIO-2a (IS/MND Section 5.4.3). No additional mitigation measures are required to reduce the Project's aesthetics impacts to a less than significant level.

Issues	(A) Potentially Significant Impact	(B) Project Impact Adequately Addressed in LRDP EIR	(C) Less Than Significant with Project-level Mitigation Incorporated	(D) Less Than Significant Impact	(E) No Impact
5.2 AGRICULTURE AND FOREST 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 Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project: 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 CA Resources Agency, to non-agricultural use?	☐	☐	☐	☐	✓
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☐	✓

Issues	(A) Potentially Significant Impact	(B) Project Impact Adequately Addressed in LRDP EIR	(C) Less Than Significant with Project-level Mitigation Incorporated	(D) Less Than Significant Impact	(E) No Impact
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☐	✓
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☐	✓
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☐	✓

5.2.1 Setting

Section 12220(g) of the Public Resources Code defines "forest land" as "land that can support 10 percent native tree cover for any species, including hardwoods, under natural condition, and that allows for management of one or more forest resources, including timber, aesthetics, fish and wildlife, biodiversity, water quality, recreation, and other public benefits.

Public Resources Code section 4526 defines "timberland" as "land, other than land owned by the federal government and land designated by the board as experimental forest land, which is available for, and capable of, growing a crop of trees of any commercial species used to produce lumber and other forest products, including Christmas trees. Commercial species shall be determined by the board on a district basis after consultation with the district committees and others."

Government Code section 51104(g) defines "timberland production zone" as "an area which has been zoned pursuant to Section 5112 or 5113 and is devoted to and used for growing and harvesting timber, or for growing and harvesting timber and compatible uses…"

There are no agricultural, forest lands or timberland resources, or Timberland Production zones on the UCSB campus or on nearby off-campus areas.

5.2.2 Checklist Responses

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 CA Resources Agency, to non-agricultural use?*

See response provided below under item "e."

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

See response provided below under item "e."

c. *Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?*

See response provided below under item "e."

d. *Result in the loss of forest land or conversion of forest land to non-forest use?*

See response provided below under item "e."

e. *Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?*

There are no agricultural operations or forest resources located on or near the UCSB Campus, and it is not reasonably foreseeable that agricultural operations or forest resources would be established near the project site in the future. Therefore, the Classroom Building Project would have **no impact** on agricultural or forest resources.

5.2.3 Mitigation Measures

The Classroom Building Project would have no impact on agricultural and forest resources. No mitigation measures are required.

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
5.3 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) 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?	☐	☐	✓	☐	☐
c) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☐	✓	☐
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☐	☐	✓	☐

5.3.1 Setting

Air Quality Conditions. Federal and state ambient air quality standards have been established for seven "criteria" pollutants: ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulates less than 10 microns in diameter (PM_{10}), particulates less than 2.5 microns in diameter ($PM_{2.5}$) and lead. California has also adopted standards for sulfates, hydrogen sulfide, vinyl chloride and visibility reducing particles.

The Santa Barbara County Air Pollution Control District (APCD) is required to monitor air pollutant levels to assure that federal and state air quality standards are being met. Santa Barbara County was designated unclassifiable/attainment for the 2008 federal 8-hour ozone standard on April 30, 2012. The 1-hour federal ozone standard was revoked for Santa Barbara County. The EPA strengthened the 8-hour ozone standard from the 2008 level of 0.075 ppm to 0.070 ppm on December 28, 2015. The EPA has not made final designations on the County's attainment status. The California Air Resources Board recommended that the County be designated attainment for the new federal ozone standard. The County is unclassifiable/attainment for the federal $PM_{2.5}$ standard. The County is currently designated nonattainment-transitional for the state 8-hour ozone standard. The California Office of Administrative Law finalized this change in designation on April 17, 2017. An air district is designated nonattainment-transitional if, during a single calendar year, the state standard is not exceeded more than three times at any one monitoring location within the district. To be designated attainment, an air district must show that the ozone standard is not violated for three consecutive years. The County violates the state standard for PM10 and is unclassified for the state $PM_{2.5}$ standard. The air basin is an attainment area for all other federal and state air quality standards.

Ozone is formed in the atmosphere through a series of chemical reactions involving nitrogen oxides (NO_x), reactive organic gases (ROG) and sunlight. Ozone is classified as a "secondary" pollutant because it is not emitted directly into the atmosphere. The major sources of ozone in the County are motor vehicles, the petroleum industry and the use of solvents (paint, consumer products and certain industrial processes). PM_{10} is generated by a variety of sources, including windblown dust, grading, agricultural tilling, road dust and quarries. Vehicle exhaust is a major source of $PM_{2.5.}$

Air Quality Regulations. The 1990 Federal Clean Air Act Amendments and the 1988 California Clean Air Act regulate the emissions of airborne pollutants and have established ambient air quality standards. The United States Environmental Protection Agency administers federal air quality regulations, and the California Air Quality Board (CARB) is the California equivalent. The CARB establishes air quality standards and is responsible for control of mobile emission sources. Local APCDs have jurisdiction over stationary sources and must adopt plans and regulations necessary to demonstrate attainment of federal and state air quality standards. The Santa Barbara County APCD has jurisdiction over air quality attainment in the Santa Barbara portion of the South Central Coast Air Basin.

<u>Clean Air Plans</u>. The 1988 California Clean Air Act requires all air pollution control districts and air quality management districts in the state to adopt and enforce regulations to achieve and maintain air quality that is within the State air quality standards. The Santa Barbara APCD prepared the 1998 Clean Air Plan to respond to federal and state requirements, and the Plan was adopted as part of the State Implementation Plan. The 2001 Clean Air Plan was developed as a comprehensive update to the 1998 Plan and was expected to bring the County into attainment of the State ozone standard through 2015. By 2004 this goal was not achieved, therefore, the 2004 Clean Air Plan was adopted in December of 2004 and focuses primarily on the Clean Air Act requirements. A 2007 Clean Air Plan was adopted by the Santa Barbara APCD Board on August 16, 2007 and a 2010 Clean Air Plan was adopted on January 20, 2011. The 2010 Plan provides updated air quality information and baseline inventories, updated future emission estimates, and new chapters related to greenhouse gas, climate protection and land use. A 2013 Clean Air Plan was adopted in March 2015. The 2016 Ozone Plan is the eighth triennial

Plan update, and similar to other Clean Air Plan updates, the 2016 Plan identifies and evaluates "every feasible measure" strategy to ensure continued progress towards attainment of the State ozone standards.

Existing Project Site Air Emission Sources. The project site is an undeveloped portion of the Main Campus and there are no existing stationary emission sources on the site.

Sensitive Receptors. Sensitive receptors are generally defined as pollutant-sensitive members of the population or where air pollutant emissions could adversely affect use of the land. Sensitive members of the population include those who may be more negatively affected by poor air quality than other members of the population, such as children, the elderly, or persons with respiratory conditions. In general, residential areas, hospitals, elder-care facilities, primary and secondary schools, are considered to be sensitive receptors. There are no hospitals, elder care facilities, or schools near the Classroom Building project site. The nearest on-campus residences are dormitories located a minimum of approximately 400 feet south of the project site. Sensitive receptors near the proposed Storke Campus temporary staging area are the Storke Family Apartments, which are approximately 230 feet west of the staging area site.

5.3.2 Impact Significance Thresholds

Long-Term Impacts. The Santa Barbara APCD and Santa Barbara County have adopted thresholds of significance for evaluating a project's air quality impacts. Consistent with the air quality impact analysis provided by the 2010 LRDP EIR, this analysis of the Classroom Building Project uses the thresholds adopted by Santa Barbara County in their *Environmental Thresholds and Guidelines Manual* (2008). Based on those thresholds, a project will <u>not</u> have a significant project-specific or cumulative air quality impact if operation of the project will:

1. Emit (from all project sources, mobile and stationary) less than the daily trigger for offsets set in the APCD New Source Review Rule for any pollutant (55 lbs/day for ROG and NO_x, and 80 lbs/day for PM_{10}).

2. Emit less than 25 pounds per day of oxides of nitrogen (NO_x) or reactive organic compounds (ROG) from motor vehicle trips only.

3. Not cause or contribute to a violation of any California or National Ambient Air Quality Standard (except ozone).

4. Not exceed the APCD health risk public notification thresholds adopted by the APCD Board for air toxics.

5. Be consistent with the adopted federal and state Air Quality Plans.

Cumulative Impacts. The Santa Barbara County Air Pollution Control District's *Scope and Content of Air Quality Sections in Environmental Documents* (2017) provides the following guidance related to the evaluation of project-related cumulative impacts:

"As discussed in the APCD Environmental Review Guidelines, the cumulative contribution of project emissions to regional levels should be compared with existing programs and plans, including the most recent Ozone Plan. Due to the county's nonattainment status for ozone and the regional nature of ozone as a pollutant, if a project's air pollutant emissions of either of the ozone precursors (NOx or ROC) exceed the long-term thresholds, then the project's cumulative impacts will be considered significant. For projects that do not have significant ozone precursor emissions or localized pollutant impacts, if emissions have been taken into account in the most recent Ozone Plan growth projections, regional cumulative impacts may be considered to be insignificant. When a project's emissions exceed the thresholds and are clearly not accounted for in the most recent Ozone Plan growth projections, then the project is considered to have significant cumulative impacts that must be mitigated to a level of insignificance."

Short-Term Impacts. Pursuant to the County's impact significance thresholds, short-term impacts to air quality from construction are less than significant if standard mitigation measures for fugitive dust are implemented. Since Santa Barbara County violates the State standard for PM_{10}, policies of the 1979 Air Quality Attainment Plan require that all discretionary construction activities implement dust control measures, regardless of the significance of fugitive dust impacts. Dust control measures are also required to minimize the potential for dust-related nuisance impacts. APCD Rule 345, *Control of Fugitive Dust from Construction and Demolition Activities* establishes limits on the generation of visible fugitive dust emissions at demolition and construction sites.

Santa Barbara has not established quantitative thresholds for short-term construction-related emissions because the total amount of construction emissions from all construction projects that occur within the air basin constitute a minor amount of the total pollution emissions, and the emissions are temporary. As a guideline, however, APCD Rule 202.F.3 identifies a substantial effect associated with projects having combined emissions from all construction equipment that exceed 25 tons of any pollutant (except carbon monoxide) within a 12-month period. For this analysis, the APCD guideline for short-term emissions has been used to evaluate the significance of project-related emissions.

5.3.3 Checklist Responses

a. *Would the project conflict with or obstruct implementation of the applicable air quality plan?*

Consistency with the Santa Barbara County Air Pollution Control District's Clean Air Plan means that direct and indirect emissions associated with the project are accounted for in the Plan's emissions growth assumptions and the project is consistent with policies adopted in the Plan. The 2016 Ozone Plan estimated future emission inventories based on Santa Barbara County population growth projections and currently adopted local, state and federal rules planned for implementation. The 2016 Ozone Plan uses the years 2025 and 2035 to estimate future emission inventories.

The Santa Barbara County Association of Governments has prepared population projections for the County. Population growth on the UCSB campus facilitated by the UCSB 2010 LRDP is allocated to the South Coast Unincorporated area. The 2010 LRDP would increase the UCSB student enrollment approximately one percent per year to 25,000 full time equivalent students by the year 2025. The 2016-2017 UCSB three quarter average campus headcount was 23,560 students.

The Classroom Building Project would not expand any existing UCSB academic programs or result in any additional students, faculty, or staff being located on the UCSB campus. If the Project were to indirectly contribute to an increase if on-campus faculty or staff positions, such an increase would not be substantial and would be consistent with increases anticipated by the 2010 LRDP, which states that approximately 1,700 additional faculty and staff would be added to the UCSB Campus. Therefore, the Project would not exceed population growth rates identified by the 2010 LRDP, or that were used by the 2016 Ozone Plan to estimate future emission inventories. In addition, the Project would implement a variety of design measures to reduce energy use for heating, cooling, and lighting, which would reduce the Project's long-term direct and indirect air emissions. Therefore, the Classroom Building Project would be consistent with/have a **less than significant** impact on the Santa Barbara County Clean Air Plan.

b. *Would the project 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?*

Short-Term Construction Impacts. Project-related construction activities that would result in air emissions include clearing the project site; grading for building foundation preparation; building construction activities; worker commute trips; and the application of architectural coatings (e.g., paint). The CalEEMod v.2016.3.2 computer model was used to estimate the Project's construction-related emissions. The analysis assumed that Project-related construction activities would occur over a 26 month period.

A summary of construction-related emissions resulting from the Classroom Building Project is shown on Table 5.3-1. The complete CalEEMod model results are provided in Appendix A. Short-term emissions of ozone precursor pollutants (ROG and NO_x) would be substantially lower than the 25 tons per year emissions guideline the APCD uses to determine the significance of construction-related emission impacts. Therefore, short-term emissions of criteria pollutants would be a **less than significant** impact and no mitigation is required. The construction equipment operation measures included in recommended measure AQ-2a would further reduce the Project's less than significant construction-related emissions of ROG and NO_x. Implementation of these measures is not required to reduce Project-related construction equipment emission air quality impacts to a less than significant level.

Table 5.3-1
Classroom Building Project
Estimated Construction Emissions

Construction Year	**Construction Emission Estimates** (unmitigated, tons per year)							
	ROG	**NO_x**	**CO**	**SO_2**	**PM_{10}**		**$PM_{2.5}$**	
					Dust	Exhaust	Dust	Exhaust
2021	0.270	2.678	1.925	0.005	0.148	0.097	0.061	0.092
2022	0.477	1.798	1.802	0.003	0.042	0.076	0.011	0.074
2023	0.827	0.035	0.052	<0.001	<0.001	0.002	<0.001	0.002
Total	**1.574**	**4.511**	**3.779**	**0.008**	**0.019**	**0.078**	**0.072**	**0.168**

Source: CalEEMod 2016.3.2

Short-term Project-related emissions of PM_{10} would incrementally contribute to an existing air quality standard exceedance, and fugitive dust has the potential to result in significant nuisance impacts. Therefore, construction-related dust emissions at the Classroom Building site and at the Storke Campus staging area would have the potential to result in a potentially significant air quality impact. This impact would be **reduced to a less than significant level** with the implementation of proposed mitigation measure AQ-1a, which provides dust control best management practices recommended by the Santa Barbara APCD and required by the 1979 Air Quality Attainment Plan.

Long-Term Operation Emissions. As described in response "a" above, the Classroom Building Project would not result in an increase in the number of students, faculty, or staff located on the UCSB campus; and as described in IS/MND Section 5.17 (Transportation) it is not expected that the Project would generate any additional traffic. Any indirect increase in existing traffic conditions that may result from the Project would be minor and would not be a substantial source of mobile emissions.

Other long-term emissions that would result from the Classroom Building Project would be from new on-site area sources (personal product use and landscape maintenance); and Project-related energy use. These Project-related emissions were estimated using the CalEEMod v.2016.3.2 computer model (Appendix A) and are summarized on Table 5.3-2.

Table 5.3-2
Classroom Building Project
Long-Term Air Emission Estimates
(Summer, unmitigated)

Emission Source	ROG (lbs/day)	NO_x (lbs/day)	CO (lbs/day)	PM_{10} (lbs/day)	$PM_{2.5}$ (lbs/day)
Mobile	0.0	0.0	0.0	0.0	0.0
Mobile Threshold	*25*	*25*	*na*	*na*	*na*
Non-Mobile Sources (area and energy)	2.602	0.380	0.319	0.029	0.029
Total Emissions	2.602	0.380	0.319	0.029	0.029
Total Operation Threshold	*55*	*55*	*na*	*80*	*na*

Source: CalEEMod v.2016.3.2

Emissions resulting from the Classroom Building Project would not exceed the County of Santa Barbara significance thresholds of 25 pounds per day for mobile emissions; 55 pounds per day for total ozone precursor emissions; or 80 pounds per day for PM_{10} emissions. Therefore, the Project would result in a **less than significant** project-specific air quality impact.

It is a design objective of the Project to not use natural gas for space or water heating purposes. Instead, the project would use an electricity-powered heat pump to produce hot water for heating, with additional heat pumps used to provide domestic hot water. This design objective is consistent with goals of the *UC Sustainable Practices Policy (2018),* and the UCSB *2016 Draft Climate Action Plan* to achieve carbon neutrality by 2025 for scope 1 and 2 emissions, and complete carbon neutrality by 2050. Should it be subsequently determined that the Project would use a boiler for the generation of hot water, any boilers installed at the project site would comply with the permitting regulations of SBCAPCD, and if necessary, required permits would be obtained by UCSB.

c. *Expose sensitive receptors to substantial pollutant concentrations?*

Short-Term Construction Emissions. Diesel engines emit a complex mixture of air pollutants, mainly composed of gases, vapors and fine particles. The visible emissions in diesel exhaust are known as particulate matter, and consist of carbon particles (soot) and other gases that become visible as they cool. Diesel exhaust particles carry many of the harmful organic compounds and metals present in the exhaust. Exposures to airborne respirable diesel particulate matter can result in respiratory symptoms such as changes in lung function, and cardiovascular disease. In 1998, California identified diesel particulate matter as a toxic air contaminant based on its potential to cause cancer and other adverse health effects.

The major sources of diesel particulate matter are diesel-fueled vehicles such as trucks and buses, construction equipment, portable equipment such as drilling rigs, trains, marine vessels, and power generation. Traffic on U.S. 101 is a principle source of diesel exhaust emissions in the project region.

The 2010 LRDP EIR includes a health risk assessment that evaluates potential diesel particulate matter exposure impacts resulting from future on-campus construction projects.[2] Based on conservative Project-related construction assumptions, the assessment concluded that if an individual on-campus construction project emitted less than 2,365 pounds of diesel particulate matter per year, that project would not result in a significant health risk to receptors near the project site. The LRDP EIR analysis of potential construction site diesel particulate matter emissions evaluates project-specific impacts (individual construction projects) because diesel particulate matter impacts only have a localized effect in the immediate vicinity of the construction site.

The 2010 LRDP EIR includes a table indicating how much construction equipment horsepower can be operated at a particular construction site on a daily basis before 2,365 pounds of diesel particulate matter would be emitted. This table provides information for construction projects of varying durations (one month, three months and one year) and the use of various "tiers" (age) of construction equipment that may be operated on the site. Newer construction equipment can be operated at a construction site for a longer duration before 2,365 pounds of diesel particulate matter is emitted because newer "tiers" of construction equipment have engines that emit less diesel particulate matter than older engines. Table 5.3-3 presents the amount of construction equipment (measured in horsepower) that can be operated on a construction site in a single day over a specified time period without emitting more than 2,365 pounds of diesel particulate matter.

Table 5.3-3
Daily Maximum Diesel Construction Equipment Horsepower to Remain Less than Significant

Emission Standards	One Month Construction Period (horsepower/day)	Three Month Construction Period (horsepower/day)	One Year Construction Period (horsepower/day)
Tier 0 (before model year 1996)	19,687	6,562	1,641
Tier 1 (starting model year 1996-1997)	26,577	8,859	2,215
Tier 2/3 (starting model year 2001-2012)	70,872	23,624	5,906
Tier 4 (Starting model year 2011-2012)	708,719	236,240	59,060

Source: 2010 LRDP EIR

Estimates of peak construction equipment horsepower that would be used during the development of the Classroom Building Project were obtained using the CalEEMod air quality model, and are based on reasonable estimates of construction equipment use, project phasing, and project-related construction characteristics. Peak construction-

[2] The health risk assessment provided by the 2010 LRDP EIR is hereby incorporated by reference. The EIR and health risk assessment analysis are available for review at the following web site: http://lrdp.id.ucsb.edu/documents-and-materials

related equipment horsepower used during the Project's construction phases are summarized on Table 5.3-4.

Table 5.3-4
Classroom Building Project
Peak Day Diesel-Powered Construction Equipment Horsepower

Site Preparation Peak Day Horsepower	Demolition Peak Day Horsepower	Grading Peak Day Horsepower	Construction Peak Day Horsepower	Analysis Threshold (maximum horsepower/day)	Significant Impact?
531	965	1,731	639	2,215	No

Source: CalEEMod v.2016.3.2

For this analysis it was conservatively estimated that the construction equipment used on the project site would be no older than Tier 1, as indicated by recommended measure AQ-2a.1. The use of Tier 2 or higher diesel-powered equipment would substantially increase the amount of horsepower that could be operated on the project site without resulting in significant health-related effects. As shown on Table 5.3-4, the peak use of diesel-powered construction equipment on the project site would not exceed the combined daily Tier 1 horsepower threshold of 2,215 identified by the 2010 LRDP EIR for construction projects with a duration of one year or longer. Construction equipment use at the proposed Storke Campus staging area would not be extensive and would generally be limited to the occasional use of equipment to move material on and off of the site. Therefore, emissions of diesel particulate matter by the Project would result in **less than significant** health-related effects to receptors adjacent to the project site.

Long-Term Emissions. The Classroom Building Project would not be a substantial source of mobile (vehicle) emissions; would not result in the use of laboratories or associated fume hoods that could have the potential to impact sensitive receptors; and would not rely on the use of a diesel-powered generator for emergency power as emergency power would be provided by the use of batteries. Therefore, the Project would not expose sensitive receptors to substantial pollutant concentrations, and long-term operation impacts would be **less than significant.**

d. *Would the project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?*

The Classroom Building Project would not a source of other emissions and would not result in the operation of facilities that have the potential to result in the generation of odors. Therefore, this project-related impact would be **less than significant** and no mitigation is required.

5.3.4 Mitigation Measures

The implementation of the following mitigation measures would reduce the construction-related fugitive dust impacts of the Classroom Building Project to a less than significant level.

Impacts Reduced to a Less Than Significant Level with Proposed Mitigation

IMPACT AQ-1 Dust emissions from construction-related activities at the building site and off-site staging area could result in a significant fugitive dust impacts and contribute to existing non-attainment conditions for PM_{10}.

AQ-1a. The following dust control measures are required by the Santa Barbara County APCD. All of these measures shall be implemented at the project site during construction.

1. During construction, use water trucks or sprinkler systems to keep all areas of vehicle movement damp enough to prevent dust from leaving the site. At a minimum, this should include wetting down such areas in the late morning and after work is completed for the day. Increased watering frequency should be required whenever the wind speed exceeds 15 mph. Reclaimed water should be used whenever possible.

2. Minimize amount of disturbed area and reduce on site vehicle speeds to 15 miles per hour or less.

3. If importation, exportation and stockpiling of fill material is involved, soil stockpiled for more than two days shall be covered, kept moist, or treated with soil binders to prevent dust generation. Trucks transporting fill material to and from the site shall be tarped from the point of origin.

4. Gravel pads shall be installed at all access points to prevent tracking of mud onto public roads.

5. After clearing, grading, earth moving or excavation is completed, treat the disturbed area by watering, or revegetating, or by spreading soil binders until the area is paved or otherwise developed so that dust generation will not occur.

6. The contractor or builder shall designate a person or persons to monitor the dust control program and to order increased watering, as necessary, to prevent transport of dust offsite. Their duties shall include holiday and weekend periods when work may not be in progress. The name and telephone number of

such persons shall be provided to the Air Pollution Control District prior to the start of grading activities.

The dust control mitigation measures listed above are best management practices that reduce short-term dust emission impacts to a less than significant level.

Recommended Measures for Less Than Significant Impacts

The following measures are recommended by the Santa Barbara County APCD to reduce project-related construction emissions to the extent feasible. Implementation of the following measures will further reduce an already less than significant impact.

IMPACT AQ-2 Construction equipment emissions at the building site and off-site staging area would contribute to emissions of diesel particulate matter and other pollutants.

The following measures would reduce the Project's less than significant short-term emissions of diesel particulate matter and criteria pollutants:

AQ-2a. The following emission control measures have been recommended by the Santa Barbara County APCD. All of these measures should be implemented at the project site during construction.

1. Diesel equipment meeting the CARB Tier 3 or higher emission standards for off-road heavy-duty diesel engines should be used to the maximum extent feasible.

2. On-road heavy-duty equipment with model year 2010 engines or newer should be used to the maximum extent feasible.

3. Diesel powered equipment should be replaced by electric equipment whenever feasible.

4. Equipment/vehicles using alternative fuels, such as compressed natural gas (CNG), liquefied natural gas (LNG), propane or biodiesel, should be used on-site where feasible.

5. Catalytic converters shall be installed on gasoline-powered equipment, if feasible.

6. All construction equipment shall be maintained in tune per the manufacturer's specifications.

7. The engine size of construction equipment shall be the minimum practical size.

8. The number of construction equipment operating simultaneously shall be minimized through efficient management practices to ensure that the smallest practical number is operating at any one time.

9. Construction worker trips should be minimized by requiring carpooling and by providing for lunch onsite.

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
5.4 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 US Fish and Wildlife Service?	☐	☐	☐	✓	☐
c) Have a substantial adverse effect on state or federally protected wetlands (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?	☐	☐	✓	☐	☐

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
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?	☐	☐	☐	☐	✓

5.4.1 Setting

Vegetation. The project site is located near the center of the Main Campus and on-site vegetation is generally sparse and consists predominately of ornamental ground covers, shrubs and trees. Ground covers generally consist of two small grass areas, areas covered with wood chips, and an area in the northwest corner of the project site planted with ornamental jasmine. On-site shrubs include an area along the southeastern edge of the project site planted with pittosporum bushes, and several Indian hawthorn plants that are distributed through the site. A variety of native and ornamental trees are located on the project site. The on-site native trees were likely planted as landscape trees and include: two oak trees on the northwest corner of the project site near the Library building that are in poor health; four sycamore trees on the north side of the on-site bicycle path; and two sycamore trees on the south side of the on-site bicycle path. All of the oak and sycamore trees have trunk diameters that are greater than six inches measured at breast height. Two ornamental trees located on the project site that have trunks greater than six inches in diameter include a coast redwood tree that is near the northwest corner of the Psychology Building, and a multi-trunk New Zealand tea tree near Building 408. Other ornamental trees on the project site have trunk diameters less than six inches. No nests were observed in the trees located on the project site when they were surveyed in February, 2019.

The Project proposes to use a temporary construction material storage area located on the Storke Campus near the intersection of Los Carneros and Mesa Road. This site has previously been used for material storage, is extensively disturbed, and is devoid of vegetation. Proposed storage activities would occur at least 200 feet from of the Storke Wetlands, which are east and south of the staging area site; and at least 200 feet from the western extent of the Goleta Slough, which is north of the staging area site.

Sensitive Habitat. The 2010 LRDP identifies environmentally sensitive habitat areas located on the Main Campus: the bluffs adjacent to the Goleta Slough; the Campus Lagoon and the Lagoon Island; and Goleta Point, including tide pools, the ocean bluffs and the adjacent Campus beaches. Each of these sensitive habitat areas are at least 1,000 feet from the Classroom Building site.

Storm runoff from the Classroom Building project site is ultimately directed to the Campus Lagoon. The lagoon is a brackish pond located approximately 1,500 feet south of the project site. The Lagoon has a surface area of about 31 acres and its surface water elevation varies from four to seven feet above sea level. The Lagoon has three sources of water: direct rainfall, storm water drainage system discharges, and seawater pumped from the UCSB Marine Biotechnology Laboratory.

Wetland habitat located in the Storke Wetlands is also designated as environmentally sensitive habitat by the 2010 LRDP. In addition, wetlands associated with the Goleta Slough are also considered to be sensitive habitat. The proposed temporary staging area on the Storke Campus would be at least 200 feet from any wetland habitat area.

2010 LRDP Requirements. 2010 LRDP Policy ESH-28C states that when trees with the potential to provide habitat for raptors or other sensitive species are removed, mitigation for the removed the trees shall be provided consistent with the requirements of 2010 LRDP Appendix 2: Campus Tree Trimming and Removal Program. Section 2.4 (Tree Replacement Program and Mitigation) of Appendix 2 requires that removed native trees or breeding/nesting trees be replaced with a native tree species at a 3:1 ratio, and that removed ornamental trees be replaced at a ratio of 1:1 with a native or ornamental tree. These requirements apply to trees six inches or greater in diameter measured at breast height, and oak trees of any size.

5.4.2 Checklist Responses

a. *Would the project 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?*

The Classroom Building project site is located in an urbanized area near the center of the Main Campus. Therefore, there is no habitat on the site that is suited for most sensitive plant or animal species. Most of the landscaping on the project site is small or moderately sized and does not provide nesting habitat. However, several of the trees located on or near the project site could have the potential to serve as nesting or roosting habitat for raptors or migratory birds, although no nests were observed in the trees during surveys conducted in February 2019. As shown on 2010 LRDP Final EIR Figure F.2 (Historic and Current biological resources) no raptor nests were observed on or near the project site during surveys conducted during the preparation of the LRDP or the LRDP EIR. Trees located on the project site that may have the potential to provide nesting habitat include the two sycamore trees on the south side of the on-site bicycle path, two of the four sycamore trees located on the north side of the bicycle path (the other two sycamore trees have been pruned substantially and currently have a very small branch structure), and the on-site redwood tree.

The absence of foraging areas in the vicinity of the Classroom Building site and the extensive use of the project area by humans (i.e., classrooms, bikepaths, parking lots, roadways, etc.) further decreases the likelihood that trees on or near the project site are used by raptors for nesting. However, the removal of an active bird nest from the project site, or the disturbance of an active nest located adjacent to the project site, would be a violation of Fish and Game Code Section 3503 and would result in a significant impact. Potential impacts resulting from the removal or disturbance of an active bird nest can be **reduced to a less than significant level** by implementing proposed mitigation measures BIO-1a through 1c, which require that nest surveys be conducted prior to the start of construction operations.

The proposed temporary material storage area on the Storke Campus has previously been used for staging and material storage, is devoid of vegetation, and has no habitat value. Activities that would be conducted on the staging area would generally be limited to the occasional use of construction equipment to move material on and off of the site. Potential traffic, noise, and human presence impacts from these types of activities would be generally similar to existing conditions resulting from traffic on nearby roads (Los Carneros Road and Mesa Road), and the presence of the Storke Family Apartments to the west. Therefore, the temporary use of this area for material storage would result in **less than significant** impacts to sensitive wildlife that may use habitat in the nearby Storke Wetlands and Goleta Slough.

b. *Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?*

Direct Impacts. The Classroom Building Project site and the proposed Storke Campus temporary material storage site do not support riparian or other sensitive habitat. Therefore, the Project would have **no impact** related to the removal of riparian or other sensitive habitat areas.

Indirect Impacts. The Environmentally Sensitive Habitat Area (ESHA) areas located closest to the Classroom Building site are the bluff and beach areas approximately 1,000 feet to the east, and the Campus Lagoon which is approximately 1,500 feet to the south. The project site is separated from the bluff areas and Campus Lagoon by substantial distances and numerous buildings. Therefore, the Project would not have the potential to result in significant lighting, noise, increase human presence, or other similar indirect impacts to riparian habitat associated with the Campus Lagoon.

As described in IS/MND Section 5.10 (Hydrology and Water Quality) the Classroom Building Project would not substantially change the existing stormwater flows that are currently discharged from the site. In addition, the Project would be required to implement construction site water quality measures (i.e., a Stormwater Pollution Prevention Plan) and would not be a substantial short- or long-term source of pollutants that may significantly impact the quality of receiving waters. Therefore, the Project would result in **less than significant** water quality-related impacts to riparian habitat resources associated with the Campus Lagoon.

c. *Would the project have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?*

The Classroom Building Project site and the proposed Storke Campus temporary staging area do not support wetlands as defined by the California Coastal Commission or the U.S. Army Corps of Engineers.

As described in IS/MND Section 5.10 (Hydrology and Water Quality) the Classroom Building Project would not substantially change the existing stormwater flows that are currently discharged from the site. In addition, the Project would be required to implement construction site water quality measures (i.e., a Stormwater Pollution Prevention Plan) and would not be a substantial short- or long-term source of pollutants that may significantly impact the quality of receiving waters. Therefore, the Project would result in **less than significant** water quality-related impacts to wetland habitat associated with the Campus Lagoon.

The Storke Campus staging area would be located a minimum of 200 feet from wetland habitat associated with the Storke Wetlands and Goleta Slough. As described in response “b” above, the staging area would be required to implement standard construction site best management practices that would minimize the potential for short-term water quality impacts to receiving waters. At the conclusion of the construction project, the staging area would be removed and restored to existing conditions. Therefore, the potential for the staging area to result in significant indirect water quality-related impacts to the Storke Wetlands or the Goleta Slough would be **less than significant**.

d. *Would the project 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?*

The Classroom Building project site is located near the center of the Main Campus and is surrounded by urban development, including classrooms, parking lots and roadways. The project site does not provide habitat or vegetative cover that would facilitate its use by wildlife to travel through the project area or region. Similarly, the proposed Storke Campus temporary staging area does not provide habitat or vegetative cover that would facilitate wildlife movement, and the site would not be lit at night. Therefore, the Project would have **less than significant** wildlife movement impacts.

e. *Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?*

2010 LRDP Policy ESH-28c/LRDP Appendix 2: *Campus Tree Trimming and Removal Program*, applies to trees with a trunk diameter of six inches or greater and requires that impacted ornamental trees be replaced with a native tree at a 1:1 ratio, and that impacted native trees be replaced with a native tree at a 3:1 ratio. Ten trees are located on the project site that are subject to the requirements of Policy ESH-28: two sycamore trees on the south side of the on-site bicycle path; four sycamore trees on the north side of the bicycle path; the redwood tree near the Psychology Building; the multi-trunk New Zealand tea tree near Building 408; and the two oak trees near the Library, however, the two oak trees are in poor health. All trees located on the project site that were planted as mitigation for tree removal impacts resulting from the construction of the adjacent Bio Engineering building would be retained or relocated.

The Classroom Building Project would result in the removal of the two native sycamore trees on the side of the on-site bicycle path, and the non-native New Zealand tea tree located near Building 408. In accordance with the requirements of 2010 LRDP Policy ESH-28, the removed sycamore trees would be replaced with native trees at a 3:1 ratio, and the tea tree would be replaced at a 1:1 ratio. As depicted on Figure 2.3-1 (Site Plan) areas would be available on the project site (i.e., the proposed bicycle parking areas) to plant the required seven replacement trees.

The four sycamore trees on the north side of the existing bicycle path, the two on-site oak trees, and the on-site redwood tree would be retained, however, grading and construction activities would occur adjacent to each of those trees. These activities could result in modifications to the ground surface around the trees, such as the compaction of the ground surface, and/or excavations that may result in root damage. Such ground surface modifications would have the potential to adversely affect the long-term health of the trees, leading to the death and removal of additional on-site trees. Potential construction-related impacts to the on-site trees that are to be retained can be **reduced to a less than significant level** with the implementation of proposed mitigation BIO-2a, which requires the implementation of tree protection measures throughout the Project's construction period, and if necessary the replacement of trees that do not survive more than five years after the conclusion of project-related construction activities.

Please refer to Table 5.11-1 in the Land Use section of this IS/MND for an evaluation of the Classroom Building Project's consistency with other applicable biological resource protection policies of the 2010 LRDP. That analysis concludes that the Project would be consistent with applicable biological resource protection policies, or would be consistent with the implementation of proposed mitigation measures.

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?*

The Classroom Building project site is not included in any Habitat Conservation Plan or Natural Community Conservation Plan. Therefore, the Project would have **no impact** related to the implementation of such plans.

5.4.3 Mitigation Measures

Impacts Reduced to a Less Than Significant Level With Proposed Mitigation

Potential Project-related impacts to nesting birds and potential long-term impacts to trees that are to be retained on the project site can be reduced to a less than significant level with the implementation of the following mitigation measures.

IMPACT BIO-1 **Project-related construction activities have the potential to result in the removal or disturbance of active nests used by raptors and common bird species.**

BIO-1a. To avoid disturbance or loss of active bird nests during development of the proposed Project, all tree and vegetation disturbing activities shall be conducted between September 15 and February 15, outside of the typical nesting season.

BIO-1b. If tree or vegetation removal is determined to be necessary during the typical nesting season (February 15 to September 15), a nesting bird survey shall be conducted by a qualified biologist approximately one week prior to the proposed action. Surveys shall follow standard protocols as established by CDFW and/or CCC. If the biologist determines that a tree/shrub is being used for nesting at that time, disturbance shall be avoided until after the young have fledged from the nest and achieved independence. If no nesting is found to occur, tree removal can proceed.

BIO-1c. To avoid indirect disturbance of active bird nests by Project construction occurring within the typical nesting season, a qualified biologist shall be retained to conduct one or more pre-construction surveys per standard protocols approximately one week prior to construction, to determine presence/absence of active nests adjacent to the project site. The survey shall be conducted to detect any bird breeding or nesting behavior on the project site or within 500 feet for raptors and 300 feet for all other bird species. If no breeding or nesting activities are detected, noise-producing construction activities may proceed. If breeding/nesting activity is confirmed, work activities within 300 and/or 500 feet of the active nest(s) shall be delayed until the young birds have fledged and left the nest.

IMPACT BIO-2. Development of the Classroom Building Project has the potential to adversely affect the long-term health of the on-site trees that are to be retained and that have a trunk diameter of six inches or greater.

BIO-2a Prior to the start of Project-related grading activities, a tree protection plan shall be prepared for all on-site trees that are to be retained and that have a trunk diameter of six inches or greater. The plan requirements shall be depicted on the Project's grading and building plans. Tree protection measures shall be implemented throughout the Project's construction period and at minimum shall include the following measures.

1. Grading and building plans shall depict the on-site trees that are to be removed and that are to be retained.

2. Temporary protective fencing shall be installed at the perimeter of the tree protection zone prior to the start of ground disturbing activities, and shall be maintained in good condition throughout the duration of the construction project. The tree protection zone is defined as the area extending five feet from the outer edge of the tree's dripline. To the extent possible, construction activities, equipment, vehicles, and personnel shall remain outside of the tree protection zone.

3. If grading must occur within the tree protection zone, a certified arborist shall be present to monitor grading activities and provide guidance regarding minimizing impacts. If excavation must occur near the trees, all exposed roots greater than one inch in diameter shall be cut cleanly under the guidance of the arborist.

4. Soil, construction materials, and equipment shall not be stored within the tree protection zone.

5. Supplemental irrigation shall be provided around the on-site trees to be retained throughout the duration of construction to ensure soil moisture is maintained around the root zone. In lieu of installation of a temporary irrigation system,

supplemental irrigation can be provided using a water truck or similar method.

6. Where possible, permeable materials shall be used for paved surfaces near the trees to provide soil moisture.

7. All trees located with 25 feet of the proposed building shall be protected from paint and other similar materials.

8. Should any of the four sycamore trees or the redwood tree that are to be retained on the project site die within five years following completion of Project-related construction, the tree(s) shall be replaced with a native tree species. Required replacement trees shall be provided at a 3:1 ratio for the sycamore trees, and a 1:1 ratio for the on-site redwood tree. These tree replacement requirements are not applicable to the two on-site oak trees due to their poor health.

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
5.5 CULTURAL RESOURCES - Would the project:					
a) Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5?	☐	☐	☐	✓	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	☐	☐	✓	☐	☐
c) Disturb any human remains, including those interred outside of dedicated cemeteries?	☐	☐	✓	☐	☐

5.5.1 Setting

This section provides a brief summary of the cultural context of the project region and known archaeological resources in the project area. This information is from a report prepared by Applied EarthWorks, Inc., titled *Phase 1* and *Extended Phase 1 Archaeological Study for the University of California, Santa Barbara Classroom Building Project, Santa Barbara County, California* (March, 2019). This confidential report is on file with the UCSB Office of Campus Planning and Design and may be reviewed by appropriately qualified persons.

The UCSB Main Campus is within the historic territory of the Native American Indian group known as the Chumash. The Chumash occupied the region from San Luis Obispo County to Malibu Canyon on the coast, the four northern Channel Islands, and inland as far as the western edge of the San Joaquin Valley. The Chumash are subdivided into factions based on distinct dialects. The Goleta area is located within the historic territory of the Barbareño Chumash whose name is derived from the Mission with local jurisdiction, Santa Barbara. The Barbareño occupied the narrow coastal plain from Point Conception in Santa Barbara County to Punta Gorda in Ventura County.

As described by the 2010 LRDP EIR, nine archaeological sites have been identified on the Main Campus. Most of these sites are located along the northern border of the Campus near the Goleta Slough, and one site has been identified on the Campus Lagoon island. Most of the identified sites have suffered moderate to severe disturbance resulting from historic development activities that occurred before UCSB was established. These activities include the use of the campus site as a borrow area to obtain fill material that was used to construct what is now the Santa Barbara Airport, and the construction of World War II Marine Corps facilities.

The UCSB Long Range Development Plan Archaeological Resources Appendix describes a prehistoric archaeological site on the Main Campus that is east of the project site that contained human burials. In addition, prehistoric archaeological site CA-SBA-48 is located on the Main Campus northeast of the Project site. Given the proximity of the site containing human remains, the Project area is considered to be archaeologically sensitive.

UCSB was established at its present site in 1954 on the site of a former Marine Corps Air Station. The base was established in 1942 to provide training facilities for Marine pilots. By the end of World War II, the base encompassed 1,500 acres, including the area now occupied by the Santa Barbara Airport.

5.5.2 Checklist Responses

a. *Would the project cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5?*

Construction of the Classroom Building Project would require the removal of Temporary Building 408, which is a remnant of the Marine Corps Air Station that occupied the Main Campus during World War II. Buildings at the Air Station were constructed as a temporary installation to be used for the duration of the war, and the structures had utilitarian and standard military designs. Building 408 was constructed in 1942 on the Air Station as a barracks building.

A field inspection of the building confirmed that it has experienced interior alterations and the addition of an exterior (attached) garage, and currently functions as a laboratory, classroom, and office space. It retains varying degrees of integrity of materials, design, workmanship, and feeling; however, it lacks integrity of setting and association. While the war was a significant event that contributed to the broad patterns of California's history, the building itself is unremarkable and many similar examples were constructed and continue to exist at military bases throughout California. In addition, it cannot be associated with important individuals, does not embody distinctive characteristics of type or period of construction, or have the potential to yield information important to history. As a result, it was concluded that Building 408 is not an historical resource or eligible for listing in the California Register of Historic Resources (Applied EarthWorks, 2019).

b. *Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?*

Applied EarthWorks, Inc. completed background research, including a records search at the Central Coast Information Center of the California Historical Resources Information System, and coordinated with local Native Americans. In addition, a Phase 1 pedestrian archaeological survey and Extended Phase 1 mechanically excavated subsurface survey was conducted. Surface survey did not find any evidence of archaeological deposits. However, visibility was limited due to landscaping and pavement. As a result, five backhoe trenches were excavated across the Project site to a maximum depth of 10 feet to assess the potential for buried archaeological deposits. A Native American monitor was present at the project site when the Extended Phase 1 archaeological investigation was conducted.

No archaeological material or soils with the potential to contain archaeological deposits were encountered during survey and Extended Phase 1 excavations. Fill is present to approximately four feet deep, and trench profiles indicate that sediments that might have contained archaeological deposits have been removed. Sediments immediately below the fill are associated with a marine terrace formation that considerably predates human occupation.

The likelihood of encountering buried archaeological deposits in the Project area is considered low due to significant ground disturbance from past construction activities. However, due to the proximity of an archaeological site that contained human remains, the project area is considered to be archaeologically sensitive. Although unlikely, if previously undetected archaeological materials (such as shellfish fragments, flaked stone, bone, or other cultural material) are encountered during construction, the Project would have the potential to result in a significant impact to cultural resources. Although unlikely, this potentially significant impact can be **reduced to a less than significant level** by implementing the requirements of proposed mitigation measures CUL-1a through 1e.

The Storke Campus temporary staging area has been previously used for material storage and the ground surface of the site has been extensively disturbed. Therefore, it is very unlikely that the significant cultural resources remain on the ground surface of the staging area. Proposed storage activities would not require the excavation of any soil at the site, therefore, the use of this area would not have the potential to disturb cultural resources that may exist below the ground surface. Therefore, the use of the off-site staging area would result in **less than significant** cultural resource impacts.

c. *Would the project disturb any human remains, including those interred outside of dedicated cemeteries?*

As described in response "b" above, there is low potential for buried archaeological resources to be located at the project site. In the unlikely event that Native American or historic-period burials are encountered during project-related construction activities, a significant cultural resource impact would result. If human remains are encountered, the University will be responsible for complying with provisions of Public Resources Code Sections 5097.98 and 5097.99, and 7050.5 of the California Health and Safety Code, as amended by Assembly Bill 2641. With the implementation of regulatory requirements and proposed mitigation measures CUL-1a through 1e, potentially significant impacts to burial sites that may be located on the project site would be **reduced to a less than significant level**.

5.5.3 Mitigation Measures

Impacts Reduced to a Less Than Significant Level With Proposed Mitigation

Impacts to cultural resources that have the potential to result from the construction of the Classroom Building Project can be reduced to a less than significant level with the implementation of the following mitigation measures.

IMPACT CUL-1 **Ground disturbing activities at the Classroom Building Project site have the potential to result in significant impacts to cultural resources.**

CUL-1a. At the commencement of project construction, an archaeologist shall provide a brief cultural resources orientation to the construction crew on the types of prehistoric and/or historic resources that might become exposed during earth disturbing activities, and the steps to be taken in the event that such a find is encountered.

CUL-1b. An archaeologist and Native American monitor shall be retained to monitor initial site preparation activities conducted on the project site, such as the removal of existing paving, initial grading activities, and the ground disturbing removal of on-site trees.

CUL-1c. The archaeologist shall have the power to temporarily halt or redirect project construction in the event that potentially significant cultural resources are exposed. Based on monitoring observations and the actual extent of project disturbance, the archaeologist shall have the authority to refine the monitoring requirements as appropriate (i.e., change to spot checks, reduce or increase the area to be monitored) in consultation with the UCSB Office of Campus Planning and Design. Upon completion of the monitoring program a monitoring report shall be presented to the UCSB Office of Campus Planning and Design and to the Central Coast Information Center (CCIC).

CUL-1d. In the event that archaeological resources are unearthed during project construction, all earth disturbing work within the vicinity of the find must be temporarily suspended or redirected until an archaeologist has evaluated the nature and significance of the find. After the find has been appropriately mitigated, work in the area may resume. A Chumash representative should monitor any mitigation work associated with Native American cultural material.

CUL-1e. If human remains are unearthed, State Health and Safety Code Section 7050.5 requires that no further disturbance shall occur until the County Coroner has made the necessary findings as to origin and disposition pursuant to Public Resources Code Section 5097.98. If the remains are determined to be of Native American descent, the coroner has 24 hours to notify the Native American Heritage Commission. If avoidance of the remains is not feasible, they should be excavated and removed by a qualified archaeologist in the presence of the Most Likely Descendent. Repatriation of the exhumed remains and all associated items shall be conducted in accordance with the requirements of the California Native American Graves Protection and Repatriation Act (Health and Safety Code 8010-8011).

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
5.6 ENERGY - Would the project:					
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	☐	☐	✓	☐
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☐	✓	☐

5.6.1 Setting

Existing Conditions. Temporary Building 408 and night lighting along the on-site bicycle path are the only uses on the project site that require the use of energy. These facilities do not result in a substantial use of energy.

University Requirements. As described in IS/MND Section 5.8.1 (Greenhouse Gas Emissions) the UC Sustainable Practices Policy (2018) addresses a range of issue areas related to enhancing sustainable practices, including standards to reduce energy use in new buildings. In summary, the energy use reduction standards require that:

- New building projects be designed, constructed, and commissioned to outperform the California Building Code (CBC) energy-efficiency standards by at least 20 percent and strive to design, construct, and commission buildings that outperform CBC energy efficiency standards by 30% or more.
- All new buildings will achieve a USGBC LEED "Silver" certification at a minimum. All new buildings will strive to achieve certification at a LEED "Gold" rating or higher, whenever possible within the constraints of program needs and standard budget parameters.

5.6.1 Checklist Responses

a) *Would the project result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?*

See response below.

b) *Would the project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?*

The Classroom Building Project would implement a variety of design measures to achieve a LEED Gold rating and to comply with the University's Sustainable Practices Policy energy use standards. Examples of the Project's proposed design measures that would reduce the building's energy use include:

- The use of a light colored roofing material to reduce the cooling load of the building.
- A naturally ventilated atrium is to be included in the building design, which would reduce the amount of conditioned area in the building and reduce energy consumption.
- The building's cooling system would be connected to the campus chilled water loop, with one heat recovery chiller to handle heating loads.
- The indoor and outdoor lighting system would consist primarily of energy-efficient LED lighting fixtures.
- The outdoor lighting system would consist of dimmable LED full cutoff luminaires.
- Interior lighting control systems would include measures such as: all lighting would be shut off during unoccupied times; vacancy sensors would be provided in all classroom and secondary spaces to force lights off when occupancy is not detected; and daylight sensors would automatically dim lights in response to available daylight.

As proposed, the Project would implement energy use reduction measures consistent with adopted University standards. Electricity used by the Project would be provided by existing service connections located at or near the project site. The Project would not have a substantial long-term demand for electricity and would not adversely affect local or regional supplies. The project would not generate a substantial amount of traffic and would result in a minimal increase in fuel used by vehicles. Although the project would result in a short-term increase in energy and fuel use during construction, and a long-term increase in the use of energy, its energy use would not be inefficient, wasteful or unnecessary. In addition, the Project's energy use would be offset somewhat by the removal of Temporary Building 408. Therefore, the project would have **less than significant** energy use impacts.

5.6.3 Mitigation Measures

The Classroom Building Project would not result in significant energy impacts and no mitigation measures are required.

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
5.7 GEOLOGY AND SOILS - Would the project:					
a) Directly or indirectly cause 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?	☐	☐	☐	✓	☐

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect 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?	☐	☐	☐	☐	✓
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	✓	☐

5.7.1 Setting

Regional Setting. The UCSB Campus is located on a marine terrace that is south of the Santa Ynez Mountains and generally about 30-50 feet above sea level. Stream erosion over the past 10,000 years eroded the terrace to form a series of valleys, which have accumulated deposits of gravel, sand, silt, and clay. The underlying bedrock formations on the Campus include the Monterey, Sisquoc, Pico and Santa Barbara Formations.

Site Geology. The project site is a relatively small mostly undeveloped area located near the center of the Main Campus, and has an elevation that ranges between approximately 48 to 51 feet above sea level. Based on the materials encountered in the drill holes performed for this project and previous explorations, the primary geologic units at the site consist of undocumented artificial fill, undifferentiated terrace deposits, and Sisquoc Formation claystone and siltstone bedrock. (Fugro, 2018a).

Artificial fill material at the project site is primarily associated with landscaping and grading that likely occurred early in the development of the campus, underground utilities, miscellaneous improvements, and demolition activities. The fill soils are generally less than 5 feet thick. Terrace deposits and alluvium are present at the site and underlie the existing fill materials. The undifferentiated terrace deposits generally consist of medium dense to dense silty sand. The contact between the terrace deposits and the underling bedrock is about 14 to 16 feet below the ground surface. Sisquoc Formation bedrock is below the terrace deposits and consists of moderately to slightly weathered claystone and clayey siltstone.

Groundwater Conditions. Groundwater at the Main Campus is generally present within the granular terrace deposits and consists of a zone of groundwater that is perched on the underlying Sisquoc Formation. The height of perched water varies from location and may vary seasonally. Groundwater conditions encountered during the subsurface explorations performed at the project site were generally consistent with conditions found on the Main Campus, with groundwater encountered at depths ranging from about 10 to 14 feet below the ground surface.

Faulting and Seismicity. The UCSB campus is located in a seismically active region that has experienced moderate to large earthquakes during historic times. The faults closest to the campus with reported historic seismic activity are offshore faults in the Santa Barbara Channel. These faults have generated earthquakes of magnitude (M) 6.3 in 1925, M5.5 in 1926, M6.0 in 1941, M5.2 in 1968, and M5.1 in 1978. The epicenters of these earthquakes were reportedly located approximately 5 to 10 miles south of the Santa Barbara coast. The project region has also experienced strong ground motion from the 1812, 1857, 1906, 1934, 1952 and 1966 earthquakes along the San Andreas fault.

Major faults located near the Main Campus include the More Ranch fault system, and the offshore Coal Oil Point and Goleta Point faults. The south branch of the More Ranch fault is approximately 2,400 feet north of the project site, and the Coal Oil Point and Goleta Point faults are approximately 3,000 feet to the south and 2,000 feet to the east of the project site respectively. The general locations of major faults near the Main Campus are depicted on Figure 5.6-1.

A fault known as the Campus fault has been mapped on the Main Campus as extending from a location north of the Main Campus to an area near the Humanities and Social Sciences Building (UCSB, 2010). Previous investigations have mapped the Campus Fault as being located at various locations within a corridor approximately 150 feet wide. Fugro (2018a) reported that based on the results of recent studies, the Campus fault is located 1,000 to 1,300 feet north-northeast of the Classroom Building Project site. A recent fault screening investigation conducted for the Project (Fugro, 2018b) concluded that the potential for faulting associated with the Campus fault "is low and consistent with published geologic mapping."

Liquefaction. Liquefaction is the loss of soil strength caused by earthquake-generated ground shaking. Liquefaction typically occurs in loose, saturated granular soil. Liquefaction is generally not considered to be a significant concern if onsite soils have a high clay content, consist of dense granular soils, or if groundwater is not present within the upper 40 to 50 feet. The degree of liquefaction susceptibility at a specific location will be dependent upon a variety of factors, including; groundwater must be present within the potentially liquefiable zone; potentially liquefiable soil must have certain grain size and other characteristics; and potentially liquefiable soil must be of low to moderate relative density.

An evaluation of liquefaction potential was conducted for the Classroom Building project site (Fugro, 2018a). That evaluation estimated that potential settlement-related consequences of liquefaction occurring in the terrace deposits below the perched groundwater level (if left in-place or untreated) could consist of total settlements of about 0.5 inch to one inch. Liquefaction of the artificial fill encountered in on-site boreholes could result in settlements of about six inches or greater.

Slope Stability. The project site is level and over 1,000 feet from the bluff east of Lagoon Road. The potential for slope stability-related impacts at the project site is very low.

2010 LRDP Requirements. 2010 LRDP Policy GEO-01 requires that new development on the UCSB Campus be supported by geotechnical and soil studies prepared by a California-licensed geologist or geotechnical engineer. The purpose of the studies is to determine technical requirements for adequate building foundation and infrastructure designs.

5.7.2 Checklist Responses

a. *Would the project directly or indirectly cause 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.*

There are no Alquist-Priolo zoned faults in the project region.

There are no known faults located on or adjacent to the Classroom Building project site. The south branch of the More Ranch fault is approximately 2,400 feet north of the project site; the Coal Oil Point and Goleta Point faults are approximately 3,000 feet south and 2,000 feet east of the project site respectively; and the project site is approximately 1,000 to 1,300 feet south of the Campus fault. Therefore, there is a low potential for ground rupture impact to affect the Project and potential fault-related impact are **less than significant.**

ii) *Strong seismic ground shaking?*

It is likely that the Classroom Building Project will experience strong ground shaking sometime during the life of the Project. Potentially significant earthquake-related ground shaking may result from movement along a local fault or a major earthquake along a more distant fault. Similar to other development that has occurred on the UCSB Campus and in the project region, potential ground shaking-related impacts to the proposed structure and Project-related infrastructure can be reduced to a less than significant level by conducting project-specific geotechnical investigations, using foundation and building design measures recommended by engineering evaluations, and compliance with applicable regulations and design standards.

A geotechnical engineering report prepared for the Project (Fugro, 2018a) includes seismic design criteria as required by the California Building Code. With the implementation of building code requirements and site-specific design recommendations as required by 2010 LRDP Policy GEO-1, potential ground shaking impacts would be **less than significant** and no mitigation measures are required.

iii) Seismic-related ground failure, including liquefaction?

An evaluation of the potential for liquefaction to occur at the project site (Fugro, 2018a) concluded that the on-site terrace deposits generally have a low potential for liquefaction based on the evaluation parameters and groundwater depth ranges assumed in the analyses. However, the analyses indicate that liquefaction could occur in the silty sand terrace deposits at a depth of 13 feet at one project site bore hole location. In addition to the potential for localized liquefaction to occur in the terrace deposits, the artificial fill soils encountered in portions of the project site are very loose and susceptible to liquefaction. As described in Section 5.7.1, terrace deposits below the perched groundwater level (if left in-place or untreated) could consist of total settlements of about 0.5 to one inch. Liquefaction of the artificial fill encountered in on-site boreholes could result in settlements of about six inches or greater.

Preliminary design recommendations for the proposed building foundation have been identified and final geotechnical engineering recommendations would be prepared after the preferred foundation system has been identified. Potential design options may include the excavation and removal of unsuitable soils beneath the building footprint, or the use of cast-in-drill-hole piles that extend to competent bedrock. With the implementation of final design and construction recommendations, as required by the California Building Code and 2010 LRDP Policy GEO-1, potential ground failure impacts would be **less than significant** and no mitigation measures are required.

iv) Landslides

The Classroom Building project site is level, and there are no slopes located on or adjacent to the site that would have the potential to result in significant slope stability impacts. The implementation of standard construction site safety measures would minimize potential excavation-related impacts to a **less than significant** level.

b. *Would the project result in substantial soil erosion or the loss of topsoil?*

Short-Term Impacts. Potential erosion and sedimentation impacts that could be caused by the Classroom Building Project would result primarily from short-term ground disturbing construction activities. The amount of grading that would occur on the project site would vary depending upon the type of foundation system used. The use of cast-in-drill-hole piles would require only minor site grading for foundation preparation, however, the use of a slab on grade foundation would require that unconsolidated fill material beneath the proposed building foot print be removed. The use of a slab on grade foundation would require the excavation of soils beneath the proposed building to a depth of approximately 15 feet and the removal of approximately 13,900 cubic yards of soil. The excavated soil would be replaced with suitable imported soil. The project site drains to the Campus Lagoon, which supports sensitive aquatic and upland habitats. Therefore, the discharge of sediment from the project site would have the potential to result in significant environmental impacts.

Construction sites over one acre in area are required to prepare and implement a Storm Water Pollution Prevention Plan (SWPPP) that has been prepared in accordance with the requirements of statewide general NPDES permit for stormwater discharges from construction sites, and that has been reviewed and approved by the Regional Water Quality Control Board. The primary objective of the SWPPP is to identify, implement and maintain appropriate best management practices to reduce or eliminate pollutants in stormwater discharges and authorized non-stormwater discharges from construction sites.

The project site is approximately 2.4 acres in size, therefore, UCSB would be required to file a Notice of Intent to comply with the National Pollutant Discharge Elimination System (NPDES) General Construction Permit, and to develop and implement a site-specific Storm Water Pollution Prevention Plan (SWPPP) prior to the start of ground disturbing activities. The proposed Storke Campus temporary staging area would not result in any ground disturbing activities, however, this area would be part of the proposed Project and would be covered by the Project's SWPPP. The primary objective of the SWPPP is to identify, implement and maintain appropriate best management practices to reduce or eliminate pollutants in stormwater discharges and authorized non-stormwater discharges from construction sites. Policies of the 2010 LRDP also require the implementation of erosion control best management practices at construction sites, and the Project's consistency with those policies are evaluated in Section 5.11 (Land Use) of this IS/MND. With the implementation of existing regulatory and policy requirements, the Project would result in **less than significant** short-term erosion impacts and no mitigation measures are required.

Long-Term Impacts. Upon the completion of construction activities, the Classroom Building Project site would be landscaped or covered with non-erosive surfaces. Material storage operations at the Storke Campus site would be discontinued and the site would be returned to a condition similar to existing conditions. Therefore, the Project would not be a significant long-term source of sediment discharges.

c. *Would the project 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?*

As described in subsection "a" above, in compliance with 2010 LRDP policies and building code regulations, a project-specific geotechnical evaluation has been prepared for the project. The implementation of building foundation design and construction recommendations identified in the geotechnical report would ensure that potential Project-related soil hazard and slope stability impacts are **less than significant**.

d. *Would the project be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?*

The geotechnical evaluation prepared for the Project (Fugro, 2018a) concluded that on the basis of laboratory testing, visual inspection, and past exploration data, the terrace deposit materials at the project site generally have a low expansion potential. The Sisquoc Formation bedrock materials at the project site should be considered to have a moderate to high potential for expansion. As a result, the geotechnical report prepared for the project recommends that earth materials derived from the Sisquoc Formation not be used as fill (including landscape fill) for the project. The implementation of building foundation design and construction recommendations identified by the geotechnical report would ensure that potential project-related soil hazard impacts are **less than significant**.

e. *Would the project have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?*

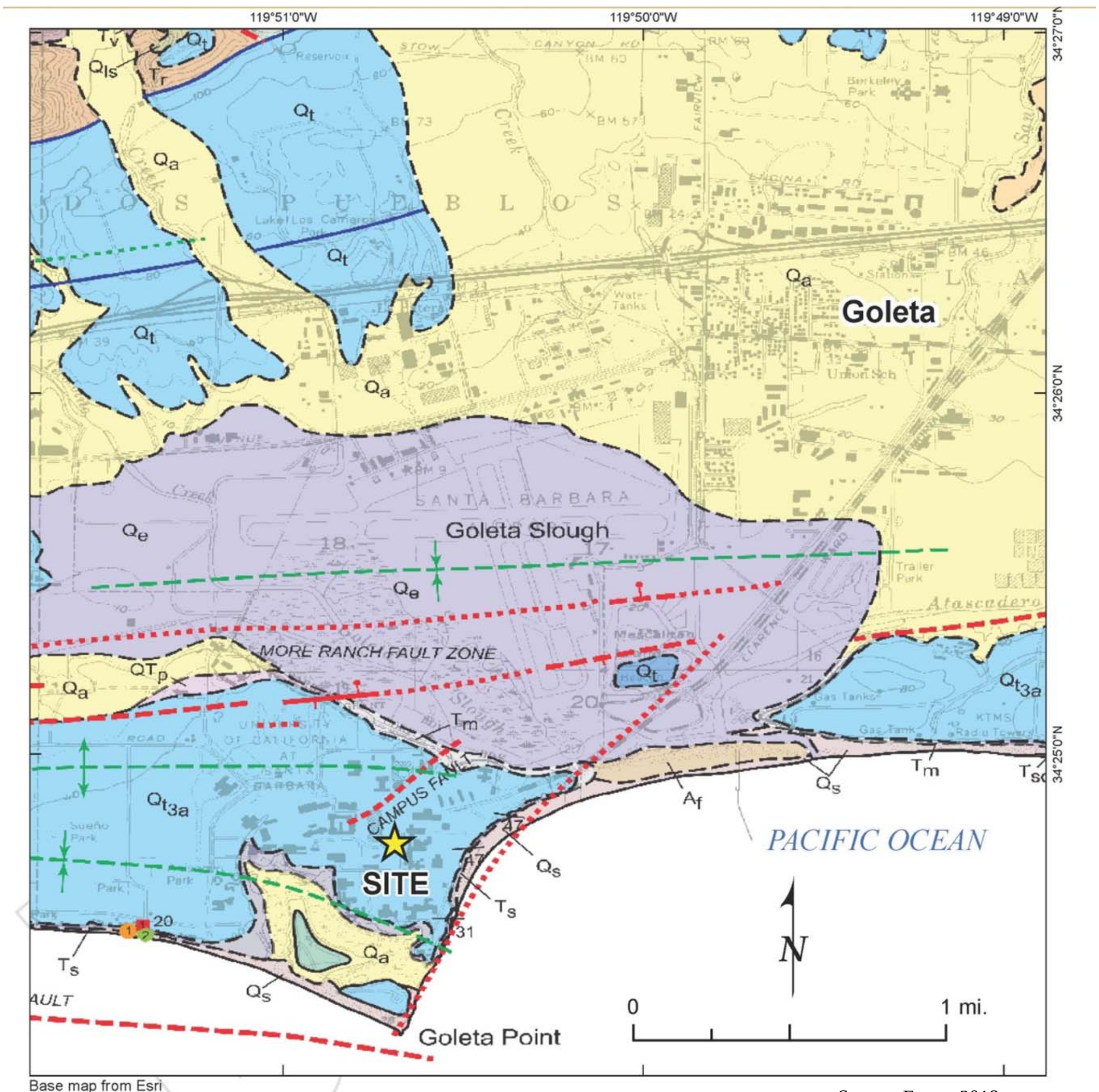
The Classroom Building Project would not rely on the use of septic tanks for waste water disposal. Therefore, the Project would have a **no impact** associated with the use of septic systems.

f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Although marine fossils are present in the project region, previous development on the UCSB campus has not encountered unique paleontological resources and it is not likely that significant paleontological resources would be impacted by project site. There are no unique geological features located on or adjacent to the project site. Therefore, the project would have a **less than significant** impact on paleontological resources or unique geological features.

5.7.3 Mitigation Measures

The Classroom Building Project would not result in significant geology or soils impacts and no mitigation measures are required.



Source: Fugro, 2018

Legend

Af	Artificial fill	Tm	Monterey Formation		Marine terrace shoreline or strand
Qa	Alluvium	Tr	Rincon Formation		Geologic contact
Qe	Estuarine Deposits	Ts	Sespe Formation	35	Strike and dip of inclined beds
Qls	Landslide Deposits				Anticline
Qt3a	Marine Terrace Deposits				Syncline

University of California, Santa Barbara

Classroom Building Project

Figure 5.7-1

Regional Geologic Map

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
5.8 GREENHOUSE GAS EMISSIONS – 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?	☐	☐	☐	✓	☐

5.8.1 Setting

Causes and Effects of Climate Change. Climate change is the observed increase in the average temperature of the Earth's atmosphere and oceans along with other substantial changes in climate (such as wind patterns, precipitation, and storms) over an extended period of time. The term "climate change" is often used interchangeably with the term "global warming," but "climate change" is preferred because it indicates that there are other related effects in addition to rising temperatures. The baseline against which these changes are measured originates in historical records identifying temperature changes that have occurred in the past, such as during previous ice ages. The global climate is continuously changing, as evidenced by repeated episodes of substantial warming and cooling documented in the geologic record. The rate of change has typically been incremental, with warming or cooling trends occurring over the course of thousands of years. The past 10,000 years have been marked by a period of incremental warming, as glaciers have steadily retreated across the globe. However, scientists have observed acceleration in the rate of warming during the past 150 years. As reported by the United Nations Intergovernmental Panel on Climate Change (IPCC, 2013), the understanding of anthropogenic warming and cooling influences on climate has led to a high confidence that the global average net effect of human activities since 1750 has been one of warming. The prevailing scientific opinion on climate change is that most of the observed increase in global average temperatures since the mid-20th century is likely due to the observed increase in anthropogenic greenhouse gas (GHG) concentrations (IPCC, 2013).

Gases that absorb and re-emit infrared radiation in the atmosphere are called greenhouse gases (GHGs). GHGs are 1) present in the atmosphere naturally, 2) are released by natural sources, or 3) are formed from secondary reactions taking place in the atmosphere. The gases that are widely seen as the principal contributors to human-induced climate change include carbon dioxide (CO_2), methane (CH_4), nitrous oxides (N_2O), fluorinated gases such as hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs), and sulfur hexafluoride (SF6). Water vapor is excluded from the list of GHGs because it is short-lived in the atmosphere and its atmospheric concentrations are largely determined by natural processes, such as oceanic evaporation.

GHGs are emitted by both natural processes and human activities. Of these gases, CO_2 and CH_4 are emitted in the greatest quantities from human activities. Emissions of CO_2 are largely by-products of fossil fuel combustion, whereas CH_4 results from off-gassing associated with agricultural practices and landfills. Man-made GHGs, many of which have greater heat-absorption potential than CO_2, include fluorinated gases and sulfur hexafluoride (SF_6). Different types of GHGs have varying global warming potentials (GWPs). The GWP of a GHG is the potential of a gas or aerosol to trap heat in the atmosphere over a specified timescale (generally, 100 years). Because GHGs absorb different amounts of heat, a common reference gas (CO_2) is used to relate the amount of heat absorbed to the amount of the gas emissions, referred to as "carbon dioxide equivalent" (CO_2E), and is the amount of a GHG emitted multiplied by its GWP. Carbon dioxide has a GWP of one. By contrast, CH_4 has a GWP of 21, meaning its global warming effect is 21 times greater than carbon dioxide on a molecule per molecule basis.

There is a substantial body of scientific evidence that climate change is occurring due to an increase in the concentration of greenhouse gases in the Earth's atmosphere. California's Fourth Climate Change Assessment (2018) summarizes the current understanding of climate impacts in California. The Assessment concludes that there is very high scientific confidence that temperatures in the State are warming and snow pack is declining; and there is very high scientific evidence that sea levels are rising. There is also medium-high confidence that the number of heavy precipitation events, the occurrence of drought, and area burned by wildfire is increasing.

Estimates of future sea level elevations vary considerably based on assumptions regarding greenhouse gas emission control effectiveness and other factors. The *California Coastal Commission Sea Level Rise Policy Guidance* (2015) document recommends using sea level rise estimates prepared by the National Research Council. Those estimates predict that for most of California, sea level will rise two to 12 inches by 2030; five to 24 inches by 2050; and 17 to 66 inches by 2100. Short-term increases in sea level due to large storms are likely to be of greater concern to coastal infrastructure and development in coastal areas over the next several decades than long-term sea level rise rates (California, 2010).

Regulatory Framework

A brief summary of some of the legislation that addresses both climate change and greenhouse gas emissions is provided below.

International Authority. The foremost international climate change initiative is the United Nations Framework Convention on Climate Change (UNFCCC), commonly known as the Kyoto Protocol. Signed on March 21, 1994, the Kyoto Protocol calls for governments to gather and share information on GHG emissions, national policies, and best practices; launch national strategies for addressing GHG emissions and adapting to expected impacts, including the provision of financial and technological support to developing countries; and cooperate in preparing for adaptation to the impacts of climate change. There have been several international summits since Kyoto, that seek to advance climate change goals and programs.

At the 2015 United Nations Climate Change Conference in Paris, a global agreement was initiated that represented a consensus of the representatives of the 196 parties in attendance. On April 22, 2016 (Earth Day), 174 countries signed the Paris Agreement in New York, and began adopting it within their own legal systems. As of November 2016, 193 United Nations Climate Change Conference members have signed the agreement, 114 of which have ratified it.

Federal Authority. On September 22, 2009, the USEPA released its final GHG Reporting Rule (Reporting Rule), in response to the fiscal year 2008 Consolidated Appropriations Act (H.R. 2764; Public Law 110-161) that required the USEPA to develop "… mandatory reporting of GHGs above appropriate thresholds in all sectors of the economy". The Reporting Rule applies to most entities that emit 25,000 metric tons (MT) CO_2E or more per year. On September 30, 2011, facility owners were required to submit an annual GHG emissions report with detailed calculations of facility GHG emissions. The Reporting Rule mandates recordkeeping and administrative requirements for the USEPA to verify annual GHG emissions reports but does not regulate GHG as a pollutant.

The Clean Air Act defines the USEPA's responsibilities for protecting and improving the nation's air quality and the stratospheric ozone layer. On May 13, 2010, USEPA set greenhouse gas emissions thresholds to define when permits under the New Source Review Prevention of Significant Deterioration and Title V Operating Permit programs are required for new and existing industrial facilities. This final rule "tailors" the requirements of these CAA permitting programs to limit covered facilities to the nation's largest greenhouse gas emitters: power plants, refineries, and cement production facilities.

California Regulations and Programs. California climate change regulations most applicable to the proposed project are summarized below.

Executive Order S-3-05. This Executive Order provides that by 2010, emissions of greenhouse gases shall be reduced to 2000 levels; by 2020, emissions shall be reduced to 1990 levels; and by 2050, emissions shall be reduced to 80 percent of 1990 levels.

Assembly Bill 32. The California Global Warming Solutions Act of 2006 (AB 32) requires the California Air Resources Board to adopt regulations to evaluate statewide greenhouse gas emissions, and then create a program and emission caps to limit statewide emissions to 1990 levels. The program is to be implemented in a manner that achieves emissions compliance by 2020. AB 32 did not directly amend CEQA or other environmental laws, but it did acknowledge that emissions of greenhouse gases cause significant adverse impacts to human health and the environment.

Senate Bill (SB) 97. Signed in August 2007, this bill acknowledged that climate change is an environmental issue that requires analysis in California Environmental Quality Act (CEQA) documents. In March 2010, the California Resources Agency (Resources Agency) adopted amendments to the State CEQA Guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions. The adopted guidelines give lead agencies the discretion to set quantitative or qualitative thresholds for the assessment and mitigation of GHGs and climate change impacts.

Executive Order B-30-15. This order was signed by Governor Brown in April 2015 and established a greenhouse gas reduction target of 40 percent below 1990 levels by 2030. The order also directed state agencies with jurisdiction of greenhouse has emission sources to implement measures to achieve the interim 2030 goal, as well as the existing 2050 goal established by Executive Order S-3-05.

Senate Bill 32. This bill was signed in 2016 and established a greenhouse gas emissions reductions target of at least 40 percent below 1990 levels by 2030.

Executive Order B-55-18. This executive order established a statewide goal to achieve carbon neutrality as soon as possible and no later than 2045.

Scoping Plans. In June 2008, the California Air Resources Board (CARB) developed a Draft Scoping Plan for Climate Change, pursuant to AB-32. The Scoping Plan was approved on December 12, 2008. The Scoping Plan proposed a comprehensive set of actions designed to reduce overall carbon emissions in California, improve our environment, reduce dependence on oil, diversify energy sources, save energy, and enhance public health while creating new jobs and enhancing the growth in California’s economy. The Climate Change Scoping Plan was updated in May 2014, and confirmed that California is on target for meeting the 2020 greenhouse gas emissions reduction goal. On December 14, 2017, CARB approved the 2017 Final Scoping Plan Update. The Plan outlines CARB's programs to achieve a 40 percent reduction in greenhouse gas emissions from 1990 levels by 2030, as required by the passage of SB 32 in 2017.

<u>UCSB and University of California Programs.</u> Climate change programs implemented by UCSB and the University of California are summarized below.

2016 Draft Climate Action Plan**.** UCSB approved its first Climate Action Plan (CAP) in 2009 based on GHG emissions data gathered during calendar year 2007. The 2009 CAP included emissions data and addressed mitigation strategies for scope 1 emissions (direct emissions: on-site natural gas, diesel and propane combustion; campus fleet emissions; marine vessel and fugitive emissions) and scope 2 emissions (indirect emissions: purchased electricity). The 2012 UCSB CAP included scope 1 and 2 emission, and also included data and mitigation strategies for scope 3 emissions (university-funded business air travel and student, staff, and faculty commuting). The 2014 Climate Action Plan quantified and analyzed UCSB's current, historical, and projected emissions and evaluated the campus' progress toward meeting reduction targets in years 2020 and 2050. Planned and conceptual climate change mitigation strategies outlined in 2014 CAP demonstrated UCSB's ability to achieve a 1990 greenhouse gas emission level (90,736 MT CO2e) by 2020 as the campus building stock and population continue to grow as projected by the 2010 LRDP.

The 2016 Draft CAP includes greenhouse gas emissions inventory results through calendar year 2015, mitigation strategies for additional emission reductions, and revised emissions forecasts. The total 2015 greenhouse gas emissions were estimated to be 70,446 MT CO2e, compared to 2012 greenhouse gas emissions of 91,596 MT CO2e. UCSB emissions fell below the 2020 reduction target in both calendar years 2014 and 2015. The 2016 Draft CAP also includes the goals of carbon neutrality by 2025 for scope 1 and 2 emissions, and complete carbon neutrality by 2050.

Emission reduction strategies identified by the 2016 CAP include: energy efficiency, including the use of on-site solar power generation in new construction; fleet fuel use reductions; procurement of biogas; behavioral changes related to construction and conservation; reduced commuter emissions; and reduced air travel. The CAP forecasts annual emission reductions of 22,788 MT CO2e resulting from the identified emission reduction measures.

UC Sustainable Practices Policy (2018). The University of California has adopted a policy program to minimize its impact on the environment and to reduce its dependence on non-renewable energy. The policy addresses a range of issue areas related to enhancing sustainable practices, including:

- Green Building Design
- Clean Energy
- Climate Protection
- Sustainable Transportation
- Sustainable Building Operations for Campuses
- Zero Waste
- Sustainable Procurement
- Sustainable Foodservices
- Sustainable Water Systems
- Sustainability at UC Health

The Green Building Design practices require new buildings to outperform the California Building Code energy-efficiency standards by at least 20 percent and should strive for 30 percent or more. New buildings are to achieve a minimum LEED certification of "Silver" and strive to achieve "Gold" or higher. Laboratory space in new buildings also shall meet at least the prerequisites of the Labs 21 Environmental Performance Criteria. The Clean Energy practices state that each UC campus will reduce energy use intensity by an average of at least two percent annually, and will install on-site renewable electricity supplies and energy storage systems whenever cost-effective and/or supportive of the campus Climate Action Plan or other goals. The Sustainable Transportation practices indicate that the University will implement transportation programs and greenhouse has emission reduction strategies that reduce the environmental impacts from commuting, fleet and business air travel. The Climate Protection practices state that each campus will develop strategies to meet the following goals: climate neutrality from scope 1 and 2 sources by 2025; climate neutrality from specific scope 3 sources by 2050 or sooner; and reduced greenhouse gas emissions to 1990 levels by 2020.

Campus Sustainability Plan. The 2015/2016 Campus Sustainability Plan describes major sustainability programs and actions to be implemented by UCSB. Eleven functional areas have been identified, including:

- Community Engagement and Partnerships
- Student Leaders
- Academics
- Built Environment
- Communication
- Energy and Climate
- Food
- Laboratory Spaces
- Landscape and Biotic Environment
- Procurement
- Transportation
- Waste
- Water

Various campus groups have developed a series of recommendations, goals, objectives and benchmarks to be implemented over short-, mid-, and long-term periods.

5.8.2 Impact Significance Thresholds

Neither the CEQA Guidelines nor UCSB has established a quantitative threshold of significance for greenhouse gas emission impacts. The Santa Barbara Air Pollution Control District (SBAPCD) has not adopted greenhouse gas CEQA significance thresholds for land use development projects, but has adopted thresholds for stationary source projects (i.e., projects with processes and equipment that require an APCD permit to operate). The SBAPCD Environmental Review Guidelines (2015) indicate that stationary source projects emitting less than the screening significance level of 10,000 MT CO2e will not have a significant greenhouse gas impact.

Santa Barbara County has in the past used a numeric threshold adopted by the Bay Area Air Quality Management District (BAAQMD) to determine the significance of greenhouse gas emissions for land use development projects. The BAAQMD threshold defines land use projects as residential, commercial, industrial, and public land uses and facilities. The numeric threshold of significance adopted by the BAAQMD is 1,110 MT CO2e/year (BAAQMD, 2017). In considering the use of the BAAQMD threshold, Santa Barbara County determined that Santa Barbara is similar to certain Bay Area counties (in particular, Sonoma and Solano) in terms of population growth, land use patterns, General Plan policies, and average commute patterns and times. Because of these similarities, the methodology used by BAAQMD to develop its greenhouse gas emission significance thresholds, as well as the thresholds themselves, have applicability to Santa Barbara County (Santa Barbara County, 2010). Santa Barbara County's evaluation of the BAAQMD threshold and its applicability to the County is attached to this IS/MND as Appendix D.

Santa Barbara, Sonoma and Solano Counties continue to have similar characteristics. For example, in 2010 Santa Barbara County had a population of 434,481, and in 2018 had a population of 453,457, an increase of approximately four percent. In 2010 Solano County had a population of 427, 837 and its 2018 population was 439,793, an increase of approximately three percent. Sonoma County had a 2010 population of 493,285 and a 2018 population of 503,332, an increase of approximately two percent. Based on the similar characteristics of the three counties, the BAAQMD greenhouse gas significance threshold of 1,110 MT CO2e/year is still considered to be applicable to Santa Barbara County and the proposed Project, which is located in the County.

For the purpose of analysis, Project-related construction emissions are amortized over the life of the Project, which has been assumed to be 30 years.

5.8.3 Checklist Responses

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

Construction Emissions. Project construction would begin in 2021 and occur over a period of approximately 26 months. To estimate Project-related construction emissions, the CalEEMod v.2016.3.2 computer model was used and the analysis results are summarized on Table 5.8-1. Based on the CalEEMod results, construction activities for the Classroom Building Project would generate an estimated 771 metric tons of carbon dioxide equivalents. When amortized over a 30-year period (the assumed minimum lifetime of the project), construction of the Project would generate an equivalent of approximately 25.7 metric tons of CO_2E per year.

Table 5.8-1
Estimated Construction Emissions of Greenhouse Gases

Year	Annual Emissions			
	Carbon Dioxide (tons CO_2)	**Methane (tons CH_4)**	**Nitrous Oxide (tons N_2O)**	**Carbon Dioxide Equivalent (metric tons CO_2E)**
2021	461	0.07	0.0	462
2022	301	0.05	0.0	302
2023	7	<0.1	0.1	7
			Total	**771 metric tons CO_2E**
			Amortized over 30 years	**25.7 metric tons CO_2E/year**

Source: CalEEMod 2016.3.2

Operation Emissions. Table 5.7-8 depicts the estimated operation-related emissions of greenhouse gases that would result from the Classroom Building Project.

Table 5.8-2
Annual Operation-Related Emissions of Greenhouse Gases

Emission Source	Annual Emissions			
	Carbon Dioxide (tons CO_2)	**Methane (tons CH_4)**	**Nitrous Oxide (tons N_2O)**	**Carbon Dioxide Equivalent (CO_2E)**
Area	0.0	0	0	0.0
Energy	438	0.02	<0.1	259
Water	6.8	<0.1	<0.1	7.6
			Total On-Site Operational Emissions	**266.6 metric tons CO_2E**

Source: CalEEMod 2016.3.2

Emissions from Mobile Sources. The Classroom Building Project would not result in an increase in the number of students, faculty, or staff located on the UCSB campus. Therefore, it is not expected that the Project would generate any additional traffic. Any indirect increase in existing traffic conditions that may result from the Project would be minor and would not be a substantial source of greenhouse gas emissions

Combined Construction, Operation, and Mobile Source Emissions. Table 5.8-3 combines the construction and operation greenhouse gas emissions that would result from the Classroom Building Project.

Table 5.8-3
Combined Annual Emissions of Greenhouse Gases

Emission Source	Annual Emissions (metric tons CO_2E)
Construction	25.7
Operation	266.6
Mobile	0
Total Project Emissions	**292.3**

Source: CalEEMod 2016.3.2

As shown in Table 5.8-3, Project-related emissions of greenhouse gases would total approximately 292.3 metric tons per year of CO_2E, which would not exceed the 1,100 metric tons CO_2E/year threshold of significance. Actual CO_2E emissions could be substantially less because the Project would implement design measures that would substantially reduce its energy and water use. Therefore, Project-related greenhouse gas emissions would not exceed the significance criterion and would result in a **less than significant** impact.

Other Climate Change Effects. The effects of global climate change may result in an increase in sea level, more frequent and severe floods, and an increase in wildfire hazards. The Classroom Building project site is approximately 50 feet above sea level, therefore, a rise in sea level of up to 66 inches by the year 2100 would not result in adverse direct effects to the project site. As described in Section 5.10 (Hydrology and Water Quality) of this IS/MND, the project site is not located within a 100-year floodplain and the nearest designated floodplain areas are adjacent to the Campus Lagoon approximately 1,500 feet south of the project site. Due to the elevation of the Project site an increase in the severity of flood events would not result in significant flooding-related impacts.

The proposed Storke Campus temporary staging area site is approximately seven feet above sea level. Due to its low elevation and proximity to the Goleta Slough the site could be affected by future increases in sea level. However, proposed staging activities would be a short-term (approximately two years) activity that would not be adversely affected by sea level rise-related impacts. In addition, due to its inland location the site would not be significantly affected by increased storm surge impacts.

High fire hazard areas are generally located in areas with steep slopes and extensive areas of highly flammable native or other fire-prone vegetation. As described in IS/MND Section 5.20 (Wildfire) the Classroom Building Project site and the proposed Storke Campus staging area are not located in a high fire hazard area. Therefore, the Project would not attract additional people to an area that may be adversely affected by a climate change-related increase in wildfires. In conclusion, the Classroom Building Project would not be significantly impacted by climate change-induced increases in sea level, flooding, or wildfire events. Therefore, these effects of global climate change would have **less than significant** impact on the Project.

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

The UCSB 2016 Draft Climate Action Plan outlines measures to reduce campus-related emissions of greenhouse gases. Measures identified by the Climate Action Plan most applicable to the Project are requirements for energy efficiency that would reduce energy use in new buildings. The Classroom Building Project would be consistent with this measure because its design would outperform the Title 24 California Building Energy Efficiency Standards by at least 20 percent, and the building would be designed to achieve a minimum LEED certification of "Gold." Design measures proposed by the project to achieve energy efficiency objectives include providing various passive cooling, ventilation and lighting mechanisms, and using heat pumps for space heating and cooling. Therefore, the Classroom Building Project would be consistent with applicable provisions of adopted plans and policies that are intended to reduce greenhouse gas emissions, and the Project's greenhouse gas emission impacts would be **less than significant**.

5.8.4 Mitigation Measures

The Classroom Building Project would not result in significant impacts related to greenhouse gas emissions and no mitigation measures are required.

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
5.9 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?	☐	☐	☐	✓	☐
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?	☐	☐	☐	✓	☐

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	✓	☐
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	☐	☐	☐	✓	☐

5.9.1 Setting

It is the policy of the University of California to maintain a reasonably safe environment for its students, academic appointees, staff and visitors. Campus operations are to be conducted in compliance with applicable regulations and with accepted health and safety protocols.

The UCSB Office of Environmental Health and Safety (EH&S) has the primary responsibility for coordinating the on campus management of hazardous materials and laboratory safety, and assists the campus in meeting its obligations for compliance with State and Federal health, safety and environmental regulations. Programs and services administered by EH&S pertain to asbestos and lead safety, biological safety, emergency management, environmental compliance, environmental health, fire protection, hazardous material management and disposal, industrial hygiene, lab safety, stormwater management, and radiation and laser safety.

Barracks buildings that were developed as part of the Marine Corps base that formerly occupied the UCSB campus were heated with fuel oil-powered heaters. The underground storage tanks used to store heating oil were removed in 1989, however, soil contamination resulting from the former use of the tank associated with Temporary Building 408 is located north of and adjacent to the building. It is estimated that approximately 200 cubic yards of contaminated soil is located on the project site approximately eight to 11.5 feet below the ground surface.

The main east-west runway at the Santa Barbara Municipal Airport is approximately 5,000 feet north of the Classroom Building Project site. The southern end of the airport's north-south runway is approximately 3,200 feet northeast of the project site.

The UCSB Campus is not located within a designated high fire hazard zone.

5.9.2 Checklist Responses

a. *Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?*

The Classroom Building Project would not require the use of substantial quantities of hazardous materials that would have the potential to result in hazards to the public. Hazardous material use associated with the project would likely be limited to substances such as cleaning agents, paints, and other similar types of products.

Numerous federal, state and local regulations pertain to the use, storage, handling, transportation and disposal of hazardous materials and waste. Enforcement of these regulations is provided by a variety of agencies, including Federal and State OSHA; California Department of Toxic Substances Control; Santa Barbara County Fire Department, Fire Prevention Division; and UCSB ES&H. In addition, the UCSB Fire Protection Division would conduct fire and life safety inspections of the project site on an annual or more frequent basis as required by California Code of Regulations Title 19, Public Safety. Complying with existing University policies, and state and federal regulations related to the use, storage, transportation and disposal of hazardous materials and waste would minimize the potential for a release to the environment. Therefore, the Project would have **less than significant** hazardous material or health and safety impacts.

b. *Would the project 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?*

Short-Term Impacts. The potential for a major release of construction materials (solvents, paints, fuels, lubricants, concrete, asphalt, etc.) from the project site is low, however, if construction materials were to be released from the project site, potentially significant environmental impacts could occur at the project site and water quality-related environmental impacts to the Campus Lagoon could result as runoff water from the project site drains to the lagoon. Compliance with existing regulations, such as the preparation and implementation of a construction site Storm Water Pollution Prevention Plan, would reduce the potential for a release of construction materials. Therefore, the potential for short-term water quality impacts is considered to be **less than significant**.

The proposed Storke Campus temporary staging area would be primarily used for the storage of inert construction materials, and would not be used for the storage of hazardous substances. Similar to the Classroom Building site, the off-site staging area would be required to comply with an approved Storm Water Pollution Prevention Plan, which would reduce the potential for a release of construction materials. Therefore, the potential for short-term water quality impacts is considered to be **less than significant.**

The proposed project would result in the demolition of Temporary Building 408. Previous assessments of the building determined that the demolition of the building would have the potential to result in the release of asbestos fibers that were used in the construction of the building or that are contained in materials within the structure, such as pipe installation, floor tile and tile mastic. Demolition activities could also have the potential to result in exposure to lead-based paint (Horstin, 2019).

Asbestos. Exposure to asbestos-containing materials has the potential to result in significant short-term impacts to construction workers and other persons at the project site. The management of asbestos-containing waste is regulated by a number of local, state and federal agencies. The Occupational Safety and Health Administration (OSHA) regulates the potential for work-place exposures to asbestos; the U.S. Department of Transportation regulates the transportation of asbestos-containing waste; and the disposal of asbestos materials is regulated by the California Department of Toxic Substances Control (DTSC). The Santa Barbara County Air Pollution Control District (APCD) also issues permits for building renovation/demolition projects that involve the removal of asbestos-containing materials. APCD Rule 1001 – National Emission Standards for Hazardous Air Pollutants – Asbestos provides notification and reporting requirements related to potential emissions of asbestos fibers.

In accordance with University policies and other regulatory requirements, asbestos identification and abatement (removal of asbestos containing materials) would occur prior to the demolition of the building. A required APCD demolition notification would be submitted at least 10 days prior to any structure demolition operations, and the removal of asbestos-containing materials would be conducted in compliance with OSHA workplace regulations. Any asbestos-containing material removed from the building would be transported from the project site in accordance with regulations that have been adopted by the U.S. Department of Transportation, and material would be disposed in a manner consistent with requirements of the DTSC. Compliance with existing regulations regarding the removal, handling, transportation and disposal of asbestos-containing waste would be adequate to reduce potential project-related health and safety impacts resulting from potential exposure to asbestos emissions to a **less than significant level** and no mitigation measures are required.

Lead-Based Paint. It is likely that lead-based paints have been used on Temporary Building 408. The use of lead based paints also has the potential to result in soil contamination if the paint has chipped or peeled. Lead-based paint and soil with lead contamination are regulated by several state and federal agencies.

The demolition of a structure that has lead based paint surfaces would have the potential to result in significant short-term impacts to construction workers and other persons at the project site. To avoid this potential impact, building materials that contain lead based paint would be removed prior to the start of demolition activities. For example, previous assessments of barracks buildings on the Main Campus have found that lead based paints were used on the building's exterior siding (Horstin, 2019). In such cases, the siding material was removed prior to demolition and disposed of as hazardous waste, unless testing of the material determined that lead concentrations were not hazardous. Previous sampling of buildings on the UCSB campus where lead-based paint have been used has typically indicated that lead concentrations are not hazardous (UCSB, 2010). The removal of materials from Building 408 that contain lead based paint prior to demolition, and compliance with applicable OSHA requirements, including the implementation of dust control measures, would be adequate to reduce potential short-term exposures to lead based paint to a **less than significant** level and no mitigation measures are required.

Long-Term Impacts. As described in response "a" above, there are numerous federal, state and University requirements related to the management of hazardous materials and waste, and the Project would not be a substantial source of hazardous materials that could be released to the environment. Compliance with these requirements would be adequate to ensure that potential project-related health and safety impacts are **less than significant.** No mitigation measures are required.

c. *Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?*

There are no school facilities (i.e., grades K-12) located within one-quarter mile of the Classroom Building Project site. In addition, the project would not be a source of hazardous emissions or handle acutely hazardous materials or water. Therefore, the Project would have **no impact** to school facilities.

d. *Would the project 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?*

Prior to the development of UCSB, portions of the Main Campus were occupied by the United States Marine Corps Air Station Santa Barbara (MCAS). Some of the MCAS buildings remain on the Main Campus, and some of those structures had underground storage tanks used to store heating oil. A former MCAS building (Temporary Building 408) is located on the northeastern portion of the Classroom Building Project site.

In 1989, 23 of the former heating oil tanks and associated piping were removed from the Main Campus (including the Temporary Building 408 tank) and disposed at off-campus locations. In addition, soil samples were collected from each of the excavations. Soil testing conducted in the vicinity of the former Temporary Building 408 underground storage tank showed that soil was impacted with total petroleum hydrocarbons to a depth of between 9 and 11 feet below the ground surface, and contamination concentrations ranged from 2,100 to 11,000 milligrams per kilogram. Trace concentrations of petroleum hydrocarbon constituents benzene, toluene, ethylbenzene, and xylenes were also reported.

Additional soil assessments at the former Temporary Building 408 underground storage tank site were conducted in 1990, 2014, and 2018. The results of those assessments were generally similar to the results of the 1989 evaluation. The results of the 2018 contamination assessment are included in Appendix C.

The Central Coast Regional Water Quality Control Board (RWQCB) granted closure of the Temporary Building 408 contamination site on February 3, 2016 and noted that "*impacted soil was estimated to be a lens from eight to eleven and a half feet deep and 200 cubic yards in volume.*" Closure of the site by the RWQCB included the following site management requirements: *"Residual soil and groundwater contamination may still exist on-site that could pose an unacceptable risk under certain site development activities such as site grading, excavation, or de-watering. The Central Coast Water Board, the local health agency and the appropriate local planning and building departments must be notified prior to any changes in land use, grading activities, excavation, or dewatering. This notification must include a statement that residual soil and groundwater contamination underlie the property and nearby properties. The levels of residual contamination and any associated risks are expected to reduce with time."* (http://geotracker.waterboards.ca.gov. Accessed January 23, 2019).

Approximately 200 cubic yards of contaminated soil is located at the northeast corner of the project site along the north side of Temporary Building 408. Detected contamination concentrations are low and as noted by the RWQCB are expected to decrease over time. The Classroom Building project would be located west of the area that contains contaminated soil. A proposed bicycle parking area would be located in the area that contains contaminated soil. The bicycle parking facility would not require the disturbance or removal of the contaminated soil. However, modifications to existing on-site utilities located in the northeast corner of the project site or the installation of a stormwater drainage management facilities may require excavations that have the potential to encounter the impacted soil. If excavations are required in the area that contains contaminated soil, the UCSB Environmental Health and Safety (EH&S) would be contacted and the contaminated soil would be removed or remediated in accordance with federal, state and University regulations and the requirements of 2010 LRDP Policy HAZ-5, which in part, requires the following:

> **HAZ-5 -** *If contaminated soil and/or contaminated groundwater are encountered during excavation and/or grading activities, except where such activities are implementing a Commission-approved remediation plan, the following steps shall be taken:*
>
> *(a) The construction contractor(s) shall stop work and immediately inform Environmental Health and Safety (EH&S).*
>
> *(c) If the materials are determined to pose such a risk, a remediation plan shall be prepared and submitted to EH&S to comply with all federal and state*

regulations necessary to clean and/or remove the contaminated soil and/or groundwater.

(d) *Soil remediation methods could include, but are not necessarily limited to, excavation and on-site treatment, excavation and off-site treatment and/or disposal, and/or treatment without excavation;*

After being notified, EH&S would implement appropriate soil remediation actions. The excavation of the contaminated and overlying soils would result in approximately 2,700 cubic yards of additional grading on the project site. This grading would likely be conducted concurrently with other Project-related grading (i.e., foundation preparation) and would not substantially increase grading-related impacts (i.e., noise, air quality, and erosion-related impacts). Based on existing site conditions and the implementation of 2010 LRDP policy requirements, the Project would have a **less than significant** impact related to the former fuel oil tank site located on the project site.

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?*

The Classroom Building Project site is approximately 5,000 feet south of the main east-west runway at the Santa Barbara Airport, and approximately 3,200 feet southwest of the southern end of the Airport's north-south runway. Most of the UCSB Campus is located within the Airport's Restrictive Surfaces boundary, which means that proposed buildings are restricted to a maximum height of 150 feet above the runway surface (UCSB, 2010). The Santa Barbara Airport runways are at an elevation of approximately nine feet above sea level, therefore, this height restriction would result a maximum structure height at the project site of approximately 159 feet above sea level. The proposed Classroom Building would have a maximum height of 85 feet (including the rooftop equipment "penthouses). When added to a maximum site elevation of approximately 51 feet above sea level, the total building height above sea level would be approximately 136 feet. Therefore the Project would not result in structure height conflicts with aircraft operations. In addition, the Project-related lighting would be low intensity and directed downward, and the building would not include reflective surfaces that would adversely affect aircraft operations. Therefore, the Project would result in **less than significant** airport-related safety impacts.

f. *Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?*

UCSB maintains a campus-wide Emergency Operations Plan (EOP) that establishes emergency response procedures. The EOP establishes a chain of command during emergencies, and provides requirements for individual departments to prepare their own EOPs for immediate response to emergency situations.

The Classroom Building Project site is located near the center of the Main Campus, approximately 400 feet north of UCen Road. Construction of the Project would not require temporary lane closures along Ucen Road, and emergency access to the project site during and after construction could be provided from the service driveway that extends northward from UCen Road. Therefore, the Project would not result in temporary or long-term obstructions of any road or access that would interfere with emergency response services or an evacuation plan.

As described in Section 5.17.3 (Transportation) of this IS/MND, the Classroom Building Project would not expand any existing UCSB academic programs or result in any additional students, faculty, or staff being located on the UCSB campus. Traffic that may be generated by the Project would not result in long-term impacts related to emergency access into or out of the Project area. Therefore, the project would have a **less than significant** impact related to emergency response or evacuation plans.

g. *Would the project expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?*

As described in IS/MND Section 5.20 (Wildfire) there are no areas on or near the project site that present a substantial wildland fire risk, such as highly flammable dense vegetation, steep slopes, difficult access and/or inadequate fire suppression water supplies. Therefore, the Project would result in a **less than significant** impact related to wildfire safety.

5.9.3 Mitigation Measures

The Classroom Building Project would not result in significant hazard or hazardous material impacts and no mitigation measures are required.

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
5.10 HYDROLOGY AND WATER QUALITY - Would the project:					
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality ?	☐	☐	☐	✓	☐
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☐	☐	✓
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:					
i) result in a substantial erosion or siltation on- or off-site;	☐	☐	☐	✓	☐
ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	☐	☐	✓	☐	☐
iii) 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, or?	☐	☐	☐	✓	☐
iv) impede or redirect flood flows?	☐	☐	☐	✓	☐

	Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
d)	In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☐	✓	☐
e)	Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☐	✓	☐

5.10.1 Setting

Surface Water Resources

Project Areas. The Classroom Building Project site is approximately 2.4 acres and is a mostly vacant area located near the center of the Main Campus. Development on the project site includes Temporary Building 408, a small two-story World War II era barracks building; and a bicycle path that extends diagonally across the site from east to west. Storm water runoff from project site is directed to the Main Campus storm drain system and is discharged the Campus Lagoon.

The Campus Lagoon is a brackish pond located in the southern portion of the Main Campus adjacent to the Pacific Ocean. The Lagoon has a surface area of about 31 acres and its surface water elevation varies from four to seven feet above sea level. The Lagoon has three sources of water: direct rainfall, storm water drainage system discharges, and seawater pumped from the UCSB Marine Biotechnology Laboratory. Storm water runoff from approximately 155 acres of the 300-acre developed portion of the Main Campus (excluding the Campus Lagoon and surrounding area) is directed to the Lagoon through the Main Campus storm drain system. Although storm water discharge can be high, the Lagoon's main continual source of water is the discharge of seawater pumped from the Marine Biotechnology Laboratory at an average rate of approximately 150 gallons per minute. The Marine Biotechnology Laboratory has the option of pumping seawater to the Lagoon or to the ocean. The major water quality issue associated with the Lagoon is the accumulation of nutrients, which result in algae blooms and eutrophic conditions.

A proposed project-related staging area would be located on the UCSB Storke Campus near the northwest corner of the Los Carneros Road/Mesa Road intersection. This site has recently been used by UCSB for material storage and is approximately one acre in size. The site is at least 200 feet from the northwestern extent of the Goleta Slough, and at least 200 feet north of the UCSB Storke Wetlands, which is an extension of the Goleta Slough. The Goleta Slough is listed on the Clean Water Act Section 303d list of Impaired Waters for pathogens and priority organics. “Priority organics” are generally chemicals such as chlorinated hydrocarbons or volatile organic compounds used in industrial or manufacturing process, or commonly found in pesticides.

100-Year Flood Areas. The Classroom Building Project site is not located in a designated 100-year floodplain area (UCSB, 2010). The nearest designated floodplain areas are adjacent to the Campus Lagoon approximately 1,500 feet south of the project site.

The proposed Stork Campus temporary staging area is located adjacent to the northwestern extent of the Goleta Slough, and is within the 100-year floodplain that has been designated for the Slough.

Storm Water Management

UCSB has been designated by the State Water Resources Control Board as a “non-traditional” small Municipal Separate Storm Sewer System (MS4) under the State’s National Pollution Discharge Elimination System (NPDES) Permit for stormwater discharges. As a small MS4, the Campus is required to enroll in the State’s General NPDES Permit for stormwater discharges, and must prepare a Stormwater Management Program Guidance Document that meets criteria specified by the State Water Resources Control Board (SWRCB).

Stormwater Management Program Guidance Document. UCSB has prepared a Storm water Management Program Guidance Document (June, 2014) that addresses seven general control measures: 1) community education and training on stormwater impacts; 2) community involvement and participation; 3) illicit discharge detection and elimination; 4) construction site storm water runoff control; 5) post-construction stormwater management in new development and redevelopment; 6) pollution prevention/good housekeeping for facilities operation and maintenance; and 7) stormwater program effectiveness evaluation.

Stormwater Management Program Guidance Document Section 3.6, *Post-Construction Stormwater Management Program,* focuses on hydromodification control. The purpose of the hydromodification control criteria are to protect beneficial uses of water resources and promote the desired conditions of healthy watersheds to the maximum extent practical, including:

- Maximize infiltration of clean storm water and minimize runoff volume and rate increases or reductions based on existing conditions.
- Protect riparian areas, wetlands and their buffer zones.
- Minimize pollutant loading.
- Provide long-term watershed protection.

Central Coast Post-Construction Stormwater Management Requirements. The Central Coast Regional Water Quality Control Board adopted post-construction requirements for new and redevelopment projects on July 12, 2013, and those requirements went into effect on March 6, 2014. The requirements stipulate that MS4 permittees, such as UCSB, ensure that regulated projects within their authority are designed to detain, retain, or treat a specified percentage of storm water runoff. This objective is achieved by mimicking a project sites natural hydrology through the implementation of Low Impact Development design measures.

Low impact development (LID) refers to runoff water management methods that minimize storm water pollutants, reduce storm water runoff rates and volumes, and promote groundwater infiltration and storm water reuse in an integrated approach to protecting water quality and managing water resources. Objectives of LID include the implementation of measures that mimic undeveloped storm water and urban runoff rates and volumes; prevent pollutants of concern from leaving a development site in storm water; and minimize hydromodification impacts to natural drainage systems. Hydromodification effects often result from urban development and associated increases in impermeable area, and can include increased storm water runoff volume, velocity, temperature, and discharge duration. Hydromodification can also result in increased erosion and sedimentation and may also contribute to increases in nutrients, pathogens, pesticides, metals hydrocarbons organic debris and litter in runoff water.

General Construction Permit and Storm Water Pollution Prevention Plans. The General Construction Permit, Order No. 2012-0006-DWQ, NPDES Permit No. CAS000002, amended by the SWRCB in 2012, regulates storm water and non-storm water discharges associated with construction activities disturbing one acre or greater of soil. Construction sites that qualify must submit a Notice of Intent to gain permit coverage or otherwise be in violation of the Clean Water Act and California Water Code.

The General Construction Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP) for each individual construction project greater than or equal to one acre of disturbed soil area regardless of the site's risk level. The SWPPP must list the Best Management Practices (BMPs) the discharger will use to control sediment and other pollutants in storm water and non-storm water runoff. The BMPs must meet the Best Available Technology Economically Achievable and Best Conventional Pollutant Control Technology (BAT/BCT) performance standards. Additionally, the SWPPP must contain a visual monitoring inspection program; a chemical monitoring program for sediment and other "non-visible" pollutants to be implemented based on the risk level of the site, as well as inspection, reporting, training and record-keeping requirements. Section XVI of the General Construction Permit describes the elements that must be contained in a SWPPP.

As mentioned above, Order No. 20012-0006-DWQ contains requirements for construction sites based on the site's risk of discharging construction-related pollutants. Each construction project must complete a risk assessment prior to commencement of construction activities, which assigns a risk level to the site and determines the level of water quality protection/requirements the site must comply with. The Permit also includes provisions for meeting specific Numeric Action Levels for pollutants based on the sites' risk level.

Since the Classroom Building Project would disturb more than one acre of land, the building project site and the proposed Storke Campus temporary staging area are subject to the storm water discharge requirements of the General Construction Permit. The Project will require submittal of a Notice of Intent, SWPPP, risk assessment, and other project registration documents required by the General Construction Permit prior to the commencement of soil disturbing activities. The SWRCB is the permitting authority, while the Central Coast RWQCB provides local oversight and enforcement of the General Construction Permit.

Groundwater Conditions

Groundwater at the UCSB Main Campus occurs primarily as perched groundwater and is not a potable resource. Perched groundwater is created when water percolates through permeable terrace deposits until it encounters relatively impermeable siltstone and shale bedrock formations. The quality of this groundwater is generally poor, with very high levels of total dissolved solids that exceed drinking water standards. Groundwater levels at the project site were reported to be approximately 14 feet below ground level (Fugro, 2018). Information in other reports has indicated that groundwater was encountered at depths ranging from about 10 to 14 feet below the ground surface.

LRDP Policy Requirements

The 2010 LRDP includes policies and project approval requirements related to the reduction of potential water quality impacts that the Project would be required to implement. Water quality policies applicable to the Project include WQ-01, WQ-03, WQ-04, WQ-05, WQ-06, WQ-07, WQ-10, WQ-11, and WQ-17. The Project's consistency with these policies is evaluated in IS/MND Section 5.11 (Land Use and Planning).

2010 LRDP Appendix 3, Water Quality Protection Plan, includes requirements for development that requires the approval of a Notice of Impending Development from the California Coastal Commission. Appendix 3 requires the preparation and approval of a Construction Pollution Prevention Plan that describes temporary Best Management Practices (BMPs) a project will implement to minimize erosion and sedimentation during construction, and to minimize pollution of runoff by construction chemicals and materials. Appendix 3 also requires the preparation and approval of Post-Development Plans. A Post-Development Runoff Plan is required to describe the site design and runoff source control measures a project will implement to protect coastal waters after development is completed. A Water Quality and Hydrology Plan requires a polluted runoff and hydrologic site characterization, sizing standard for BMPs, use of low impact development approach to retain runoff on-site, and documentation of the expected effectiveness of proposed BMPs.

5.10.2 Checklist Responses

a. *Would the project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?*

Under Section 303(d) of the Federal Water Pollution Prevention and Control Act (i.e., the Clean Water Act) states are required to identify water bodies that do not meet their water quality standards. Once a water body has been listed as impaired, a Total Maximum Daily Load (TMDL) for the constituent of concern (pollutant) must be developed for that water body. A TMDL is an estimate of the daily load of pollutants that a water body may receive from point sources, non-point sources, and natural background conditions, without exceeding its water quality standard.

Runoff from the Classroom Building Project site discharges to the Campus Lagoon. The Lagoon has not been identified by the State Water Resources Control Board or the Regional Water Quality Control Board as an impaired water body and no TMDL water quality standards have been adopted for the Lagoon.

Runoff from the Storke Campus temporary staging area could be discharged to the Goleta Slough. The Slough has been listed as being impaired for pathogens and priority organics. As described in responses below, the short-term use of the staging area would not be a substantial source of pollutants, including pathogens or priority organics. Therefore, the Project would not violate any adopted water quality standards or discharge requirements.

The potential for the Project to substantially degrade surface and ground water quality is evaluated below.

Short-Term Impacts

Project-related construction would require grading of the project site, primarily for foundation preparation purposes, utility trenching, construction of the proposed building, and building finishing and coating activities. If not properly managed, each of these development activities would have the potential to impair the quality of surface water due to discharges of sediment and other construction-related materials, such as solid waste and other debris, concrete and asphalt, paint, metals, fuel and other automotive products. Although the potential for a major release would be low, a release of construction-related pollutants from the Classroom Building Project site would have the potential to result in a significant water quality impact to the Campus Lagoon.

The proposed Storke Campus temporary staging area would be primarily used for the storage of inert construction materials, and would not be used for the storage of hazardous or other substances that could adversely affect water quality. However, an accidental release from the staging area would have the potential to result in water quality impacts to the Storke Wetlands and Goleta Slough.

Construction site requirements included in the Stormwater Management Program Guidance Document; policies of the 2010 LRDP; and the requirements of LRDP Appendix 3, would substantially reduce the potential for significant short-term impacts to water quality by requiring the implementation of various best management practices that reduce the potential for the discharge of pollutants to the "maximum extent practicable." In addition, The Classroom Building Project would be required to prepare and implement a SWPPP as required by the NPDES General Construction Permit. The Project contractor would prepare a site-specific SWPPP and submit it to UCSB Environmental Health and Safety for approval before construction of the Project begins. A Notice of Intent to comply with the NPDES General Construction permit would also be filed with the State Water Resources Control Board. With the implementation of existing regulatory and policy requirements, the potential for the Classroom Building Project to result in significant short-term construction-related water quality impacts would be **less than significant** and no mitigation measures are required.

Long-Term Impacts

The UCSB Stormwater Management Program Guidance Document identifies pollutants of concern associated with on-campus development that have the potential to affect water quality. The potential for the Classroom Building Project to result in long-term discharges of pollutants of concern is evaluated below. The proposed Storke Campus staging area would be a temporary use and not a long-term source of pollutants of concern.

<u>Pollutants of Concern</u>

Sediment. Sediment is commonly found in stormwater and is considered a pollutant of concern because it can harm aquatic life and transport other pollutants that are attached to it, such as trace metals, nutrients and hydrocarbons. The Classroom Building Project site is relatively level and is predominately covered with impervious surfaces or areas that have been landscaped. Therefore, the existing project site is not a substantial source of sediment discharges.

After the completion of construction activities, the project site would be predominately covered by impervious surfaces or landscaping and would not be a substantial long-term source of sediment discharges. Untreated stormwater discharges from the project site could contain minor amounts of sediment. However, runoff would be directed to the Project's stormwater treatment system, which would minimize sediment loads in the runoff that is discharged from the site. Therefore, stormwater and dry weather runoff from the Project would not be a substantial long-term source of sediment discharges and would not result in a substantial change in existing sediment discharges from the project site. Sediment discharges from the project site would be **less than significant** and no mitigation measures are required.

Pathogens. Sources of pathogens such as bacteria and viruses typically include animal wastes, human encampments, and overflows from wastewater systems. The project site is not a substantial source of pathogens.

The Classroom Building Project would not introduce new sources of pathogens and all domestic wastewater from the project site would be discharged to the UCSB sewer system through pipes installed to serve the Project. Therefore, the Project would not be a substantial source of pathogens that could adversely affect the Campus Lagoon. Discharges of pathogens from the project site would be **less than significant** and no mitigation measures are required.

Hydrocarbons. The most common sources of hydrocarbons in residential areas is oil and grease from spilled fuels and lubricants, discharge of domestic wastes, and runoff. Some petroleum hydrocarbons, such as polycyclic aromatic hydrocarbons (PAHs), can bioaccumulate in aquatic organisms and are toxic at low concentrations. Hydrocarbons can persist in sediment for long periods of time in the environment and can result in adverse impacts on the diversity and abundance of benthic communities. The Classroom Building Project site does not include uses that have the potential to be a substantial source of hydrocarbons.

As described in IS/MND Section 5.17.3, the Classroom Building Project would not result in a substantial increase in existing traffic conditions, and the Project would not result in a substantial increase in on-campus vehicle use. In addition, the proposed building and other Project-related site improvements (i.e., bicycle parking, walkways, and landscaping) would not be a substantial source of hydrocarbons. Therefore, storm water and dry weather discharges of hydrocarbons from the Project site would be **less than significant** and no mitigation measures are required.

Pesticides. The presence of pesticides in water sources has the potential to result in a wide range of impacts, including elevated levels of pesticides in organisms and concerns related to human health. Pesticide use (including the use of insecticides, rodenticides, herbicides, fungicides and growth regulators) on the UCSB campus has been reduced and the University has adopted an Integrated Pest Management (IPM) program for inside and outside all on-campus structures (UCSB Use of Pesticides Policy 5435). IPM is a set of principles developed to reduce or eliminate pesticide use while minimizing pest damage. An IPM Committee at UCSB reviews and approves on-campus uses of pesticides. Based on existing pesticide use practices implemented at UCSB the Classroom Building Project would not be a substantial source of pesticides in stormwater or dry weather runoff. Discharges of pesticides from the project site would be **less than significant** and no mitigation measures are required.

Nutrients. Nitrogen and phosphorus are the major plant nutrients used for fertilizing landscapes and can result in excessive or accelerated growth of aquatic vegetation. Other sources of nutrients in runoff water include the reclaimed water used on the UCSB Campus for landscape irrigation, leaking sewage pipes, animal wastes and discharging detergents to the ground surface (e.g., car washing). The most common impact of excessive nutrient input is eutrophication of the receiving water body, resulting in excessive algal production, elevated biological oxygen demand, fish kills and potential releases of toxins from sediment due to changes in water chemistry profiles.

The UCSB Stormwater Management Program Guidance Document identified measures that have been implemented at UCSB to reduce fertilizer use and the discharge of nutrients in runoff. These measures include:

- Designing and maintaining irrigation systems to ensure that minimal irrigation is applied to prevent runoff and conserve water.

- Implementation of a UCSB campus policy that prohibits pooling or discharge of irrigation water to storm drain inlets. This policy results in the reduction or elimination of runoff into receiving waters.

- Reductions in or the elimination of fertilizer use: Recycled water distributed by the Goleta Water District is used extensively for landscaping irrigation on campus. The recycled water contains background levels of nitrogen and other salts, which eliminates the need for applying additional fertilizer to ornamental plants.

With the continued implementation of existing campus-wide landscape practices, the use of fertilizers and the potential for non-storm runoff from landscaped areas at the project site would be minimized, and it is likely that any discharges of nutrients that may occur would be similar to the amount and concentration of nutrients currently leaving the project site. Runoff from the project site would be directed to the Project's stormwater treatment system, which would have the beneficial effect of reducing nutrient loads that may be contained in runoff water. Based on existing source control practices implemented at UCSB, and proposed treatment facilities that would be provided at the project site, discharges of nutrients from the project site would be **less than significant** and no mitigation measures are required.

Gross pollutants (litter, trash, debris). Gross pollutants can include items such as trash, litter and vegetative matter. These materials can transmit other pollutants, result in unsightly conditions, and depress dissolved oxygen levels in water bodies. The UCSB Stormwater Management Program Guidance Document indicates that UCSB implements a variety of "good housekeeping" best management practices to reduce accumulations of gross pollutants, including monthly sweeping of parking lots, inspections of storm drain inlets, daily removal of trash collected in receptacles, and providing receptacles with covers or lids. With the implementation of these existing programs, it is not expected that the project site is a substantial source of gross pollutants.

The Classroom Building Project could increase human activity at the project site when compared to existing activity levels, however, with the continued implementation of the "good housekeeping" measures the Project would not result in a substantial increase in the potential for the generation of gross pollutants when compared to existing conditions. In addition, the Project's stormwater treatment system would include the installation of mechanical or other methods to minimize the potential for gross pollutants to enter the Project's stormwater treatment system. Therefore, the Project would not be a substantial source of gross pollutants, associated potential water quality impacts would be **less than significant,** and no mitigation measures are required.

<u>Groundwater Quality</u>

As described above, the Classroom Building Project would not be a substantial source of substances that have the potential to impair the quality of surface water sources. As a result, the Project would also have a low potential to result in significant impacts to the limited ground water resources located on the project site and the Main Campus. In addition, the removal of contaminated soil located on the project site that resulted from the historic use of a heating oil underground storage tank would have the beneficial effect of limiting the potential for future ground water quality impacts at and near the project site. Therefore, potential Project-related groundwater quality impacts would be **less than significant**.

b. *Would the project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?*

The Classroom Building Project would not result in direct withdrawals of groundwater and would not reduce groundwater recharge within a basin used as a water source. The Main Campus is located south of the Goleta Groundwater Basin, which is the primary source of groundwater in the region. The southern extent of the Goleta Groundwater Basin is located north of the North Branch of the More Ranch fault, which is located north of the UCSB campus. Therefore, the Project would have **no impact** related to project-specific or cumulative impacts to local groundwater supplies.

c. *Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:*

i) *result in a substantial erosion or siltation on- or off-site.*

Short-Term Impacts. Construction activities required to develop the Classroom Building Project would result in the removal of existing hardscape and the disturbance of the ground surface. These short-term activities have the potential to result in an increase in erosion and sedimentation of surface water sources. Runoff from the project site is discharged to the Campus Lagoon, and a short-term increase in sedimentation would have the potential to result in significant impacts to the lagoon and the sensitive habitats it supports. The use of the Storke Campus temporary staging area would not result in the excavation of soil, however, the use of vehicles on the site and other site disturbances could have the potential to result in the release of sediment to the Storke Wetlands and Goleta Slough.

The potential for the Project to result in significant erosion and sedimentation impacts is evaluated in Section 5.7.2b (Geology and Soils) and subsection "a" above. The analysis in those sections concluded that potential short-term erosion and sedimentation impacts of the Project would be **less than significant** with the implementation of existing regulatory requirements and LRDP policies.

Long-Term Impacts. Upon the completion of construction activities, the Classroom Building Project site would be landscaped or covered with impervious surfaces. Therefore, the project site would not be a substantial source of erosion or sediment that could adversely affect downstream water resources and the long-term sedimentation impacts of the Project would be **less than significant**.

ii) *substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite.*

The potential for the Classroom Building Project to result in drainage-related impacts resulting from an increase in the rate or amount of surface runoff is evaluated in a report titled *Environmental Stormwater Analysis for UCSB Classroom Project* (Stantec, 2019). The conclusions of the report are summarized below and the complete report is provided in Appendix B of this IS/MND. This section also evaluates potential environmental impacts that may result from the construction and operation of the potential stormwater treatment options that have been identified for the Project.

Background. The analysis of potential stormwater management systems to serve the Classroom Building Project was based on the criteria identified in the UCSB Post-Construction Stormwater Manual, which generally follows the Central Coast Regional Water Quality Control Board guidance for most of Santa Barbara County. Most of the UCSB Campus is located within Water Quality Management Zone 1, and the project site has a 95th Percentile 24-hour Rainfall Depth of 2.15 inches.[1] The proposed development would involve more than 22,500 square feet of new or

[1] The 95th percentile means 95 percent of all measured 24-hour runoff events are less than this amount.

replaced impervious surfaces, which requires the Project to meet the following post-construction stormwater quality performance standards:

1. Site Design and Runoff Reduction – limit the disturbance of creeks and natural features, minimize compaction of highly permeable soils, limit clearing of native vegetation, and minimize impervious surfaces.

2. Water Quality Treatment – provide water quality treatment for the 85th percentile 24-hour rainfall event via infiltration/evapotranspiration or an acceptable equivalent.

3. Runoff Retention – retain the storm volume from a 95th percentile 24-hour rainfall event. Satisfying the runoff retention requirement also fully satisfies the water quality treatment requirement. The amount of retention volume required for the proposed Project is 10,981 cubic feet.

4. Peak Management – reduce peak runoff from the post-project site to or below pre-project conditions for the 2-year through 10-year event. However, the local standard of care typically is for 2-year through 100-year events.

Two storm water treatment systems are being considered for the proposed Project. Option 1 is a retention/detention system consisting of a ground surface detention pond with an underground rock-filled water infiltration chamber. Storm flow in excess of the 95th percentile volume (10,981 cubic feet) would pond above the rock fill and be metered out of the basin by a piped connection to an adjacent storm drain. The surface of the rock fill would be covered with sand or mulch to prevent trash and debris from accumulating within the rock fill. The detention pond would require an area of approximately 5,800 square feet and would have a depth of approximately two feet.

Option 2 is a retention/detention system consisting of a subsurface excavation filled with rocks and water storage chambers. The incoming water would be pre-treated wither with bioswales, a hydrodynamic separator, or other filtering devices to remove gross solids. Storm flow in in excess of the 95th percentile would slowly drain to the Main Campus storm drain system. The below ground water storage area would be approximately 60 feet long, 50 feet wide, and seven feet deep.

Figure 5.10-1 depicts the general design characteristics of both treatment system options.

Storm water management Options 1 and 2 could be installed at one of three potential sites located on or near the Project site. Site A is located in the northern portion of Parking Lot 3. Site B is a vacant area south of the Psychology Building and north of Ucen Road, approximately 300 feet south of the Project site. Site C is on the eastern portion of the Project site. Each of the potential water treatment sites would adequately facilitate treatment Options 1 and 2 due to the depth of the existing storm drains that the Project's stormwater treatment system would drain to, and the topography of the project site and surrounding area.

Drainage Analysis. Under existing conditions, approximately 40 percent of the project site is covered with impervious surfaces. After development of the Project, it is estimated that impervious area would cover approximately 65 percent of the project site. Existing and post-project runoff flow rates, with and without the proposed treatment system options, are summarized on Table 5.10-1.

Table 5.10-1
Project Site Peak Flow Rates

Return Period (years)	Pre-Project (cfs)	Post-Project No Detention/Retention (cfs)	Post Project Option 1 (cfs)	Post Project Option 2 (cfs)
95th %	0.96	1.64	0.00	0.00
2	1.46	2.49	0.33	0.43
5	2.12	3.63	1.43	1.53
10	2.56	4.38	1.96	2.07
25	3.11	5.31	2.40	3.01
50	3.59	6.03	2.65	3.57
100	4.16	6.79	2.88	4.06

Source: Stantec, 2019
cfs = cubic feet per second

With the construction and operation of proposed water treatment Options 1 or 2, the Project would result in small reductions in existing peak stormwater flow rates when compared to existing conditions, and would be consistent with the Central Coast Regional Water Quality Control Board requirements. The Project would not result in an increase or a substantial reduction in the rate at which runoff leaves the project site, and would not substantially reduce the amount of water that is discharged to the Campus Lagoon. Therefore, potential drainage impacts of the Classroom Building Project would be **less than significant** and no mitigation is required.

Short-Term Construction Impacts. The evaluation of short-term construction-related impacts included in this IS/MND determined that the Project's impacts would either be not significant; reduced to a less than significant level by complying with existing regulatory programs and UCSB policies; or be reduced to a less than significant level with the implementation of proposed mitigation measures to reduce construction-related impacts. These potential impacts include: impacts to trees that are to be retained on the project site (mitigation measure BIO-2a); impacts to nesting birds (mitigation measures BIO 1a through 1c); dust emissions (mitigation measure AQ-1a); impacts from construction noise (mitigation measure NOI-1); and potential impacts to previously undetected cultural resources (mitigation measures CUL-1a through 1e). Therefore, short-term construction activities required to develop stormwater treatment Options 1 or 2 at potential treatment sites A, B or C would result in **less than significant** environmental impacts and no additional mitigation measures are required.

Long-Term Construction Impacts

Treatment Option 1. Locating stormwater treatment Option 1 (detention pond with underground water infiltration) at site A (Parking Lot 3) would require the permanent removal of approximately 40 faculty/staff parking spaces. It is anticipated that vehicles displaced from Parking Lot 3 would park in other Main Campus parking lots, such as Lot 22, which is located adjacent to Ocean Road, and is approximately 3,600 feet west of the Project site. Lot 22 is a six-level structure with 841 visitor, student, faculty and staff spaces, 202 student spaces, 60 coastal access spaces, and 25 other spaces. The 202 student parking spaces are located on level 4 and a portion of level 5. Parking occupancy surveys conducted in the Fall of 2018 show that the structure’s lower level, and levels 1, 2 and 3 have average weekday occupancy rates ranging from 24 to 61 percent. Therefore, there is adequate capacity in Lot 22 to accommodate vehicles that may be displaced from Lot 3.

Locating treatment Option 1 at site B (between the Psychology building and Ucen Road) would convert a portion of a vacant area that has a lawn ground cover to a stormwater treatment use, and could require the removal of two large lemon scented gum trees that have trunk diameters greater than six inches. The conversion of the site from a lawn area to a stormwater detention basin would not result in a substantial change in existing visual conditions and would result in a less than significant scenic quality impact. Consistent with 2010 LRDP Policy ESH-28c/LRDP Appendix 2: *Campus Tree Trimming and Removal Program*, the two removed gum trees would be replaced at a 1:1 ratio. Therefore, the Project would result in less than significant tree removal impacts.

Treatment Option 1 on site C (the east side of the Project site) would occupy an area that is proposed to provide Project-related bicycle parking, and would reduce the amount of proposed on-site bicycle parking from approximately 2,106 spaces to approximately 1,666 spaces (a reduction of approximately 440 spaces). Providing a reduced number of bicycle parking spaces at the Project site would be an adverse result of locating stormwater treatment on the site, however, a substantial number of bicycle parking spaces would still be provided, and a reduction in planned bicycle parking would be a less than significant change in existing environmental conditions.

Treatment Option 2. Locating stormwater treatment Option 2 (subsurface water retention/detention) at site A (Parking Lot 3) would require the temporary removal of approximately 40 faculty/staff parking spaces while the treatment system is constructed. As described above, an adequate number of parking spaces are available in Lot 22 to accommodate the temporarily displaced parking spaces. The use of site B (between the Psychology Building and Ucen Road) to construct the underground storage system would result in a temporary change to the visual character of the vacant area, however, after the completion of construction activity the site would be restored to conditions similar to those that currently exist. The construction of Option 2 at this site, however, could require the removal of two large gum trees. Compliance with LRDP policy tree replacement requirements would avoid potential tree removal-related impacts. The construction of Option 2 at site C (the Project site) would not result in the displacement of any proposed bicycle parking spaces.

The operation of an underground water retention/detention system (Option 2) would require some type of pre-treatment of the runoff water to remove trash and debris before it enters the underground chamber. Pre-treatment would be required to prevent clogging of the gravel and to extend the life of the system. Several types of pre-treatment systems may be used. Potential impacts associated with potential pre-treatment systems are evaluated below.

Surface pre-treatment systems may include the use of features such as bioswales, filter strips, and rain gardens. For these types of systems to operate, stormwater must be directed to and flow through the features using gravity flow. Providing adequate gravity flow at the project site and the proposed treatment sites may be constrained due to the relatively flat topography of the area and may require changes in existing grades and the use of retaining walls. Bioswales, filter strips, and rain gardens also require the use of surface space. For example, a bioswale typically requires a minimum of a 3-foot-wide flat bottom, 3H:1V side slopes, and a minimum length of 100 feet. Also, surface treatment systems should be set back from buildings to avoid saturating the structural footings, and should also be set back from pedestrian and bicycle paths for safety purposes. These types of constraints associated with use of surface pre-treatment systems may have the potential to result in significant soil (ground saturation) and circulation (pedestrian and bicycle) safety impacts. In addition, the installation of surface treatment systems could result in less than significant impacts related to a loss of bicycle parking area on the project site, or the permanent loss of parking spaces in Parking Lot No. 3.

Underground pre-treatment systems, such as a hydrodynamic separator[2] or other filtering devices, require a smaller treatment area footprint, and their surface area requirements is usually limited to a manhole-like structure. Site storm drains are routed to the pre-treatment device and then the treated water is discharged to the main underground treatment system. The use of a subsurface pre-treatment system would require regular (seasonal) maintenance to remove the collected trash and sediment, however, the use of underground pre-treatment systems would not require additional grading to facilitate the

[2] Hydrodynamic separator units are vault-like structures placed below ground and are connected to large storm drain lines to capture floatable trash/debris and sediment from the contributing drainage area. The units use a vortex action created by the hydraulic energy of incoming water. The treated water is discharged through an outlet pipe back to the storm drain system. These types of units are installed below ground and do not result in visual impacts, do not require the use of electrical or other types of energy to operate, and are not a substantial source of noise.

gravity flow of runoff; and would not result in the potential loss of bicycle or vehicle parking, potential soil saturation impacts, or potential pedestrian/bicycle safety impacts.

In conclusion, the implementation of stormwater treatment Option 1 at sites A, B or C would not result in significant environmental impacts. The use of an underground water retention/detention system (Option 2) at sites A, B or C would also not result in significant environmental impacts. However, the construction and use of ground surface pre-treatment systems (e.g., bioswales, filter strips, and rain gardens) that are necessary for the operation of Option 2 may have the potential to result in significant soil- and safety- related impacts. These potential impacts would be avoided by using a subsurface pre-treatment system. Therefore, the Classroom Building Project's drainage system could have the potential to result in **significant but mitigable** drainage-related impacts. This potential impact can be avoided by implementing proposed mitigation measure HYD-1, which requires the use of a subsurface pretreatment system if stormwater management Option 2 is implemented.

Cumulative Impacts. All cumulative development on the UCSB campus and in the project region would be required to implement appropriate water quality and drainage control measures consistent with the requirements of the jurisdiction's Stormwater Management Program Guidance Document and the Central Coast Post-Construction Stormwater Management Requirements. The Classroom Building Project's downstream effects on water resources would not be cumulatively considerable and with the implementation of adopted water quality and stormwater management regulatory programs by other jurisdictions in the region, cumulative water quality/drainage impacts would be **less than significant** and no mitigation measures are required.

iii) *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.*

As described in response "ii" above, the Classroom Building Project would result in a small decrease in storm water runoff leaving the project site. The proposed Storke Campus temporary staging area would not result in an increase in impervious area at the site or an increase in existing stormwater runoff characteristics (i.e., rate or volume). Therefore, the Project would not result in significant impacts to existing storm water drainage systems. As described in response "a" above, the Project would not be a substantial short- or long-term source of polluted runoff. Therefore, the Project would have a **less than significant** impact related to the operation of existing storm water drainage systems or receiving waters.

iv) *impede or redirect flood flows?*

The Classroom Building Project would not result in the development of any structures in a 100-year flood hazard area, and would not impede or redirect flood flows. The proposed Storke Campus temporary staging area is located adjacent to the northwestern extent of the Goleta Slough and is within the 100-year floodplain that has been designated for the Slough. The amount of material stored on the staging area site would not be substantial (i.e., a limited amount of building materials) and fencing around the site would be permeable mesh over chainlink. Therefore, the temporary use of the staging site for building material storage would not adversely impede or redirect potential flood flows. Therefore, the proposed Project would have a **less than significant** impact related to flooding hazards.

d) *In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?*

The California Emergency Management Agency has prepared Tsunami Inundation Maps for Emergency Planning (2009) that identify areas that could be affected by a tsunami. The hazard map for the Goleta area shows areas on and near the UCSB campus that could be affected by a tsunami, including the Goleta Slough, Campus Lagoon and the Devereaux Lagoon. The Classroom Building Project site is not located within or adjacent to a designated hazard area. Water bodies near the project site, such as the Campus Lagoon, are too shallow to result in a significant seiche impact.

The proposed Storke Campus temporary staging area would be primarily used for the storage of inert construction materials, and would not be used for the storage of hazardous substances. Therefore, a 100-year flood event that may affect the staging area site would not result in the release of pollutants that would result in significant water quality impacts. The staging area site is located approximately 160 feet west of the designated tsunami runup area for the Goleta Slough, which terminates on the east side of Los Carneros Road. Water levels that may occur in the Goleta Slough and Storke Wetlands would be too shallow to result in a significant seiche impact. Therefore, the Project would have **less than significant** impacts related to inundation hazards.

e) *Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?*

As described in responses provided above, the Classroom Building project would not be a substantial source of pollutants that would result in significant impacts to surface water quality or the quality of groundwater. The Project would also implement the requirements of the UCSB Stormwater Management Program Guidance Document, and as described in IS/MND Section 5.11 (Land Use and Planning) would be consistent with applicable water quality policies of the 2010 LRDP. Groundwater on the Main Campus is not used a water source and is not subject to the requirements of a groundwater management plan. Therefore, the Project would have **less than significant** impacts related to this significance criterion.

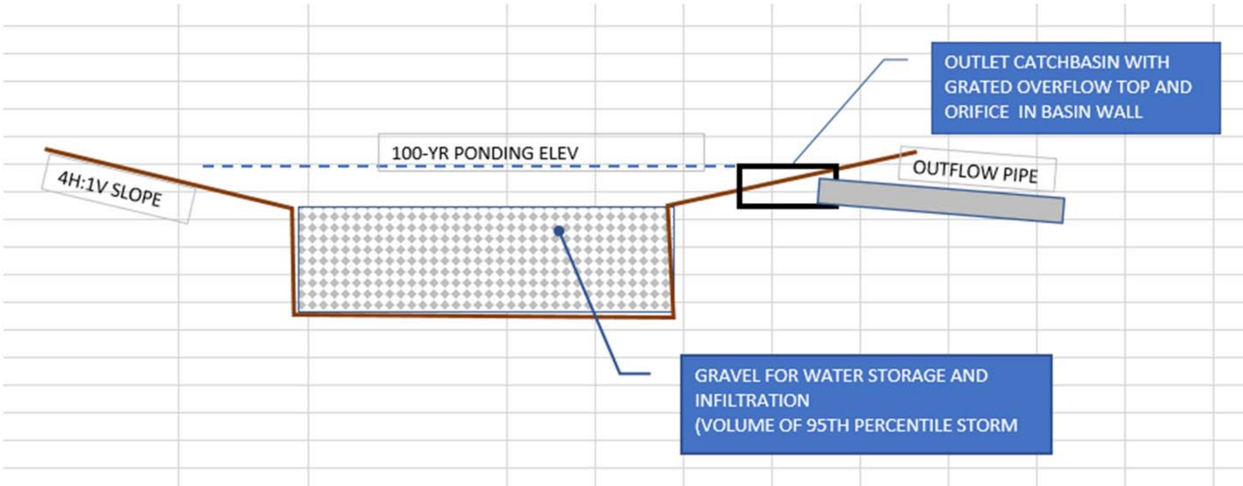
5.10.3 Mitigation Measures

Potential drainage-related impacts that may result from the implementation of runoff management Option 2 can be avoided with the implementation of the following mitigation measure.

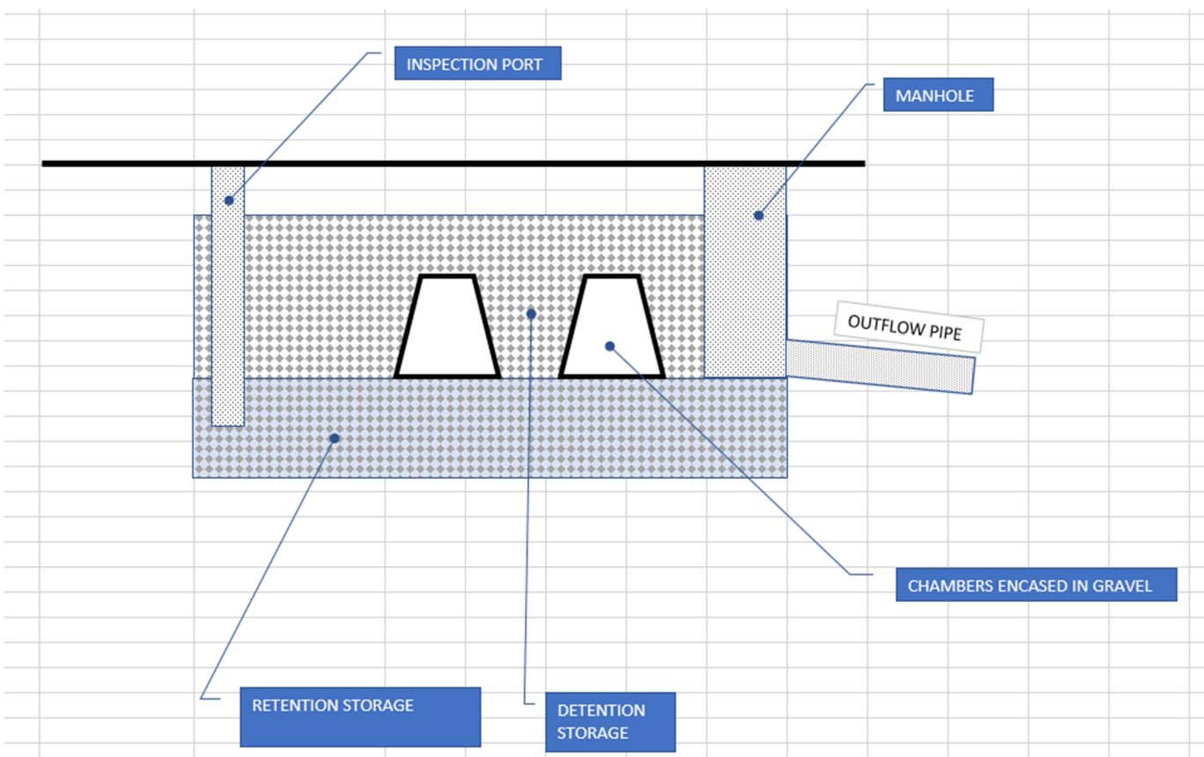
IMPACT HYD-1 **The construction and use of ground surface pre-treatment systems (e.g., bioswales, filter strips, and rain gardens) that are necessary for the operation of stormwater management Option 2 (below ground retention and detention) may have the potential to result in significant soil- and safety-related impacts.**

HYD-1a. If stormwater treatment Option 2 (below ground retention and detention) is used to manage stormwater runoff from the project site, required pre-treatment filtering of runoff water shall be accomplished using a below ground treatment system. Such a treatment system may include the use of a hydrodynamic separator other suitable filtering devices.

OPTION 1: Surface Basin with Retention/Detention System



OPTION 2: Buried Retention/Detention System



Source: Stantec, 2019

University of California, Santa Barbara

Classroom Building Project

Figure 5.10-1

Stormwater Treatment System Options

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
5.11 LAND USE AND PLANNING - Would the project:					
a) Physically divide an established community?	☐	☐	☐	☐	✓
b) Cause a significant environmental effect due to a conflict with any applicable land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	✓	☐	☐

5.11.1 Setting

2010 LRDP 2010 LRDP. Land use planning requirements for the UCSB campus are included in the 2010 Long Range Development Plan (LRDP), which was certified by the Regents in September 2010 and was certified by the California Coastal Commission in November, 2014. The 2010 LRDP identifies and describes the physical development needed to achieve the campus's academic goals through 2025; is a land use plan for the development of future campus facilities; and addresses the requirements of the California Coastal Act of 1976. The 2010 LRDP applied an "Academic and Support" land use designation to the Classroom Building Project site, and a "Student Housing" land use designation to the proposed Storke Campus temporary staging area site.

5.11.2 Checklist Responses

a. *Physically divide an established community*?

The Classroom Building Project would be located on an approximately 2.4-acre mostly vacant area located near the center of the Main Campus. On-site development includes Temporary Building 408 and a bicycle path. Access to the project site is currently and would continue to be from UCen Road and an existing service vehicle driveway. The Classroom Building and infrastructure required to serve the building (i.e., access roads and utilities) are existing facilities and would not divide or isolate any uses on the Main Campus. The proposed Storke Campus staging area would be a temporary use that would not result any utility service or access improvements. Therefore, the Project would have **no impact** related to this significance criterion.

b. *Cause a significant environmental effect due to a conflict with any applicable land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?*

The 2010 LRDP identifies five major goals and identifies how elements of the LRDP implement each of the goals. The five goals of the 2010 LRDP include:

- Mature the academic programs
- Strengthen the campus form
- House students, faculty and staff
- Integrate sustainable practices
- Contribute to regional solutions

The Classroom Building Project would be consistent with the 2010 LRDP goals as it would provide classroom facilities that are needed to accommodate existing demand and planned student enrollment growth identified by the 2010 LRDP. The Project site is designated as a potential Academic and Support building area by 2010 LRDP Figure D.3 (Potential Development Areas) and the Project's design would be compatible with nearby buildings. In addition, the Project would provide a well-defined extension of the Pardall Mall along the site's northern border, which will strengthen the campus form. The Project would be designed to achieve a minimum "Gold" LEED rating, which would promote sustainable practices. The project would not generate a substantial amount of traffic and would include systems that minimize the building's energy use and stormwater-related impacts, which will contribute to regional traffic, air quality, greenhouse gas emissions, and stormwater management solutions. The Project would provide new academic facilities and it is not an objective of the Project to provide student or faculty housing.

Proposed development projects undertaken at UCSB must be consistent with the policies of the 2010 LRDP. An evaluation of the New Classroom Building Project's consistency with applicable LRDP policies is provided on Table 5.11-1.

Table 5.11-1
2010 Long Range Development Plan
Policy Consistency Analysis

POLICY	ANALYSIS
Land Use	
LU-01 - A maximum of 3.6 million gross square feet (GSF) of additional academic and support uses may be developed on the UCSB campus where	**Consistent.** One new building (KITP Visiting Scholar Residences) has been constructed on the UCSB campus since the 2010 LRDP was certified

Table 5.11-1
2010 Long Range Development Plan
Policy Consistency Analysis

POLICY	ANALYSIS
designated on Figure D.3, Potential Development Areas, and provided that it is consistent with all other policies and provisions of the LRDP.	by the Coastal Commission in 2014, and the Henley Hall building is currently under construction. The KITP project provides 32 residential units, and that building's gross square footage is not counted towards the requirements of this policy. The Henley Hall project has 53,000 gsf of floor area. With the 95,250 gsf of floor area provided by the proposed Classroom Building, a total of 148,250 additional gsf of building area would have been added to the UCSB campus since the 2010 LRDP was certified, which is substantially lower than the 3.6 million gsf of building area allowed by the LRDP.
LU-05 - Development shall be planned to fit the topography, soils, geology, hydrology, and other conditions existing on the site so that grading is kept to a minimum. Campus development shall protect, and where feasible restore, natural hydrologic features such as natural stream corridors, groundwater recharge areas, floodplains, vernal pools, and wetlands.	**Consistent.** The Classroom Building project site is level and would require grading for foundation preparation purposes and minor utility installation. The Project is located near the center of the Main Campus and would not result in significant direct impacts to streams or wetlands. Storm water runoff from the project site would have the potential to result in indirect water quality impacts to the Campus Lagoon, however, potential impacts would be minimized by implementing construction and post-construction water quality measures included in an approved SWPPP, and the requirements of the 2014 UCSB Stormwater Management Program Guidance Document. Additional information regarding this requirements are provided in IS/MND section 5.10 (Hydrology and Water Quality). The UCSB Main Campus is not located in an important groundwater recharge area, and the project site is not located within a floodplain area. The proposed Storke Campus temporary staging area is located adjacent to the Goleta Slough and Storke Wetlands, and is within the 100-year floodplain designated for the Goleta Slough. As described in IS/MND section 5.10 (Hydrology and Water Quality), the temporary use of the proposed site for the storage of construction materials would not result in significant water quality of flooding impacts. Therefore, the Project would be consistent with the requirements of this policy.
LU-06 - New campus development shall be located within, contiguous with, or in close proximity to existing developed areas able to accommodate it and where it will not have significant adverse effects, either individually or cumulatively, on coastal	**Consistent.** The Classroom Building Project site is located near the center of the Main Campus and existing access and utility services are located on and adjacent to the site. The project site is able to accommodate the proposed development.

Table 5.11-1
2010 Long Range Development Plan
Policy Consistency Analysis

POLICY	ANALYSIS
resources.	The Project would result in the removal of two native sycamore trees (that were likely planted as landscape trees) and a New Zealand tea tree. This impact would not be significant with the implementation of LRDP Policy ESH-28, which requires that removed native trees be replaced at a 3:1 ratio and non-native trees be replaced at a 1:1 ratio. There are no other sensitive coastal resources located on the Project site. The project site is approximately 1,500 feet north of the Campus Lagoon, which would minimize the potential for it to result in impacts (such as lighting, short-term noise, and increased human presence) to the coastal resources associated with the Lagoon. As described in IS/MND Section 5.10 (Hydrology and Water Quality) the Project would be required to comply with construction and post-construction water quality measures, such as the requirements of an approved SWPPP, and the requirements of the 2014 UCSB Stormwater Management Program Guidance Document. These requirements would minimize the potential for the Project to result in water quality related to the coastal resources associated with the Campus Lagoon. The proposed Storke Campus temporary staging area site is devoid of vegetation and would not result in direct (i.e., removal) impacts to coastal resources. As described in IS/MND sections 5.4 (Biological Resources) and 5.10 (Hydrology and Water Quality) the use of the staging area would not result in significant water quality or other indirect impacts to the Goleta Slough or Storke Wetlands. Therefore, the Project would be consistent with the requirements of this policy.
Public Access	
PA-02 - The coastal access improvements shown in Figures E.3 and E.4 shall be implemented in conjunction with nearby development projects and submitted as part of the relevant Notice of Impending Development. Alternately, these improvements may be implemented independently in advance, as funding permits.	**Consistent.** There are no planned coastal access improvements depicted on 2010 LRDP Figure E.3 (Trail Routes) or Figure E.4 (Coastal Access Program) in the vicinity of the Classroom Building Program) site. Therefore, the Project would not be required to provide or enhance coastal access facilities and would be consistent with the requirements of this policy.

Table 5.11-1
2010 Long Range Development Plan
Policy Consistency Analysis

POLICY	ANALYSIS
PA-12 - Motor vehicle traffic generated by new development shall not restrict or impede public access to or along the coast by exceeding the roadway capacity of existing coastal access routes on Campus. Should any proposed development significantly impact the roadway capacity of existing coastal access routes on Campus, the University shall implement or pay its fair share of costs to the City of Goleta and/or County of Santa Barbara to implement improvements to roadways and intersections or other traffic control measures necessary to mitigate the impacts.	**Consistent.** The Classroom Building Project would not expand any existing UCSB academic programs or result in any additional students, faculty, or staff being located on the UCSB campus. Therefore, it is unlikely that the project would result in an increase in existing traffic conditions at on- or off-campus roadways or intersections. Any traffic that may be generated by the Project would not result in significant impacts to on- or off-campus roadways and intersections, and would not restrict or impede public access to the coast. In addition, UCSB will continue to implement the requirements of the Mitigation Implementation and Settlement Agreement that was entered into with the County of Santa Barbara and the City of Goleta, which among other things specifies that UCSB will provide "fair share" payments for specified roadway and intersection improvements. Therefore, the Project would be consistent with the requirements of this policy.
Transportation and Parking	
TRANS-01-A - The University will work with the Cities, County, SBCAG, SBMTD and other transit providers to provide a balanced transportation system on campus, offering vehicular, bicycle, pedestrian, and transit mobility, including augmentation of external transit systems with University shuttle systems to increase capacity, efficiency, and use by the UCSB-affiliated population. The University shall include in the plans and designs submitted in support of the requisite Notice of Impending Development for new campus development, intersection and roadway improvements necessary to offset the proportional impacts of the University's LRDP build-out on roadway capacity. Roadway and intersection improvements shall not conflict with existing or planned pedestrian and bicycle facilities or degrade mobility for pedestrians and bicyclists. The University shall maintain campus intersections at a minimum Level of Service D.	**Consistent.** The Classroom Building Project would not expand any existing UCSB academic programs or result in additional students, faculty, or staff on the UCSB campus. Therefore, it is unlikely that the project would result in an increase in existing traffic conditions at on- or off-campus roadways or intersections. Any increase in traffic that may result from the Project would not be substantial and would not adversely affect the existing operation characteristics of the Main Campus gateway intersections or the operation of other on-campus roads or intersections, which currently operate at LOS A and B. Since any increase in roadway or intersection traffic conditions that may result from the Project would be very low, Project-related traffic volumes would not be cumulatively considerable. Therefore, the Project would not require any on- or off-campus roadway or intersection improvements to offset the impacts of project development. The project would not result in roadway or intersection improvements. As depicted on Figure 2.3-1 (Site Plan), the Project includes the relocation of existing pedestrian and bicycle paths located on the project site. The existing pathways would be relocated to the northern portion of the project site

Table 5.11-1
2010 Long Range Development Plan
Policy Consistency Analysis

POLICY	ANALYSIS
	and would function as an extension of the Pardall Mall, which is the main east-west thoroughfare across the Main Campus. Therefore, the Project would be consistent with the requirements of this policy.
TRANS-06 - The University shall provide additional bicycle parking facilities as part of all campus building projects. The University shall periodically survey campus bicyclists (at a minimum before undertaking the environmental review of significant projects) to determine the kinds and locations of bicycle facilities and other bicycle support features (such as bus access for bicyclists, securable bicycle lockers, etc.) that are most needed. The University shall incorporate the requested features in new campus development projects to the maximum extent feasible. The University shall additionally provide bicycle parking facilities near public coastal accessways and trails, where appropriate, to support public access opportunities while ensuring adequate protection of sensitive resources. The bicycle features shall be indicated on the campus visitor's map upon construction. The University shall identify the requisite bicycle parking facilities as part of the Notice of Impending Development submittal for all significant new campus development proposals.	**Consistent.** The Classroom Building Project would remove approximately 986 existing bicycle parking spaces (i.e., bike racks) located adjacent to the Library and Psychology Building, and would provide approximately 2,106 new bicycle parking spaces at locations depicted on Figure 2.3-1 (Site Plan). The new bicycle parking facilities would replace the 986 existing spaces that are to be removed, and would provide 1,120 additional spaces to serve the Classroom Building. Therefore, the Project would be consistent with the requirements of this policy.
TRANS-10 - The University shall contribute funds toward intersection and transportation improvements in the City of Goleta and County of Santa Barbara proportionate to the University's impacts to the intersection and/or roadway.	**Consistent.** UCSB will continue to implement the requirements of the Mitigation Implementation and Settlement Agreement that UCSB entered into with the County of Santa Barbara and the City of Goleta, which among other things specifies that UCSB will provide "fair share" payments for specified roadway and intersection improvements. The Agreement provides a procedure for making future impact fee payments. Section 4.2a of the Agreement requires the County and City to annually provide UCSB with a 5-year plan of projected transportation improvements included in the Agreement. Section 4.2b establishes notification requirements to be implemented by the County and City after determining that a transportation improvement identified by the Agreement is necessary. Section 4.2c provides a schedule for the payment of specified mitigation fees by UCSB. Section 4.3 of the Agreement provides monitoring provisions to ensure compliance with the Agreement's traffic impact fee provisions.

Table 5.11-1
2010 Long Range Development Plan
Policy Consistency Analysis

POLICY	ANALYSIS
	The Classroom Building Project would not expand any existing UCSB academic programs or result in any additional students, faculty, or staff being located on the UCSB campus. Therefore, it is unlikely that the project would result in an increase in existing traffic conditions at on- or off-campus roadways or intersections. Therefore, the Project would be consistent with the requirements of this policy.
TRANS-16. Where new development would remove existing commuter or residential parking, the NOID for the project must account for the removed spaces and identify where the removed spaces can either be accommodated in existing campus parking facilities or where new spaces will be built to replace the lost spaces. Where redevelopment of a site also removes a building function and associated potential commuter population, and where the function/population is not displaced elsewhere on campus, the spaces may be removed without being reassigned. **TRANS-17D** - The University shall evaluate commuter parking supply and demand for each new development that has an impact on commuter parking. Any development that reduces commuter parking supply shall demonstrate that adequate commuter parking capacity still exists, or will exist prior to occupancy of the development, for campus commuters in general, as part of the NOID submittal (as determined in subparagraph "D" below). Where the proposed development contributes to the use of commuter parking, commuter parking supply shall not be deemed adequate for the development if the parking surveys demonstrate 85% occupancy, or greater, for commuter parking within a 10-minute walk of the proposed development.	**Consistent.** The proposed classroom building would not result in the removal of any existing parking spaces from Parking Lot 3 or other on-campus parking lots. The Project would not expand existing UCSB academic programs, or result in any additional students, faculty, or staff on the UCSB campus. Therefore, the Project would not increase the existing demand for parking spaces on the Main Campus. As described in IS/MND Section 5.10 (Hydrology and Water Quaility) construction of the Project's stormwater drainage system may have the potential to result in a short-term or permanent removal of approximately 40 parking spaces from Lot 3. It is anticipated that vehicles displaced from Parking Lot 3 would park in other Main Campus parking lots, such as Lot 22, which is located adjacent to Ocean Road, and is approximately 3,600 feet west of the Project site. Lot 22 is a six-level structure with 841 visitor, student, faculty and staff spaces, 202 student spaces, 60 coastal access spaces, and 25 other spaces. The 202 student parking spaces are located on level 4 and a portion of level 5. Parking occupancy surveys conducted in the Fall of 2018 show that the structure's lower level, and levels 1, 2 and 3 have average weekday occupancy rates ranging from 24 to 61 percent. Therefore, there is adequate capacity in Lot 22 to accommodate vehicles that may be displaced from Lot 3, and the Project would be consistent with the requirements of this policy.
Environmentally Sensitive Habitat	
ESH-06 – Operational noise levels shall not exceed state standards. The following operational noise sources are not subject to the maximum sound levels: **(a)** Noise of safety signals, warning devices and emergency pressure relief valves; and	**Consistent.** There are no environmentally sensitive habitat areas located on or adjacent to the Classroom Building project site. Therefore, project-related noise would not affect coastal habitat areas. Activities to be conducted at the Classroom Building project site would generally consist of the use of

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(b) Noise from moving sources such as tractors, automobiles, trucks, airplanes, etc. For all special events where the proposed event or activity is expected to generate significant noise in close proximity to sensitive receptor locations, the campus shall impose limitations on the hours of the event or activity.	interior classrooms and small group gatherings in outdoor areas near the proposed building. These types of activities would not be a substantial source of noise or result in a long-term noise increase when compared to the existing conditions at the project site. Noise from air handling and other equipment located on the roof of the building would be enclosed by a "penthouse" screen wall. Noise attenuation provided by structural shielding around the equipment would substantially reduce equipment noise at and near the project site. As described in IS/MND Section 5.13 (Noise) the proposed Storke Road temporary staging area would not be a substantial source of noise. Therefore, the Project would be consistent with the requirements of this policy.
Policy ESH-14 – Topsoil that is excavated, stored, or moved as part of an approved development shall be managed to preserve the viability of the mycorrhizae by being stockpiled no higher than 3 feet to protect the viability of the mycorrhizae. To the extent feasible, topsoil should be reused on site or for restoration.	**Consistent.** Grading at the project site would generally be for soil excavation necessary for building foundation preparation and utility installation. As described in IS/MND Section 5.7.2b, it is estimated that grading to construct the proposed building's foundation could require the excavation and export of up to approximately 13,900 cubic yards of soil depending on the foundation system that is used. The excavated soil would not be retained on the project site for landscape purposes. No soil would be excavated at the proposed Storke Campus temporary staging area site. Therefore, the Project would be consistent with the requirements of this policy.
ESH-15C - All outdoor lighting shall be designed to avoid, or minimize to the maximum extent feasible, all forms of light pollution, including light trespass, glare, and sky glow, and shall at a minimum incorporate the following: **1.** Best available visor technology to minimize light spill and direct/focalize lighting downward, toward the targeted area(s) only; **2.** The minimum standard (pole) height and height of the light mounting necessary to achieve the identified lighting design objective; **3.** The best available technology and a lighting spectrum designed to minimize lighting impacts on sensitive species and habitat; and **4.** Measures to minimize light trespass onto ESHA and open space areas.	**Consistent.** There are no environmentally sensitive habitat areas located on or adjacent to the Classroom Building Project site, and no lighting would be installed at the Storke Campus temporary staging area site. Therefore, project-related lighting would not affect coastal habitat areas. Exterior lighting installed at the Classroom Building Project site would consist of low-level safety and security lighting provided primarily near building entrances and in courtyard areas. All proposed light fixtures would be oriented downward and shielded to minimize light intrusion onto adjoining areas. Exterior lighting at the project site would generally be similar to the existing lighting conditions in Parking Lot No. 3 and the lighting provided along bicycle and pedestrian paths located on and adjacent

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	to the project site. In addition, all proposed lighting would be consistent with the requirements of 2010 LRDP Appendix 4, Outdoor Lighting Replacement and Retrofit Program. Therefore, the Project would be consistent with the requirements of this policy.
ESH-21 - Biological resources surveys shall be performed for all new development that is proposed where there is a potential for sensitive species, ESHA, or wetlands to be present; within or adjacent to ESHA (where the proposed development is within 200 feet of ESHA); within or adjacent (within 200 feet) to wetlands; within or adjacent (within 200 feet) to designated Open Space or other natural open space areas; or within 500 feet of trees suitable for nesting or roosting or significant foraging habitat is present. The results shall be presented in a biological report that shall include an analysis of the potential impacts of the proposed development on any identified habitat or species and recommendations for siting and design of the development to ensure protection of sensitive biological resources and habitat values.	**Consistent with Proposed Mitigation.** The Classroom Building Project site is a located near the center of the Main Campus; is surrounded by academic buildings; and does not contain habitat suitable for sensitive species. In addition, there are no wetlands, ESHA, or designated open spaces areas located adjacent to the project site. Due to the absence of foraging areas on and adjacent to the Classroom Building site; the distance of the project site from potential foraging areas such as the Campus Lagoon and Goleta Slough; and the extensive use of the project site and surrounding areas by humans (i.e., parking lot activities, adjacent academic buildings, and bicycle paths on and adjacent to the project site), it is unlikely that any of the trees located on or near the project site are used for nesting or roosting by raptors or other birds. However, to comply with the requirements of this policy, proposed mitigation measures BIO-1a through 1c require that a preconstruction nesting bird survey be conducted within prescribed distances of the project site if vegetation removal would occur during the typical nesting season (February 15-September 15). If an active nest is observed, construction activities shall be delayed unit the chicks have fledged and left the nest. With the implementation of these mitigation measures, the Project would be consistent with the requirements of this policy. The proposed Storke Campus Staging area site is at least 200 feet from ESHA and sensitive wetland habitat areas. Due to the low-intensity activities that would occur at the staging area (e.g., material storage) the temporary use of this area would not result in impacts to potential nearby foraging habitat. Therefore, the use of the off-site staging area would be consistent with the requirements of this policy.

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ESH-27 – Raptor habitat, including nesting trees, roosting trees, perching locations, and foraging habitat, shall be protected and preserved.	**Consistent.** Due to the absence of foraging areas on and adjacent to the Classroom Building project site, the distance of the project site from potential foraging areas such as the Campus Lagoon and Goleta Slough, and the extensive use of the project site and surrounding area by humans (i.e., parking lot activities, adjacent academic buildings, and bicycle paths on and adjacent to the project site), it is unlikely that any of the trees located on or near the project site are used for nesting or roosting by raptors. In addition, bird nest surveys conducted for the 2010 LRDP EIR did not detect any raptor nests on or near the project site, or on the Main Campus, and no nests were observed in on-site trees when surveyed in February 2019. There are no trees located on or near the proposed Storke Campus temporary staging area. Due to the low-intensity activities that would occur at the staging area (e.g., material storage) the temporary use of this area would not result in impacts to potential nearby foraging habitat. Therefore, the Project would not result in significant impacts to raptor habitat and would be consistent with the requirements of this policy.
ESH-28 – **A.** The routine trimming and/or removal of trees on campus necessary to maintain campus landscaping or to address potential public safety concerns shall be exempt from the requirement to obtain a Notice of Impending Development (NOID), unless otherwise required pursuant to subparagraph B, below, and provided that the trimming and/or removal activities are carried out consistent with all provisions and protocols of the certified Campus Tree Trimming and Removal Program in Appendix 2, except that the following shall require a NOID: **1.** Trimming and/or removal of trees located within ESHA or on lands designated Open Space as covered in Policy ESH-29, **2.** The removal of any tree associated with new development, re-development, or renovation shall be evaluated separately through the NOID process as detailed in subparagraph C, below; **3.** The removal of tree windrows, and **4.** Trimming and/or removal of egret, heron, or cormorant roosting trees proximate to the Lagoon.	**Consistent with Proposed Mitigation.** As described in IS/MND Section 5.4.2e, a total of ten trees are located on the project site that are subject to the requirements of this policy: two sycamore trees on the south side of the on-site bicycle path; four sycamore trees on the north side of the bicycle path; the redwood tree near the Psychology Building; the New Zealand tea tree adjacent to Building 408; and the two oak trees located near the Library, however, the oak trees are in poor health. The Classroom Building Project would remove the two sycamore trees located south of the on-site bicycle path, and a New Zealand tea tree located near Building 408. As required by this policy and LRDP Appendix 2: *Campus Tree Trimming and Removal Program*, the Project would be required to provide three replacement trees for each removed native tree, and one replacement tree for the ornamental tea tree, for a total of seven required replacement trees. As depicted on Figure 2.3-1 (Site Plan), the Project would provide adequate area on

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B. All tree trimming and tree removal activities, including trimming or removal that is exempt from the requirement to obtain a Notice of Impending Development, shall be prohibited during the breeding and nesting season (February 15 to September 1) unless the University, in consultation with a qualified arborist, determines that: **1.** Immediate tree trimming or tree removal action by the University is required to protect life and property of the University from imminent danger, authorization is required where such activity would occur in ESHA or Open Space through an emergency permit, **2.** Trimming or removal of trees located outside of ESHA or Open Space areas during June 15 to September 1, provided where a qualified biologist has found that there are no active raptor nests or colonial birds roosts within 500 feet of the trees to be trimmed or removed, or **3.** Is part of a development or redevelopment approved pursuant to a Notice of Impending Development. **C.** To preserve roosting habitat for bird species and monarch butterflies, tree(s) associated with new development, re-development, or renovation that are either native or have the potential to provide habitat for raptors or other sensitive species shall be preserved and protected to the greatest extent feasible. Where native, or otherwise biologically significant, trees are retained, new development shall be sited a minimum of five feet from the outer edge of that tree's canopy drip-line. The removal of such trees shall be evaluated pursuant to the Notice of Impending Development for the new development. Prior to the removal of any native and/or sensitive tree for development purposes, the University shall conduct biological studies to show whether the tree(s) provide nesting, roosting, or foraging habitat for raptors and sensitive bird species, aggregation or significant foraging sites for monarch butterflies, or habitat for other sensitive biological resources. The Commission may condition the subject Notice of Impending Development to secure the seasonal timing restrictions and mitigation requirements otherwise set forth in the Campus Tree Trimming and Removal Program in Appendix 2.	the project site to plant the required replacement trees. Therefore, the Project would be consistent with the requirements of this policy. The four on-site sycamore trees located on the north side of the on-site bicycle path, the two on-site oak trees, and the on-site redwood tree would be retained, however, grading and construction activities would occur adjacent to each of these trees. Construction activities and ground surface modifications would have the potential to adversely affect the long-term health of the trees, leading to the death and removal of additional on-site trees. Potential construction-related impacts to the on-site trees that are to be retained can be reduced to a less than significant level with the implementation of proposed mitigation BIO-2a, which requires the implementation of tree protection measures throughout the Project's construction period, and if necessary the replacement of trees that do not survive more than five years after the conclusion of project-related construction activities. To ensure that the Project does not result in significant impacts to active bird nests, proposed mitigation measures BIO-1a through 1c require surveys for active nests if trees would be removed during the nesting season, and that avoidance measures be implemented if active nests are detected. Implementation of these mitigation measures would reduce the potential short-term bird nesting impacts of the Project to a less than significant level. The Project would not impact any trees near the Campus Lagoon, or impact any trees that have the potential to provide monarch butterfly habitat. There are not trees located on or near the proposed Storke Campus temporary staging area site.

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Scenic and Visual Resources	
SCEN-01- New structures on the campus shall be in general conformance with the scale and character of surrounding development. Clustered developments and innovative designs are encouraged.	**Consistent.** The proposed Classroom Building would have approximately 95,250 gross square feet of floor area and would be a four story structure. The scale and character of the new building would be similar to other Main Campus buildings adjacent to the project site, including the Davidson Library, which adjacent to the project site is four stores; the Phycology Building, which is a one and three story building; and the Bio Engineering Building, which is a three story building. Therefore, the Project would be consistent with this policy.
SCEN-03 - New development shall be sited and designed to minimize adverse impacts to the greatest extent feasible on scenic resources, including places on, along, within, or visible from public viewing areas such as public parklands, public trails, beaches, and state waters that offer scenic vistas of mountains, coastline, beaches, and other unique natural features, as identified as viewpoints, scenic routes, and trails on Figure F.4. The University shall seek to enhance primary and secondary view corridors where feasible, to the ocean and scenic coastal areas shown in Figure F.4, such as by the removal of temporary buildings.	**Consistent.** As described in IS/MND Section 5.1.2 (Aesthetics), the Classroom Building Project would not obstruct or interfere with any of the view corridors identified by 2010 LRDP Figure F.4 (Scenic & Visual Resources). Due to the presence of intervening structures (the Davidson Library and the Bio Engineering Building) the Classroom Building Project would not affect existing views of the Santa Ynez Mountains from viewpoints located on or near the project site. Also due to the location of buildings adjacent to the project site, the Project would not affect existing views of the Pacific Ocean, Campus Lagoon, or the Goleta Slough as seen from the UCSB campus. The proposed building would not be visible from off-campus viewpoints. As described in IS/MND Section 5.1.2c, the proposed Storke Campus staging area would not result in significant short-term impacts to scenic resources. Therefore, the Project would be consistent with the requirements of this policy.
SCEN-04 - Development shall not exceed the height limits established in Figure D.4. Height shall be measured as the vertical distance at any one point from the existing grade to the highest point of the top of the roof of the structure. The highest point shall be the coping of a flat roof, or peak of the ridge for a pitch or hip roof. Mechanical and electrical equipment and solar energy systems on the roof shall not be included in the height measurement. However, mechanical equipment shall be setback as far as feasible from public roads and other viewing areas and screened by architectural features.	**Consistent.** 2010 LRDP Figure D.4 establishes a 65-foot building height limit for the project site. The proposed Classroom Building would have a height of approximately 70 feet measured at the building's roof line. Roof-top mechanical equipment would be located near the center of the roof area and would be screened. Therefore, the Project would be consistent with the requirements of this policy.

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SCEN-06 - All new development shall include landscaping which mitigates the development's visual impacts. A landscape plan representing these landscape elements shall be submitted in support of the Notice of Impending Development.	**Consistent.** As depicted on IS/MND Figure 2.3-1 (Site Plan), the Project would include on-site areas that can be used for the installation of landscaping. Therefore, the Project would be consistent with the requirements of this policy.
SCEN-07 - For trees with significant scenic value, the first priority shall be to avoid tree removal where feasible. If tree removal cannot be avoided, the second priority shall be relocation of the tree. If the scenic tree cannot feasibly be retained in place, the tree removal shall be conducted and mitigated consistent with the Tree Trimming and Removal Program in Appendix 2. Where a scenic tree is located within ESHA or Open Space the tree trimming and removal shall be subject to Policy ESH-29.	**Consistent with Proposed Mitigation.** Scenic trees on the project site are considered to be large, visually prominent trees that are in good health. Scenic trees on the project site include the two sycamore trees located on the south side of the on-site bicycle path; two of the four sycamore trees located on the north side of the bicycle path; and the redwood tree located near the Psychology Building. The two oak trees located near the Library are in poor health and not considered to be scenic trees. Two of the sycamore trees on the north side of the on-site bicycle path have been pruned substantially and are not considered to visually prominent, and the on-site New Zealand tea tree is not considered to be visually prominent. Of the five scenic trees located on the project site, the two sycamore trees on the north side of the bicycle path and the redwood tree would be retained. Proposed mitigation measure BIO-2a requires the preparation and implementation of a tree protection plan to protect these trees during the Project's construction period. The two scenic sycamore trees located on the south side of the on-site bicycle path would be removed. Due to their location near the center of the proposed building site, it would not be feasible to retain those two trees. Consistent with 2010 LRDP Policy ESH-28c/LRDP Appendix 2: *Campus Tree Trimming and Removal Program* the two removed sycamore trees would be replaced at a 3:1 ratio. As depicted on Figure 2.3-1 (Site Plan), adequate area on the project site would be provided to plant the required replacement trees. Therefore, the Project would be consistent with the requirements of this policy.
Archaeology	
ARC-01 - New development that requires ground disturbance shall be evaluated for its potential to impact archaeological resources. Site research, records reviews and archaeological surveys shall be undertaken by a Registered Professional. This documentation shall be submitted with the Notice of	**Consistent** A literature search and Extended Phase 1 investigation of the project site were conducted as part of the evaluation of the Project's potential impacts to archaeological resources. The use of the proposed Storke Campus staging area would not result in excavations that would have the potential to

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Impending Development.	encounter buried cultural resources. Therefore, the Project would be consistent with the requirements of this policy.
ARC-02 - The Department of Anthropology and Native American tribal groups approved by the Native American Heritage Commission for the area shall be consulted when development may adversely impact archeological resources.	**Consistent.** The NAHC was contacted in conjunction with the preparation of the project-specific Extended Phase 1 investigation. In addition, organizations and individuals identified by the NAHC were also contacted. Therefore, the Project would be consistent with the requirements of this policy.
ARC-03 - A mitigation plan shall be prepared by a Registered Professional Archaeologist when development may adversely impact archaeological resources. The mitigation plan shall be prepared in consultation with Native American tribal groups approved by the Native American Heritage Commission for the area, and the State Historic Preservation Officer, as applicable. Mitigation shall be designed in accordance with guidelines of the State Office of Historic Preservation and the State of California Native American Heritage Commission and shall, as the first priority, preserve the resources in place. Where in-situ preservation is not feasible, partial or total recovery of archaeological resources shall be undertaken.	**Consistent with Proposed Mitigation**. The Extended Phase 1 investigation prepared for the Project determined that there is a low potential for buried cultural resources to be present at the project site. However, due to the proximity of other archaeological sites on the Main Campus, mitigation measures CUL-1a through 1e are proposed, and those measures would reduce potential Project-related impacts to a less than significant level in the unlikely event that previously undetected resources are encountered during project construction.
ARC-04 - Archaeological monitors shall be on-site during all earth moving activities and/or other ground disturbances that have the potential to uncover or otherwise disturb archaeological resources. A Registered Professional Archaeological consultant and a Native American representative shall both be present.	**Consistent with Proposed Mitigation.** As required by proposed mitigation measure CUL-1b, an archaeologist and Native American representative shall be retained to monitor initial site preparation activities conducted on the project site. With the implementation of this mitigation measure, the Project would be consistent with the requirements of this policy.
ARC-05 - If archaeological or paleontological resources are discovered in the course of construction, all activity which could damage or destroy these resources shall be immediately halted. A Registered Professional Archaeologist, or paleontologist as applicable, shall examine the site and provide an evaluation of the nature and significance of the resources. Mitigation measures shall be developed and implemented to address the impacts of the development on the resources. The Office of Campus Planning and Design shall determine whether the development or mitigation measures require a new Notice of Impending Development and shall notify Coastal Commission	**Consistent with Proposed Mitigation.** As required by proposed mitigation measure CUL-1d, all earth disturbing work in the vicinity of cultural resources detected during project construction must be temporarily suspended or redirected until an archaeologist has evaluated the nature and significance of the find. After the find has been appropriately mitigated, work in the area may resume. A Chumash representative would be required to monitor any mitigation work associated with Native American cultural material. With the implementation of this mitigation measure, the Classroom Building Project would be consistent

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staff that archaeological or paleontological resources were discovered during construction. Activities that may adversely impact these resources shall not resume without written authorization from the University Office of Planning & Design that construction may proceed.	with the requirements of this policy. Based on the results of previous development projects conducted on the Main Campus, the Project would not result in significant impacts to paleontological resources.
ARC-06 - Vehicle use, unauthorized collecting of artifacts, or other activities that have the potential to destroy or disturb archaeological resources shall be prohibited.	**Consistent.** There are no archaeological resources located on the project site ground surface that may be subject to unauthorized collecting or other similar impacts. Therefore, the Project would be consistent with the requirements of this policy.
ARC-07 - Work shall be halted immediately when suspected human bone is discovered, regardless of context, until the coroner and a qualified archaeologist can examine the remains. University staff shall notify Coastal Commission staff of the nature of the discovery and that all work has been halted on the site. Activities shall not resume without written authorization from the Office of Campus Planning and Design that construction may proceed. Where Native American remains are discovered, further activities may require a Notice of Impending Development.	**Consistent with Proposed Mitigation.** Proposed mitigation measure CUL-1e describes actions to be taken in the unlikely event that human remains are detected during project construction. With the implementation of this mitigation measure, the Project would be consistent with the requirements of this policy.
ARC-08 - New development shall be sited and designed to avoid adverse impacts to archaeological and paleontological resources to the maximum extent feasible. If there is no feasible alternative that eliminates all impacts to these resources, then the alternative that would result in the fewest or least significant impacts to resources shall be selected. Impacts to archaeological or paleontological resources that cannot be avoided through siting and design alternatives shall be fully mitigated.	**Consistent with Proposed Mitigation.** The proposed project site is located beyond the boundaries of known archaeological sites on the Main Campus, and the archaeological survey of the project site did not detect the presence of cultural resources. However, due to the proximity of other archaeological sites on the Main Campus, mitigation measures CUL-1a through 1e have been proposed and those measures would reduce potential Project-related impacts to a less than significant level in the unlikely event that previously undetected resources are encountered during project construction.
Water	
WQ-01 - New development shall be sited, designed, and managed to prevent adverse impacts from stormwater or dry weather runoff to coastal waters and environmentally sensitive habitat areas. Sources of inflow to coastal wetlands shall be maintained so that the quality, volume and duration of flows do not diminish wetland hydrology.	**Consistent.** As described in Section 5.10 (Hydrology and Water Quality) of this IS/MND, the Project would not result in a substantial change in the rate that runoff water is discharged from the project site to the Campus Lagoon, and the Project would result in less than significant water quality impacts. By maintaining hydrologic characteristics and water quality conditions that are similar to existing conditions, the Project would have less than significant drainage-related impacts to wetlands, riparian habitat, or their buffer areas. Therefore, the

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	Project would be consistent with this policy.
WQ-03 - Stormwater and dry weather runoff management shall be addressed early in site design planning and alternatives analyses, taking into account existing site characteristics that affect runoff, (such as topography, drainage, vegetation, soil conditions, natural hydrologic features, and infiltration conditions) in designing strategies that minimize post-development changes in the runoff flow regime, control pollutant sources, and, where necessary, remove pollutants. The University shall, within a reasonable amount of time, develop a comprehensive surface water quality monitoring program for all discharges from campus. Properties and/or discharges with the highest levels of water pollution will be evaluated and water quality problems addressed, beginning with discharges deemed unhealthful or unsafe for human contact. **WQ-04 -** Campus site development is to be accomplished, whenever feasible, in a manner that will maximize percolation and infiltration of precipitation into the ground. The University shall site, design, construct and manage development to maintain or enhance where appropriate, on-site infiltration. Where inadequate infiltration would increase site runoff, development shall be scaled to ensure that on-site detention capacity (such as storage ponds or vaults) is increased sufficiently to avoid increased offsite discharge volume or velocity to the maximum extent feasible. Increased surface runoff shall not be conveyed over bluffs, including through sheet flow, open channels, or outfalls.	**Consistent With Proposed Mitigation.** As described in Section 5.10.2 of this IS/MND, two stormwater treatment options are being considered to manage stormwater from the project site in accordance with UCSB and RWQCB requirements. Proposed mitigation measure HYD-1 would avoid potential soil and safety impacts that may result if the Project were to include the use of bioswales or other ground surface systems to treat runoff water before it enters a subsurface retention/detention system. Also as described in Section 5.10.2, the Project would not substantially change the existing rate of stormwater runoff discharge from the Project site or the proposed Storke Campus staging area site. Runoff from the Classroom Building site would continue to be conveyed to the Campus Lagoon through the existing Main Campus stormwater drainage system. Stormwater treatment facilities to be provided on the Classroom Building project site, would have the beneficial effect of increasing water infiltration, reducing pollutant loads that may be contained in stormwater and dry weather runoff, and would minimize potential water quality impacts of the Project. The proposed staging area would not result in significant stormwater quality impacts. Therefore, the Project would be consistent with these policies.
WQ-05 - The University shall site, design, construct and manage development to preserve or enhance vegetation that provides water quality benefits such as transpiration, vegetative interception, pollutant uptake, shading of waterways, and erosion control. Native vegetation shall be prioritized for use in water-quality treatment facilities such as bioswales and vegetated filter strips. Removal of existing vegetation on campus shall be minimized and limited to a pre-approved area required for construction operations. The construction area shall be fenced to define project boundaries. When vegetation must be removed, the method shall be one that will minimize the erosive effects from the	**Consistent.** The Classroom Building Project site does not contain any native habitat and contains only a small amount of landscape vegetation. The proposed Storke Campus staging area is devoid of vegetation. Therefore, the Project would not result in the removal of a substantial amount of vegetation. The Project sites would be fenced during the construction period, which would avoid the removal or disturbance of vegetation at locations adjacent to the sites. All Project-related construction would comply with erosion minimization/water quality requirements of NPDES stormwater regulations; the construction site erosion control best management practices identified by a project-specific Storm

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removal. Temporary mulching or other suitable interim stabilization measures shall be used to protect exposed areas during construction or other land disturbance activities.	Water Pollution Prevention Plan; the requirements of the UCSB Stormwater Management Program Guidance Document; and a project-specific Construction Pollution Prevention Plan prepared in accordance with the requirements of 2010 LRDP Appendix 3: Water Quality Protection Program. Therefore, the Project would be consistent with the requirements of this policy.
WQ-06 - The University shall design, construct and manage campus development to minimize the introduction of pollutants, including trash and sediment, into coastal waters. Pollutants shall not be allowed to enter coastal waters through drainage systems. Low Impact Development (LID) strategies shall be used to emphasize an integrated system of decentralized, small-scale control measures that minimize alteration of the site's natural hydrologic conditions through infiltration, evapotranspiration, filtration, detention, and retention of runoff close to its source. Traps and filters for roadway contaminants shall be provided as part of all drainage structures.	**Consistent.** The Project includes the use of Low Impact Development design measures to reduce pollutant loads, such as the use of pervious paving materials, and discharging runoff to on-site treatment facilities. Therefore, the Project would be consistent with this policy.
WQ-07 - New development shall be designed to minimize the extent of new impervious surface area, especially directly-connected impervious surfaces, and where feasible to increase the area of pervious surfaces, to reduce runoff.	**Consistent.** Under existing conditions approximately 40 percent of the 2.4-acre project site is covered with impervious surfaces. After development of the Project, impervious surfaces would cover approximately 65 percent of the site. The Project-related increase in impervious area would result in corresponding increases in stormwater discharges. The additional runoff would be managed by installing stormwater retention/detention facilities on or near the project site. Therefore, the Project would be consistent with this policy.
WQ-10 - Grading operations that have the potential to deliver sediment to wetlands, environmentally sensitive habitat areas, or coastal waters shall be scheduled during the dry months of the year (May through October). The construction timeline may be extended into the rainy season for a specific, limited length of time, based on an inspection of the site, and a determination that conditions at the project site are suitable for. Continuation of work may be allowed if appropriate erosion and sedimentation control measures are in place and will be maintained during the activity. If grading occurs during the	**Consistent.** As described in IS/MND Section 5.7.2b, it is estimated that grading to construct the proposed building's foundation could require the excavation and export of up to approximately 13,900 cubic yards of soil depending on the foundation system that is used. Erosion of the exposed ground surface, and soil temporarily stored on the project site would have the potential to result in sediment discharges to the Campus Lagoon. Construction of the Classroom Building project would occur over a period of approximately 26 months, which would result in construction during the rainy season. The use of the proposed Storke Campus temporary

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rainy season (November through April), sediment traps, barriers, covers or other methods shall be used to reduce erosion and sedimentation in compliance with Appendix 3, Water Quality Protection Program. **WQ-11** - Excavated materials shall not be deposited or stored where the material can be washed away by storm water runoff. Topsoil removed from the surface in preparation for grading and construction is to be stored on or near the site, where the stockpile area(s) will not impact natural vegetation, and protected from erosion while grading operations are underway, provided that the topsoil is also managed consistent with Policy ESH-14. Appropriate measures shall be taken to protect the preserved topsoil from erosion and runoff through such measures as tarping, jute netting, silt fencing, and sandbagging soil. After completion of such grading, topsoil is to be restored to exposed cut and fill embankments of building pads so as to provide a suitable base for seeding and planting. These requirements shall be incorporated into applicable water quality protection plans (Construction Pollution Prevention Plan, Post-Development Runoff Plan, and/or Water Quality and Hydrology Plan as applicable) for processing during the NOID process as described in Appendix 3, Water Quality Protection Program.	staging area would not result in any site grading. All Project-related construction would comply with erosion minimization/water quality requirements of NPDES stormwater regulations, and the construction site erosion control best management practices identified by a project-specific Storm Water Pollution Prevention Plan, the requirements of the UCSB Stormwater Management Program Guidance Document, and a project-specific Construction Pollution Prevention Plan prepared in accordance with the requirements of 2010 LRDP Appendix 3: Water Quality Protection Program. Compliance with these program requirements would include the installation and maintenance of a soil stockpile erosion control measures. The project site does not contain any native vegetation and would not result in the creation of exposed cut or fill embankments that would have the potential to result in long-term erosion-related impacts. Therefore, the Project would be consistent with the requirements of these policies.
WQ-17 - All sewage from campus development shall be disposed of in sanitary sewer lines or approved septic tank system subject to design and performance requirements of the Regional Water Quality Control Board.	**Consistent.** All sewage from the Project would be directed to sanitary sewer lines. Therefore, the Project would be consistent with the requirements of this policy.
Climate Change and Shoreline Protection	
SH-02 - New development shall be sited to avoid potential flooding, inundation, and erosion hazards created or exacerbated by long-range sea level rise. New development that is potentially subject to the effects of sea level rise shall require a current (prepared within the past 2 years) coastal hazards assessment as described in Policy SH-04. Based on the coastal hazards assessment, new development and redevelopment shall be sited: to avoid any hazards anticipated during the life of the structure and to avoid the need for bluff retaining or shoreline protection devices. Hazard avoidance efforts shall	**Consistent.** The Classroom Building project site is approximately 50 feet above sea level, therefore, a climate change induced rise in sea level of up to 66 inches by the year 2100 would not result in adverse direct effects to the project site. The project site is not located within a 100-year floodplain, and the nearest designated floodplain areas are adjacent to the Campus Lagoon, approximately 1,500 feet south of the project site. Due to the elevation of the project site, an increase in the severity of flood events would not result in significant flooding-related impacts and no bluff retaining or shoreline

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not result in impacts to coastal resources or encroachment into coastal habitats and shall not undermine broader ecosystem sustainability, for example, siting and design of new development must not only avoid sea-level rise hazards, but also ensure that the development does not have unintended adverse consequences that impact sensitive habitats or species in the area. The assessment must also consider the potential need for larger setbacks near ESHA and natural open spaces to allow for habitat sustainability and migration.	protection devices would be required. The proposed Storke Campus temporary staging area site is approximately seven feet above sea level. Due to its low elevation and proximity to the Goleta Slough the site could be affected by future increases in sea level. However, proposed staging activities would be a short-term (approximately two years) activity that would not be adversely affected by sea level rise-related impacts. Therefore, the Project would be consistent with the requirements of this policy.
Hazardous Spills	
HAZ-5 - If contaminated soil and/or contaminated groundwater are encountered during excavation and/or grading activities, except where such activities are implementing a Commission-approved remediation plan, the following steps shall be taken: **(a)** The construction contractor(s) shall stop work and immediately inform Environmental Health and Safety (EH&S); **(b)** An on-site assessment shall be conducted to determine if the discovered materials pose a significant risk to the public or construction workers; **(c)** If the materials are determined to pose such a risk, a remediation plan shall be prepared and submitted to EH&S to comply with all federal and state regulations necessary to clean and/or remove the contaminated soil and/or groundwater; **(d)** Soil remediation methods could include, but are not necessarily limited to, excavation and on-site treatment, excavation and off-site treatment and/or disposal, and/or treatment without excavation; **(e)** Remediation alternatives for contaminated groundwater could include, but are not necessarily limited to, on-site treatment, extraction and off-site treatment, and/or disposal; and **(f)** The construction schedule shall be modified or delayed to ensure that construction will not obstruct remediation activities and will not expose the public or construction workers to significant risks associated with hazardous conditions. The Ellwood Marine Terminal Facility has a known contamination risk and shall be subject to Policy ESH-46.	**Consistent.** Approximately 200 cubic yards of contaminated soil is located at the northeast corner of the project site along the north side of Temporary Building 408. The contaminated soil is associated with Building 408 and a former heating oil storage tank that was removed in 1989. As described in IS/MND Section 5.9.2d, based on the results of several contamination assessments, the impacted soil is located approximately eight to 11.5 feet below the ground surface, and detected contamination concentrations are low. The Central Coast Regional Water Quality Control Board (RWQCB) granted closure of the Building 408 contamination site on February 3, 2016 and noted that residual soil and groundwater contamination may still exist that could pose an unacceptable risk under certain site development activities such as site grading, excavation, or de-watering. It was also noted that residual contamination and associated risks are expected to decrease over time. The Classroom Building project would be located west of the area that contains contaminated soil. Project-related development to be located in the area with contaminated soil would be a bicycle parking area, which would not require the disturbance or removal of the contaminated soil. However, modifications to existing on-site utilities located in the northeast corner of the project site and/or the installation of the proposed subsurface stormwater treatment facilities may require excavations that have the potential to encounter the impacted soil. If excavations are required in the area that contains contaminated soil, the UCSB Environmental Health

Table 5.11-1
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	and Safety (EH&S) would be contacted and the disturbed contaminated soil would be removed or remediated in accordance with federal, state and University regulations and the requirements of this policy. Therefore, the Project would be consistent with the requirements of this policy.
Geology	
GEO-01 - New development proposals shall be supported by geotechnical and soil studies conducted by a California-licensed geologist or geotechnical engineer, as appropriate, to determine technical requirements for adequate building foundation and infrastructure designs; such studies shall include an appropriate evaluation of seismic or liquefaction hazards that may affect the subject site. The results of such studies, and the recommendations of the preparing professional, shall be submitted in support of the pertinent Notice of Impending Development	**Consistent.** A Preliminary Geotechnical Engineering Report (Fugro, 2018a) was prepared for the Classroom Building Project. This report identifies California Building Code seismic design parameters applicable to the Project, and provides site and building design recommendations related to issues such as seismic and geologic hazards, foundation design, site development and grading, fill placement, and surface drainage considerations. Therefore, the Project would be consistent with this policy.
GEO-02 - Building setbacks from an active fault trace shall be a minimum of fifty (50) feet, or a greater distance if required by the California Building Code and California Geologic Survey standards in effect at the time of University design approval.	The Alquist-Priolo Earthquake Fault Zoning Act defines an active fault as one that has had movement in the Holocene, which is the most recent 11,000 years. A previous fault investigation (AMEC, 2012) conducted at a Main Campus site located northeast of the Classroom Building project site could "not preclude that the Campus fault has moved in the Holocene." A Fault Screening Report (Fugro, 2018b) prepared for the Classroom Building Project concluded that the Campus fault is approximately 1,000 to 1,300 feet north-northeast of the project site, and that the potential for faulting associated with the Campus fault "is low and consistent with published geologic mapping." Therefore, the Project would be consistent with this policy.
GEO-11 - New development shall comply with Federal Emergency Management Agency (FEMA) requirements for development in an A1-30 flood hazard zone provided that the development fully complies with all other provisions of the certified LRDP.	**Consistent.** The A1-30 flood hazard zone is a designation applied to areas subject to inundation by floods with a one percent chance of occurring in any given year (a 100-year storm). The Classroom Building Project site is not located within a 100-year floodplain, and the nearest designated floodplain areas are adjacent to the Campus Lagoon approximately 1,500 feet south of the project site. The proposed Storke Campus temporary staging area is located adjacent to the northwestern extent of the Goleta Slough and is within the 100-year floodplain that has been designated for the Slough. The amount of material stored on the staging area

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	site would not be substantial (i.e., a limited amount of building materials) and fencing around the site would be permeable mesh over chainlink. Therefore, the temporary use of the staging site for building material storage would not adversely impede or redirect potential flood flows. Therefore, the Project would be consistent with this policy.
Public Works Facilities	
PS-02 - Future development provided for in the LRDP land use plan will only be authorized after the University demonstrates at the time of NOID submittal that adequate water supplies, water mains, reclaimed water distribution systems, water treatment facilities, sewer services, utility lines, parking lots and structures, roadways and bicycle/pedestrian corridors, fire suppression facilities, and other essential infrastructure services will be available to supply the existing and proposed development.	**Consistent.** As described in section 5.19 (Utilities and Service Systems) of this IS/MND, the Classroom Building Project would not result in significant project-specific or cumulative water or wastewater impacts because adequate service capacity is available for the Project and reasonably foreseeable cumulative development listed on Table 1.8-1. As also stated in Section 5.19, water, wastewater and other service connections are available on or adjacent to the Project site. As stated in IS/MND Section 5.17 (Transportation), the Project would not result in significant transportation-related impacts. As stated in Section 5.15 (Public Services), adequate fire protection services are available to serve the Project. Therefore, the Project would be consistent with the requirements of this policy.
Sustainability and Recycling	
SUST-06 - The University shall minimize energy use and reduce pollution through such methods as the use of solar power and other renewable energy systems, natural lighting, passive solar heating and cooling and other techniques to produce energy efficient development, building management techniques such as smart metering and lighting/appliance management systems that limit waste, and use of light colored buildings and roofing materials.	**Consistent.** The Classroom Building project would include a variety of design measures to reduce energy use. Examples of proposed energy saving design measures include the building's open atrium design that will provide passive heating, cooling, and lighting; the use of light colored roofing material; use of LED lighting fixtures; and interior lighting control systems such as daylight and vacancy sensors. The Project would be designed and constructed to outperform the California Building Code (CBC) energy-efficiency standards by at least 20 percent.

5.11.3 Mitigation Measures

With the implementation of mitigation measures identified by this IS/MND and described below, the Classroom Building Project would be consistent with applicable policies of the 2010 LRDP. No additional mitigation measures are required.

- Conduct bird nest surveys prior to the start project-related construction activities during the bird nesting season (Section 5.4.3, Measures BIO-1a through 1c).

- Protection of scenic tree that would be retained on the project site (Section 5.4.3, Measure BIO-2a).

- Require archaeological resource monitoring during initial site preparation activities and implement specified actions in the unlikely event that potentially significant archaeological resources are detected during project construction (Section 5.5.3, Measures CUL 1a through 1e).

- Require the use of a hydrodynamic separator to provide stormwater pre-treatment to remove trash and gross solids before the water enters a buried stormwater retention/detention system (Section 5.10.3, Measure HYD-1).

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
5.12 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?	☐	☐	☐	☐	✓

5.12.1 Setting

There are no mineral resources or existing mineral resource recovery operations located on or near the UCSB campus.

5.12.2 Checklist Responses

a. *Would the project 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?*

See response provided below under item "b."

b. *Would the project 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?*

The Classroom Building Project would not limit the availability of mineral resources to the Project area or region, or interfere with mineral resource recovery operations. Therefore, the Project would have **no impact** on mineral resources.

5.12.3 Mitigation Measures

The Classroom Building Project would have no impact to mineral resources. No mitigation measures are required.

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
5.13 NOISE - Would the project result in:					
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	✓	☐	☐
b) Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☐	✓	☐
c) For a project located within the vicinity of a private airstrip or 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?	☐	☐	☐	✓	☐

5.13.1 Setting

Noise Characteristics. Noise may be described as "unwanted or objectionable sound." It is common to measure sound magnitude in decibels (dB), which is a logarithmic scale. A doubling of sound intensity is represented by a 3 dB increase in sound level. Generally, a 1 dB increase is barely perceptible to the human ear, a 3 dB increase is clearly noticeable, and a 10 dB increase is perceived as a doubling in sound.

One method that is used to express a measured noise value is the "equivalent noise level" (Leq). The Leq is defined as the single steady noise level that is equivalent to the same amount of energy as that contained in the actual fluctuating noise levels over a period of time. Typically, Leq is summed over a period of approximately one-hour. Another method to express a noise measurement is to use a day-night average sound level (Ldn). Ldn is the time average of noise levels for a 24-hour period with a 10 dB addition to noises occurring between 10:00 PM and 7:00 AM. This adjustment accounts for the increased sensitivity of people to nighttime noise. The Community Noise Equivalent Level (CNEL) is similar to the Ldn, except the CNEL adds 5 dB to evening noise levels (7:00 PM to 10:00 PM).

Existing Noise Sources. The project site is a generally vacant area located near the center of the Main Campus and is not a substantial source of noise. Noise sources located on and near the project site include bicycle paths and parking areas, and Parking Lot No. 3. Other existing sources of noise that affect the project area include on- and off-campus construction activities, and aircraft operations at the Santa Barbara Municipal Airport.

Noise Sensitive Receptors. On-campus noise sensitive uses generally include academic buildings, offices and residence halls. Several academic and office are located adjacent to the project site, including: the Davidson Library and Bio Engineering Building to the north; the Psychology Building to the south; Buildings 383 and 387, which are small portable office buildings near the southwest corner of the project site; and Noble Hall to the east. The closest residential area is the Main Campus dormitory area. The Santa Rosa Residence Hall is located approximately 600 feet south of the project site. Numerous other noise sensitive classroom, academic and office uses are also located in the project area.

Noise sensitive receptors near the proposed Storke Campus temporary staging area are the residences located in the Storke Family Housing Apartments. The residences closest to the proposed staging area are approximately 230 feet to the west.

Noise Thresholds. Based on thresholds used by the 2010 LRDP EIR, a project would result in a significant impact if it would:

a. Generate outdoor noise levels in excess of 65 dBA CNEL that could affect existing sensitive noise receptors.

b. Expose noise sensitive uses to 65 dBA CNEL or greater in outdoor living areas or if indoor noise levels cannot be reduced to at least 45 dBA CNEL.

c. Increase ambient noise levels at noise sensitive receptors by 3 dBA or more when ambient noise levels are at or already exceed the 65 dBA outdoor CNEL.

d. Place active construction sites within 1,000 feet of noise-sensitive uses.

5.13.2 Checklist Responses

a. *Would the project result in the generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards* *established in the local general plan or noise ordinance, or applicable standards of other agencies?*

Short-Term Noise Sources. The highest noise levels associated with construction activities generally occur during the site preparation/grading phase of the project. During this phase of construction, several pieces of construction equipment may be used simultaneously and noise levels within 50 feet of the equipment may exceed 90 dBA. Other construction phases and activities can also result in the generation of elevated noise levels, however, those activities generally result in lower intensity noise levels and occur on an intermittent basis.

Grading activities at the project site would primarily result from the excavation of soils to prepare the building foundation, and from minor trenching for the extension or relocation of utilities. As described in IS/MND Section 5.7.2b, the construction of a slab on grade foundation would require the excavation of approximately 13,900 cubic yards of soil from beneath the proposed building footprint. The construction of a cast-in-drill-hole piles foundation would require only minor site grading but would require the use of a drill rig at the project site. Proposed site preparation/grading activities would occur over a period of approximately two months.

Construction noise resulting from heavy equipment use at the project site was calculated based on the type of construction equipment likely to be used during the excavation/foundation construction phase of the project. It was estimated that there could be five pieces of construction equipment operating simultaneously on the project site: a drill rig to construct cast-in-drill-hole piles; a backhoe, dozer and dump truck to excavate and remove soil; and a water truck for dust control. Without considering noise attenuation that would be provided by the three-story Psychology Building, which is located between the Classroom Building Project site and the Santa Rosa Residence Hall, the simultaneous operation of each piece of construction equipment on the Project site would result in exterior noise levels of 64 CNEL at the Residence Hall. The Psychology Building, however, would act as a noise barrier and based on anticipated noise attenuation would likely provide at least 10 dBA of noise reduction for receptors south of the building. With this additional noise attenuation, estimated project-related construction noise at the Santa Rosa Residence Hall would be approximately 59 CNEL. Estimated noise levels at the residence hall resulting from on-site construction equipment use are summarized on Table 5.13-1.

Table 5.13-1
Construction Noise Levels at the Santa Rosa Residence Hall

Equipment Type	Noise Level at 50 Feet (dBA)	Distance to the Santa Rosa Residence Hall (feet)	Noise Level With No Noise Barriers (dBA)	Noise Level With Psychology Building Noise Barrier
Backhoe	85	600	62 L_{eq}	52 L_{eq}
Dozer	82	600	59 L_{eq}	50 L_{eq}
Dump Truck	76	600	53 L_{eq}	43 L_{eq}
Water Truck	76	600	53 L_{eq}	43 L_{eq}
Drill Rig	84	500	61 L_{eq}	51 L_{eq}
Combined Noise L_{eq}	---	---	66 L_{eq}	56 L_{eq}
Combined Noise CNEL	---	---	**64 CNEL**	**59 CNEL**

Short-term construction operations at the Classroom Building Project site would occur within 1,000 feet of the Santa Rosa Residence Hall, however, estimated peak noise during the site preparation phase would generally not exceed 59 dBA CNEL. Interior noise levels are typically 20 dBA lower than exterior noise levels. Therefore, interior noise from construction activities at the Santa Rosa Residence Hall would generally not exceed 45 dBA CNEL. Construction noise at the residence hall would not result in a significant impact. However, exterior noise levels resulting from construction activities at other locations adjacent to the project site, such as the Library, Psychology Building, Biology Building, Noble Hall, and 383 and 387 would exceed 65 dBA CNEL. As a result, short-term construction noise would be a **significant but mitigable** impact. Due to the short-duration of construction-related noise and with proposed mitigation measures this impact would be reduced to a less than significant level with the implementation of construction site noise minimization measures that were identified by the 2010 LRDP Final EIR.

Additional construction-related noise may result if it is necessary to remove contaminated soil from the area that is north of Building 408. Noise resulting from contaminated soil removal operations would primarily result from the operation of a backhoe. Noise from this equipment would occur intermittently over a period of less than one month. Therefore, noise from the planned soil remediation project would be **less than significant.**

The Classroom Building Project would result in a very small amount of construction-related traffic. Due to the low number of daily worker and delivery vehicle trips that would be generated by the Project, and the intermittent nature of construction traffic, such as trucks that would remove excavated soil from the site, the additional construction traffic generated by the Project would not substantially increase existing traffic noise levels and would result in **less than significant** traffic noise impacts.

The proposed Storke Campus temporary material storage area would be used for the storage of building materials and potential short-term noise sources at the site would generally be limited to the occasional use of construction equipment to move material on and off of the site. The use of vehicles at the staging area site would not be a substantial source of noise. However, construction-related activities at the staging area would occur within 1,000 feet of the Storke Family Housing Apartments, which could result in a potentially significant noise impact. This temporary **significant but mitigable** impact would be reduced to a less than significant level with the implementation of the construction site noise minimization measures that were identified by the 2010 LRDP Final EIR and included in proposed mitigation measure NOI-1a.

Long-Term Noise Sources

Building Operations. Activities conducted within and near the Classroom Building would generally consist of the use of lecture halls and classrooms, and small group gatherings in outdoor areas on the project site. These types of activities would not result in a long-term noise increase that would adversely affect surrounding uses.

Air handling equipment that would serve the building for ventilation, heating and cooling etc., could be a potentially significant noise source. This type of equipment, however, would either be incorporated into the building or located in the proposed equipment "penthouse" on the roof of the building. Noise attenuation by structural shielding around the air handling equipment, which is a project design feature, would ensure that the potential for long-term noise impacts from roof-top equipment would be less than significant.

The Classroom Building Project would result in the relocation of an on-site bicycle path and two existing bicycle parking areas, and additional bicycle parking to serve the project would also be provided. New or relocated bicycle facilities would not result in a substantial change in existing noise conditions on or near the Project site.

As described above, the Classroom Building Project would not result in a substantial increase in existing noise levels in the central portion of the Main Campus, and resulting noise levels would generally be similar to existing conditions and conditions that exist elsewhere on the Main Campus. Therefore, the Project would not result in the generation of outdoor noise levels in excess of 65 dBA CNEL that could affect existing sensitive noise receptors, and the project's long-term noise impacts would be **less than significant**.

Traffic Noise. The Classroom Building Project would not expand any existing UCSB academic programs or result in any additional students, faculty, or staff on the UCSB campus. Therefore, it is unlikely that the Project would result in an increase in existing traffic conditions at on- or off-campus roadways or intersections. Any increase in traffic that may result from the Project would not substantially increase existing traffic noise conditions. Therefore, the Project would have a **less than significant** long-term traffic noise impact.

b. *Would the project result in the generation of excessive groundborne vibration or groundborne noise levels?*

Site preparation activities (i.e., grading) and the construction of the proposed building would not require equipment or construction techniques (*e.g.* pile driving) that would result in the creation of excessive groundborne vibrations. Therefore, the short-term vibration impacts of the Project would be **less than significant** and no mitigation measures are required.

c. *For a project located within the vicinity of a private airstrip or 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?*

2010 LRDP EIR Figure 4.9-2 (Santa Barbara Municipal Airport CNEL Noise Exposure) depicts noise levels in the community surrounding the airport that result from aircraft operations. The Classroom Building Project site is located approximately 2,000 feet southwest of the 60 dBA CNEL noise contour. Therefore, airport-related noise would result in a **less than significant** impact to the proposed project.

5.13.3 Mitigation Measures

Impacts Reduced to a Less Than Significant Level with Proposed Mitigation

The following mitigation measures were identified by the 2010 LRDP EIR and would reduce the effects of short-term noise impacts resulting from the construction of the Classroom Building and the use of the off-site staging area to the extent feasible. Due to the short-term duration of the project-related construction operations, the following measures would be adequate to reduce the project's construction noise impacts to sensitive receptors located near the project site to a less than significant level.

NOISE-1 Project-related construction and staging activities would have the potential to result in a short-term increase in ambient noise levels at sensitive noise receptors near the project site.

NOI-1a. Prior to the initiation of Project-related construction activities, a noise mitigation plan shall be prepared and shall be implemented throughout the duration of construction. At minimum, the noise mitigation plan shall include the following:

1. Construction equipment shall be properly maintained and be outfitted with feasible noise-reduction devices to minimize construction-generated noise.

2. Stationary noise sources such as generators and pumps are to be located at least 100 feet away from noise-sensitive land uses.

3. Laydown and construction vehicle staging areas are to be located at least 100 feet from noise-sensitive land uses.

4. Whenever possible, academic, administrative and residential areas that will be subject to construction noise will be informed in writing at least one week before the start of construction activities.

5. Loud construction activities, such as jackhammering, concrete sawing, asphalt removal, and trenching operations, within 100 feet of a residential or academic building shall not be scheduled during finals week.

6. Loud construction activity as described in item 5 conducted within 100 feet of an academic or residential use shall, to the extent feasible, be scheduled during holidays, Thanksgiving break, Winter break, Spring break, or Summer break.

7. Loud construction activity within 100 feet of a residential building shall be restricted to the hours between 7:30 AM and 7:30 PM, Monday through Saturday.

8. Loud construction activity within 100 feet of an academic building shall be scheduled to the extent feasible on weekends.

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
5.14 POPULATION AND HOUSING –Would the project:					
a) Induce substantial unplanned 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 people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	✓	☐

5.14.1 Setting

The Classroom Building project site is a predominantly vacant area located near the center of the UCSB Main Campus. There are no residences located on or adjacent to the site. Infrastructure required to serve the Project (i.e., power, water, wastewater and roads) is located on and in the vicinity of the project site.

5.14.2 Checklist Responses

a. *Would the project induce substantial unplanned 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)?*

As described in IS/MND Section 1.3 (Project Background) the Classroom Building Project has been proposed to meet the existing demand for on-campus classroom facilities. Providing additional on-campus classrooms would not expand existing UCSB academic programs or result in any additional students, faculty, or staff on the UCSB campus. In addition, no extensions of roads and other infrastructure systems are required to serve the Project. Therefore, the Project would have a **less than significant** impact related to potential direct or indirect increases in the number of people located on the UCSB campus or in nearby communities.

b. *Would the project displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?*

The Classroom Building Project would not displace any people or the result in the removal of any residential units. Therefore, the Project would have a **less than significant** impact related to the need for replacement housing.

5.14.3 Mitigation Measures

The Classroom Building Project would have less than significant housing and housing impacts, and no mitigation measures are required.

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
5.15 PUBLIC SERVICES - Would the project:					
a) 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:					
Fire protection?	☐	☐	☐	✓	☐
Police protection?	☐	☐	☐	✓	☐
Schools?	☐	☐	☐	✓	☐
Parks?	☐	☐	☐	✓	☐
Other public facilities?	☐	☐	☐	✓	☐

5.15.1 Setting

Fire Protection. UCSB is located within the service area of the Santa Barbara County Fire Protection District, and fire prevention and suppression services are provided by the Santa Barbara County Fire Department. Fire Station No. 17 is located on-campus on Mesa Road, approximately three-quarters of a mile west of the project site, and Fire Station No. 11 is located off-campus on Storke Road, approximately 1.5 miles west of the project site.

The review and approval of campus development plans for compliance with fire protection-related requirements is the responsibility of the UCSB Fire Protection Division of the Environmental Health and Safety Department. An employee of the on-campus Fire Protection Division has been designated as a “Campus Fire Marshall” by the State Fire Marshall’s Office. The review of proposed development plans, such as access and hydrant locations, is also coordinated with the County of Santa Barbara Fire Department.

Police Protection. The UCSB Police Department is responsible for the safety and security of the UCSB campus as well as properties owned, controlled or occupied by the University. The Police Department is open 24 hours a day and is located in the Public Safety Building, which is located on the Main Campus. University Police officers, Santa Barbara County Sheriff's Deputies and California Highway Patrol officers work together to staff the Isla Vista Foot Patrol, which is located in facility in Isla Vista along the western edge of the Main Campus.

Schools. UCSB is located within the Goleta Union School District and the Santa Barbara High School District.

Parks. Numerous and varied recreation facilities for UCSB students, faculty and staff, and the public are provided on the Main Campus. Other park facilities are provided in the project region by the cities of Santa Barbara and Goleta, the County of Santa Barbara and the Isla Vista Recreation and Park District.

5.15.2 Checklist Responses

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:*

Fire protection

As reported by the 2010 LRDP EIR, Santa Barbara County has indicated that Fire Station 17 is currently deficient and is overburdened because only three firefighters staff the station. Based on the County's minimum service standard for fire protection of one firefighter per 4,000 people, the station is designed to serve a population up to 12,000 residents. Isla Vista's population is approximately 18,344 and the UCSB campus population is estimated to be 9,144. Therefore, the area served by Station 17 has a population of approximately 27,488, more than twice the population the station is designed to serve. Station 11, which is located off-campus, can also provide service to UCSB, however, this option is usually reserved in the event of simultaneous emergencies, as Station 11 has its own service area.

The 2010 LRDP EIR identified mitigation measures for LRDP-related impacts to fire protection services and facilities, including: UCSB would provide land adjacent to Fire Station 17 that the County could use to expand the fire station, or UCSB would pay its proportionate share of the cost of mitigating significant environmental effects resulting from the construction of a fire station at a different site; and UCSB would continue to require that all new campus buildings over 5,000 square feet in area be sprinklered, which reduces the demand for fire suppression services. However, the expansion of Fire Station 17 or the construction of a new fire station cannot be implemented by the UCSB. Since a new fire station or the expansion of Station 17 were the only measures considered by the 2010 LRDP EIR to be adequate to reduce the identified service impact to a less than significant level, the EIR determined that impacts to fire protection resulting from the implementation of the 2010 LRDP would be significant and unavoidable.

Subsequent to the 2010 LRDP EIR's analysis of the LRDP-related impacts to fire protection services, UCSB and the County of Santa Barbara entered into the *2010 Cooperative Agreement for Fire Protection, Emergency Response and Paramedic Services.* This agreement indicates that the County will maintain adequate fire protection service levels commensurate with County standards, and UCSB will pay its fair share of the cost for additional fire personnel. The agreement does not require the expansion of Station No. 17. Based on the requirements of the Agreement, fire protection service will be provided to UCSB adequate to serve land uses proposed by the 2010 LRDP, and as a result, the significant fire protection impact identified by the 2010 LRDP EIR would not occur.

The Classroom Building Project would result in the construction of 95,250 gross square feet of building area, but would not expand any existing UCSB academic programs or result in any additional students, faculty, or staff on the UCSB campus. Since the proposed new building area would not substantially increase the demand for fire protection services, and the Project would not result in an increase in on-campus population, the Project would not substantially increase the demand for fire protection services. With the implementation of the Agreement requirements described above to provide adequate fire protection personnel to serve UCSB and the project area, the New Classroom Building Project would result in **less than significant** project-specific and cumulative fire protection impacts.

Police protection

The 2010 LRDP EIR indicates that the current facilities occupied by the UCSB Police Department have been identified as being inadequate to meet the current needs of the Department, and that additional public service building area proposed by the 2010 LRDP could be allocated for Police Department use. It is also anticipated that environmental impacts resulting from the development of the proposed public service building space could be reduced to a less than significant level by mitigation measures proposed by the 2010 LRDP EIR. As a result, the 2010 LRDP EIR concluded that the facilities required by the Police Department to serve the on-campus population after buildout of the 2010 LRDP would not result in significant environmental impacts on a project-specific or cumulative basis. The 2010 LRDP EIR also concluded that the 2010 LRDP would not result in a service demand increase to the Santa Barbara County Sheriff's Department such that physical effects on the environment would occur resulting from the need for additional facilities.

The Classroom Building Project would not substantially increase demands for police services. Therefore, the Project would result in **less than significant** project-specific and cumulative police protection impacts.

Schools

The Classroom Building Project would not expand existing UCSB academic programs or result in any additional students, faculty, or staff on the UCSB campus. Therefore, the Project would not result in an increase in school-age children that would attend local schools. Therefore, the Project would have less than significant Project-specific impacts and would not result in a cumulatively considerable impact related to the need for future expansions of school facilities. Therefore, the Project would result in **less than significant** impacts to schools.

Parks

An evaluation of potential Project-related impacts to park facilities is provided in section 5.16 (Recreation) of this IS/MND. That analysis concluded that the Project would have a **less than significant** impact to on- and off-site recreation facilities.

Other public facilities

The Classroom Building Project would have a **less than significant** impact on other public facilities, such as libraries, as the Project would not expand any existing UCSB academic programs or result in any additional students, faculty, or staff on the UCSB campus.

5.15.3 Mitigation Measures

The Classroom Building Project would not result in significant public service impacts. No mitigation measures are required.

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
5.16 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?	☐	☐	☐	✓	☐
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?	☐	☐	☐	✓	☐

5.16.1 Setting

Numerous recreation facilities and opportunities exist on the UCSB campus, including the Recreation Center, ball fields; tennis, basketball and volleyball courts; swimming pools; and open space areas that can be used for active and passive recreation activities. Numerous bicycle and pedestrian pathways and trails also provide access throughout the campus, and to adjoining beaches and other areas throughout the region. Other park facilities are provided by the cities of Santa Barbara and Goleta, the County of Santa Barbara and the Isla Vista Recreation and Park District. There are no formal recreational facilities located on the proposed project site.

5.16.2 Checklist Responses

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?*

As described in Section 1.3 (Project Background) above, the Classroom Building Project has been proposed at this time to meet an existing demand for on-campus classroom facilities. Providing additional on-campus classrooms would not expand existing UCSB academic programs or result in any additional students, faculty, or staff on the UCSB campus. Therefore, the Project would not increase the use of existing recreation facilities and would not result in the substantial deterioration of on- or off-campus recreation facilities. Therefore, the Project would have a **less than significant** impact on existing recreation 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?*

As described by response "a" above, the Classroom Building Project would not result in a substantial increase in the demand for on-campus or regional recreation facilities. Therefore, the Project would have a **less than significant** impact related to a need to expand or construct recreation facilities.

5.16.3 Mitigation Measures

The Classroom Building Project would have a less than significant impact to on- or off-campus recreation facilities. No mitigation measures are required.

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
5.17 TRANSPORTATION Would the project:					
a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☐	☐	☐	✓	☐
b) Conflict or be inconsistent with CEQA Guidelines § 15064.3, subdivision (b)?	☐	☐	☐	✓	☐
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	✓	☐
d) Result in inadequate emergency access?	☐	☐	☐	✓	☐

5.17.1 Setting

Study Area Roads and Intersections. The UCSB Main Campus is served by three “gateway” roadways that connect the campus to the surrounding areas of Santa Barbara County, the City of Goleta, and Isla Vista. The east campus gateway provides direct access to Highway 217, which connects to U.S. 101. The west campus gateway at El Colegio Road and north gateway at Mesa Road provide access to Isla Vista, Santa Barbara County, and the City of Goleta. On- and off-campus roads that serve as the Main Campus gateways are described below:

- El Colegio Road serves the western campus gateway and is a four-lane roadway that provides access from the Main Campus to Isla Vista, City of Goleta and the West Campus.

- Los Carneros Road serves the northern gateway at Mesa Road, and is a two- to four-lane roadway that provides access from El Colegio Road to Hollister Avenue and U.S. 101.

- Mesa Road is a two- to four-lane east-west roadway along the northern border of the Main Campus. Mesa Road provides access from the northern gateway at Los Carneros Road to the eastern gateway where it connects to Lagoon Road and Hwy. 217.

The 2010 LRDP EIR indicates that in the vicinity of campus, traffic volumes are highest during the afternoon commute period, and that the UCSB gateway roadways carry a combined total of approximately 2,500 vehicles during the AM peak hour compared to 3,800 vehicles during the PM peak hour. Traffic counts conducted in the UCSB area have shown a recent decrease in traffic volumes at Project area intersections. Table 5.17-1 compares PM gateway intersection traffic counts from Spring 2012/2013 to traffic counts collected in Spring 2006 and Winter 2007. The decreases in traffic volumes range from approximately 12 to 39 percent and are consistent with observations of reduced campus parking demand and an increase in bicycle travel to campus.

Table 5.17-1
PM Peak Hour Traffic Count Comparison for Gateway Intersections

Gateway	Intersection	2006/2007 PM Peak Hour	2012/2013 PM Peak Hour	% Change
Northern	Los Carneros Rd / Mesa Rd	1,968	1,607	**-18%**
Western	Stadium Rd / El Colegio Rd	1,432	872	**-39%**
Eastern	Hwy 217 / Mesa Rd / Lagoon Rd	1,956	1,727	**-12%**

Source: San Joaquin Apartments and Precinct Improvements Project FEIR, 2014

Vehicle access to the Classroom Building project site is from UCen Road and a service vehicle driveway located east of and adjacent to the project site. The service driveway is the former Parking Lot No. 7, which was converted to its current driveway configuration in 2017 and no longer provides vehicle parking. The intersection closest to the Classroom Building Project site is Lagoon Road at UCen Road. The locations of the Lagoon Road/UCen Road intersection and the Main Campus gateway intersections are depicted on Figure 5.17-1. Table 5.17-2 presents the existing operating conditions of the Lagoon Road/UCen Road intersection and the UCSB gateway intersections. LOS A indicates free flow operations and LOS B indicates stable operation conditions.

Table 5.17-2
PM Peak Hour Intersection Operations

Number On Figure 5.17-1	Intersection	PM Level of Service
1	Lagoon Road/UCen Road	A (1)
2	Hwy 217 / Mesa Rd / Lagoon Rd (east gateway)	A (1) (2)
3	Mesa Rd / Los Carneros Rd (north gateway)	B (2)
4	El Colegio Rd / Stadium Rd (west gateway)	B (2)

(1) Source: 2010 LRDP Final EIR
(2) Source: San Joaquin Apartments and Precinct Improvements Project FEIR, 2014. Reported LOS conditions reflect intersection operations after the addition of traffic generated by the San Joaquin housing project.

Bicycle and Pedestrian Facilities. UCSB provides an extensive bicycle and pedestrian network on campus. Bicycling and walking are the two most popular modes for traveling to campus. Travel surveys have shown that 46 percent of students typically bike and 26 percent of students walk to campus, and that approximately 12 percent of faculty and staff bike or walk to campus[5] (UCSB, 2018).

<u>Bicycle Paths and Parking</u>. Several bicycle paths are located on or adjacent to the project site. A bicycle path that extends diagonally across the project site connects with a bicycle path to the east of the project site and two bicycle paths to the west of the site. The locations of the existing bicycle paths on and near the project site are shown on Figure 1.4-2.

Two bicycle parking areas are located on the project site (Figure 1.4-2). Bicycle parking for the Davidson Library is located in the northwest corner of the project site, and bicycle parking for the Psychology Building is located along the southern perimeter of the project site. In total, these bicycle parking areas provide bicycle racks for approximately 986 bicycles.

<u>Pedestrian Paths</u>. The Main Campus pedestrian network consists of sidewalks adjacent to campus roadways and internal paths providing access to academic and recreational uses. Several pedestrian paths are located on and adjacent to the project site. A path located on the southwestern portion of the project site connects the southern extension of the Library Mall walkway with the Davidson Library and extends through Parking Lot No. 3. Two Main Campus pedestrian corridors are located to the east and west of the project site. To the east is a walkway known as "Science Walk," which extends northward from UCen Road to the northern portion of the Main Campus. To the west is the southern extension of the Library Mall, which extends north-south from UCen Road to North Hall.

[5] http://www.sustainability.ucsb.edu/wp-content/uploads/ModeSplit-1.pdf

Transit System. Santa Barbara Metropolitan Transit District (SBMTD) provides local bus service for the region. UCSB has bus stops on El Colegio Road and a transit loop centrally located in the Main Campus along Ocean Road. The transit loop is served by five bus routes. Travel surveys (UCSB, 2018) have reported that approximately 12% of all students commute to UCSB using transit, and approximately 4% of all faculty and staff typically commute to campus using transit.

Parking. UCSB provides a combination of vehicle parking surface lots and structures, and parking spaces are designated by permit type. Faculty parking is designated by an “A” permit, staff by a “B” permit, and students and visitors by a “C” permit. Resident students can purchase a permit for parking areas designated for student residents. All visitors, students, and faculty/staff can purchase hourly parking permits for short-term parking needs. The largest parking facilities located near the project site are described below.

- Parking Lot No. 3. This lot is located west of and adjacent to the project site and has 107 vehicle spaces for faculty and staff.

- Parking Structure 10. This structure has a total of 606 vehicle spaces of which 548 spaces are designated for faculty and staff only. The structure is located approximately 300 yards east of the project site.

- Parking Structure 18. The Mesa Parking Structure has 865 vehicle spaces for visitors, students, faculty and staff, and is approximately 250 yards west of the project site.

- Parking Lot No. 16. This parking lot has 501 parking spaces and is approximately 250 yards west of the project site.

2010 LRDP Requirements. Improvements to the UCSB campus circulation and parking systems identified in the 2010 LRDP are designed to move traffic more smoothly, reduce conflicts between bicyclists and pedestrians, and improve access to both public transportation and the coast. Parking that serves the campus academic, support, and housing uses includes surface lots and structures that are located throughout the Main Campus. The 2010 LRDP also includes a variety of policies that pertain to campus-related circulation, transit, roadways, bicycle and pedestrian facilities. Policy TRANS-01-A addresses campus-related circulation systems:

> ***Policy TRANS-01-A*** *- The University will work with the Cities, County, SBCAG, SBMTD and other transit providers to provide a balanced transportation system on campus, offering vehicular, bicycle, pedestrian, and transit mobility, including augmentation of external transit systems with University shuttle systems to increase capacity, efficiency, and use by the UCSB-affiliated population. The University shall include in the plans and designs submitted in support of the requisite Notice of Impending Development for new campus development, intersection and roadway improvements necessary to offset the proportional impacts of the University’s LRDP build-out on roadway capacity. Roadway and intersection improvements shall not conflict with existing or planned pedestrian and*

bicycle facilities or degrade mobility for pedestrians and bicyclists. The University shall maintain campus intersections at a minimum Level of Service D.

Santa Barbara County and City of Goleta Settlement Agreement. In conjunction with the University's adoption of the 2010 LRDP, UCSB Santa Barbara County and the City of Goleta entered into a Mitigation Implementation and Settlement Agreement related to off-campus traffic-related impacts. The objective of the Agreement is to avoid PM peak hour trip impacts to local roadways and intersections resulting from the implementation of LRDP development projects. The agreement requires UCSB to conduct long-term traffic monitoring of traffic conditions at specified locations in the vicinity of the campus, and to pay specified County and City of Goleta traffic impact fees for the improvement of certain roadways and intersections. The timing for the implementation of the specified improvements is to be determined by the County and City of Goleta.

5.17.2 Impact Significance Thresholds

The 2010 LRDP EIR evaluated the traffic- and circulation-related impacts that would result from the implementation of the 2010 LRDP and used the following criteria to assess the significance of impacts to on-campus roadways.

1. Cause an increase in traffic that 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).

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

3. Result in inadequate emergency access.

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

5. Exceed LOS E for on-campus intersections while maintaining a balanced transportation system for all modes of travel as described below.

   - UCSB shall maintain LOS E traffic operations during morning and afternoon peak hours as measured by average vehicle delay at on-campus intersections.

   - UCSB shall provide a balanced transportation system on campus in consideration of vehicular, bicycle, pedestrian, and transit mobility. If a proposed project causes an intersection to degrade to LOS F, improvements shall be identified to restore operations to LOS E or better conditions. The proposed improvements shall not conflict with pedestrian or bicycle facilities or degrade mobility for pedestrians or bicyclists traveling on campus.

5.17.3 Checklist Responses

a. *Would the project conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?*

Transit. Existing bus service provided by SBMTD would serve people using the Classroom Building Project, and the Main Campus transit loop is located approximately 400 yards northwest of the project site. The Project would not expand existing UCSB academic programs or result in any additional students, faculty, or staff on the UCSB campus. As a result, the Project would not substantially increase the demand for transit service to and from the UCSB campus. Therefore, the Project would not adversely affect transit mobility, as required by 2010 LRDP Policy TRANS-01-A, and the Project would have a **less than significant** impact on existing transit services.

Roadways. Vehicle access to the project site is from existing on-campus roads. For vehicles arriving from the west, site access would likely be from the Mesa Road/Los Carneros Road gateway intersection, east on Mesa Road. through the Highway 217/Mesa Road/ Lagoon Road gateway intersection, south on Lagoon Road, east on UCen road, then northward on the service vehicle driveway that is east of and adjacent to the project site. For vehicles arriving from the east, site access is through the Highway 217/Mesa Road/ Lagoon Road gateway intersection, south on Lagoon Road, east on UCen road, then northward along the service vehicle driveway. As shown on Table 5.17-2, each of the intersections likely to be used by persons driving to the project site currently operate at LOS A or B.

<u>Short-Term Impacts.</u> Potential Project-related construction traffic impacts may result from construction personnel commuting to and from the project site; the delivery of construction material; the export of soil excavated for foundation preparation purposes, the import of soil suitable for construction purposes, and the use of the Storke Campus temporary staging area. The Project would not require a substantial number of construction workers and would not generate a substantial amount of construction-related traffic during the AM or PM peak traffic hours. Given the good existing traffic conditions at the on-campus intersections likely to be used by Project-related construction traffic and the short duration of construction activities, short-term traffic generation impacts would be **less than significant.**

<u>Long-Term Impacts.</u> The Classroom Building Project would not expand existing UCSB academic programs or result in any additional students, faculty, or staff on the UCSB campus. Therefore, it is unlikely that the project would increase existing traffic volumes at on- or off-campus roadways or intersections. If the Project were to indirectly result in an increase in existing traffic (deliveries, service vehicles, etc.) such an increase would be minor and would not adversely affect the existing operation characteristics of the Main Campus gateway intersections or the operation of other on- or off-campus roads or

intersections. Since any increase in roadway or intersection traffic conditions that may result from the Project would be very low, Project-related traffic volumes would not be cumulatively considerable. Therefore, the Project would not require any on- or off-campus roadway or intersection improvements to offset the impacts of project development as required by 2010 LRDP Policy TRANS-01-A; and the Project's project-specific and cumulative traffic impacts would be **less than significant**.

Bicycle Facilities. The Classroom Building Project would remove the existing bicycle path that extends diagonally across the project site, and relocate the path to the locations along the eastern and northern perimeters of the project site. The relocated path would continue to provide existing connections to other bicycle paths located adjacent to the project site and would not substantially alter the existing Main Campus bicycle path network.

The Classroom Building Project would remove approximately 986 existing bicycle parking spaces (i.e., bike racks) located adjacent to the Library and Psychology Building, and would provide approximately 2,106 new bicycle parking spaces at locations depicted on Figure 2.3-1 (Site Plan). The new bicycle parking facilities would replace the 986 existing spaces that are to be removed, and would provide 1,120 additional spaces to serve the Classroom Building. Therefore, the Project would provide an adequate number of bicycle parking spaces and would result in a **less than significant** bicycle facility-related impact.

Pedestrian Facilities. A new pedestrian walkway would be located along the northern perimeter of the project site. The western end of the new path would connect to the Library Mall, and would also serve as an extension of the Pardall Mall, which is located west of the project site. The Pardall Mall is the main east-west thoroughfare across the campus and contains the primary pedestrian and bicycle connections with Isla Vista. The eastern end of the new pedestrian walkway would connect to the existing walkway that is south of an adjacent to the Bio Engineering Building. The proposed walkway would also provide a new well-defined route that connects the Science Walk pedestrian corridor with the Library Mall.

Pedestrian access to the Library and Library Mall from Parking Lot 3 would continue to be provided by a new at grade crossing across the proposed new bicycle path located along the northern perimeter of the project site. The proposed crossing would replace an existing crossing that connects Parking Lot 3 with the bicycle parking area that is adjacent to the Davidson Library. As depicted on Figure 2.3-1 (Site Plan) the new crossing would be prominently marked to minimize potential conflicts between pedestrian and bicycles. Therefore, the Project would result in an overall improvement in existing pedestrian circulation conditions on the project site would result in a **less than significant** pedestrian facility-related impacts.

Parking. On March 18, 2010, Appendix G of the CEQA Guidelines was amended and the threshold related to parking impacts was omitted. Similarly, the December 28, 2018 updates to the CEQA Guidelines do not include requirements to evaluate project-related parking impacts. However, for information purposes, potential parking-related impacts of the Classroom Building Project are evaluated below.

Faculty and staff that drive to the Classroom Building would likely park in Parking Lot No. 3, which is located west of and adjacent to the project site, although other faculty and staff parking lots are located in the vicinity of the project site (i.e., Lots 1, 10, and 12). Students that drive to the Classroom Building would likely park in Parking Lot Nos. 16 or 18, which are located approximately 700 yards to the north of the project site.

The proposed classroom building would not require the removal of any existing parking spaces from Lot 3 or other on-campus parking lots. In addition, the Project would not expand any existing UCSB academic programs, or result in any additional students, faculty, or staff on the UCSB campus. Therefore, the Project would not result in a demand for additional parking. However, as described in IS/MND Section 5.10 (Hydrology and Water Quality) construction of the Project's stormwater drainage system may have the potential to result in a short-term or permanent removal of approximately 40 parking spaces from Lot 3. It is anticipated that vehicles displaced from Parking Lot 3 would park in other Main Campus parking lots, such as Lot 22, which is located adjacent to Ocean Road, and is approximately 3,600 feet west of the Project site. Lot 22 is a six-level structure with 841 visitor, student, faculty and staff spaces, 202 student spaces, 60 coastal access spaces, and 25 other spaces. The 202 student parking spaces are located on level 4 and a portion of level 5. Parking occupancy surveys conducted in the Fall of 2018 show that the structure's lower level, and levels 1, 2 and 3 have average weekday occupancy rates ranging from 24 to 61 percent. Therefore, there is adequate capacity in Lot 22 to accommodate vehicles that may be displaced from Lot 3. Therefore, the Project would result in **less than significant** project-specific and cumulative parking supply impacts.

b. *Would the project conflict or be inconsistent with CEQA Guidelines § 15064.3, subdivision (b)?*

Senate Bill 743 (Steinberg, 2013) required changes to the CEQA Guidelines regarding the analysis of transportation impacts. The California Office of Planning and Research proposed changes to the CEQA Guidelines that identify vehicle miles traveled (VMT) as the most appropriate metric to evaluate a project's transportation impacts. The California Natural Resources Agency adopted the recommended changes to the CEQA Guidelines and they became effective on December 28, 2018. With the adopted changes, automobile delay as measured by "level of service" and other similar metrics, will generally no longer constitute a significant environmental effect under CEQA.

CEQA Guidelines Section 15064.3, subdivision (b) implements the adopted VMT analysis requirements and states:

(b) *Criteria for Analyzing Transportation Impacts.*

(1) Land Use Projects. Vehicle miles traveled exceeding an applicable threshold of significance may indicate a significant impact. Generally, projects within one-half mile of either an existing major transit stop or a stop along an existing high quality transit corridor should be presumed to cause a less than significant transportation impact. Projects that decrease vehicle miles traveled in the project area compared to existing conditions should be presumed to have a less than significant transportation impact.

(2) Transportation Projects. Transportation projects that reduce, or have no impact on, vehicle miles traveled should be presumed to cause a less than significant transportation impact. For roadway capacity projects, agencies have discretion to determine the appropriate measure of transportation impact consistent with CEQA and other applicable requirements. To the extent that such impacts have already been adequately addressed at a programmatic level, such as in a regional transportation plan EIR, a lead agency may tier from that analysis as provided in Section 15152.

(3) Qualitative Analysis. If existing models or methods are not available to estimate the vehicle miles traveled for the particular project being considered, a lead agency may analyze the project's vehicle miles traveled qualitatively. Such a qualitative analysis would evaluate factors such as the availability of transit, proximity to other destinations, etc. For many projects, a qualitative analysis of construction traffic may be appropriate.

(4) Methodology. A lead agency has discretion to choose the most appropriate methodology to evaluate a project's vehicle miles traveled, including whether to express the change in absolute terms, per capita, per household or in any other measure. A lead agency may use models to estimate a project's vehicle miles traveled, and may revise those estimates to reflect professional judgment based on substantial evidence. Any assumptions used to estimate vehicle miles traveled and any revisions to model outputs should be documented and explained in the environmental document prepared for the project. The standard of adequacy in Section 15151 shall apply to the analysis described in this section.

The Classroom Building Project would be a "land use project" as described by CEQA Guidelines Section 15064.3, subdivision (b)(1). The Project would not expand existing UCSB academic programs or result in any additional students, faculty, or staff on the UCSB campus. As a result, it is unlikely that the Project would generate a substantial amount of additional vehicle traffic. In addition, the Main Campus transit loop is located approximately 400 yards northwest of the project site, and recent UCSB commuter mode data shows that 46 percent of students typically bike and 26 percent of students walk to campus. Also, the Project would provide bicycle parking and relocate an existing on-site bicycle path, which would also encourage building occupants to use bicycle transportation. Therefore, as described by subsection (b)(1) above, it is presumed that the Project would not result in a substantial increase in VMT and would result in a **less than significant** transportation impact.

c. *Would the project substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?*

Short-Term Impacts. The Classroom Building Project site is located near the center of the Main Campus and is adjacent to pedestrian walkways, bicycle paths, roadways and a service vehicle driveway. Project-related construction activities, such as heavy equipment use at the project site and the construction of new connections to existing utilities, would have the potential to result in potentially significant short-term safety impacts to vehicles, pedestrians and bicycles. The implementation of standard construction site safety measures, such as the installation of temporary fencing around construction areas and the staging area, the use of warning signs, barricades, flag persons, etc., would reduce potential short-term construction site safety impacts to faculty, staff, students and the general public to a **less than significant level**. No mitigation measures are required.

Long-Term Impacts. Vehicle access to the Classroom Building would be from UCen Road, then northward along a service vehicle driveway. Vehicle access to the project site would not require any changes to the existing access route, and the minimal amount of traffic that would be generated by the Project would not result in conflicts or hazards with other uses in the vicinity of the project site. Therefore, the Project would result in **less than significant** long-term traffic hazard impacts.

d. *Result in inadequate emergency access?*

Emergency access to the Classroom Building project site is provided from the adjacent service vehicle driveway and through Parking Lot No. 3. The Project would not develop structures that would impede emergency access to the project site or other areas on the Main Campus, and would not result in a substantial amount of additional traffic on local roadways that would have the potential to interfere with access by emergency personnel. Therefore, the Project would have **less than significant** impacts related to long-term emergency vehicle access impacts.

5.17.4 Mitigation Measures

The Classroom Building Project would result in less than significant transportation and traffic impacts. No mitigation measures are required.

Main Campus Intersections

1. Lagoon Road / Ucen Road

Main Campus Gateway Intersections

2. Hwy 217 /Mesa Road / Lagoon Road
3. Mesa Road / Los Carneros Road
4. El Colegio Road / Stadium Road

University of California, Santa Barbara

Classroom Building Project

Figure 5.17-1

Project Area Roads, Intersections and Gateways

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
5.18 TRIBAL CULTURAL RESOURCES.					
a) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in the Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:					
i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020(k), or	☐	☐	☐	☐	✓
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant according to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1? In applying the criteria set forth in subdivision (c) of the Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☐	☐	☐	✓

5.18.1 Setting

Please refer IS/MND Section 5.5 (Cultural Resources) for a description of existing conditions that exist at and near the project site.

Assembly Bill 52 (AB 52) created a process for consultation with California Native American Tribes in the CEQA process. Tribal Governments can request consultation with a lead agency and give input into potential impacts to tribal cultural resources before the agency decides what type of environmental assessment is appropriate for a proposed project. No local tribal representatives have contacted UCSB in writing to request that they be formally notified of project proposals under the requirements of AB 52. Therefore, the requirements of AB 52 are not applicable to the Classroom Building Project.

5.18.2 Checklist Responses

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

i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020(k),

Please refer to the response provided below.

ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant according to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1? In applying the criteria set forth in subdivision (c) of the Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

In conjunction with the preparation of the project-specific Phase 1 and Extended Phase 1 investigation, Applied EarthWorks coordinated with Native Americans and contacted the Native American Heritage Commission (NAHC) to request a review of the Sacred Lands File for sacred or sensitive Native American areas that may be within or near the project site. In a their reply, the NAHC stated that cultural sites are present in the project area and provided contact information for organizations and individuals that may have knowledge of cultural resources in the project area and recommended they be contacted for additional information. The recommended organizations and individuals were contacted and responses were received from four Native American individuals. In general, the responses expressed concerns related to the potential for the Project to encounter sensitive cultural resources. Comments from Native Americans did not indicate concerns that the Project would have the potential to impact tribal cultural resources. Based on responses from Native Americans knowledgeable of conditions on the Main Campus, and the cultural resources research conducted for the Project, no tribal cultural resources were identified and the Project would have **no impact** to tribal cultural resources.

5.18.3 Mitigation Measures

The Classroom Building Project would not result in impacts to tribal cultural resources. No mitigation measures are required.

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
5.19 UTILITIES AND SERVICE SYSTEMS - Would the project:					
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☐	✓	☐
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	☐	☐	☐	✓	☐
c) 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?	☐	☐	☐	✓	☐
d) Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☐	✓	☐

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☐	✓	☐

5.19.1 Setting

Wastewater Treatment and Disposal. The Goleta Sanitary District (GSD) provides wastewater treatment service for UCSB and wastewater from the Main Campus is sent directly to the GSD for treatment and disposal. The GSD operates the Goleta Wastewater Treatment Plant, which is located southeast of the Santa Barbara Municipal Airport. The treatment plant has a design capacity of 9.7 million gallons per day (MGD), however, the NPDES permit issued by the Central Coast Regional Water Quality Control Board for the plant's ocean outfall sets a plant capacity limit of 7.64 MGD. Current average daily dry weather flows into the treatment plant are approximately 4.8 MGD (GSD, 2013).

UCSB has a contractual capacity ownership of 7.09% of the GSD treatment plant's permitted capacity, which is equivalent to 0.542 MGD. The 2010 LRDP EIR indicates that UCSB's annual average wastewater flow directly to the treatment plant is approximately 0.19 MGD. Based on current average flow data and the University's ownership allocation, there is approximately 0.35 MGD of additional permitted capacity for the University at the Goleta Sanitary District Treatment Plant.

Wastewater from the UCSB Storke, West and North Campuses is sent to the Goleta West Sanitary District (GWSD). The GWSD owns a 40.8 percent share of the GSD treatment plant capacity.

Water Supply. The Goleta Water District (GWD) provides potable water service for the City of Goleta and surrounding areas, including UCSB. Most of the water provided by the District is from Lake Cachuma and the State Water Project. Additional supply sources include groundwater from the Goleta North/Central Groundwater Basin and recycled water. The District's *2015 Urban Water Management Plan* (UWMP) indicates that under average water supply conditions, the total water supply available to the District (including recycled water) is 16,737 acre feet per year (AFY). In response to prolonged drought conditions and associated water conservation efforts, water deliveries made by the GWD have recently decreased. The District delivered 13,095 acre feet of water in 2013, compared to deliveries of 10,711 acre feet in 2015 (GWD, 2017).

Water demand in the GWD service area is expected to increase over the long-term planning horizon. The 2015 UWMP evaluated available water supplies and demand for three water supply scenarios: normal water supply and demand conditions, a single dry year, and multiple dry year conditions. The analysis of these scenarios shows that the GWD has adequate water supplies to meet projected growth until 2035 under normal water supply and single dry year conditions. A water supply deficit is projected to occur during the third year of a multiple dry year condition (GWD, 2017).

The District's Safe Water Supplies Ordinance (SAFE) sets certain restrictions on the use of groundwater, and includes the creation of a "drought buffer" of water that is stored in the Central Basin, which may be pumped and distributed by the District to existing customers only in the event that a drought causes a reduction in the District's annual deliveries from Lake Cachuma. The drought buffer supplies may not be used as a source of supplemental water supply to serve new or additional demands for District water. SAFE also restricts deliveries to new developments by limiting the release of water to new customers to one percent of its total potable water supply. A determination of available water allocation for new uses is made on an annual basis.

On September 9, 2014, the Goleta Water District Board of Directors adopted a resolution declaring a Stage II Water Shortage Emergency, and in May 2015 GWD declared a Stage III emergency. The Board also adopted a resolution directing the denial of applications for new and additional service connections for potable water beginning on October 1, 2014. Projects with existing entitlement to potable water are exempt from the restrictions on new and additional service connections.

UCSB Water Use. A water allocation agreement between UCSB and the GWD (Permit No. 14) states that potable water consumption on the Main Campus and by the West Campus Family Housing project shall not exceed 953 acre feet per year (AFY). In fiscal year 2015/2016, UCSB used 526 acre feet of potable water under Permit No. 14 (UCSB, 2016). Based on water supplies available to UCSB under Permit 14 and existing water use characteristics, 427 acre feet remain available to UCSB under the requirements of Permit 14.

In April 1998, UCSB entered into an agreement with the Goleta Water District for the "first right of refusal" to 280 AFY of recycled water from the Goleta Sanitary District Wastewater Treatment Plant. In fiscal year 2015/2016, UCSB used 184 AFY of recycled water (UCSB, 2016) for approximately 90% of its irrigation needs.

UCSB has implemented water conservation programs that have substantially reduced potable water use. In 1996/1997 it is estimated that the average annual potable water use by UCSB was 292.7 million gallons (896 acre feet), while the average annual potable water use from 2008 to 2011 was 218.5 million gallons (669 acre feet). Actions undertaken by UCSB to reduce potable water use targeted academic, research and other non-residential buildings, and residential buildings operated by Housing & Residential Services. Water use reduction projects also addressed landscaping, irrigation, and industrial applications.

The University of California, Office of the President (UCOP) mandated all universities system-wide to reduce growth-adjusted potable water consumption 20% by 2020, and 36% by 2025 when compared to a three-year average baseline of 2005-2008. UCSB has currently achieved a 17% reduction from the baseline. Given the University's historical water conservation and efficiency achievements, along with water use reduction measures identified in UCSB's *2017 Water Action Plan*, the campus has the ability to meet the UCOP mandated goal. The water reduction measures of the *2017 Water Action Plan* focus on implementing multiple conservation and efficiency strategies, including the substitution of recycled water for potable water in a variety of applications. Identified water use reduction measures include increasing the installation of low-flow aerators, showerheads, and toilets in academic and housing buildings; improving the quality of recycled water used in irrigation and other non-potable applications; and expanding overall administrative actions to encourage water conservation.

Solid Waste Disposal. Solid waste generated on the UCSB campus is collected by the Marborg Company and transported to the Tajiguas Landfill for disposal. The Tajiguas Landfill is operated by the County of Santa Barbara, and is located approximately 20 miles west of the UCSB campus. The landfill accepts solid waste primarily from the cities of Santa Barbara and Goleta and unincorporated Santa Barbara County south coast areas. Final approvals by the Regional Water Quality Control Board and California Integrated Waste Management Board were obtained in 2003 to expand the landfill, and minor changes to the landfill's waste disposal area were approved in 2009. Based on current solid waste disposal trends, it was estimated that the landfill expansion would provide solid waste disposal capacity until 2023.

In July 2016, the County of Santa Barbara Board approved the construction and operation of the Tajiguas Resource Recovery Project, which would consist of a Materials Recovery Facility, Anaerobic Digestion Facility, and a Compost Management Unit. This project would be located at the landfill and would include a materials recovery facility to recover recyclable material, a dry fermentation anaerobic digestion facility to process organic waste into biogas, and an energy facility that would generate electricity using the produced biogas fuel. Operation of the recently approved project would extend the estimated closure date of the landfill to 2036.

The University of California and UCSB has taken a very active approach towards reducing the amount of generated solid waste and the amount of waste that is sent to a landfill for disposal. The University's Policy on Sustainable Practices established waste disposal diversion goals of 50 percent to be achieved by 2008, 75 percent by 2012, and 100 percent by 2020. During the 2012-2013 fiscal year, UCSB achieved an overall solid waste diversion rate of approximately 70 percent excluding construction and demolition waste, and a diversion rate of approximately 79 percent including construction and demolition waste (UCSB, 2013).

5.19.2 Checklist Responses

a) *Would the project require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?*

The Classroom Building Project site is located near the center of the Main Camus and utilities that would serve the Project, including water, wastewater, storm water drainage, electricity, natural gas, and telecommunications are located on or adjacent to the project site. Existing utility lines that conflict with the location of proposed building would be removed and replaced at appropriate on-site locations. The relocation of existing utilities and constructing connections to existing service lines adjacent to the project site would incrementally contribute to the construction-related impacts of the Project, such as short-term air quality emissions, the potential for a release of sediment or other pollutants in runoff water, disturbing previously undetected cultural resources, and noise. The evaluation of short-term construction-related impacts included in this IS/MND determined that the Project's impacts would not be significant, would be reduced to a less than significant level by complying with existing regulatory programs and UCSB policies, or would be reduced to a less than significant level with the implementation of proposed mitigation measures to reduce construction-related impacts to trees that are to be retained on the project site (mitigation measure BIO-2a); nesting birds (mitigation measures BIO 1a through 1c); dust emissions (mitigation measure AQ-1a); impacts from construction noise (mitigation measure NOI-1);and potential impacts to previously undetected cultural resources (mitigation measures CUL-1a through 1e). Therefore, providing connections to existing utility systems to serve the Project would result in **less than significant** environmental impacts and no additional mitigation measures are required.

b) *Would the project have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?*

Project-Specific Impacts. Potable water use by the Classroom Building Project was estimated using water demand factors included in the 2010 LRDP Final EIR. The estimated water demand factor for "instruction, research and other" uses is 0.184 acre feet per year (AFY) for each 1,000 assignable square feet of building floor area (UCSB, 2010). Assignable Square Feet (ASF) is a measure of the usable area within a building available to occupants. The Classroom Building Project would have approximately 53,700 ASF, resulting in a potable water demand of approximately 9.9 AFY.

Water for the Classroom Building Project would be supplied by the Goleta Water District under Permit 14, which allocates 953 AFY of water for use by the Main Campus and by the West Campus Family Housing project. The Permit 14 water entitlement is included in the existing and future water demand projections contained in the GWD's 2015 UWMP. In fiscal year 2015/2016, UCSB used 526 acre feet of potable water under Permit No. 14. Therefore 427 AFY is available under Permit 14 to serve the Project. Approximately 417 AFY would remain available under Permit 14 after the Project is occupied. Therefore, adequate water supplies are available for the Project during normal, dry and multiple dry years. Since water for the Project would be supplied based on the existing Permit 14 entitlement, the Project would be exempt from the GWD resolution directing the denial of applications for new and additional service connections for potable water. Therefore, the Project would result in a **less than significant** project-specific water supply impact.

The goal of the UCSB *2017 Water Action Plan* is to reduce potable water use at UCSB, and the Plan focuses on implementing conservation and efficiency strategies. The Project would implement the water conservation goal of the *Water Action Plan* by seeking a LEED "Gold" Certification while striving to achieve a "Platinum" certification. Water demand reductions would be achieved through design measures such as using low flow plumbing fixtures; the use of recycled water for irrigation; and water conserving irrigation systems.

Cumulative Impacts. To estimate cumulative water use that would result from reasonably foreseeable development on the UCSB Campus, the projects listed on Table 1.8-1 that would obtain water under GWD Permit 14 were identified and grouped into three water use categories: instruction, research and other uses; housing; and uses that would not result in a substantial long-term increase in water use. Water demand factors for each of these types of uses were derived from the 2010 LRDP Final EIR. The water use estimate provided on Table 5.19-1 indicates that the cumulative water demand resulting from reasonably foreseeable development projects on the UCSB campus that would be served under the requirements of GWD Permit 14 would be approximately 113.9 AFY. Added to the 9.9 AFY water demand of the Classroom Building Project, the total reasonably foreseeable cumulative water demand under the Permit 14 would be approximately 123.8 AFY. After deducting estimated Project and cumulative water demand (123.8 AFY) from the 427 AFY that remains under the Permit 14 allocation, approximately 303.2 AFY would remain available to UCSB under the requirements of Permit 14. Therefore, the Project would result in a **less than significant** cumulative water supply impact.

Table 5.19-1
GWD Permit 14 Cumulative Potable Water Demand

Project	Size	Water Demand Factor	Potable Water Demand (afy)
Housing Projects			
North Campus Faculty Housing (1)	--	--	--
Ocean Road Housing	543 units	0.152 afy/unit	82.5
Instruction, Research and Other			
Henley Hall	31,538 ASF	0.184 afy/1,000 ASF	5.8
New Physics Building	64,000 ASF	0.184 afy/1,000 ASF	11.8
Engineering III Building	75,000 ASF	0.184 afy/1,000 ASF	13.8
No Substantial Long-Term Increase in Water Use			
Main Campus Infrastructure Renewal	--	--	--
Ocean Rd. Storm Drain	--	--	--
Multi Building Boiler Replacement	--	--	
Total	--	--	**113.9**

(1) Water for the North Campus Faculty Housing project is provided under a 1993 agreement between the Goleta Water District and the University Exchange Corporation.

c. *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?*

Project-Specific Impacts. The amount of wastewater generated by the Classroom Building Project was estimated using generation factors included in the 2010 LRDP Final EIR. The wastewater generation factor for "institutional" uses is 100 gallons/day for each 1,000 square feet of building ASF. The Project would have approximately 53,700 ASF, resulting in a wastewater flow of approximately 5,400 gallons per day, or 0.005 MGD. Based on an existing wastewater treatment capacity of 0.35 MGD available to UCSB at the GSD Wastewater Treatment Plant, adequate treatment capacity is available to serve the Project. Therefore, the Project would result in a **less than significant** project-specific wastewater generation impact.

Cumulative Impacts. Cumulative wastewater impacts resulting from reasonably foreseeable development on the UCSB campus were estimated by calculating wastewater flows from the projects identified on Table 1.8-1 that would be located within the GSD service area (i.e., the Main Campus). Wastewater generation factors for future development projects were derived from the 2010 LRDP Final EIR. The cumulative wastewater generation estimates on Table 5.19-2 indicate that the cumulative wastewater generated by reasonably foreseeable UCSB development projects would be approximately 0.115 MGD. Added to the 0.005 MGD of wastewater that would be generated by Classroom Building Project, reasonably foreseeable cumulative wastewater flows from UCSB would be approximately 0.120

MGD, which would not exceed the 0.35 MGD of wastewater treatment capacity currently available to UCSB. Therefore, cumulative wastewater treatment impacts would be **less than significant**.

Table 5.19-2
Cumulative UCSB Wastewater Generation in the Goleta Sanitary District Service Area

Project	Size	Waste Water Generation Factor	Waste Water Generation (MGD)
Housing Projects			
North Campus Faculty Housing (1)	--	--	--
Ocean Road Housing	543 units	180 gallons/unit/day	0.098
Instruction, Research and Other			
Henley Hall	31,538 ASF	100 gallons/1,000 ASF	0.003
New Physics Building	64,000 ASF	100 gallons/1,000 ASF	0.006
Engineering III Building	75,000 ASF	100 gallons/1,000 ASF	0.008
No Substantial Long-Term Increase in Wastewater Generation			
Main Campus Infrastructure Renewal	--	--	--
Ocean Rd. Storm Drain	--	--	--
Multi Building Boiler Replacement	--	--	--
Total	--	--	**0.115**

(1) Wastewater collection for this project would be provided by the GWSD, and treatment at the GSD treatment plant would utilize capacity allocated to the GWSD.

d) *Would the project generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?*

Construction of the Classroom Building Project would result in the short-term generation of construction and demolition waste, which would be recycled to the maximum extent possible. Construction contractors at UCSB are required to contract with waste haulers to dispose of construction and demolition waste. MarBorg is generally the primary waste hauler and construction and demolition waste is taken to the MarBorg Construction and Demolition Recycling and Transfer Facility in Santa Barbara. During the 2012-2013 fiscal year, UCSB achieved an overall solid waste diversion rate of approximately 79 percent including construction and demolition waste. Therefore, the Project’s short-term waste generation would not use a substantial amount of the remaining disposal capacity available at the Tajiguas Landfill and would result in a **less than significant** waste disposal impact.

As described in IS/MND Section 1.3 (Project Background) the Classroom Building Project has been proposed to meet an existing demand for on-campus classroom facilities. Providing additional on-campus classrooms would not expand existing UCSB academic programs or result in any additional students, faculty, or staff on the

UCSB campus. Therefore, the Project would not result in a substantial increase in the amount of solid waste generated by UCSB, or result in a substantial increase in the amount of solid waste that requires disposal at the Tajiguas Landfill. During the 2012-2013 fiscal year, UCSB achieved an overall solid waste diversion rate of approximately 70 percent. The proposed Project would not reduce existing waste diversion/recycling efforts and would not impede the ability of the campus to achieve the University's Policy on Sustainable Practices waste diversion goal of 100 percent by 2020. Therefore, the Project would have a **less than significant** long-term waste disposal impact.

e) *Would the project comply with federal, state, and local management and reduction statutes and regulations related to solid waste?*

The California Integrated Waste Management Act of 1991 (AB 939) required that local agencies divert 25 percent of generated solid waste from landfill disposal by 1995, and divert 50 percent of generated solid waste by 2000. Assembly Bill 341 requires that the State achieve a 75 percent solid waste recycling rate by 2020. As indicated above, during the 2012-13 fiscal year, UCSB achieved an overall solid waste diversion rate of approximately 70 percent. The Project would not generate a substantial amount of additional solid waste or impede the ability of UCSB to maintain or further reduce existing waste diversion rates. Therefore, the Project would have a **less than significant** effect regarding the implementation of solid waste regulations.

5.19.3 Mitigation Measures

The Classroom Building Project would not result in significant impacts to utilities and service systems. No mitigation measures are required.

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
5.20 WILDFIRE. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:					
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	✓	☐
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☐	☐	☐	✓
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☐	☐	✓
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☐	☐	✓

5.20.1 Setting

The California State Board of Forestry and Fire Prevention has identified areas in California where the State has the primary financial responsibility for preventing and suppressing fires. These areas are referred to "State Responsibility Areas." Lands where neither the state nor the federal government has any legal responsibility for providing fire protection are referred to as "Local Responsibility Areas." State Responsibility Areas and Local Responsibility Areas are depicted on a map that can be viewed or downloaded at: http://www.fire.ca.gov/firepreventionfee/sraviewer. The UCSB campus is not located in a State Responsibility Area and the nearest areas designated as such are in the Santa Ynez Mountain foothills north of the City of Goleta, approximately 2 miles north of the UCSB campus. The UCSB campus is located in a Local Responsibility Area and the Santa Barbara County Fire Department is responsible for providing fire prevention and suppression services.

Very High Fire Hazard Severity Zones (VHFHSZ) in Local Responsibility Areas have been mapped by CalFire and can be viewed or downloaded at: http://frap.fire.ca.gov/webdata/maps/santa_barbara/fhszl_map.42.jpg. The CalFire map shows that the UCSB Campus and areas surrounding the campus are not located in a VHFHSZ.

The Classroom Building project site is located near the center of the Main Campus. The project area is level, and vegetation on the Main Campus consists predominately of irrigated ornamental landscaping. Access to the project site is from existing paved roads and along a service vehicle driveway that extends northward from UCen Road. Fire suppression infrastructure is located on and adjacent to the project site. The proposed Storke Campus temporary staging area is not located in an area with dense vegetation and access is available from Mesa Road.

a) *Would the project substantially impair an adopted emergency response plan or emergency evacuation plan?*

UCSB maintains a campus-wide Emergency Operations Plan (EOP) that establishes emergency response procedures. The EOP establishes a chain of command during emergencies, and provides requirements for individual departments to prepare their own EOPs for immediate response to emergency situations.

The Classroom Building project site is located near the center of the Main Campus, and emergency vehicle access to the project site is from UCen Road then northward along a service vehicle driveway. Emergency access to the project site is also available through Parking Lot No. 3. Construction of the Project would not require temporary closures along UCen Road, the adjacent service drive, or Parking Lot No. 3. Therefore, construction activities would not result in temporary obstructions of any road or access that would interfere with emergency response services or an evacuation plan.

As described in Section 5.17.2 (Transportation and Traffic) of this IS/MND, the proposed Project would not be a substantial long-term source of additional traffic along on- or off-campus roads because the Project would not increase on-campus population or expand any existing academic programs. Therefore, the Project would not result in the generation of additional traffic volume that would have the potential to result in impacts related to emergency access into or out of the Project area.

Adequate short- and long-term access to and around the project site is provided and would be maintained. Therefore, the project would have a **less than significant** impact related to emergency response or evacuation plans.

b) *Would the project due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?*

Areas designated as having a high wildfire risk generally have characteristics such as steep slopes, dense native vegetation, limited vehicle access, and limited water supplies. The proposed Project site is level, is surrounded by urban development and services, has good vehicle access, and vegetation on and near the project site is predominately irrigated ornamental plants and trees. Similarly, the proposed Storke Campus temporary staging area also has good vehicle access and is not located in an area with dense vegetation. The Project is not located in a designated high fire hazard area, would not introduce additional development in a high hazard area, and would not hinder wildfire suppression efforts. Therefore, the Project would have **no impact** related to an increase in existing wildfire risk.

c) *Would the project require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?*

The project site is not located in a high wildfire risk area, and the site is adequately served by existing access roads, water and other utilities. Therefore, the project would have **no impact** related to the installation or maintenance of roads, fuel breaks, fire suppression water, or other utilities.

d) *Would the project expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?*

The Classroom Building Project site is level, not located near any streams or water courses, and not located in a high wildfire risk area. Similarly, the proposed Storke Campus temporary staging area is level and not located in a high fire hazard area. Therefore, the Project would have **no impact** related to potential fire-related flooding, landslide, debris flow, or other related impacts.

Issues	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant with Project-level Mitigation Incorporated	Less Than Significant Impact	No Impact
5.21 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, substantially 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 significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of past, present and probable future projects)?	☐	☐	☐	✓	☐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	✓	☐	☐

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?*

The Classroom Building Project would have the potential to result in significant impacts to active bird nests that could be located on or adjacent to the project site. This impact can be reduced to a less than significant level with the implementation of proposed mitigation measures, including requirements to conduct pre-construction bird nest surveys and if necessary nest avoidance (mitigation measures BIO-1a through c).

Construction of the Classroom Building Project would have the potential to adversely affect the long-term health of the on-site trees that are to be retained on the project site. This impact can be reduced to a less than significant level with the implementation of proposed mitigation measures, including requirements to implement the tree protection measures specified by mitigation measure BIO-2a.

Construction activities at the project site have the potential to result in significant impacts to cultural resources. This impact can be reduced to a less than significant level with the implementation of proposed mitigation measures CUL-1a through 1e, which require the implementation of site monitoring and if necessary other requirements that would reduce potential impacts to intact archaeological resources to a less than significant level.

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)?*

The Classroom Building Project would not generate a substantial amount of new vehicle traffic, and its cumulative traffic impacts would not be significant. The project's cumulative potable water supply and wastewater treatment capacity impacts would also not be significant. The Project would not result in significant cumulative impacts related to other environmental issue areas, including aesthetics, air quality, climate change, water quality and hydrology, housing, noise, or public services.

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

All of the proposed project's significant environmental effects can be feasibly reduced to a less than significant level with the implementation of proposed mitigation measures.

5.22 FISH AND GAME DETERMINATION

Based on consultation with the California Dept. of Fish and Game, there is no evidence that the project has a potential for a change that would adversely affect wildlife resources or the habitat upon which the wildlife depends.

___ Yes (No Effect)

✓ No (Pay fee)

6.0 MITIGATION MEASURES

Mitigation Measures to Reduce Impacts to a Less Than Significant Level

Aesthetics

Potential impacts to existing scenic trees that are to be retained on the project site. This potential impact can be reduced to a less than significant level with the implementation of the tree protection requirements of proposed mitigation measure BIO-2a.

Air Quality

AQ-1a. The following dust control measures are required by the Santa Barbara County APCD. All of these measures shall be implemented at the project site during construction.

1. During construction, use water trucks or sprinkler systems to keep all areas of vehicle movement damp enough to prevent dust from leaving the site. At a minimum, this should include wetting down such areas in the late morning and after work is completed for the day. Increased watering frequency should be required whenever the wind speed exceeds 15 mph. Reclaimed water should be used whenever possible.

2. Minimize amount of disturbed area and reduce on site vehicle speeds to 15 miles per hour or less.

3. If importation, exportation and stockpiling of fill material is involved, soil stockpiled for more than two days shall be covered, kept moist, or treated with soil binders to prevent dust generation. Trucks transporting fill material to and from the site shall be tarped from the point of origin.

4. Gravel pads shall be installed at all access points to prevent tracking of mud onto public roads.

5. After clearing, grading, earth moving or excavation is completed, treat the disturbed area by watering, or revegetating, or by spreading soil binders until the area is paved or otherwise developed so that dust generation will not occur.

6. The contractor or builder shall designate a person or persons to monitor the dust control program and to order increased watering, as necessary, to prevent transport of dust offsite. Their duties shall include holiday and weekend periods when work may not be in progress. The name and telephone number of such persons shall be provided to the Air Pollution Control District prior to the start of grading activities.

Biological Resources

BIO-1a. To avoid disturbance or loss of active bird nests during development of the proposed project, all tree and vegetation disturbing activities shall be conducted between September 15 and February 15, outside of the typical nesting season.

BIO-1b. If tree or vegetation removal is determined to be necessary during the typical nesting season (February 15 to September 15), a nesting bird survey shall be conducted by a qualified biologist approximately one week prior to the proposed action. Surveys shall follow standard protocols as established by CDFW and/or CCC. If the biologist determines that a tree/shrub is being used for nesting at that time, disturbance shall be avoided until after the young have fledged from the nest and achieved independence. If no nesting is found to occur, tree removal can proceed.

BIO-1c. To avoid indirect disturbance of active bird nests by project construction occurring within the typical nesting season, a qualified biologist shall be retained to conduct one or more pre-construction surveys per standard protocols approximately one week prior to construction, to determine presence/absence of active nests adjacent to the project site. If no breeding or nesting activities are detected within 200 feet of the proposed work area, noise-producing construction activities may proceed. If breeding/nesting activity is confirmed, work activities within 200 feet of the active nest shall be delayed until the young birds have fledged and left the nest.

BIO-2a Prior to the start of Project-related grading activities, a tree protection plan shall be prepared for all on-site trees that are to be retained and that have a trunk diameter of six inches or greater. The plan requirements shall be depicted on the Project's grading and building plans. Tree protection measures shall be implemented throughout the Project's construction period and at minimum shall include the following measures.

1. Grading and building plans shall depict the on-site trees that are to be removed and that are to be retained.

2. Temporary protective fencing shall be installed at the perimeter of the tree protection zone prior to the start of ground disturbing activities, and shall be maintained in good condition throughout the duration of the construction project. The tree protection zone is defined as the area extending five feet from the outer edge of the tree's dripline. To the extent possible, construction activities, equipment, vehicles, and personnel shall remain outside of the tree protection zone.

3. If grading must occur within the tree protection zone, a certified arborist shall be present to monitor grading activities and provide guidance regarding minimizing impacts. If excavation must occur near the trees, all exposed roots greater than one inch in diameter shall be cut cleanly under the guidance of the arborist.

4. Soil, construction materials, and equipment shall not be stored within the tree protection zone.

5. Supplemental irrigation shall be provided around the on-site trees to be retained throughout the duration of construction to ensure soil moisture is maintained around the root zone. In lieu of installation of a temporary irrigation system, supplemental irrigation can be provided using a water truck or similar method.

6. Where possible, permeable materials shall be utilized for paved surfaces near the trees to provide soil moisture.

7. All trees located with 25 feet of the proposed building shall be protected from paint and other similar materials.

8. Should any of the four sycamore trees or the redwood tree that are to be tree retained on the project site die within five years following completion of Project-related construction, the tree(s) shall be replaced with a native tree species. Required replacement trees shall be provided at a 3:1 ratio for native trees, and a 1:1 ratio for ornamental trees. These tree replacement requirements are not applicable to the two on-site oak trees due to their poor health.

Cultural Resources

CUL-1a. At the commencement of project construction, an archaeologist shall provide a brief cultural resources orientation to the construction crew on the types of prehistoric and/or historic resources that might become exposed during earth disturbing activities, and the steps to be taken in the event that such a find is encountered.

CUL-1b. An archaeologist and Native American monitor shall be retained to monitor initial site preparation activities conducted on the project site, such as the removal of existing paving, initial grading activities, and the ground disturbing removal of on-site trees.

CUL-1c. The archaeologist shall have the power to temporarily halt or redirect project construction in the event that potentially significant cultural resources are exposed. Based on monitoring observations and the actual extent of project disturbance, the archaeologist shall have the authority to refine the monitoring requirements as appropriate (i.e., change to spot checks, reduce or increase the area to be monitored) in consultation with the UCSB Office of Campus Planning and Design. Upon completion of the monitoring program a monitoring report shall be presented to the UCSB Office of Campus Planning and Design and to the Central Coast Information Center (CCIC).

CUL-1d. In the event that archaeological resources are unearthed during project construction, all earth disturbing work within the vicinity of the find must be temporarily suspended or redirected until an archaeologist has evaluated the nature and significance of the find. After the find has been appropriately mitigated, work in the area may resume. A Chumash representative should monitor any mitigation work associated with Native American cultural material.

CUL-1e. If human remains are unearthed, State Health and Safety Code Section 7050.5 requires that no further disturbance shall occur until the County Coroner has made the necessary findings as to origin and disposition pursuant to Public Resources Code Section 5097.98. If the remains are determined to be of Native American descent, the coroner has 24 hours to notify the Native American Heritage Commission. If avoidance of the remains is not feasible, they should be excavated and removed by a qualified archaeologist in the presence of the Most Likely Descendent. Repatriation of the exhumed remains and all associated items shall be conducted in accordance with the requirements of the California Native American Graves Protection and Repatriation Act (Health and Safety Code 8010-8011).

Hydrology and Water Quality

HYD-1a. If stormwater treatment Option 2 (below ground retention and detention) is used to manage stormwater runoff from the project site, required pre-treatment filtering of runoff water shall be accomplished using a below ground treatment system. Such a treatment system may include the use of a hydrodynamic separator other suitable filtering devices.

Noise

NOI-1a: Prior to the initiation of Project-related construction activities, a noise mitigation plan shall be prepared and shall be implemented throughout the duration of construction. At minimum, the noise mitigation plan shall include the following:

1. Construction equipment shall be properly maintained and be outfitted with feasible noise-reduction devices to minimize construction-generated noise.

2. Stationary noise sources such as generators and pumps are to be located at least 100 feet away from noise-sensitive land uses.

3. Laydown and construction vehicle staging areas are to be located at least 100 feet from noise-sensitive land uses.

4. Whenever possible, academic, administrative and residential areas that will be subject to construction noise will be informed in writing at least one week before the start of construction activities.

5. Loud construction activities, such as jackhammering, concrete sawing, asphalt removal, and trenching operations, within 100 feet of a residential or academic building shall not be scheduled during finals week.

6. Loud construction activity as described in item 5 conducted within 100 feet of an academic or residential use shall, to the extent feasible, be scheduled during holidays, Thanksgiving break, Winter break, Spring break, or Summer break.

7. Loud construction activity within 100 feet of a residential building shall be restricted to the hours between 7:30 AM and 7:30 PM, Monday through Saturday.

8. Loud construction activity within 100 feet of an academic building shall be scheduled to the extent feasible on weekends.

Recommended Measures for Less Than Significant Impacts

Air Quality

The following measures are recommended by the Santa Barbara County APCD to reduce project-related construction emissions to the extent feasible.

AQ-2a The following emission control measures have been recommended by the Santa Barbara County APCD. All of these measures should be implemented at the project site during construction.

1. Diesel equipment meeting the CARB Tier 3 or higher emission standards for off-road heavy-duty diesel engines should be used to the maximum extent feasible.

2. On-road heavy-duty equipment with model year 2010 engines or newer should be used to the maximum extent feasible.

3. Diesel powered equipment should be replaced by electric equipment whenever feasible.

4. Equipment/vehicles using alternative fuels, such as compressed natural gas (CNG), liquefied natural gas (LNG), propane or biodiesel, should be used on-site where feasible.

5. Catalytic converters shall be installed on gasoline-powered equipment, if feasible.

6. All construction equipment shall be maintained in tune per the manufacturer's specifications.

7. The engine size of construction equipment shall be the minimum practical size.

8. The number of construction equipment operating simultaneously shall be minimized through efficient management practices to ensure that the smallest practical number is operating at any one time.

9. Construction worker trips should be minimized by requiring carpooling and by providing for lunch onsite.

7.0 REFERENCES and PREPARERS

7.1 References

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7.2 Contacts

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Liana Khammash, UCSB Design and Construction Services
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7.3 Preparers

This Initial Study/Mitigated Negative Declaration was prepared by Rodriguez Consulting, Inc., under contract to U.C. Santa Barbara. The analysis of the Project's drainage impacts was prepared by Stantec Consulting Services Inc. The evaluation of the Project's archaeological resource impacts was prepared by Applied EarthWorks.

Appendix A

Air Quality Worksheets

UCSB Classroom Building Project

Santa Barbara-South of Santa Ynez Range County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
University/College (4Yr)	0.00	Student	1.80	92,250.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.7	**Precipitation Freq (Days)**	37
Climate Zone	8			**Operational Year**	2023
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - The project site is approximatley 1.8 acres and the proposed building would have approximately 95,250 gross square feet of floor area

Construction Phase - Estimated during of construction is from January 2021 to February 2023

Off-road Equipment - Demolition activity primarily for the removal of Temporary Building 408

Off-road Equipment -

Off-road Equipment - Project would result in approximately 21,000 cubic yards of grading for foundation preparation

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Demolition -

Vehicle Trips - The Classroom Building Project would not expand any academic programs and would not increase existing on-campus student, faculty or staff population. Therefore, the Project would not generate a substantial amount of vehicle traffic

Stationary Sources - Emergency Generators and Fire Pumps -

Land Use Change -

Grading - Grading for foundation preparation would be less than approximately one acre

Water And Wastewater - The project would use approximately 10 acre feet of water per year

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	10.00	39.00
tblConstructionPhase	NumDays	200.00	460.00
tblConstructionPhase	NumDays	4.00	21.00
tblConstructionPhase	NumDays	10.00	14.00
tblConstructionPhase	NumDays	2.00	10.00
tblConstructionPhase	PhaseEndDate	12/13/2021	2/10/2023
tblConstructionPhase	PhaseEndDate	11/15/2021	12/19/2022
tblConstructionPhase	PhaseEndDate	2/8/2021	3/15/2021
tblConstructionPhase	PhaseEndDate	11/29/2021	1/6/2023
tblConstructionPhase	PhaseEndDate	2/2/2021	2/12/2021

tblConstructionPhase	PhaseStartDate	11/30/2021	12/20/2022
tblConstructionPhase	PhaseStartDate	2/9/2021	3/16/2021
tblConstructionPhase	PhaseStartDate	2/3/2021	2/15/2021
tblConstructionPhase	PhaseStartDate	11/16/2021	12/20/2022
tblGrading	AcresOfGrading	15.75	1.00
tblGrading	AcresOfGrading	5.00	1.00
tblGrading	MaterialExported	0.00	21,000.00
tblGrading	MaterialImported	0.00	21,000.00
tblLandUse	LandUseSquareFeet	0.00	92,250.00
tblLandUse	LotAcreage	0.00	1.80
tblOffRoadEquipment	HorsePower	16.00	97.00
tblOffRoadEquipment	HorsePower	212.00	187.00
tblOffRoadEquipment	HorsePower	16.00	231.00
tblOffRoadEquipment	HorsePower	97.00	212.00
tblOffRoadEquipment	HorsePower	158.00	187.00
tblOffRoadEquipment	HorsePower	16.00	187.00
tblOffRoadEquipment	LoadFactor	0.38	0.37
tblOffRoadEquipment	LoadFactor	0.43	0.41
tblOffRoadEquipment	LoadFactor	0.38	0.29
tblOffRoadEquipment	LoadFactor	0.37	0.43
tblOffRoadEquipment	LoadFactor	0.38	0.41
tblOffRoadEquipment	LoadFactor	0.38	0.41
tblOffRoadEquipment	OffRoadEquipmentType	Tractors/Loaders/Backhoes	Dumpers/Tenders
tblOffRoadEquipment	OffRoadEquipmentType	Graders	Crawler Tractors
tblOffRoadEquipment	OffRoadEquipmentType		Dumpers/Tenders
tblOffRoadEquipment	OffRoadEquipmentType		Other Material Handling Equipment
tblOffRoadEquipment	OffRoadEquipmentType	Graders	Excavators

tblOffRoadEquipment	OffRoadEquipmentType	Graders	Dumpers/Tenders
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblStationaryGeneratorsPumpsEF	CH4_EF	0.07	0.07
tblStationaryGeneratorsPumpsEF	CO_EF	5.97	5.97
tblStationaryGeneratorsPumpsEF	NOX_EF	5.32	5.32
tblStationaryGeneratorsPumpsEF	PM10_EF	0.60	0.60
tblStationaryGeneratorsPumpsEF	PM2_5_EF	0.60	0.60
tblStationaryGeneratorsPumpsEF	ROG_EF	2.2480e-003	2.2477e-003
tblTripsAndVMT	WorkerTripNumber	25.00	23.00
tblVehicleTrips	CC_TL	5.50	0.00
tblVehicleTrips	CC_TTP	88.60	0.00
tblVehicleTrips	CNW_TL	6.40	0.00
tblVehicleTrips	CNW_TTP	5.00	0.00
tblVehicleTrips	CW_TL	6.60	0.00
tblVehicleTrips	CW_TTP	6.40	0.00
tblVehicleTrips	DV_TP	9.00	0.00
tblVehicleTrips	PR_TP	91.00	0.00
tblVehicleTrips	ST_TR	1.30	0.00
tblVehicleTrips	WD_TR	1.71	0.00
tblWater	IndoorWaterUseRate	0.00	3,258,510.00

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					
2021	0.2701	2.6777	1.9253	5.0900e-003	0.1482	0.0966	0.2449	0.0606	0.0924	0.1530	0.0000	460.7234	460.7234	0.0681	0.0000	462.4267
2022	0.4772	1.7984	1.8023	3.5400e-003	0.0418	0.0765	0.1183	0.0114	0.0739	0.0852	0.0000	300.9491	300.9491	0.0455	0.0000	302.0860
2023	0.8272	0.0354	0.0519	9.0000e-005	9.4000e-004	1.8400e-003	2.7800e-003	2.5000e-004	1.7800e-003	2.0300e-003	0.0000	7.4629	7.4629	1.1800e-003	0.0000	7.4924
Maximum	**0.8272**	**2.6777**	**1.9253**	**5.0900e-003**	**0.1482**	**0.0966**	**0.2449**	**0.0606**	**0.0924**	**0.1530**	**0.0000**	**460.7234**	**460.7234**	**0.0681**	**0.0000**	**462.4267**

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					
2021	0.2701	2.6777	1.9253	5.0900e-003	0.1482	0.0966	0.2449	0.0606	0.0924	0.1530	0.0000	460.7231	460.7231	0.0681	0.0000	462.4264
2022	0.4772	1.7984	1.8023	3.5400e-003	0.0418	0.0765	0.1183	0.0114	0.0739	0.0852	0.0000	300.9488	300.9488	0.0455	0.0000	302.0857
2023	0.8272	0.0354	0.0519	9.0000e-005	9.4000e-004	1.8400e-003	2.7800e-003	2.5000e-004	1.7800e-003	2.0300e-003	0.0000	7.4628	7.4628	1.1800e-003	0.0000	7.4924
Maximum	**0.8272**	**2.6777**	**1.9253**	**5.0900e-003**	**0.1482**	**0.0966**	**0.2449**	**0.0606**	**0.0924**	**0.1530**	**0.0000**	**460.7231**	**460.7231**	**0.0681**	**0.0000**	**462.4264**

	ROG	NOx	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

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	1-4-2021	4-3-2021	1.2291	1.2291
2	4-4-2021	7-3-2021	0.5591	0.5591
3	7-4-2021	10-3-2021	0.5653	0.5653
4	10-4-2021	1-3-2022	0.5645	0.5645
5	1-4-2022	4-3-2022	0.5088	0.5088
6	4-4-2022	7-3-2022	0.5138	0.5138
7	7-4-2022	10-3-2022	0.5195	0.5195
8	10-4-2022	1-3-2023	0.7774	0.7774
9	1-4-2023	4-3-2023	0.7722	0.7722
		Highest	1.2291	1.2291

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	0.4672	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Energy	7.6300e-003	0.0693	0.0582	4.2000e-004		5.2700e-003	5.2700e-003		5.2700e-003	5.2700e-003	0.0000	438.4681	438.4681	0.0164	4.4800e-003	440.2152
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
Stationary	0.0000	0.0000	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	1.1529	5.6179	6.7707	4.2000e-003	2.5600e-003	7.6372
Total	**0.4748**	**0.0693**	**0.0582**	**4.2000e-004**	**0.0000**	**5.2700e-003**	**5.2700e-003**	**0.0000**	**5.2700e-003**	**5.2700e-003**	**1.1529**	**444.0860**	**445.2388**	**0.0206**	**7.0400e-003**	**447.8524**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.4672	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Energy	7.6300e-003	0.0693	0.0582	4.2000e-004		5.2700e-003	5.2700e-003		5.2700e-003	5.2700e-003	0.0000	438.4681	438.4681	0.0164	4.4800e-003	440.2152
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
Stationary	0.0000	0.0000	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	1.1529	5.6179	6.7707	4.2000e-003	2.5600e-003	7.6372
Total	**0.4748**	**0.0693**	**0.0582**	**4.2000e-004**	**0.0000**	**5.2700e-003**	**5.2700e-003**	**0.0000**	**5.2700e-003**	**5.2700e-003**	**1.1529**	**444.0860**	**445.2388**	**0.0206**	**7.0400e-003**	**447.8524**

	ROG	NOx	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**

2.3 Vegetation

Vegetation

	CO2e
Category	MT
Vegetation Land Change	0.0000
Total	**0.0000**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/4/2021	1/29/2021	5	20	
2	Site Preparation	Site Preparation	1/30/2021	2/12/2021	5	10	
3	Grading	Grading	2/15/2021	3/15/2021	5	21	
4	Building Construction	Building Construction	3/16/2021	12/19/2022	5	460	
5	Paving	Paving	12/20/2022	1/6/2023	5	14	
6	Architectural Coating	Architectural Coating	12/20/2022	2/10/2023	5	39	

Acres of Grading (Site Preparation Phase): 1

Acres of Grading (Grading Phase): 1

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 138,375; Non-Residential Outdoor: 46,125; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Cranes	1	6.00	231	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Site Preparation	Graders	1	8.00	187	0.41
Paving	Pavers	1	6.00	130	0.42
Paving	Rollers	1	7.00	80	0.38
Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Rubber Tired Dozers	1	6.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Demolition	Dumpers/Tenders	2	8.00	97	0.37
Grading	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Crawler Tractors	1	6.00	187	0.41
Paving	Paving Equipment	1	8.00	132	0.36
Site Preparation	Rubber Tired Dozers	1	7.00	247	0.40
Building Construction	Welders	3	8.00	46	0.45
Demolition	Dumpers/Tenders	1	8.00	231	0.29
Demolition	Tractors/Loaders/Backhoes	1	8.00	212	0.43
Grading	Other Material Handling Equipment	1		168	0.40
Grading	Excavators	1	6.00	187	0.41
Grading	Dumpers/Tenders	3	6.00	187	0.41
Grading	Graders	1	6.00	187	0.41

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	9.00	8.30	6.40	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	8.00	0.00	0.00	8.30	6.40	20.00	LD_Mix	HDT_Mix	HHDT
Grading	10	23.00	0.00	4,153.00	8.30	6.40	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	39.00	15.00	0.00	8.30	6.40	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	13.00	0.00	0.00	8.30	6.40	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	8.00	0.00	0.00	8.30	6.40	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2021

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					1.0000e-003	0.0000	1.0000e-003	1.5000e-004	0.0000	1.5000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0177	0.1782	0.0962	2.3000e-004		8.3400e-003	8.3400e-003		7.8100e-003	7.8100e-003	0.0000	19.7458	19.7458	4.9600e-003	0.0000	19.8697
Total	**0.0177**	**0.1782**	**0.0962**	**2.3000e-004**	**1.0000e-003**	**8.3400e-003**	**9.3400e-003**	**1.5000e-004**	**7.8100e-003**	**7.9600e-003**	**0.0000**	**19.7458**	**19.7458**	**4.9600e-003**	**0.0000**	**19.8697**

3.2 Demolition - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.0000e-005	1.2600e-003	3.8000e-004	0.0000	8.0000e-005	0.0000	8.0000e-005	2.0000e-005	0.0000	3.0000e-005	0.0000	0.3478	0.3478	3.0000e-005	0.0000	0.3486
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.5000e-004	3.6000e-004	3.2200e-003	1.0000e-005	9.3000e-004	1.0000e-005	9.3000e-004	2.5000e-004	1.0000e-005	2.5000e-004	0.0000	0.7310	0.7310	2.0000e-005	0.0000	0.7315
Total	**4.8000e-004**	**1.6200e-003**	**3.6000e-003**	**1.0000e-005**	**1.0100e-003**	**1.0000e-005**	**1.0100e-003**	**2.7000e-004**	**1.0000e-005**	**2.8000e-004**	**0.0000**	**1.0788**	**1.0788**	**5.0000e-005**	**0.0000**	**1.0802**

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					1.0000e-003	0.0000	1.0000e-003	1.5000e-004	0.0000	1.5000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0177	0.1782	0.0962	2.3000e-004		8.3400e-003	8.3400e-003		7.8100e-003	7.8100e-003	0.0000	19.7457	19.7457	4.9600e-003	0.0000	19.8697
Total	**0.0177**	**0.1782**	**0.0962**	**2.3000e-004**	**1.0000e-003**	**8.3400e-003**	**9.3400e-003**	**1.5000e-004**	**7.8100e-003**	**7.9600e-003**	**0.0000**	**19.7457**	**19.7457**	**4.9600e-003**	**0.0000**	**19.8697**

3.2 Demolition - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.0000e-005	1.2600e-003	3.8000e-004	0.0000	8.0000e-005	0.0000	8.0000e-005	2.0000e-005	0.0000	3.0000e-005	0.0000	0.3478	0.3478	3.0000e-005	0.0000	0.3486
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.5000e-004	3.6000e-004	3.2200e-003	1.0000e-005	9.3000e-004	1.0000e-005	9.3000e-004	2.5000e-004	1.0000e-005	2.5000e-004	0.0000	0.7310	0.7310	2.0000e-005	0.0000	0.7315
Total	**4.8000e-004**	**1.6200e-003**	**3.6000e-003**	**1.0000e-005**	**1.0100e-003**	**1.0000e-005**	**1.0100e-003**	**2.7000e-004**	**1.0000e-005**	**2.8000e-004**	**0.0000**	**1.0788**	**1.0788**	**5.0000e-005**	**0.0000**	**1.0802**

3.3 Site Preparation - 2021

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					0.0269	0.0000	0.0269	0.0145	0.0000	0.0145	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.7800e-003	0.0871	0.0378	9.0000e-005		3.8300e-003	3.8300e-003		3.5200e-003	3.5200e-003	0.0000	7.5592	7.5592	2.4400e-003	0.0000	7.6203
Total	**7.7800e-003**	**0.0871**	**0.0378**	**9.0000e-005**	**0.0269**	**3.8300e-003**	**0.0307**	**0.0145**	**3.5200e-003**	**0.0181**	**0.0000**	**7.5592**	**7.5592**	**2.4400e-003**	**0.0000**	**7.6203**

3.3 Site Preparation - 2021

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	1.2000e-004	1.0000e-004	8.6000e-004	0.0000	2.5000e-004	0.0000	2.5000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.1949	0.1949	1.0000e-005	0.0000	0.1951
Total	**1.2000e-004**	**1.0000e-004**	**8.6000e-004**	**0.0000**	**2.5000e-004**	**0.0000**	**2.5000e-004**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**0.0000**	**0.1949**	**0.1949**	**1.0000e-005**	**0.0000**	**0.1951**

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					0.0269	0.0000	0.0269	0.0145	0.0000	0.0145	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.7800e-003	0.0871	0.0378	9.0000e-005		3.8300e-003	3.8300e-003		3.5200e-003	3.5200e-003	0.0000	7.5592	7.5592	2.4400e-003	0.0000	7.6203
Total	**7.7800e-003**	**0.0871**	**0.0378**	**9.0000e-005**	**0.0269**	**3.8300e-003**	**0.0307**	**0.0145**	**3.5200e-003**	**0.0181**	**0.0000**	**7.5592**	**7.5592**	**2.4400e-003**	**0.0000**	**7.6203**

3.3 Site Preparation - 2021

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	1.2000e-004	1.0000e-004	8.6000e-004	0.0000	2.5000e-004	0.0000	2.5000e-004	7.0000e-005	0.0000	7.0000e-005	0.0000	0.1949	0.1949	1.0000e-005	0.0000	0.1951
Total	**1.2000e-004**	**1.0000e-004**	**8.6000e-004**	**0.0000**	**2.5000e-004**	**0.0000**	**2.5000e-004**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**0.0000**	**0.1949**	**0.1949**	**1.0000e-005**	**0.0000**	**0.1951**

3.4 Grading - 2021

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					0.0480	0.0000	0.0480	0.0261	0.0000	0.0261	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0206	0.2322	0.1151	2.8000e-004		0.0100	0.0100		9.2200e-003	9.2200e-003	0.0000	24.6371	24.6371	7.9700e-003	0.0000	24.8364
Total	**0.0206**	**0.2322**	**0.1151**	**2.8000e-004**	**0.0480**	**0.0100**	**0.0580**	**0.0261**	**9.2200e-003**	**0.0354**	**0.0000**	**24.6371**	**24.6371**	**7.9700e-003**	**0.0000**	**24.8364**

3.4 Grading - 2021

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	0.0159	0.5836	0.1769	1.5800e-003	0.0354	2.2600e-003	0.0376	9.7000e-003	2.1600e-003	0.0119	0.0000	160.4919	160.4919	0.0154	0.0000	160.8772
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	7.2000e-004	5.8000e-004	5.1900e-003	1.0000e-005	1.4900e-003	1.0000e-005	1.5000e-003	4.0000e-004	1.0000e-005	4.1000e-004	0.0000	1.1769	1.1769	4.0000e-005	0.0000	1.1778
Total	**0.0166**	**0.5842**	**0.1821**	**1.5900e-003**	**0.0369**	**2.2700e-003**	**0.0391**	**0.0101**	**2.1700e-003**	**0.0123**	**0.0000**	**161.6688**	**161.6688**	**0.0155**	**0.0000**	**162.0549**

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					0.0480	0.0000	0.0480	0.0261	0.0000	0.0261	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0206	0.2322	0.1151	2.8000e-004		0.0100	0.0100		9.2200e-003	9.2200e-003	0.0000	24.6371	24.6371	7.9700e-003	0.0000	24.8363
Total	**0.0206**	**0.2322**	**0.1151**	**2.8000e-004**	**0.0480**	**0.0100**	**0.0580**	**0.0261**	**9.2200e-003**	**0.0354**	**0.0000**	**24.6371**	**24.6371**	**7.9700e-003**	**0.0000**	**24.8363**

3.4 Grading - 2021

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	0.0159	0.5836	0.1769	1.5800e-003	0.0354	2.2600e-003	0.0376	9.7000e-003	2.1600e-003	0.0119	0.0000	160.4919	160.4919	0.0154	0.0000	160.8772
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	7.2000e-004	5.8000e-004	5.1900e-003	1.0000e-005	1.4900e-003	1.0000e-005	1.5000e-003	4.0000e-004	1.0000e-005	4.1000e-004	0.0000	1.1769	1.1769	4.0000e-005	0.0000	1.1778
Total	**0.0166**	**0.5842**	**0.1821**	**1.5900e-003**	**0.0369**	**2.2700e-003**	**0.0391**	**0.0101**	**2.1700e-003**	**0.0123**	**0.0000**	**161.6688**	**161.6688**	**0.0155**	**0.0000**	**162.0549**

3.5 Building Construction - 2021

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	0.1894	1.4250	1.3480	2.3000e-003		0.0715	0.0715		0.0691	0.0691	0.0000	189.7173	189.7173	0.0339	0.0000	190.5640
Total	**0.1894**	**1.4250**	**1.3480**	**2.3000e-003**		**0.0715**	**0.0715**		**0.0691**	**0.0691**	**0.0000**	**189.7173**	**189.7173**	**0.0339**	**0.0000**	**190.5640**

3.5 Building Construction - 2021

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	5.2100e-003	0.1595	0.0542	3.7000e-004	9.1100e-003	4.7000e-004	9.5900e-003	2.6300e-003	4.5000e-004	3.0800e-003	0.0000	36.2614	36.2614	2.7600e-003	0.0000	36.3304
Worker	0.0121	9.8400e-003	0.0875	2.2000e-004	0.0252	1.6000e-004	0.0253	6.6900e-003	1.5000e-004	6.8400e-003	0.0000	19.8602	19.8602	6.2000e-004	0.0000	19.8758
Total	**0.0173**	**0.1693**	**0.1417**	**5.9000e-004**	**0.0343**	**6.3000e-004**	**0.0349**	**9.3200e-003**	**6.0000e-004**	**9.9200e-003**	**0.0000**	**56.1216**	**56.1216**	**3.3800e-003**	**0.0000**	**56.2061**

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	0.1894	1.4250	1.3480	2.3000e-003		0.0715	0.0715		0.0691	0.0691	0.0000	189.7170	189.7170	0.0339	0.0000	190.5638
Total	**0.1894**	**1.4250**	**1.3480**	**2.3000e-003**		**0.0715**	**0.0715**		**0.0691**	**0.0691**	**0.0000**	**189.7170**	**189.7170**	**0.0339**	**0.0000**	**190.5638**

3.5 Building Construction - 2021

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	5.2100e-003	0.1595	0.0542	3.7000e-004	9.1100e-003	4.7000e-004	9.5900e-003	2.6300e-003	4.5000e-004	3.0800e-003	0.0000	36.2614	36.2614	2.7600e-003	0.0000	36.3304
Worker	0.0121	9.8400e-003	0.0875	2.2000e-004	0.0252	1.6000e-004	0.0253	6.6900e-003	1.5000e-004	6.8400e-003	0.0000	19.8602	19.8602	6.2000e-004	0.0000	19.8758
Total	**0.0173**	**0.1693**	**0.1417**	**5.9000e-004**	**0.0343**	**6.3000e-004**	**0.0349**	**9.3200e-003**	**6.0000e-004**	**9.9200e-003**	**0.0000**	**56.1216**	**56.1216**	**3.3800e-003**	**0.0000**	**56.2061**

3.5 Building Construction - 2022

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	0.2069	1.5691	1.5972	2.7700e-003		0.0739	0.0739		0.0714	0.0714	0.0000	227.8790	227.8790	0.0397	0.0000	228.8713
Total	**0.2069**	**1.5691**	**1.5972**	**2.7700e-003**		**0.0739**	**0.0739**		**0.0714**	**0.0714**	**0.0000**	**227.8790**	**227.8790**	**0.0397**	**0.0000**	**228.8713**

3.5 Building Construction - 2022

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	5.7600e-003	0.1817	0.0599	4.4000e-004	0.0110	5.0000e-004	0.0114	3.1600e-003	4.8000e-004	3.6400e-003	0.0000	43.1800	43.1800	3.3600e-003	0.0000	43.2640
Worker	0.0136	0.0106	0.0956	2.5000e-004	0.0302	1.9000e-004	0.0304	8.0300e-003	1.7000e-004	8.2000e-003	0.0000	23.0006	23.0006	6.6000e-004	0.0000	23.0172
Total	**0.0193**	**0.1922**	**0.1555**	**6.9000e-004**	**0.0412**	**6.9000e-004**	**0.0419**	**0.0112**	**6.5000e-004**	**0.0118**	**0.0000**	**66.1807**	**66.1807**	**4.0200e-003**	**0.0000**	**66.2812**

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	0.2069	1.5691	1.5972	2.7700e-003		0.0739	0.0739		0.0714	0.0714	0.0000	227.8788	227.8788	0.0397	0.0000	228.8710
Total	**0.2069**	**1.5691**	**1.5972**	**2.7700e-003**		**0.0739**	**0.0739**		**0.0714**	**0.0714**	**0.0000**	**227.8788**	**227.8788**	**0.0397**	**0.0000**	**228.8710**

3.5 Building Construction - 2022

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	5.7600e-003	0.1817	0.0599	4.4000e-004	0.0110	5.0000e-004	0.0114	3.1600e-003	4.8000e-004	3.6400e-003	0.0000	43.1800	43.1800	3.3600e-003	0.0000	43.2640
Worker	0.0136	0.0106	0.0956	2.5000e-004	0.0302	1.9000e-004	0.0304	8.0300e-003	1.7000e-004	8.2000e-003	0.0000	23.0006	23.0006	6.6000e-004	0.0000	23.0172
Total	**0.0193**	**0.1922**	**0.1555**	**6.9000e-004**	**0.0412**	**6.9000e-004**	**0.0419**	**0.0112**	**6.5000e-004**	**0.0118**	**0.0000**	**66.1807**	**66.1807**	**4.0200e-003**	**0.0000**	**66.2812**

3.6 Paving - 2022

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	3.0900e-003	0.0305	0.0396	6.0000e-005		1.5600e-003	1.5600e-003		1.4400e-003	1.4400e-003	0.0000	5.2963	5.2963	1.6800e-003	0.0000	5.3383
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.0900e-003**	**0.0305**	**0.0396**	**6.0000e-005**		**1.5600e-003**	**1.5600e-003**		**1.4400e-003**	**1.4400e-003**	**0.0000**	**5.2963**	**5.2963**	**1.6800e-003**	**0.0000**	**5.3383**

3.6 Paving - 2022

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	1.6000e-004	1.3000e-004	1.1400e-003	0.0000	3.6000e-004	0.0000	3.6000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.2749	0.2749	1.0000e-005	0.0000	0.2751
Total	**1.6000e-004**	**1.3000e-004**	**1.1400e-003**	**0.0000**	**3.6000e-004**	**0.0000**	**3.6000e-004**	**1.0000e-004**	**0.0000**	**1.0000e-004**	**0.0000**	**0.2749**	**0.2749**	**1.0000e-005**	**0.0000**	**0.2751**

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	3.0900e-003	0.0305	0.0396	6.0000e-005		1.5600e-003	1.5600e-003		1.4400e-003	1.4400e-003	0.0000	5.2963	5.2963	1.6800e-003	0.0000	5.3383
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.0900e-003**	**0.0305**	**0.0396**	**6.0000e-005**		**1.5600e-003**	**1.5600e-003**		**1.4400e-003**	**1.4400e-003**	**0.0000**	**5.2963**	**5.2963**	**1.6800e-003**	**0.0000**	**5.3383**

3.6 Paving - 2022

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	1.6000e-004	1.3000e-004	1.1400e-003	0.0000	3.6000e-004	0.0000	3.6000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.2749	0.2749	1.0000e-005	0.0000	0.2751
Total	**1.6000e-004**	**1.3000e-004**	**1.1400e-003**	**0.0000**	**3.6000e-004**	**0.0000**	**3.6000e-004**	**1.0000e-004**	**0.0000**	**1.0000e-004**	**0.0000**	**0.2749**	**0.2749**	**1.0000e-005**	**0.0000**	**0.2751**

3.6 Paving - 2023

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	1.6100e-003	0.0156	0.0220	3.0000e-005		7.7000e-004	7.7000e-004		7.1000e-004	7.1000e-004	0.0000	2.9431	2.9431	9.3000e-004	0.0000	2.9664
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.6100e-003**	**0.0156**	**0.0220**	**3.0000e-005**		**7.7000e-004**	**7.7000e-004**		**7.1000e-004**	**7.1000e-004**	**0.0000**	**2.9431**	**2.9431**	**9.3000e-004**	**0.0000**	**2.9664**

3.6 Paving - 2023

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	8.0000e-005	6.0000e-005	5.8000e-004	0.0000	2.0000e-004	0.0000	2.0000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.1470	0.1470	0.0000	0.0000	0.1471
Total	**8.0000e-005**	**6.0000e-005**	**5.8000e-004**	**0.0000**	**2.0000e-004**	**0.0000**	**2.0000e-004**	**5.0000e-005**	**0.0000**	**5.0000e-005**	**0.0000**	**0.1470**	**0.1470**	**0.0000**	**0.0000**	**0.1471**

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	1.6100e-003	0.0156	0.0220	3.0000e-005		7.7000e-004	7.7000e-004		7.1000e-004	7.1000e-004	0.0000	2.9431	2.9431	9.3000e-004	0.0000	2.9664
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.6100e-003**	**0.0156**	**0.0220**	**3.0000e-005**		**7.7000e-004**	**7.7000e-004**		**7.1000e-004**	**7.1000e-004**	**0.0000**	**2.9431**	**2.9431**	**9.3000e-004**	**0.0000**	**2.9664**

3.6 Paving - 2023

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	8.0000e-005	6.0000e-005	5.8000e-004	0.0000	2.0000e-004	0.0000	2.0000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.1470	0.1470	0.0000	0.0000	0.1471
Total	**8.0000e-005**	**6.0000e-005**	**5.8000e-004**	**0.0000**	**2.0000e-004**	**0.0000**	**2.0000e-004**	**5.0000e-005**	**0.0000**	**5.0000e-005**	**0.0000**	**0.1470**	**0.1470**	**0.0000**	**0.0000**	**0.1471**

3.7 Architectural Coating - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.2467					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.2000e-004	6.3400e-003	8.1600e-003	1.0000e-005		3.7000e-004	3.7000e-004		3.7000e-004	3.7000e-004	0.0000	1.1490	1.1490	7.0000e-005	0.0000	1.1508
Total	**0.2476**	**6.3400e-003**	**8.1600e-003**	**1.0000e-005**		**3.7000e-004**	**3.7000e-004**		**3.7000e-004**	**3.7000e-004**	**0.0000**	**1.1490**	**1.1490**	**7.0000e-005**	**0.0000**	**1.1508**

3.7 Architectural Coating - 2022

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	1.0000e-004	8.0000e-005	7.0000e-004	0.0000	2.2000e-004	0.0000	2.2000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.1692	0.1692	0.0000	0.0000	0.1693
Total	**1.0000e-004**	**8.0000e-005**	**7.0000e-004**	**0.0000**	**2.2000e-004**	**0.0000**	**2.2000e-004**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**0.0000**	**0.1692**	**0.1692**	**0.0000**	**0.0000**	**0.1693**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.2467					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.2000e-004	6.3400e-003	8.1600e-003	1.0000e-005		3.7000e-004	3.7000e-004		3.7000e-004	3.7000e-004	0.0000	1.1490	1.1490	7.0000e-005	0.0000	1.1508
Total	**0.2476**	**6.3400e-003**	**8.1600e-003**	**1.0000e-005**		**3.7000e-004**	**3.7000e-004**		**3.7000e-004**	**3.7000e-004**	**0.0000**	**1.1490**	**1.1490**	**7.0000e-005**	**0.0000**	**1.1508**

3.7 Architectural Coating - 2022

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	1.0000e-004	8.0000e-005	7.0000e-004	0.0000	2.2000e-004	0.0000	2.2000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.1692	0.1692	0.0000	0.0000	0.1693
Total	**1.0000e-004**	**8.0000e-005**	**7.0000e-004**	**0.0000**	**2.2000e-004**	**0.0000**	**2.2000e-004**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**0.0000**	**0.1692**	**0.1692**	**0.0000**	**0.0000**	**0.1693**

3.7 Architectural Coating - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.8223					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.8700e-003	0.0195	0.0272	4.0000e-005		1.0600e-003	1.0600e-003		1.0600e-003	1.0600e-003	0.0000	3.8299	3.8299	2.3000e-004	0.0000	3.8356
Total	**0.8251**	**0.0195**	**0.0272**	**4.0000e-005**		**1.0600e-003**	**1.0600e-003**		**1.0600e-003**	**1.0600e-003**	**0.0000**	**3.8299**	**3.8299**	**2.3000e-004**	**0.0000**	**3.8356**

3.7 Architectural Coating - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.1000e-004	2.3000e-004	2.1400e-003	1.0000e-005	7.4000e-004	0.0000	7.5000e-004	2.0000e-004	0.0000	2.0000e-004	0.0000	0.5428	0.5428	1.0000e-005	0.0000	0.5432
Total	**3.1000e-004**	**2.3000e-004**	**2.1400e-003**	**1.0000e-005**	**7.4000e-004**	**0.0000**	**7.5000e-004**	**2.0000e-004**	**0.0000**	**2.0000e-004**	**0.0000**	**0.5428**	**0.5428**	**1.0000e-005**	**0.0000**	**0.5432**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.8223					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.8700e-003	0.0195	0.0272	4.0000e-005		1.0600e-003	1.0600e-003		1.0600e-003	1.0600e-003	0.0000	3.8299	3.8299	2.3000e-004	0.0000	3.8356
Total	**0.8251**	**0.0195**	**0.0272**	**4.0000e-005**		**1.0600e-003**	**1.0600e-003**		**1.0600e-003**	**1.0600e-003**	**0.0000**	**3.8299**	**3.8299**	**2.3000e-004**	**0.0000**	**3.8356**

3.7 Architectural Coating - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.1000e-004	2.3000e-004	2.1400e-003	1.0000e-005	7.4000e-004	0.0000	7.5000e-004	2.0000e-004	0.0000	2.0000e-004	0.0000	0.5428	0.5428	1.0000e-005	0.0000	0.5432
Total	**3.1000e-004**	**2.3000e-004**	**2.1400e-003**	**1.0000e-005**	**7.4000e-004**	**0.0000**	**7.5000e-004**	**2.0000e-004**	**0.0000**	**2.0000e-004**	**0.0000**	**0.5428**	**0.5428**	**1.0000e-005**	**0.0000**	**0.5432**

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
University/College (4Yr)	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
University/College (4Yr)	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
University/College (4Yr)	0.567965	0.027871	0.206163	0.120389	0.019588	0.005343	0.017610	0.019838	0.002797	0.002169	0.006725	0.002609	0.000932

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	363.0014	363.0014	0.0150	3.1000e-003	364.3001
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	363.0014	363.0014	0.0150	3.1000e-003	364.3001
NaturalGas Mitigated	7.6300e-003	0.0693	0.0582	4.2000e-004		5.2700e-003	5.2700e-003		5.2700e-003	5.2700e-003	0.0000	75.4667	75.4667	1.4500e-003	1.3800e-003	75.9152
NaturalGas Unmitigated	7.6300e-003	0.0693	0.0582	4.2000e-004		5.2700e-003	5.2700e-003		5.2700e-003	5.2700e-003	0.0000	75.4667	75.4667	1.4500e-003	1.3800e-003	75.9152

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					
University/College (4Yr)	1.41419e+006	7.6300e-003	0.0693	0.0582	4.2000e-004		5.2700e-003	5.2700e-003		5.2700e-003	5.2700e-003	0.0000	75.4667	75.4667	1.4500e-003	1.3800e-003	75.9152
Total		**7.6300e-003**	**0.0693**	**0.0582**	**4.2000e-004**		**5.2700e-003**	**5.2700e-003**		**5.2700e-003**	**5.2700e-003**	**0.0000**	**75.4667**	**75.4667**	**1.4500e-003**	**1.3800e-003**	**75.9152**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
University/College (4Yr)	1.41419e +006	7.6300e-003	0.0693	0.0582	4.2000e-004		5.2700e-003	5.2700e-003		5.2700e-003	5.2700e-003	0.0000	75.4667	75.4667	1.4500e-003	1.3800e-003	75.9152
Total		**7.6300e-003**	**0.0693**	**0.0582**	**4.2000e-004**		**5.2700e-003**	**5.2700e-003**		**5.2700e-003**	**5.2700e-003**	**0.0000**	**75.4667**	**75.4667**	**1.4500e-003**	**1.3800e-003**	**75.9152**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
University/College (4Yr)	1.13929e +006	363.0014	0.0150	3.1000e-003	364.3001
Total		**363.0014**	**0.0150**	**3.1000e-003**	**364.3001**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
University/College (4Yr)	1.13929e +006	363.0014	0.0150	3.1000e-003	364.3001
Total		**363.0014**	**0.0150**	**3.1000e-003**	**364.3001**

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	0.4672	0.0000	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	0.4672	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

6.2 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	0.1069					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.3603					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	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	**0.4672**	**0.0000**	**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

	ROG	NOx	CO	SO2	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	0.1069					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.3603					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	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	**0.4672**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	6.7707	4.2000e-003	2.5600e-003	7.6372
Unmitigated	6.7707	4.2000e-003	2.5600e-003	7.6372

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
University/College (4Yr)	3.25851 / 0	6.7707	4.2000e-003	2.5600e-003	7.6372
Total		**6.7707**	**4.2000e-003**	**2.5600e-003**	**7.6372**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
University/College (4Yr)	3.25851 / 0	6.7707	4.2000e-003	2.5600e-003	7.6372
Total		**6.7707**	**4.2000e-003**	**2.5600e-003**	**7.6372**

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			
University/College (4Yr)	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			
University/College (4Yr)	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 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
Emergency Generator	0	0	0	0	0.73	Diesel

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

10.1 Stationary Sources

Unmitigated/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
Equipment Type	tons/yr										MT/yr					
Emergency Generator - Diesel (0 - 11 HP)	0.0000	0.0000	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**

11.0 Vegetation

	Total CO2	CH4	N2O	CO2e
Category	MT			
Unmitigated	0.0000	0.0000	0.0000	0.0000

11.1 Vegetation Land Change

Vegetation Type

	Initial/Final	Total CO2	CH4	N2O	CO2e
	Acres	MT			
Others	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

UCSB Classroom Building Project

Santa Barbara-South of Santa Ynez Range County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
University/College (4Yr)	0.00	Student	1.80	92,250.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.7	**Precipitation Freq (Days)**	37
Climate Zone	8			**Operational Year**	2023
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - The project site is approximatley 1.8 acres and the proposed building would have approximately 95,250 gross square feet of floor area

Construction Phase - Estimated during of construction is from January 2021 to February 2023

Off-road Equipment - Demolition activity primarily for the removal of Temporary Building 408

Off-road Equipment -

Off-road Equipment - Project would result in approximately 21,000 cubic yards of grading for foundation preparation

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Demolition -

Vehicle Trips - The Classroom Building Project would not expand any academic programs and would not increase existing on-campus student, faculty or staff population. Therefore, the Project would not generate a substantial amount of vehicle traffic

Stationary Sources - Emergency Generators and Fire Pumps -

Land Use Change -

Grading - Grading for foundation preparation would be less than approximately one acre

Water And Wastewater - The project would use approximately 10 acre feet of water per year

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	10.00	39.00
tblConstructionPhase	NumDays	200.00	460.00
tblConstructionPhase	NumDays	4.00	21.00
tblConstructionPhase	NumDays	10.00	14.00
tblConstructionPhase	NumDays	2.00	10.00
tblConstructionPhase	PhaseEndDate	12/13/2021	2/10/2023
tblConstructionPhase	PhaseEndDate	11/15/2021	12/19/2022
tblConstructionPhase	PhaseEndDate	2/8/2021	3/15/2021
tblConstructionPhase	PhaseEndDate	11/29/2021	1/6/2023
tblConstructionPhase	PhaseEndDate	2/2/2021	2/12/2021

tblConstructionPhase	PhaseStartDate	11/30/2021	12/20/2022
tblConstructionPhase	PhaseStartDate	2/9/2021	3/16/2021
tblConstructionPhase	PhaseStartDate	2/3/2021	2/15/2021
tblConstructionPhase	PhaseStartDate	11/16/2021	12/20/2022
tblGrading	AcresOfGrading	15.75	1.00
tblGrading	AcresOfGrading	5.00	1.00
tblGrading	MaterialExported	0.00	21,000.00
tblGrading	MaterialImported	0.00	21,000.00
tblLandUse	LandUseSquareFeet	0.00	92,250.00
tblLandUse	LotAcreage	0.00	1.80
tblOffRoadEquipment	HorsePower	16.00	97.00
tblOffRoadEquipment	HorsePower	212.00	187.00
tblOffRoadEquipment	HorsePower	16.00	231.00
tblOffRoadEquipment	HorsePower	97.00	212.00
tblOffRoadEquipment	HorsePower	158.00	187.00
tblOffRoadEquipment	HorsePower	16.00	187.00
tblOffRoadEquipment	LoadFactor	0.38	0.37
tblOffRoadEquipment	LoadFactor	0.43	0.41
tblOffRoadEquipment	LoadFactor	0.38	0.29
tblOffRoadEquipment	LoadFactor	0.37	0.43
tblOffRoadEquipment	LoadFactor	0.38	0.41
tblOffRoadEquipment	LoadFactor	0.38	0.41
tblOffRoadEquipment	OffRoadEquipmentType	Tractors/Loaders/Backhoes	Dumpers/Tenders
tblOffRoadEquipment	OffRoadEquipmentType	Graders	Crawler Tractors
tblOffRoadEquipment	OffRoadEquipmentType		Dumpers/Tenders
tblOffRoadEquipment	OffRoadEquipmentType		Other Material Handling Equipment
tblOffRoadEquipment	OffRoadEquipmentType	Graders	Excavators

tblOffRoadEquipment	OffRoadEquipmentType	Graders	Dumpers/Tenders
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblStationaryGeneratorsPumpsEF	CH4_EF	0.07	0.07
tblStationaryGeneratorsPumpsEF	CO_EF	5.97	5.97
tblStationaryGeneratorsPumpsEF	NOX_EF	5.32	5.32
tblStationaryGeneratorsPumpsEF	PM10_EF	0.60	0.60
tblStationaryGeneratorsPumpsEF	PM2_5_EF	0.60	0.60
tblStationaryGeneratorsPumpsEF	ROG_EF	2.2480e-003	2.2477e-003
tblTripsAndVMT	WorkerTripNumber	25.00	23.00
tblVehicleTrips	CC_TL	5.50	0.00
tblVehicleTrips	CC_TTP	88.60	0.00
tblVehicleTrips	CNW_TL	6.40	0.00
tblVehicleTrips	CNW_TTP	5.00	0.00
tblVehicleTrips	CW_TL	6.60	0.00
tblVehicleTrips	CW_TTP	6.40	0.00
tblVehicleTrips	DV_TP	9.00	0.00
tblVehicleTrips	PR_TP	91.00	0.00
tblVehicleTrips	ST_TR	1.30	0.00
tblVehicleTrips	WD_TR	1.71	0.00
tblWater	IndoorWaterUseRate	0.00	3,258,510.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	3.5297	76.5677	28.0000	0.1793	8.1478	1.1680	9.3158	3.4665	1.0824	4.5489	0.0000	19,658.8458	19,658.8458	2.4443	0.0000	19,719.9524
2022	55.7667	14.0108	13.9347	0.0276	0.3351	0.5942	0.9294	0.0909	0.5739	0.6648	0.0000	2,591.1823	2,591.1823	0.4328	0.0000	2,600.7661
2023	55.7069	7.5750	10.9848	0.0176	0.1326	0.3800	0.5127	0.0352	0.3562	0.3913	0.0000	1,686.1818	1,686.1818	0.4310	0.0000	1,696.9577
Maximum	**55.7667**	**76.5677**	**28.0000**	**0.1793**	**8.1478**	**1.1680**	**9.3158**	**3.4665**	**1.0824**	**4.5489**	**0.0000**	**19,658.8458**	**19,658.8458**	**2.4443**	**0.0000**	**19,719.9524**

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					
2021	3.5297	76.5677	28.0000	0.1793	8.1478	1.1680	9.3158	3.4665	1.0824	4.5489	0.0000	19,658.8458	19,658.8458	2.4443	0.0000	19,719.9524
2022	55.7667	14.0108	13.9347	0.0276	0.3351	0.5942	0.9294	0.0909	0.5739	0.6648	0.0000	2,591.1823	2,591.1823	0.4328	0.0000	2,600.7661
2023	55.7069	7.5750	10.9848	0.0176	0.1326	0.3800	0.5127	0.0352	0.3562	0.3913	0.0000	1,686.1818	1,686.1818	0.4310	0.0000	1,696.9577
Maximum	**55.7667**	**76.5677**	**28.0000**	**0.1793**	**8.1478**	**1.1680**	**9.3158**	**3.4665**	**1.0824**	**4.5489**	**0.0000**	**19,658.8458**	**19,658.8458**	**2.4443**	**0.0000**	**19,719.9524**

	ROG	NOx	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	2.5599	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Energy	0.0418	0.3799	0.3191	2.2800e-003		0.0289	0.0289		0.0289	0.0289		455.8235	455.8235	8.7400e-003	8.3600e-003	458.5323
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
Stationary	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	**2.6017**	**0.3799**	**0.3191**	**2.2800e-003**	**0.0000**	**0.0289**	**0.0289**	**0.0000**	**0.0289**	**0.0289**		**455.8235**	**455.8235**	**8.7400e-003**	**8.3600e-003**	**458.5323**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	2.5599	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Energy	0.0418	0.3799	0.3191	2.2800e-003		0.0289	0.0289		0.0289	0.0289		455.8235	455.8235	8.7400e-003	8.3600e-003	458.5323
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
Stationary	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	**2.6017**	**0.3799**	**0.3191**	**2.2800e-003**	**0.0000**	**0.0289**	**0.0289**	**0.0000**	**0.0289**	**0.0289**		**455.8235**	**455.8235**	**8.7400e-003**	**8.3600e-003**	**458.5323**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/4/2021	1/29/2021	5	20	
2	Site Preparation	Site Preparation	1/30/2021	2/12/2021	5	10	
3	Grading	Grading	2/15/2021	3/15/2021	5	21	
4	Building Construction	Building Construction	3/16/2021	12/19/2022	5	460	
5	Paving	Paving	12/20/2022	1/6/2023	5	14	
6	Architectural Coating	Architectural Coating	12/20/2022	2/10/2023	5	39	

Acres of Grading (Site Preparation Phase): 1

Acres of Grading (Grading Phase): 1

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 138,375; Non-Residential Outdoor: 46,125; Striped Parking Area: 0 (Architectural Coating – sqft)

<u>OffRoad Equipment</u>

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Cranes	1	6.00	231	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Site Preparation	Graders	1	8.00	187	0.41
Paving	Pavers	1	6.00	130	0.42
Paving	Rollers	1	7.00	80	0.38
Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Rubber Tired Dozers	1	6.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Demolition	Dumpers/Tenders	2	8.00	97	0.37
Grading	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Crawler Tractors	1	6.00	187	0.41
Paving	Paving Equipment	1	8.00	132	0.36
Site Preparation	Rubber Tired Dozers	1	7.00	247	0.40
Building Construction	Welders	3	8.00	46	0.45
Demolition	Dumpers/Tenders	1	8.00	231	0.29
Demolition	Tractors/Loaders/Backhoes	1	8.00	212	0.43
Grading	Other Material Handling Equipment	1		168	0.40
Grading	Excavators	1	6.00	187	0.41
Grading	Dumpers/Tenders	3	6.00	187	0.41
Grading	Graders	1	6.00	187	0.41

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	9.00	8.30	6.40	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	8.00	0.00	0.00	8.30	6.40	20.00	LD_Mix	HDT_Mix	HHDT
Grading	10	23.00	0.00	4,153.00	8.30	6.40	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	39.00	15.00	0.00	8.30	6.40	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	13.00	0.00	0.00	8.30	6.40	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	8.00	0.00	0.00	8.30	6.40	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2021

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					0.1000	0.0000	0.1000	0.0151	0.0000	0.0151			0.0000			0.0000
Off-Road	1.7679	17.8184	9.6188	0.0226		0.8342	0.8342		0.7813	0.7813		2,176.595 9	2,176.595 9	0.5467		2,190.263 1
Total	**1.7679**	**17.8184**	**9.6188**	**0.0226**	**0.1000**	**0.8342**	**0.9342**	**0.0151**	**0.7813**	**0.7964**		**2,176.595 9**	**2,176.595 9**	**0.5467**		**2,190.263 1**

3.2 Demolition - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.4100e-003	0.1238	0.0377	3.4000e-004	7.8200e-003	4.8000e-004	8.3000e-003	2.1400e-003	4.6000e-004	2.6000e-003		38.5602	38.5602	3.6500e-003		38.6515
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	0.0435	0.0324	0.3185	8.3000e-004	0.0947	5.8000e-004	0.0953	0.0251	5.4000e-004	0.0257		82.3686	82.3686	2.5300e-003		82.4319
Total	**0.0469**	**0.1562**	**0.3562**	**1.1700e-003**	**0.1026**	**1.0600e-003**	**0.1036**	**0.0273**	**1.0000e-003**	**0.0283**		**120.9288**	**120.9288**	**6.1800e-003**		**121.0833**

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					0.1000	0.0000	0.1000	0.0151	0.0000	0.0151			0.0000			0.0000
Off-Road	1.7679	17.8184	9.6188	0.0226		0.8342	0.8342		0.7813	0.7813	0.0000	2,176.5959	2,176.5959	0.5467		2,190.2631
Total	**1.7679**	**17.8184**	**9.6188**	**0.0226**	**0.1000**	**0.8342**	**0.9342**	**0.0151**	**0.7813**	**0.7964**	**0.0000**	**2,176.5959**	**2,176.5959**	**0.5467**		**2,190.2631**

3.2 Demolition - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.4100e-003	0.1238	0.0377	3.4000e-004	7.8200e-003	4.8000e-004	8.3000e-003	2.1400e-003	4.6000e-004	2.6000e-003		38.5602	38.5602	3.6500e-003		38.6515
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	0.0435	0.0324	0.3185	8.3000e-004	0.0947	5.8000e-004	0.0953	0.0251	5.4000e-004	0.0257		82.3686	82.3686	2.5300e-003		82.4319
Total	**0.0469**	**0.1562**	**0.3562**	**1.1700e-003**	**0.1026**	**1.0600e-003**	**0.1036**	**0.0273**	**1.0000e-003**	**0.0283**		**120.9288**	**120.9288**	**6.1800e-003**		**121.0833**

3.3 Site Preparation - 2021

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					5.3754	0.0000	5.3754	2.9079	0.0000	2.9079			0.0000			0.0000
Off-Road	1.5558	17.4203	7.5605	0.0172		0.7654	0.7654		0.7041	0.7041		1,666.5174	1,666.5174	0.5390		1,679.9920
Total	**1.5558**	**17.4203**	**7.5605**	**0.0172**	**5.3754**	**0.7654**	**6.1408**	**2.9079**	**0.7041**	**3.6120**		**1,666.5174**	**1,666.5174**	**0.5390**		**1,679.9920**

3.3 Site Preparation - 2021

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	0.0232	0.0173	0.1699	4.4000e-004	0.0505	3.1000e-004	0.0508	0.0134	2.9000e-004	0.0137		43.9299	43.9299	1.3500e-003		43.9637
Total	**0.0232**	**0.0173**	**0.1699**	**4.4000e-004**	**0.0505**	**3.1000e-004**	**0.0508**	**0.0134**	**2.9000e-004**	**0.0137**		**43.9299**	**43.9299**	**1.3500e-003**		**43.9637**

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					5.3754	0.0000	5.3754	2.9079	0.0000	2.9079			0.0000			0.0000
Off-Road	1.5558	17.4203	7.5605	0.0172		0.7654	0.7654		0.7041	0.7041	0.0000	1,666.517 4	1,666.517 4	0.5390		1,679.992 0
Total	**1.5558**	**17.4203**	**7.5605**	**0.0172**	**5.3754**	**0.7654**	**6.1408**	**2.9079**	**0.7041**	**3.6120**	**0.0000**	**1,666.517 4**	**1,666.517 4**	**0.5390**		**1,679.992 0**

3.3 Site Preparation - 2021

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	0.0232	0.0173	0.1699	4.4000e-004	0.0505	3.1000e-004	0.0508	0.0134	2.9000e-004	0.0137		43.9299	43.9299	1.3500e-003		43.9637
Total	**0.0232**	**0.0173**	**0.1699**	**4.4000e-004**	**0.0505**	**3.1000e-004**	**0.0508**	**0.0134**	**2.9000e-004**	**0.0137**		**43.9299**	**43.9299**	**1.3500e-003**		**43.9637**

3.4 Grading - 2021

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					4.5671	0.0000	4.5671	2.4881	0.0000	2.4881			0.0000			0.0000
Off-Road	1.9649	22.1148	10.9640	0.0267		0.9541	0.9541		0.8778	0.8778		2,586.4571	2,586.4571	0.8365		2,607.3699
Total	**1.9649**	**22.1148**	**10.9640**	**0.0267**	**4.5671**	**0.9541**	**5.5211**	**2.4881**	**0.8778**	**3.3659**		**2,586.4571**	**2,586.4571**	**0.8365**		**2,607.3699**

3.4 Grading - 2021

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	1.4982	54.4033	16.5475	0.1514	3.4355	0.2130	3.6485	0.9398	0.2038	1.1436		16,946.0901	16,946.0901	1.6039		16,986.1869
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	0.0666	0.0496	0.4884	1.2700e-003	0.1453	9.0000e-004	0.1462	0.0385	8.3000e-004	0.0394		126.2985	126.2985	3.8800e-003		126.3956
Total	**1.5648**	**54.4529**	**17.0360**	**0.1526**	**3.5807**	**0.2139**	**3.7947**	**0.9784**	**0.2046**	**1.1830**		**17,072.3886**	**17,072.3886**	**1.6078**		**17,112.5824**

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					4.5671	0.0000	4.5671	2.4881	0.0000	2.4881			0.0000			0.0000
Off-Road	1.9649	22.1148	10.9640	0.0267		0.9541	0.9541		0.8778	0.8778	0.0000	2,586.4571	2,586.4571	0.8365		2,607.3699
Total	**1.9649**	**22.1148**	**10.9640**	**0.0267**	**4.5671**	**0.9541**	**5.5211**	**2.4881**	**0.8778**	**3.3659**	**0.0000**	**2,586.4571**	**2,586.4571**	**0.8365**		**2,607.3699**

3.4 Grading - 2021

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	1.4982	54.4033	16.5475	0.1514	3.4355	0.2130	3.6485	0.9398	0.2038	1.1436		16,946.0901	16,946.0901	1.6039		16,986.1869
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	0.0666	0.0496	0.4884	1.2700e-003	0.1453	9.0000e-004	0.1462	0.0385	8.3000e-004	0.0394		126.2985	126.2985	3.8800e-003		126.3956
Total	**1.5648**	**54.4529**	**17.0360**	**0.1526**	**3.5807**	**0.2139**	**3.7947**	**0.9784**	**0.2046**	**1.1830**		**17,072.3886**	**17,072.3886**	**1.6078**		**17,112.5824**

3.5 Building Construction - 2021

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	1.8125	13.6361	12.8994	0.0221		0.6843	0.6843		0.6608	0.6608		2,001.2200	2,001.2200	0.3573		2,010.1517
Total	**1.8125**	**13.6361**	**12.8994**	**0.0221**		**0.6843**	**0.6843**		**0.6608**	**0.6608**		**2,001.2200**	**2,001.2200**	**0.3573**		**2,010.1517**

3.5 Building Construction - 2021

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	0.0486	1.5088	0.4928	3.5500e-003	0.0888	4.4300e-003	0.0933	0.0256	4.2400e-003	0.0298		386.3353	386.3353	0.0285		387.0480
Worker	0.1130	0.0842	0.8282	2.1500e-003	0.2463	1.5200e-003	0.2478	0.0653	1.4000e-003	0.0667		214.1583	214.1583	6.5800e-003		214.3229
Total	**0.1616**	**1.5930**	**1.3210**	**5.7000e-003**	**0.3351**	**5.9500e-003**	**0.3411**	**0.0909**	**5.6400e-003**	**0.0965**		**600.4936**	**600.4936**	**0.0351**		**601.3709**

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	1.8125	13.6361	12.8994	0.0221		0.6843	0.6843		0.6608	0.6608	0.0000	2,001.2200	2,001.2200	0.3573		2,010.1517
Total	**1.8125**	**13.6361**	**12.8994**	**0.0221**		**0.6843**	**0.6843**		**0.6608**	**0.6608**	**0.0000**	**2,001.2200**	**2,001.2200**	**0.3573**		**2,010.1517**

3.5 Building Construction - 2021

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	0.0486	1.5088	0.4928	3.5500e-003	0.0888	4.4300e-003	0.0933	0.0256	4.2400e-003	0.0298		386.3353	386.3353	0.0285		387.0480
Worker	0.1130	0.0842	0.8282	2.1500e-003	0.2463	1.5200e-003	0.2478	0.0653	1.4000e-003	0.0667		214.1583	214.1583	6.5800e-003		214.3229
Total	**0.1616**	**1.5930**	**1.3210**	**5.7000e-003**	**0.3351**	**5.9500e-003**	**0.3411**	**0.0909**	**5.6400e-003**	**0.0965**		**600.4936**	**600.4936**	**0.0351**		**601.3709**

3.5 Building Construction - 2022

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	1.6487	12.5031	12.7264	0.0221		0.5889	0.5889		0.5689	0.5689		2,001.5429	2,001.5429	0.3486		2,010.2581
Total	**1.6487**	**12.5031**	**12.7264**	**0.0221**		**0.5889**	**0.5889**		**0.5689**	**0.5689**		**2,001.5429**	**2,001.5429**	**0.3486**		**2,010.2581**

3.5 Building Construction - 2022

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	0.0447	1.4325	0.4537	3.5100e-003	0.0888	3.8900e-003	0.0927	0.0256	3.7200e-003	0.0293		383.1208	383.1208	0.0289		383.8428
Worker	0.1052	0.0752	0.7546	2.0700e-003	0.2463	1.4700e-003	0.2478	0.0653	1.3600e-003	0.0667		206.5187	206.5187	5.8600e-003		206.6653
Total	**0.1499**	**1.5078**	**1.2083**	**5.5800e-003**	**0.3351**	**5.3600e-003**	**0.3405**	**0.0909**	**5.0800e-003**	**0.0960**		**589.6395**	**589.6395**	**0.0347**		**590.5080**

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	1.6487	12.5031	12.7264	0.0221		0.5889	0.5889		0.5689	0.5689	0.0000	2,001.5429	2,001.5429	0.3486		2,010.2581
Total	**1.6487**	**12.5031**	**12.7264**	**0.0221**		**0.5889**	**0.5889**		**0.5689**	**0.5689**	**0.0000**	**2,001.5429**	**2,001.5429**	**0.3486**		**2,010.2581**

3.5 Building Construction - 2022

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	0.0447	1.4325	0.4537	3.5100e-003	0.0888	3.8900e-003	0.0927	0.0256	3.7200e-003	0.0293		383.1208	383.1208	0.0289		383.8428
Worker	0.1052	0.0752	0.7546	2.0700e-003	0.2463	1.4700e-003	0.2478	0.0653	1.3600e-003	0.0667		206.5187	206.5187	5.8600e-003		206.6653
Total	**0.1499**	**1.5078**	**1.2083**	**5.5800e-003**	**0.3351**	**5.3600e-003**	**0.3405**	**0.0909**	**5.0800e-003**	**0.0960**		**589.6395**	**589.6395**	**0.0347**		**590.5080**

3.6 Paving - 2022

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	0.6877	6.7738	8.8060	0.0135		0.3474	0.3474		0.3205	0.3205		1,297.3789	1,297.3789	0.4113		1,307.6608
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.6877**	**6.7738**	**8.8060**	**0.0135**		**0.3474**	**0.3474**		**0.3205**	**0.3205**		**1,297.3789**	**1,297.3789**	**0.4113**		**1,307.6608**

3.6 Paving - 2022

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	0.0351	0.0251	0.2515	6.9000e-004	0.0821	4.9000e-004	0.0826	0.0218	4.5000e-004	0.0222		68.8396	68.8396	1.9500e-003		68.8884
Total	**0.0351**	**0.0251**	**0.2515**	**6.9000e-004**	**0.0821**	**4.9000e-004**	**0.0826**	**0.0218**	**4.5000e-004**	**0.0222**		**68.8396**	**68.8396**	**1.9500e-003**		**68.8884**

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	0.6877	6.7738	8.8060	0.0135		0.3474	0.3474		0.3205	0.3205	0.0000	1,297.3789	1,297.3789	0.4113		1,307.6608
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.6877**	**6.7738**	**8.8060**	**0.0135**		**0.3474**	**0.3474**		**0.3205**	**0.3205**	**0.0000**	**1,297.3789**	**1,297.3789**	**0.4113**		**1,307.6608**

3.6 Paving - 2022

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	0.0351	0.0251	0.2515	6.9000e-004	0.0821	4.9000e-004	0.0826	0.0218	4.5000e-004	0.0222		68.8396	68.8396	1.9500e-003		68.8884
Total	**0.0351**	**0.0251**	**0.2515**	**6.9000e-004**	**0.0821**	**4.9000e-004**	**0.0826**	**0.0218**	**4.5000e-004**	**0.0222**		**68.8396**	**68.8396**	**1.9500e-003**		**68.8884**

3.6 Paving - 2023

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	0.6446	6.2357	8.8024	0.0136		0.3084	0.3084		0.2846	0.2846		1,297.6880	1,297.6880	0.4114		1,307.9725
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.6446**	**6.2357**	**8.8024**	**0.0136**		**0.3084**	**0.3084**		**0.2846**	**0.2846**		**1,297.6880**	**1,297.6880**	**0.4114**		**1,307.9725**

3.6 Paving - 2023

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	0.0327	0.0225	0.2298	6.7000e-004	0.0821	4.8000e-004	0.0826	0.0218	4.4000e-004	0.0222		66.2664	66.2664	1.7400e-003		66.3100
Total	**0.0327**	**0.0225**	**0.2298**	**6.7000e-004**	**0.0821**	**4.8000e-004**	**0.0826**	**0.0218**	**4.4000e-004**	**0.0222**		**66.2664**	**66.2664**	**1.7400e-003**		**66.3100**

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	0.6446	6.2357	8.8024	0.0136		0.3084	0.3084		0.2846	0.2846	0.0000	1,297.6880	1,297.6880	0.4114		1,307.9725
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.6446**	**6.2357**	**8.8024**	**0.0136**		**0.3084**	**0.3084**		**0.2846**	**0.2846**	**0.0000**	**1,297.6880**	**1,297.6880**	**0.4114**		**1,307.9725**

3.6 Paving - 2023

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	0.0327	0.0225	0.2298	6.7000e-004	0.0821	4.8000e-004	0.0826	0.0218	4.4000e-004	0.0222		66.2664	66.2664	1.7400e-003		66.3100
Total	**0.0327**	**0.0225**	**0.2298**	**6.7000e-004**	**0.0821**	**4.8000e-004**	**0.0826**	**0.0218**	**4.4000e-004**	**0.0222**		**66.2664**	**66.2664**	**1.7400e-003**		**66.3100**

3.7 Architectural Coating - 2022

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	54.8178					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817		281.4481	281.4481	0.0183		281.9062
Total	**55.0223**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**		**281.4481**	**281.4481**	**0.0183**		**281.9062**

3.7 Architectural Coating - 2022

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	0.0216	0.0154	0.1548	4.3000e-004	0.0505	3.0000e-004	0.0508	0.0134	2.8000e-004	0.0137		42.3628	42.3628	1.2000e-003		42.3929
Total	**0.0216**	**0.0154**	**0.1548**	**4.3000e-004**	**0.0505**	**3.0000e-004**	**0.0508**	**0.0134**	**2.8000e-004**	**0.0137**		**42.3628**	**42.3628**	**1.2000e-003**		**42.3929**

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	54.8178					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817	0.0000	281.4481	281.4481	0.0183		281.9062
Total	**55.0223**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**	**0.0000**	**281.4481**	**281.4481**	**0.0183**		**281.9062**

3.7 Architectural Coating - 2022

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	0.0216	0.0154	0.1548	4.3000e-004	0.0505	3.0000e-004	0.0508	0.0134	2.8000e-004	0.0137		42.3628	42.3628	1.2000e-003		42.3929
Total	**0.0216**	**0.0154**	**0.1548**	**4.3000e-004**	**0.0505**	**3.0000e-004**	**0.0508**	**0.0134**	**2.8000e-004**	**0.0137**		**42.3628**	**42.3628**	**1.2000e-003**		**42.3929**

3.7 Architectural Coating - 2023

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	54.8178					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1917	1.3030	1.8111	2.9700e-003		0.0708	0.0708		0.0708	0.0708		281.4481	281.4481	0.0168		281.8690
Total	**55.0095**	**1.3030**	**1.8111**	**2.9700e-003**		**0.0708**	**0.0708**		**0.0708**	**0.0708**		**281.4481**	**281.4481**	**0.0168**		**281.8690**

3.7 Architectural Coating - 2023

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	0.0138	0.1414	4.1000e-004	0.0505	2.9000e-004	0.0508	0.0134	2.7000e-004	0.0137		40.7793	40.7793	1.0700e-003		40.8062
Total	**0.0201**	**0.0138**	**0.1414**	**4.1000e-004**	**0.0505**	**2.9000e-004**	**0.0508**	**0.0134**	**2.7000e-004**	**0.0137**		**40.7793**	**40.7793**	**1.0700e-003**		**40.8062**

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	54.8178					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1917	1.3030	1.8111	2.9700e-003		0.0708	0.0708		0.0708	0.0708	0.0000	281.4481	281.4481	0.0168		281.8690
Total	**55.0095**	**1.3030**	**1.8111**	**2.9700e-003**		**0.0708**	**0.0708**		**0.0708**	**0.0708**	**0.0000**	**281.4481**	**281.4481**	**0.0168**		**281.8690**

3.7 Architectural Coating - 2023

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	0.0138	0.1414	4.1000e-004	0.0505	2.9000e-004	0.0508	0.0134	2.7000e-004	0.0137		40.7793	40.7793	1.0700e-003		40.8062
Total	**0.0201**	**0.0138**	**0.1414**	**4.1000e-004**	**0.0505**	**2.9000e-004**	**0.0508**	**0.0134**	**2.7000e-004**	**0.0137**		**40.7793**	**40.7793**	**1.0700e-003**		**40.8062**

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
University/College (4Yr)	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
University/College (4Yr)	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
University/College (4Yr)	0.567965	0.027871	0.206163	0.120389	0.019588	0.005343	0.017610	0.019838	0.002797	0.002169	0.006725	0.002609	0.000932

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0418	0.3799	0.3191	2.2800e-003		0.0289	0.0289		0.0289	0.0289		455.8235	455.8235	8.7400e-003	8.3600e-003	458.5323
NaturalGas Unmitigated	0.0418	0.3799	0.3191	2.2800e-003		0.0289	0.0289		0.0289	0.0289		455.8235	455.8235	8.7400e-003	8.3600e-003	458.5323

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					
University/College (4Yr)	3874.5	0.0418	0.3799	0.3191	2.2800e-003		0.0289	0.0289		0.0289	0.0289		455.8235	455.8235	8.7400e-003	8.3600e-003	458.5323
Total		**0.0418**	**0.3799**	**0.3191**	**2.2800e-003**		**0.0289**	**0.0289**		**0.0289**	**0.0289**		**455.8235**	**455.8235**	**8.7400e-003**	**8.3600e-003**	**458.5323**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
University/College (4Yr)	3.8745	0.0418	0.3799	0.3191	2.2800e-003		0.0289	0.0289		0.0289	0.0289		455.8235	455.8235	8.7400e-003	8.3600e-003	458.5323
Total		**0.0418**	**0.3799**	**0.3191**	**2.2800e-003**		**0.0289**	**0.0289**		**0.0289**	**0.0289**		**455.8235**	**455.8235**	**8.7400e-003**	**8.3600e-003**	**458.5323**

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	2.5599	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	2.5599	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

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	0.5857					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.9742					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	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	**2.5599**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

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	0.5857					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.9742					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	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	**2.5599**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

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 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
Emergency Generator	0	0	0	0	0.73	Diesel

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

10.1 Stationary Sources

Unmitigated/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
Equipment Type	lb/day										lb/day					
Emergency Generator - Diesel (0 - 11 HP)	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**

11.0 Vegetation

Appendix B

Preliminary Drainage Analysis

Environmental Stormwater Analysis for UCSB Classroom Building Project

Concept-level analysis of required stormwater quality features for proposed UCSB Classroom Building Project

March 18, 2019

Prepared for:

Rodriguez Consulting, Inc.

Prepared by:

Craig Steward, P.E., CFM

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Prepared by ________________________________
(signature)

Craig Steward, P.E., CFM

REGISTERED PROFESSIONAL ENGINEER
CRAIG A. STEWARD
No. 37253
CIVIL
STATE OF CALIFORNIA

Reviewed by ________________________________
(signature)

Steve Wang, P.E.,

Table of Contents

1.0 PURPOSE OF THE REPORT

The purpose of this report is to evaluate the UCSB Classroom Building Project site for potentially successful stormwater treatment methods, based on concept-level data, including building location, grading and development parameters, and soil characteristics.

2.0 LOCATION

The UCSB Classroom Building Project site is located in the East of Main Campus area, immediately east of the Library Corridor, south of Davidson Library and the Bioengineering Building and north of UCEN Road. See Figure 1.

Figure 1 - Location Map

3.0 BACKGROUND

The current configuration concept consists of one massed building consisting of three interconnected structures located within a project limit area of about 2.4 acres. The existing bike path passes through the proposed building area and so would need to be relocated. Currently, only a small pedestrian pathway has been shown to serve the site. The project area is relatively flat with most ground elevations ranging from 48 feet NAVD1988 to 51 feet NAVD1988. The surface soils have been identified in the USDA Soil Web Site as pervious sands, classified as Hydraulic Soil Group A. Currently no data has been provided to evaluation the infiltration capacity of the deeper soils.

The project site is served by a number of drainage inlets and campus storm drains. Two major storm drain systems are located near the project site. One system runs in the Library corridor to the west of the site and the other runs to the east of the site. Both major systems are about 7 feet deep.

4.0 METHODS OF ANALYSIS

The analysis has been based on the criteria identified in the UCSB Post-Construction Stormwater Manual which generally follows the Central Coast Regional Water Quality Control Board guidance for most of Santa Barbara County. Most of the UCSB Campus is located within Water Quality Management Zone 1 and this site has a 95th Percentile 24-hour Rainfall Depth of 2.15 inches. The site development will involve more than 22,500 square feet of new or replaced impervious surfaces which leads to the following post-construction stormwater quality performance requirements:

1. Site Design and Runoff Reduction – limiting the disturbance of creeks and natural features, minimizing compaction of highly permeable soils, limiting clearing of native vegetation, and minimizing impervious surfaces.

2. Water Quality Treatment – provide water quality treatment for the 85th percentile 24-hour rainfall event via infiltration/evapotranspiration or an acceptable equivalent.

3. Runoff Retention – retain the storm volume from the project of a 95th percentile 24-hour rainfall event. Please note that satisfying the runoff retention requirement also fully satisfies the water quality treatment requirement.

4. Peak Management – reduce peak runoff from the post-project site to or below pre-project condition peak runoff conditions for the 2-year through 10-year event. However, the local standard of care typically is for 2-year through 100-year events.

The analysis included a pre-project and post-project evaluation of the imperviousness of the project site. Then using the estimated impervious data, soil type and the record 24-hour rainfall depths with HydroCAD v10.0 software, the 95th percentile 24-hour runoff volume was calculated along with the 2-year, 5-year, 10-year, 25-year, 50-year, and 100-year peak flowrate for the pre-project and post-project site conditions. The model applies the determined rainfall depth over project site, developing runoff flow rate over time (hydrograph) and volume. The model aggregates the flows and routes them to a treatment device (above ground basin, below ground basin, bioswale) which calculated the amount stored (retained) on site via infiltration and the amount metered out slowly (detained) to adjacent storm drain systems.

Using this information, the following options were evaluated or considered:

- Option 1 - surface retention/detention basin
- Option 2 – underground retention/detention system using chambers

The University has been considering several treatment sites for stormwater requirements. The potential treatment site locations are all accessible via gravity slope for surface basin and underground basin options due to the depth of the existing storm drain systems to which they will drain and the flatness of the site. The potential treatment site locations will be referred as West, South, and East as identified on Figure 2.

- West – within the limits of existing Parking Lot 3
- South – within open space south of the project site
- East – within the area of the proposed bicycle parking, east of the proposed building

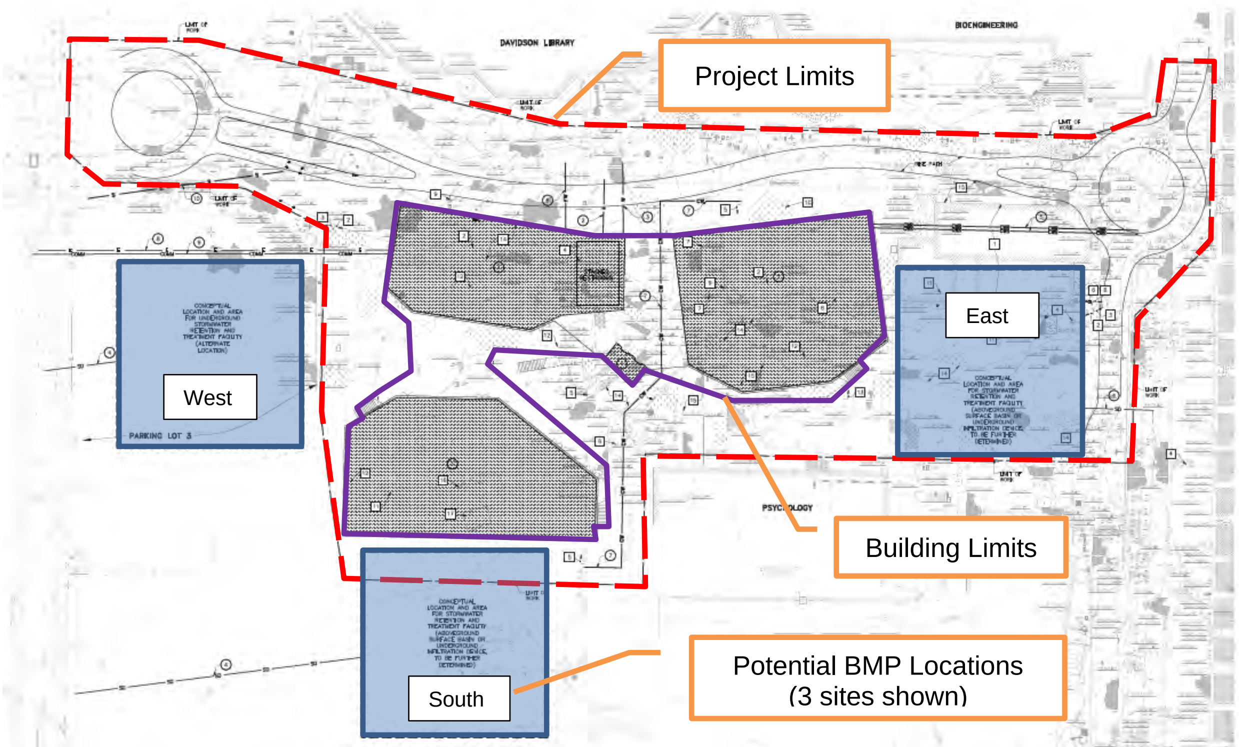


Figure 2 - Building Layout

5.0 FINDINGS

The following finding have been made as part of the analysis of this analysis:

5.1 IMPERVIOUSNESS

Imperviousness is identified as concrete pathways, patios, any kind of roofing, and asphalt paving. The pre-project imperviousness was found to be about 40 percent of the project area. The post-project imperviousness was found to be approximately 43 percent of the site based on the site conditions that were provided to us. However, it is anticipated that there will be additional paths and features that will increase this figure as the site design progresses. For the purposes of this study, a post-project impervious estimate of 65 percent was used.

5.2 INFILTRATION RATE

No site infiltration analysis has been completed for this location. A request for infiltration testing at the site has been issued. USDA Web Soil Survey[1] data indicates that the top layer of the soil may have a

[1] https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm

saturated conductivity of 13 inches per hour. In our opinion, most infiltration rates in this area, after accounting for various safety factors, generally do not exceed 1 inch per hour. This is the rate that was used for this evaluation.

5.3 PRE- AND POST-PROJECT PEAK FLOW RATES WITHOUT RETENTION/DETENTION

Table 1 shows the pre- and post-project peak flow rates from the entire site without retention or detention of flows.

Table 1 - Pre- and Post-Project Peak Flow Rates Without Retention/Detention

Return Period	Pre-Project cfs	Post-Project (no detention/retention) cfs
95%*	0.96	1.64
2-yr	1.46	2.49
5-yr	2.12	3.63
10-yr	2.56	4.38
25-yr	3.11	5.31
50-yr	3.59	6.03
100-yr	4.16	6.79
*95% = 95th percentile means 95% of all measured 24-hour runoff events are less than this amount.		

5.4 PRE- AND POST-PROJECT PEAK FLOW RATES WITH OPTION 1 RETENTION/DETENTION

Option 1 Retention/Detention proposes the construction of a surface detention pond with an underground infiltration gallery. See Figure 3. Based on the current hydrologic analysis, the amount of retention volume required during the 95th percentile storm event is 10,981 cubic feet. The analysis will combine infiltration during the storm as well as storage within the interstices of the rock fill to satisfy this volume. Storm flow in excess in excess of the 95th percentile volume will pond above the rock fill and be metered out of the basin by a piped connection to an adjacent storm drain system. This option could potentially be constructed at any of the three designated locations but may result in negative impacts such as reduced parking (either bike or automobile). The surface of the rock fill may need to be covered with sand or mulch to prevent trash and debris from accumulating within the rock fill. It will be important that an overland escape path be provided should the piped connection to the storm drain becomes blocked. Campus storm drains serving the new classroom building project will need to discharge into the area above the rock fill.

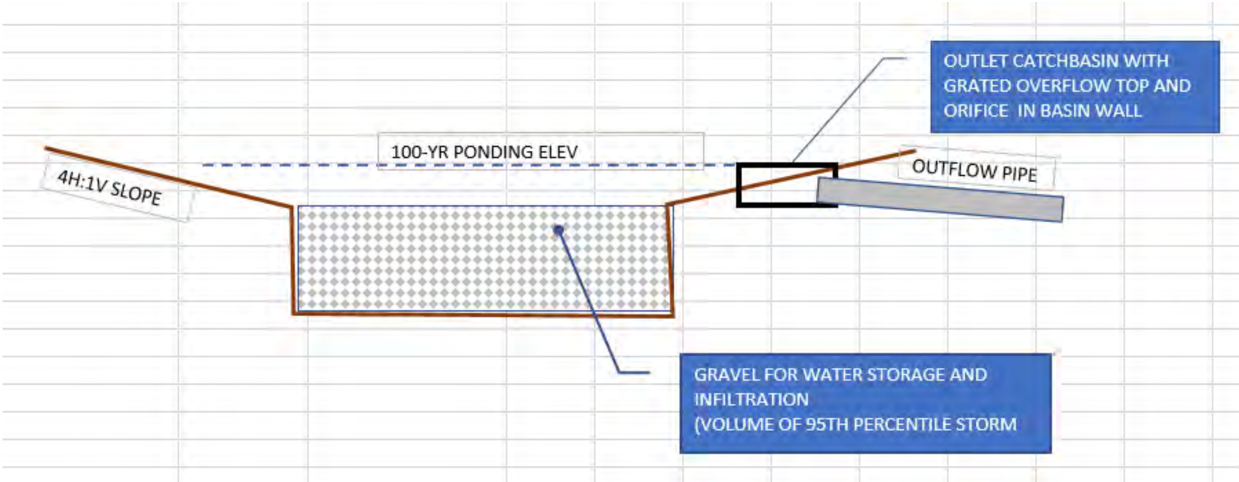


Figure 3 - Schematic of Option 1 Surface Basin

Table 2 describes the pre-project and post-project peak flows with the implementation of Option 1.

Table 2 - Option 1 Pre- and Post-Project Peak Outflow Results

Return Period	Pre-Project	Post-Project (with detention/retention)
95%	0.96	0.00
2-yr	1.46	0.33
5-yr	2.12	1.43
10-yr	2.56	1.96
25-yr	3.11	2.40
50-yr	3.59	2.65
100-yr	4.16	2.88

Table 3 describes the basic basin configuration.

Table 3 - Option 1 Physical Configuration

Basin Top Area =	5800	sf (76' x 76')
Basin Bottom Area =	3600	sf (60' x 60')
Depth of Open Basin	2	ft
Depth of Gravel =	4.5	ft

5.5 PRE- AND POST-PROJECT PEAK FLOW RATES WITH OPTION 2 RETENTION/DETENTION

Option 2 Retention/Detention proposes the construction of a subsurface excavation filled with rock fill and the use of chambers encased in the rock to enhance the storage capacity and reduce the size of the excavation. See Figure 4. The incoming water would need to be pretreated either with bioswales, hydrodynamic separators, or some other type of filtering device to remove gross solids and trash prior to the water entering the infiltration/detention area. The amount of the required retention volume is 10,981 cubic feet. The analysis combines ongoing infiltration during the storm as well as storage within the interstices of the rock fill to satisfy the treatment volume. Storm flow in excess of the 95th percentile (required treatment) volume will extend into the rock and chamber area above the outflow pipe elevation and slowly drain out to the UCSB storm drain system. The system will require at least one manhole and an inspection port. The incoming water would need to be pretreated either with bioswales, hydrodynamic separators, or some other type of filtering device to remove gross solids and trash prior to the water entering the infiltration/detention area. This option could potentially be constructed at any of the three designated locations (West, South, or East). It has the benefit of being underground and thus can be built under a parking lot, walkway, or bike parking lot. It does need routine maintenance to clean out trapped trash and debris from the pre-treatment device.

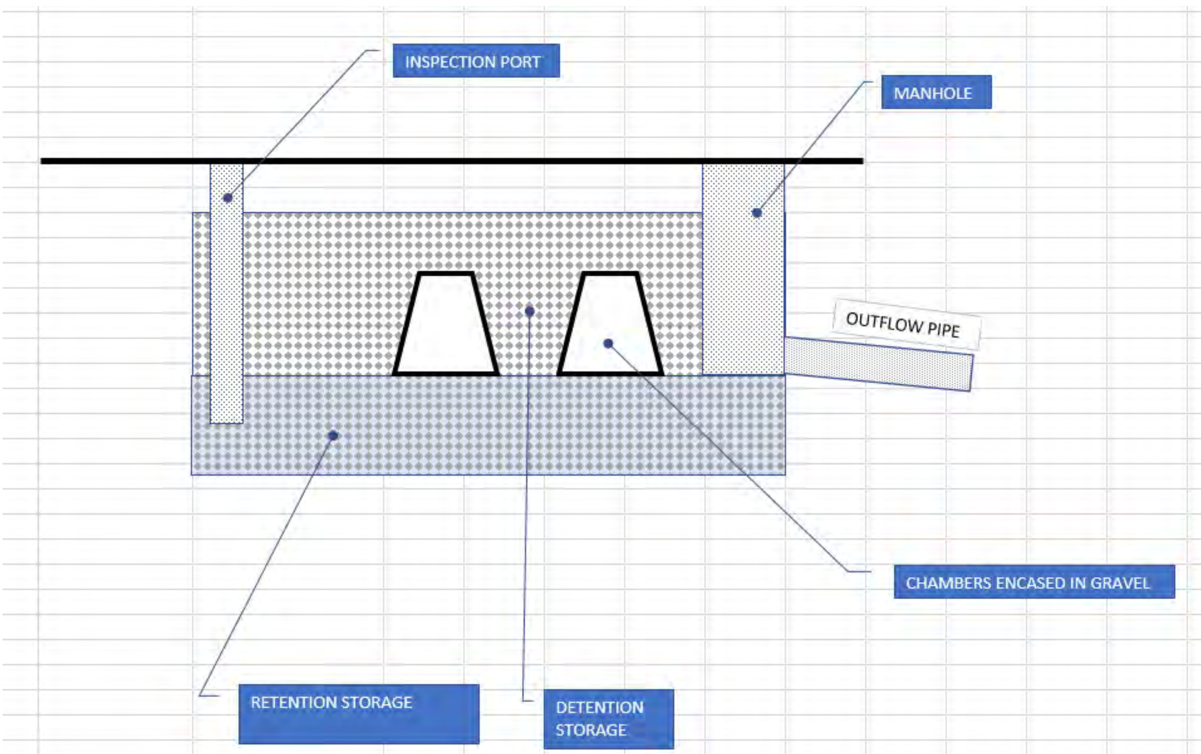


Figure 4 – Schematic of Option 2 Underground Basin

Table 4 – Option 2 Pre- and Post-Project Peak Outflow Results

Return Period	Pre-Project cfs	Post-Project (with detention/retention) cfs
95%	0.96	0.00
2-yr	1.46	0.43
5-yr	2.12	1.53
10-yr	2.56	2.07
25-yr	3.11	3.01
50-yr	3.59	3.57
100-yr	4.16	4.06

Table 5 describes the physical configuration of this option.

Table 5 - Option 2 Physical Configuration

Overrall Excavation=	60 ft long x 50 ft wide x 7 ft deep
Assumed Chamber =	ADS StormTech MC-4500
65 chambers, 19 chamber per row, 5 rows.	__________
Excavation	720 cy
Rock Fill	450 cy

6.0 CONCLUSIONS

It is our opinion that Options 1 and 2 are essentially equivalent in function and meeting the requirements of UCSB Post-Construction Stormwater Management Requirements. Both options will:

- impact potential future building locations as they occupy space which can be mitigated through future campus planning.
- have the potential to overflow if they malfunction or a storm event exceeds the design capacity which can be mitigated by appropriate grading design, directing overland discharge away from buildings.
- require relocation of underground utilities.

The differing impacts of the implementation of each system are discussed below:

6.1 OPTION 1

Option 1 is an open pond with sloping sides and a flat, open bottom. As such it occupies space that may be used for other functions. Option 1 will be less expensive to implement and maintain than Option 2. The additional impacts of using Option 1 in the various proposed locations are as follows:

- West Area – there would be a permanent loss of parking spaces in Lot 3.
- South Area – there would be a change in character for the open space from landscaped area that can be traversed to an area with restricted access and a flat, sparsely vegetated open space.
- East Area – there would be a loss of a number of bicycle parking spaces.

6.2 OPTION 2

Option 2 is a buried volume of rock fill and open chambers or pipes. The pipes or chambers convey and distributed water through the rock and provide additional storage space, allowing a smaller footprint. All implementations of Option 2 will require some type of pretreatment of flow into the underground chamber to prevent the clogging of the gravel and extend the life of the system. However, there are several types of pretreatment systems each with their own impacts. Some types receive surface flow and other types are underground systems.

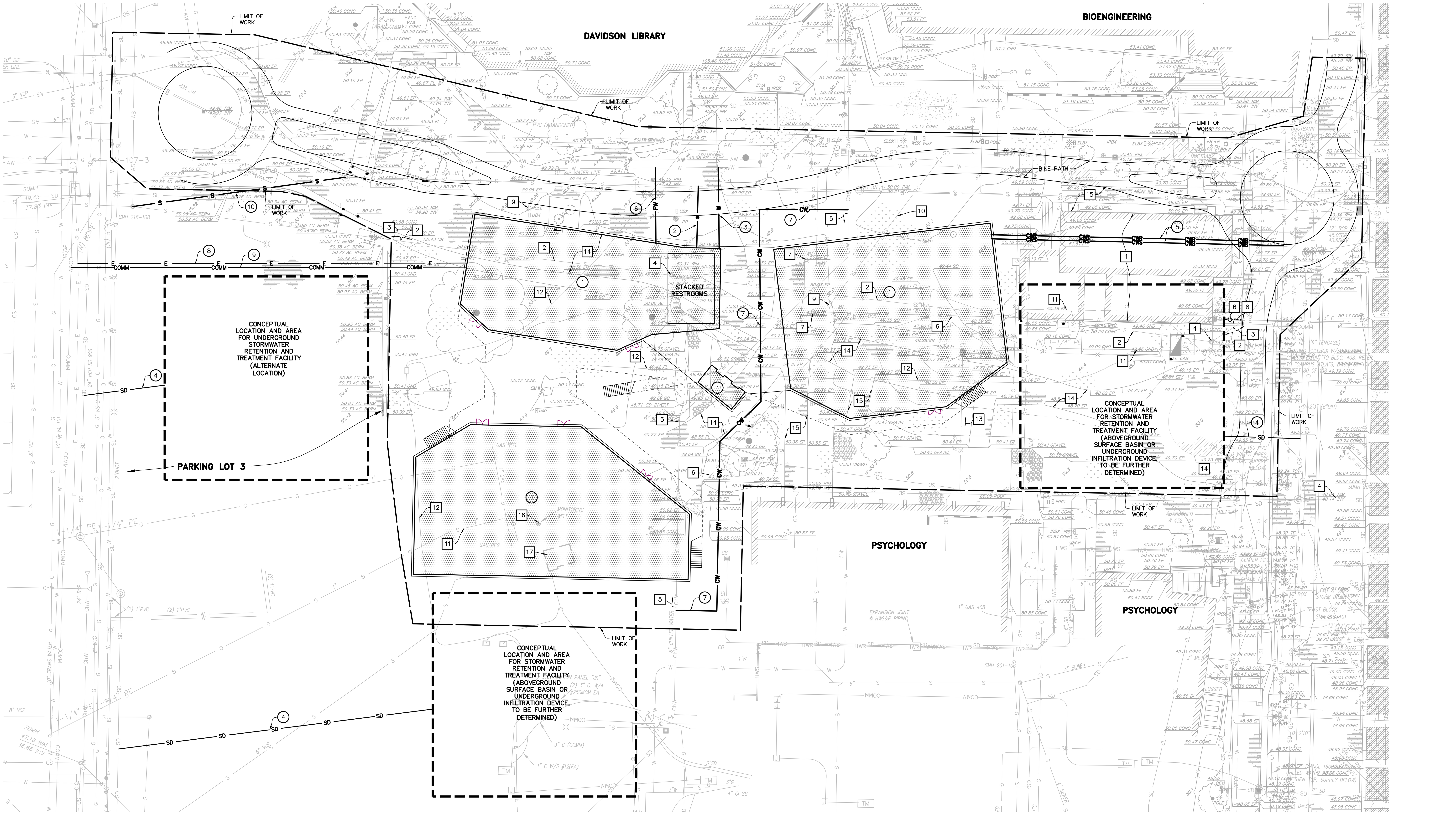
Surface pre-treatment systems include bioswales, filter strips, and rain gardens. One difficulty is that in order to use them, the water has to drain by gravity into them. Most of the locations for surface treatment is at the northerly end of the site which is generally higher than the rest of the project site. That means either the site would need to be filled with soil and likely with a high usage of retaining walls. Another challenge is that they require surface space. Generally, bioswales require a minimum of a 3-foot-wide flat bottom, 3H:1V side slopes, and a minimum length of 100 feet. This type of construction needs to be set back from buildings to avoid saturating the structural footings. It also needs to be set back from pedestrian and bicycle paths for safety purposes.

Underground pre-treatment systems have a much more confined footprint, usually limited to a manhole-like structure. Site storm drains are routed to the device and then discharges the water to the main filter underground filter. The construction cost of an underground pre-treatment system is likely higher than a surface pre-treatment system and it will require regular (seasonal) specialized treatment to remove the collected trash and sediment.

The additional impacts of Option 2 in the designated areas are summarized as follows:

- West Area with surface pre-treatment
    - Loss of vehicle parking spaces within Parking Lot 3
- South Area with surface pre-treatment
    - Disruption and redesign of access to Psychology building.

  - Potential saturation of existing building foundation
- East Area with surface pre-treatment
  - Loss of bicycle parking spaces.
  - Increased fill and retaining wall during new construction
  - Disruption and redesign of access to Psychology building.
  - Potential saturation of existing building foundation
- West Area with underground manhole-like pre-treatment
  - No additional impact
- South Area with underground manhole-like pre-treatment
  - No additional impact
- East Area with underground manhole-like pre-treatment
  - No additional impact



LEGEND

(shaded)	PROPOSED BUILDING	— W —	WATER LINE
— —	LIMIT OF WORK	— SD —	STORM DRAIN PIPE
— CW —	CHILLED WATERLINE	— S —	SEWER LINE
— CWR —	CHILLED WATER RETURN	— FW —	FIRE WATER LINE
— CWS —	CHILLED WATER SUPPLY	— E —	ELECTRICAL LINE
		— COMM —	COMMUNICATION LINE

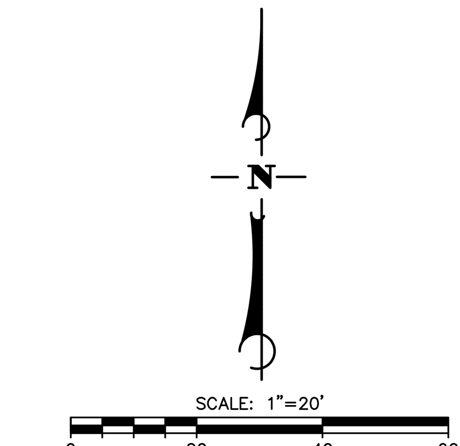
AC	ASPHALT CONCRETE	PD	PERFORATED DRAIN
BW	BOTTOM OF WALL ELEV.	P.L.	PROPERTY LINE
FL	FLOWLINE	RIM	RIM ELEVATION
FS	FINISH SURFACE	R.O.W.	RIGHT OF WAY
GB	GRADE BREAK	TC	TOP OF CURB
INV	INVERT ELEVATION	TG	TOP OF GRATE
LP	LOW POINT	TW	TOP OF WALL ELEV.
(N)	NORTH	(W)	WEST

DEMOLITION NOTES:

1. DEMOLISH EXISTING BUILDING COMPLETE, INCLUDING FOUNDATION AND ALL UTILITY CONNECTIONS.
2. REMOVE EXISTING SEWER LINE COMPLETE AND LEGALLY DISPOSE OF OFF-CAMPUS. BACKFILL TRENCH WITH NATIVE MATERIAL AT 95% COMPACTION.
3. ABANDON EXISTING SEWER LINE IN PLACE.
4. REMOVE EXISTING SEWER MANHOLE COMPLETE AND LEGALLY DISPOSE OF OFF-CAMPUS,
5. REMOVE EXISTING (2)-6" DIA. CHILLED WATERLINES (SUPPLY AND RETURN) AND LEGALLY DISPOSE OF OFF-CAMPUS.
6. REMOVE EXISTING WATER LINE COMPLETE AND LEGALLY DISPOSE OF OFF-CAMPUS. BACKFILL TRENCH WITH NATIVE MATERIAL AT 95% COMPACTION.
7. REMOVE EXISTING FIRE HYDRANT COMPLETE.
8. ABANDON EXISTING WATER LINE IN PLACE.
9. REMOVE EXISTING LIGHT STANDARD COMPLETE AND LEGALLY DISPOSE OF OFF-CAMPUS.
10. REMOVE EXISTING STREET LIGHT CONDUIT COMPLETE AND LEGALLY DISPOSE OF OFF-CAMPUS.
11. REMOVE EXISTING GAS LINE COMPLETE AND LEGALLY DISPOSE OF OFF-CAMPUS.
12. REMOVE EXISTING COMMUNICATION CONDUIT COMPLETE AND LEGALLY DISPOSE OF OFF-CAMPUS.
13. REMOVE EXISTING STORM DRAIN COMPLETE AND LEGALLY DISPOSE OF OFF-CAMPUS.
14. DEMOLISH EXISTING BIKE PATH COMPLETE.
15. DEMOLISH EXISTING CONCRETE WALKWAY COMPLETE.
16. REMOVE EXISTING MONITORING WELL COMPLETE.
17. REMOVE EXISTING COMMUNICATION VAULT COMPLETE.

CONSTRUCTION NOTES:

1. CONSTRUCT BUILDING PER ARCHITECTURAL PLANS.
2. CONSTRUCT 6" DIA. SEWER SERVICE.
3. CONSTRUCT 4" DIA. POTABLE WATER SERVICE.
4. CONSTRUCT OVERFLOW STORM DRAIN OUTLET PIPE AND CONNECT TO EXISTING STORM DRAIN.
5. CONSTRUCT (2)-8" DIA. CHILLED WATERLINES (SUPPLY AND RETURN).
6. CONSTRUCT 6" DIA. FIRE WATER SERVICE.
7. CONSTRUCT (2)-6" DIA. CHILLED WATERLINES (SUPPLY AND RETURN).
8. CONSTRUCT ELECTRICAL SERVICE TO BUILDING.
9. CONSTRUCT COMMUNICATION SERVICE TO BUILDING.
10. CONSTRUCT 10" DIA. SEWER LINE CONNECTION.



ORIGINAL SHEET - ARCH E1

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UCSB CLASSROOM

UNIVERSITY OF CALIFORNIA, SANTA BARBARA

Title
SCHEMATIC DESIGN PHASE - CONCEPTUAL SITE UTILITY PLAN

Project Number: 2064179000
File Name: drawing.dwg

ghj	jjj	jjj	04.09.17
Dwn.	Chkd.	Dsgn.	YY.MM.DD

Drawing No. C1.1

Revision Sheet

1 of

HYDROLOGY

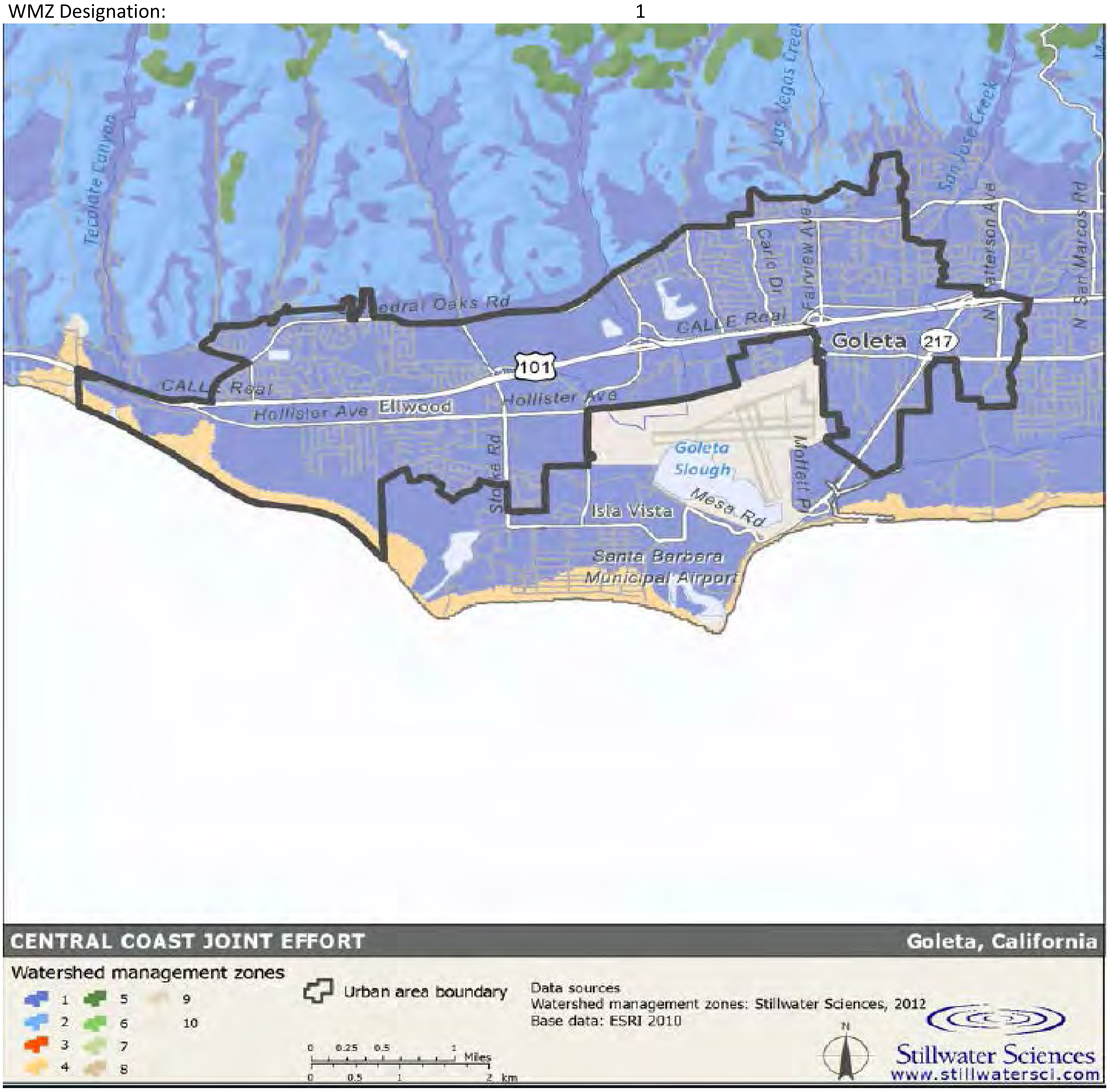
Project Size: 2.42 acres
Pre-Project Imperviousness: 40%
Impervious Area: 0.96 acres

Post-Project Imperviousness: 43% (Does not include paths or bike parking)
Impervious Area: 1.03 acres = 44956.08
Assumed Imperviousness: 65%

Hydrologic Soil Group: A
Saturated Hydraulic Conductivity: 92 micrometers per second = 13 inches/hour

Factored infiltration rate: 1 inches per hour

WMZ Designation: 1



Project > 15,000 sf new or replaced impervious surface: Retain 95th percentile event via infiltration
Project > 22,500 sf new or replaced impervious surface: Do Peak Management

95th Percentile 24-hour Rainfall Depth: 2.15 inches

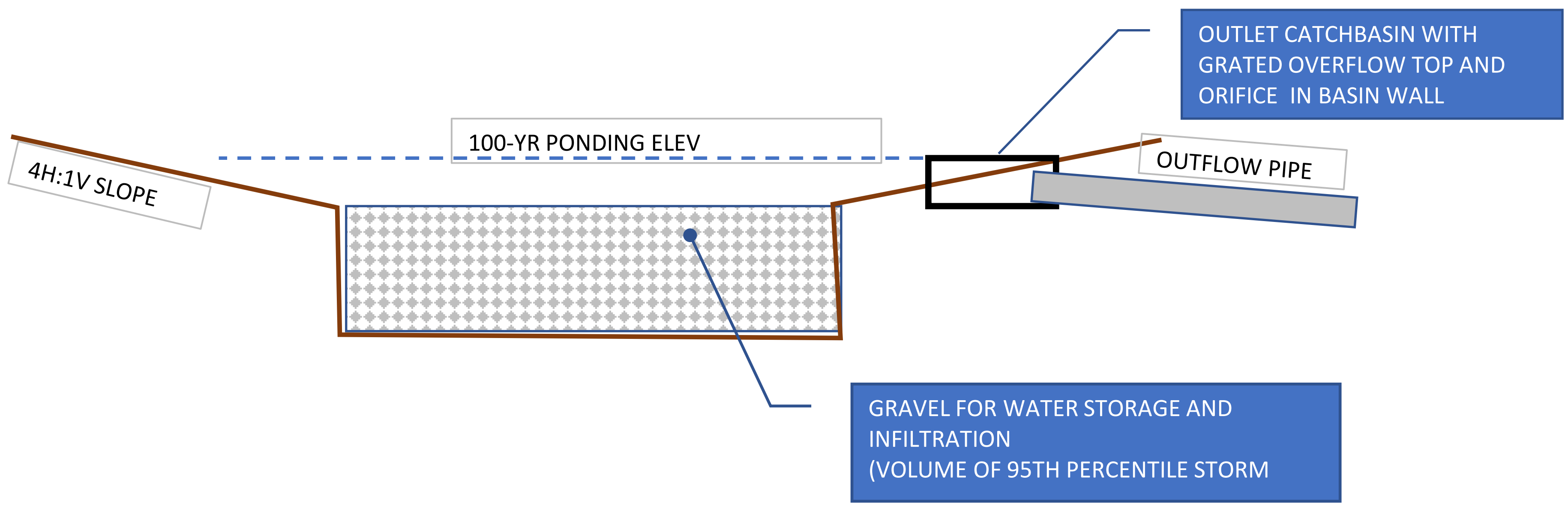
Return Period	Pre-Project	Post-Project (no detention/retention)
95%	0.96	1.64
2-yr	1.46	2.49
5-yr	2.12	3.63
10-yr	2.56	4.38
25-yr	3.11	5.31
50-yr	3.59	6.03
100-yr	4.16	6.79

Design Requirements

Capture and Infiltrate On-Site the 95th Percentile 24-Hour Rainfall
Reduce Post-Project Peak Flow Rates to Equal or Less Than the Pre-Project Peak Flow Rates for the 2-yr - 100-yr Storm Events.

OPTION 1 - SURFACE BASIN

Diagram:

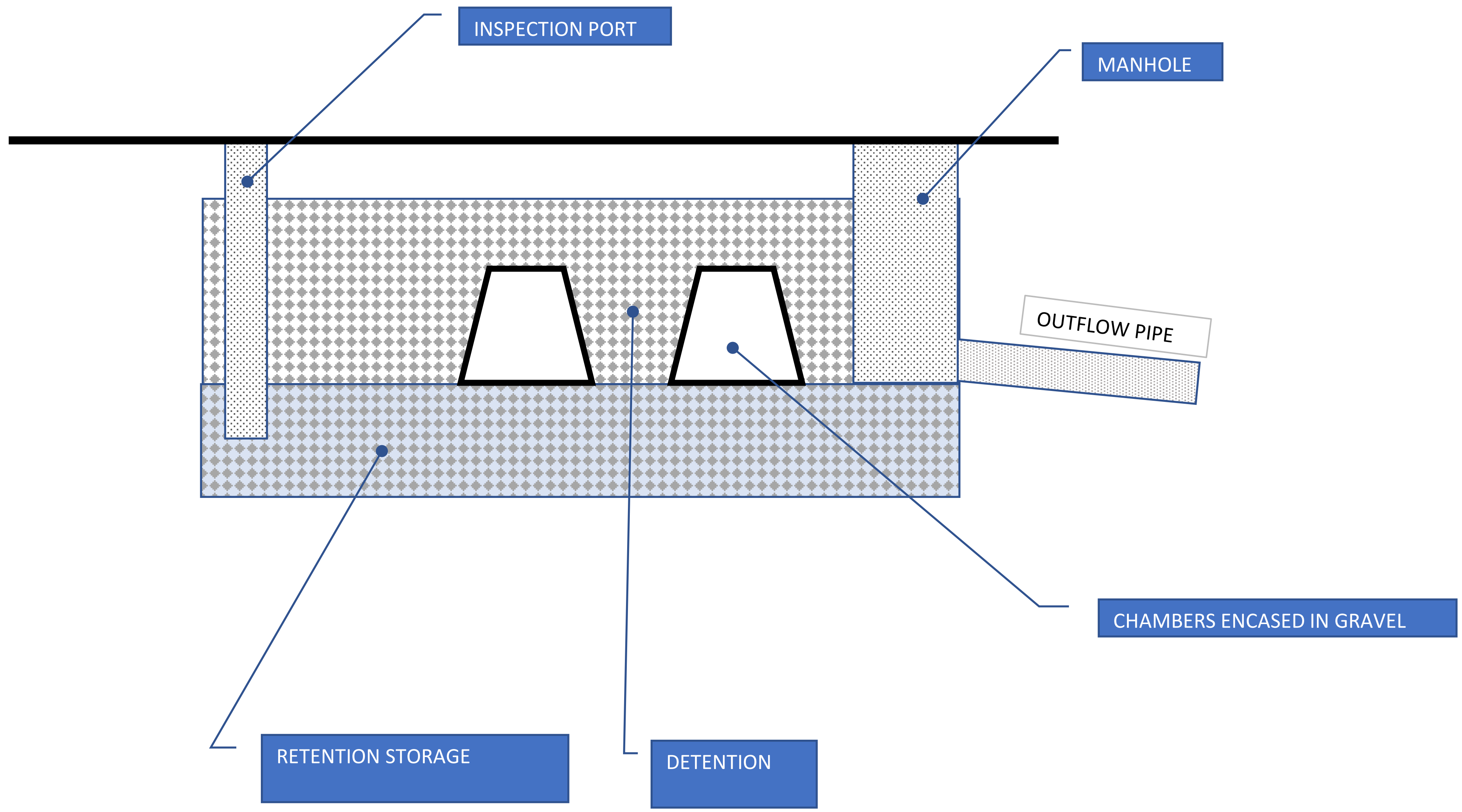


Basin Top Area =	5800	sf (76' x 76')
Basin Bottom Area =	3600	sf (60' x 60')
Depth of Open Basin	2	ft
Depth of Gravel =	4.5	ft

Return Period	**Pre-Project**	**Post-Project (with detention/retention)**
95%	0.96	0.00
2-yr	1.46	0.33
5-yr	2.12	1.43
10-yr	2.56	1.96
25-yr	3.11	2.40
50-yr	3.59	2.65
100-yr	4.16	2.88

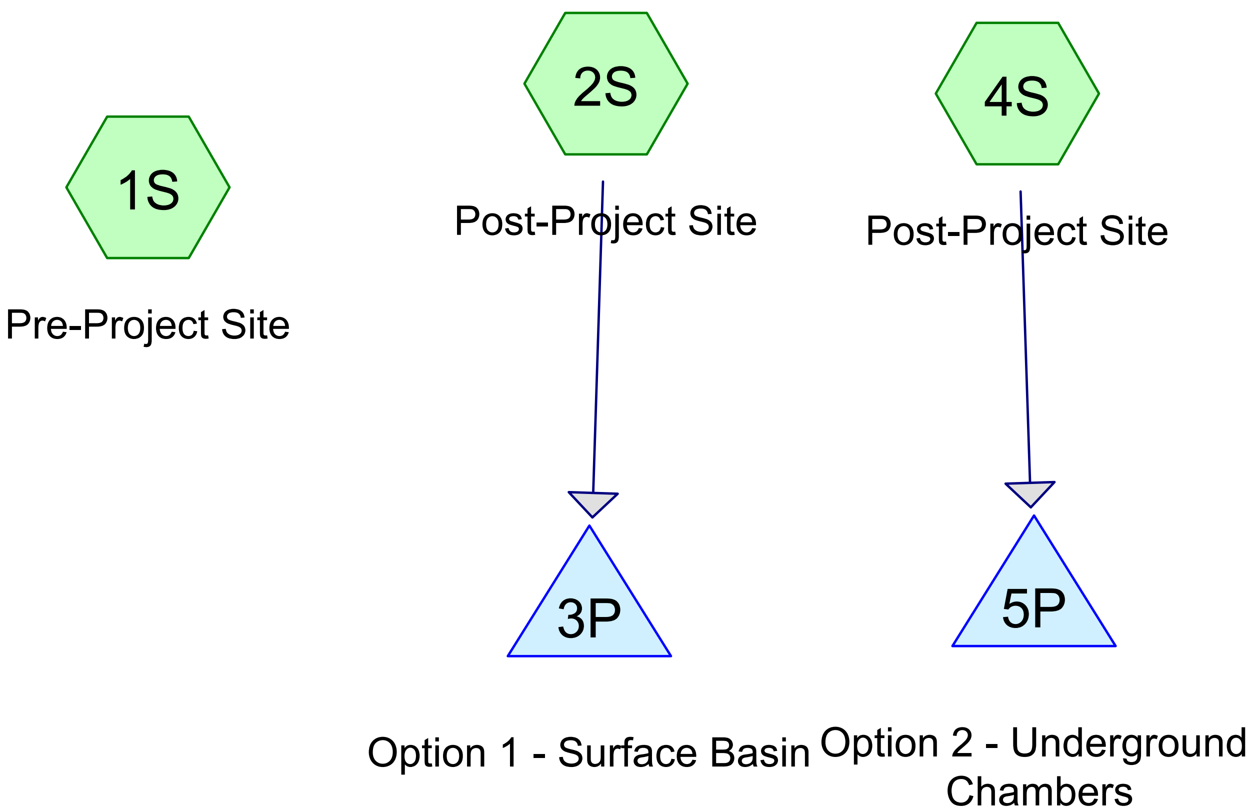
OPTION 2 - UNDERGROUND CHAMBERS

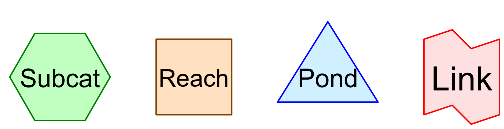
Diagram:



Overall Excavation=	60 ft long x 50 ft wide x 7 ft deep
Assumed Chamber =	ADS StormTech MC-4500
65 chambers, 19 chamber per row, 5 rows.	
720 cy excavation	
450 cy stone	

Return Period	Pre-Project	Post-Project (with detention/retention)
95%	0.96	0.00
2-yr	1.46	0.43
5-yr	2.12	1.53
10-yr	2.56	2.07
25-yr	3.11	3.01
50-yr	3.59	3.57
100-yr	4.16	4.06





Routing Diagram for 20190306 UCSB
Prepared by Stantec Consulting Ltd., Printed 3/15/2019
HydroCAD® 10.00-22 s/n 03040 © 2018 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
105,415	61	1/4 acre lots, 38% imp, HSG A (1S)
210,830	77	1/8 acre lots, 65% imp, HSG A (2S, 4S)
316,246	**72**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
316,246	HSG A	1S, 2S, 4S
0	HSG B	
0	HSG C	
0	HSG D	
0	Other	
316,246		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Subcat Numbe
105,415	0	0	0	0	105,415	1/4 acre lots, 38% imp	
210,830	0	0	0	0	210,830	1/8 acre lots, 65% imp	
316,246	**0**	**0**	**0**	**0**	**316,246**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	3P	41.00	40.00	100.0	0.0100	0.013	18.0	0.0	0.0
2	5P	38.70	37.70	100.0	0.0100	0.013	18.0	0.0	0.0

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Pre-Project Site Runoff Area=2.420 ac 38.00% Impervious Runoff Depth=0.73"
Tc=12.0 min CN=38/98 Runoff=0.96 cfs 6,420 cf

Subcatchment 2S: Post-Project Site Runoff Area=2.420 ac 65.00% Impervious Runoff Depth=1.25"
Tc=12.0 min CN=38/98 Runoff=1.64 cfs 10,981 cf

Subcatchment 4S: Post-Project Site Runoff Area=2.420 ac 65.00% Impervious Runoff Depth=1.25"
Tc=12.0 min CN=38/98 Runoff=1.64 cfs 10,981 cf

Pond 3P: Option 1 - Surface Basin Peak Elev=41.94' Storage=4,954 cf Inflow=1.64 cfs 10,981 cf
Discarded=0.10 cfs 10,981 cf Primary=0.00 cfs 0 cf Outflow=0.10 cfs 10,981 cf

Pond 5P: Option 2 - Underground Chambers Peak Elev=39.80' Storage=5,785 cf Inflow=1.64 cfs 10,981 cf
Discarded=0.08 cfs 10,981 cf Primary=0.00 cfs 0 cf Outflow=0.08 cfs 10,981 cf

Total Runoff Area = 316,246 sf Runoff Volume = 28,381 cf Average Runoff Depth = 1.08"
44.00% Pervious = 139,148 sf 56.00% Impervious = 177,098 sf

Summary for Subcatchment 1S: Pre-Project Site

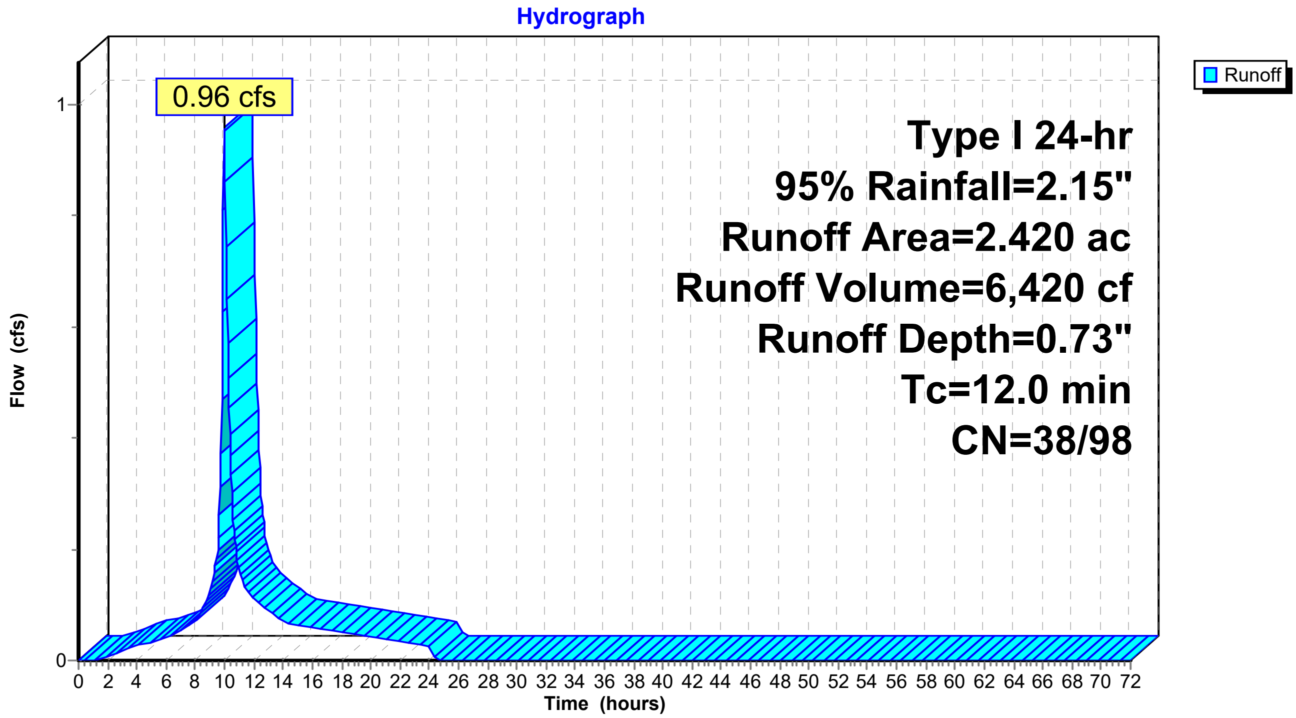
Runoff = 0.96 cfs @ 9.98 hrs, Volume= 6,420 cf, Depth= 0.73"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type I 24-hr 95% Rainfall=2.15"

Area (ac)	CN	Description
2.420	61	1/4 acre lots, 38% imp, HSG A
1.500	38	62.00% Pervious Area
0.920	98	38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					**Direct Entry,**

Subcatchment 1S: Pre-Project Site



Summary for Subcatchment 2S: Post-Project Site

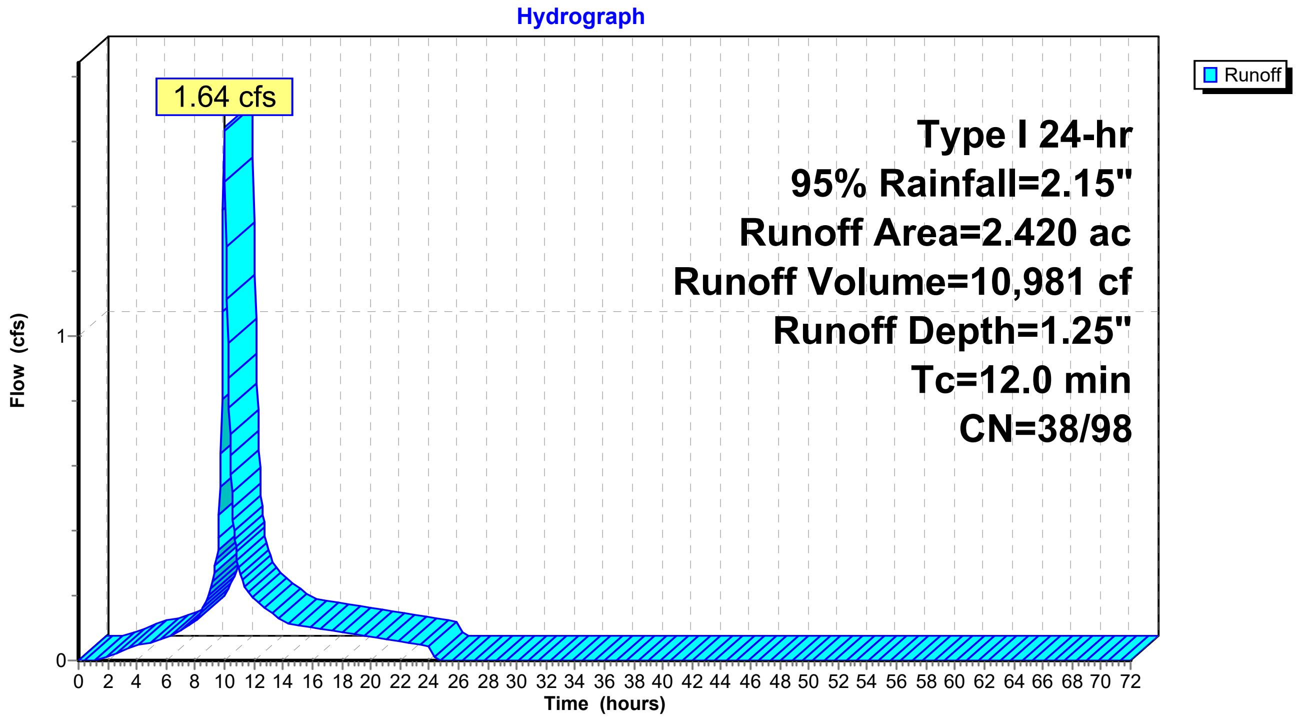
Runoff = 1.64 cfs @ 9.98 hrs, Volume= 10,981 cf, Depth= 1.25"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type I 24-hr 95% Rainfall=2.15"

Area (ac)	CN	Description
2.420	77	1/8 acre lots, 65% imp, HSG A
0.847	38	35.00% Pervious Area
1.573	98	65.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					**Direct Entry,**

Subcatchment 2S: Post-Project Site



Summary for Subcatchment 4S: Post-Project Site

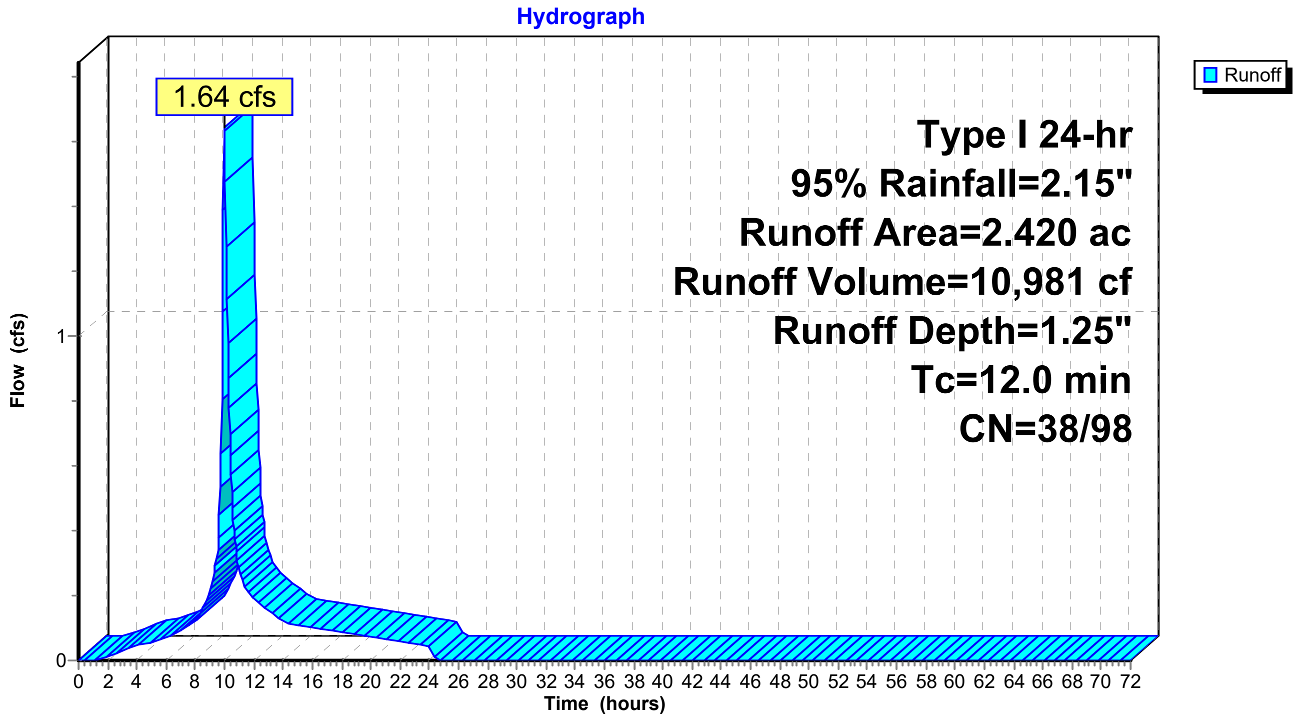
Runoff = 1.64 cfs @ 9.98 hrs, Volume= 10,981 cf, Depth= 1.25"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type I 24-hr 95% Rainfall=2.15"

Area (ac)	CN	Description
2.420	77	1/8 acre lots, 65% imp, HSG A
0.847	38	35.00% Pervious Area
1.573	98	65.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					**Direct Entry,**

Subcatchment 4S: Post-Project Site



Summary for Pond 3P: Option 1 - Surface Basin

```
Inflow Area =      105,415 sf,  65.00% Impervious,  Inflow Depth =   1.25"    for  95% event
Inflow      =      1.64 cfs @    9.98 hrs,  Volume=         10,981 cf
Outflow     =      0.10 cfs @   15.53 hrs,  Volume=         10,981 cf,  Atten= 94%,  Lag= 332.9 min
Discarded   =      0.10 cfs @   15.53 hrs,  Volume=         10,981 cf
Primary     =      0.00 cfs @    0.00 hrs,  Volume=              0 cf
```

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 41.94' @ 15.53 hrs Surf.Area= 3,600 sf Storage= 4,954 cf

Plug-Flow detention time= 501.6 min calculated for 10,981 cf (100% of inflow)
Center-of-Mass det. time= 501.4 min (1,224.1 - 722.7)

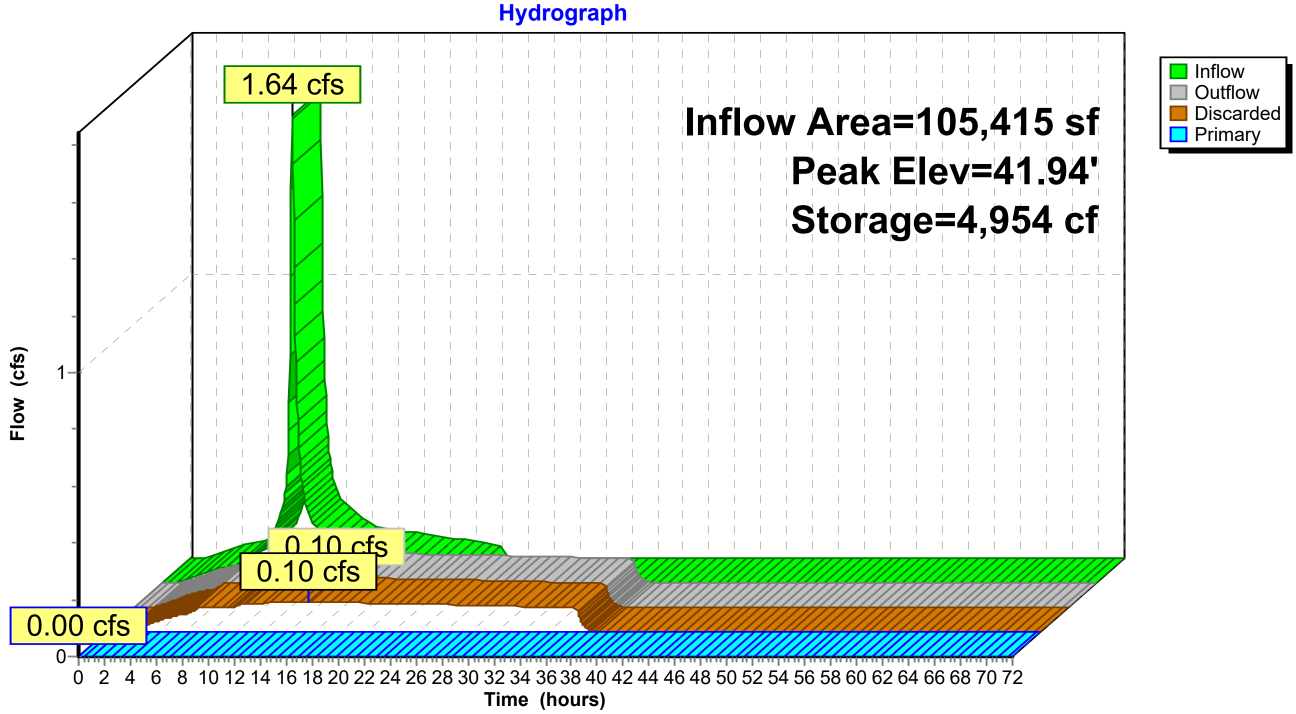
Volume	Invert	Avail.Storage	Storage Description
#1	38.50'	5,040 cf	**60.00'W x 60.00'L x 3.50'H Prismatoid** 12,600 cf Overall x 40.0% Voids
#2	43.00'	15,696 cf	**60.00'W x 60.00'L x 3.00'H Prismatoid Z=4.0**
		20,736 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	38.50'	**1.000 in/hr Exfiltration over Wetted area**
#2	Primary	41.00'	**18.0" Round Culvert** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 41.00' / 40.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Device 2	43.00'	**10.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	45.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.10 cfs @ 15.53 hrs HW=41.94' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.10 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=38.50' (Free Discharge)
└─**2=Culvert** (Controls 0.00 cfs)
  ├─**3=Orifice/Grate** (Controls 0.00 cfs)
  └─**4=Orifice/Grate** (Controls 0.00 cfs)

Pond 3P: Option 1 - Surface Basin



Summary for Pond 5P: Option 2 - Underground Chambers

Inflow Area =	105,415 sf,	65.00% Impervious,	Inflow Depth = 1.25"	for 95% event
Inflow =	1.64 cfs @	9.98 hrs, Volume=	10,981 cf	
Outflow =	0.08 cfs @	19.00 hrs, Volume=	10,981 cf,	Atten= 95%, Lag= 541.2 min
Discarded =	0.08 cfs @	19.00 hrs, Volume=	10,981 cf	
Primary =	0.00 cfs @	0.00 hrs, Volume=	0 cf	

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 39.80' @ 19.00 hrs Surf.Area= 2,774 sf Storage= 5,785 cf

Plug-Flow detention time= 735.8 min calculated for 10,981 cf (100% of inflow)
Center-of-Mass det. time= 735.6 min (1,458.3 - 722.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	36.75'	4,855 cf	**46.67'W x 59.44'L x 7.00'H Field A**
			19,418 cf Overall - 7,279 cf Embedded = 12,139 cf x 40.0% Voids
#2A	37.75'	7,279 cf	**ADS_StormTech MC-4500 +Cap** x 65 Inside #1
			Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf
			Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap
			5 Rows of 13 Chambers
			Cap Storage= +35.7 cf x 2 x 5 rows = 357.0 cf
		12,134 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	36.75'	**1.000 in/hr Exfiltration over Wetted area**
#2	Primary	38.70'	**18.0" Round Culvert**
			L= 100.0' RCP, groove end w/headwall, Ke= 0.200
			Inlet / Outlet Invert= 38.70' / 37.70' S= 0.0100 '/' Cc= 0.900
			n= 0.013, Flow Area= 1.77 sf
#3	Device 2	39.90'	**8.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	41.80'	**6.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.08 cfs @ 19.00 hrs HW=39.80' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=36.75' (Free Discharge)
└─**2=Culvert** (Controls 0.00 cfs)
  ├─**3=Orifice/Grate** (Controls 0.00 cfs)
  └─**4=Orifice/Grate** (Controls 0.00 cfs)

Pond 5P: Option 2 - Underground Chambers - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-4500 +Cap (ADS StormTech® MC-4500 with cap volume)
Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf
Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap
Cap Storage= +35.7 cf x 2 x 5 rows = 357.0 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

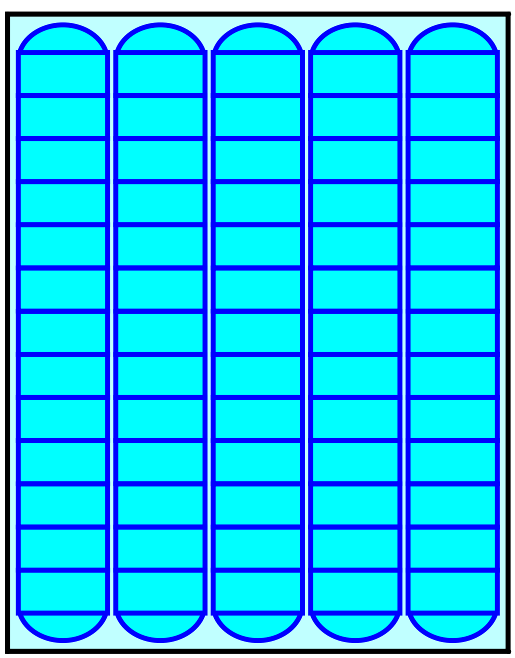
13 Chambers/Row x 4.02' Long +2.56' Cap Length x 2 = 57.44' Row Length +12.0" End Stone x 2 = 59.44' Base Length
5 Rows x 100.0" Wide + 9.0" Spacing x 4 + 12.0" Side Stone x 2 = 46.67' Base Width
12.0" Base + 60.0" Chamber Height + 12.0" Cover = 7.00' Field Height

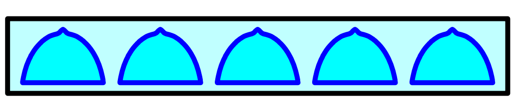
65 Chambers x 106.5 cf + 35.7 cf Cap Volume x 2 x 5 Rows = 7,278.9 cf Chamber Storage

19,417.6 cf Field - 7,278.9 cf Chambers = 12,138.7 cf Stone x 40.0% Voids = 4,855.5 cf Stone Storage

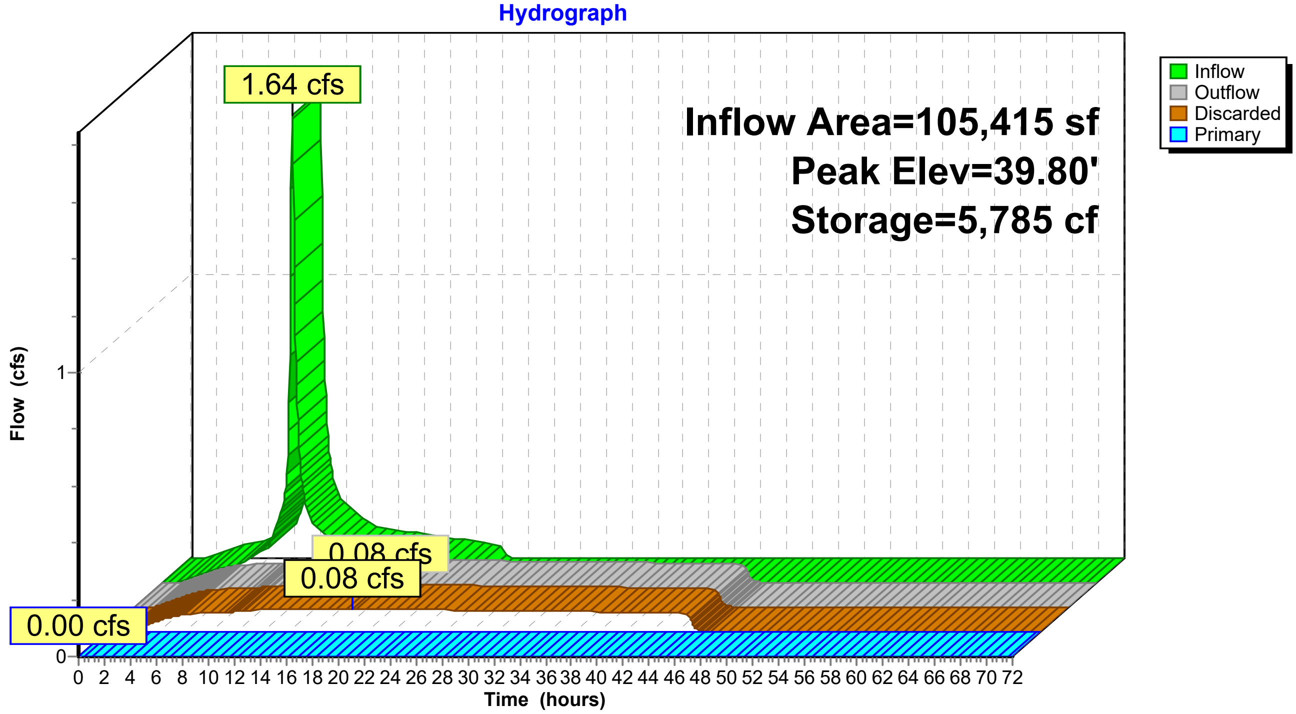
Chamber Storage + Stone Storage = 12,134.4 cf = 0.279 af
Overall Storage Efficiency = 62.5%
Overall System Size = 59.44' x 46.67' x 7.00'

65 Chambers
719.2 cy Field
449.6 cy Stone





Pond 5P: Option 2 - Underground Chambers



Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Pre-Project Site Runoff Area=2.420 ac 38.00% Impervious Runoff Depth=1.13"
Tc=12.0 min CN=38/98 Runoff=1.46 cfs 9,906 cf

Subcatchment 2S: Post-Project Site Runoff Area=2.420 ac 65.00% Impervious Runoff Depth=1.93"
Tc=12.0 min CN=38/98 Runoff=2.49 cfs 16,944 cf

Subcatchment 4S: Post-Project Site Runoff Area=2.420 ac 65.00% Impervious Runoff Depth=1.93"
Tc=12.0 min CN=38/98 Runoff=2.49 cfs 16,944 cf

Pond 3P: Option 1 - Surface Basin Peak Elev=43.30' Storage=6,167 cf Inflow=2.49 cfs 16,944 cf
Discarded=0.19 cfs 14,875 cf Primary=0.33 cfs 2,390 cf Outflow=0.52 cfs 17,265 cf

Pond 5P: Option 2 - Underground Chambers Peak Elev=40.28' Storage=6,804 cf Inflow=2.49 cfs 16,944 cf
Discarded=0.08 cfs 12,023 cf Primary=0.43 cfs 4,922 cf Outflow=0.51 cfs 16,944 cf

Total Runoff Area = 316,246 sf Runoff Volume = 43,795 cf Average Runoff Depth = 1.66"
44.00% Pervious = 139,148 sf 56.00% Impervious = 177,098 sf

Summary for Subcatchment 1S: Pre-Project Site

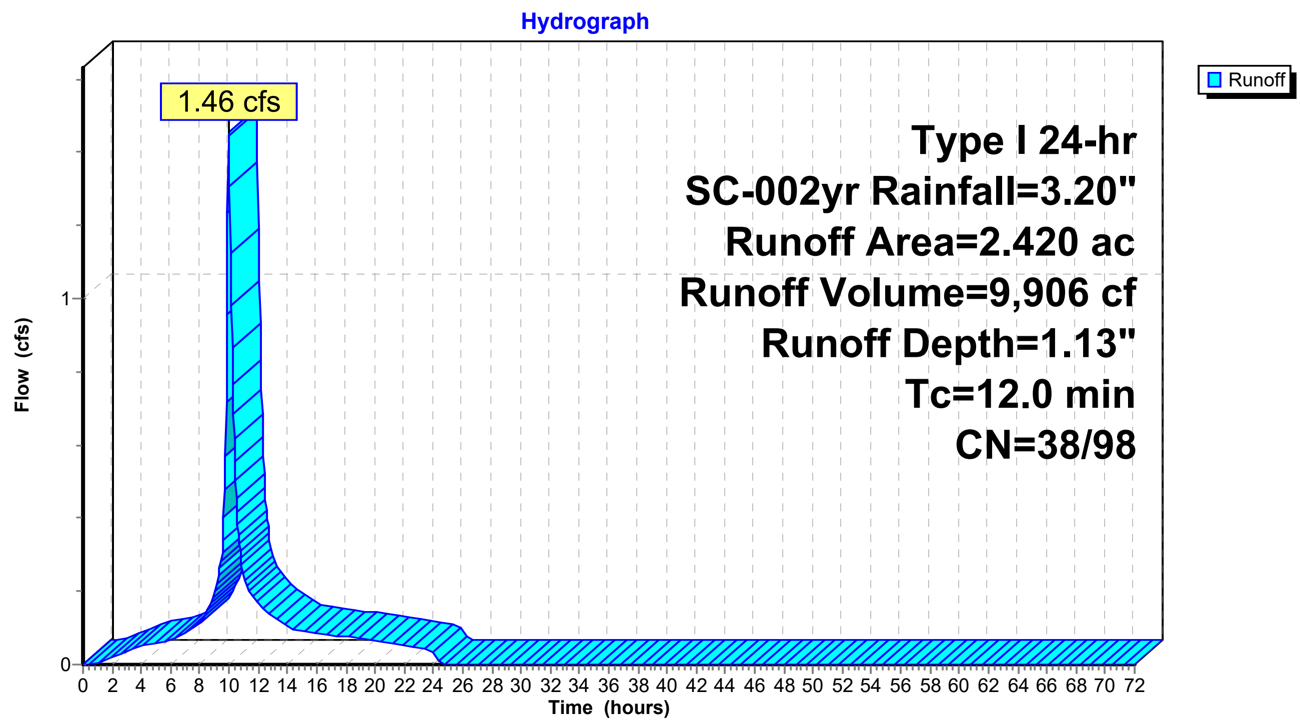
Runoff = 1.46 cfs @ 9.98 hrs, Volume= 9,906 cf, Depth= 1.13"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type I 24-hr SC-002yr Rainfall=3.20"

Area (ac)	CN	Description
2.420	61	1/4 acre lots, 38% imp, HSG A
1.500	38	62.00% Pervious Area
0.920	98	38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					**Direct Entry,**

Subcatchment 1S: Pre-Project Site



Summary for Subcatchment 2S: Post-Project Site

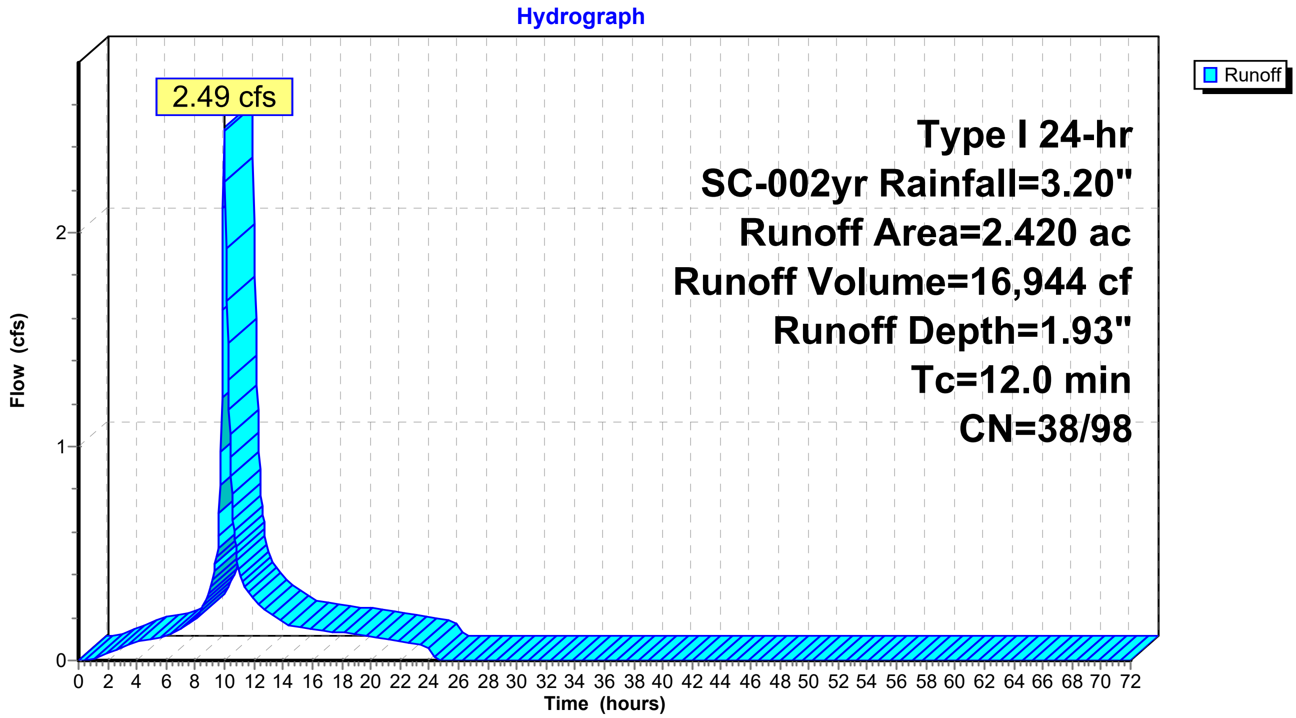
Runoff = 2.49 cfs @ 9.98 hrs, Volume= 16,944 cf, Depth= 1.93"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type I 24-hr SC-002yr Rainfall=3.20"

Area (ac)	CN	Description
2.420	77	1/8 acre lots, 65% imp, HSG A
0.847	38	35.00% Pervious Area
1.573	98	65.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					**Direct Entry,**

Subcatchment 2S: Post-Project Site



Summary for Subcatchment 4S: Post-Project Site

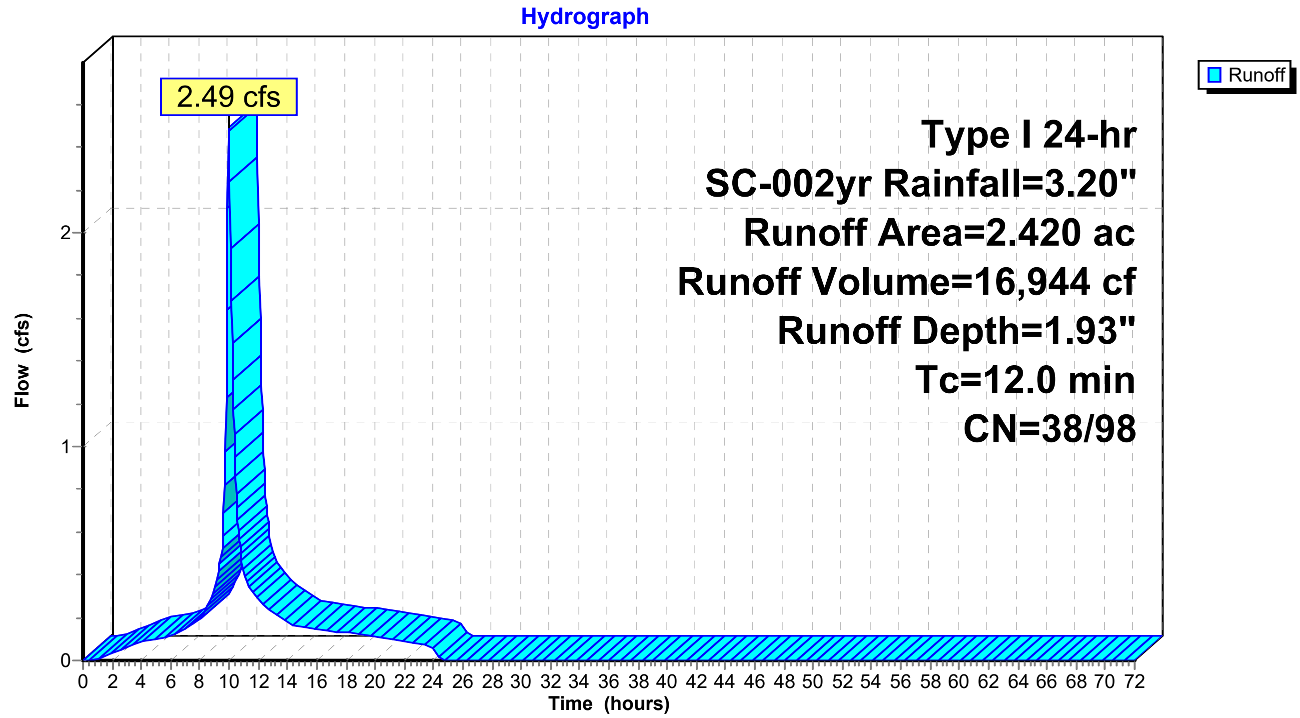
Runoff = 2.49 cfs @ 9.98 hrs, Volume= 16,944 cf, Depth= 1.93"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type I 24-hr SC-002yr Rainfall=3.20"

Area (ac)	CN	Description
2.420	77	1/8 acre lots, 65% imp, HSG A
0.847	38	35.00% Pervious Area
1.573	98	65.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					**Direct Entry,**

Subcatchment 4S: Post-Project Site



Summary for Pond 3P: Option 1 - Surface Basin

Inflow Area = 105,415 sf, 65.00% Impervious, Inflow Depth = 1.93" for SC-002yr event
Inflow = 2.49 cfs @ 9.98 hrs, Volume= 16,944 cf
Outflow = 0.52 cfs @ 10.76 hrs, Volume= 17,265 cf, Atten= 79%, Lag= 46.8 min
Discarded = 0.19 cfs @ 10.76 hrs, Volume= 14,875 cf
Primary = 0.33 cfs @ 10.76 hrs, Volume= 2,390 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 43.30' @ 10.76 hrs Surf.Area= 7,495 sf Storage= 6,167 cf

Plug-Flow detention time= 374.2 min calculated for 16,941 cf (100% of inflow)
Center-of-Mass det. time= 396.7 min (1,108.2 - 711.5)

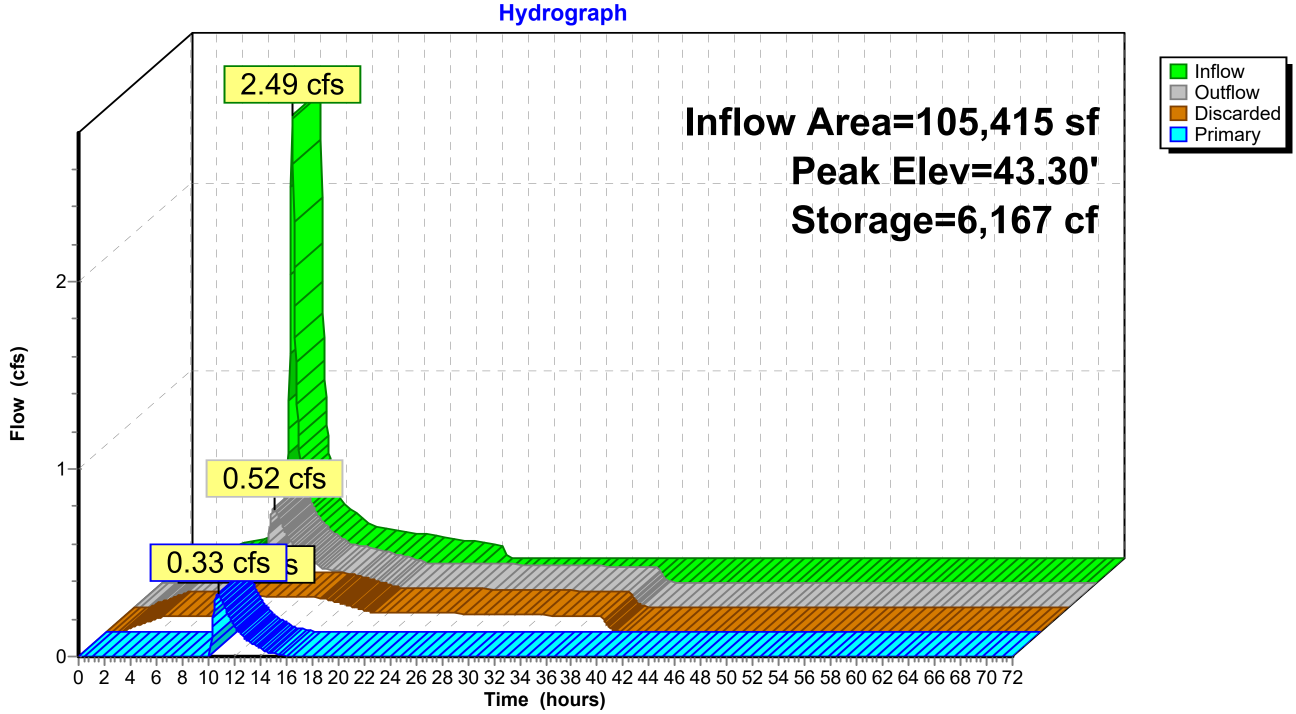
Volume	Invert	Avail.Storage	Storage Description
#1	38.50'	5,040 cf	**60.00'W x 60.00'L x 3.50'H Prismatoid** 12,600 cf Overall x 40.0% Voids
#2	43.00'	15,696 cf	**60.00'W x 60.00'L x 3.00'H Prismatoid Z=4.0**
		20,736 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	38.50'	**1.000 in/hr Exfiltration over Wetted area**
#2	Primary	41.00'	**18.0" Round Culvert** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 41.00' / 40.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Device 2	43.00'	**10.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	45.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.19 cfs @ 10.76 hrs HW=43.30' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.19 cfs)

Primary OutFlow Max=0.33 cfs @ 10.76 hrs HW=43.30' (Free Discharge)
└─**2=Culvert** (Passes 0.33 cfs of 10.93 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 0.33 cfs @ 1.87 fps)
  └─**4=Orifice/Grate** (Controls 0.00 cfs)

Pond 3P: Option 1 - Surface Basin



Summary for Pond 5P: Option 2 - Underground Chambers

Inflow Area = 105,415 sf, 65.00% Impervious, Inflow Depth = 1.93" for SC-002yr event
Inflow = 2.49 cfs @ 9.98 hrs, Volume= 16,944 cf
Outflow = 0.51 cfs @ 10.78 hrs, Volume= 16,944 cf, Atten= 79%, Lag= 48.1 min
Discarded = 0.08 cfs @ 10.78 hrs, Volume= 12,023 cf
Primary = 0.43 cfs @ 10.78 hrs, Volume= 4,922 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 40.28' @ 10.78 hrs Surf.Area= 2,774 sf Storage= 6,804 cf

Plug-Flow detention time= 574.5 min calculated for 16,933 cf (100% of inflow)
Center-of-Mass det. time= 575.1 min (1,286.6 - 711.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	36.75'	4,855 cf	**46.67'W x 59.44'L x 7.00'H Field A** 19,418 cf Overall - 7,279 cf Embedded = 12,139 cf x 40.0% Voids
#2A	37.75'	7,279 cf	**ADS_StormTech MC-4500 +Cap** x 65 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 5 Rows of 13 Chambers Cap Storage= +35.7 cf x 2 x 5 rows = 357.0 cf
		12,134 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	36.75'	**1.000 in/hr Exfiltration over Wetted area**
#2	Primary	38.70'	**18.0" Round Culvert** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 38.70' / 37.70' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Device 2	39.90'	**8.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	41.80'	**6.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.08 cfs @ 10.78 hrs HW=40.28' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=0.43 cfs @ 10.78 hrs HW=40.28' (Free Discharge)
└─**2=Culvert** (Passes 0.43 cfs of 8.78 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 0.43 cfs @ 2.10 fps)
  └─**4=Orifice/Grate** (Controls 0.00 cfs)

Pond 5P: Option 2 - Underground Chambers - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-4500 +Cap (ADS StormTech® MC-4500 with cap volume)
Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf
Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap
Cap Storage= +35.7 cf x 2 x 5 rows = 357.0 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

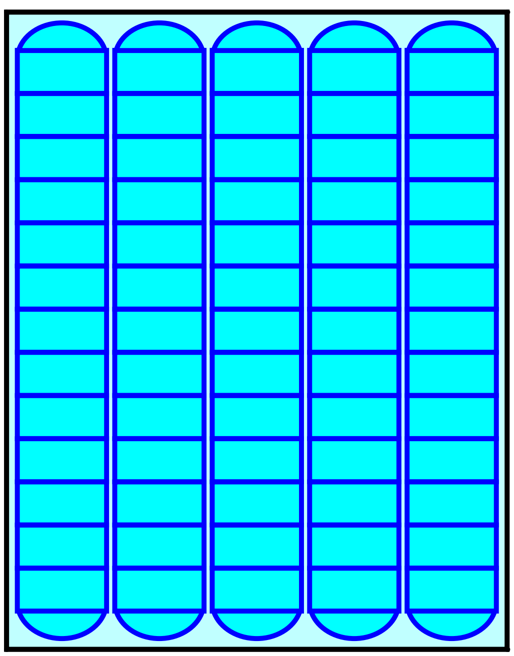
13 Chambers/Row x 4.02' Long +2.56' Cap Length x 2 = 57.44' Row Length +12.0" End Stone x 2 = 59.44' Base Length
5 Rows x 100.0" Wide + 9.0" Spacing x 4 + 12.0" Side Stone x 2 = 46.67' Base Width
12.0" Base + 60.0" Chamber Height + 12.0" Cover = 7.00' Field Height

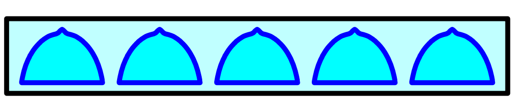
65 Chambers x 106.5 cf + 35.7 cf Cap Volume x 2 x 5 Rows = 7,278.9 cf Chamber Storage

19,417.6 cf Field - 7,278.9 cf Chambers = 12,138.7 cf Stone x 40.0% Voids = 4,855.5 cf Stone Storage

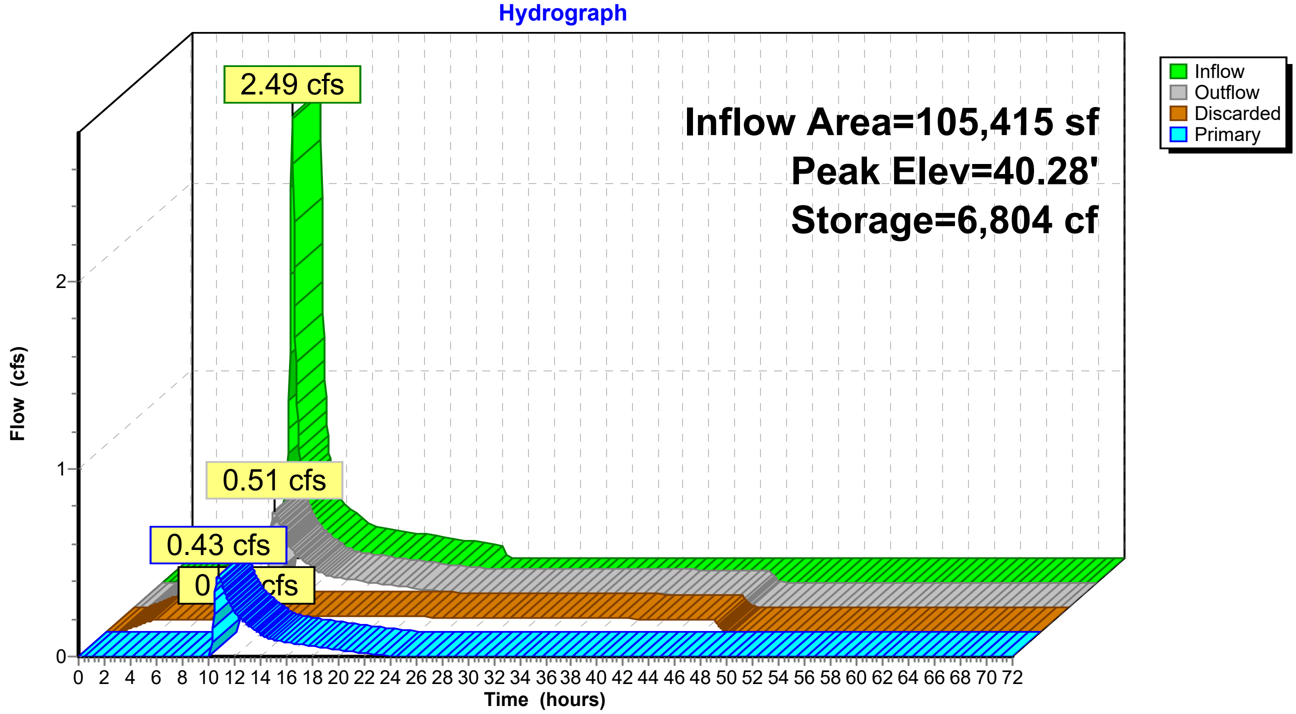
Chamber Storage + Stone Storage = 12,134.4 cf = 0.279 af
Overall Storage Efficiency = 62.5%
Overall System Size = 59.44' x 46.67' x 7.00'

65 Chambers
719.2 cy Field
449.6 cy Stone





Pond 5P: Option 2 - Underground Chambers



Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Pre-Project Site Runoff Area=2.420 ac 38.00% Impervious Runoff Depth=1.73"
Tc=12.0 min CN=38/98 Runoff=2.12 cfs 15,160 cf

Subcatchment 2S: Post-Project Site Runoff Area=2.420 ac 65.00% Impervious Runoff Depth=2.88"
Tc=12.0 min CN=38/98 Runoff=3.63 cfs 25,290 cf

Subcatchment 4S: Post-Project Site Runoff Area=2.420 ac 65.00% Impervious Runoff Depth=2.88"
Tc=12.0 min CN=38/98 Runoff=3.63 cfs 25,290 cf

Pond 3P: Option 1 - Surface Basin Peak Elev=43.71' Storage=7,866 cf Inflow=3.63 cfs 25,290 cf
Discarded=0.20 cfs 16,775 cf Primary=1.43 cfs 8,564 cf Outflow=1.63 cfs 25,339 cf

Pond 5P: Option 2 - Underground Chambers Peak Elev=41.07' Storage=8,388 cf Inflow=3.63 cfs 25,290 cf
Discarded=0.09 cfs 12,449 cf Primary=1.53 cfs 12,842 cf Outflow=1.62 cfs 25,290 cf

Total Runoff Area = 316,246 sf Runoff Volume = 65,740 cf Average Runoff Depth = 2.49"
44.00% Pervious = 139,148 sf 56.00% Impervious = 177,098 sf

Summary for Subcatchment 1S: Pre-Project Site

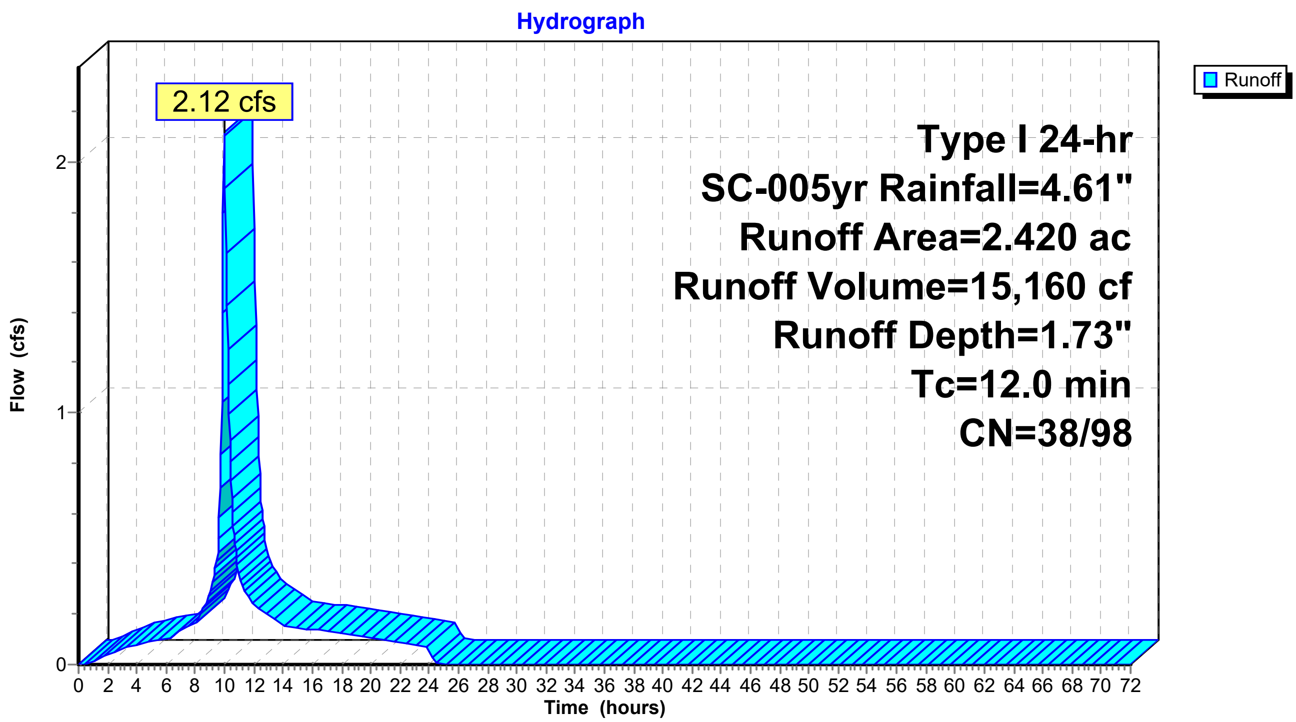
Runoff = 2.12 cfs @ 9.98 hrs, Volume= 15,160 cf, Depth= 1.73"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type I 24-hr SC-005yr Rainfall=4.61"

Area (ac)	CN	Description
2.420	61	1/4 acre lots, 38% imp, HSG A
1.500	38	62.00% Pervious Area
0.920	98	38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					**Direct Entry,**

Subcatchment 1S: Pre-Project Site



Summary for Subcatchment 2S: Post-Project Site

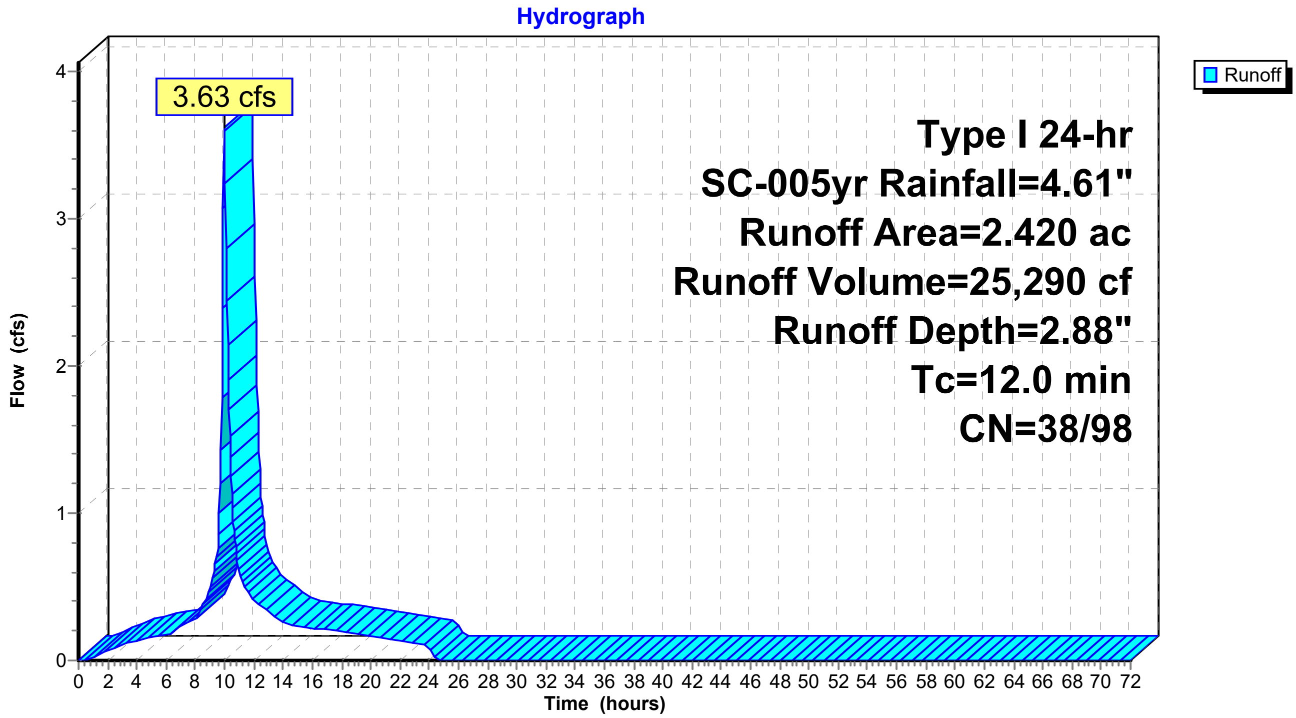
Runoff = 3.63 cfs @ 9.98 hrs, Volume= 25,290 cf, Depth= 2.88"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type I 24-hr SC-005yr Rainfall=4.61"

Area (ac)	CN	Description
2.420	77	1/8 acre lots, 65% imp, HSG A
0.847	38	35.00% Pervious Area
1.573	98	65.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					**Direct Entry,**

Subcatchment 2S: Post-Project Site



Summary for Subcatchment 4S: Post-Project Site

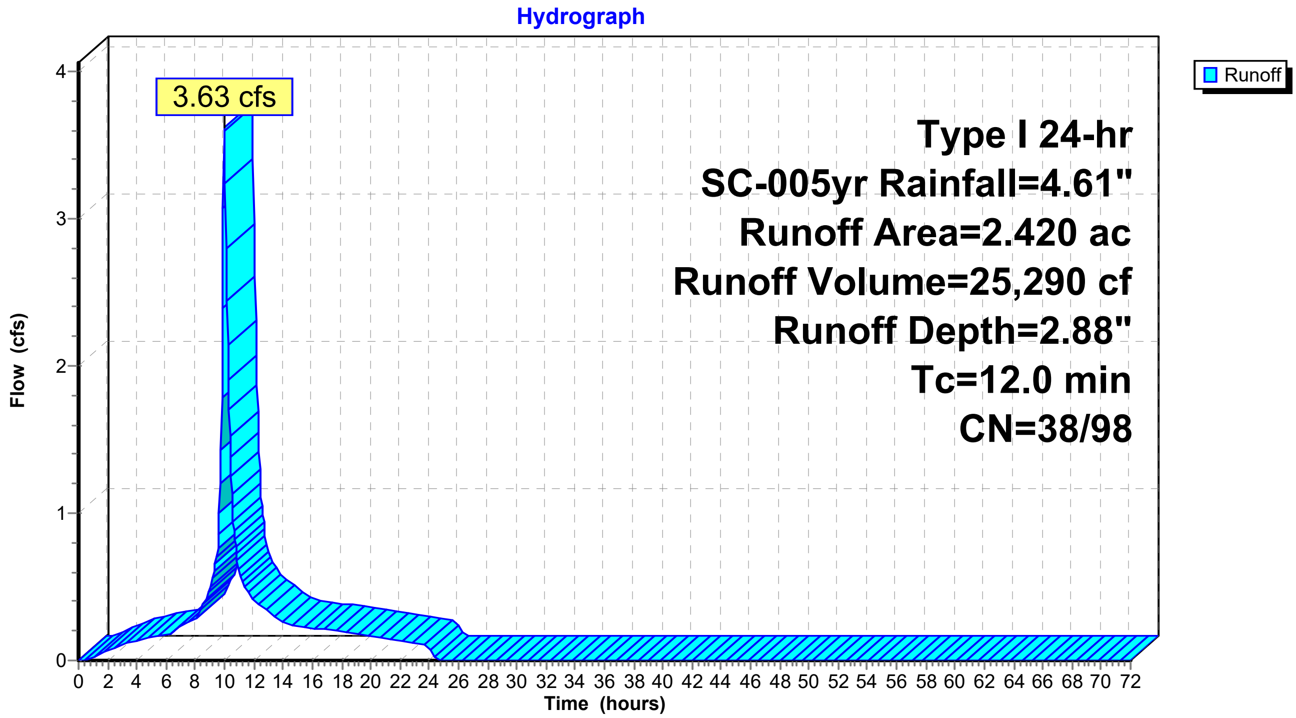
Runoff = 3.63 cfs @ 9.98 hrs, Volume= 25,290 cf, Depth= 2.88"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type I 24-hr SC-005yr Rainfall=4.61"

Area (ac)	CN	Description
2.420	77	1/8 acre lots, 65% imp, HSG A
0.847	38	35.00% Pervious Area
1.573	98	65.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					**Direct Entry,**

Subcatchment 4S: Post-Project Site



Summary for Pond 3P: Option 1 - Surface Basin

Inflow Area =	105,415 sf,	65.00% Impervious,	Inflow Depth = 2.88"	for SC-005yr event
Inflow =	3.63 cfs @	9.98 hrs, Volume=	25,290 cf	
Outflow =	1.63 cfs @	10.32 hrs, Volume=	25,339 cf,	Atten= 55%, Lag= 20.4 min
Discarded =	0.20 cfs @	10.32 hrs, Volume=	16,775 cf	
Primary =	1.43 cfs @	10.32 hrs, Volume=	8,564 cf	

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 43.71' @ 10.32 hrs Surf.Area= 7,919 sf Storage= 7,866 cf

Plug-Flow detention time= 296.8 min calculated for 25,286 cf (100% of inflow)
Center-of-Mass det. time= 299.6 min (1,008.5 - 709.0)

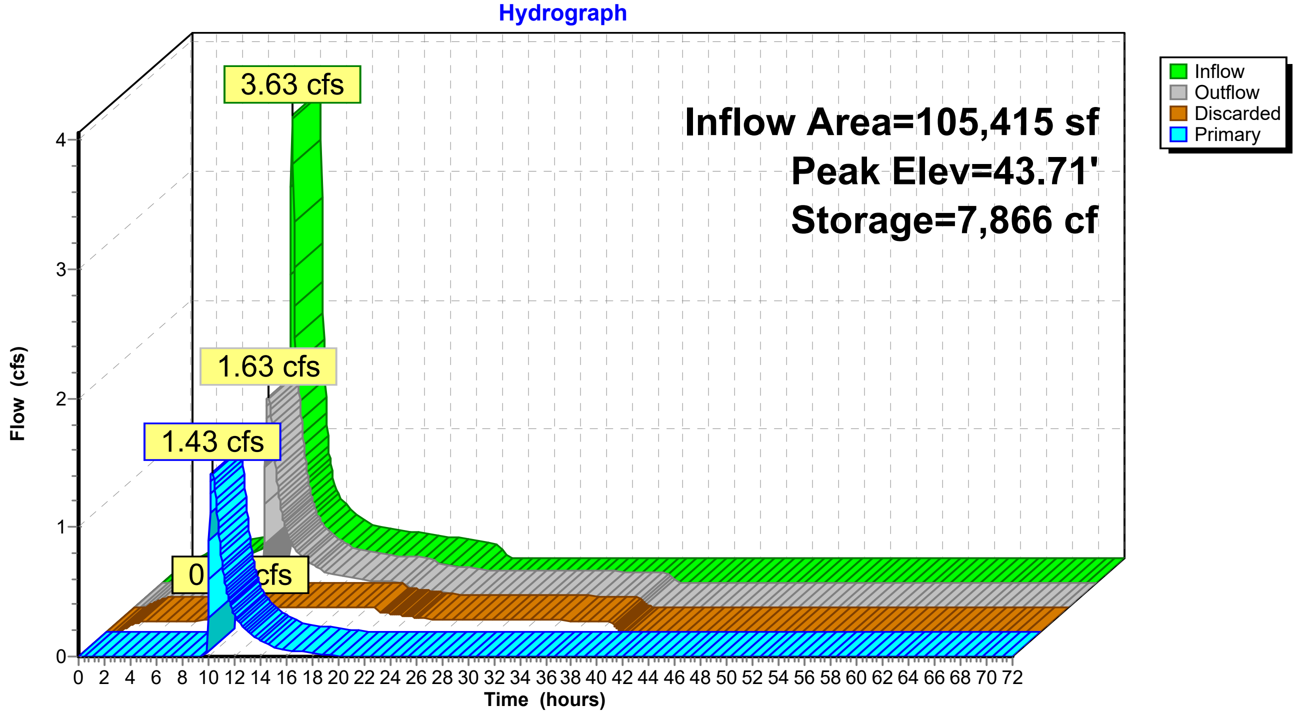
Volume	Invert	Avail.Storage	Storage Description
#1	38.50'	5,040 cf	**60.00'W x 60.00'L x 3.50'H Prismatoid** 12,600 cf Overall x 40.0% Voids
#2	43.00'	15,696 cf	**60.00'W x 60.00'L x 3.00'H Prismatoid Z=4.0**
		20,736 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	38.50'	**1.000 in/hr Exfiltration over Wetted area**
#2	Primary	41.00'	**18.0" Round Culvert** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 41.00' / 40.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Device 2	43.00'	**10.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	45.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.20 cfs @ 10.32 hrs HW=43.71' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.20 cfs)

Primary OutFlow Max=1.43 cfs @ 10.32 hrs HW=43.71' (Free Discharge)
└─**2=Culvert** (Passes 1.43 cfs of 12.12 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 1.43 cfs @ 2.88 fps)
  └─**4=Orifice/Grate** (Controls 0.00 cfs)

Pond 3P: Option 1 - Surface Basin



Summary for Pond 5P: Option 2 - Underground Chambers

Inflow Area = 105,415 sf, 65.00% Impervious, Inflow Depth = 2.88" for SC-005yr event
Inflow = 3.63 cfs @ 9.98 hrs, Volume= 25,290 cf
Outflow = 1.62 cfs @ 10.32 hrs, Volume= 25,290 cf, Atten= 55%, Lag= 20.6 min
Discarded = 0.09 cfs @ 10.32 hrs, Volume= 12,449 cf
Primary = 1.53 cfs @ 10.32 hrs, Volume= 12,842 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 41.07' @ 10.32 hrs Surf.Area= 2,774 sf Storage= 8,388 cf

Plug-Flow detention time= 415.7 min calculated for 25,273 cf (100% of inflow)
Center-of-Mass det. time= 416.5 min (1,125.4 - 709.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	36.75'	4,855 cf	**46.67'W x 59.44'L x 7.00'H Field A** 19,418 cf Overall - 7,279 cf Embedded = 12,139 cf x 40.0% Voids
#2A	37.75'	7,279 cf	**ADS_StormTech MC-4500 +Cap** x 65 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 5 Rows of 13 Chambers Cap Storage= +35.7 cf x 2 x 5 rows = 357.0 cf
		12,134 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	36.75'	**1.000 in/hr Exfiltration over Wetted area**
#2	Primary	38.70'	**18.0" Round Culvert** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 38.70' / 37.70' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Device 2	39.90'	**8.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	41.80'	**6.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.09 cfs @ 10.32 hrs HW=41.06' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=1.53 cfs @ 10.32 hrs HW=41.06' (Free Discharge)
└─**2=Culvert** (Passes 1.53 cfs of 11.12 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 1.53 cfs @ 4.39 fps)
  └─**4=Orifice/Grate** (Controls 0.00 cfs)

Pond 5P: Option 2 - Underground Chambers - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-4500 +Cap (ADS StormTech® MC-4500 with cap volume)
Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf
Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap
Cap Storage= +35.7 cf x 2 x 5 rows = 357.0 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

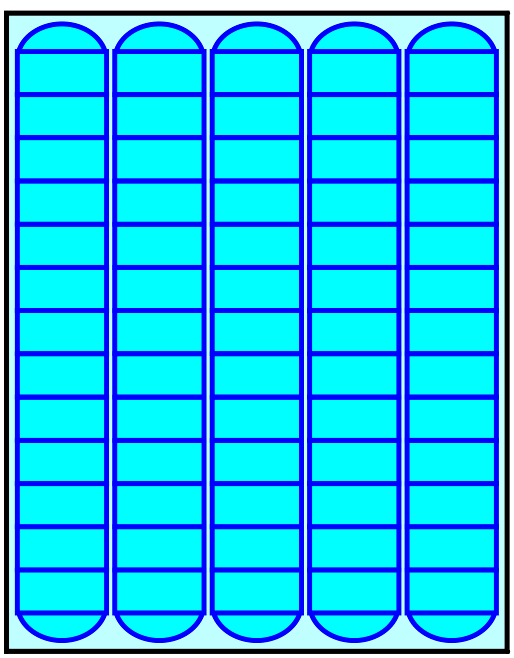
13 Chambers/Row x 4.02' Long +2.56' Cap Length x 2 = 57.44' Row Length +12.0" End Stone x 2 = 59.44' Base Length
5 Rows x 100.0" Wide + 9.0" Spacing x 4 + 12.0" Side Stone x 2 = 46.67' Base Width
12.0" Base + 60.0" Chamber Height + 12.0" Cover = 7.00' Field Height

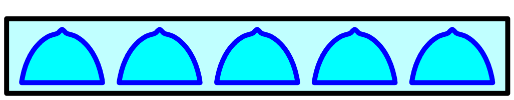
65 Chambers x 106.5 cf + 35.7 cf Cap Volume x 2 x 5 Rows = 7,278.9 cf Chamber Storage

19,417.6 cf Field - 7,278.9 cf Chambers = 12,138.7 cf Stone x 40.0% Voids = 4,855.5 cf Stone Storage

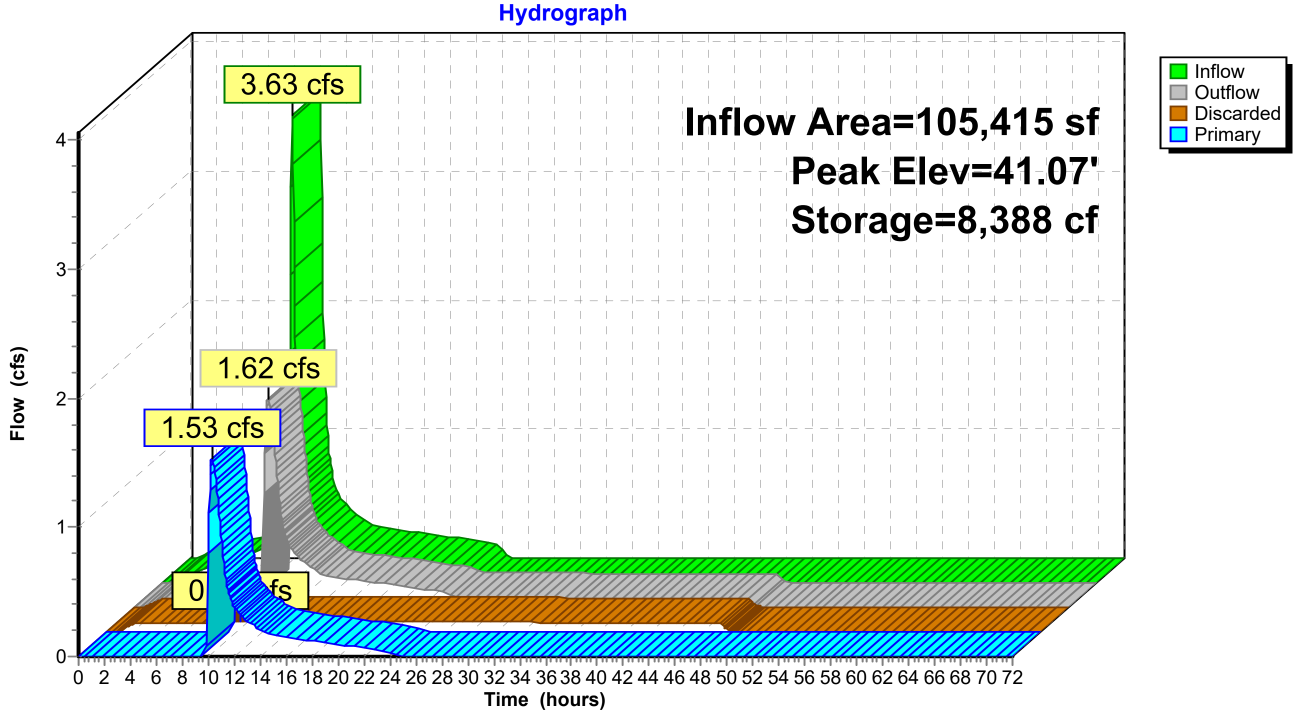
Chamber Storage + Stone Storage = 12,134.4 cf = 0.279 af
Overall Storage Efficiency = 62.5%
Overall System Size = 59.44' x 46.67' x 7.00'

65 Chambers
719.2 cy Field
449.6 cy Stone





Pond 5P: Option 2 - Underground Chambers



Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Pre-Project Site Runoff Area=2.420 ac 38.00% Impervious Runoff Depth=2.19"
Tc=12.0 min CN=38/98 Runoff=2.56 cfs 19,265 cf

Subcatchment 2S: Post-Project Site Runoff Area=2.420 ac 65.00% Impervious Runoff Depth=3.55"
Tc=12.0 min CN=38/98 Runoff=4.38 cfs 31,198 cf

Subcatchment 4S: Post-Project Site Runoff Area=2.420 ac 65.00% Impervious Runoff Depth=3.55"
Tc=12.0 min CN=38/98 Runoff=4.38 cfs 31,198 cf

Pond 3P: Option 1 - Surface Basin Peak Elev=43.98' Storage=9,030 cf Inflow=4.38 cfs 31,198 cf
Discarded=0.21 cfs 17,524 cf Primary=1.96 cfs 13,587 cf Outflow=2.17 cfs 31,111 cf

Pond 5P: Option 2 - Underground Chambers Peak Elev=41.75' Storage=9,633 cf Inflow=4.38 cfs 31,198 cf
Discarded=0.09 cfs 12,625 cf Primary=2.07 cfs 18,572 cf Outflow=2.16 cfs 31,197 cf

Total Runoff Area = 316,246 sf Runoff Volume = 81,661 cf Average Runoff Depth = 3.10"
44.00% Pervious = 139,148 sf 56.00% Impervious = 177,098 sf

Summary for Subcatchment 1S: Pre-Project Site

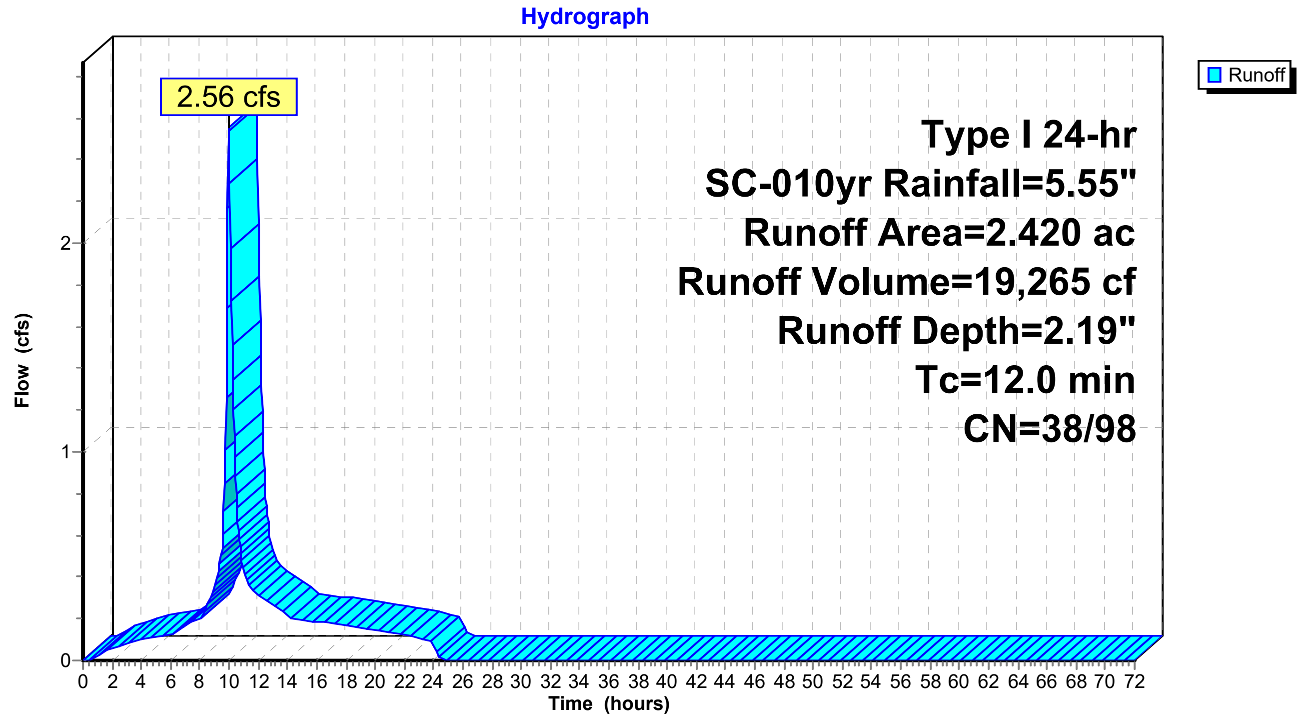
Runoff = 2.56 cfs @ 9.98 hrs, Volume= 19,265 cf, Depth= 2.19"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type I 24-hr SC-010yr Rainfall=5.55"

Area (ac)	CN	Description
2.420	61	1/4 acre lots, 38% imp, HSG A
1.500	38	62.00% Pervious Area
0.920	98	38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					**Direct Entry,**

Subcatchment 1S: Pre-Project Site



Summary for Subcatchment 2S: Post-Project Site

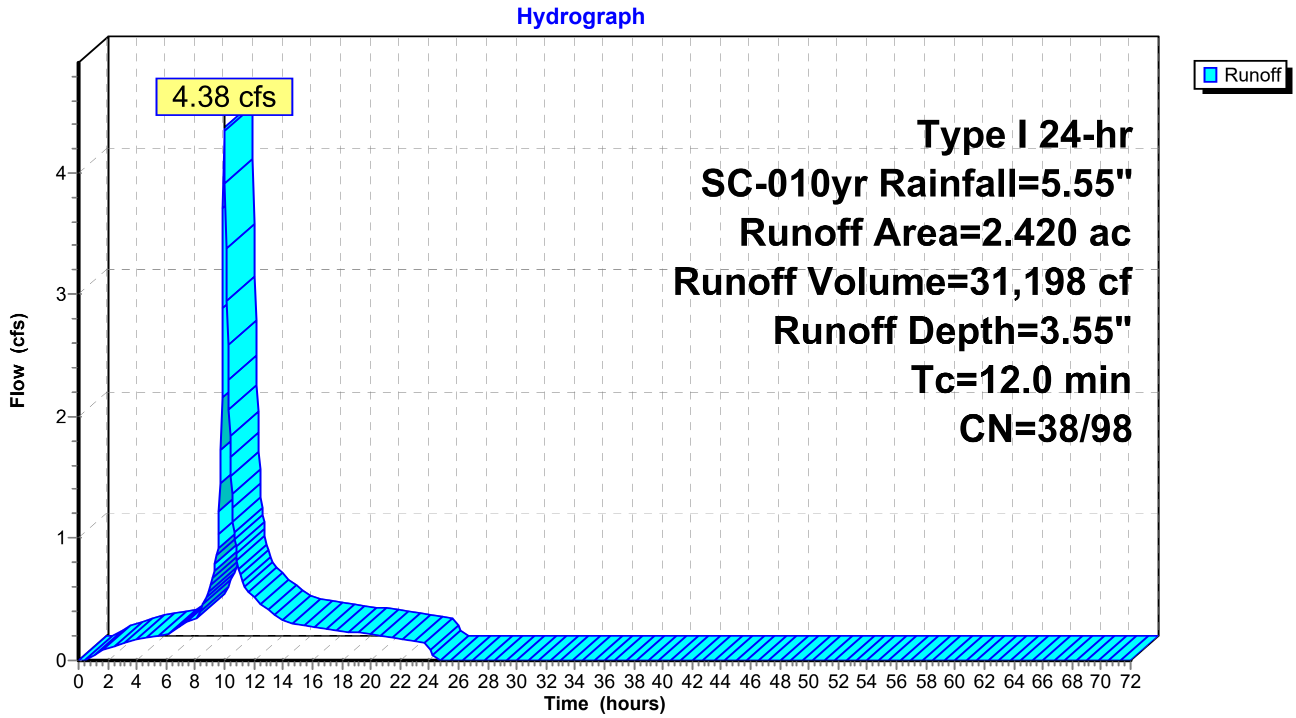
Runoff = 4.38 cfs @ 9.98 hrs, Volume= 31,198 cf, Depth= 3.55"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type I 24-hr SC-010yr Rainfall=5.55"

Area (ac)	CN	Description
2.420	77	1/8 acre lots, 65% imp, HSG A
0.847	38	35.00% Pervious Area
1.573	98	65.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					**Direct Entry,**

Subcatchment 2S: Post-Project Site



Summary for Subcatchment 4S: Post-Project Site

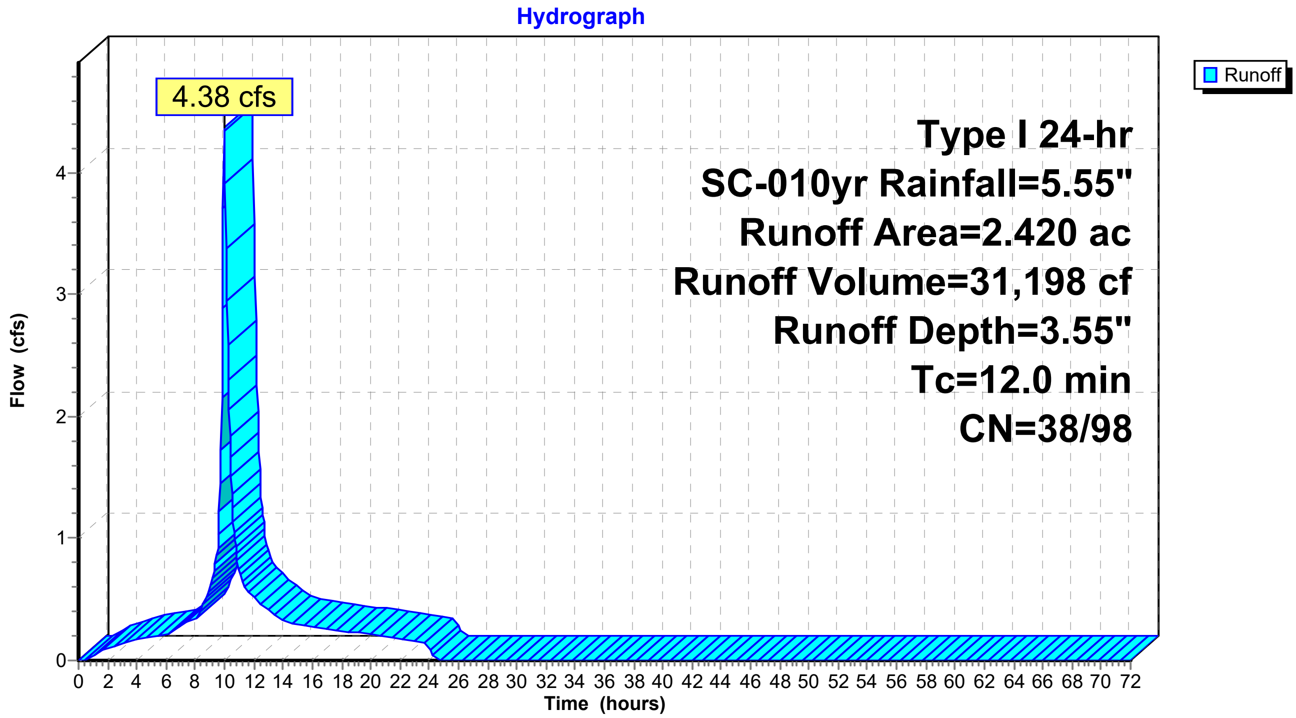
Runoff = 4.38 cfs @ 9.98 hrs, Volume= 31,198 cf, Depth= 3.55"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type I 24-hr SC-010yr Rainfall=5.55"

Area (ac)	CN	Description
2.420	77	1/8 acre lots, 65% imp, HSG A
0.847	38	35.00% Pervious Area
1.573	98	65.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					**Direct Entry,**

Subcatchment 4S: Post-Project Site



Summary for Pond 3P: Option 1 - Surface Basin

Inflow Area = 105,415 sf, 65.00% Impervious, Inflow Depth = 3.55" for SC-010yr event
Inflow = 4.38 cfs @ 9.98 hrs, Volume= 31,198 cf
Outflow = 2.17 cfs @ 10.28 hrs, Volume= 31,111 cf, Atten= 50%, Lag= 17.7 min
Discarded = 0.21 cfs @ 10.28 hrs, Volume= 17,524 cf
Primary = 1.96 cfs @ 10.28 hrs, Volume= 13,587 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 43.98' @ 10.28 hrs Surf.Area= 8,198 sf Storage= 9,030 cf

Plug-Flow detention time= 259.1 min calculated for 31,111 cf (100% of inflow)
Center-of-Mass det. time= 256.8 min (966.8 - 710.0)

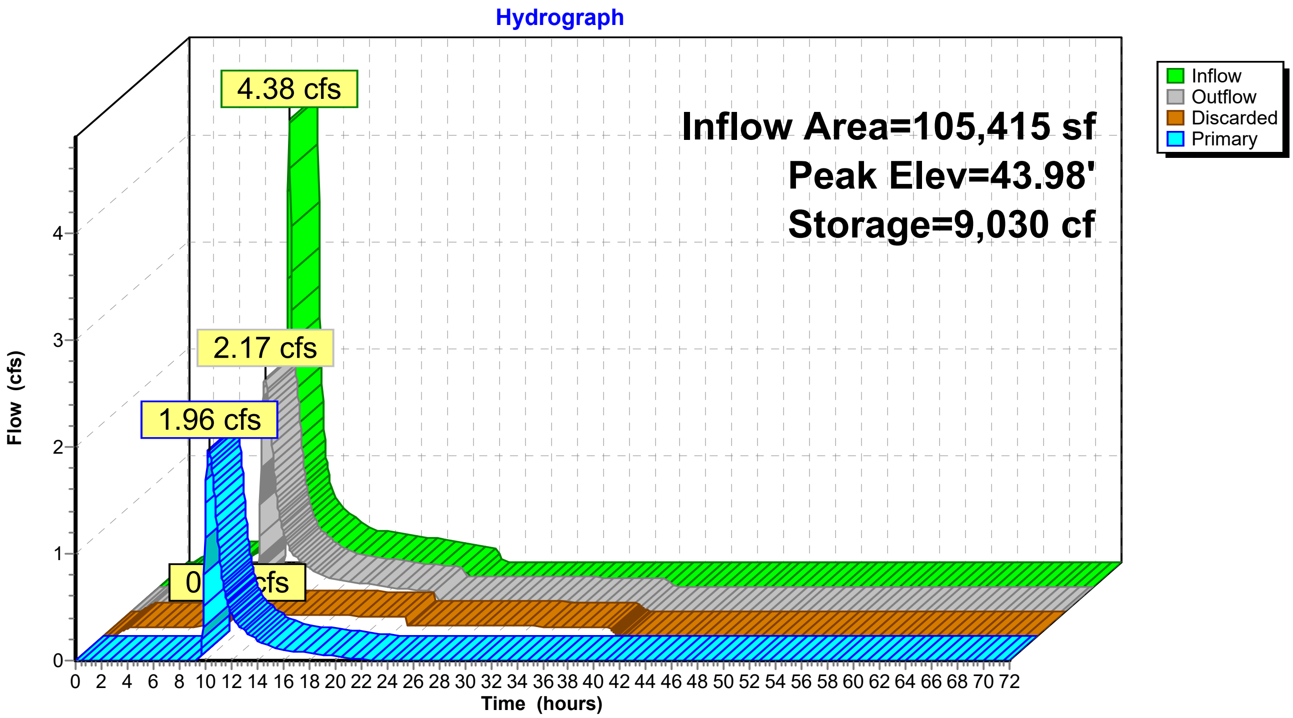
Volume	Invert	Avail.Storage	Storage Description
#1	38.50'	5,040 cf	**60.00'W x 60.00'L x 3.50'H Prismatoid** 12,600 cf Overall x 40.0% Voids
#2	43.00'	15,696 cf	**60.00'W x 60.00'L x 3.00'H Prismatoid Z=4.0**
		20,736 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	38.50'	**1.000 in/hr Exfiltration over Wetted area**
#2	Primary	41.00'	**18.0" Round Culvert** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 41.00' / 40.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Device 2	43.00'	**10.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	45.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.21 cfs @ 10.28 hrs HW=43.97' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.21 cfs)

Primary OutFlow Max=1.96 cfs @ 10.28 hrs HW=43.97' (Free Discharge)
└─**2=Culvert** (Passes 1.96 cfs of 12.82 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 1.96 cfs @ 3.60 fps)
  └─**4=Orifice/Grate** (Controls 0.00 cfs)

Pond 3P: Option 1 - Surface Basin



Summary for Pond 5P: Option 2 - Underground Chambers

Inflow Area = 105,415 sf, 65.00% Impervious, Inflow Depth = 3.55" for SC-010yr event
Inflow = 4.38 cfs @ 9.98 hrs, Volume= 31,198 cf
Outflow = 2.16 cfs @ 10.28 hrs, Volume= 31,197 cf, Atten= 51%, Lag= 17.9 min
Discarded = 0.09 cfs @ 10.28 hrs, Volume= 12,625 cf
Primary = 2.07 cfs @ 10.28 hrs, Volume= 18,572 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 41.75' @ 10.28 hrs Surf.Area= 2,774 sf Storage= 9,633 cf

Plug-Flow detention time= 353.5 min calculated for 31,197 cf (100% of inflow)
Center-of-Mass det. time= 353.3 min (1,063.3 - 710.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	36.75'	4,855 cf	**46.67'W x 59.44'L x 7.00'H Field A** 19,418 cf Overall - 7,279 cf Embedded = 12,139 cf x 40.0% Voids
#2A	37.75'	7,279 cf	**ADS_StormTech MC-4500 +Cap** x 65 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 5 Rows of 13 Chambers Cap Storage= +35.7 cf x 2 x 5 rows = 357.0 cf
		12,134 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	36.75'	**1.000 in/hr Exfiltration over Wetted area**
#2	Primary	38.70'	**18.0" Round Culvert** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 38.70' / 37.70' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Device 2	39.90'	**8.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	41.80'	**6.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.09 cfs @ 10.28 hrs HW=41.75' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=2.07 cfs @ 10.28 hrs HW=41.75' (Free Discharge)
└─**2=Culvert** (Passes 2.07 cfs of 13.00 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 2.07 cfs @ 5.92 fps)
  └─**4=Orifice/Grate** (Controls 0.00 cfs)

Pond 5P: Option 2 - Underground Chambers - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-4500 +Cap (ADS StormTech® MC-4500 with cap volume)
Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf
Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap
Cap Storage= +35.7 cf x 2 x 5 rows = 357.0 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

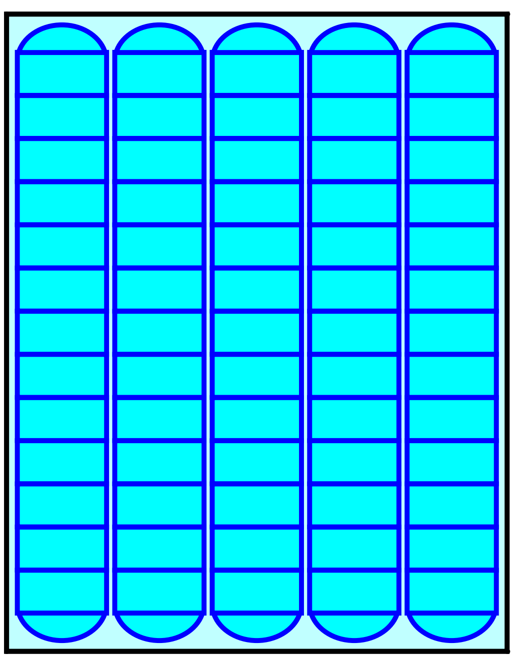
13 Chambers/Row x 4.02' Long +2.56' Cap Length x 2 = 57.44' Row Length +12.0" End Stone x 2 = 59.44' Base Length
5 Rows x 100.0" Wide + 9.0" Spacing x 4 + 12.0" Side Stone x 2 = 46.67' Base Width
12.0" Base + 60.0" Chamber Height + 12.0" Cover = 7.00' Field Height

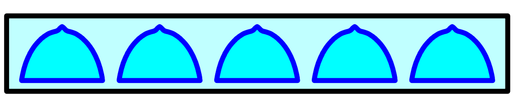
65 Chambers x 106.5 cf + 35.7 cf Cap Volume x 2 x 5 Rows = 7,278.9 cf Chamber Storage

19,417.6 cf Field - 7,278.9 cf Chambers = 12,138.7 cf Stone x 40.0% Voids = 4,855.5 cf Stone Storage

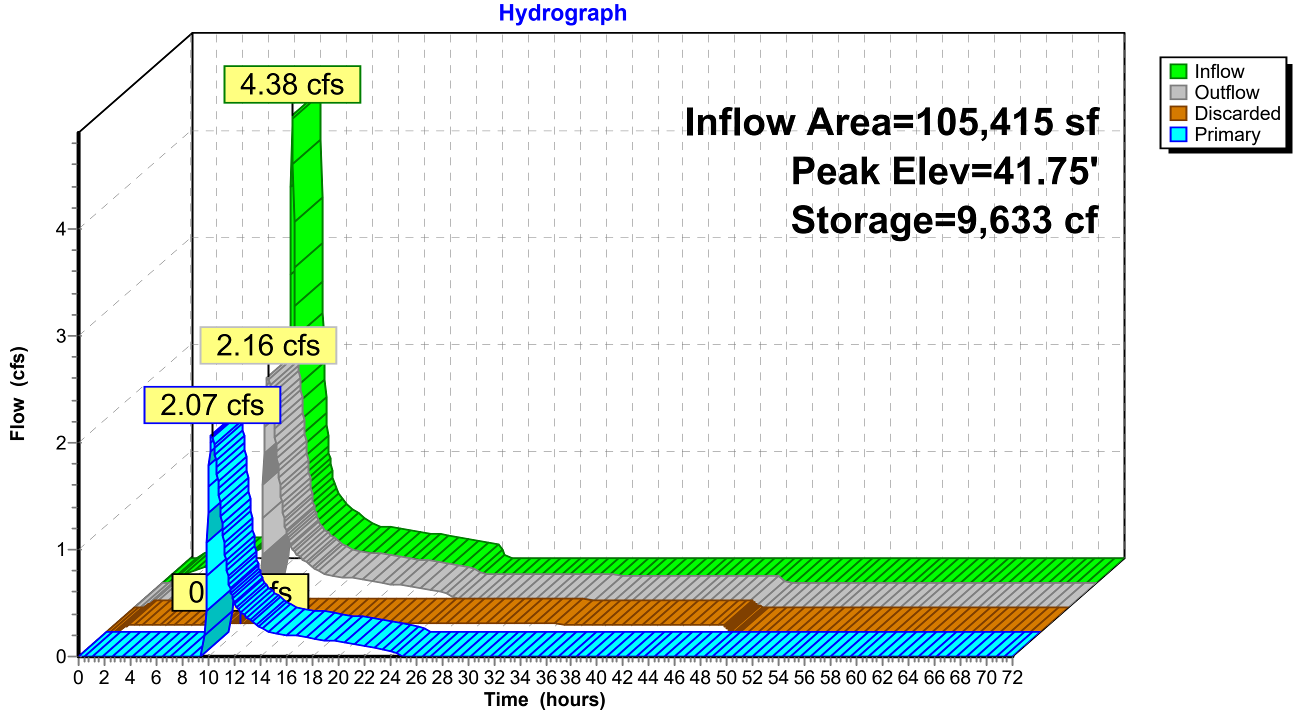
Chamber Storage + Stone Storage = 12,134.4 cf = 0.279 af
Overall Storage Efficiency = 62.5%
Overall System Size = 59.44' x 46.67' x 7.00'

65 Chambers
719.2 cy Field
449.6 cy Stone





Pond 5P: Option 2 - Underground Chambers



Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Pre-Project Site Runoff Area=2.420 ac 38.00% Impervious Runoff Depth=2.83"
Tc=12.0 min CN=38/98 Runoff=3.11 cfs 24,876 cf

Subcatchment 2S: Post-Project Site Runoff Area=2.420 ac 65.00% Impervious Runoff Depth=4.42"
Tc=12.0 min CN=38/98 Runoff=5.31 cfs 38,799 cf

Subcatchment 4S: Post-Project Site Runoff Area=2.420 ac 65.00% Impervious Runoff Depth=4.42"
Tc=12.0 min CN=38/98 Runoff=5.31 cfs 38,799 cf

Pond 3P: Option 1 - Surface Basin Peak Elev=44.25' Storage=10,335 cf Inflow=5.31 cfs 38,799 cf
Discarded=0.22 cfs 18,372 cf Primary=2.40 cfs 20,434 cf Outflow=2.61 cfs 38,806 cf

Pond 5P: Option 2 - Underground Peak Elev=42.39' Storage=10,595 cf Inflow=5.31 cfs 38,799 cf
Discarded=0.09 cfs 12,787 cf Primary=3.01 cfs 26,013 cf Outflow=3.10 cfs 38,799 cf

Total Runoff Area = 316,246 sf Runoff Volume = 102,473 cf Average Runoff Depth = 3.89"
44.00% Pervious = 139,148 sf 56.00% Impervious = 177,098 sf

Summary for Subcatchment 1S: Pre-Project Site

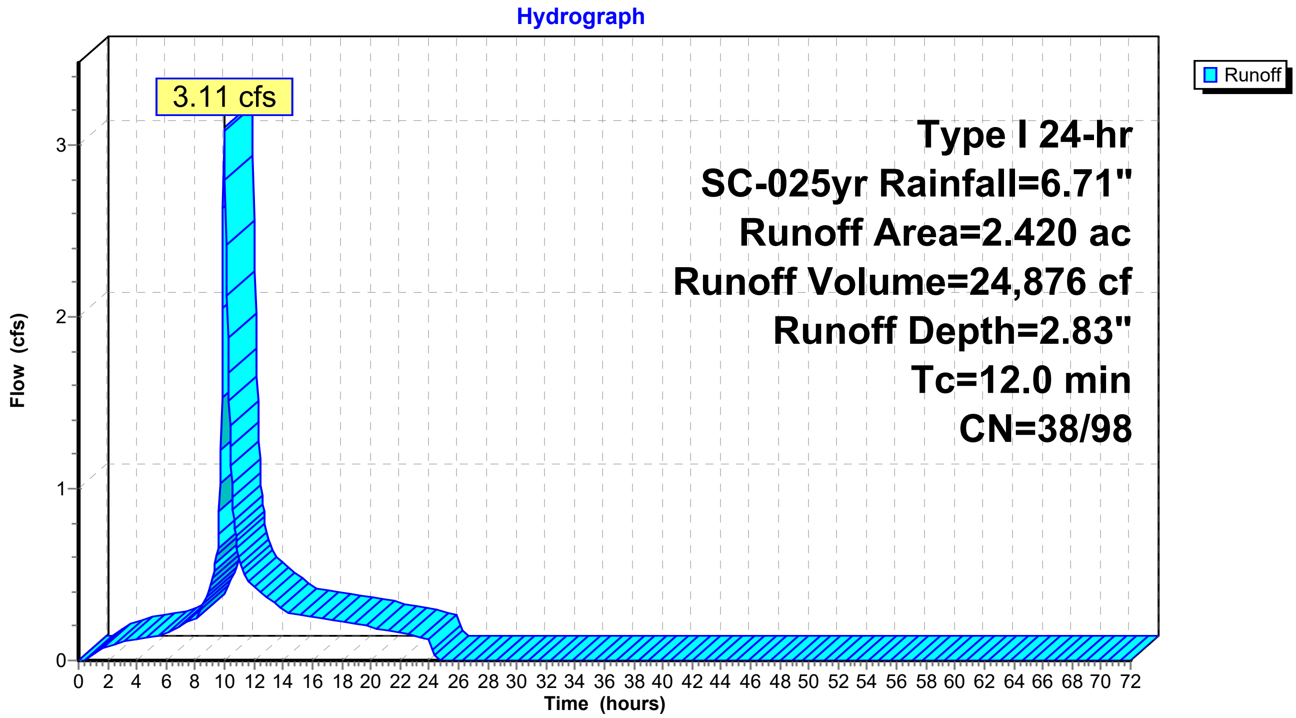
Runoff = 3.11 cfs @ 9.98 hrs, Volume= 24,876 cf, Depth= 2.83"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type I 24-hr SC-025yr Rainfall=6.71"

Area (ac)	CN	Description
2.420	61	1/4 acre lots, 38% imp, HSG A
1.500	38	62.00% Pervious Area
0.920	98	38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					**Direct Entry,**

Subcatchment 1S: Pre-Project Site



Summary for Subcatchment 2S: Post-Project Site

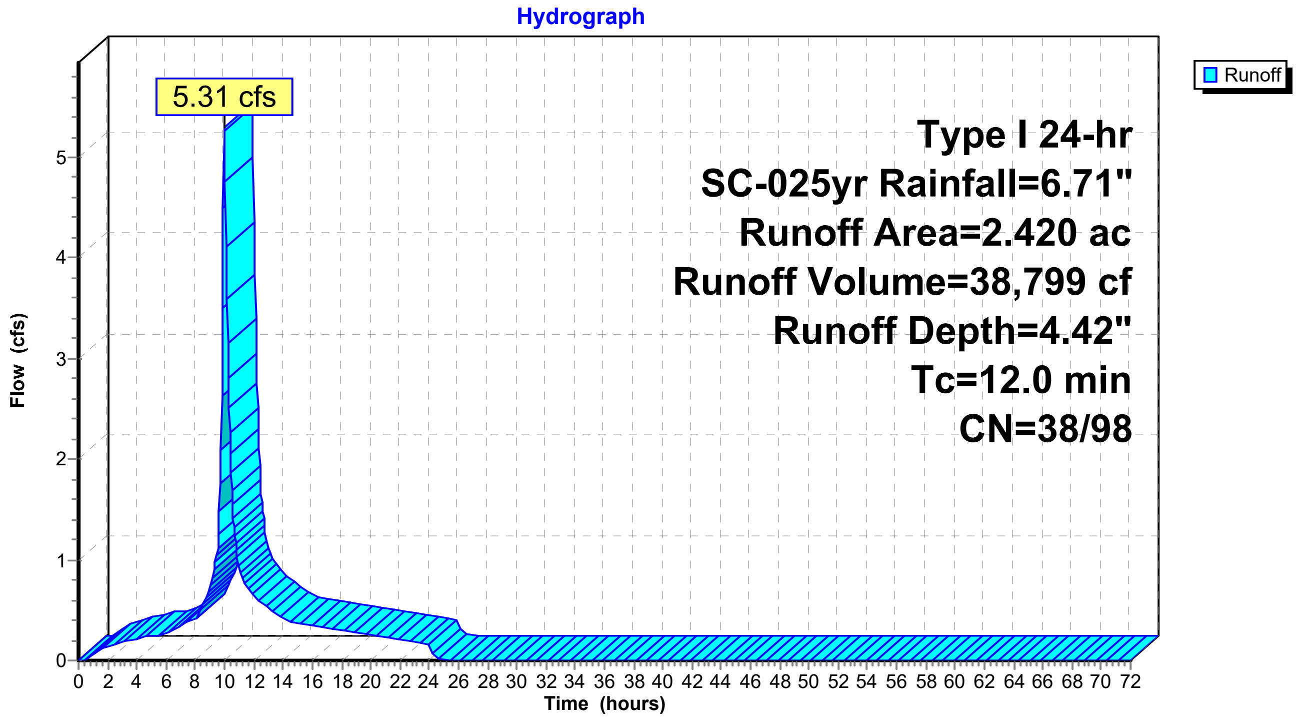
Runoff = 5.31 cfs @ 9.98 hrs, Volume= 38,799 cf, Depth= 4.42"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type I 24-hr SC-025yr Rainfall=6.71"

Area (ac)	CN	Description
2.420	77	1/8 acre lots, 65% imp, HSG A
0.847	38	35.00% Pervious Area
1.573	98	65.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					**Direct Entry,**

Subcatchment 2S: Post-Project Site



Summary for Subcatchment 4S: Post-Project Site

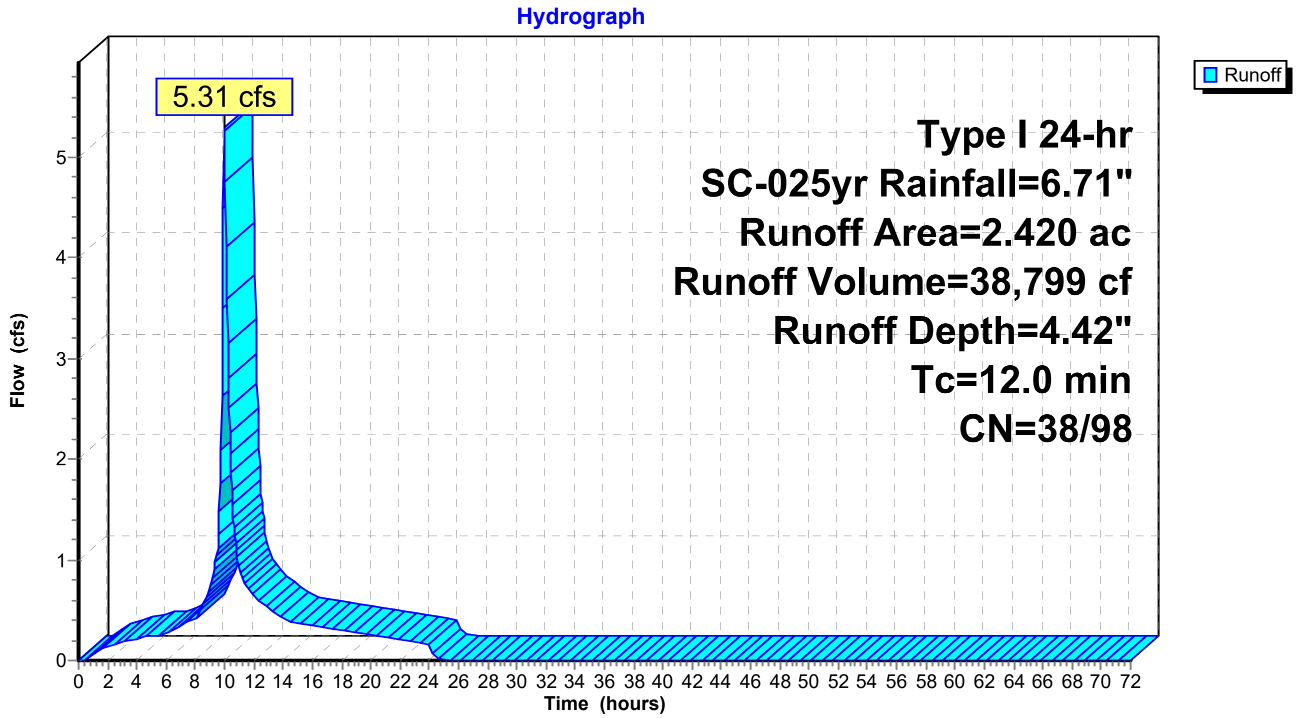
Runoff = 5.31 cfs @ 9.98 hrs, Volume= 38,799 cf, Depth= 4.42"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type I 24-hr SC-025yr Rainfall=6.71"

Area (ac)	CN	Description
2.420	77	1/8 acre lots, 65% imp, HSG A
0.847	38	35.00% Pervious Area
1.573	98	65.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					**Direct Entry,**

Subcatchment 4S: Post-Project Site



Summary for Pond 3P: Option 1 - Surface Basin

Inflow Area =	105,415 sf,	65.00% Impervious,	Inflow Depth = 4.42"	for SC-025yr event
Inflow =	5.31 cfs @	9.98 hrs, Volume=	38,799 cf	
Outflow =	2.61 cfs @	10.28 hrs, Volume=	38,806 cf,	Atten= 51%, Lag= 18.2 min
Discarded =	0.22 cfs @	10.28 hrs, Volume=	18,372 cf	
Primary =	2.40 cfs @	10.28 hrs, Volume=	20,434 cf	

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 44.25' @ 10.28 hrs Surf.Area= 8,501 sf Storage= 10,335 cf

Plug-Flow detention time= 223.4 min calculated for 38,779 cf (100% of inflow)
Center-of-Mass det. time= 224.0 min (935.3 - 711.2)

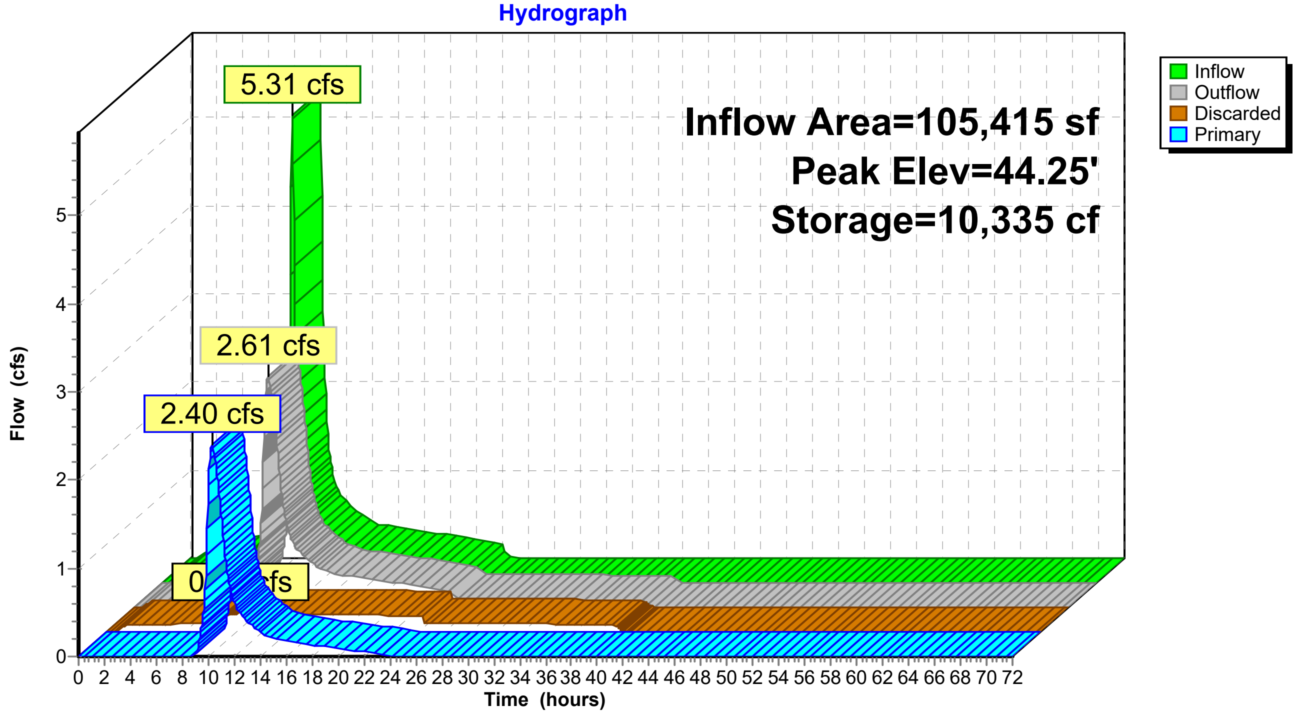
Volume	Invert	Avail.Storage	Storage Description
#1	38.50'	5,040 cf	**60.00'W x 60.00'L x 3.50'H Prismatoid** 12,600 cf Overall x 40.0% Voids
#2	43.00'	15,696 cf	**60.00'W x 60.00'L x 3.00'H Prismatoid Z=4.0**
		20,736 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	38.50'	**1.000 in/hr Exfiltration over Wetted area**
#2	Primary	41.00'	**18.0" Round Culvert** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 41.00' / 40.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Device 2	43.00'	**10.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	45.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.22 cfs @ 10.28 hrs HW=44.25' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.22 cfs)

Primary OutFlow Max=2.40 cfs @ 10.28 hrs HW=44.25' (Free Discharge)
└─**2=Culvert** (Passes 2.40 cfs of 13.51 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 2.40 cfs @ 4.39 fps)
  └─**4=Orifice/Grate** (Controls 0.00 cfs)

Pond 3P: Option 1 - Surface Basin



Summary for Pond 5P: Option 2 - Underground Chambers

Inflow Area = 105,415 sf, 65.00% Impervious, Inflow Depth = 4.42" for SC-025yr event
Inflow = 5.31 cfs @ 9.98 hrs, Volume= 38,799 cf
Outflow = 3.10 cfs @ 10.21 hrs, Volume= 38,799 cf, Atten= 41%, Lag= 13.8 min
Discarded = 0.09 cfs @ 10.21 hrs, Volume= 12,787 cf
Primary = 3.01 cfs @ 10.21 hrs, Volume= 26,013 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 42.39' @ 10.21 hrs Surf.Area= 2,774 sf Storage= 10,595 cf

Plug-Flow detention time= 297.3 min calculated for 38,772 cf (100% of inflow)
Center-of-Mass det. time= 298.1 min (1,009.3 - 711.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	36.75'	4,855 cf	**46.67'W x 59.44'L x 7.00'H Field A** 19,418 cf Overall - 7,279 cf Embedded = 12,139 cf x 40.0% Voids
#2A	37.75'	7,279 cf	**ADS_StormTech MC-4500 +Cap** x 65 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 5 Rows of 13 Chambers Cap Storage= +35.7 cf x 2 x 5 rows = 357.0 cf
		12,134 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	36.75'	**1.000 in/hr Exfiltration over Wetted area**
#2	Primary	38.70'	**18.0" Round Culvert** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 38.70' / 37.70' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Device 2	39.90'	**8.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	41.80'	**6.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.09 cfs @ 10.21 hrs HW=42.38' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=3.01 cfs @ 10.21 hrs HW=42.38' (Free Discharge)
└─**2=Culvert** (Passes 3.01 cfs of 14.53 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 2.46 cfs @ 7.06 fps)
  └─**4=Orifice/Grate** (Orifice Controls 0.54 cfs @ 2.77 fps)

Pond 5P: Option 2 - Underground Chambers - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-4500 +Cap (ADS StormTech® MC-4500 with cap volume)
Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf
Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap
Cap Storage= +35.7 cf x 2 x 5 rows = 357.0 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

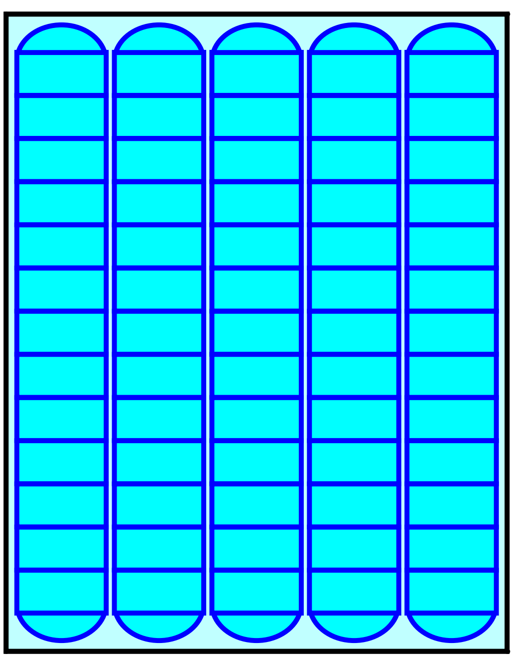
13 Chambers/Row x 4.02' Long +2.56' Cap Length x 2 = 57.44' Row Length +12.0" End Stone x 2 = 59.44' Base Length
5 Rows x 100.0" Wide + 9.0" Spacing x 4 + 12.0" Side Stone x 2 = 46.67' Base Width
12.0" Base + 60.0" Chamber Height + 12.0" Cover = 7.00' Field Height

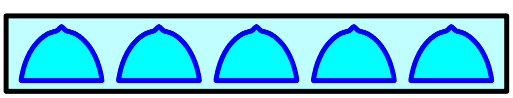
65 Chambers x 106.5 cf + 35.7 cf Cap Volume x 2 x 5 Rows = 7,278.9 cf Chamber Storage

19,417.6 cf Field - 7,278.9 cf Chambers = 12,138.7 cf Stone x 40.0% Voids = 4,855.5 cf Stone Storage

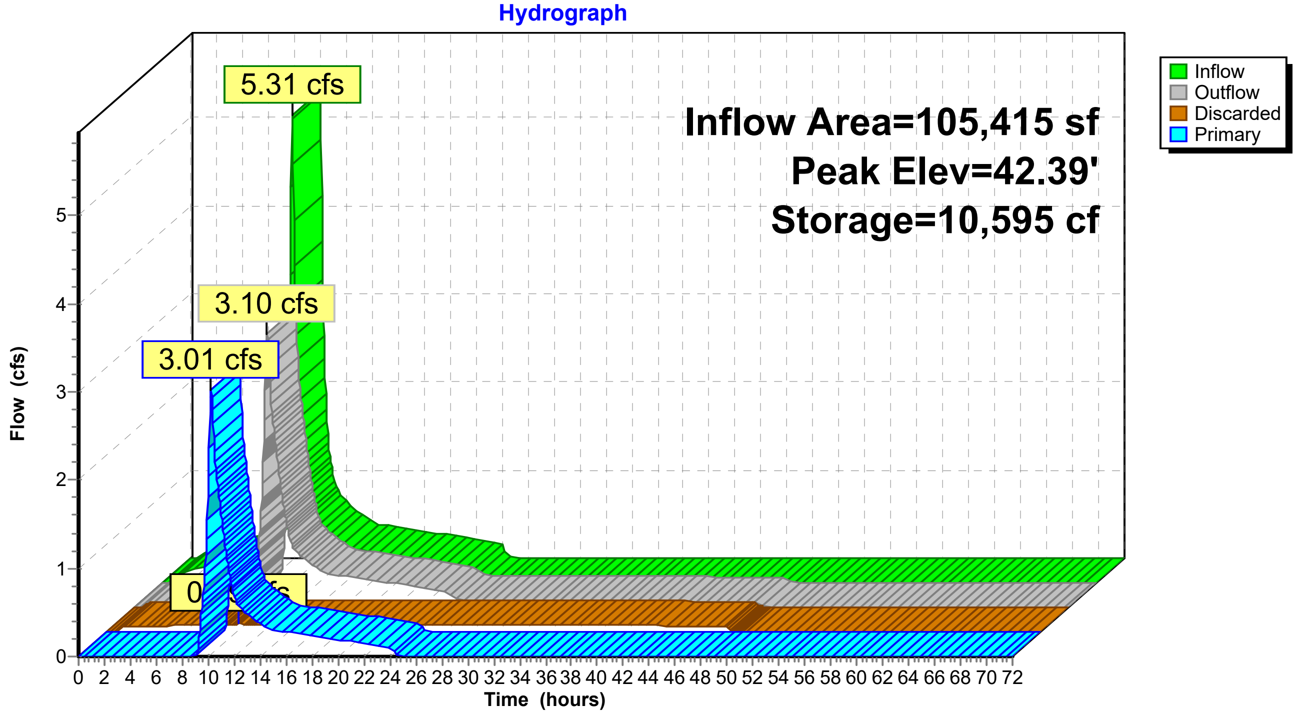
Chamber Storage + Stone Storage = 12,134.4 cf = 0.279 af
Overall Storage Efficiency = 62.5%
Overall System Size = 59.44' x 46.67' x 7.00'

65 Chambers
719.2 cy Field
449.6 cy Stone





Pond 5P: Option 2 - Underground Chambers



Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Pre-Project Site Runoff Area=2.420 ac 38.00% Impervious Runoff Depth=3.34"
Tc=12.0 min CN=38/98 Runoff=3.59 cfs 29,315 cf

Subcatchment 2S: Post-Project Site Runoff Area=2.420 ac 65.00% Impervious Runoff Depth=5.07"
Tc=12.0 min CN=38/98 Runoff=6.03 cfs 44,554 cf

Subcatchment 4S: Post-Project Site Runoff Area=2.420 ac 65.00% Impervious Runoff Depth=5.07"
Tc=12.0 min CN=38/98 Runoff=6.03 cfs 44,554 cf

Pond 3P: Option 1 - Surface Basin Peak Elev=44.44' Storage=11,266 cf Inflow=6.03 cfs 44,554 cf
Discarded=0.22 cfs 18,809 cf Primary=2.65 cfs 25,752 cf Outflow=2.87 cfs 44,561 cf

Pond 5P: Option 2 - Underground Peak Elev=42.86' Storage=11,143 cf Inflow=6.03 cfs 44,554 cf
Discarded=0.09 cfs 12,882 cf Primary=3.57 cfs 31,671 cf Outflow=3.67 cfs 44,554 cf

Total Runoff Area = 316,246 sf Runoff Volume = 118,423 cf Average Runoff Depth = 4.49"
44.00% Pervious = 139,148 sf 56.00% Impervious = 177,098 sf

Summary for Subcatchment 1S: Pre-Project Site

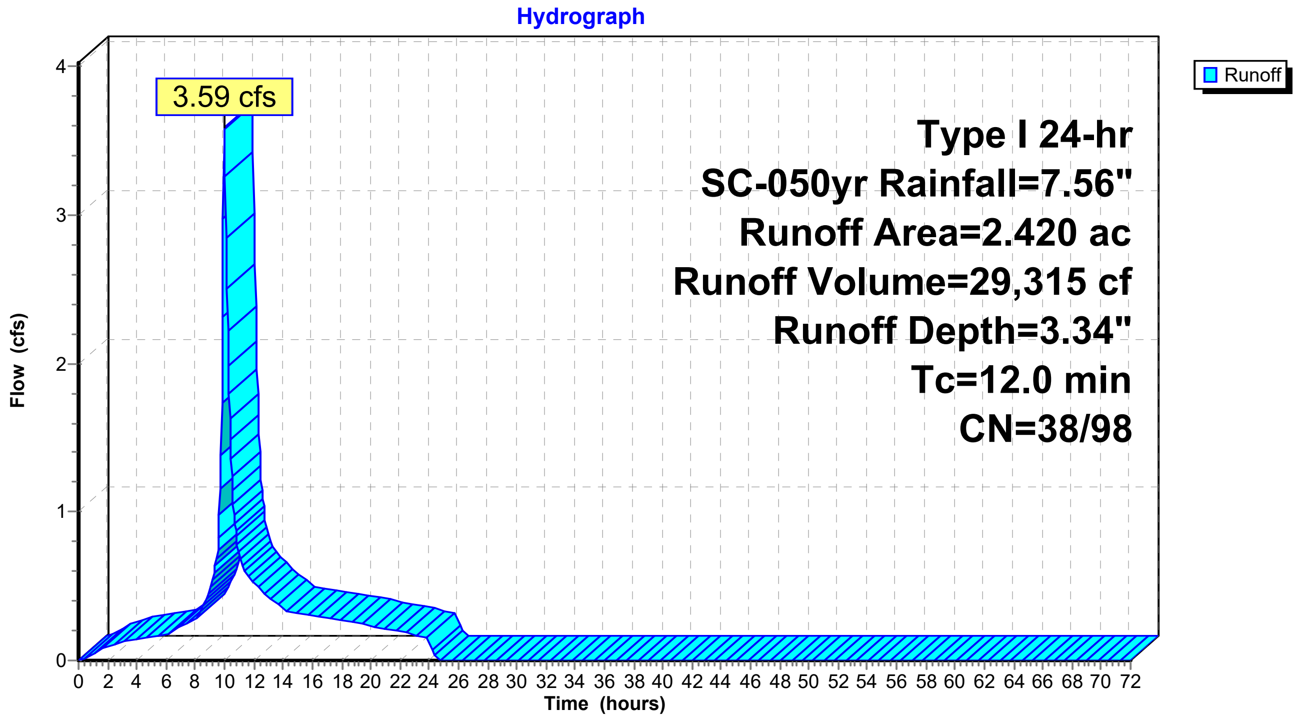
Runoff = 3.59 cfs @ 9.99 hrs, Volume= 29,315 cf, Depth= 3.34"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type I 24-hr SC-050yr Rainfall=7.56"

Area (ac)	CN	Description
2.420	61	1/4 acre lots, 38% imp, HSG A
1.500	38	62.00% Pervious Area
0.920	98	38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					**Direct Entry,**

Subcatchment 1S: Pre-Project Site



Summary for Subcatchment 2S: Post-Project Site

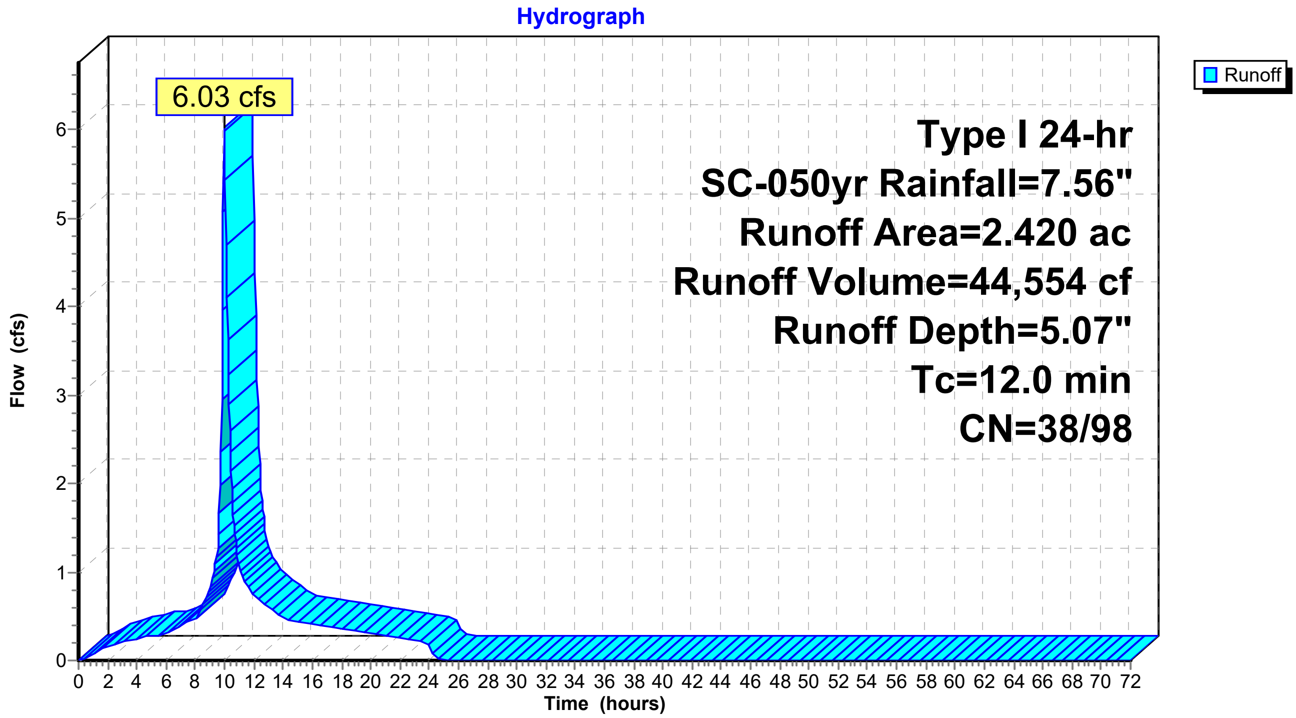
Runoff = 6.03 cfs @ 9.98 hrs, Volume= 44,554 cf, Depth= 5.07"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type I 24-hr SC-050yr Rainfall=7.56"

Area (ac)	CN	Description
2.420	77	1/8 acre lots, 65% imp, HSG A
0.847	38	35.00% Pervious Area
1.573	98	65.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					**Direct Entry,**

Subcatchment 2S: Post-Project Site



Summary for Subcatchment 4S: Post-Project Site

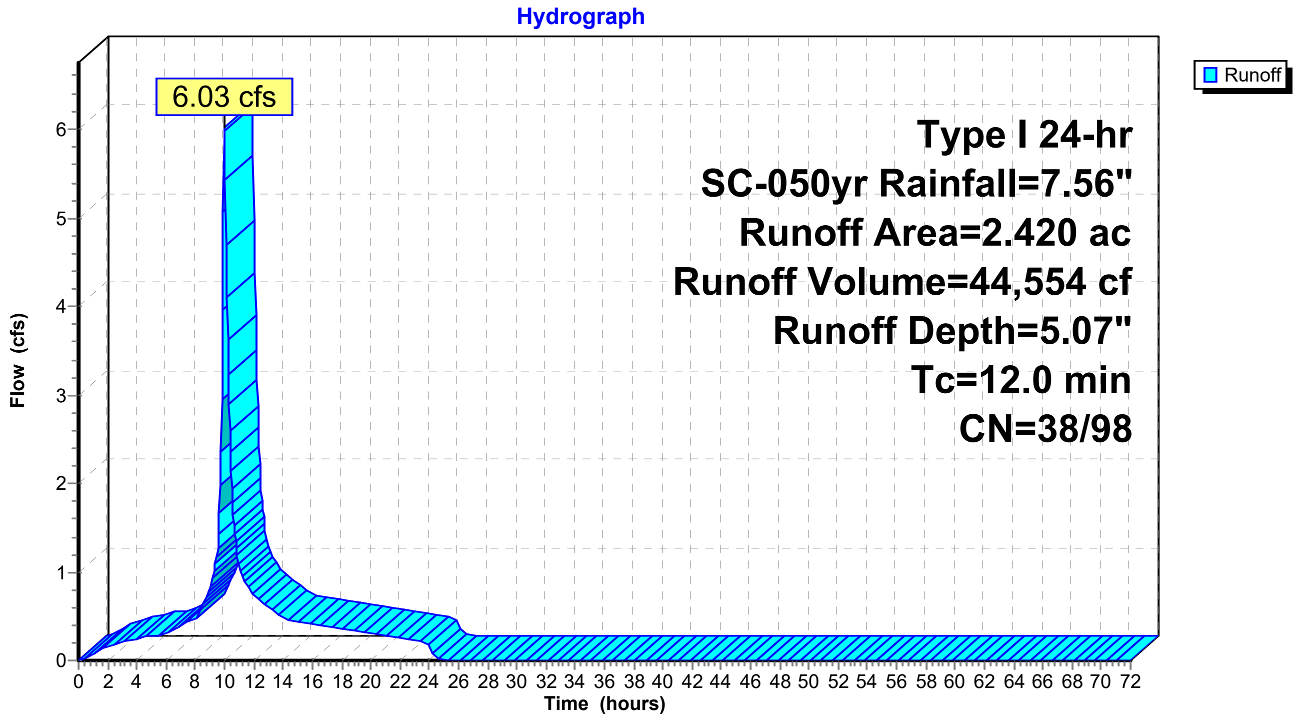
Runoff = 6.03 cfs @ 9.98 hrs, Volume= 44,554 cf, Depth= 5.07"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type I 24-hr SC-050yr Rainfall=7.56"

Area (ac)	CN	Description
2.420	77	1/8 acre lots, 65% imp, HSG A
0.847	38	35.00% Pervious Area
1.573	98	65.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					**Direct Entry,**

Subcatchment 4S: Post-Project Site



Summary for Pond 3P: Option 1 - Surface Basin

Inflow Area = 105,415 sf, 65.00% Impervious, Inflow Depth = 5.07" for SC-050yr event
Inflow = 6.03 cfs @ 9.98 hrs, Volume= 44,554 cf
Outflow = 2.87 cfs @ 10.31 hrs, Volume= 44,561 cf, Atten= 52%, Lag= 19.3 min
Discarded = 0.22 cfs @ 10.31 hrs, Volume= 18,809 cf
Primary = 2.65 cfs @ 10.31 hrs, Volume= 25,752 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 44.44' @ 10.31 hrs Surf.Area= 8,711 sf Storage= 11,266 cf

Plug-Flow detention time= 204.7 min calculated for 44,530 cf (100% of inflow)
Center-of-Mass det. time= 205.4 min (917.4 - 712.0)

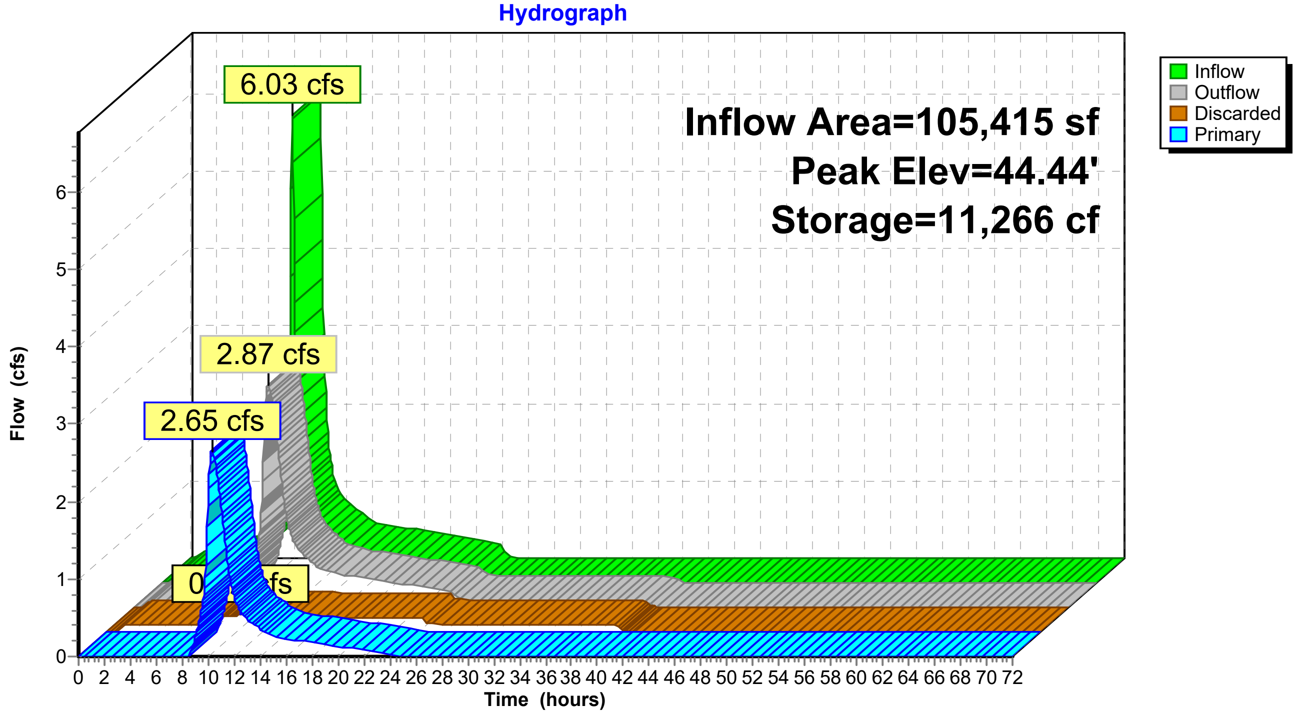
Volume	Invert	Avail.Storage	Storage Description
#1	38.50'	5,040 cf	**60.00'W x 60.00'L x 3.50'H Prismatoid** 12,600 cf Overall x 40.0% Voids
#2	43.00'	15,696 cf	**60.00'W x 60.00'L x 3.00'H Prismatoid Z=4.0**
		20,736 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	38.50'	**1.000 in/hr Exfiltration over Wetted area**
#2	Primary	41.00'	**18.0" Round Culvert** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 41.00' / 40.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Device 2	43.00'	**10.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	45.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.22 cfs @ 10.31 hrs HW=44.44' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.22 cfs)

Primary OutFlow Max=2.65 cfs @ 10.31 hrs HW=44.44' (Free Discharge)
└─**2=Culvert** (Passes 2.65 cfs of 13.96 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 2.65 cfs @ 4.86 fps)
  └─**4=Orifice/Grate** (Controls 0.00 cfs)

Pond 3P: Option 1 - Surface Basin



Summary for Pond 5P: Option 2 - Underground Chambers

Inflow Area = 105,415 sf, 65.00% Impervious, Inflow Depth = 5.07" for SC-050yr event
Inflow = 6.03 cfs @ 9.98 hrs, Volume= 44,554 cf
Outflow = 3.67 cfs @ 10.20 hrs, Volume= 44,554 cf, Atten= 39%, Lag= 13.0 min
Discarded = 0.09 cfs @ 10.20 hrs, Volume= 12,882 cf
Primary = 3.57 cfs @ 10.20 hrs, Volume= 31,671 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 42.86' @ 10.20 hrs Surf.Area= 2,774 sf Storage= 11,143 cf

Plug-Flow detention time= 266.7 min calculated for 44,523 cf (100% of inflow)
Center-of-Mass det. time= 267.5 min (979.5 - 712.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	36.75'	4,855 cf	**46.67'W x 59.44'L x 7.00'H Field A** 19,418 cf Overall - 7,279 cf Embedded = 12,139 cf x 40.0% Voids
#2A	37.75'	7,279 cf	**ADS_StormTech MC-4500 +Cap** x 65 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 5 Rows of 13 Chambers Cap Storage= +35.7 cf x 2 x 5 rows = 357.0 cf
		12,134 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	36.75'	**1.000 in/hr Exfiltration over Wetted area**
#2	Primary	38.70'	**18.0" Round Culvert** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 38.70' / 37.70' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Device 2	39.90'	**8.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	41.80'	**6.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.09 cfs @ 10.20 hrs HW=42.86' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=3.57 cfs @ 10.20 hrs HW=42.86' (Free Discharge)
└**2=Culvert** (Passes 3.57 cfs of 15.58 cfs potential flow)
  ├**3=Orifice/Grate** (Orifice Controls 2.72 cfs @ 7.80 fps)
  └**4=Orifice/Grate** (Orifice Controls 0.85 cfs @ 4.32 fps)

Pond 5P: Option 2 - Underground Chambers - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-4500 +Cap (ADS StormTech® MC-4500 with cap volume)
Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf
Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap
Cap Storage= +35.7 cf x 2 x 5 rows = 357.0 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

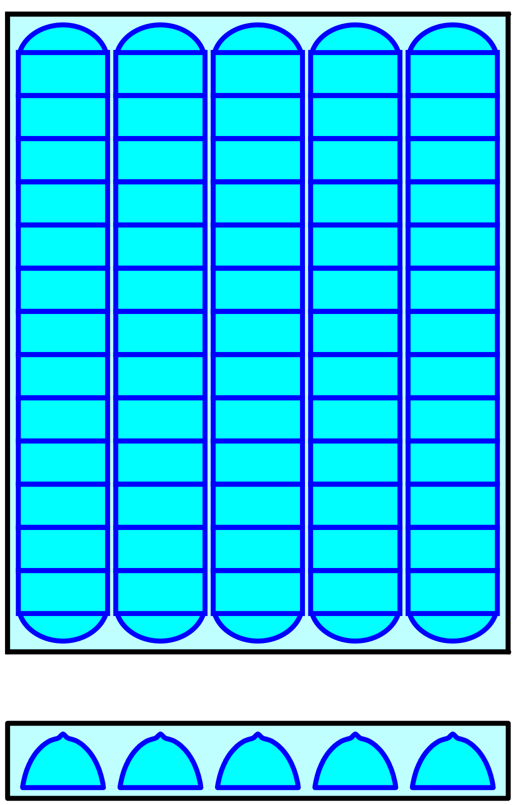
13 Chambers/Row x 4.02' Long +2.56' Cap Length x 2 = 57.44' Row Length +12.0" End Stone x 2 = 59.44' Base Length
5 Rows x 100.0" Wide + 9.0" Spacing x 4 + 12.0" Side Stone x 2 = 46.67' Base Width
12.0" Base + 60.0" Chamber Height + 12.0" Cover = 7.00' Field Height

65 Chambers x 106.5 cf + 35.7 cf Cap Volume x 2 x 5 Rows = 7,278.9 cf Chamber Storage

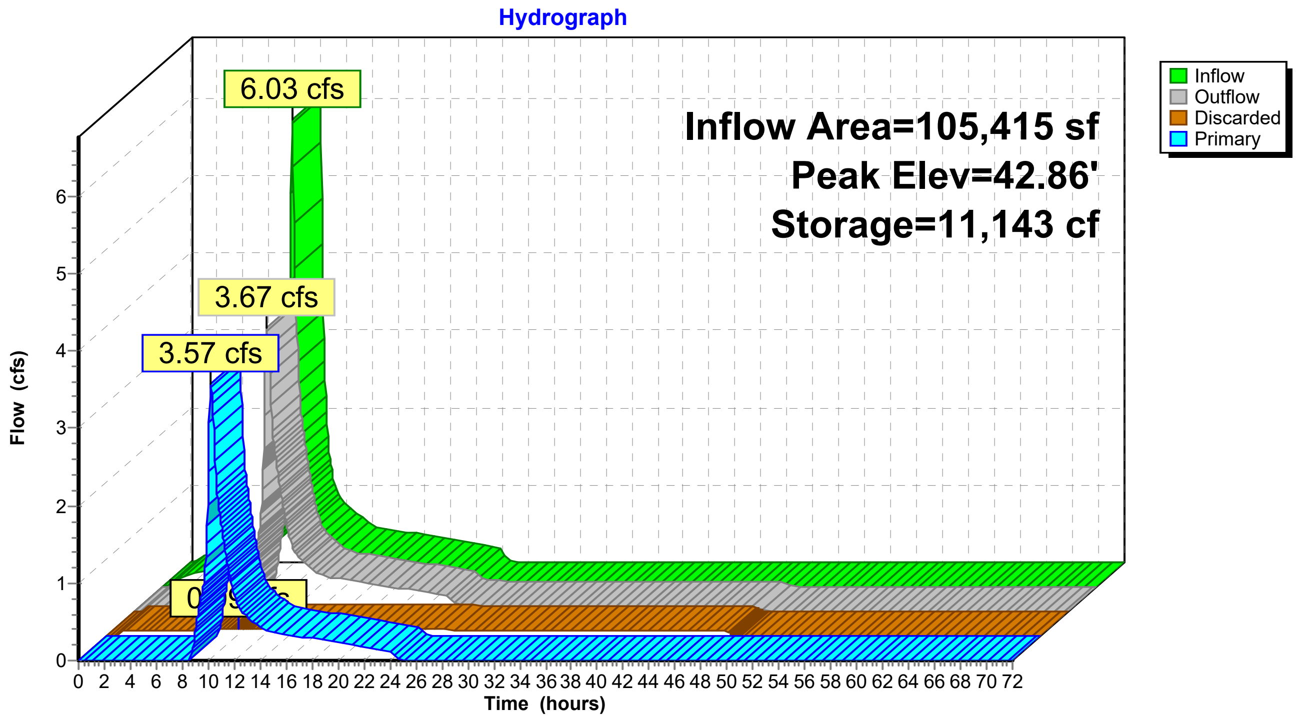
19,417.6 cf Field - 7,278.9 cf Chambers = 12,138.7 cf Stone x 40.0% Voids = 4,855.5 cf Stone Storage

Chamber Storage + Stone Storage = 12,134.4 cf = 0.279 af
Overall Storage Efficiency = 62.5%
Overall System Size = 59.44' x 46.67' x 7.00'

65 Chambers
719.2 cy Field
449.6 cy Stone



Pond 5P: Option 2 - Underground Chambers



Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Pre-Project Site Runoff Area=2.420 ac 38.00% Impervious Runoff Depth=3.85"
Tc=12.0 min CN=38/98 Runoff=4.16 cfs 33,826 cf

Subcatchment 2S: Post-Project Site Runoff Area=2.420 ac 65.00% Impervious Runoff Depth=5.72"
Tc=12.0 min CN=38/98 Runoff=6.79 cfs 50,235 cf

Subcatchment 4S: Post-Project Site Runoff Area=2.420 ac 65.00% Impervious Runoff Depth=5.72"
Tc=12.0 min CN=38/98 Runoff=6.79 cfs 50,235 cf

Pond 3P: Option 1 - Surface Basin Peak Elev=44.62' Storage=12,206 cf Inflow=6.79 cfs 50,235 cf
Discarded=0.23 cfs 19,198 cf Primary=2.88 cfs 31,037 cf Outflow=3.10 cfs 50,235 cf

Pond 5P: Option 2 - Underground Peak Elev=43.36' Storage=11,706 cf Inflow=6.79 cfs 50,235 cf
Discarded=0.10 cfs 12,963 cf Primary=4.06 cfs 37,270 cf Outflow=4.15 cfs 50,233 cf

Total Runoff Area = 316,246 sf Runoff Volume = 134,296 cf Average Runoff Depth = 5.10"
44.00% Pervious = 139,148 sf 56.00% Impervious = 177,098 sf

Summary for Subcatchment 1S: Pre-Project Site

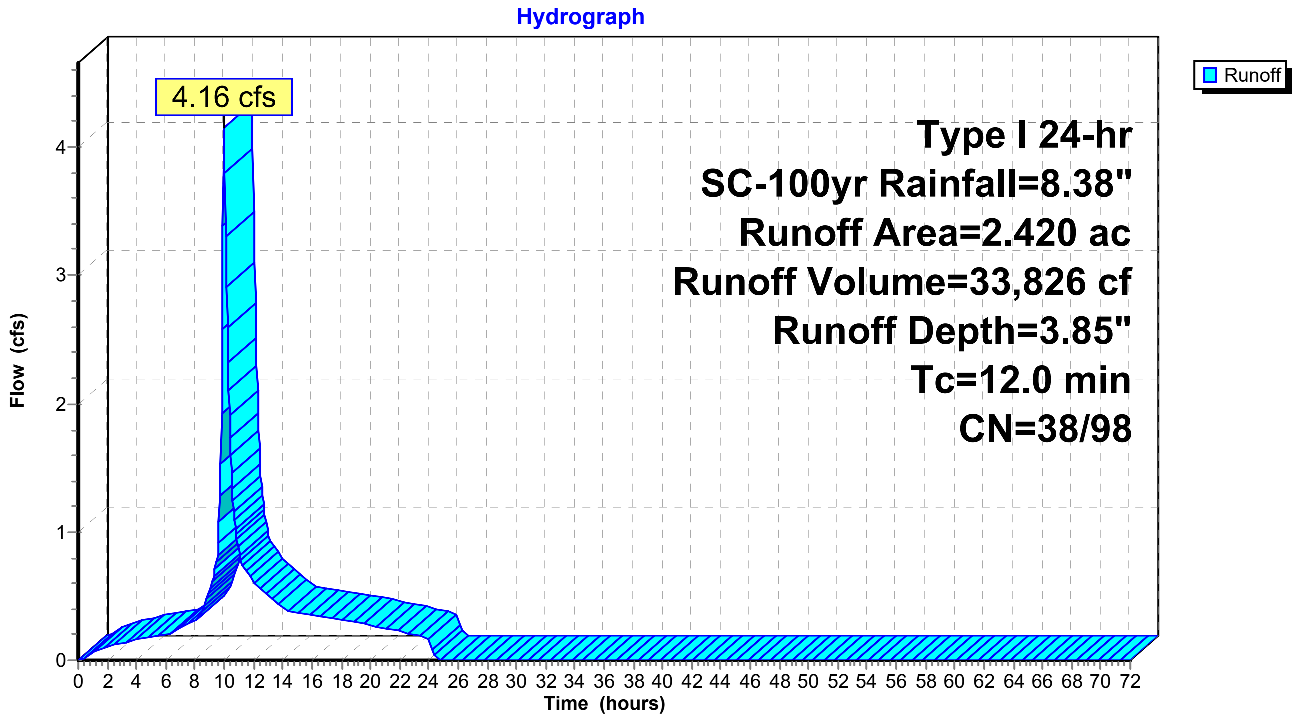
Runoff = 4.16 cfs @ 9.99 hrs, Volume= 33,826 cf, Depth= 3.85"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type I 24-hr SC-100yr Rainfall=8.38"

Area (ac)	CN	Description
2.420	61	1/4 acre lots, 38% imp, HSG A
1.500	38	62.00% Pervious Area
0.920	98	38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					**Direct Entry,**

Subcatchment 1S: Pre-Project Site



Summary for Subcatchment 2S: Post-Project Site

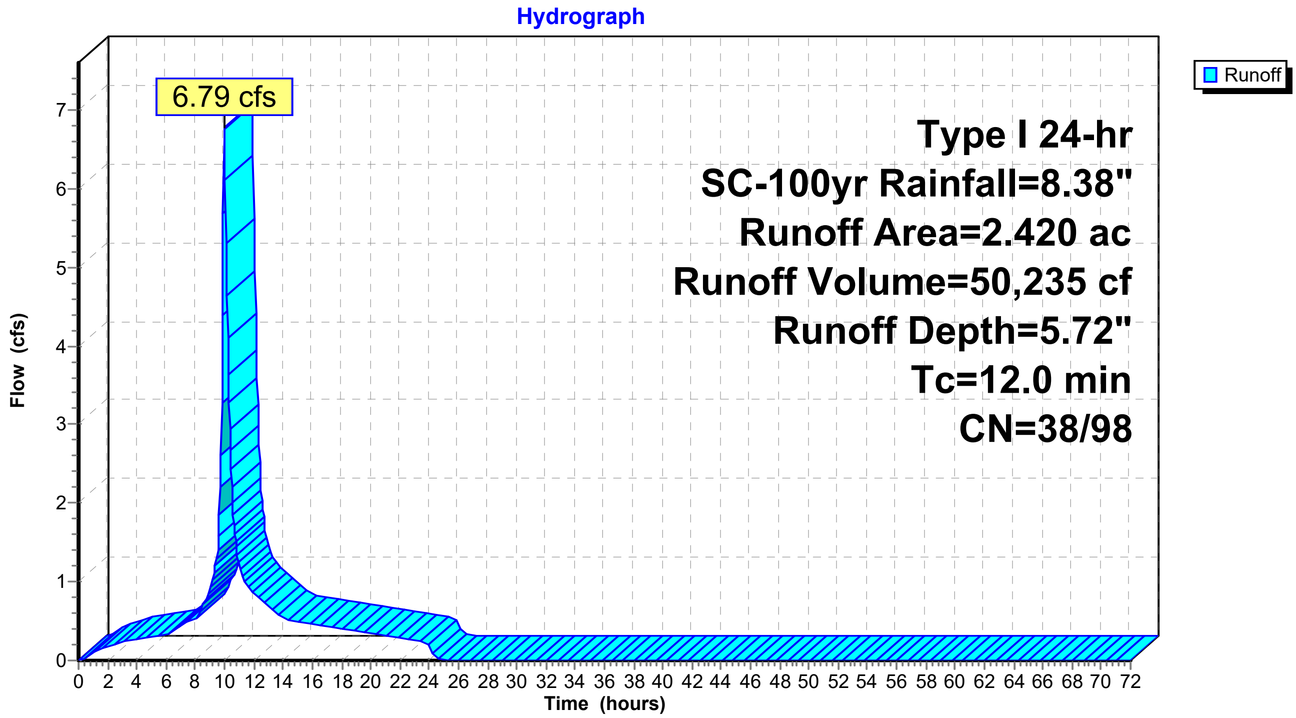
Runoff = 6.79 cfs @ 9.98 hrs, Volume= 50,235 cf, Depth= 5.72"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type I 24-hr SC-100yr Rainfall=8.38"

Area (ac)	CN	Description
2.420	77	1/8 acre lots, 65% imp, HSG A
0.847	38	35.00% Pervious Area
1.573	98	65.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					**Direct Entry,**

Subcatchment 2S: Post-Project Site



Summary for Subcatchment 4S: Post-Project Site

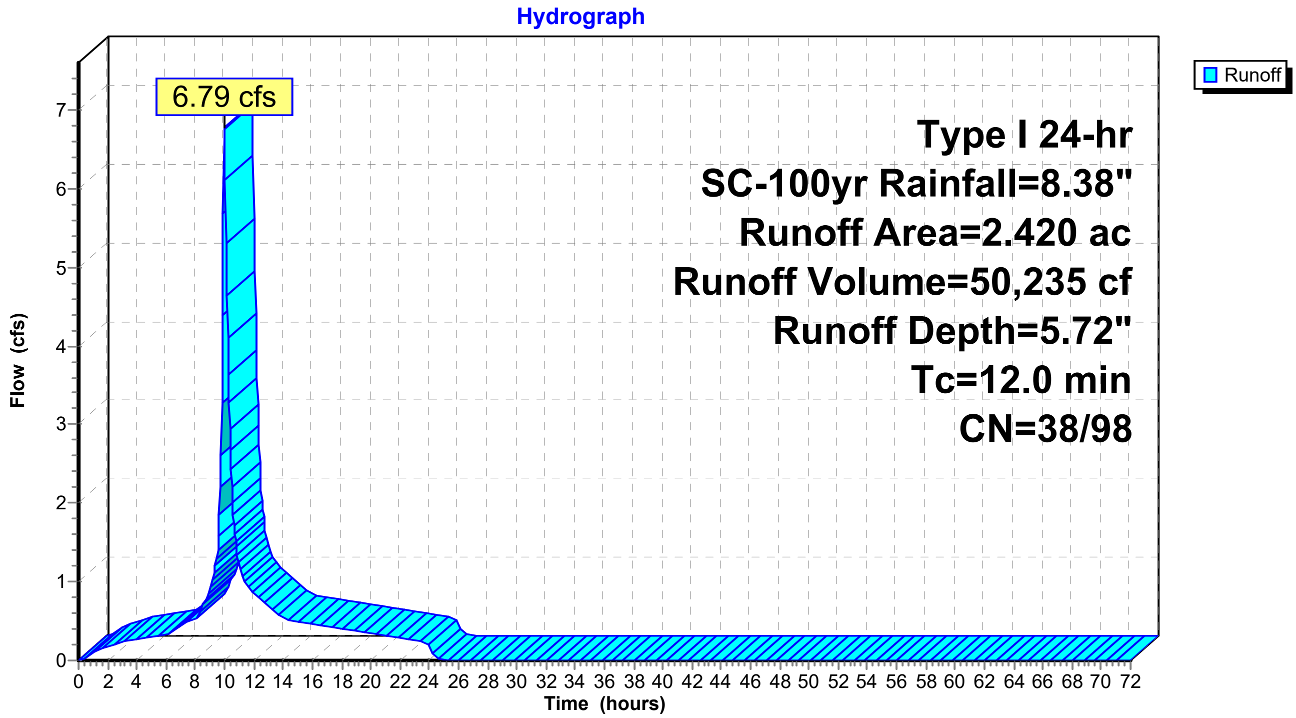
Runoff = 6.79 cfs @ 9.98 hrs, Volume= 50,235 cf, Depth= 5.72"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type I 24-hr SC-100yr Rainfall=8.38"

Area (ac)	CN	Description
2.420	77	1/8 acre lots, 65% imp, HSG A
0.847	38	35.00% Pervious Area
1.573	98	65.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					**Direct Entry,**

Subcatchment 4S: Post-Project Site



Summary for Pond 3P: Option 1 - Surface Basin

Inflow Area = 105,415 sf, 65.00% Impervious, Inflow Depth = 5.72" for SC-100yr event
Inflow = 6.79 cfs @ 9.98 hrs, Volume= 50,235 cf
Outflow = 3.10 cfs @ 10.33 hrs, Volume= 50,235 cf, Atten= 54%, Lag= 20.5 min
Discarded = 0.23 cfs @ 10.33 hrs, Volume= 19,198 cf
Primary = 2.88 cfs @ 10.33 hrs, Volume= 31,037 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 44.62' @ 10.33 hrs Surf.Area= 8,920 sf Storage= 12,206 cf

Plug-Flow detention time= 190.5 min calculated for 50,235 cf (100% of inflow)
Center-of-Mass det. time= 190.3 min (902.9 - 712.6)

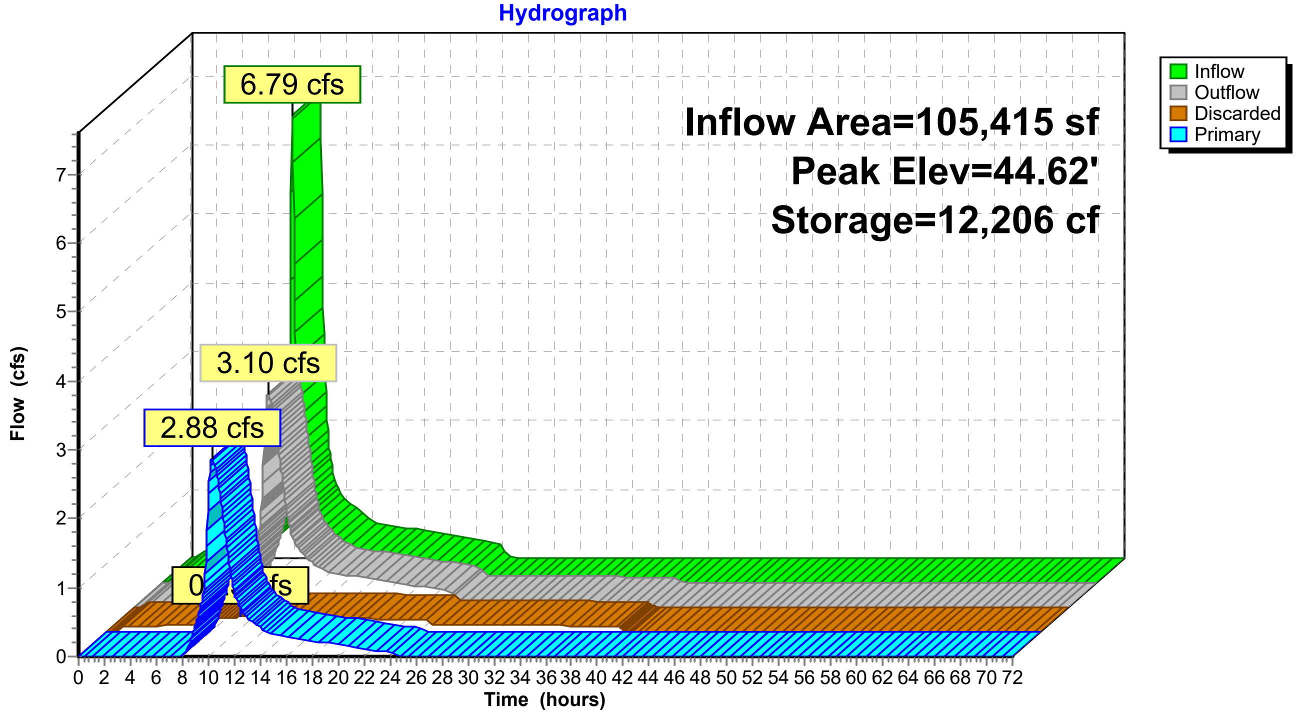
Volume	Invert	Avail.Storage	Storage Description
#1	38.50'	5,040 cf	**60.00'W x 60.00'L x 3.50'H Prismatoid**
			12,600 cf Overall x 40.0% Voids
#2	43.00'	15,696 cf	**60.00'W x 60.00'L x 3.00'H Prismatoid Z=4.0**
		20,736 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	38.50'	**1.000 in/hr Exfiltration over Wetted area**
#2	Primary	41.00'	**18.0" Round Culvert**
			L= 100.0' RCP, groove end w/headwall, Ke= 0.200
			Inlet / Outlet Invert= 41.00' / 40.00' S= 0.0100 '/' Cc= 0.900
			n= 0.013, Flow Area= 1.77 sf
#3	Device 2	43.00'	**10.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	45.00'	**12.0" Horiz. Orifice/Grate** C= 0.600
			Limited to weir flow at low heads

Discarded OutFlow Max=0.23 cfs @ 10.33 hrs HW=44.62' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.23 cfs)

Primary OutFlow Max=2.88 cfs @ 10.33 hrs HW=44.62' (Free Discharge)
└─**2=Culvert** (Passes 2.88 cfs of 14.38 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 2.88 cfs @ 5.27 fps)
  └─**4=Orifice/Grate** (Controls 0.00 cfs)

Pond 3P: Option 1 - Surface Basin



Summary for Pond 5P: Option 2 - Underground Chambers

Inflow Area = 105,415 sf, 65.00% Impervious, Inflow Depth = 5.72" for SC-100yr event
Inflow = 6.79 cfs @ 9.98 hrs, Volume= 50,235 cf
Outflow = 4.15 cfs @ 10.20 hrs, Volume= 50,233 cf, Atten= 39%, Lag= 12.8 min
Discarded = 0.10 cfs @ 10.20 hrs, Volume= 12,963 cf
Primary = 4.06 cfs @ 10.20 hrs, Volume= 37,270 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 43.36' @ 10.20 hrs Surf.Area= 2,774 sf Storage= 11,706 cf

Plug-Flow detention time= 243.8 min calculated for 50,233 cf (100% of inflow)
Center-of-Mass det. time= 243.6 min (956.2 - 712.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	36.75'	4,855 cf	**46.67'W x 59.44'L x 7.00'H Field A** 19,418 cf Overall - 7,279 cf Embedded = 12,139 cf x 40.0% Voids
#2A	37.75'	7,279 cf	**ADS_StormTech MC-4500 +Cap** x 65 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 5 Rows of 13 Chambers Cap Storage= +35.7 cf x 2 x 5 rows = 357.0 cf
		12,134 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	36.75'	**1.000 in/hr Exfiltration over Wetted area**
#2	Primary	38.70'	**18.0" Round Culvert** L= 100.0' RCP, groove end w/headwall, Ke= 0.200 Inlet / Outlet Invert= 38.70' / 37.70' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Device 2	39.90'	**8.0" Vert. Orifice/Grate** C= 0.600
#4	Device 2	41.80'	**6.0" Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.10 cfs @ 10.20 hrs HW=43.36' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.10 cfs)

Primary OutFlow Max=4.06 cfs @ 10.20 hrs HW=43.36' (Free Discharge)
└─**2=Culvert** (Passes 4.06 cfs of 16.62 cfs potential flow)
  ├─**3=Orifice/Grate** (Orifice Controls 2.97 cfs @ 8.52 fps)
  └─**4=Orifice/Grate** (Orifice Controls 1.08 cfs @ 5.52 fps)

Pond 5P: Option 2 - Underground Chambers - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-4500 +Cap (ADS StormTech® MC-4500 with cap volume)
Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf
Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap
Cap Storage= +35.7 cf x 2 x 5 rows = 357.0 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

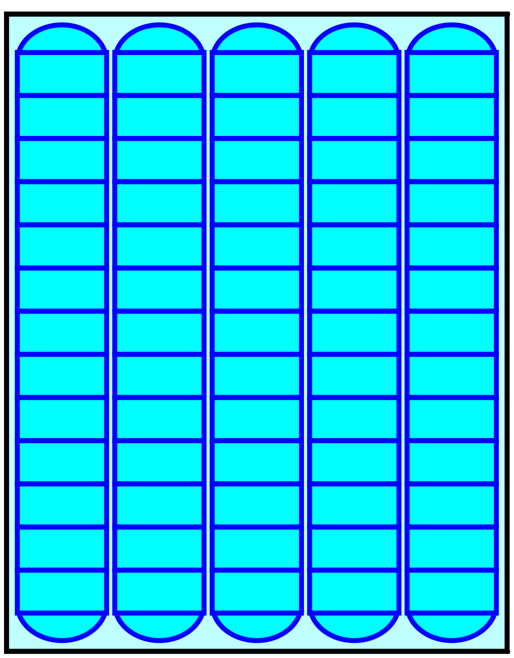
13 Chambers/Row x 4.02' Long +2.56' Cap Length x 2 = 57.44' Row Length +12.0" End Stone x 2 = 59.44' Base Length
5 Rows x 100.0" Wide + 9.0" Spacing x 4 + 12.0" Side Stone x 2 = 46.67' Base Width
12.0" Base + 60.0" Chamber Height + 12.0" Cover = 7.00' Field Height

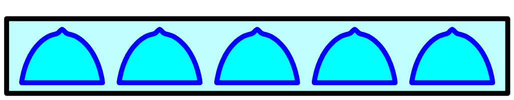
65 Chambers x 106.5 cf + 35.7 cf Cap Volume x 2 x 5 Rows = 7,278.9 cf Chamber Storage

19,417.6 cf Field - 7,278.9 cf Chambers = 12,138.7 cf Stone x 40.0% Voids = 4,855.5 cf Stone Storage

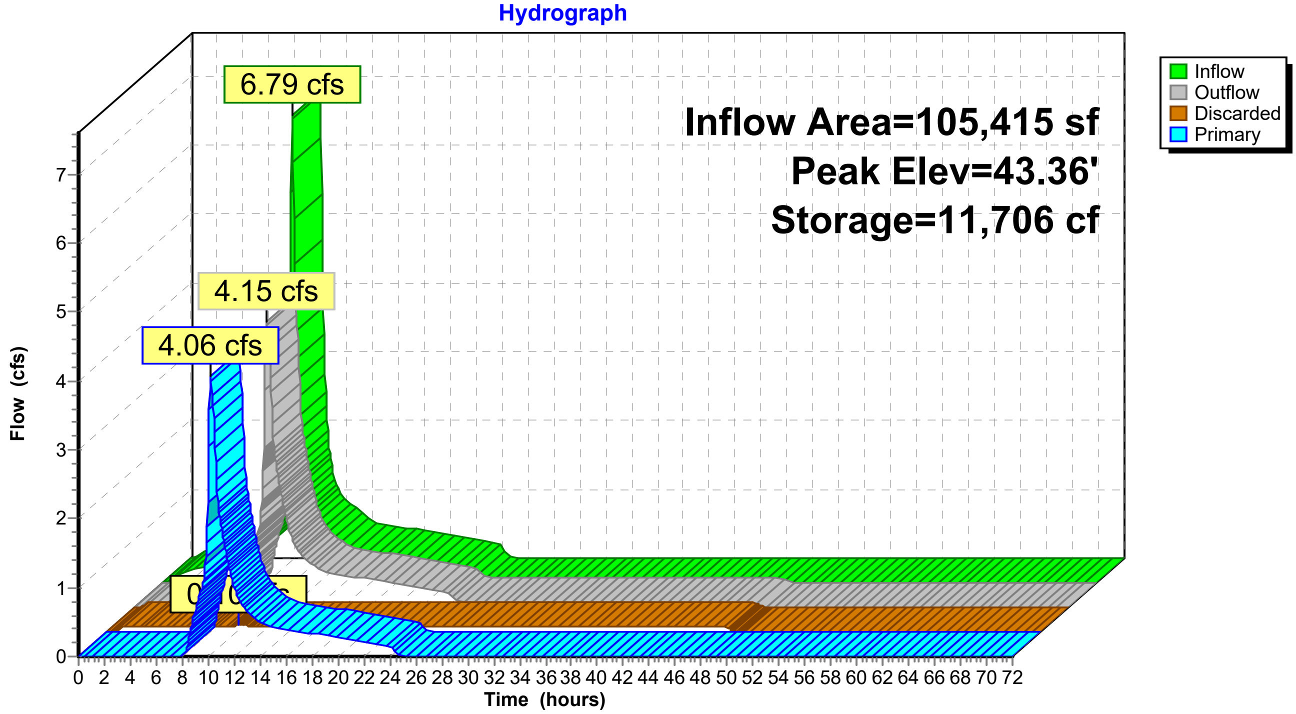
Chamber Storage + Stone Storage = 12,134.4 cf = 0.279 af
Overall Storage Efficiency = 62.5%
Overall System Size = 59.44' x 46.67' x 7.00'

65 Chambers
719.2 cy Field
449.6 cy Stone





Pond 5P: Option 2 - Underground Chambers



United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Santa Barbara County, California, South Coastal Part

UCSB Classroom Project

March 18, 2019

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Soil Map


119° 50' 50" W
119° 50' 35" W
34° 24' 49" N
34° 24' 41" N
238300
238340
238380
238420
238460
238500
238540
238580
238620
238660
3811720
3811680
3811640
3811600
3811560
3811520
3811480
BcC
Soil Map may not be valid at this scale.
N
Map Scale: 1:1,760 if printed on A landscape (11" x 8.5") sheet.
Meters
0 25 50 100 150
Feet
0 50 100 200 300
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Santa Barbara County, California, South Coastal Part
Survey Area Data: Version 11, Sep 12, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 16, 2016—Dec 22, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND	MAP INFORMATION
	imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BcC	Baywood loamy sand, 2 to 9 percent slopes	13.4	100.0%
Totals for Area of Interest		**13.4**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Santa Barbara County, California, South Coastal Part

BcC—Baywood loamy sand, 2 to 9 percent slopes

Map Unit Setting

National map unit symbol: hc46
Elevation: 20 to 200 feet
Mean annual precipitation: 16 to 20 inches
Mean annual air temperature: 61 degrees F
Frost-free period: 330 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Baywood and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Baywood

Setting

Landform: Dunes
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Beach sand

Typical profile

H1 - 0 to 62 inches: loamy sand

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Ecological site: SANDY (R015XD055CA)
Hydric soil rating: No

Minor Components

Milpitas

Percent of map unit: 5 percent
Landform: Terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread

Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Concepcion

Percent of map unit: 5 percent
Landform: Terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Unnamed

Percent of map unit: 5 percent
Hydric soil rating: No

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Physical Properties

Soil Physical Properties are measured or inferred from direct observations in the field or laboratory. Examples of soil physical properties include percent clay, organic matter, saturated hydraulic conductivity, available water capacity, and bulk density.

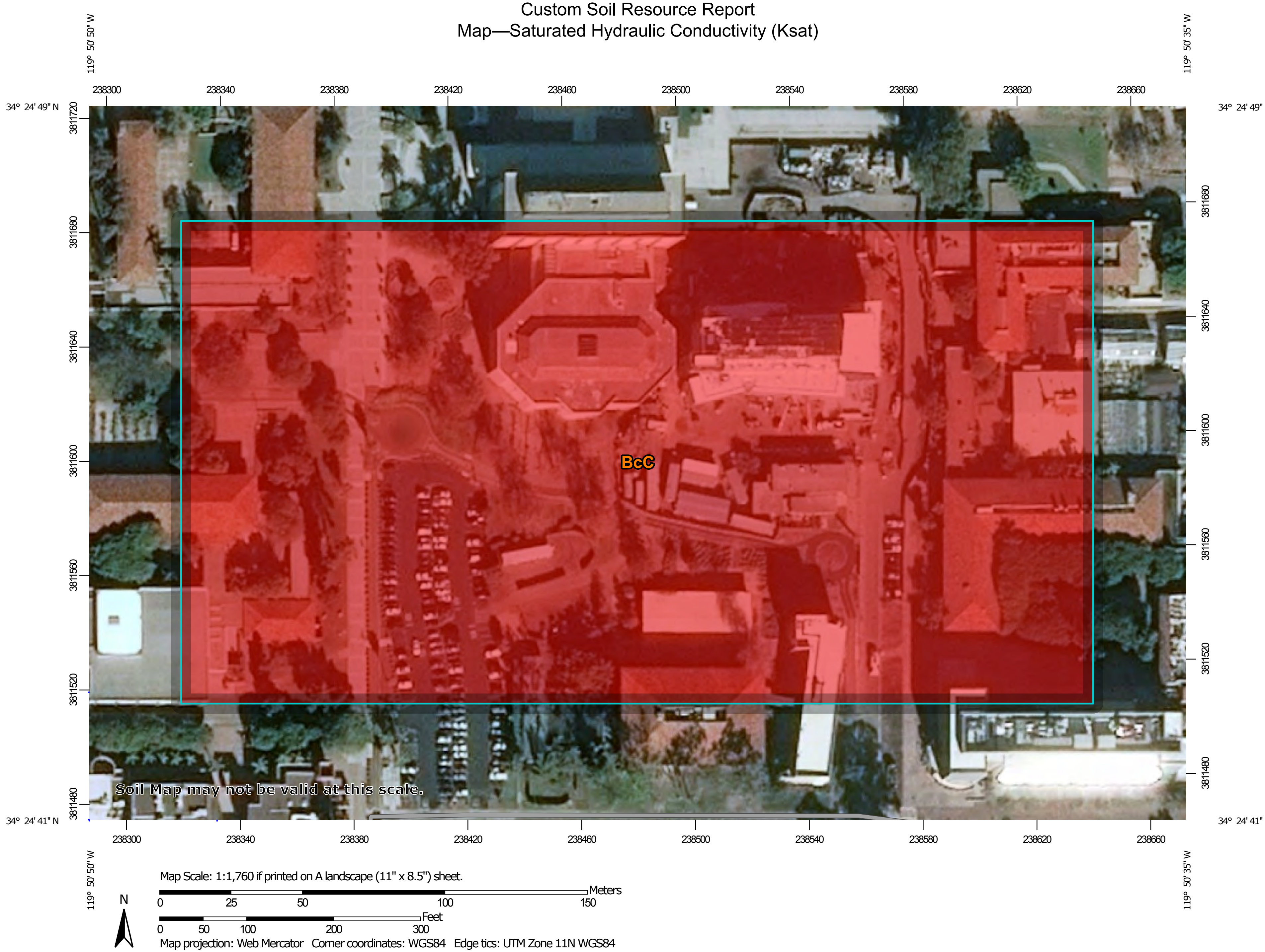
Saturated Hydraulic Conductivity (Ksat)

Saturated hydraulic conductivity (Ksat) refers to the ease with which pores in a saturated soil transmit water. The estimates are expressed in terms of micrometers per second. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Saturated hydraulic conductivity is considered in the design of soil drainage systems and septic tank absorption fields.

For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

The numeric Ksat values have been grouped according to standard Ksat class limits.

Custom Soil Resource Report
Map—Saturated Hydraulic Conductivity (Ksat)



MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- = 92.0000
- Not rated or not available

Soil Rating Lines

- = 92.0000
- Not rated or not available

Soil Rating Points

- = 92.0000
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND	MAP INFORMATION
	imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Saturated Hydraulic Conductivity (Ksat)

Map unit symbol	Map unit name	Rating (micrometers per second)	Acres in AOI	Percent of AOI
BcC	Baywood loamy sand, 2 to 9 percent slopes	92.0000	13.4	100.0%
Totals for Area of Interest			**13.4**	**100.0%**

Rating Options—Saturated Hydraulic Conductivity (Ksat)

Units of Measure: micrometers per second

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Fastest

Interpret Nulls as Zero: No

Layer Options (Horizon Aggregation Method): All Layers (Weighted Average)

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Custom Soil Resource Report
Map—Hydrologic Soil Group

Map Scale: 1:1,760 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0, 25, 50, 100, 150

Feet: 0, 50, 100, 200, 300

Map projection: Web Mercator   Corner coordinates: WGS84   Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Santa Barbara County, California, South Coastal Part
Survey Area Data: Version 11, Sep 12, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 16, 2016—Dec 22, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND	MAP INFORMATION
	imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
BcC	Baywood loamy sand, 2 to 9 percent slopes	A	13.4	100.0%
Totals for Area of Interest			**13.4**	**100.0%**

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Appendix C

Shallow Environmental Soil Assessment Report

4680 East Los Angeles Avenue, Suite O
Simi Valley, California 93063

November 9, 2018

Liana Khammash, Project Manager
University of California, Santa Barbara
Design, Facilities & Safety Services
Santa Barbara, California 93106

Shallow Environmental Soil Assessment Report
Proposed New Classroom Building
UCSB, Santa Barbara, California

1.0 INTRODUCTION

JHA Environmental, Inc. (JHA) is pleased to present this report documenting the shallow environmental soil assessment at the University of California, Santa Barbara (UCSB) near Building 408 (Site; Figures 1 and 2). JHA understands that Building 408 will be demolished in preparation to construct a new classroom building. Fugro USA Land, Inc. (Fugro) was contracted by UCSB to perform a geotechnical investigation in the vicinity of the proposed new classroom building. As a part of the geotechnical investigation, Fugro completed cone penetration testing (CPT) and hollow-stem auger (HSA) borings in the vicinity of Building 408.

2.0 BACKGROUND

In the 1940s, portions of the current UCSB campus were a Naval Marine air training base. During this time underground storage tanks (USTs) were installed near military buildings to store heating oil for furnaces. The base, including all of the buildings and infrastructure, was transferred to the Regents of the University of California in 1949. In 1989, 23 of the heating oil USTs and associated piping were removed, and disposed of off-Site. Confirmation soil samples were collected from each of the excavations.

One of the USTs removed in 1989 was located north of current Building 408, is historically referred to as UST No. 2 with a reported 1,000-gallon capacity. Confirmation soil samples collected following the removal of UST No. 2 indicated that soil was impacted with total petroleum hydrocarbons (TPH) to a depth of between 9 and 10 feet bgs, which ranged in concentration from 2,100 to 11,000 milligrams per kilogram (mg/kg). Trace concentrations of petroleum hydrocarbon constituents benzene, toluene, ethylbenzene, and xylenes (BTEX) were also reported (ECO 2015).

In 1990, two soil assessment investigations were completed in the vicinity of former UST No. 2. A total of 24 soil samples were collected in 11 soil borings. The results of these assessments indicated that diesel range hydrocarbons ranged up to 14,000 mg/kg in soil. The highest concentrations of BTEX in soil were 0.011 mg/kg, 1.4 mg/kg, 9.0 mg/kg, and 3.8 mg/kg, respectively. Based on these investigations, it was concluded that the petroleum hydrocarbon-impacted soil in the vicinity of former UST No. 2 was approximately 10 to 11.5 feet bgs. Soil was described as wet between 11.5 and 13 feet bgs. One groundwater monitoring well was installed during this investigation. Due to insufficient water during attempted development and sampling, the well was not sampled. The status of the well is unknown (ECO 2015).

Two additional soil assessment investigations were completed in 2014 in the vicinity of former UST No. 2. A total of 14 soil samples were collected at 10 locations. Nine of the collected samples had detectable concentrations of TPH that ranged from 31.2 to 25,400 mg/kg. Ethylbenzene was the only detected BTEX constituent that was identified in three the samples at concentrations ranging from 7.59 to 1,050 mg/kg. The assessment concluded that petroleum hydrocarbon-impacted soil was present between approximately 8 and 11.5 feet bgs, in general, immediately above the same groundwater level that was documented in the 1990 assessment (ECO 2015).

UST No. 2 was granted closure by the Central Coast Regional Water Quality Control Board and local agency representative, Santa Barbara County Public Health Department, Environmental Health Services (EHS) on February 3, 2016 (CCWB 2016) with the following Site management requirements: "*Residual soil and groundwater contamination may still exist on-site that could pose an unacceptable risk under certain site development activities such as site grading, excavation, or de-watering. The Central Coast Water Board, the local health agency and the appropriate local planning and building departments must be notified prior to any changes in land use, grading activities, excavation, or dewatering. This notification must include a statement that residual soil and groundwater contamination underlie the property and nearby properties. The levels of residual contamination and any associated risks are expected to reduce with time.*"

Historically, natural occurring crude oil (also petroleum hydrocarbons) has been encountered in shallow soils during soil assessments and excavation work at other locations on campus. Shallow groundwater in the vicinity of former UST No. 2 was reported in previous assessments at approximately 11.5 feet bgs, and is likely perched on the weathered Sisquoc formation (bedrock). Based on the Central Coast Regional Water Quality Control Board's case closure summary, the groundwater gradient in the vicinity of former UST No. 2 is to the southwest.

3.0 SHALLOW ENVIRONMENTAL SOIL ASSESSMENT – SEPTEMBER 2018

JHA completed the proposed shallow environmental soil assessment concurrently with the geotechnical investigation completed by Fugro on September 21, 2018. Fugro completed a total of seven borings, four by CPT rig (CPT-1 through CPT-4) and three by HSA rig (BH-1 through BH-3). JHA collected soils from all three of the borings completed by HSA. In addition to the HSA locations, JHA completed hand auger borings HA-1 and HA-2 which were collocated with the CPT locations CPT-3 and CPT-1, respectively. JHA also completed two hand auger borings (HA-3 and HA-4) in the landscaping planter north of Building 408 in the vicinity of the petroleum hydrocarbon-impacted soil documented in the UST No. 2 assessments discussed in Section 2.0. All boring locations are shown on Figure 2.

3.1 Pre-Field Activities

Prior to the drilling activities, Fugro marked the CPT and HSA locations, notified DigAlert of Southern California and contracted ULS Services to conduct a utility clearance at each of the drilling locations. In addition, JHA marked the hand auger locations (HA-3 and HA-4) in the planter north of Building 408 and also notified DigAlert of Southern California.

3.2 Assessment Methodology

JHA collected grab soil samples at approximately 10 and 15 feet below ground surface (bgs) at HSA locations BH-1 through BH-3. Soil samples were collected at 12 and 17 feet bgs at HA-1 (collocated with location CPT-3), at 11 and 15 feet bgs at hand auger location HA-2 (collocated with location CPT-1), 9 and 15 feet bgs at hand auger location HA-3, and 10 and 15 feet bgs at HA-4. All soil samples were collected in accordance with EPA Sampling Method 5035 (Encore® Sampler) for volatile organic compound (VOC) analysis and glass jar for carbon chain and metals analysis. The samples were labeled, placed in a cooler for transport to E

urofins Calscience Inc. (ECI) stationary laboratory following chain-of-custody protocol. All soil samples were analyzed for VOCs by EPA Test Method 8260B and carbon chain analysis by EPA Test Method 8015B. One selected soil sample (HA-3-9') was analyzed for California Code of Regulations (CCR) Title 22 Metals by EPA Test Method 6010B.

Soil was logged by a licensed California Professional Geologist in accordance with the Unified Soil Classification System (USCS). Subsamples at each grab sample depth were screened for organic vapors using a calibrated photo-ionizing detector (PID).

3.3 Assessment Results

In summary, the soil encountered was consistent across the project area. The grab samples collected at 5 feet bgs consisted of a grayish brown clayey to silty sand. At 9 to 12 feet bgs the grab samples consisted of a poorly graded fine sand with trace fines. The deepest grab samples (15 to 17 feet bgs) consisted of a dark gray weathered mudstone with shell fragments. Elevated PID readings of 397 and 579 parts per million by volume (ppmV) were recorded at HA-3 at 9 feet bgs and HA-4 at 10 feet bgs, respectively. There were no visual indications of petroleum hydrocarbon impact. Increase moisture was encountered at three of the hand auger borings (HA-1 through HA-3), though no groundwater was encountered. The boring logs of sample locations are provided in Appendix A.

The soil analytical results indicate concentrations of VOCs as follows: n-butylbenze of 1.8 mg/kg at HA-4-10'; sec-butylbenze of 1.1mg/kg at HA-4-10'; carbon disulfide of 0.016 mg/kg at HA-3-15'; ethylbenze of 0.14 mg/kg at HA-4-10'; isopropylbenzene of 0.22 mg/kg at HA-4-10'; p-isopropyltoluene of 0.10 and 1.7 at HA-3-9' and HA-4-10', respectively; naphthalene of 6.2 mg/kg at HA-4-10'; n-propylbenzene of 0.45 mg/kg at HA-4-10'; 1,2,4-trimethylbenzene of 2.1 mg/kg at HA-4-10'; and 1,3,5-trimethylbenzene of 0.82 mg/kg at HA-4-10'. All other soil samples and VOCs listed in the EPA Test Method 8260B analytical suite were not detected above the individual reporting limits. The VOC analytical data is summarized in Table 1 and the laboratory report is provided in Appendix B.

The soil analytical results indicate concentrations of TPH as follows: 32 mg/kg at HA-1-12'; 18 mg/kg at HA-1-17'; 160 mg/kg at BH-1-10'; 46 mg/kg at BH-1-15'; 160 mg/kg at HA-2-11'; 16 mg/kg at HA-2-15'; 1.4 mg/kg at BH-2-10'; 42 mg/kg at BH-2-15'; 5,400 mg at HA-3-9'; 24 mg/kg at HA-3-15'; 13,000 mg/kg at HA-4-10'; 41 mg/kg at HA-4-15'; 110 mg/kg at BH-3-10'; and not detected at BH-3-15'. The carbon chain analytical data is summarized in Table 2 and the laboratory report is provided in Appendix B.

The soil sample analyzed for metals (HA-3-9’) indicated concentrations of arsenic of 1.04 mg/kg, barium of 18.0 mg/kg, beryllium of 0.372 mg/kg, total chromium of 11.2 mg/kg, cobalt of 3.38 mg/kg, copper of 1.97 mg/kg, lead of 1.94 mg/kg, nickel of 8.09 mg/kg, vanadium of 9.01 mg/kg and zinc of 9.31 mg/kg. All other CCR Title 22 Metals listed in the EPA Test Method 6010B were not detected above the individual reporting limits. The metals analytical data is summarized in Table 3 and the laboratory report is provided in Appendix B.

3.4 Discussion and Conclusion

VOCs were only detected in the hand auger locations HA-3-9’, HA-3-15’ and HA-4-10’. Only naphthalene exceeded the Environmental Screening Levels (ESLs) for residential land use (most conservative) published by the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB 2016). Carbon chain analysis indicates that lighter gasoline and diesel range organics that comprise heating oil that would be associated with former UST No. 2 were detected at HA-3-9’, HA-3-15’, HA-4-10’ and HA-4-15’. These locations are near the area north of Building 408 already defined by previous environmental assessments and associated with former UST No. 2. The concentration of VOCs and carbon chain show significant decrease at 15 feet bgs (deepest depth explored at HA-3 and HA-4). The results of the VOC and carbon chain analysis at HA-3 and HA-4 was expected based on the previous assessments north of Building 408 as discussed in Section 2.0. Excavation to at least 15 feet bgs and proper off-Site disposal of the shallow soil in this area is recommended.

The heavier petroleum hydrocarbons (carbon chain analytical results) indicate that locations HA-1-12’, HA-1-17’, BH-1-10’, BH-1-15’, HA-2-11’, HA-2-15’, BH-2-15’ and BH-3-10’ are likely associated with the naturally occurring crude oil encountered regionally. Santa Barbara County Public Health Department, EHS has established an action level for TPH in soil at less than 100 mg/kg for residential land use (most conservative). Of the above listed locations, only three locations slightly exceeded the TPH action level of 100 mg/kg at BH-1-10’ at 160 mg/kg, HA-2-11’ at 160 mg/kg and BH-3- 10’ at 110 mg/kg. Soils removed during construction in these areas can likely be classified and disposed of as non-hazardous, but should not be used for clean fill material at any on- or off-Site location.

Arsenic exceeded the San Francisco Bay Regional Water Quality Control Board ESL of 0.067 mg/kg though the concentration is less than 12 mg/kg which is considered background for Southern California by Cal-EPA (DTSC 2008). All other metals results for soil samples were either not detected or were below the San Francisco Bay Regional Water Quality Control Board ESLs for residential land use (most conservative).

4.0 LIMITATIONS

This report has been prepared for UCSB as a shallow environmental soil assessment at the proposed new classroom building in the general vicinity of existing Building 408. Parties not designated by UCSB should not rely on the information in this report without the written consent of JHA.

JHA has applied present engineering and scientific judgment and used a level of effort consistent with the standard of practice measured on the date of this report and in the locale of the project Site for similar type studies. Inferences with respect to potential subsurface contamination are based on a review of readily available information and limited soil sampling. The findings and interpretations in this report have been developed based on the review of existing information pertaining to the subject Site. It should be recognized that subsurface contamination can vary laterally and with depth below a given Site.

5.0 CLOSURE

If there are any questions or concerns regarding this report or documentation, please do not hesitate to contact the undersigned at (805) 832-0718.

Sincerely,
JHA Environmental, Inc.

PROFESSIONAL GEOLOGIST
STACIE AICHNER
No. 8595
STATE OF CALIFORNIA

Stacie L. Aichner, PG #8595
Senior Project Geologist

ATTACHMENTS

Figure 1 – Site Vicinity Map
Figure 2 – Site Map

Table 1 – Soil VOC Analytical Results
Table 2 – Soil Carbon Chain Analytical Results
Table 3 – Soil CCR Title 22 Metals Analytical Results

Appendix A – Boring Logs
Appendix B – Laboratory Report

REFERENCES

Eco & Associates, Inc. (ECO 2015) *Finding of No DoD Action Indicated – UST No. 2, Former Navy Marine Air Training Base, University of California at Santa Barbara, Santa Barbara County, Goleta, California.* March 12, 2015

Central Coast Water Board Case Summary Form, Military Underground Storage Tank (CCWB 2016) February 3, 2016

San Francisco Regional Water Quality Control Board (SFBRWQCB 2016) *User's Guide: Derivation and Application of Environmental Screening Levels (ESLs).* February 2016

California Department of Toxic Substances Control (DTSC 2008) *Determination of a Southern California Regional Background Arsenic Concentration in Soil.* March 2008

JHA ENVIRONMENTAL

FIGURES

JHA ENVIRONMENTAL, INC.
15375 BARRANCA PARKWAY, SUITE #J-101
IRVINE, CALIFORNIA 92618
PHONE: (949) 453-1045 FAX: (949) 453-1047

FIGURE 1 – SITE VICINITY MAP

PROJECT NAME:	ENVIRONMENTAL SOIL ASSESSMENT		
CLIENT NAME:	UNIVERSITY OF CALIFORNIA		
LOCATION:	SANTA BARBARA, CA		
DATE PREPARED:	11/07/18		
SHEET:	FIG. 1	JOB NO.	F039

H:\F\F039\CAD\181107 – Figure 1 – Aerial Map Draft.dwg

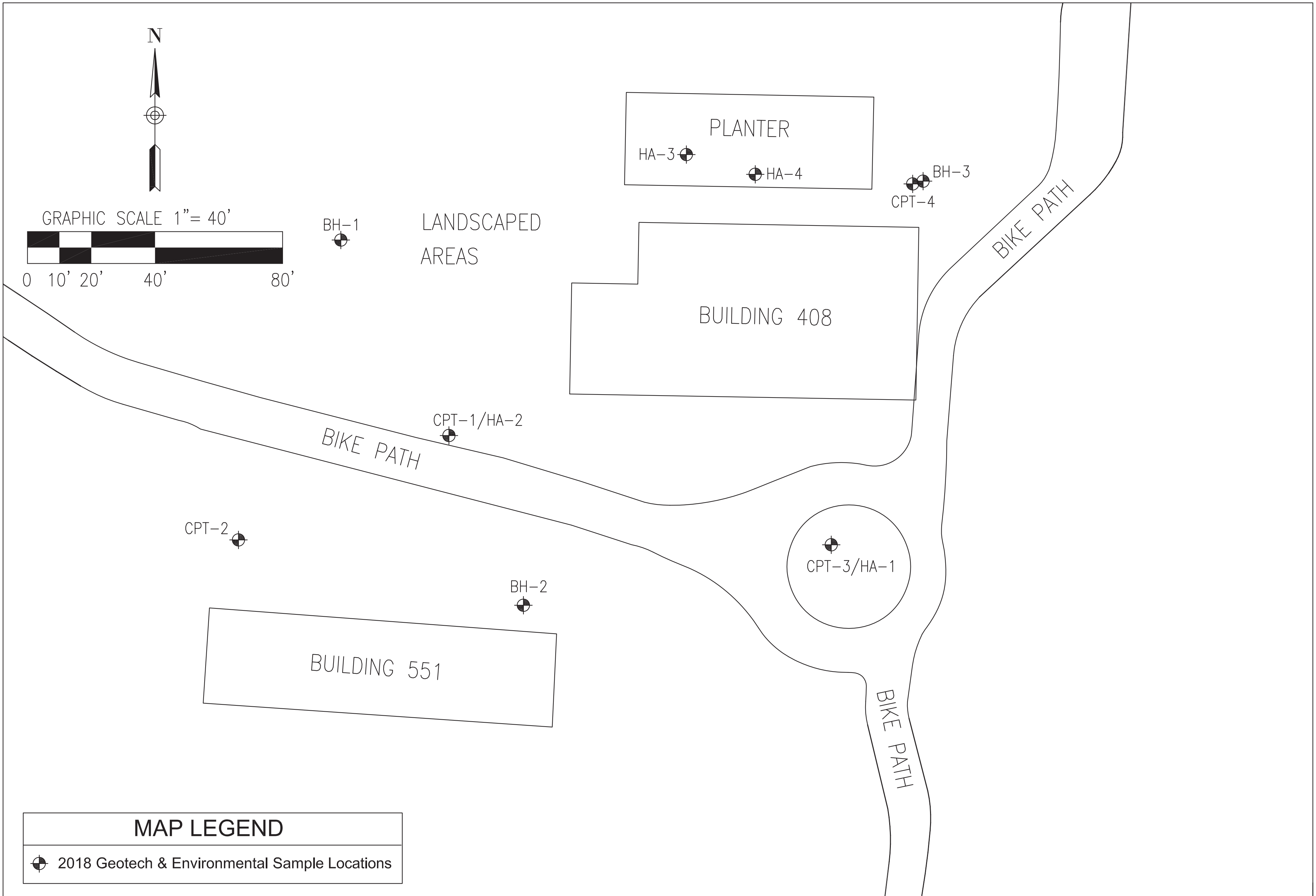

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FIGURE 2 – SITE MAP

PROJECT NAME:	ENVIRONMENTAL SOIL ASSESSMENT
CLIENT NAME:	UNIVERSITY OF CALIFORNIA
LOCATION:	SANTA BARBARA, CA
DATE PREPARED:	11/08/18
SHEET:	FIG. 2 — JOB NO. F039

H:\F\F039\CAD\181107 – Figure 2 – Site Map Draft.dwg

TABLES

Table 1
Soil VOC Analytical Results[a]
University of California, Santa Barbara, California

Location/ Sample ID	Date Sampled	Sample Depth (feet bgs)	n-Butyl benzene (mg/kg)	sec-Butyl benzene (mg/kg)	Carbon disulfide (mg/kg)	Ethyl benzene (mg/kg)	Isopropyl benzene (mg/kg)	p-Isopropyl toluene (mg/kg)	Naphthalene (mg/kg)	n-Propyl benzene (mg/kg)	1,2,4-Trimethyl benzene (mg/kg)	1,3,5-Trimethyl benzene (mg/kg)
HA-1-12'	09/21/18	12	<0.00098	<0.00098	<0.0098	<0.00098	<0.00098	<0.00098	<0.0098	<0.0020	<0.0020	<0.0020
HA-1-17'	09/21/18	17	<0.00097	<0.00097	<0.0097	<0.00097	<0.00097	<0.00097	<0.0097	<0.0019	<0.0019	<0.0019
BH-1-10'	09/21/18	10	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.010	<0.0020	<0.0020	<0.0020
BH-1-15'	09/21/18	15	<0.00089	<0.00089	<0.0089	<0.00089	<0.00089	<0.00089	<0.0089	<0.0089	<0.0018	<0.0018
HA-2-11'	09/21/18	11	<0.0011	<0.0011	<0.011	<0.0011	<0.0011	<0.0011	<0.011	<0.0021	<0.0021	<0.0021
HA-2-15'	09/21/18	15	<0.0010	<0.0010	<0.010	<0.0010	<0.0010	<0.0010	<0.010	<0.0020	<0.0020	<0.0020
BH-2-10'	09/21/18	10	<0.00098	<0.00098	<0.0098	<0.00098	<0.00098	<0.00098	<0.0098	<0.0020	<0.0020	<0.0020
BH-2-15'	09/21/18	15	<0.00089	<0.00089	<0.0089	<0.00089	<0.00089	<0.00089	<0.0089	<0.0018	<0.0018	<0.0018
HA-3-9'	09/21/18	9	<0.10	<0.10	<1.0	<0.10	<0.10	**0.10**	<1.0	<0.20	<0.20	<0.20
HA-3-15'	09/21/18	15	<0.00084	<0.00084	**0.016**	<0.00084	<0.00084	<0.00084	<0.0084	<0.0017	<0.0017	<0.0017
HA-4-10'	09/21/18	10	**1.8**	**1.1**	<1.2	**0.14**	**0.22**	**1.7**	**6.2**	**0.45**	**2.1**	**0.82**
HA-4-15'	09/21/18	15	<0.0011	<0.0011	<0.011	<0.0011	<0.0011	<0.0011	<0.011	<0.0022	<0.0022	<0.0022
BH-3-10'	09/21/18	10	<0.00083	<0.00083	<0.0083	<0.00083	<0.00083	<0.00083	<0.0083	<0.0017	<0.0017	<0.0017
BH-3-15'	09/21/18	15	<0.00091	<0.00091	<0.0091	<0.00091	<0.00091	<0.00091	<0.0091	<0.0018	<0.0018	<0.0018
SFBRWQCB ESLs[b] (mg/kg)			c	c	c	1.4	c	c	0.033	c	c	c

notes:

a = All other analytes listed in EPA Method 8260B not detected above the stated reporting limit (RL). See laboratory report for details.

b = San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) Tier 1 Environmental Screening Levels (ESLs) dated February 2016

c = no established ESL

VOC = volatile organic compounds

bgs = below ground surface

mg/kg= milligrams per kilogram

< = result is less than the stated RL

Table 2

Soil Carbon Chain Analytical Results[a]

University of California, Santa Barbara, California

Location/ Sample ID	Date Sampled	Sample Depth (feet bgs)	gasoline range organics				diesel range organics								oil range organics				C6-C44 Total (mg/kg)
			C6 (mg/kg)	C7 (mg/kg)	C8 (mg/kg)	C9-C10 (mg/kg)	C11-C12 (mg/kg)	C13-C14 (mg/kg)	C15-C16 (mg/kg)	C17-C18 (mg/kg)	C19-C20 (mg/kg)	C21-C22 (mg/kg)	C23-C24 (mg/kg)	C25-C28 (mg/kg)	C29-C32 (mg/kg)	C33-C36 (mg/kg)	C37-C40 (mg/kg)	C41-C44 (mg/kg)	
HA-1-12'	09/21/18	12	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	1.3J	1.8J	**6.0**	**7.3**	**6.6**	4.0J	4.5J	**32**
HA-1-17'	09/21/18	17	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	3.3J	4.2J	3.3J	1.8J	2.8J	**18**
BH-1-10'	09/21/18	10	<9.9	<9.9	<9.9	<9.9	<9.9	<9.9	<9.9	<9.9	4.7J	7.6J	**11**	**30**	**40**	**32**	**18**	**15**	**160**
BH-1-15'	09/21/18	15	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	1.3J	2.7J	3.2J	3.3J	**9.7**	**10**	**7.4**	3.7J	4.0J	**46**
HA-2-11'	09/21/18	11	<25	<25	<25	<25	<25	<25	<25	<25	<25	7.3J	8.9J	**29**	**39**	**31**	16J	17J	**160**
HA-2-15'	09/21/18	15	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	1.4J	2.2J	3.8J	3.0J	<5.0	2.3J	**16**
BH-2-10'	09/21/18	10	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	1.4J
BH-2-15'	09/21/18	15	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	1.3J	2.1J	2.6J	3.4J	**8.8**	**10**	**7.0**	2.8J	3.2J	**42**
HA-3-9'	09/21/18	9	<49	<49	<49	**260**	**1,600**	**1,600**	**880**	**610**	**250**	**110**	45J	21J	<49	<49	<49	<49	**5,400**
HA-3-15'	09/21/18	15	<4.9	<4.9	<4.9	<4.9	**5.3**	**5.4**	3.7J	2.3J	<4.9	<4.9	<4.9	1.3J	2.0J	1.6J	<4.9	<4.9	**24**
HA-4-10'	09/21/18	10	<98	<98	<98	**1,000**	**4,400**	**4,000**	**2,000**	**1,000**	**340**	**130**	49J	<98	<98	<98	<98	<98	**13,000**
HA-4-15'	09/21/18	15	<4.9	<4.9	<4.9	1.5J	**9.1**	**9.1**	**6.7**	3.4J	1.2J	<4.9	<4.9	2.1J	3.4J	2.4J	<4.9	<4.9	**41**
BH-3-10'	09/21/18	10	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	16J	**30**	**26**	16J	20J	**110**
BH-3-15'	09/21/18	15	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<1.2
RWQCB ESLs (mg/kg)[b]			100				230								5,100				100[c]

notes:

a = Carbon chain petroleum hydrocarbons analyzed by EPA Test Method 8015M.

b = San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) Tier 1 Environmental Screening Levels (ESLs) dated February 2016.

c = no established ESL, Santa Barbara County Public Health Department, Environmental Health Services action level

C9 = carbon chain length

mg/kg= milligrams per kilogram

bgs = below ground surface

< = result is less than the stated method detection limit

J = Analyte was detected at a concentration below the RL and above the MDL. Reported value is estimated

Table 3

Soil CCR Title 22 Metals Analytical Results[a]

University of California, Santa Barbara, California

Location/ Sample ID	Date Sampled	Sample Depth (feet bgs)	Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Total Chromium (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Molybdenum (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)	Mercury (mg/kg)
HA-1-12'	09/21/18	12	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
HA-1-17'	09/21/18	17	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
BH-1-10'	09/21/18	10	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
BH-1-15'	09/21/18	15	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
HA-2-11'	09/21/18	11	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
HA-2-15'	09/21/18	15	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
BH-2-10'	09/21/18	10	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
BH-2-15'	09/21/18	15	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
HA-3-9'	09/21/18	9	<0.781	**1.04**	**18.0**	**0.372**	<0.521	**11.2**	**3.38**	**1.97**	**1.94**	<0.260	**8.09**	<0.781	<0.260	<0.781	**9.01**	**9.31**	<0.0794
HA-3-15'	09/21/18	15	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
HA-4-10'	09/21/18	10	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
HA-4-15'	09/21/18	15	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
BH-3-10'	09/21/18	10	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
BH-3-15'	09/21/18	15	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
SFBRWQCB ESLs[b] (mg/kg)			31	0.067	3,000	42	39	c	23	3,100	80	390	86	390	390	0.78	390	23,000	13

notes:

a = California Code of Regulations (CCR) Title 22 Metals analyzed by EPA Test Method 6010B

b = San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) Tier 1 Environmental Screening Levels (ESLs) dated February 2016

c = SFBRWQCB Tier 1 ESLs for Chromium III is 120,000 mg/kg and 0.3 mg/kg for Chromium VI

mg/kg= milligrams per kilogram

< = result is less than the stated reporting limit

na = not analyzed

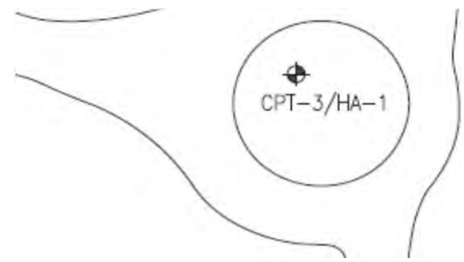
APPENDIX A

Boring Logs

Boring ID#: HA-1

Project: UCSB, New Classroom Building
Location: Vicinity of Building 408
Date: September 21, 2018
Logged By: S. Aichner
Drilling Method: Hand Auger
Borehole Diameter: 4-inch
Sampling Method: Grab

see Figure 2



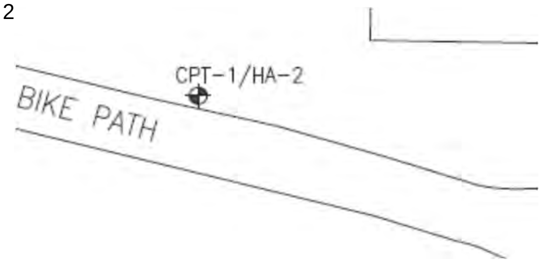
not to scale

Time	PID (ppmV)	Sample ID	Blow Count	Well Construction	Depth (feet bgs)	USCS	Description
					0		surface conditions: landscape bark
					1		
					2		
					3		
					4		
0815	0.0		not applicable	not applicable	**5**	**SC**	**CLAYEY SAND (SC)** grayish brown, slightly moist, fine sand with clay, trace silt
					6		
					7		
					8		
					9		
					10		
					11		
0830	0.0	HA-1-12'			12	**SP**	**SAND (SP)** light gray, slightly moist, poorly graded sand with trace silt, slight moisture increase at 12.5 feet bgs
					13	**CL**	**SANDY CLAY (CL)** dark gray, slightly moist, clay with fine sand, shell fragments, weathered mudstone
					14		
					15		
					16		
0855	0.0	HA-1-17'			17		boring terminated at 17 feet bgs, no staining, odors or groundwater encountered
					18		
					19		
					20		

Boring ID#: HA-2

Project: UCSB, New Classroom Building
Location: Vicinity of Building 408
Date: September 21, 2018
Logged By: S. Aichner
Drilling Method: Hand Auger
Borehole Diameter: 4-inch
Sampling Method: Grab

see Figure 2



not to scale

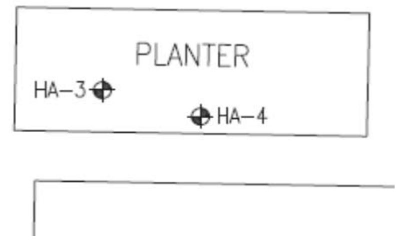
Time	PID (ppmV)	Sample ID	Blow Count	Well Construction	Depth (feet bgs)	USCS	Description
					0		surface conditions: lawn
			not applicable	not applicable	1		
					2		
					3		
					4		
1005	0.0				**5**	**SC**	**CLAYEY SAND (SC)** grayish brown, slightly moist, fine sand with clay, trace silt
					6		
					7		
					8		
					9		
					10		
1015	0.0	HA-2-11'			11	**SP**	**SAND (SP)** light gray, slightly moist, poorly graded sand with trace silt
					12		
					13		
					14		slight moisture increase at 14 feet bgs
						CL	**SANDY CLAY (CL)** dark gray, slightly moist, clay with fine sand, shell fragments, weathered mudstone
1035	0.0	HA-2-15'			**15**		boring terminated at 15 feet bgs, no staining, odors or groundwater encountered
					16		
					17		
					18		
					19		
					20		

Boring ID#: HA-3

JHA ENVIRONMENTAL

Project: UCSB, New Classroom Building
Location: Vicinity of Building 408
Date: September 21, 2018
Logged By: S. Aichner
Drilling Method: Hand Auger
Borehole Diameter: 4-inch
Sampling Method: Grab

see Figure 2



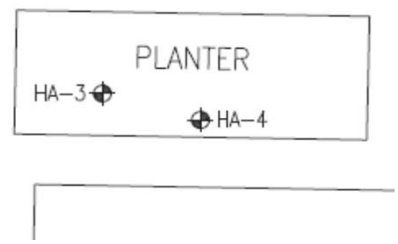
not to scale

Time	PID (ppmV)	Sample ID	Blow Count	Well Construction	Depth (feet bgs)	USCS	Description
					0		surface conditions: landscape groundcover
			not applicable	not applicable	1		
					2		
					3		
					4		
1230	0.0				**5**	**SM**	**SILTY SAND (SM)** grayish brown, slightly moist, fine sand with silt, no odor or staining encountered
					6		
					7		
					8		
1240	397	HA-3-9'			9	**SP**	**SAND (SP)** light gray, slightly moist, poorly graded sand with trace silt, no staining, hydrocarbon odor present
					10		
					11		
					12		
					13		slight moisture increase at 13.5 feet bgs
					14	**CL**	**SANDY CLAY (CL)** dark gray, slightly moist, clay with fine sand, shell fragments, weathered mudstone, no staining, slight hydrocarbon odor present
1250	40.1	HA-3-15'			**15**		boring terminated at 15 feet bgs, no groundwater encountered
					16		
					17		
					18		
					19		
					20		

Boring ID#: HA-4

Project: UCSB, New Classroom Building
Location: Vicinity of Building 408
Date: September 21, 2018
Logged By: S. Aichner
Drilling Method: Hand Auger
Borehole Diameter: 4-inch
Sampling Method: Grab

see Figure 2



not to scale

Time	PID (ppmV)	Sample ID	Blow Count	Well Construction	Depth (feet bgs)	USCS	Description
					0		surface conditions: landscape groundcover
1410	3.4				5	SM	**SILTY SAND (SM)** grayish brown, slightly moist, fine sand with silt, no staining, slight hydrocarbon odor present
1420	579	HA-4-10'	not applicable	not applicable	10	SP	**SAND (SP)** light gray, slightly moist, poorly graded sand with trace silt, no staining, hydrocarbon odor present
1430	7.0	HA-4-15'			15	CL	**SANDY CLAY (CL)** dark gray, slightly moist, clay with fine sand, shell fragments, weathered mudstone, no staining, slight hydrocarbon odor
							boring terminated at 15 feet bgs, no groundwater encountered
					20		

JHA ENVIRONMENTAL

Boring ID#: BH-1

Project: UCSB, New Classroom Building
Location: Vicinity of Building 408
Date: September 21, 2018
Logged By: S. Aichner
Drilling Method: Hollow Stem Auger
Borehole Diameter: 8-inch
Sampling Method: Grab

see Figure 2

not to scale

Time	PID (ppmV)	Sample ID	Blow Count	Well Construction	Depth (feet bgs)	USCS	Description
					0		surface conditions: lawn
			see Fugro log for geotechnical data	not applicable	1		
					2		
					3		
					4		
0905	0.0				**5**	**SC**	**CLAYEY SAND (SC)** grayish brown, slightly moist fine sand with clay, trace silt, no staining or odors
					6		
					7		
					8		
					9		
0920	0.7	BH-1-10'			**10**	**SP**	**SAND (SP)** light gray, slightly moist, poorly graded sand with trace silt, no staining or odors
					11		
					12		
					13		
					14		
0930	0.1	BH-1-15'			**15**	**CL**	**SANDY CLAY (CL)** dark gray, slightly moist, clay with fine sand, shell fragments, weathered mudstone, no staining or odors
					16		
					17		
					18		
					19		
					20		note: soil description based on grab samples collected at Fugro hollow stem auger boring locations, see Fugro boring logs for detail boring location information

Boring ID#: BH-2

Project: UCSB, New Classroom Building

Location: Vicinity of Building 408

Date: September 21, 2018

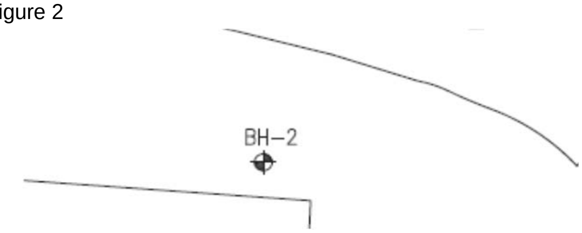
Logged By: S. Aichner

Drilling Method: Hollow Stem Auger

Borehole Diameter: 8-inch

Sampling Method: Grab

see Figure 2



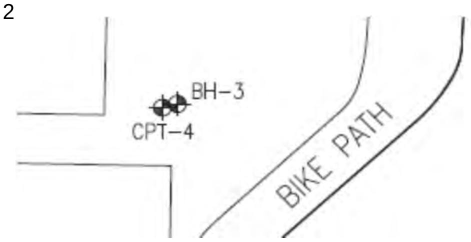
not to scale

Time	PID (ppmV)	Sample ID	Blow Count	Well Construction	Depth (feet bgs)	USCS	Description
					0		surface conditions: decomposed granite fill
					1		
					2		
					3		
					4		
1150	0.0				**5**	**SM**	**SILTY SAND (SM)** grayish brown, slightly moist, fine sand with silt, no odor or staining encountered
					6		
					7		
					8		
					9		
1200	0.0	BH-2-10'	see Fugro log for geotechnical data	not applicable	**10**	**SP**	**SAND (SP)** light gray, slightly moist, poorly graded sand with trace silt, no staining or odors
					11		
					12		
					13		
					14		
1220	0.0	BH-2-15'			**15**	**CL**	**SANDY CLAY (CL)** dark gray, slightly moist, clay with fine sand, shell fragments, weathered mudstone, no staining or odors
					16		
					17		
					18		
					19		
					20		note: soil description based on grab samples collected at Fugro hollow stem auger boring locations, see Fugro boring logs for detail boring location information

Boring ID#: BH-3

Project: UCSB, New Classroom Building
Location: Vicinity of Building 408
Date: September 21, 2018
Logged By: S. Aichner
Drilling Method: Hollow Stem Auger
Borehole Diameter: 8-inch
Sampling Method: Grab

see Figure 2



not to scale

Time	PID (ppmV)	Sample ID	Blow Count	Well Construction	Depth (feet bgs)	USCS	Description
					0		surface conditions: lawn
			see Fugro log for geotechnical data	not applicable	1		
					2		
					3		
					4		
1450	2.4				**5**	**SM**	**SILTY SAND (SM)** grayish brown, slightly moist, fine sand with silt, no odor or staining encountered
					6		
					7		
					8		
					9		
1505	3.8	BH-3-10'			**10**	**SP**	**SAND (SP)** light gray, slightly moist, poorly graded sand with trace silt, no staining, very slight hydrocarbon odor
					11		
					12		
					13		
					14		
1520	4.5	BH-3-15'			**15**	**CL**	**SANDY CLAY (CL)** dark gray, slightly moist, clay with fine sand, shell fragments, weathered mudstone, no staining, very slight hydrocarbon odor
					16		
					17		
					18		
					19		
					20		note: soil description based on grab samples collected at Fugro hollow stem auger boring locations, see Fugro boring logs for detail boring location information

APPENDIX B

Laboratory Report

Supplemental Report 1

WORK ORDER NUMBER: 18-09-1668

The difference is service

AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For

Client: Jacob & Hefner Associates, Inc.

Client Project Name: UCSB - Building 408

Attention: Stacie Aichner
4680 East Los Angeles Ave, Suite O
Simi Valley, CA 93063-3407

Approved for release on 11/07/2018 by:
Richard Villafania
Project Manager

ResultLink ▸

Email your PM ▸

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Contents

Client Project Name: UCSB - Building 408
Work Order Number: 18-09-1668

Work Order Narrative

Work Order: 18-09-1668 | Page 1 of 1

Condition Upon Receipt:

Samples were received under Chain-of-Custody (COC) on 09/22/18. They were assigned to Work Order 18-09-1668.

Unless otherwise noted on the Sample Receiving forms all samples were received in good condition and within the recommended EPA temperature criteria for the methods noted on the COC. The COC and Sample Receiving Documents are integral elements of the analytical report and are presented at the back of the report.

Holding Times:

All samples were analyzed within prescribed holding times (HT) and/or in accordance with the Calscience Sample Acceptance Policy unless otherwise noted in the analytical report and/or comprehensive case narrative, if required.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

Quality Control:

All quality control parameters (QC) were within established control limits except where noted in the QC summary forms or described further within this report.

Subcontractor Information:

Unless otherwise noted below (or on the subcontract form), no samples were subcontracted.

Additional Comments:

Air - Sorbent-extracted air methods (EPA TO-4A, EPA TO-10, EPA TO-13A, EPA TO-17): Analytical results are converted from mass/sample basis to mass/volume basis using client-supplied air volumes.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are always reported on a wet weight basis.

DoD Projects:

The test results contained in this report are accredited under the laboratory's ISO/IEC 17025:2005 and DoD-ELAP accreditation issued by the ANSI-ASQ National Accreditation Board. Refer to certificate and scope of accreditation ADE-1864.

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Sample Summary

Client:	Jacob & Hefner Associates, Inc. 4680 East Los Angeles Ave, Suite O Simi Valley, CA 93063-3407	Work Order:	18-09-1668
		Project Name:	UCSB - Building 408
		PO Number:	F039f_1L_800
		Date/Time Received:	09/22/18 10:15
		Number of Containers:	57
Attn:	Stacie Aichner		

Sample Identification	Lab Number	Collection Date and Time	Number of Containers	Matrix
HA-1-12'	18-09-1668-1	09/21/18 08:30	4	Solid
HA-1-17'	18-09-1668-2	09/21/18 08:55	4	Solid
BH-1-10'	18-09-1668-3	09/21/18 09:20	4	Solid
BH-1-15'	18-09-1668-4	09/21/18 09:30	4	Solid
HA-2-11'	18-09-1668-5	09/21/18 10:15	4	Solid
HA-2-15'	18-09-1668-6	09/21/18 10:35	4	Solid
BH-2-10'	18-09-1668-7	09/21/18 12:00	4	Solid
BH-2-15'	18-09-1668-8	09/21/18 12:20	4	Solid
HA-3-9'	18-09-1668-9	09/21/18 12:40	5	Solid
HA-3-15'	18-09-1668-10	09/21/18 12:50	4	Solid
HA-4-10'	18-09-1668-11	09/21/18 14:20	4	Solid
HA-4-15	18-09-1668-12	09/21/18 14:30	4	Solid
BH-3-10'	18-09-1668-13	09/21/18 15:05	4	Solid
BH-3-15'	18-09-1668-14	09/21/18 15:20	4	Solid

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Analytical Report

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 3550B
		Method:	EPA 8015B (M)
		Units:	mg/kg
Project: UCSB - Building 408			Page 1 of 15

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
HA-1-12'	**18-09-1668-1-A**	**09/21/18 08:30**	**Solid**	**GC 46**	**09/26/18**	**09/27/18 06:45**	**180926B10**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.
- The total concentration includes individual carbon range concentrations (estimated), if any, below the RL reported as ND.

Parameter	Result	RL	MDL	DF	Qualifiers
C6	ND	4.9	1.2	1.00	
C7	ND	4.9	1.2	1.00	
C8	ND	4.9	1.2	1.00	
C9-C10	ND	4.9	1.2	1.00	
C11-C12	ND	4.9	1.2	1.00	
C13-C14	ND	4.9	1.2	1.00	
C15-C16	ND	4.9	1.2	1.00	
C17-C18	ND	4.9	1.2	1.00	
C19-C20	ND	4.9	1.2	1.00	
C21-C22	1.3	4.9	1.2	1.00	J
C23-C24	1.8	4.9	1.2	1.00	J
C25-C28	6.0	4.9	1.2	1.00	
C29-C32	7.3	4.9	1.2	1.00	
C33-C36	6.6	4.9	1.2	1.00	
C37-C40	4.0	4.9	1.2	1.00	J
C41-C44	4.5	4.9	1.2	1.00	J
C6-C44 Total	32	4.9	1.2	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
n-Octacosane	88	61-145	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.	Date Received: 09/22/18
4680 East Los Angeles Ave, Suite O	Work Order: 18-09-1668
Simi Valley, CA 93063-3407	Preparation: EPA 3550B
	Method: EPA 8015B (M)
	Units: mg/kg
Project: UCSB - Building 408	Page 2 of 15

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
HA-1-17'	**18-09-1668-2-A**	**09/21/18 08:55**	**Solid**	**GC 46**	**09/26/18**	**09/27/18 07:06**	**180926B10**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.
- The total concentration includes individual carbon range concentrations (estimated), if any, below the RL reported as ND.

Parameter	Result	RL	MDL	DF	Qualifiers
C6	ND	4.9	1.2	1.00	
C7	ND	4.9	1.2	1.00	
C8	ND	4.9	1.2	1.00	
C9-C10	ND	4.9	1.2	1.00	
C11-C12	ND	4.9	1.2	1.00	
C13-C14	ND	4.9	1.2	1.00	
C15-C16	ND	4.9	1.2	1.00	
C17-C18	ND	4.9	1.2	1.00	
C19-C20	ND	4.9	1.2	1.00	
C21-C22	ND	4.9	1.2	1.00	
C23-C24	ND	4.9	1.2	1.00	
C25-C28	3.3	4.9	1.2	1.00	J
C29-C32	4.2	4.9	1.2	1.00	J
C33-C36	3.3	4.9	1.2	1.00	J
C37-C40	1.8	4.9	1.2	1.00	J
C41-C44	2.8	4.9	1.2	1.00	J
C6-C44 Total	18	4.9	1.2	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
n-Octacosane	84	61-145	

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Analytical Report

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 3550B
		Method:	EPA 8015B (M)
		Units:	mg/kg
Project: UCSB - Building 408			Page 3 of 15

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
BH-1-10'	**18-09-1668-3-A**	**09/21/18 09:20**	**Solid**	**GC 46**	**09/26/18**	**09/27/18 07:26**	**180926B10**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.
- The total concentration includes individual carbon range concentrations (estimated), if any, below the RL reported as ND.

Parameter	Result	RL	MDL	DF	Qualifiers
C6	ND	9.9	2.5	2.00	
C7	ND	9.9	2.5	2.00	
C8	ND	9.9	2.5	2.00	
C9-C10	ND	9.9	2.5	2.00	
C11-C12	ND	9.9	2.5	2.00	
C13-C14	ND	9.9	2.5	2.00	
C15-C16	ND	9.9	2.5	2.00	
C17-C18	ND	9.9	2.5	2.00	
C19-C20	4.7	9.9	2.5	2.00	J
C21-C22	7.6	9.9	2.5	2.00	J
C23-C24	11	9.9	2.5	2.00	
C25-C28	30	9.9	2.5	2.00	
C29-C32	40	9.9	2.5	2.00	
C33-C36	32	9.9	2.5	2.00	
C37-C40	18	9.9	2.5	2.00	
C41-C44	15	9.9	2.5	2.00	
C6-C44 Total	160	9.9	2.5	2.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
n-Octacosane	106	61-145	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.
4680 East Los Angeles Ave, Suite O
Simi Valley, CA 93063-3407

Date Received:	09/22/18
Work Order:	18-09-1668
Preparation:	EPA 3550B
Method:	EPA 8015B (M)
Units:	mg/kg

Project: UCSB - Building 408

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
BH-1-15'	**18-09-1668-4-A**	**09/21/18 09:30**	**Solid**	**GC 46**	**09/26/18**	**09/27/18 07:46**	**180926B10**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.
- The total concentration includes individual carbon range concentrations (estimated), if any, below the RL reported as ND.

Parameter	Result	RL	MDL	DF	Qualifiers
C6	ND	4.8	1.2	1.00	
C7	ND	4.8	1.2	1.00	
C8	ND	4.8	1.2	1.00	
C9-C10	ND	4.8	1.2	1.00	
C11-C12	ND	4.8	1.2	1.00	
C13-C14	ND	4.8	1.2	1.00	
C15-C16	ND	4.8	1.2	1.00	
C17-C18	1.3	4.8	1.2	1.00	J
C19-C20	2.7	4.8	1.2	1.00	J
C21-C22	3.2	4.8	1.2	1.00	J
C23-C24	3.3	4.8	1.2	1.00	J
C25-C28	9.7	4.8	1.2	1.00	
C29-C32	10	4.8	1.2	1.00	
C33-C36	7.4	4.8	1.2	1.00	
C37-C40	3.7	4.8	1.2	1.00	J
C41-C44	4.0	4.8	1.2	1.00	J
C6-C44 Total	46	4.8	1.2	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
n-Octacosane	96	61-145	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Calscience

Analytical Report

Jacob & Hefner Associates, Inc.	Date Received: 09/22/18
4680 East Los Angeles Ave, Suite O	Work Order: 18-09-1668
Simi Valley, CA 93063-3407	Preparation: EPA 3550B
	Method: EPA 8015B (M)
	Units: mg/kg
Project: UCSB - Building 408	Page 5 of 15

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
HA-2-11'	**18-09-1668-5-A**	**09/21/18 10:15**	**Solid**	**GC 46**	**09/26/18**	**09/27/18 08:07**	**180926B10**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.
- The total concentration includes individual carbon range concentrations (estimated), if any, below the RL reported as ND.

Parameter	Result	RL	MDL	DF	Qualifiers
C6	ND	25	6.1	5.00	
C7	ND	25	6.1	5.00	
C8	ND	25	6.1	5.00	
C9-C10	ND	25	6.1	5.00	
C11-C12	ND	25	6.1	5.00	
C13-C14	ND	25	6.1	5.00	
C15-C16	ND	25	6.1	5.00	
C17-C18	ND	25	6.1	5.00	
C19-C20	ND	25	6.1	5.00	
C21-C22	7.3	25	6.1	5.00	J
C23-C24	8.9	25	6.1	5.00	J
C25-C28	29	25	6.1	5.00	
C29-C32	39	25	6.1	5.00	
C33-C36	31	25	6.1	5.00	
C37-C40	16	25	6.1	5.00	J
C41-C44	17	25	6.1	5.00	J
C6-C44 Total	160	25	6.1	5.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
n-Octacosane	89	61-145	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

eurofins Calscience

Analytical Report

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 3550B
		Method:	EPA 8015B (M)
		Units:	mg/kg
Project: UCSB - Building 408			Page 6 of 15

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
HA-2-15'	**18-09-1668-6-A**	**09/21/18 10:35**	**Solid**	**GC 46**	**09/26/18**	**09/27/18 08:28**	**180926B10**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.
- The total concentration includes individual carbon range concentrations (estimated), if any, below the RL reported as ND.

Parameter	Result	RL	MDL	DF	Qualifiers
C6	ND	5.0	1.2	1.00	
C7	ND	5.0	1.2	1.00	
C8	ND	5.0	1.2	1.00	
C9-C10	ND	5.0	1.2	1.00	
C11-C12	ND	5.0	1.2	1.00	
C13-C14	ND	5.0	1.2	1.00	
C15-C16	ND	5.0	1.2	1.00	
C17-C18	ND	5.0	1.2	1.00	
C19-C20	ND	5.0	1.2	1.00	
C21-C22	ND	5.0	1.2	1.00	
C23-C24	1.4	5.0	1.2	1.00	J
C25-C28	2.2	5.0	1.2	1.00	J
C29-C32	3.8	5.0	1.2	1.00	J
C33-C36	3.0	5.0	1.2	1.00	J
C37-C40	ND	5.0	1.2	1.00	
C41-C44	2.3	5.0	1.2	1.00	J
C6-C44 Total	16	5.0	1.2	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
n-Octacosane	100	61-145	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.	Date Received: 09/22/18
4680 East Los Angeles Ave, Suite O	Work Order: 18-09-1668
Simi Valley, CA 93063-3407	Preparation: EPA 3550B
	Method: EPA 8015B (M)
	Units: mg/kg
Project: UCSB - Building 408	Page 7 of 15

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
BH-2-10'	**18-09-1668-7-A**	**09/21/18 12:00**	**Solid**	**GC 46**	**09/26/18**	**09/27/18 08:48**	**180926B10**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.
- The total concentration includes individual carbon range concentrations (estimated), if any, below the RL reported as ND.

Parameter	Result	RL	MDL	DF	Qualifiers
C6	ND	4.9	1.2	1.00	
C7	ND	4.9	1.2	1.00	
C8	ND	4.9	1.2	1.00	
C9-C10	ND	4.9	1.2	1.00	
C11-C12	ND	4.9	1.2	1.00	
C13-C14	ND	4.9	1.2	1.00	
C15-C16	ND	4.9	1.2	1.00	
C17-C18	ND	4.9	1.2	1.00	
C19-C20	ND	4.9	1.2	1.00	
C21-C22	ND	4.9	1.2	1.00	
C23-C24	ND	4.9	1.2	1.00	
C25-C28	ND	4.9	1.2	1.00	
C29-C32	ND	4.9	1.2	1.00	
C33-C36	ND	4.9	1.2	1.00	
C37-C40	ND	4.9	1.2	1.00	
C41-C44	ND	4.9	1.2	1.00	
C6-C44 Total	1.4	4.9	1.2	1.00	J

Surrogate	Rec. (%)	Control Limits	Qualifiers
n-Octacosane	92	61-145	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

eurofins Calscience

Analytical Report

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 3550B
		Method:	EPA 8015B (M)
		Units:	mg/kg
Project: UCSB - Building 408			Page 8 of 15

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
BH-2-15'	**18-09-1668-8-A**	**09/21/18 12:20**	**Solid**	**GC 46**	**09/26/18**	**09/27/18 09:08**	**180926B10**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.
- The total concentration includes individual carbon range concentrations (estimated), if any, below the RL reported as ND.

Parameter	Result	RL	MDL	DF	Qualifiers
C6	ND	4.9	1.2	1.00	
C7	ND	4.9	1.2	1.00	
C8	ND	4.9	1.2	1.00	
C9-C10	ND	4.9	1.2	1.00	
C11-C12	ND	4.9	1.2	1.00	
C13-C14	ND	4.9	1.2	1.00	
C15-C16	ND	4.9	1.2	1.00	
C17-C18	1.3	4.9	1.2	1.00	J
C19-C20	2.1	4.9	1.2	1.00	J
C21-C22	2.6	4.9	1.2	1.00	J
C23-C24	3.4	4.9	1.2	1.00	J
C25-C28	8.8	4.9	1.2	1.00	
C29-C32	10	4.9	1.2	1.00	
C33-C36	7.0	4.9	1.2	1.00	
C37-C40	2.8	4.9	1.2	1.00	J
C41-C44	3.2	4.9	1.2	1.00	J
C6-C44 Total	42	4.9	1.2	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
n-Octacosane	96	61-145	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 3550B
		Method:	EPA 8015B (M)
		Units:	mg/kg
Project: UCSB - Building 408			Page 9 of 15

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
HA-3-9'	**18-09-1668-9-B**	**09/21/18 12:40**	**Solid**	**GC 46**	**09/26/18**	**09/27/18 21:59**	**180926B10**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.
- The total concentration includes individual carbon range concentrations (estimated), if any, below the RL reported as ND.

Parameter	Result	RL	MDL	DF	Qualifiers
C6	ND	49	12	10.0	
C7	ND	49	12	10.0	
C8	ND	49	12	10.0	
C9-C10	260	49	12	10.0	
C11-C12	1600	49	12	10.0	
C13-C14	1600	49	12	10.0	
C15-C16	880	49	12	10.0	
C17-C18	610	49	12	10.0	
C19-C20	250	49	12	10.0	
C21-C22	110	49	12	10.0	
C23-C24	45	49	12	10.0	J
C25-C28	21	49	12	10.0	J
C29-C32	ND	49	12	10.0	
C33-C36	ND	49	12	10.0	
C37-C40	ND	49	12	10.0	
C41-C44	ND	49	12	10.0	
C6-C44 Total	5400	49	12	10.0	

Surrogate	Rec. (%)	Control Limits	Qualifiers
n-Octacosane	116	61-145	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.	Date Received: 09/22/18
4680 East Los Angeles Ave, Suite O	Work Order: 18-09-1668
Simi Valley, CA 93063-3407	Preparation: EPA 3550B
	Method: EPA 8015B (M)
	Units: mg/kg
Project: UCSB - Building 408	Page 10 of 15

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
HA-3-15'	**18-09-1668-10-A**	**09/21/18 12:50**	**Solid**	**GC 46**	**09/26/18**	**09/27/18 09:49**	**180926B10**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.
- The total concentration includes individual carbon range concentrations (estimated), if any, below the RL reported as ND.

Parameter	Result	RL	MDL	DF	Qualifiers
C6	ND	4.9	1.2	1.00	
C7	ND	4.9	1.2	1.00	
C8	ND	4.9	1.2	1.00	
C9-C10	ND	4.9	1.2	1.00	
C11-C12	5.3	4.9	1.2	1.00	
C13-C14	5.4	4.9	1.2	1.00	
C15-C16	3.7	4.9	1.2	1.00	J
C17-C18	2.3	4.9	1.2	1.00	J
C19-C20	ND	4.9	1.2	1.00	
C21-C22	ND	4.9	1.2	1.00	
C23-C24	ND	4.9	1.2	1.00	
C25-C28	1.3	4.9	1.2	1.00	J
C29-C32	2.0	4.9	1.2	1.00	J
C33-C36	1.6	4.9	1.2	1.00	J
C37-C40	ND	4.9	1.2	1.00	
C41-C44	ND	4.9	1.2	1.00	
C6-C44 Total	24	4.9	1.2	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
n-Octacosane	97	61-145	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 3550B
		Method:	EPA 8015B (M)
		Units:	mg/kg
Project: UCSB - Building 408			Page 11 of 15

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
HA-4-10'	**18-09-1668-11-A**	**09/21/18 14:20**	**Solid**	**GC 46**	**09/26/18**	**09/28/18 14:00**	**180926B10**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.
- The total concentration includes individual carbon range concentrations (estimated), if any, below the RL reported as ND.

Parameter	Result	RL	MDL	DF	Qualifiers
C6	ND	98	25	20.0	
C7	ND	98	25	20.0	
C8	ND	98	25	20.0	
C9-C10	1000	98	25	20.0	
C11-C12	4400	98	25	20.0	
C13-C14	4000	98	25	20.0	
C15-C16	2000	98	25	20.0	
C17-C18	1000	98	25	20.0	
C19-C20	340	98	25	20.0	
C21-C22	130	98	25	20.0	
C23-C24	49	98	25	20.0	J
C25-C28	ND	98	25	20.0	
C29-C32	ND	98	25	20.0	
C33-C36	ND	98	25	20.0	
C37-C40	ND	98	25	20.0	
C41-C44	ND	98	25	20.0	
C6-C44 Total	13000	98	25	20.0	

Surrogate	Rec. (%)	Control Limits	Qualifiers
n-Octacosane	99	61-145	

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eurofins Calscience

Analytical Report

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 3550B
		Method:	EPA 8015B (M)
		Units:	mg/kg
Project: UCSB - Building 408			Page 12 of 15

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
HA-4-15	**18-09-1668-12-A**	**09/21/18 14:30**	**Solid**	**GC 46**	**09/26/18**	**09/27/18 10:30**	**180926B10**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.
- The total concentration includes individual carbon range concentrations (estimated), if any, below the RL reported as ND.

Parameter	Result	RL	MDL	DF	Qualifiers
C6	ND	4.9	1.2	1.00	
C7	ND	4.9	1.2	1.00	
C8	ND	4.9	1.2	1.00	
C9-C10	1.5	4.9	1.2	1.00	J
C11-C12	9.1	4.9	1.2	1.00	
C13-C14	9.1	4.9	1.2	1.00	
C15-C16	6.7	4.9	1.2	1.00	
C17-C18	3.4	4.9	1.2	1.00	J
C19-C20	1.2	4.9	1.2	1.00	J
C21-C22	ND	4.9	1.2	1.00	
C23-C24	ND	4.9	1.2	1.00	
C25-C28	2.1	4.9	1.2	1.00	J
C29-C32	3.4	4.9	1.2	1.00	J
C33-C36	2.4	4.9	1.2	1.00	J
C37-C40	ND	4.9	1.2	1.00	
C41-C44	ND	4.9	1.2	1.00	
C6-C44 Total	41	4.9	1.2	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
n-Octacosane	100	61-145	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

eurofins Calscience

Analytical Report

Jacob & Hefner Associates, Inc.	Date Received: 09/22/18
4680 East Los Angeles Ave, Suite O	Work Order: 18-09-1668
Simi Valley, CA 93063-3407	Preparation: EPA 3550B
	Method: EPA 8015B (M)
	Units: mg/kg
Project: UCSB - Building 408	Page 13 of 15

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
BH-3-10'	**18-09-1668-13-A**	**09/21/18 15:05**	**Solid**	**GC 46**	**09/26/18**	**09/27/18 10:52**	**180926B10**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.
- The total concentration includes individual carbon range concentrations (estimated), if any, below the RL reported as ND.

Parameter	Result	RL	MDL	DF	Qualifiers
C6	ND	25	6.3	5.00	
C7	ND	25	6.3	5.00	
C8	ND	25	6.3	5.00	
C9-C10	ND	25	6.3	5.00	
C11-C12	ND	25	6.3	5.00	
C13-C14	ND	25	6.3	5.00	
C15-C16	ND	25	6.3	5.00	
C17-C18	ND	25	6.3	5.00	
C19-C20	ND	25	6.3	5.00	
C21-C22	ND	25	6.3	5.00	
C23-C24	ND	25	6.3	5.00	
C25-C28	16	25	6.3	5.00	J
C29-C32	30	25	6.3	5.00	
C33-C36	26	25	6.3	5.00	
C37-C40	16	25	6.3	5.00	J
C41-C44	20	25	6.3	5.00	J
C6-C44 Total	110	25	6.3	5.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
n-Octacosane	92	61-145	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 3550B
		Method:	EPA 8015B (M)
		Units:	mg/kg
Project: UCSB - Building 408			Page 14 of 15

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
BH-3-15'	**18-09-1668-14-A**	**09/21/18 15:20**	**Solid**	**GC 46**	**09/26/18**	**09/27/18 19:55**	**180926B10**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.
- The total concentration includes individual carbon range concentrations (estimated), if any, below the RL reported as ND.

Parameter	Result	RL	MDL	DF	Qualifiers
C6	ND	4.8	1.2	1.00	
C7	ND	4.8	1.2	1.00	
C8	ND	4.8	1.2	1.00	
C9-C10	ND	4.8	1.2	1.00	
C11-C12	ND	4.8	1.2	1.00	
C13-C14	ND	4.8	1.2	1.00	
C15-C16	ND	4.8	1.2	1.00	
C17-C18	ND	4.8	1.2	1.00	
C19-C20	ND	4.8	1.2	1.00	
C21-C22	ND	4.8	1.2	1.00	
C23-C24	ND	4.8	1.2	1.00	
C25-C28	ND	4.8	1.2	1.00	
C29-C32	ND	4.8	1.2	1.00	
C33-C36	ND	4.8	1.2	1.00	
C37-C40	ND	4.8	1.2	1.00	
C41-C44	ND	4.8	1.2	1.00	
C6-C44 Total	ND	4.8	1.2	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
n-Octacosane	104	61-145	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

eurofins Calscience

Analytical Report

Jacob & Hefner Associates, Inc.	Date Received: 09/22/18
4680 East Los Angeles Ave, Suite O	Work Order: 18-09-1668
Simi Valley, CA 93063-3407	Preparation: EPA 3550B
	Method: EPA 8015B (M)
	Units: mg/kg
Project: UCSB - Building 408	Page 15 of 15

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-15-490-3305**	**N/A**	**Solid**	**GC 46**	**09/26/18**	**09/27/18 19:13**	**180926B10**

Comment(s): - Results were evaluated to the MDL (DL), concentrations >= to the MDL (DL) but < RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
C6	ND	5.0	1.3	1.00	
C7	ND	5.0	1.3	1.00	
C8	ND	5.0	1.3	1.00	
C9-C10	ND	5.0	1.3	1.00	
C11-C12	ND	5.0	1.3	1.00	
C13-C14	ND	5.0	1.3	1.00	
C15-C16	ND	5.0	1.3	1.00	
C17-C18	ND	5.0	1.3	1.00	
C19-C20	ND	5.0	1.3	1.00	
C21-C22	ND	5.0	1.3	1.00	
C23-C24	ND	5.0	1.3	1.00	
C25-C28	ND	5.0	1.3	1.00	
C29-C32	ND	5.0	1.3	1.00	
C33-C36	ND	5.0	1.3	1.00	
C37-C40	ND	5.0	1.3	1.00	
C41-C44	ND	5.0	1.3	1.00	
C6-C44 Total	ND	5.0	1.3	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
n-Octacosane	102	61-145	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

eurofins Calscience

Analytical Report

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 3050B
		Method:	EPA 6010B
		Units:	mg/kg
Project: UCSB - Building 408			Page 1 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
HA-3-9'	**18-09-1668-9-A**	**09/21/18 12:40**	**Solid**	**ICP 8300**	**09/27/18**	**09/28/18 20:30**	**180927L01**

Parameter	Result	RL	DF	Qualifiers
Antimony	ND	0.781	1.04	
Arsenic	1.04	0.781	1.04	
Barium	18.0	0.521	1.04	
Beryllium	0.372	0.260	1.04	
Cadmium	ND	0.521	1.04	
Chromium	11.2	0.260	1.04	
Cobalt	3.38	0.260	1.04	
Copper	1.97	0.521	1.04	
Lead	1.94	0.521	1.04	
Molybdenum	ND	0.260	1.04	
Nickel	8.09	0.260	1.04	
Selenium	ND	0.781	1.04	
Silver	ND	0.260	1.04	
Thallium	ND	0.781	1.04	
Vanadium	9.01	0.260	1.04	
Zinc	9.31	1.04	1.04	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 3050B
		Method:	EPA 6010B
		Units:	mg/kg
Project: UCSB - Building 408			Page 2 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**097-01-002-27033**	**N/A**	**Solid**	**ICP 8300**	**09/27/18**	**09/28/18 19:53**	**180927L01**

Parameter	Result	RL	DF	Qualifiers
Antimony	ND	0.728	0.971	
Arsenic	ND	0.728	0.971	
Barium	ND	0.485	0.971	
Beryllium	ND	0.243	0.971	
Cadmium	ND	0.485	0.971	
Chromium	ND	0.243	0.971	
Cobalt	ND	0.243	0.971	
Copper	ND	0.485	0.971	
Lead	ND	0.485	0.971	
Molybdenum	0.314	0.243	0.971	
Nickel	ND	0.243	0.971	
Selenium	ND	0.728	0.971	
Silver	ND	0.243	0.971	
Thallium	ND	0.728	0.971	
Vanadium	ND	0.243	0.971	
Zinc	ND	0.971	0.971	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 7471A Total
		Method:	EPA 7471A
		Units:	mg/kg
Project: UCSB - Building 408			Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
HA-3-9'	**18-09-1668-9-A**	**09/21/18 12:40**	**Solid**	**Mercury 08**	**09/27/18**	**09/27/18 13:12**	**180927L02**

Parameter	Result	RL	DF	Qualifiers
Mercury	ND	0.0794	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-16-272-4165**	**N/A**	**Solid**	**Mercury 08**	**09/27/18**	**09/27/18 12:47**	**180927L02**

Parameter	Result	RL	DF	Qualifiers
Mercury	ND	0.0833	1.00	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.	Date Received: 09/22/18
4680 East Los Angeles Ave, Suite O	Work Order: 18-09-1668
Simi Valley, CA 93063-3407	Preparation: EPA 5035
	Method: EPA 8260B
	Units: ug/kg
Project: UCSB - Building 408	Page 1 of 48

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
HA-1-12'	**18-09-1668-1-C**	**09/21/18 08:30**	**Solid**	**GC/MS OO**	**09/22/18**	**09/28/18 00:30**	**180927L055**

Parameter	Result	RL	DF	Qualifiers
Acetone	ND	49	1.00	
Benzene	ND	0.98	1.00	
Bromobenzene	ND	0.98	1.00	
Bromochloromethane	ND	2.0	1.00	
Bromodichloromethane	ND	0.98	1.00	
Bromoform	ND	4.9	1.00	
Bromomethane	ND	20	1.00	
2-Butanone	ND	20	1.00	
n-Butylbenzene	ND	0.98	1.00	
sec-Butylbenzene	ND	0.98	1.00	
tert-Butylbenzene	ND	0.98	1.00	
Carbon Disulfide	ND	9.8	1.00	
Carbon Tetrachloride	ND	0.98	1.00	
Chlorobenzene	ND	0.98	1.00	
Chloroethane	ND	2.0	1.00	
Chloroform	ND	0.98	1.00	
Chloromethane	ND	20	1.00	
2-Chlorotoluene	ND	0.98	1.00	
4-Chlorotoluene	ND	0.98	1.00	
Dibromochloromethane	ND	2.0	1.00	
1,2-Dibromo-3-Chloropropane	ND	4.9	1.00	
1,2-Dibromoethane	ND	0.98	1.00	
Dibromomethane	ND	0.98	1.00	
1,2-Dichlorobenzene	ND	0.98	1.00	
1,3-Dichlorobenzene	ND	0.98	1.00	
1,4-Dichlorobenzene	ND	0.98	1.00	
Dichlorodifluoromethane	ND	2.0	1.00	
1,1-Dichloroethane	ND	0.98	1.00	
1,2-Dichloroethane	ND	0.98	1.00	
1,1-Dichloroethene	ND	0.98	1.00	
c-1,2-Dichloroethene	ND	0.98	1.00	
t-1,2-Dichloroethene	ND	0.98	1.00	
1,2-Dichloropropane	ND	0.98	1.00	
1,3-Dichloropropane	ND	0.98	1.00	
2,2-Dichloropropane	ND	4.9	1.00	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 5035
		Method:	EPA 8260B
		Units:	ug/kg
Project: UCSB - Building 408			Page 2 of 48

Parameter	Result	RL	DF	Qualifiers
1,1-Dichloropropene	ND	2.0	1.00	
c-1,3-Dichloropropene	ND	0.98	1.00	
t-1,3-Dichloropropene	ND	2.0	1.00	
Ethylbenzene	ND	0.98	1.00	
2-Hexanone	ND	20	1.00	
Isopropylbenzene	ND	0.98	1.00	
p-Isopropyltoluene	ND	0.98	1.00	
Methylene Chloride	ND	9.8	1.00	
4-Methyl-2-Pentanone	ND	20	1.00	
Naphthalene	ND	9.8	1.00	
n-Propylbenzene	ND	2.0	1.00	
Styrene	ND	0.98	1.00	
1,1,1,2-Tetrachloroethane	ND	0.98	1.00	
1,1,2,2-Tetrachloroethane	ND	2.0	1.00	
Tetrachloroethene	ND	0.98	1.00	
Toluene	ND	0.98	1.00	
1,2,3-Trichlorobenzene	ND	2.0	1.00	
1,2,4-Trichlorobenzene	ND	2.0	1.00	
1,1,1-Trichloroethane	ND	0.98	1.00	
1,1,2-Trichloroethane	ND	0.98	1.00	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	9.8	1.00	
Trichloroethene	ND	2.0	1.00	
Trichlorofluoromethane	ND	9.8	1.00	
1,2,3-Trichloropropane	ND	2.0	1.00	
1,2,4-Trimethylbenzene	ND	2.0	1.00	
1,3,5-Trimethylbenzene	ND	2.0	1.00	
Vinyl Acetate	ND	9.8	1.00	
Vinyl Chloride	ND	0.98	1.00	
p/m-Xylene	ND	2.0	1.00	
o-Xylene	ND	0.98	1.00	
Methyl-t-Butyl Ether (MTBE)	ND	2.0	1.00	
Tert-Butyl Alcohol (TBA)	ND	20	1.00	
Diisopropyl Ether (DIPE)	ND	0.98	1.00	
Ethyl-t-Butyl Ether (ETBE)	ND	0.98	1.00	
Tert-Amyl-Methyl Ether (TAME)	ND	0.98	1.00	
Ethanol	ND	490	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	95	80-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 5035
		Method:	EPA 8260B
		Units:	ug/kg
Project: UCSB - Building 408			Page 3 of 48

Surrogate	Rec. (%)	Control Limits	Qualifiers
Dibromofluoromethane	96	79-133	
1,2-Dichloroethane-d4	86	71-155	
Toluene-d8	105	80-120	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.	Date Received: 09/22/18
4680 East Los Angeles Ave, Suite O	Work Order: 18-09-1668
Simi Valley, CA 93063-3407	Preparation: EPA 5035
	Method: EPA 8260B
	Units: ug/kg
Project: UCSB - Building 408	Page 4 of 48

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
HA-1-17'	**18-09-1668-2-C**	**09/21/18 08:55**	**Solid**	**GC/MS OO**	**09/22/18**	**09/28/18 00:59**	**180927L055**

Parameter	Result	RL	DF	Qualifiers
Acetone	ND	49	1.00	
Benzene	ND	0.97	1.00	
Bromobenzene	ND	0.97	1.00	
Bromochloromethane	ND	1.9	1.00	
Bromodichloromethane	ND	0.97	1.00	
Bromoform	ND	4.9	1.00	
Bromomethane	ND	19	1.00	
2-Butanone	ND	19	1.00	
n-Butylbenzene	ND	0.97	1.00	
sec-Butylbenzene	ND	0.97	1.00	
tert-Butylbenzene	ND	0.97	1.00	
Carbon Disulfide	ND	9.7	1.00	
Carbon Tetrachloride	ND	0.97	1.00	
Chlorobenzene	ND	0.97	1.00	
Chloroethane	ND	1.9	1.00	
Chloroform	ND	0.97	1.00	
Chloromethane	ND	19	1.00	
2-Chlorotoluene	ND	0.97	1.00	
4-Chlorotoluene	ND	0.97	1.00	
Dibromochloromethane	ND	1.9	1.00	
1,2-Dibromo-3-Chloropropane	ND	4.9	1.00	
1,2-Dibromoethane	ND	0.97	1.00	
Dibromomethane	ND	0.97	1.00	
1,2-Dichlorobenzene	ND	0.97	1.00	
1,3-Dichlorobenzene	ND	0.97	1.00	
1,4-Dichlorobenzene	ND	0.97	1.00	
Dichlorodifluoromethane	ND	1.9	1.00	
1,1-Dichloroethane	ND	0.97	1.00	
1,2-Dichloroethane	ND	0.97	1.00	
1,1-Dichloroethene	ND	0.97	1.00	
c-1,2-Dichloroethene	ND	0.97	1.00	
t-1,2-Dichloroethene	ND	0.97	1.00	
1,2-Dichloropropane	ND	0.97	1.00	
1,3-Dichloropropane	ND	0.97	1.00	
2,2-Dichloropropane	ND	4.9	1.00	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 5035
		Method:	EPA 8260B
		Units:	ug/kg
Project: UCSB - Building 408			Page 5 of 48

Parameter	Result	RL	DF	Qualifiers
1,1-Dichloropropene	ND	1.9	1.00	
c-1,3-Dichloropropene	ND	0.97	1.00	
t-1,3-Dichloropropene	ND	1.9	1.00	
Ethylbenzene	ND	0.97	1.00	
2-Hexanone	ND	19	1.00	
Isopropylbenzene	ND	0.97	1.00	
p-Isopropyltoluene	ND	0.97	1.00	
Methylene Chloride	ND	9.7	1.00	
4-Methyl-2-Pentanone	ND	19	1.00	
Naphthalene	ND	9.7	1.00	
n-Propylbenzene	ND	1.9	1.00	
Styrene	ND	0.97	1.00	
1,1,1,2-Tetrachloroethane	ND	0.97	1.00	
1,1,2,2-Tetrachloroethane	ND	1.9	1.00	
Tetrachloroethene	ND	0.97	1.00	
Toluene	ND	0.97	1.00	
1,2,3-Trichlorobenzene	ND	1.9	1.00	
1,2,4-Trichlorobenzene	ND	1.9	1.00	
1,1,1-Trichloroethane	ND	0.97	1.00	
1,1,2-Trichloroethane	ND	0.97	1.00	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	9.7	1.00	
Trichloroethene	ND	1.9	1.00	
Trichlorofluoromethane	ND	9.7	1.00	
1,2,3-Trichloropropane	ND	1.9	1.00	
1,2,4-Trimethylbenzene	ND	1.9	1.00	
1,3,5-Trimethylbenzene	ND	1.9	1.00	
Vinyl Acetate	ND	9.7	1.00	
Vinyl Chloride	ND	0.97	1.00	
p/m-Xylene	ND	1.9	1.00	
o-Xylene	ND	0.97	1.00	
Methyl-t-Butyl Ether (MTBE)	ND	1.9	1.00	
Tert-Butyl Alcohol (TBA)	ND	19	1.00	
Diisopropyl Ether (DIPE)	ND	0.97	1.00	
Ethyl-t-Butyl Ether (ETBE)	ND	0.97	1.00	
Tert-Amyl-Methyl Ether (TAME)	ND	0.97	1.00	
Ethanol	ND	490	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	95	80-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 5035
		Method:	EPA 8260B
		Units:	ug/kg
Project: UCSB - Building 408			Page 6 of 48

Surrogate	Rec. (%)	Control Limits	Qualifiers
Dibromofluoromethane	94	79-133	
1,2-Dichloroethane-d4	87	71-155	
Toluene-d8	102	80-120	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.	Date Received: 09/22/18
4680 East Los Angeles Ave, Suite O	Work Order: 18-09-1668
Simi Valley, CA 93063-3407	Preparation: EPA 5035
	Method: EPA 8260B
	Units: ug/kg
Project: UCSB - Building 408	Page 7 of 48

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
BH-1-10'	**18-09-1668-3-C**	**09/21/18 09:20**	**Solid**	**GC/MS OO**	**09/22/18**	**09/28/18 01:27**	**180927L055**

Parameter	Result	RL	DF	Qualifiers
Acetone	ND	51	1.00	
Benzene	ND	1.0	1.00	
Bromobenzene	ND	1.0	1.00	
Bromochloromethane	ND	2.0	1.00	
Bromodichloromethane	ND	1.0	1.00	
Bromoform	ND	5.1	1.00	
Bromomethane	ND	20	1.00	
2-Butanone	ND	20	1.00	
n-Butylbenzene	ND	1.0	1.00	
sec-Butylbenzene	ND	1.0	1.00	
tert-Butylbenzene	ND	1.0	1.00	
Carbon Disulfide	ND	10	1.00	
Carbon Tetrachloride	ND	1.0	1.00	
Chlorobenzene	ND	1.0	1.00	
Chloroethane	ND	2.0	1.00	
Chloroform	ND	1.0	1.00	
Chloromethane	ND	20	1.00	
2-Chlorotoluene	ND	1.0	1.00	
4-Chlorotoluene	ND	1.0	1.00	
Dibromochloromethane	ND	2.0	1.00	
1,2-Dibromo-3-Chloropropane	ND	5.1	1.00	
1,2-Dibromoethane	ND	1.0	1.00	
Dibromomethane	ND	1.0	1.00	
1,2-Dichlorobenzene	ND	1.0	1.00	
1,3-Dichlorobenzene	ND	1.0	1.00	
1,4-Dichlorobenzene	ND	1.0	1.00	
Dichlorodifluoromethane	ND	2.0	1.00	
1,1-Dichloroethane	ND	1.0	1.00	
1,2-Dichloroethane	ND	1.0	1.00	
1,1-Dichloroethene	ND	1.0	1.00	
c-1,2-Dichloroethene	ND	1.0	1.00	
t-1,2-Dichloroethene	ND	1.0	1.00	
1,2-Dichloropropane	ND	1.0	1.00	
1,3-Dichloropropane	ND	1.0	1.00	
2,2-Dichloropropane	ND	5.1	1.00	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.
4680 East Los Angeles Ave, Suite O
Simi Valley, CA 93063-3407

Date Received:	09/22/18
Work Order:	18-09-1668
Preparation:	EPA 5035
Method:	EPA 8260B
Units:	ug/kg

Project: UCSB - Building 408

Parameter	Result	RL	DF	Qualifiers
1,1-Dichloropropene	ND	2.0	1.00	
c-1,3-Dichloropropene	ND	1.0	1.00	
t-1,3-Dichloropropene	ND	2.0	1.00	
Ethylbenzene	ND	1.0	1.00	
2-Hexanone	ND	20	1.00	
Isopropylbenzene	ND	1.0	1.00	
p-Isopropyltoluene	ND	1.0	1.00	
Methylene Chloride	ND	10	1.00	
4-Methyl-2-Pentanone	ND	20	1.00	
Naphthalene	ND	10	1.00	
n-Propylbenzene	ND	2.0	1.00	
Styrene	ND	1.0	1.00	
1,1,1,2-Tetrachloroethane	ND	1.0	1.00	
1,1,2,2-Tetrachloroethane	ND	2.0	1.00	
Tetrachloroethene	ND	1.0	1.00	
Toluene	ND	1.0	1.00	
1,2,3-Trichlorobenzene	ND	2.0	1.00	
1,2,4-Trichlorobenzene	ND	2.0	1.00	
1,1,1-Trichloroethane	ND	1.0	1.00	
1,1,2-Trichloroethane	ND	1.0	1.00	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	10	1.00	
Trichloroethene	ND	2.0	1.00	
Trichlorofluoromethane	ND	10	1.00	
1,2,3-Trichloropropane	ND	2.0	1.00	
1,2,4-Trimethylbenzene	ND	2.0	1.00	
1,3,5-Trimethylbenzene	ND	2.0	1.00	
Vinyl Acetate	ND	10	1.00	
Vinyl Chloride	ND	1.0	1.00	
p/m-Xylene	ND	2.0	1.00	
o-Xylene	ND	1.0	1.00	
Methyl-t-Butyl Ether (MTBE)	ND	2.0	1.00	
Tert-Butyl Alcohol (TBA)	ND	20	1.00	
Diisopropyl Ether (DIPE)	ND	1.0	1.00	
Ethyl-t-Butyl Ether (ETBE)	ND	1.0	1.00	
Tert-Amyl-Methyl Ether (TAME)	ND	1.0	1.00	
Ethanol	ND	510	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	96	80-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 5035
		Method:	EPA 8260B
		Units:	ug/kg
Project: UCSB - Building 408			Page 9 of 48

Surrogate	Rec. (%)	Control Limits	Qualifiers
Dibromofluoromethane	93	79-133	
1,2-Dichloroethane-d4	87	71-155	
Toluene-d8	102	80-120	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.	Date Received: 09/22/18
4680 East Los Angeles Ave, Suite O	Work Order: 18-09-1668
Simi Valley, CA 93063-3407	Preparation: EPA 5035
	Method: EPA 8260B
	Units: ug/kg
Project: UCSB - Building 408	Page 10 of 48

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
BH-1-15'	**18-09-1668-4-C**	**09/21/18 09:30**	**Solid**	**GC/MS OO**	**09/22/18**	**09/28/18 01:56**	**180927L055**

Parameter	Result	RL	DF	Qualifiers
Acetone	ND	44	1.00	
Benzene	ND	0.89	1.00	
Bromobenzene	ND	0.89	1.00	
Bromochloromethane	ND	1.8	1.00	
Bromodichloromethane	ND	0.89	1.00	
Bromoform	ND	4.4	1.00	
Bromomethane	ND	18	1.00	
2-Butanone	ND	18	1.00	
n-Butylbenzene	ND	0.89	1.00	
sec-Butylbenzene	ND	0.89	1.00	
tert-Butylbenzene	ND	0.89	1.00	
Carbon Disulfide	ND	8.9	1.00	
Carbon Tetrachloride	ND	0.89	1.00	
Chlorobenzene	ND	0.89	1.00	
Chloroethane	ND	1.8	1.00	
Chloroform	ND	0.89	1.00	
Chloromethane	ND	18	1.00	
2-Chlorotoluene	ND	0.89	1.00	
4-Chlorotoluene	ND	0.89	1.00	
Dibromochloromethane	ND	1.8	1.00	
1,2-Dibromo-3-Chloropropane	ND	4.4	1.00	
1,2-Dibromoethane	ND	0.89	1.00	
Dibromomethane	ND	0.89	1.00	
1,2-Dichlorobenzene	ND	0.89	1.00	
1,3-Dichlorobenzene	ND	0.89	1.00	
1,4-Dichlorobenzene	ND	0.89	1.00	
Dichlorodifluoromethane	ND	1.8	1.00	
1,1-Dichloroethane	ND	0.89	1.00	
1,2-Dichloroethane	ND	0.89	1.00	
1,1-Dichloroethene	ND	0.89	1.00	
c-1,2-Dichloroethene	ND	0.89	1.00	
t-1,2-Dichloroethene	ND	0.89	1.00	
1,2-Dichloropropane	ND	0.89	1.00	
1,3-Dichloropropane	ND	0.89	1.00	
2,2-Dichloropropane	ND	4.4	1.00	

RL: Reporting Limit.   DF: Dilution Factor.   MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 5035
		Method:	EPA 8260B
		Units:	ug/kg
Project: UCSB - Building 408			Page 11 of 48

Parameter	Result	RL	DF	Qualifiers
1,1-Dichloropropene	ND	1.8	1.00	
c-1,3-Dichloropropene	ND	0.89	1.00	
t-1,3-Dichloropropene	ND	1.8	1.00	
Ethylbenzene	ND	0.89	1.00	
2-Hexanone	ND	18	1.00	
Isopropylbenzene	ND	0.89	1.00	
p-Isopropyltoluene	ND	0.89	1.00	
Methylene Chloride	ND	8.9	1.00	
4-Methyl-2-Pentanone	ND	18	1.00	
Naphthalene	ND	8.9	1.00	
n-Propylbenzene	ND	1.8	1.00	
Styrene	ND	0.89	1.00	
1,1,1,2-Tetrachloroethane	ND	0.89	1.00	
1,1,2,2-Tetrachloroethane	ND	1.8	1.00	
Tetrachloroethene	ND	0.89	1.00	
Toluene	ND	0.89	1.00	
1,2,3-Trichlorobenzene	ND	1.8	1.00	
1,2,4-Trichlorobenzene	ND	1.8	1.00	
1,1,1-Trichloroethane	ND	0.89	1.00	
1,1,2-Trichloroethane	ND	0.89	1.00	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	8.9	1.00	
Trichloroethene	ND	1.8	1.00	
Trichlorofluoromethane	ND	8.9	1.00	
1,2,3-Trichloropropane	ND	1.8	1.00	
1,2,4-Trimethylbenzene	ND	1.8	1.00	
1,3,5-Trimethylbenzene	ND	1.8	1.00	
Vinyl Acetate	ND	8.9	1.00	
Vinyl Chloride	ND	0.89	1.00	
p/m-Xylene	ND	1.8	1.00	
o-Xylene	ND	0.89	1.00	
Methyl-t-Butyl Ether (MTBE)	ND	1.8	1.00	
Tert-Butyl Alcohol (TBA)	ND	18	1.00	
Diisopropyl Ether (DIPE)	ND	0.89	1.00	
Ethyl-t-Butyl Ether (ETBE)	ND	0.89	1.00	
Tert-Amyl-Methyl Ether (TAME)	ND	0.89	1.00	
Ethanol	ND	440	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	98	80-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 5035
		Method:	EPA 8260B
		Units:	ug/kg
Project: UCSB - Building 408			Page 12 of 48

Surrogate	Rec. (%)	Control Limits	Qualifiers
Dibromofluoromethane	97	79-133	
1,2-Dichloroethane-d4	89	71-155	
Toluene-d8	101	80-120	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 5035
		Method:	EPA 8260B
		Units:	ug/kg
Project: UCSB - Building 408			Page 13 of 48

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
HA-2-11'	**18-09-1668-5-C**	**09/21/18 10:15**	**Solid**	**GC/MS OO**	**09/22/18**	**09/28/18 02:24**	**180927L055**

Parameter	Result	RL	DF	Qualifiers
Acetone	ND	53	1.00	
Benzene	ND	1.1	1.00	
Bromobenzene	ND	1.1	1.00	
Bromochloromethane	ND	2.1	1.00	
Bromodichloromethane	ND	1.1	1.00	
Bromoform	ND	5.3	1.00	
Bromomethane	ND	21	1.00	
2-Butanone	ND	21	1.00	
n-Butylbenzene	ND	1.1	1.00	
sec-Butylbenzene	ND	1.1	1.00	
tert-Butylbenzene	ND	1.1	1.00	
Carbon Disulfide	ND	11	1.00	
Carbon Tetrachloride	ND	1.1	1.00	
Chlorobenzene	ND	1.1	1.00	
Chloroethane	ND	2.1	1.00	
Chloroform	ND	1.1	1.00	
Chloromethane	ND	21	1.00	
2-Chlorotoluene	ND	1.1	1.00	
4-Chlorotoluene	ND	1.1	1.00	
Dibromochloromethane	ND	2.1	1.00	
1,2-Dibromo-3-Chloropropane	ND	5.3	1.00	
1,2-Dibromoethane	ND	1.1	1.00	
Dibromomethane	ND	1.1	1.00	
1,2-Dichlorobenzene	ND	1.1	1.00	
1,3-Dichlorobenzene	ND	1.1	1.00	
1,4-Dichlorobenzene	ND	1.1	1.00	
Dichlorodifluoromethane	ND	2.1	1.00	
1,1-Dichloroethane	ND	1.1	1.00	
1,2-Dichloroethane	ND	1.1	1.00	
1,1-Dichloroethene	ND	1.1	1.00	
c-1,2-Dichloroethene	ND	1.1	1.00	
t-1,2-Dichloroethene	ND	1.1	1.00	
1,2-Dichloropropane	ND	1.1	1.00	
1,3-Dichloropropane	ND	1.1	1.00	
2,2-Dichloropropane	ND	5.3	1.00	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.
4680 East Los Angeles Ave, Suite O
Simi Valley, CA 93063-3407

Date Received:	09/22/18
Work Order:	18-09-1668
Preparation:	EPA 5035
Method:	EPA 8260B
Units:	ug/kg

Project: UCSB - Building 408

Parameter	Result	RL	DF	Qualifiers
1,1-Dichloropropene	ND	2.1	1.00	
c-1,3-Dichloropropene	ND	1.1	1.00	
t-1,3-Dichloropropene	ND	2.1	1.00	
Ethylbenzene	ND	1.1	1.00	
2-Hexanone	ND	21	1.00	
Isopropylbenzene	ND	1.1	1.00	
p-Isopropyltoluene	ND	1.1	1.00	
Methylene Chloride	ND	11	1.00	
4-Methyl-2-Pentanone	ND	21	1.00	
Naphthalene	ND	11	1.00	
n-Propylbenzene	ND	2.1	1.00	
Styrene	ND	1.1	1.00	
1,1,1,2-Tetrachloroethane	ND	1.1	1.00	
1,1,2,2-Tetrachloroethane	ND	2.1	1.00	
Tetrachloroethene	ND	1.1	1.00	
Toluene	ND	1.1	1.00	
1,2,3-Trichlorobenzene	ND	2.1	1.00	
1,2,4-Trichlorobenzene	ND	2.1	1.00	
1,1,1-Trichloroethane	ND	1.1	1.00	
1,1,2-Trichloroethane	ND	1.1	1.00	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	11	1.00	
Trichloroethene	ND	2.1	1.00	
Trichlorofluoromethane	ND	11	1.00	
1,2,3-Trichloropropane	ND	2.1	1.00	
1,2,4-Trimethylbenzene	ND	2.1	1.00	
1,3,5-Trimethylbenzene	ND	2.1	1.00	
Vinyl Acetate	ND	11	1.00	
Vinyl Chloride	ND	1.1	1.00	
p/m-Xylene	ND	2.1	1.00	
o-Xylene	ND	1.1	1.00	
Methyl-t-Butyl Ether (MTBE)	ND	2.1	1.00	
Tert-Butyl Alcohol (TBA)	ND	21	1.00	
Diisopropyl Ether (DIPE)	ND	1.1	1.00	
Ethyl-t-Butyl Ether (ETBE)	ND	1.1	1.00	
Tert-Amyl-Methyl Ether (TAME)	ND	1.1	1.00	
Ethanol	ND	530	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	96	80-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.	Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O	Work Order:	18-09-1668
Simi Valley, CA 93063-3407	Preparation:	EPA 5035
	Method:	EPA 8260B
	Units:	ug/kg
Project: UCSB - Building 408		Page 15 of 48

Surrogate	Rec. (%)	Control Limits	Qualifiers
Dibromofluoromethane	95	79-133	
1,2-Dichloroethane-d4	90	71-155	
Toluene-d8	101	80-120	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 5035
		Method:	EPA 8260B
		Units:	ug/kg
Project: UCSB - Building 408			Page 16 of 48

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
HA-2-15'	**18-09-1668-6-C**	**09/21/18 10:35**	**Solid**	**GC/MS OO**	**09/22/18**	**09/28/18 02:52**	**180927L055**

Parameter	Result	RL	DF	Qualifiers
Acetone	ND	50	1.00	
Benzene	ND	1.0	1.00	
Bromobenzene	ND	1.0	1.00	
Bromochloromethane	ND	2.0	1.00	
Bromodichloromethane	ND	1.0	1.00	
Bromoform	ND	5.0	1.00	
Bromomethane	ND	20	1.00	
2-Butanone	ND	20	1.00	
n-Butylbenzene	ND	1.0	1.00	
sec-Butylbenzene	ND	1.0	1.00	
tert-Butylbenzene	ND	1.0	1.00	
Carbon Disulfide	ND	10	1.00	
Carbon Tetrachloride	ND	1.0	1.00	
Chlorobenzene	ND	1.0	1.00	
Chloroethane	ND	2.0	1.00	
Chloroform	ND	1.0	1.00	
Chloromethane	ND	20	1.00	
2-Chlorotoluene	ND	1.0	1.00	
4-Chlorotoluene	ND	1.0	1.00	
Dibromochloromethane	ND	2.0	1.00	
1,2-Dibromo-3-Chloropropane	ND	5.0	1.00	
1,2-Dibromoethane	ND	1.0	1.00	
Dibromomethane	ND	1.0	1.00	
1,2-Dichlorobenzene	ND	1.0	1.00	
1,3-Dichlorobenzene	ND	1.0	1.00	
1,4-Dichlorobenzene	ND	1.0	1.00	
Dichlorodifluoromethane	ND	2.0	1.00	
1,1-Dichloroethane	ND	1.0	1.00	
1,2-Dichloroethane	ND	1.0	1.00	
1,1-Dichloroethene	ND	1.0	1.00	
c-1,2-Dichloroethene	ND	1.0	1.00	
t-1,2-Dichloroethene	ND	1.0	1.00	
1,2-Dichloropropane	ND	1.0	1.00	
1,3-Dichloropropane	ND	1.0	1.00	
2,2-Dichloropropane	ND	5.0	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 5035
		Method:	EPA 8260B
		Units:	ug/kg
Project: UCSB - Building 408			Page 17 of 48

Parameter	Result	RL	DF	Qualifiers
1,1-Dichloropropene	ND	2.0	1.00	
c-1,3-Dichloropropene	ND	1.0	1.00	
t-1,3-Dichloropropene	ND	2.0	1.00	
Ethylbenzene	ND	1.0	1.00	
2-Hexanone	ND	20	1.00	
Isopropylbenzene	ND	1.0	1.00	
p-Isopropyltoluene	ND	1.0	1.00	
Methylene Chloride	ND	10	1.00	
4-Methyl-2-Pentanone	ND	20	1.00	
Naphthalene	ND	10	1.00	
n-Propylbenzene	ND	2.0	1.00	
Styrene	ND	1.0	1.00	
1,1,1,2-Tetrachloroethane	ND	1.0	1.00	
1,1,2,2-Tetrachloroethane	ND	2.0	1.00	
Tetrachloroethene	ND	1.0	1.00	
Toluene	ND	1.0	1.00	
1,2,3-Trichlorobenzene	ND	2.0	1.00	
1,2,4-Trichlorobenzene	ND	2.0	1.00	
1,1,1-Trichloroethane	ND	1.0	1.00	
1,1,2-Trichloroethane	ND	1.0	1.00	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	10	1.00	
Trichloroethene	ND	2.0	1.00	
Trichlorofluoromethane	ND	10	1.00	
1,2,3-Trichloropropane	ND	2.0	1.00	
1,2,4-Trimethylbenzene	ND	2.0	1.00	
1,3,5-Trimethylbenzene	ND	2.0	1.00	
Vinyl Acetate	ND	10	1.00	
Vinyl Chloride	ND	1.0	1.00	
p/m-Xylene	ND	2.0	1.00	
o-Xylene	ND	1.0	1.00	
Methyl-t-Butyl Ether (MTBE)	ND	2.0	1.00	
Tert-Butyl Alcohol (TBA)	ND	20	1.00	
Diisopropyl Ether (DIPE)	ND	1.0	1.00	
Ethyl-t-Butyl Ether (ETBE)	ND	1.0	1.00	
Tert-Amyl-Methyl Ether (TAME)	ND	1.0	1.00	
Ethanol	ND	500	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	94	80-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 5035
		Method:	EPA 8260B
		Units:	ug/kg
Project: UCSB - Building 408			Page 18 of 48

Surrogate	Rec. (%)	Control Limits	Qualifiers
Dibromofluoromethane	95	79-133	
1,2-Dichloroethane-d4	89	71-155	
Toluene-d8	101	80-120	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 5035
		Method:	EPA 8260B
		Units:	ug/kg
Project: UCSB - Building 408			Page 19 of 48

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
BH-2-10'	**18-09-1668-7-C**	**09/21/18 12:00**	**Solid**	**GC/MS OO**	**09/22/18**	**09/28/18 03:21**	**180927L055**

Parameter	Result	RL	DF	Qualifiers
Acetone	ND	49	1.00	
Benzene	ND	0.98	1.00	
Bromobenzene	ND	0.98	1.00	
Bromochloromethane	ND	2.0	1.00	
Bromodichloromethane	ND	0.98	1.00	
Bromoform	ND	4.9	1.00	
Bromomethane	ND	20	1.00	
2-Butanone	ND	20	1.00	
n-Butylbenzene	ND	0.98	1.00	
sec-Butylbenzene	ND	0.98	1.00	
tert-Butylbenzene	ND	0.98	1.00	
Carbon Disulfide	ND	9.8	1.00	
Carbon Tetrachloride	ND	0.98	1.00	
Chlorobenzene	ND	0.98	1.00	
Chloroethane	ND	2.0	1.00	
Chloroform	ND	0.98	1.00	
Chloromethane	ND	20	1.00	
2-Chlorotoluene	ND	0.98	1.00	
4-Chlorotoluene	ND	0.98	1.00	
Dibromochloromethane	ND	2.0	1.00	
1,2-Dibromo-3-Chloropropane	ND	4.9	1.00	
1,2-Dibromoethane	ND	0.98	1.00	
Dibromomethane	ND	0.98	1.00	
1,2-Dichlorobenzene	ND	0.98	1.00	
1,3-Dichlorobenzene	ND	0.98	1.00	
1,4-Dichlorobenzene	ND	0.98	1.00	
Dichlorodifluoromethane	ND	2.0	1.00	
1,1-Dichloroethane	ND	0.98	1.00	
1,2-Dichloroethane	ND	0.98	1.00	
1,1-Dichloroethene	ND	0.98	1.00	
c-1,2-Dichloroethene	ND	0.98	1.00	
t-1,2-Dichloroethene	ND	0.98	1.00	
1,2-Dichloropropane	ND	0.98	1.00	
1,3-Dichloropropane	ND	0.98	1.00	
2,2-Dichloropropane	ND	4.9	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 5035
		Method:	EPA 8260B
		Units:	ug/kg
Project: UCSB - Building 408			Page 20 of 48

Parameter	Result	RL	DF	Qualifiers
1,1-Dichloropropene	ND	2.0	1.00	
c-1,3-Dichloropropene	ND	0.98	1.00	
t-1,3-Dichloropropene	ND	2.0	1.00	
Ethylbenzene	ND	0.98	1.00	
2-Hexanone	ND	20	1.00	
Isopropylbenzene	ND	0.98	1.00	
p-Isopropyltoluene	ND	0.98	1.00	
Methylene Chloride	ND	9.8	1.00	
4-Methyl-2-Pentanone	ND	20	1.00	
Naphthalene	ND	9.8	1.00	
n-Propylbenzene	ND	2.0	1.00	
Styrene	ND	0.98	1.00	
1,1,1,2-Tetrachloroethane	ND	0.98	1.00	
1,1,2,2-Tetrachloroethane	ND	2.0	1.00	
Tetrachloroethene	ND	0.98	1.00	
Toluene	ND	0.98	1.00	
1,2,3-Trichlorobenzene	ND	2.0	1.00	
1,2,4-Trichlorobenzene	ND	2.0	1.00	
1,1,1-Trichloroethane	ND	0.98	1.00	
1,1,2-Trichloroethane	ND	0.98	1.00	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	9.8	1.00	
Trichloroethene	ND	2.0	1.00	
Trichlorofluoromethane	ND	9.8	1.00	
1,2,3-Trichloropropane	ND	2.0	1.00	
1,2,4-Trimethylbenzene	ND	2.0	1.00	
1,3,5-Trimethylbenzene	ND	2.0	1.00	
Vinyl Acetate	ND	9.8	1.00	
Vinyl Chloride	ND	0.98	1.00	
p/m-Xylene	ND	2.0	1.00	
o-Xylene	ND	0.98	1.00	
Methyl-t-Butyl Ether (MTBE)	ND	2.0	1.00	
Tert-Butyl Alcohol (TBA)	ND	20	1.00	
Diisopropyl Ether (DIPE)	ND	0.98	1.00	
Ethyl-t-Butyl Ether (ETBE)	ND	0.98	1.00	
Tert-Amyl-Methyl Ether (TAME)	ND	0.98	1.00	
Ethanol	ND	490	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	98	80-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 5035
		Method:	EPA 8260B
		Units:	ug/kg
Project: UCSB - Building 408			

Surrogate	Rec. (%)	Control Limits	Qualifiers
Dibromofluoromethane	98	79-133	
1,2-Dichloroethane-d4	91	71-155	
Toluene-d8	102	80-120	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 5035
		Method:	EPA 8260B
		Units:	ug/kg
Project: UCSB - Building 408			Page 22 of 48

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
BH-2-15'	**18-09-1668-8-C**	**09/21/18 12:20**	**Solid**	**GC/MS OO**	**09/22/18**	**09/28/18 03:49**	**180927L055**

Parameter	Result	RL	DF	Qualifiers
Acetone	ND	45	1.00	
Benzene	ND	0.89	1.00	
Bromobenzene	ND	0.89	1.00	
Bromochloromethane	ND	1.8	1.00	
Bromodichloromethane	ND	0.89	1.00	
Bromoform	ND	4.5	1.00	
Bromomethane	ND	18	1.00	
2-Butanone	ND	18	1.00	
n-Butylbenzene	ND	0.89	1.00	
sec-Butylbenzene	ND	0.89	1.00	
tert-Butylbenzene	ND	0.89	1.00	
Carbon Disulfide	ND	8.9	1.00	
Carbon Tetrachloride	ND	0.89	1.00	
Chlorobenzene	ND	0.89	1.00	
Chloroethane	ND	1.8	1.00	
Chloroform	ND	0.89	1.00	
Chloromethane	ND	18	1.00	
2-Chlorotoluene	ND	0.89	1.00	
4-Chlorotoluene	ND	0.89	1.00	
Dibromochloromethane	ND	1.8	1.00	
1,2-Dibromo-3-Chloropropane	ND	4.5	1.00	
1,2-Dibromoethane	ND	0.89	1.00	
Dibromomethane	ND	0.89	1.00	
1,2-Dichlorobenzene	ND	0.89	1.00	
1,3-Dichlorobenzene	ND	0.89	1.00	
1,4-Dichlorobenzene	ND	0.89	1.00	
Dichlorodifluoromethane	ND	1.8	1.00	
1,1-Dichloroethane	ND	0.89	1.00	
1,2-Dichloroethane	ND	0.89	1.00	
1,1-Dichloroethene	ND	0.89	1.00	
c-1,2-Dichloroethene	ND	0.89	1.00	
t-1,2-Dichloroethene	ND	0.89	1.00	
1,2-Dichloropropane	ND	0.89	1.00	
1,3-Dichloropropane	ND	0.89	1.00	
2,2-Dichloropropane	ND	4.5	1.00	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Analytical Report

Jacob & Hefner Associates, Inc.	Date Received: 09/22/18
4680 East Los Angeles Ave, Suite O	Work Order: 18-09-1668
Simi Valley, CA 93063-3407	Preparation: EPA 5035
	Method: EPA 8260B
	Units: ug/kg
Project: UCSB - Building 408	Page 23 of 48

Parameter	Result	RL	DF	Qualifiers
1,1-Dichloropropene	ND	1.8	1.00	
c-1,3-Dichloropropene	ND	0.89	1.00	
t-1,3-Dichloropropene	ND	1.8	1.00	
Ethylbenzene	ND	0.89	1.00	
2-Hexanone	ND	18	1.00	
Isopropylbenzene	ND	0.89	1.00	
p-Isopropyltoluene	ND	0.89	1.00	
Methylene Chloride	ND	8.9	1.00	
4-Methyl-2-Pentanone	ND	18	1.00	
Naphthalene	ND	8.9	1.00	
n-Propylbenzene	ND	1.8	1.00	
Styrene	ND	0.89	1.00	
1,1,1,2-Tetrachloroethane	ND	0.89	1.00	
1,1,2,2-Tetrachloroethane	ND	1.8	1.00	
Tetrachloroethene	ND	0.89	1.00	
Toluene	ND	0.89	1.00	
1,2,3-Trichlorobenzene	ND	1.8	1.00	
1,2,4-Trichlorobenzene	ND	1.8	1.00	
1,1,1-Trichloroethane	ND	0.89	1.00	
1,1,2-Trichloroethane	ND	0.89	1.00	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	8.9	1.00	
Trichloroethene	ND	1.8	1.00	
Trichlorofluoromethane	ND	8.9	1.00	
1,2,3-Trichloropropane	ND	1.8	1.00	
1,2,4-Trimethylbenzene	ND	1.8	1.00	
1,3,5-Trimethylbenzene	ND	1.8	1.00	
Vinyl Acetate	ND	8.9	1.00	
Vinyl Chloride	ND	0.89	1.00	
p/m-Xylene	ND	1.8	1.00	
o-Xylene	ND	0.89	1.00	
Methyl-t-Butyl Ether (MTBE)	ND	1.8	1.00	
Tert-Butyl Alcohol (TBA)	ND	18	1.00	
Diisopropyl Ether (DIPE)	ND	0.89	1.00	
Ethyl-t-Butyl Ether (ETBE)	ND	0.89	1.00	
Tert-Amyl-Methyl Ether (TAME)	ND	0.89	1.00	
Ethanol	ND	450	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	96	80-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 5035
		Method:	EPA 8260B
		Units:	ug/kg
Project: UCSB - Building 408			Page 24 of 48

Surrogate	Rec. (%)	Control Limits	Qualifiers
Dibromofluoromethane	94	79-133	
1,2-Dichloroethane-d4	87	71-155	
Toluene-d8	102	80-120	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 5035
		Method:	EPA 8260B
		Units:	ug/kg
Project: UCSB - Building 408			Page 25 of 48

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
HA-3-9'	**18-09-1668-9-F**	**09/21/18 12:40**	**Solid**	**GC/MS OO**	**09/22/18**	**09/28/18 06:10**	**180927L057**

Comment(s): - Reporting limit is elevated due to high levels of non-target hydrocarbons.

Parameter	Result	RL	DF	Qualifiers
Acetone	ND	5100	50.0	
Benzene	ND	100	50.0	
Bromobenzene	ND	100	50.0	
Bromochloromethane	ND	200	50.0	
Bromodichloromethane	ND	100	50.0	
Bromoform	ND	510	50.0	
Bromomethane	ND	2000	50.0	
2-Butanone	ND	2000	50.0	
n-Butylbenzene	ND	100	50.0	
sec-Butylbenzene	ND	100	50.0	
tert-Butylbenzene	ND	100	50.0	
Carbon Disulfide	ND	1000	50.0	
Carbon Tetrachloride	ND	100	50.0	
Chlorobenzene	ND	100	50.0	
Chloroethane	ND	200	50.0	
Chloroform	ND	100	50.0	
Chloromethane	ND	2000	50.0	
2-Chlorotoluene	ND	100	50.0	
4-Chlorotoluene	ND	100	50.0	
Dibromochloromethane	ND	200	50.0	
1,2-Dibromo-3-Chloropropane	ND	510	50.0	
1,2-Dibromoethane	ND	100	50.0	
Dibromomethane	ND	100	50.0	
1,2-Dichlorobenzene	ND	100	50.0	
1,3-Dichlorobenzene	ND	100	50.0	
1,4-Dichlorobenzene	ND	100	50.0	
Dichlorodifluoromethane	ND	200	50.0	
1,1-Dichloroethane	ND	100	50.0	
1,2-Dichloroethane	ND	100	50.0	
1,1-Dichloroethene	ND	100	50.0	
c-1,2-Dichloroethene	ND	100	50.0	
t-1,2-Dichloroethene	ND	100	50.0	
1,2-Dichloropropane	ND	100	50.0	
1,3-Dichloropropane	ND	100	50.0	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 5035
		Method:	EPA 8260B
		Units:	ug/kg
Project: UCSB - Building 408			Page 26 of 48

Parameter	Result	RL	DF	Qualifiers
2,2-Dichloropropane	ND	510	50.0	
1,1-Dichloropropene	ND	200	50.0	
c-1,3-Dichloropropene	ND	100	50.0	
t-1,3-Dichloropropene	ND	200	50.0	
Ethylbenzene	ND	100	50.0	
2-Hexanone	ND	2000	50.0	
Isopropylbenzene	ND	100	50.0	
p-Isopropyltoluene	100	100	50.0	
Methylene Chloride	ND	1000	50.0	
4-Methyl-2-Pentanone	ND	2000	50.0	
Naphthalene	ND	1000	50.0	
n-Propylbenzene	ND	200	50.0	
Styrene	ND	100	50.0	
1,1,1,2-Tetrachloroethane	ND	100	50.0	
1,1,2,2-Tetrachloroethane	ND	200	50.0	
Tetrachloroethene	ND	100	50.0	
Toluene	ND	100	50.0	
1,2,3-Trichlorobenzene	ND	200	50.0	
1,2,4-Trichlorobenzene	ND	200	50.0	
1,1,1-Trichloroethane	ND	100	50.0	
1,1,2-Trichloroethane	ND	100	50.0	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	1000	50.0	
Trichloroethene	ND	200	50.0	
Trichlorofluoromethane	ND	1000	50.0	
1,2,3-Trichloropropane	ND	200	50.0	
1,2,4-Trimethylbenzene	ND	200	50.0	
1,3,5-Trimethylbenzene	ND	200	50.0	
Vinyl Acetate	ND	1000	50.0	
Vinyl Chloride	ND	100	50.0	
p/m-Xylene	ND	200	50.0	
o-Xylene	ND	100	50.0	
Methyl-t-Butyl Ether (MTBE)	ND	200	50.0	
Tert-Butyl Alcohol (TBA)	ND	2000	50.0	
Diisopropyl Ether (DIPE)	ND	100	50.0	
Ethyl-t-Butyl Ether (ETBE)	ND	100	50.0	
Tert-Amyl-Methyl Ether (TAME)	ND	100	50.0	
Ethanol	ND	51000	50.0	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.	Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O	Work Order:	18-09-1668
Simi Valley, CA 93063-3407	Preparation:	EPA 5035
	Method:	EPA 8260B
	Units:	ug/kg
Project: UCSB - Building 408		Page 27 of 48

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	99	80-120	
Dibromofluoromethane	95	79-133	
1,2-Dichloroethane-d4	87	71-155	
Toluene-d8	103	80-120	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 5035
		Method:	EPA 8260B
		Units:	ug/kg
Project: UCSB - Building 408			Page 28 of 48

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
HA-3-15'	**18-09-1668-10-C**	**09/21/18 12:50**	**Solid**	**GC/MS OO**	**09/22/18**	**09/28/18 05:14**	**180927L055**

Parameter	Result	RL	DF	Qualifiers
Acetone	ND	42	1.00	
Benzene	ND	0.84	1.00	
Bromobenzene	ND	0.84	1.00	
Bromochloromethane	ND	1.7	1.00	
Bromodichloromethane	ND	0.84	1.00	
Bromoform	ND	4.2	1.00	
Bromomethane	ND	17	1.00	
2-Butanone	ND	17	1.00	
n-Butylbenzene	ND	0.84	1.00	
sec-Butylbenzene	ND	0.84	1.00	
tert-Butylbenzene	ND	0.84	1.00	
Carbon Disulfide	16	8.4	1.00	
Carbon Tetrachloride	ND	0.84	1.00	
Chlorobenzene	ND	0.84	1.00	
Chloroethane	ND	1.7	1.00	
Chloroform	ND	0.84	1.00	
Chloromethane	ND	17	1.00	
2-Chlorotoluene	ND	0.84	1.00	
4-Chlorotoluene	ND	0.84	1.00	
Dibromochloromethane	ND	1.7	1.00	
1,2-Dibromo-3-Chloropropane	ND	4.2	1.00	
1,2-Dibromoethane	ND	0.84	1.00	
Dibromomethane	ND	0.84	1.00	
1,2-Dichlorobenzene	ND	0.84	1.00	
1,3-Dichlorobenzene	ND	0.84	1.00	
1,4-Dichlorobenzene	ND	0.84	1.00	
Dichlorodifluoromethane	ND	1.7	1.00	
1,1-Dichloroethane	ND	0.84	1.00	
1,2-Dichloroethane	ND	0.84	1.00	
1,1-Dichloroethene	ND	0.84	1.00	
c-1,2-Dichloroethene	ND	0.84	1.00	
t-1,2-Dichloroethene	ND	0.84	1.00	
1,2-Dichloropropane	ND	0.84	1.00	
1,3-Dichloropropane	ND	0.84	1.00	
2,2-Dichloropropane	ND	4.2	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 5035
		Method:	EPA 8260B
		Units:	ug/kg
Project: UCSB - Building 408			Page 29 of 48

Parameter	Result	RL	DF	Qualifiers
1,1-Dichloropropene	ND	1.7	1.00	
c-1,3-Dichloropropene	ND	0.84	1.00	
t-1,3-Dichloropropene	ND	1.7	1.00	
Ethylbenzene	ND	0.84	1.00	
2-Hexanone	ND	17	1.00	
Isopropylbenzene	ND	0.84	1.00	
p-Isopropyltoluene	ND	0.84	1.00	
Methylene Chloride	ND	8.4	1.00	
4-Methyl-2-Pentanone	ND	17	1.00	
Naphthalene	ND	8.4	1.00	
n-Propylbenzene	ND	1.7	1.00	
Styrene	ND	0.84	1.00	
1,1,1,2-Tetrachloroethane	ND	0.84	1.00	
1,1,2,2-Tetrachloroethane	ND	1.7	1.00	
Tetrachloroethene	ND	0.84	1.00	
Toluene	ND	0.84	1.00	
1,2,3-Trichlorobenzene	ND	1.7	1.00	
1,2,4-Trichlorobenzene	ND	1.7	1.00	
1,1,1-Trichloroethane	ND	0.84	1.00	
1,1,2-Trichloroethane	ND	0.84	1.00	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	8.4	1.00	
Trichloroethene	ND	1.7	1.00	
Trichlorofluoromethane	ND	8.4	1.00	
1,2,3-Trichloropropane	ND	1.7	1.00	
1,2,4-Trimethylbenzene	ND	1.7	1.00	
1,3,5-Trimethylbenzene	ND	1.7	1.00	
Vinyl Acetate	ND	8.4	1.00	
Vinyl Chloride	ND	0.84	1.00	
p/m-Xylene	ND	1.7	1.00	
o-Xylene	ND	0.84	1.00	
Methyl-t-Butyl Ether (MTBE)	ND	1.7	1.00	
Tert-Butyl Alcohol (TBA)	ND	17	1.00	
Diisopropyl Ether (DIPE)	ND	0.84	1.00	
Ethyl-t-Butyl Ether (ETBE)	ND	0.84	1.00	
Tert-Amyl-Methyl Ether (TAME)	ND	0.84	1.00	
Ethanol	ND	420	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	96	80-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 5035
		Method:	EPA 8260B
		Units:	ug/kg
Project: UCSB - Building 408			Page 30 of 48

Surrogate	Rec. (%)	Control Limits	Qualifiers
Dibromofluoromethane	95	79-133	
1,2-Dichloroethane-d4	89	71-155	
Toluene-d8	101	80-120	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.	Date Received: 09/22/18
4680 East Los Angeles Ave, Suite O	Work Order: 18-09-1668
Simi Valley, CA 93063-3407	Preparation: EPA 5035
	Method: EPA 8260B
	Units: ug/kg
Project: UCSB - Building 408	Page 31 of 48

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
HA-4-10'	**18-09-1668-11-E**	**09/21/18 14:20**	**Solid**	**GC/MS OO**	**09/22/18**	**09/28/18 06:38**	**180927L057**

Parameter	Result	RL	DF	Qualifiers
Acetone	ND	5800	50.0	
Benzene	ND	120	50.0	
Bromobenzene	ND	120	50.0	
Bromochloromethane	ND	230	50.0	
Bromodichloromethane	ND	120	50.0	
Bromoform	ND	580	50.0	
Bromomethane	ND	2300	50.0	
2-Butanone	ND	2300	50.0	
n-Butylbenzene	1800	120	50.0	
sec-Butylbenzene	1100	120	50.0	
tert-Butylbenzene	ND	120	50.0	
Carbon Disulfide	ND	1200	50.0	
Carbon Tetrachloride	ND	120	50.0	
Chlorobenzene	ND	120	50.0	
Chloroethane	ND	230	50.0	
Chloroform	ND	120	50.0	
Chloromethane	ND	2300	50.0	
2-Chlorotoluene	ND	120	50.0	
4-Chlorotoluene	ND	120	50.0	
Dibromochloromethane	ND	230	50.0	
1,2-Dibromo-3-Chloropropane	ND	580	50.0	
1,2-Dibromoethane	ND	120	50.0	
Dibromomethane	ND	120	50.0	
1,2-Dichlorobenzene	ND	120	50.0	
1,3-Dichlorobenzene	ND	120	50.0	
1,4-Dichlorobenzene	ND	120	50.0	
Dichlorodifluoromethane	ND	230	50.0	
1,1-Dichloroethane	ND	120	50.0	
1,2-Dichloroethane	ND	120	50.0	
1,1-Dichloroethene	ND	120	50.0	
c-1,2-Dichloroethene	ND	120	50.0	
t-1,2-Dichloroethene	ND	120	50.0	
1,2-Dichloropropane	ND	120	50.0	
1,3-Dichloropropane	ND	120	50.0	
2,2-Dichloropropane	ND	580	50.0	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 5035
		Method:	EPA 8260B
		Units:	ug/kg
Project: UCSB - Building 408			Page 32 of 48

Parameter	Result	RL	DF	Qualifiers
1,1-Dichloropropene	ND	230	50.0	
c-1,3-Dichloropropene	ND	120	50.0	
t-1,3-Dichloropropene	ND	230	50.0	
Ethylbenzene	140	120	50.0	
2-Hexanone	ND	2300	50.0	
Isopropylbenzene	220	120	50.0	
p-Isopropyltoluene	1700	120	50.0	
Methylene Chloride	ND	1200	50.0	
4-Methyl-2-Pentanone	ND	2300	50.0	
Naphthalene	6200	1200	50.0	
n-Propylbenzene	450	230	50.0	
Styrene	ND	120	50.0	
1,1,1,2-Tetrachloroethane	ND	120	50.0	
1,1,2,2-Tetrachloroethane	ND	230	50.0	
Tetrachloroethene	ND	120	50.0	
Toluene	ND	120	50.0	
1,2,3-Trichlorobenzene	ND	230	50.0	
1,2,4-Trichlorobenzene	ND	230	50.0	
1,1,1-Trichloroethane	ND	120	50.0	
1,1,2-Trichloroethane	ND	120	50.0	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	1200	50.0	
Trichloroethene	ND	230	50.0	
Trichlorofluoromethane	ND	1200	50.0	
1,2,3-Trichloropropane	ND	230	50.0	
1,2,4-Trimethylbenzene	2100	230	50.0	
1,3,5-Trimethylbenzene	820	230	50.0	
Vinyl Acetate	ND	1200	50.0	
Vinyl Chloride	ND	120	50.0	
p/m-Xylene	ND	230	50.0	
o-Xylene	ND	120	50.0	
Methyl-t-Butyl Ether (MTBE)	ND	230	50.0	
Tert-Butyl Alcohol (TBA)	ND	2300	50.0	
Diisopropyl Ether (DIPE)	ND	120	50.0	
Ethyl-t-Butyl Ether (ETBE)	ND	120	50.0	
Tert-Amyl-Methyl Ether (TAME)	ND	120	50.0	
Ethanol	ND	58000	50.0	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	96	80-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 5035
		Method:	EPA 8260B
		Units:	ug/kg
Project: UCSB - Building 408			Page 33 of 48

Surrogate	Rec. (%)	Control Limits	Qualifiers
Dibromofluoromethane	91	79-133	
1,2-Dichloroethane-d4	81	71-155	
Toluene-d8	104	80-120	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 5035
		Method:	EPA 8260B
		Units:	ug/kg
Project: UCSB - Building 408			Page 34 of 48

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
HA-4-15	**18-09-1668-12-C**	**09/21/18 14:30**	**Solid**	**GC/MS OO**	**09/22/18**	**09/28/18 05:42**	**180927L055**

Parameter	Result	RL	DF	Qualifiers
Acetone	ND	55	1.00	
Benzene	ND	1.1	1.00	
Bromobenzene	ND	1.1	1.00	
Bromochloromethane	ND	2.2	1.00	
Bromodichloromethane	ND	1.1	1.00	
Bromoform	ND	5.5	1.00	
Bromomethane	ND	22	1.00	
2-Butanone	ND	22	1.00	
n-Butylbenzene	ND	1.1	1.00	
sec-Butylbenzene	ND	1.1	1.00	
tert-Butylbenzene	ND	1.1	1.00	
Carbon Disulfide	ND	11	1.00	
Carbon Tetrachloride	ND	1.1	1.00	
Chlorobenzene	ND	1.1	1.00	
Chloroethane	ND	2.2	1.00	
Chloroform	ND	1.1	1.00	
Chloromethane	ND	22	1.00	
2-Chlorotoluene	ND	1.1	1.00	
4-Chlorotoluene	ND	1.1	1.00	
Dibromochloromethane	ND	2.2	1.00	
1,2-Dibromo-3-Chloropropane	ND	5.5	1.00	
1,2-Dibromoethane	ND	1.1	1.00	
Dibromomethane	ND	1.1	1.00	
1,2-Dichlorobenzene	ND	1.1	1.00	
1,3-Dichlorobenzene	ND	1.1	1.00	
1,4-Dichlorobenzene	ND	1.1	1.00	
Dichlorodifluoromethane	ND	2.2	1.00	
1,1-Dichloroethane	ND	1.1	1.00	
1,2-Dichloroethane	ND	1.1	1.00	
1,1-Dichloroethene	ND	1.1	1.00	
c-1,2-Dichloroethene	ND	1.1	1.00	
t-1,2-Dichloroethene	ND	1.1	1.00	
1,2-Dichloropropane	ND	1.1	1.00	
1,3-Dichloropropane	ND	1.1	1.00	
2,2-Dichloropropane	ND	5.5	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 5035
		Method:	EPA 8260B
		Units:	ug/kg
Project: UCSB - Building 408			Page 35 of 48

Parameter	Result	RL	DF	Qualifiers
1,1-Dichloropropene	ND	2.2	1.00	
c-1,3-Dichloropropene	ND	1.1	1.00	
t-1,3-Dichloropropene	ND	2.2	1.00	
Ethylbenzene	ND	1.1	1.00	
2-Hexanone	ND	22	1.00	
Isopropylbenzene	ND	1.1	1.00	
p-Isopropyltoluene	ND	1.1	1.00	
Methylene Chloride	ND	11	1.00	
4-Methyl-2-Pentanone	ND	22	1.00	
Naphthalene	ND	11	1.00	
n-Propylbenzene	ND	2.2	1.00	
Styrene	ND	1.1	1.00	
1,1,1,2-Tetrachloroethane	ND	1.1	1.00	
1,1,2,2-Tetrachloroethane	ND	2.2	1.00	
Tetrachloroethene	ND	1.1	1.00	
Toluene	ND	1.1	1.00	
1,2,3-Trichlorobenzene	ND	2.2	1.00	
1,2,4-Trichlorobenzene	ND	2.2	1.00	
1,1,1-Trichloroethane	ND	1.1	1.00	
1,1,2-Trichloroethane	ND	1.1	1.00	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	11	1.00	
Trichloroethene	ND	2.2	1.00	
Trichlorofluoromethane	ND	11	1.00	
1,2,3-Trichloropropane	ND	2.2	1.00	
1,2,4-Trimethylbenzene	ND	2.2	1.00	
1,3,5-Trimethylbenzene	ND	2.2	1.00	
Vinyl Acetate	ND	11	1.00	
Vinyl Chloride	ND	1.1	1.00	
p/m-Xylene	ND	2.2	1.00	
o-Xylene	ND	1.1	1.00	
Methyl-t-Butyl Ether (MTBE)	ND	2.2	1.00	
Tert-Butyl Alcohol (TBA)	ND	22	1.00	
Diisopropyl Ether (DIPE)	ND	1.1	1.00	
Ethyl-t-Butyl Ether (ETBE)	ND	1.1	1.00	
Tert-Amyl-Methyl Ether (TAME)	ND	1.1	1.00	
Ethanol	ND	550	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	97	80-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 5035
		Method:	EPA 8260B
		Units:	ug/kg
Project: UCSB - Building 408			Page 36 of 48

Surrogate	Rec. (%)	Control Limits	Qualifiers
Dibromofluoromethane	96	79-133	
1,2-Dichloroethane-d4	90	71-155	
Toluene-d8	102	80-120	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Analytical Report

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 5035
		Method:	EPA 8260B
		Units:	ug/kg
Project: UCSB - Building 408			Page 37 of 48

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
BH-3-10'	**18-09-1668-13-C**	**09/21/18 15:05**	**Solid**	**GC/MS OO**	**09/22/18**	**09/28/18 04:17**	**180927L055**

Parameter	Result	RL	DF	Qualifiers
Acetone	ND	41	1.00	
Benzene	ND	0.83	1.00	
Bromobenzene	ND	0.83	1.00	
Bromochloromethane	ND	1.7	1.00	
Bromodichloromethane	ND	0.83	1.00	
Bromoform	ND	4.1	1.00	
Bromomethane	ND	17	1.00	
2-Butanone	ND	17	1.00	
n-Butylbenzene	ND	0.83	1.00	
sec-Butylbenzene	ND	0.83	1.00	
tert-Butylbenzene	ND	0.83	1.00	
Carbon Disulfide	ND	8.3	1.00	
Carbon Tetrachloride	ND	0.83	1.00	
Chlorobenzene	ND	0.83	1.00	
Chloroethane	ND	1.7	1.00	
Chloroform	ND	0.83	1.00	
Chloromethane	ND	17	1.00	
2-Chlorotoluene	ND	0.83	1.00	
4-Chlorotoluene	ND	0.83	1.00	
Dibromochloromethane	ND	1.7	1.00	
1,2-Dibromo-3-Chloropropane	ND	4.1	1.00	
1,2-Dibromoethane	ND	0.83	1.00	
Dibromomethane	ND	0.83	1.00	
1,2-Dichlorobenzene	ND	0.83	1.00	
1,3-Dichlorobenzene	ND	0.83	1.00	
1,4-Dichlorobenzene	ND	0.83	1.00	
Dichlorodifluoromethane	ND	1.7	1.00	
1,1-Dichloroethane	ND	0.83	1.00	
1,2-Dichloroethane	ND	0.83	1.00	
1,1-Dichloroethene	ND	0.83	1.00	
c-1,2-Dichloroethene	ND	0.83	1.00	
t-1,2-Dichloroethene	ND	0.83	1.00	
1,2-Dichloropropane	ND	0.83	1.00	
1,3-Dichloropropane	ND	0.83	1.00	
2,2-Dichloropropane	ND	4.1	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 5035
		Method:	EPA 8260B
		Units:	ug/kg
Project: UCSB - Building 408			Page 38 of 48

Parameter	Result	RL	DF	Qualifiers
1,1-Dichloropropene	ND	1.7	1.00	
c-1,3-Dichloropropene	ND	0.83	1.00	
t-1,3-Dichloropropene	ND	1.7	1.00	
Ethylbenzene	ND	0.83	1.00	
2-Hexanone	ND	17	1.00	
Isopropylbenzene	ND	0.83	1.00	
p-Isopropyltoluene	ND	0.83	1.00	
Methylene Chloride	ND	8.3	1.00	
4-Methyl-2-Pentanone	ND	17	1.00	
Naphthalene	ND	8.3	1.00	
n-Propylbenzene	ND	1.7	1.00	
Styrene	ND	0.83	1.00	
1,1,1,2-Tetrachloroethane	ND	0.83	1.00	
1,1,2,2-Tetrachloroethane	ND	1.7	1.00	
Tetrachloroethene	ND	0.83	1.00	
Toluene	ND	0.83	1.00	
1,2,3-Trichlorobenzene	ND	1.7	1.00	
1,2,4-Trichlorobenzene	ND	1.7	1.00	
1,1,1-Trichloroethane	ND	0.83	1.00	
1,1,2-Trichloroethane	ND	0.83	1.00	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	8.3	1.00	
Trichloroethene	ND	1.7	1.00	
Trichlorofluoromethane	ND	8.3	1.00	
1,2,3-Trichloropropane	ND	1.7	1.00	
1,2,4-Trimethylbenzene	ND	1.7	1.00	
1,3,5-Trimethylbenzene	ND	1.7	1.00	
Vinyl Acetate	ND	8.3	1.00	
Vinyl Chloride	ND	0.83	1.00	
p/m-Xylene	ND	1.7	1.00	
o-Xylene	ND	0.83	1.00	
Methyl-t-Butyl Ether (MTBE)	ND	1.7	1.00	
Tert-Butyl Alcohol (TBA)	ND	17	1.00	
Diisopropyl Ether (DIPE)	ND	0.83	1.00	
Ethyl-t-Butyl Ether (ETBE)	ND	0.83	1.00	
Tert-Amyl-Methyl Ether (TAME)	ND	0.83	1.00	
Ethanol	ND	410	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	94	80-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 5035
		Method:	EPA 8260B
		Units:	ug/kg
Project: UCSB - Building 408			Page 39 of 48

Surrogate	Rec. (%)	Control Limits	Qualifiers
Dibromofluoromethane	94	79-133	
1,2-Dichloroethane-d4	90	71-155	
Toluene-d8	99	80-120	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 5035
		Method:	EPA 8260B
		Units:	ug/kg
Project: UCSB - Building 408			Page 40 of 48

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
BH-3-15'	**18-09-1668-14-C**	**09/21/18 15:20**	**Solid**	**GC/MS OO**	**09/22/18**	**09/28/18 04:45**	**180927L055**

Parameter	Result	RL	DF	Qualifiers
Acetone	ND	46	1.00	
Benzene	ND	0.91	1.00	
Bromobenzene	ND	0.91	1.00	
Bromochloromethane	ND	1.8	1.00	
Bromodichloromethane	ND	0.91	1.00	
Bromoform	ND	4.6	1.00	
Bromomethane	ND	18	1.00	
2-Butanone	ND	18	1.00	
n-Butylbenzene	ND	0.91	1.00	
sec-Butylbenzene	ND	0.91	1.00	
tert-Butylbenzene	ND	0.91	1.00	
Carbon Disulfide	ND	9.1	1.00	
Carbon Tetrachloride	ND	0.91	1.00	
Chlorobenzene	ND	0.91	1.00	
Chloroethane	ND	1.8	1.00	
Chloroform	ND	0.91	1.00	
Chloromethane	ND	18	1.00	
2-Chlorotoluene	ND	0.91	1.00	
4-Chlorotoluene	ND	0.91	1.00	
Dibromochloromethane	ND	1.8	1.00	
1,2-Dibromo-3-Chloropropane	ND	4.6	1.00	
1,2-Dibromoethane	ND	0.91	1.00	
Dibromomethane	ND	0.91	1.00	
1,2-Dichlorobenzene	ND	0.91	1.00	
1,3-Dichlorobenzene	ND	0.91	1.00	
1,4-Dichlorobenzene	ND	0.91	1.00	
Dichlorodifluoromethane	ND	1.8	1.00	
1,1-Dichloroethane	ND	0.91	1.00	
1,2-Dichloroethane	ND	0.91	1.00	
1,1-Dichloroethene	ND	0.91	1.00	
c-1,2-Dichloroethene	ND	0.91	1.00	
t-1,2-Dichloroethene	ND	0.91	1.00	
1,2-Dichloropropane	ND	0.91	1.00	
1,3-Dichloropropane	ND	0.91	1.00	
2,2-Dichloropropane	ND	4.6	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 5035
		Method:	EPA 8260B
		Units:	ug/kg
Project: UCSB - Building 408			Page 41 of 48

Parameter	Result	RL	DF	Qualifiers
1,1-Dichloropropene	ND	1.8	1.00	
c-1,3-Dichloropropene	ND	0.91	1.00	
t-1,3-Dichloropropene	ND	1.8	1.00	
Ethylbenzene	ND	0.91	1.00	
2-Hexanone	ND	18	1.00	
Isopropylbenzene	ND	0.91	1.00	
p-Isopropyltoluene	ND	0.91	1.00	
Methylene Chloride	ND	9.1	1.00	
4-Methyl-2-Pentanone	ND	18	1.00	
Naphthalene	ND	9.1	1.00	
n-Propylbenzene	ND	1.8	1.00	
Styrene	ND	0.91	1.00	
1,1,1,2-Tetrachloroethane	ND	0.91	1.00	
1,1,2,2-Tetrachloroethane	ND	1.8	1.00	
Tetrachloroethene	ND	0.91	1.00	
Toluene	ND	0.91	1.00	
1,2,3-Trichlorobenzene	ND	1.8	1.00	
1,2,4-Trichlorobenzene	ND	1.8	1.00	
1,1,1-Trichloroethane	ND	0.91	1.00	
1,1,2-Trichloroethane	ND	0.91	1.00	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	9.1	1.00	
Trichloroethene	ND	1.8	1.00	
Trichlorofluoromethane	ND	9.1	1.00	
1,2,3-Trichloropropane	ND	1.8	1.00	
1,2,4-Trimethylbenzene	ND	1.8	1.00	
1,3,5-Trimethylbenzene	ND	1.8	1.00	
Vinyl Acetate	ND	9.1	1.00	
Vinyl Chloride	ND	0.91	1.00	
p/m-Xylene	ND	1.8	1.00	
o-Xylene	ND	0.91	1.00	
Methyl-t-Butyl Ether (MTBE)	ND	1.8	1.00	
Tert-Butyl Alcohol (TBA)	ND	18	1.00	
Diisopropyl Ether (DIPE)	ND	0.91	1.00	
Ethyl-t-Butyl Ether (ETBE)	ND	0.91	1.00	
Tert-Amyl-Methyl Ether (TAME)	ND	0.91	1.00	
Ethanol	ND	460	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	95	80-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 5035
		Method:	EPA 8260B
		Units:	ug/kg
Project: UCSB - Building 408			Page 42 of 48

Surrogate	Rec. (%)	Control Limits	Qualifiers
Dibromofluoromethane	96	79-133	
1,2-Dichloroethane-d4	86	71-155	
Toluene-d8	100	80-120	

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Analytical Report

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 5035
		Method:	EPA 8260B
		Units:	ug/kg
Project: UCSB - Building 408			Page 43 of 48

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**095-01-025-30411**	**N/A**	**Solid**	**GC/MS OO**	**09/27/18**	**09/27/18 23:34**	**180927L055**

Parameter	Result	RL	DF	Qualifiers
Acetone	ND	50	1.00	
Benzene	ND	1.0	1.00	
Bromobenzene	ND	1.0	1.00	
Bromochloromethane	ND	2.0	1.00	
Bromodichloromethane	ND	1.0	1.00	
Bromoform	ND	5.0	1.00	
Bromomethane	ND	20	1.00	
2-Butanone	ND	20	1.00	
n-Butylbenzene	ND	1.0	1.00	
sec-Butylbenzene	ND	1.0	1.00	
tert-Butylbenzene	ND	1.0	1.00	
Carbon Disulfide	ND	10	1.00	
Carbon Tetrachloride	ND	1.0	1.00	
Chlorobenzene	ND	1.0	1.00	
Chloroethane	ND	2.0	1.00	
Chloroform	ND	1.0	1.00	
Chloromethane	ND	20	1.00	
2-Chlorotoluene	ND	1.0	1.00	
4-Chlorotoluene	ND	1.0	1.00	
Dibromochloromethane	ND	2.0	1.00	
1,2-Dibromo-3-Chloropropane	ND	5.0	1.00	
1,2-Dibromoethane	ND	1.0	1.00	
Dibromomethane	ND	1.0	1.00	
1,2-Dichlorobenzene	ND	1.0	1.00	
1,3-Dichlorobenzene	ND	1.0	1.00	
1,4-Dichlorobenzene	ND	1.0	1.00	
Dichlorodifluoromethane	ND	2.0	1.00	
1,1-Dichloroethane	ND	1.0	1.00	
1,2-Dichloroethane	ND	1.0	1.00	
1,1-Dichloroethene	ND	1.0	1.00	
c-1,2-Dichloroethene	ND	1.0	1.00	
t-1,2-Dichloroethene	ND	1.0	1.00	
1,2-Dichloropropane	ND	1.0	1.00	
1,3-Dichloropropane	ND	1.0	1.00	
2,2-Dichloropropane	ND	5.0	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 5035
		Method:	EPA 8260B
		Units:	ug/kg
Project: UCSB - Building 408			Page 44 of 48

Parameter	Result	RL	DF	Qualifiers
1,1-Dichloropropene	ND	2.0	1.00	
c-1,3-Dichloropropene	ND	1.0	1.00	
t-1,3-Dichloropropene	ND	2.0	1.00	
Ethylbenzene	ND	1.0	1.00	
2-Hexanone	ND	20	1.00	
Isopropylbenzene	ND	1.0	1.00	
p-Isopropyltoluene	ND	1.0	1.00	
Methylene Chloride	ND	10	1.00	
4-Methyl-2-Pentanone	ND	20	1.00	
Naphthalene	ND	10	1.00	
n-Propylbenzene	ND	2.0	1.00	
Styrene	ND	1.0	1.00	
1,1,1,2-Tetrachloroethane	ND	1.0	1.00	
1,1,2,2-Tetrachloroethane	ND	2.0	1.00	
Tetrachloroethene	ND	1.0	1.00	
Toluene	ND	1.0	1.00	
1,2,3-Trichlorobenzene	ND	2.0	1.00	
1,2,4-Trichlorobenzene	ND	2.0	1.00	
1,1,1-Trichloroethane	ND	1.0	1.00	
1,1,2-Trichloroethane	ND	1.0	1.00	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	10	1.00	
Trichloroethene	ND	2.0	1.00	
Trichlorofluoromethane	ND	10	1.00	
1,2,3-Trichloropropane	ND	2.0	1.00	
1,2,4-Trimethylbenzene	ND	2.0	1.00	
1,3,5-Trimethylbenzene	ND	2.0	1.00	
Vinyl Acetate	ND	10	1.00	
Vinyl Chloride	ND	1.0	1.00	
p/m-Xylene	ND	2.0	1.00	
o-Xylene	ND	1.0	1.00	
Methyl-t-Butyl Ether (MTBE)	ND	2.0	1.00	
Tert-Butyl Alcohol (TBA)	ND	20	1.00	
Diisopropyl Ether (DIPE)	ND	1.0	1.00	
Ethyl-t-Butyl Ether (ETBE)	ND	1.0	1.00	
Tert-Amyl-Methyl Ether (TAME)	ND	1.0	1.00	
Ethanol	ND	500	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	96	80-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 5035
		Method:	EPA 8260B
		Units:	ug/kg
Project: UCSB - Building 408			Page 45 of 48

Surrogate	Rec. (%)	Control Limits	Qualifiers
Dibromofluoromethane	95	79-133	
1,2-Dichloroethane-d4	90	71-155	
Toluene-d8	100	80-120	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.	Date Received: 09/22/18
4680 East Los Angeles Ave, Suite O	Work Order: 18-09-1668
Simi Valley, CA 93063-3407	Preparation: EPA 5035
	Method: EPA 8260B
	Units: ug/kg
Project: UCSB - Building 408	Page 46 of 48

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**095-01-025-30412**	**N/A**	**Solid**	**GC/MS OO**	**09/27/18**	**09/28/18 00:02**	**180927L057**

Parameter	Result	RL	DF	Qualifiers
Acetone	ND	5000	50.0	
Benzene	ND	100	50.0	
Bromobenzene	ND	100	50.0	
Bromochloromethane	ND	200	50.0	
Bromodichloromethane	ND	100	50.0	
Bromoform	ND	500	50.0	
Bromomethane	ND	2000	50.0	
2-Butanone	ND	2000	50.0	
n-Butylbenzene	ND	100	50.0	
sec-Butylbenzene	ND	100	50.0	
tert-Butylbenzene	ND	100	50.0	
Carbon Disulfide	ND	1000	50.0	
Carbon Tetrachloride	ND	100	50.0	
Chlorobenzene	ND	100	50.0	
Chloroethane	ND	200	50.0	
Chloroform	ND	100	50.0	
Chloromethane	ND	2000	50.0	
2-Chlorotoluene	ND	100	50.0	
4-Chlorotoluene	ND	100	50.0	
Dibromochloromethane	ND	200	50.0	
1,2-Dibromo-3-Chloropropane	ND	500	50.0	
1,2-Dibromoethane	ND	100	50.0	
Dibromomethane	ND	100	50.0	
1,2-Dichlorobenzene	ND	100	50.0	
1,3-Dichlorobenzene	ND	100	50.0	
1,4-Dichlorobenzene	ND	100	50.0	
Dichlorodifluoromethane	ND	200	50.0	
1,1-Dichloroethane	ND	100	50.0	
1,2-Dichloroethane	ND	100	50.0	
1,1-Dichloroethene	ND	100	50.0	
c-1,2-Dichloroethene	ND	100	50.0	
t-1,2-Dichloroethene	ND	100	50.0	
1,2-Dichloropropane	ND	100	50.0	
1,3-Dichloropropane	ND	100	50.0	
2,2-Dichloropropane	ND	500	50.0	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 5035
		Method:	EPA 8260B
		Units:	ug/kg
Project: UCSB - Building 408			

Parameter	Result	RL	DF	Qualifiers
1,1-Dichloropropene	ND	200	50.0	
c-1,3-Dichloropropene	ND	100	50.0	
t-1,3-Dichloropropene	ND	200	50.0	
Ethylbenzene	ND	100	50.0	
2-Hexanone	ND	2000	50.0	
Isopropylbenzene	ND	100	50.0	
p-Isopropyltoluene	ND	100	50.0	
Methylene Chloride	ND	1000	50.0	
4-Methyl-2-Pentanone	ND	2000	50.0	
Naphthalene	ND	1000	50.0	
n-Propylbenzene	ND	200	50.0	
Styrene	ND	100	50.0	
1,1,1,2-Tetrachloroethane	ND	100	50.0	
1,1,2,2-Tetrachloroethane	ND	200	50.0	
Tetrachloroethene	ND	100	50.0	
Toluene	ND	100	50.0	
1,2,3-Trichlorobenzene	ND	200	50.0	
1,2,4-Trichlorobenzene	ND	200	50.0	
1,1,1-Trichloroethane	ND	100	50.0	
1,1,2-Trichloroethane	ND	100	50.0	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	1000	50.0	
Trichloroethene	ND	200	50.0	
Trichlorofluoromethane	ND	1000	50.0	
1,2,3-Trichloropropane	ND	200	50.0	
1,2,4-Trimethylbenzene	ND	200	50.0	
1,3,5-Trimethylbenzene	ND	200	50.0	
Vinyl Acetate	ND	1000	50.0	
Vinyl Chloride	ND	100	50.0	
p/m-Xylene	ND	200	50.0	
o-Xylene	ND	100	50.0	
Methyl-t-Butyl Ether (MTBE)	ND	200	50.0	
Tert-Butyl Alcohol (TBA)	ND	2000	50.0	
Diisopropyl Ether (DIPE)	ND	100	50.0	
Ethyl-t-Butyl Ether (ETBE)	ND	100	50.0	
Tert-Amyl-Methyl Ether (TAME)	ND	100	50.0	
Ethanol	ND	50000	50.0	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	97	80-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 5035
		Method:	EPA 8260B
		Units:	ug/kg
Project: UCSB - Building 408			Page 48 of 48

Surrogate	Rec. (%)	Control Limits	Qualifiers
Dibromofluoromethane	94	79-133	
1,2-Dichloroethane-d4	84	71-155	
Toluene-d8	102	80-120	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Quality Control - Spike/Spike Duplicate

Jacob & Hefner Associates, Inc.	Date Received: 09/22/18
4680 East Los Angeles Ave, Suite O	Work Order: 18-09-1668
Simi Valley, CA 93063-3407	Preparation: EPA 3550B
	Method: EPA 8015B (M)
Project: UCSB - Building 408	Page 1 of 3

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
HA-2-11'	**Sample**	**Solid**	**GC 46**	**09/26/18**	**09/27/18 08:07**	**180926S10**
HA-2-11'	**Matrix Spike**	**Solid**	**GC 46**	**09/26/18**	**09/27/18 06:05**	**180926S10**
HA-2-11'	**Matrix Spike Duplicate**	**Solid**	**GC 46**	**09/26/18**	**09/27/18 06:25**	**180926S10**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
TPH as Diesel	159.0	400.0	333.1	44	364.5	51	64-130	9	0-15	3

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RPD: Relative Percent Difference.   CL: Control Limits

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Quality Control - Spike/Spike Duplicate

Jacob & Hefner Associates, Inc.
4680 East Los Angeles Ave, Suite O
Simi Valley, CA 93063-3407

Date Received: 09/22/18
Work Order: 18-09-1668
Preparation: EPA 3050B
Method: EPA 6010B

Project: UCSB - Building 408

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
18-09-1650-1	**Sample**	**Solid**	**ICP 8300**	**09/27/18**	**09/28/18 19:56**	**180927S01**
18-09-1650-1	**Matrix Spike**	**Solid**	**ICP 8300**	**09/27/18**	**09/28/18 19:58**	**180927S01**
18-09-1650-1	**Matrix Spike Duplicate**	**Solid**	**ICP 8300**	**09/27/18**	**09/28/18 20:02**	**180927S01**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Antimony	ND	25.00	5.985	24	6.055	24	50-115	1	0-20	3
Arsenic	1.027	25.00	27.27	105	26.07	100	75-125	5	0-20	
Barium	72.37	25.00	132.3	240	86.86	58	75-125	41	0-20	3,4
Beryllium	0.4084	25.00	28.64	113	27.81	110	75-125	3	0-20	
Cadmium	ND	25.00	29.86	119	28.26	113	75-125	6	0-20	
Chromium	12.24	25.00	43.39	125	40.47	113	75-125	7	0-20	
Cobalt	6.171	25.00	35.43	117	33.35	109	75-125	6	0-20	
Copper	10.29	25.00	40.30	120	37.33	108	75-125	8	0-20	
Lead	6.161	25.00	36.64	122	34.40	113	75-125	6	0-20	
Molybdenum	ND	25.00	24.29	97	22.79	91	75-125	6	0-20	
Nickel	7.441	25.00	35.97	114	33.65	105	75-125	7	0-20	
Selenium	ND	25.00	25.69	103	25.19	101	75-125	2	0-20	
Silver	ND	12.50	14.53	116	12.66	101	75-125	14	0-20	
Thallium	ND	25.00	6.205	25	3.233	13	75-125	63	0-20	3,4
Vanadium	20.32	25.00	45.52	101	42.64	89	75-125	7	0-20	
Zinc	38.92	25.00	74.18	141	90.54	206	75-125	20	0-20	3

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - Spike/Spike Duplicate

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 7471A Total
		Method:	EPA 7471A
Project: UCSB - Building 408			Page 3 of 3

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
18-09-1676-1	**Sample**	**Solid**	**Mercury 08**	**09/27/18**	**09/27/18 12:51**	**180927S02**
18-09-1676-1	**Matrix Spike**	**Solid**	**Mercury 08**	**09/27/18**	**09/27/18 12:54**	**180927S02**
18-09-1676-1	**Matrix Spike Duplicate**	**Solid**	**Mercury 08**	**09/27/18**	**09/27/18 12:56**	**180927S02**

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Mercury	ND	0.8350	0.7990	96	0.8026	96	71-137	0	0-14	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS

Jacob & Hefner Associates, Inc.
4680 East Los Angeles Ave, Suite O
Simi Valley, CA 93063-3407

Date Received: 09/22/18
Work Order: 18-09-1668
Preparation: EPA 3550B
Method: EPA 8015B (M)

Project: UCSB - Building 408

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
099-15-490-3305	**LCS**	**Solid**	**GC 46**	**09/26/18**	**09/27/18 19:34**	**180926B10**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	Qualifiers
TPH as Diesel	400.0	348.4	87	75-123	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS

Jacob & Hefner Associates, Inc.	Date Received: 09/22/18
4680 East Los Angeles Ave, Suite O	Work Order: 18-09-1668
Simi Valley, CA 93063-3407	Preparation: EPA 3050B
	Method: EPA 6010B
Project: UCSB - Building 408	Page 2 of 5

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
097-01-002-27033	**LCS**	**Solid**	**ICP 8300**	**09/27/18**	**09/28/18 19:55**	**180927L01**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	ME CL	Qualifiers
Antimony	25.00	22.06	88	80-120	73-127	
Arsenic	25.00	21.53	86	80-120	73-127	
Barium	25.00	26.20	105	80-120	73-127	
Beryllium	25.00	25.19	101	80-120	73-127	
Cadmium	25.00	25.20	101	80-120	73-127	
Chromium	25.00	25.08	100	80-120	73-127	
Cobalt	25.00	25.48	102	80-120	73-127	
Copper	25.00	24.60	98	80-120	73-127	
Lead	25.00	26.58	106	80-120	73-127	
Molybdenum	25.00	23.34	93	80-120	73-127	
Nickel	25.00	25.49	102	80-120	73-127	
Selenium	25.00	22.89	92	80-120	73-127	
Silver	12.50	11.87	95	80-120	73-127	
Thallium	25.00	23.71	95	80-120	73-127	
Vanadium	25.00	24.34	97	80-120	73-127	
Zinc	25.00	25.62	102	80-120	73-127	

Total number of LCS compounds: 16
Total number of ME compounds: 0
Total number of ME compounds allowed: 1
LCS ME CL validation result: Pass

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RPD: Relative Percent Difference. CL: Control Limits

Quality Control - LCS

Jacob & Hefner Associates, Inc.	Date Received: 09/22/18
4680 East Los Angeles Ave, Suite O	Work Order: 18-09-1668
Simi Valley, CA 93063-3407	Preparation: EPA 7471A Total
	Method: EPA 7471A
Project: UCSB - Building 408	Page 3 of 5

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
099-16-272-4165	**LCS**	**Solid**	**Mercury 08**	**09/27/18**	**09/27/18 12:49**	**180927L02**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	Qualifiers
Mercury	0.8350	0.7758	93	85-121	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS/LCSD

Jacob & Hefner Associates, Inc.
4680 East Los Angeles Ave, Suite O
Simi Valley, CA 93063-3407

Date Received: 09/22/18
Work Order: 18-09-1668
Preparation: EPA 5035
Method: EPA 8260B

Project: UCSB - Building 408

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
095-01-025-30411	**LCS**	**Solid**	**GC/MS OO**	**09/27/18**	**09/27/18 21:40**	**180927L055**
095-01-025-30411	**LCSD**	**Solid**	**GC/MS OO**	**09/27/18**	**09/27/18 22:08**	**180927L055**

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	ME CL	RPD	RPD CL	Qualifiers
Benzene	50.00	50.18	100	52.03	104	80-120	73-127	4	0-20	
Carbon Tetrachloride	50.00	44.88	90	43.39	87	65-137	53-149	3	0-20	
Chlorobenzene	50.00	53.61	107	53.73	107	80-120	73-127	0	0-20	
1,2-Dibromoethane	50.00	55.43	111	55.69	111	80-120	73-127	0	0-20	
1,2-Dichlorobenzene	50.00	56.45	113	55.04	110	80-120	73-127	3	0-20	
1,2-Dichloroethane	50.00	46.96	94	48.15	96	80-120	73-127	3	0-20	
1,1-Dichloroethene	50.00	47.37	95	46.94	94	68-128	58-138	1	0-20	
Ethylbenzene	50.00	52.38	105	52.84	106	80-120	73-127	1	0-20	
Toluene	50.00	52.87	106	53.58	107	80-120	73-127	1	0-20	
Trichloroethene	50.00	56.07	112	58.60	117	80-120	73-127	4	0-20	
Vinyl Chloride	50.00	53.50	107	53.60	107	67-127	57-137	0	0-20	
p/m-Xylene	100.0	100.9	101	101.3	101	75-125	67-133	0	0-25	
o-Xylene	50.00	50.37	101	51.01	102	75-125	67-133	1	0-25	
Methyl-t-Butyl Ether (MTBE)	50.00	50.79	102	50.09	100	70-124	61-133	1	0-20	
Tert-Butyl Alcohol (TBA)	250.0	252.6	101	273.6	109	73-121	65-129	8	0-20	
Diisopropyl Ether (DIPE)	50.00	48.60	97	48.58	97	69-129	59-139	0	0-20	
Ethyl-t-Butyl Ether (ETBE)	50.00	49.06	98	48.64	97	70-124	61-133	1	0-20	
Tert-Amyl-Methyl Ether (TAME)	50.00	50.17	100	51.64	103	74-122	66-130	3	0-20	
Ethanol	500.0	536.5	107	553.8	111	51-135	37-149	3	0-27	

Total number of LCS compounds: 19
Total number of ME compounds: 0
Total number of ME compounds allowed: 1
LCS ME CL validation result: Pass

RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS/LCSD

Jacob & Hefner Associates, Inc.		Date Received:	09/22/18
4680 East Los Angeles Ave, Suite O		Work Order:	18-09-1668
Simi Valley, CA 93063-3407		Preparation:	EPA 5035
		Method:	EPA 8260B
Project: UCSB - Building 408			Page 5 of 5

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
095-01-025-30412	**LCS**	**Solid**	**GC/MS OO**	**09/27/18**	**09/27/18 21:40**	**180927L057**
095-01-025-30412	**LCSD**	**Solid**	**GC/MS OO**	**09/27/18**	**09/27/18 22:08**	**180927L057**

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	ME CL	RPD	RPD CL	Qualifiers
Benzene	50.00	50.18	100	52.03	104	80-120	73-127	4	0-20	
Carbon Tetrachloride	50.00	44.88	90	43.39	87	65-137	53-149	3	0-20	
Chlorobenzene	50.00	53.61	107	53.73	107	80-120	73-127	0	0-20	
1,2-Dibromoethane	50.00	55.43	111	55.69	111	80-120	73-127	0	0-20	
1,2-Dichlorobenzene	50.00	56.45	113	55.04	110	80-120	73-127	3	0-20	
1,2-Dichloroethane	50.00	46.96	94	48.15	96	80-120	73-127	3	0-20	
1,1-Dichloroethene	50.00	47.37	95	46.94	94	68-128	58-138	1	0-20	
Ethylbenzene	50.00	52.38	105	52.84	106	80-120	73-127	1	0-20	
Toluene	50.00	52.87	106	53.58	107	80-120	73-127	1	0-20	
Trichloroethene	50.00	56.07	112	58.60	117	80-120	73-127	4	0-20	
Vinyl Chloride	50.00	53.50	107	53.60	107	67-127	57-137	0	0-20	
p/m-Xylene	100.0	100.9	101	101.3	101	75-125	67-133	0	0-25	
o-Xylene	50.00	50.37	101	51.01	102	75-125	67-133	1	0-25	
Methyl-t-Butyl Ether (MTBE)	50.00	50.79	102	50.09	100	70-124	61-133	1	0-20	
Tert-Butyl Alcohol (TBA)	250.0	252.6	101	273.6	109	73-121	65-129	8	0-20	
Diisopropyl Ether (DIPE)	50.00	48.60	97	48.58	97	69-129	59-139	0	0-20	
Ethyl-t-Butyl Ether (ETBE)	50.00	49.06	98	48.64	97	70-124	61-133	1	0-20	
Tert-Amyl-Methyl Ether (TAME)	50.00	50.17	100	51.64	103	74-122	66-130	3	0-20	
Ethanol	500.0	536.5	107	553.8	111	51-135	37-149	3	0-27	

Total number of LCS compounds: 19
Total number of ME compounds: 0
Total number of ME compounds allowed: 1
LCS ME CL validation result: Pass

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RPD: Relative Percent Difference.   CL: Control Limits

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Sample Analysis Summary Report

Work Order: 18-09-1668

Method	Extraction	Chemist ID	Instrument	Analytical Location
EPA 6010B	EPA 3050B	110	ICP 8300	1
EPA 7471A	EPA 7471A Total	868	Mercury 08	1
EPA 8015B (M)	EPA 3550B	1028	GC 46	1
EPA 8260B	EPA 5035	1178	GC/MS OO	2

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Location 1: 7440 Lincoln Way, Garden Grove, CA 92841
Location 2: 7445 Lampson Avenue, Garden Grove, CA 92841

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Glossary of Terms and Qualifiers

Work Order: 18-09-1668 Page 1 of 1

Qualifiers	Definition
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to suspected matrix interference. The associated LCS recovery was in control.
4	The MS/MSD RPD was out of control due to suspected matrix interference.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to suspected matrix interference.
6	Surrogate recovery below the acceptance limit.
7	Surrogate recovery above the acceptance limit.
B	Analyte was present in the associated method blank.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
CI	See case narrative.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
HD	The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
HDH	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but heavier hydrocarbons were also present (or detected).
HDL	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but lighter hydrocarbons were also present (or detected).
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
JA	Analyte positively identified but quantitation is an estimate.
ME	LCS Recovery Percentage is within Marginal Exceedance (ME) Control Limit range (+/- 4 SD from the mean).
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
SG	The sample extract was subjected to Silica Gel treatment prior to analysis.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.
	Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.
	Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.
	A calculated total result (Example: Total Pesticides) is the summation of each component concentration and/or, if "J" flags are reported, estimated concentration. Component concentrations showing not detected (ND) are summed into the calculated total result as zero concentrations.

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CHAIN OF CUSTODY RECORD

WO # / LAB USE ONLY: **18-09-1668**

DATE: 9/21/18
PAGE: 1 OF 2

LABORATORY CLIENT: JHA Environmental, Inc.
ADDRESS: 4680 East Los Angeles Avenue, Suite O
CITY: Simi Valley STATE: CA ZIP: 93003
TEL: 805.832.0718 E-MAIL: saichner@jacobandhefner.com

CLIENT PROJECT NAME / NUMBER: UCSB - Building 408
P.O. NO.: F039f_IL_800
PROJECT CONTACT: Stacie Aichner
SAMPLER(S): (PRINT) S. AICHNER

TURNAROUND TIME (Rush surcharges may apply to any TAT not "STANDARD"):
☐ SAME DAY ☐ 24 HR ☐ 48 HR ☐ 72 HR ☐ 5 DAYS ☒ STANDARD

☐ COELT EDF GLOBAL ID: N/A LOG CODE:

SPECIAL INSTRUCTIONS:

REQUESTED ANALYSES

Please check box or fill in blank as needed.

LAB USE ONLY	SAMPLE ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. OF CONT.	Unpreserved	Preserved	Field Filtered	TPH (8015M) full range C6-C44	VOCs (8260) Full Suite	T22 Metals 6010/747X
1	HA-1-12'	9/21/18	0830	Soil	4	X			X	X	
2	HA-1-17'		0855			X			X	X	
3	BH-1-10'		0920			X			X	X	
4	BH-1-15'		0930			X			X	X	
5	HA-2-11'		1015			X			X	X	
6	HA-2-15'		1035			X			X	X	
7	BH-2-10'		1200			X			X	X	
8	BH-2-15'		1220			X			X	X	
9	HA-3-9'		1240		5	X			X	X	X
10	HA-3-15'		1250		4	X			X	X	

Relinquished by: (Signature)	Received by: (Signature/Affiliation)	Date:	Time:
		9/22/18	1015
Relinquished by: (Signature)	Received by: (Signature/Affiliation)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature/Affiliation)	Date:	Time:

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PAGE: 2 OF 2

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PROJECT CONTACT: Stacie Aichner

SAMPLER(S): (PRINT) S. AICHNER

TURNAROUND TIME (Rush surcharges may apply to any TAT not "STANDARD"):
☐ SAME DAY ☐ 24 HR ☐ 48 HR ☐ 72 HR ☐ 5 DAYS ☒ STANDARD

☐ COELT EDF GLOBAL ID: N/A LOG CODE:

SPECIAL INSTRUCTIONS:

REQUESTED ANALYSES

Please check box or fill in blank as needed.

LAB USE ONLY	SAMPLE ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. OF CONT.	Unpreserved	Preserved	Field Filtered	TPH (8015M) full range C6-C44	VOCs (8260) Full Suite	T22 Metals 6010/747X
11	HA-4-10'	9/21/18	1420	SOIL	4	X			X	X	
12	HA-4-15	↓	1430	↓	↓	X			X	X	
13	BH-3-10'	↓	1505	↓	↓	X			X	X	
14	BH-3-15'	↓	1520	↓	↓	X			X	X	

Relinquished by: (Signature)	Received by: (Signature/Affiliation)	Date:	Time:
[signature]	[signature]	9/22/18	1015
Relinquished by: (Signature)	Received by: (Signature/Affiliation)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature/Affiliation)	Date:	Time:

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WORK ORDER NUMBER: 18-09-1668

SAMPLE RECEIPT CHECKLIST

COOLER 1 OF 1

CLIENT: JHA

DATE: 09 /22/ 2018

TEMPERATURE: (Criteria: 0.0°C – 6.0°C, not frozen except sediment/tissue)

Thermometer ID: SC6 (CF: -0.5°C); Temperature (w/o CF): 2.9 °C (w/ CF): 2.4 °C; ☑ Blank ☐ Sample

☐ Sample(s) outside temperature criteria (PM/APM contacted by: ________)

☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling

☐ Sample(s) received at ambient temperature; placed on ice for transport by courier

Ambient Temperature: ☐ Air ☐ Filter

Checked by: UGL1

CUSTODY SEAL:

Cooler	☐ Present and Intact	☐ Present but Not Intact	☑ Not Present	☐ N/A	Checked by: UGL1
Sample(s)	☐ Present and Intact	☐ Present but Not Intact	☑ Not Present	☐ N/A	Checked by: UWL2

SAMPLE CONDITION:	Yes	No	N/A
Chain-of-Custody (COC) document(s) received with samples	☑	☐	☐
COC document(s) received complete	☑	☐	☐
☐ Sampling date ☐ Sampling time ☐ Matrix ☐ Number of containers			
☐ No analysis requested ☐ Not relinquished ☐ No relinquished date ☐ No relinquished time			
Sampler's name indicated on COC	☑	☐	☐
Sample container label(s) consistent with COC	☑	☐	☐
Sample container(s) intact and in good condition	☑	☐	☐
Proper containers for analyses requested	☑	☐	☐
Sufficient volume/mass for analyses requested	☑	☐	☐
Samples received within holding time	☑	☐	☐
Aqueous samples for certain analyses received within 15-minute holding time			
☐ pH ☐ Residual Chlorine ☐ Dissolved Sulfide ☐ Dissolved Oxygen	☐	☐	☑
Proper preservation chemical(s) noted on COC and/or sample container	☐	☐	☑
Unpreserved aqueous sample(s) received for certain analyses			
☐ Volatile Organics ☐ Total Metals ☐ Dissolved Metals			
Acid/base preserved samples - pH within acceptable range	☐	☐	☑
Container(s) for certain analysis free of headspace	☐	☐	☑
☐ Volatile Organics ☐ Dissolved Gases (RSK-175) ☐ Dissolved Oxygen (SM 4500)			
☐ Carbon Dioxide (SM 4500) ☐ Ferrous Iron (SM 3500) ☐ Hydrogen Sulfide (Hach)			
Tedlar™ bag(s) free of condensation	☐	☐	☑

CONTAINER TYPE: **(Trip Blank Lot Number: ________________)**

Aqueous: ☐ VOA ☐ VOAh ☐ VOAna2 ☐ 100PJ ☐ 100PJna2 ☐ 125AGB ☐ 125AGBh ☐ 125AGBp ☐ 125PB ☐ 125PBznna (pH__9) ☐ 250AGB ☐ 250CGB ☐ 250CGBs (pH__2) ☐ 250PB ☐ 250PBn (pH__2) ☐ 500AGB ☐ 500AGJ ☐ 500AGJs (pH__2) ☐ 500PB ☐ 1AGB ☐ 1AGBna2 ☐ 1AGBs (pH__2) ☐ 1AGBs (O&G) ☐ 1PB ☐ 1PBna (pH__12) ☐ ________ ☐ ________ ☐ ________

Solid: ☑ 4ozCGJ ☐ 8ozCGJ ☐ 16ozCGJ ☐ Sleeve (___) ☑ EnCores® (3) ☐ TerraCores® (___) ☐ ________ ☐ ________ ☐ ________

Air: ☐ Tedlar™ ☐ Canister ☐ Sorbent Tube ☐ PUF ☐ ________ **Other Matrix** (__________): ☐ ________ ☐ ________ ☐ ________

Container: **A** = Amber, **B** = Bottle, **C** = Clear, **E** = Envelope, **G** = Glass, **J** = Jar, **P** = Plastic, and **Z** = Ziploc/Resealable Bag

Preservative: **b** = buffered, **f** = filtered, **h** = HCl, **n** = HNO_3, **na** = NaOH, **na2** = $Na_2S_2O_3$, **p** = H_3PO_4, **s** = H_2SO_4, **u** = ultra-pure, **x** = $Na_2SO_3+NaHSO_4.H_2O$, **znna** = Zn $(CH_3CO_2)_2$ + NaOH

Labeled/Checked by: UWL2

Reviewed by: UGL1

Appendix D

Support for Use of BAAQMD Greenhouse Gas Emission Standards

Support for Use of Bay Area Air Quality Management District Greenhouse Gas Emissions Standards

This memorandum discusses factual background and justification for the County's interim reliance on thresholds of significance for GHG emissions developed and proposed by the Bay Area Air Quality Management District (BAAQMD). The County is presently working to develop an inventory of current GHG emissions and a Climate Action Strategy and Climate Action Plan based on this data. Until County-specific data becomes available and significance thresholds applicable to GHG emissions are developed and formally adopted, the County has developed interim procedures that rely on the proposed BAAQMD standards. Santa Barbara is similar to certain Bay Area counties (in particular, Sonoma, Solano, and Marin) in terms of population growth, land use patterns, General Plan policies, and average commute patterns and times. Because of these similarities, the methodology used by BAAQMD to develop its GHG emission significance thresholds, as well as the thresholds themselves, have applicability to Santa Barbara County and represent the best available interim standards for Santa Barbara County.

A. <u>Summary of BAAQMD Methodology</u>

The BAAQMD has developed a methodology and significance thresholds for GHG emissions using the emission reduction goals of AB 32 while taking into account the emission reduction strategies outlined in the Scoping Plan. BAAQMD proposes thresholds for both land use projects (stationary and non-stationary sources) and plans. Using the emission reductions levels required to meet the goals of AB 32, BAAQMD identified two methods and thresholds for land use projects. The first threshold is based on a gap analysis and the second threshold is based on what would be considered a GHG-efficient project. The BAAQMD also established thresholds for land use plans based on the GHG-efficient method. Thresholds for stationary sources were established using a separate method specific to stationary source polluters.

1. <u>Project-Level Thresholds</u>

The Gap Analysis Approach

This approach focuses on a limited set of State mandates that appear to have the greatest potential to reduce land use development related GHG emissions. The BAAQMD's steps in determining the threshold are outlined below.

1) Determine growth in emissions attributable to land use driven sectors.

2) Estimate the anticipated GHG reductions affecting the same land use-driven emissions sectors associated with the AB 32 Scoping Plan.

3) Determine the gap between statewide inventory estimates and the estimated reductions from the adopted AB 32 Scoping Plan. The gap identified represents the additional GHG emissions reductions needed statewide from land use-driven emissions sectors, which represents new land use developments' share of the emissions reductions needed to meet the statewide reduction goals.

4) Determine the percent reduction that the gap represents in the land-use driven sectors from the BAAQMD's inventory. Identify the amount of reductions needed to meet this gap.

5) Assess historical CEQA documents to determine the frequency distribution trend of project sizes and types that have been subject to CEQA for the past several years.

6) Forecast new land use development for the Bay Area through the year 2020.

7) Estimate GHG emissions from each land use development project type and size using URBEMIS. Determine the amount of GHG emissions that can reasonable be reduced through current mitigation measures for future development projects subject to CEQA.

8) Conduct a sensitivity analysis of the GHG mass emissions threshold needed to achieve the desired reduction identified in Step 4. The mass emissions threshold is what would be needed to achieve the emissions reductions necessary by 2020 to meet the Bay Area's fare share of the statewide gap from land use-driven emissions.

Using these steps BAAQMD identified a significance threshold of 1,100 MT of CO_2e/year for non-stationary sources.

Efficiency-Based Approach

The threshold was determined by dividing the emissions inventory goal for 2020 (for land use-related sectors only) by the estimated 2020 population and employment. The number given by this calculation provides what would be considered a GHG efficient project if its emissions were to remain below that level.

This approach resulted in a significance threshold of 4.6 MT CO_2e/California Service Population/yr (residents + employees) for non-stationary sources and can be applied to both projects and plans.

Stationary Sources

BAAQMD determined a threshold of 10,000 MT CO_2/year for greenhouse gas emissions from stationary sources. This threshold was developed based on estimating CO_2 emissions from projects in the Air District from 2005 – 2007. Only CO_2 emissions were included as they represent the majority of GHG emissions from stationary combustion. Emissions were estimated for the maximum permitted amount. Using this data, BAAQMD determined that a threshold of 10,000 MT CO_2/year would encompass 95% of all GHG emissions from stationary sources. While this threshold would capture 95% of emissions, only 10% of new permits would actually hit this threshold. Thus the threshold captures the large significant polluters.

2. Plan-Level Thresholds

Plans would be considered to have less than significant GHG emissions if they are:

1) Consistent with a locally adopted GHG Reduction Plan or Climate Action Plan

2) Less than the efficiency threshold identified for project level GHG impacts, 4.6 MT CO_2e/California Service Population/yr (residents + employees).

B. Reasoning for Santa Barbara County Reliance on BAAQMD Standards

Until the County of Santa Barbara has formally adopted thresholds of significance for GHG emissions, the County must look to other jurisdictions with similar characteristics for guidance in the interim. Currently the BAAQMD is the first air quality management district to have formally adopted GHG thresholds. As described above, BAAQMD's thresholds are based on a sound, factually supported methodology. While land use patterns in Santa Barbara County are different from the Bay Area as a whole region, the BAAQMD does contain county jurisdictions very similar to Santa Barbara County. Santa Barbara County and several Bay Area counties have similar demographics, land use patterns, and behaviors, while other Bay Area counties are quite different in these characteristics. Given that the BAAQMD's adopted thresholds provide the best and most defensible significance criteria available at this time, the County proposes to refer to the BAAQMD thresholds for determinations of impact significance with respect to GHG emissions as an interim measure. Once data is available on GHG emissions for Santa Barbara County, a locally based analysis will be conducted to update the significance criteria.

To the extent that Santa Barbara County is similar to certain counties in the Bay Area with similar land use patterns and past population growth rates, Santa Barbara County can be expected to continue to grow in a similar fashion to these Bay Area in the future as well. Examining land use policies in General Plans in the two regions, which guide growth in the future, provides support for this conclusion. Given that the two regions would be expected to have similar future growth, the forecast for future land use development in BAAQMD's gap analysis threshold methodology should also generally apply to Santa Barbara County, such that the BAAQMD thresholds would also be relevant to Santa Barbara County. It should be noted that this methodology also applies in blanket fashion to areas that are very different from Santa Barbara County.

The BAAQMD encompasses all of Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, and Napa Counties as well as the southwestern portion of Solano County and southern Sonoma County. While not all of these Counties are analogous to Santa Barbara County in land use characteristics, population growth, etc., three of these counties, Sonoma, Solano, and Marin, are considered to be Benchmark Counties to Santa Barbara County.[1] Benchmark Counties are considered to have common characteristics including, but not limited to, the following: total population of more than 250,000 but less than 500,000; suburban to rural environments; do not contain a large metropolitan city and are known for their scenic beauty and environmental focus. Table 1 below summarizes the population characteristics and commuter behavior for all Bay Area counties and Santa Barbara County. Sonoma and Solano Counties present a very similar picture to that of Santa Barbara County. The other seven counties show very different characteristics, especially with respect to population size and vehicle miles travelled (VMT). Marin and Napa Counties are smaller counties with slower growth, while the remaining counties contain a much larger populations and corresponding VMT.

Table 1. Bay Area and Santa Barbara County Characteristics[2][3][4] [5]

County	Population (2010)	% Change in Population (2009-2010)	Average Annual Growth Rate (2000 – 2009)	Average Household Size[6]	Average Commute Time (minutes)	Daily VMT (millions)
Santa Barbara	434,481	1	0.86	2.73	20	9.7

[1] Santa Barbara County Operating Plan for 2010-1011

[2] 2006 -2008 American Communities Survey

[3] Source Inventory of Bay Area Greenhouse Gas Emissions, BAAQMD, 2010

[4] Vision 2030: SBCAG 2008 Regional Transportation Plan

[5] California Department of Finance

[6] 2006 -2008 American Communities Survey

Napa	138,917	0.9	1.13	2.63	24	4.5
Marin	260,651	0.8	0.5	2.36	29	6.2
Solano	427,837	0.5	0.79	2.9	30	7.2
Sonoma	493,285	1.2	0.67	2.53	25	10.6
San Mateo	754,285	1.2	0.61	2.74	25	19.4
San Francisco	856,095	1.1	0.96	2.42	29	12.4
Contra Costa	1,073,005	1.1	1.24	2.76	32	25.7
Alameda	1,574,857	1.1	0.86	2.75	28	38
Santa Clara	1,880,876	1.3	1.12	2.91	24	40.1

The efficiency-based approach applies to the entire State of California since the threshold which was calculated is based upon the State's greenhouse gas emissions inventory and population growth and employment data. None of the data used to calculate this threshold was region or county-specific data.

The method used to calculate the threshold which applies to stationary sources is an industry-based threshold rather than land use-based. Some of the stationary sources represented in both regions include oil and gas industry, landfills, electric utilities, cogeneration, and food and agriculture (such as wine fermentation). Oil refineries were found to be the largest source of GHG emissions in the industrial sector in the Bay Area.[7] Data is not yet available for GHG emissions from stationary sources in Santa Barbara County, but the oil and gas industry is the most prominent industrial use in the County.

CAPCOA conducted an analysis of permitting activity to estimate the number of stationary source projects with potentially significant GHG emissions for a given threshold that could be seen in a given year for the four largest air districts. The results of that analysis for a 10,000 MT/yr threshold is presented in Table 2 below.

---

[7] Source Inventory of Bay Area Greenhouse Gas Emissions, BAAQMD, 2010

Table 2. Potential Stationary Source Projects Affected a Given Threshold[8]

	BAAQMD	Sacramento Metropolitan AQMD	San Joaquin Valley Unified APCD	South Coast AQMD
Applications per year affected at threshold of:	1,499	778	1,535	1,179
10,000 MT/yr	7	5	26	8

CARB has predicted that a threshold of 25,000 MT/year would capture greater than 90% of emissions from stationary sources. If this prediction holds true, then a lower threshold of 10,000 metric tons is likely to capture an even greater percentage of emissions. BAAQMD found that a 10,000 MT/yr threshold would capture 95% of GHG emissions, while SCAQMD found that this same threshold would capture at least 90% of GHG emissions.[9] Table 2 illustrates that the 10,000 MT/yr threshold will capture greater than 90% of GHG emissions from stationary sources while only affecting a small portion of polluters for the four largest air districts. Without a GHG emissions inventory, the percentage of GHG emissions that would be captured from stationary sources in Santa Barbara County by this threshold cannot be determined with specificity.

However, insofar asSanta Barbara County is similar to the four air districts listed in Table 3, this high capture rate should hold true for Santa Barbara County as well. Santa Barbara County is located adjacent to the SCAQMD district, with that district including neighboring Ventura County. Additionally, Santa Barbara County, SCAQMD and BAAQMD are all coastal regions. As discussed above, BAAQMD contains many of the same types of stationary source polluters as Santa Barbara County. Given these factual similarities, the BAAQMD's rationale for a 10,000-metric ton significance criterion for stationary sources also applies to Santa Barbara County.

C. Conclusion

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[8] CEQA & Climate Change, CAPCOA, 2008

[9] South Coast Air Quality Management District, Draft Guidance Document – Interim CEQA GHG Significance Threshold

Given the similar population growth, land use patterns, General Plan policies, and behaviors such as average commute time that exist between these two regions, Santa Barbara County's future land use development can be shown to be similar to the Bay Area counties within the BAAQMD's jurisdiction discussed above. Relying as an interim measure on BAAQMD's gap analysis threshold methodology and significance thresholds for GHG emissions can therefore be justified. Because they are not based on region-specific data, the efficiency-based standards are applicable statewide.