University of California, Riverside
School of Business Building
Project Number: 950592

Addendum No. 1 to the Program Environmental Impact Report for the University of California, Riverside 2021 Long Range Development Plan

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JULY 2022

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Acronyms and Abbreviations

Acronym/Abbreviation	Description
ACM	Asbestos-Containing Material
ADA	Americans with Disabilities Act
AES	Aesthetics
AFY	Acre feet per year
ALUCP	Airport Land Use Compatibility Plan
AQMP	Air Quality Management Plan
Asf	Assignable Square Feet
BIO	Biological Resources
BMP	Best Management Practice
CAL FIRE	California Department of Forestry and Fire Protection
Cal/OSHA	California Occupational Safety and Health Administration
CalEEMod	California Emissions Estimator Model
CalGreen	California Green Building Standards Code
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CBC	California Building Code
CBP	Continuing Best Practice
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CGS	California Geological Survey
City	City of Riverside
CNEL	Community Noise Equivalent Level
CO	Carbon monoxide
CRHR	California Register of Historical Resources
CUL	Cultural Resources
CVARS	Coachella Valley Agricultural Research Station
CWA	Clean Water Act
Cy	Cubic Yards
dBA	A-Weighted Decibel
DOC	California Department of Conservation
DPR	Department of Parks and Recreation
DTSC	Department of Toxic Substances Control
EH&S	Environmental Health & Safety
EIR	Environmental Impact Report
EN	Energy
ESA	Environmental Site Assessment

Acronym/Abbreviation	Description
FEMA	Federal Emergency Management Agency
GEO	Geology and Soils
GHG	Greenhouse Gas
Gsf	Gross Square Feet
HABS	Historic American Building Survey
HAZ	Hazards and Hazardous Materials
HVAC	Heating, Ventilation, and Air Conditioning
I-215	Interstate 215
IESNA	Illuminating Engineering Society of North America
IS	Initial Study
LBP	Lead Based Paint
LEED	Leadership in Energy and Environmental Design
Leq	Equivalent Continuous Sound Level
LID	Low Impact Development
Lmax	instantaneous maximum noise level
LRDP	Long Range Development Plan
MBTA	Migratory Bird Treaty Act
MGD	Million Gallons Per Day
MM	Mitigation Measures
MOU	Memorandum of Understanding
MRZ	Mineral Resource Zone
MS4	Municipal Separate Storm Sewer System Permits
MSHCP	Multiple Species Habitat Conservation Plan
$MTCO_2e$	metric tons of carbon dioxide equivalent
MWh	Megawatt-Hours
NAHC	Native American Heritage Commission
NO_x	Nitrogen Oxide
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRHP	National Register of Historic Places
PCB	Polychlorinated Biphenyls
PF	Public Facilities
PM_{10}	Particulate Matter 10 Micrometers in Diameter or Less
$PM_{2.5}$	Fine Particulate Matter 2.5 Micrometers in Diameter or Less
PRC	Public Resources Code
PS	Public Services
PSE	Participating Special Entity
Qof	Quaternary Old Alluvial Fan Deposits
Qvof	Quaternary Very Old Alluvial Fan Deposits
RCA	Western Riverside County Regional Conservation Authority

Acronym/Abbreviation	Description
RCDEH	Riverside County Department of Environmental Health
RCHCA	Riverside County Habitat Conservation Agency
Regents	University of California Board of Regents
RFD	City of Riverside Fire Department
RPD	City of Riverside Police Department
RivTAM	Riverside Traffic Analysis Model
ROG	Reactive Organic Gases
RPU	Riverside Public Utilities
RTP/SCS	Regional Transportation Plan/Sustainable Communities Strategy
RUSD	Riverside Unified School District
RWQCB	Regional Water Quality Control Board
RWQCP	Riverside Water Quality Control Plant
SBB	School of Business Building
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCG	Southern California Gas
SCH	State Clearinghouse
SLR	Single Lens Reflex
SMP	Construction Site Management Plan
SO_2	Sulfur dioxide
SR 60	State Route 60
SR 91	State Route 91
ST	Measurement Short-Term
SVP	Society of Vertebrate Paleontology
SWMP	Storm Water Management Program
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TACs	Toxic air contaminants
TCR	Tribal Cultural Resources
U.S.	United States
UCPD	University of California Police Department
UCR	University of California, Riverside
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tanks
UWMP	Urban Water Management Plan
VHFHSZ	Very High Fire Hazard Severity Zone
VMT	Vehicle Miles Traveled
WF	Wildfire
WRCOG	Western Riverside Council of Governments

1 INTRODUCTION

1.1 PROJECT SUMMARY

The University of California, Riverside (UCR) School of Business Building project (proposed project) is evaluated in this Addendum for consistency with the UCR 2021 Long Range Development Plan (2021 LRDP) and its associated Program Environmental Impact Report (EIR), certified November 18, 2021 (State Clearinghouse [SCH] No. 2020070120).

Project name:	School of Business Building (SBB)
Project location:	University of California, Riverside
Lead agency's name and address:	The Regents of the University of California 1111 Franklin Street Oakland, California 94607
Contact person:	Stephanie Tang, Campus Environmental Planner University of California, Riverside Planning, Design & Construction
Project sponsor's name and address:	University of California, Riverside Planning, Design & Construction 1223 University Avenue, Suite 240 Riverside, California 92507
Location of administrative record:	See Project Sponsor
Previously Certified 2021 LRDP Program EIR:	The 2021 LRDP is a comprehensive land use plan that guides physical development on UCR's campus in order to accommodate projected enrollment increases and new or expanded program initiatives. This Addendum documents that none of the conditions analyzed in the 2021 LRDP Program EIR (2021 LRDP EIR), pursuant to the California Environmental Quality Act (CEQA) Guidelines Section 15162 have occurred, and that the proposed project will not have additional significant effects that were not already evaluated in the 2021 LRDP EIR. The 2021 LRDP and its associated EIR are available at the following locations: ▪ University of California, Riverside Planning, Design & Construction Office located at 1223 University Avenue, Suite 240 Riverside, California 92507 ▪ Online at: https://pdc.ucr.edu/environmental-planning-ceqa

1.2 PURPOSE OF THIS ADDENDUM

The University of California school system requires all of its campuses to develop and administer a LRDP to define each campus' physical development and land use plan to meet academic and institutional objectives for the campus or medical center of public higher education. In 2021, UCR comprehensively updated and adopted the campus LRDP and certified the associated EIR.

UCR's 2021 LRDP identified the land use framework and facility development required to achieve UCR's academic goals and projected growth of 35,000 students and 7,545 faculty and staff for a total campus population of 42,545 by 2035 (UCR 2021a). The 2021 LRDP updated the existing campus land use plan; anticipated growth in new student enrollment, faculty and staff; and projected new or expanded program initiatives (UCR 2021a). It is intended to serve as a guide for campus planners, faculty, and administrators through academic year 2035/2036. Future projects on the UCR campus (campus) would be evaluated for consistency with the 2021 LRDP, the campus' Physical Design Framework, Campus Construction and Design Standards, and Capital Financial Plan. Approval of future projects would also be subject to project specific CEQA review, as needed.

The 2021 LRDP EIR was prepared in accordance with CEQA Guidelines Section 15168 and Public Resources Code (PRC) 21094. It analyzed the environmental impacts of full implementation of the uses and physical development proposed under the 2021 LRDP and identified measures to mitigate the significant adverse program-level and cumulative impacts associated with that growth. Though the campus' future growth had been anticipated and analyzed under the 2021 LRDP and EIR, these documents evaluated future campus growth at a broad, program level. Subsequent specific campus development projects would need to be evaluated at a more defined project level, pursuant to CEQA Guidelines Section 15168(c).

An addendum to an EIR is appropriate where a previously certified EIR has been prepared and some changes or revisions to the project are proposed, or the circumstances surrounding the project have changed, but none of the changes or revisions would result in significant new or substantially more severe environmental impacts, consistent with CEQA Guidelines Sections 21166, 15162, 15163, and 15164.

Altered conditions, site changes, or additions to a project that occur after certification of an EIR may require additional analysis under CEQA. The legal principles that guide decisions regarding whether additional environmental documentation is required are provided in the CEQA Guidelines, which establish three mechanisms to address these changes: a subsequent EIR, a supplement to an EIR, or an addendum to an EIR.

After a lead agency's certification of an EIR, if the lead agency proposes substantial changes to the project or substantial changes to the project's circumstances occur or there is new information of substantial importance, then CEQA Guidelines Section 15162 describes the conditions under which a subsequent EIR may be prepared. When an EIR has been certified for a project, no subsequent or supplemental EIR shall be prepared for that project unless the lead agency determines, based on substantial evidence in light of the whole record, one or more of the following:

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

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

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

a. The project will have one or more significant effects not discussed in the previous EIR;
b. Significant effects previously examined will be substantially more severe than shown in the previous EIR;
c. Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measures or alternatives; or
d. Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

CEQA Guidelines Section 15163 states that a lead agency may choose to prepare a supplement to an EIR rather than a subsequent EIR if:

(1) Any of the conditions described in Section 15162 would require the preparation of a subsequent EIR; and
(2) Only minor additions or changes would be necessary to make the previous EIR adequately apply to the project in the changed situation.

As such, UCR is now proposing an expansion to its School of Business. The proposed project is consistent with the land uses and campus development identified in the 2021 LRDP but was not specifically evaluated as part of the 2021 LRDP EIR. This Addendum, therefore, documents the proposed project's consistency with objectives, land use plans, development and population forecasts evaluated in the 2021 LRDP EIR to determine project-specific compliance with CEQA Guidelines Sections 15164 and 15168(c)(4) by demonstrating that none of the conditions described in CEQA Guidelines Section 15162 calling for the preparation of a subsequent EIR have occurred.

The organization of the environmental analysis in this Addendum follows the same overall format of the 2021 LRDP EIR; however, it avoids repetition of general background and setting information, the regulatory context, overall growth-related information, issues that were evaluated in the Initial Study (IS) prepared for the 2021 LRDP EIR that determined no further analysis in the 2021 LRDP EIR was required, and cumulative impacts and alternatives to the 2021 LRDP. Instead, this Addendum provides more detailed project-level information specific to the proposed project and; document that the proposed project is within the activities evaluated in the 2021 LRDP EIR and that no subsequent EIR is required.

1.3 CEQA DETERMINATION

UCR previously prepared the 2021 LRDP EIR, and on the basis of this evaluation and pursuant to the CEQA Guidelines:

- [x] I find that the project WOULD NOT have new significant effects on the environment that have not already been addressed by the 2021 LRDP EIR, no substantial changes have occurred with respect to the circumstances under which the project will be undertaken, and no new information of substantial importance to the project has been identified. However, minor technical changes or additions are necessary, and in accordance with CEQA Guidelines Section 15164, an ADDENDUM has been prepared.

- [ ] I find that although the project WOULD have one or more new significant effects on the environment, there will not be a significant effect in this case because new project-specific mitigation measures have been identified that would reduce the effects to a less than significant level. In accordance with CEQA Guidelines Section 15162, a TIERED MITIGATED NEGATIVE DECLARATION has been prepared.

- [ ] I find that the project MAY have a new significant effect on the environment that was not adequately addressed in the previous 2021 LRDP EIR or a significant effect previously examined will be substantially more severe than shown in the previous EIR, and there may not be feasible mitigation which would reduce the new significant effect to a less than significant level. In accordance with CEQA Guidelines Section 15162, a TIERED ENVIRONMENTAL IMPACT REPORT is required.

Stephanie Tang	July 5, 2022
Signature of Project Sponsor	Date

2 PROJECT DESCRIPTION

This section of the Addendum describes the regional location and setting, local setting, project setting, project goals and objectives, major project features, and discretionary actions needed for project approval.

2.1 REGIONAL LOCATION AND SETTING

The UCR main campus (campus) is located within the City of Riverside (City) in Riverside County, California. It is approximately three miles east of downtown Riverside, two miles northwest of the City of Moreno Valley, and just west of the Box Springs Mountains. The campus is part of a larger geographic area known as Inland Southern California, which includes western Riverside and southwestern San Bernardino counties, as well as portions of the Pomona Valley in easternmost Los Angeles County (see Figure 2-1).

The City is bordered by the City of Jurupa Valley and the unincorporated community of Highgrove to the north, the City of Moreno Valley and Box Springs Mountain Reserve to the east, the unincorporated community of Woodcrest to the south, and the City of Norco and the unincorporated community of Home Gardens to the west. Regional access to the City is provided via Interstate 215 (I-215)/State Route 60 (SR 60) freeway which traverse northwest-southeast through the City, and SR 91 freeway which traverses northeast-southwest through the City (see Figure 2-1).

2.2 LOCAL SETTING

The approximate 1,108-acre[1] UCR main campus, is generally bounded by University Avenue and Blaine Street to the north, Watkins Drive and Valencia Hill Drive to the east, Le Conte Drive to the south, and Chicago Avenue to the west. The campus is bisected diagonally by I-215/SR 60 freeway, resulting in two areas referred to as East Campus and West Campus (see Figure 2-2).

The East Campus is approximately 604 acres in size and contains most of the campus' built space. Nearly all the academic, research, and support facilities are in the Academic Center, which is circumscribed by Campus Drive and many original campus buildings. The northern half of East Campus is devoted to student housing and recreation. The UCR Botanic Gardens is in the northeastern area of East Campus. The terrain steepens to the south and east of East Campus surrounding the UCR Botanic Gardens; these areas are largely unbuilt.

The West Campus is approximately 504 acres in size and is largely used as agricultural research fields and teaching managed by the Agricultural Operations unit of the College of Natural and Agricultural Sciences. Several University facilities are also on West Campus: surface parking, solar farm, University Extension, and International Village – a housing complex intended for visiting international students. The University Substation, jointly owned by the City and UCR, is at the northern edge of Parking Lot 30. A California Department of Transportation (Caltrans) service yard is situated on a triangular parcel directly west of the I-215/SR 60 freeway, at the eastern terminus of Everton Place.

[1] The UCR Palm Desert Center, UCR Natural Reserves, all other Regents-owned properties, and all off-campus leased spaces are excluded.

Figure 2-1 Regional Location

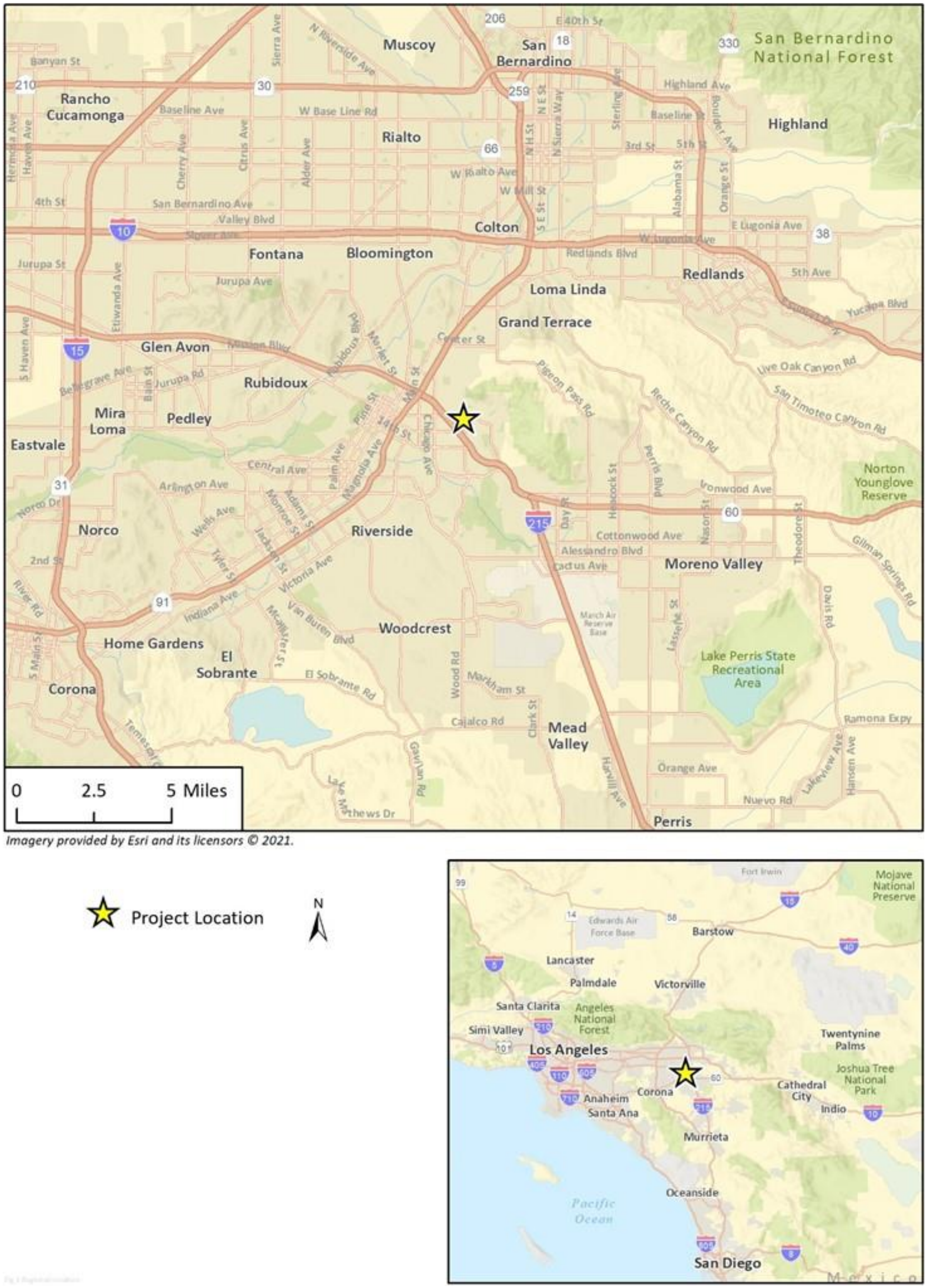
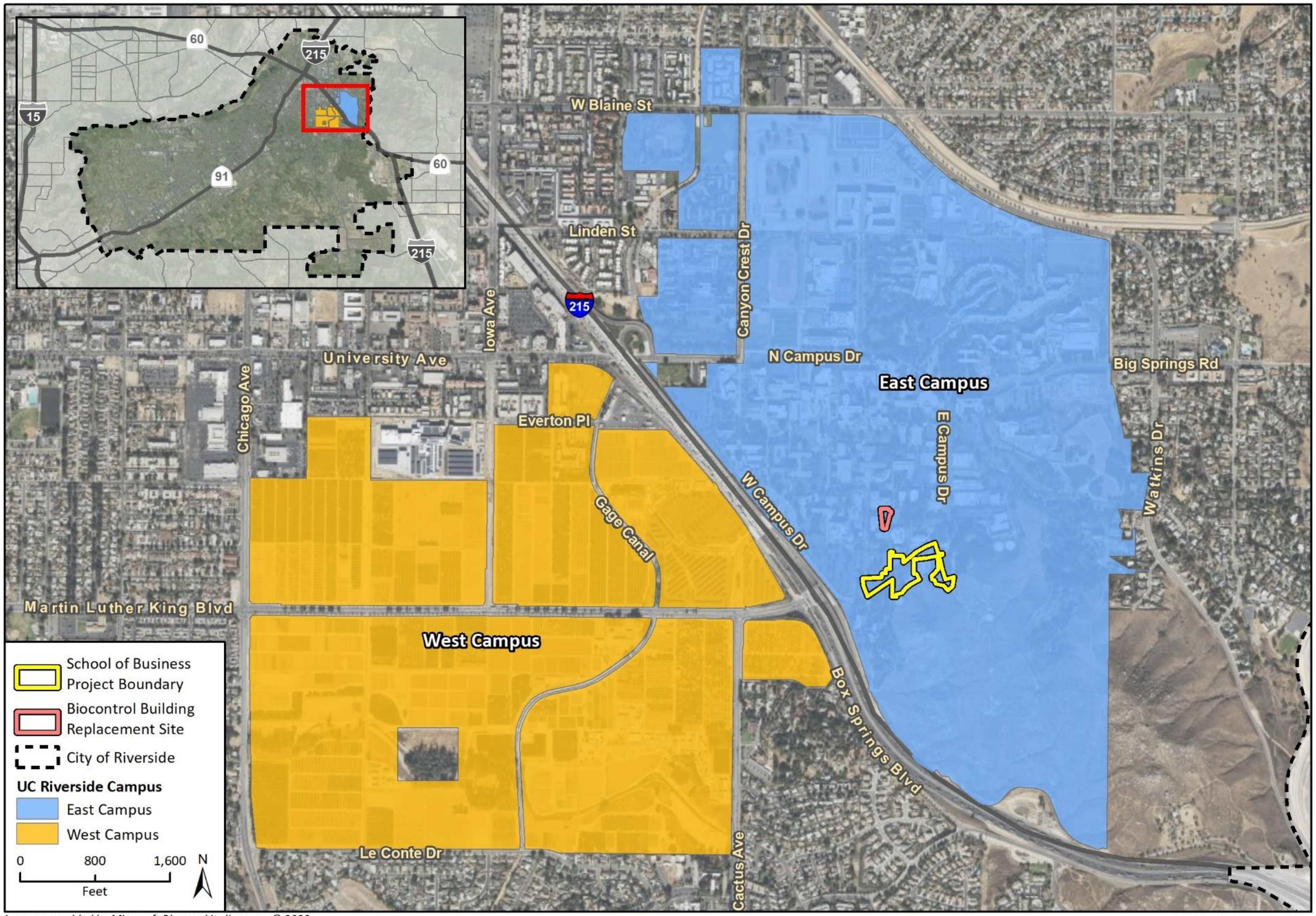


Figure 2-2 UCR Campus



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Data provided by UC Riverside and County of Riverside, 2020.

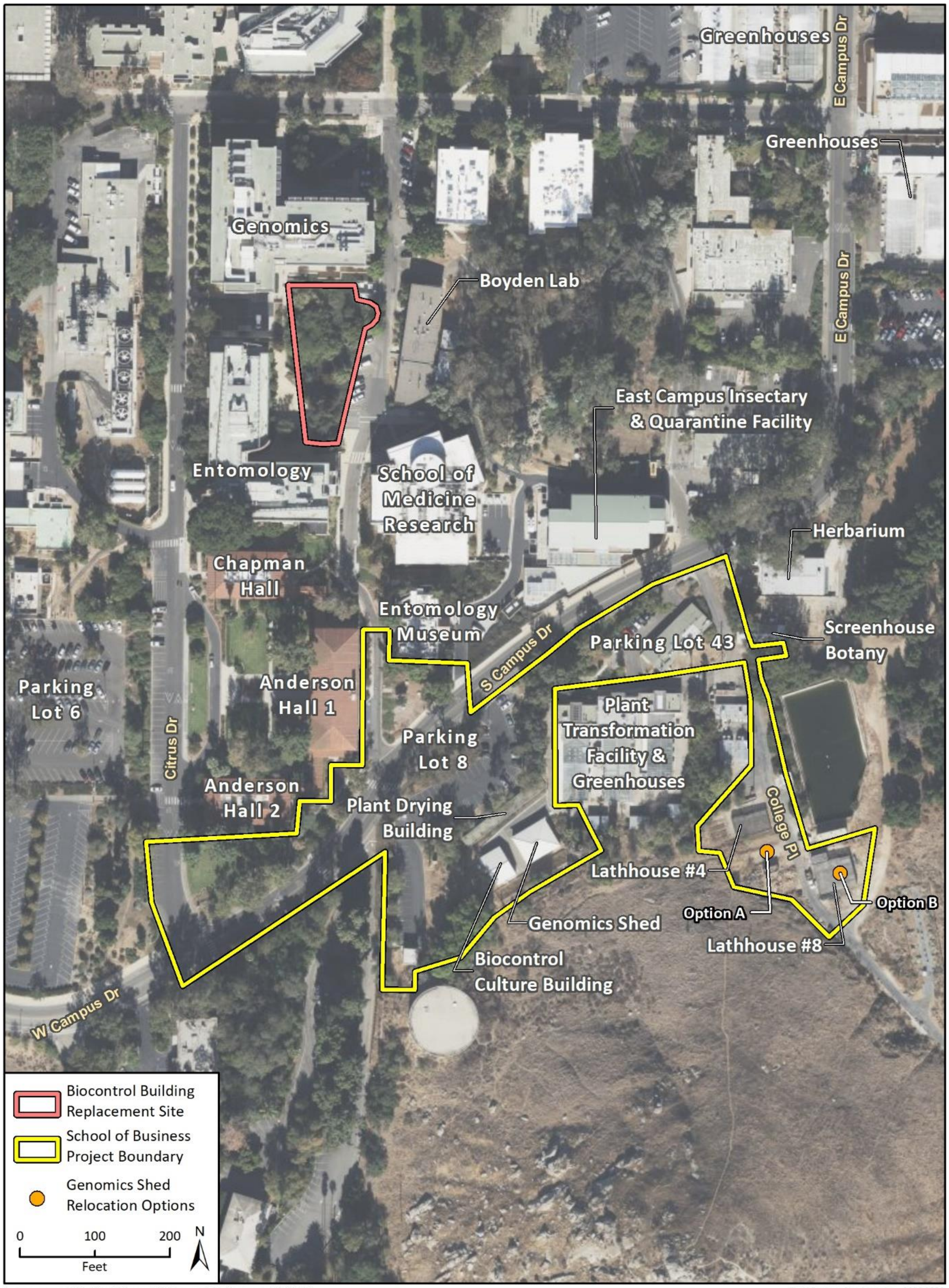
2.3 PROJECT SETTING

The existing School of Business facilities are split between two buildings on campus: Anderson Hall (Anderson Hall 1, Anderson Hall 2 collectively is referred to as Anderson Hall), and Olmsted Hall. Anderson Hall is located north of South Campus Drive; the graduate students are based in Anderson South. Olmsted Hall is located north of South Campus Drive and Parking Lot 6, south of Eucalyptus Drive between Citrus Drive and West Campus Drive; Olmsted Hall houses the Graduate Admissions Office, Undergraduate Academic Advisor Offices, and the Office of Graduate Business Admissions.

The proposed project consists of the development of a new SBB as part of the new School of Business complex within the South District area of East Campus, generally along South Campus Drive between Citrus Drive and College Place. The overall project area is approximately 4.8 acres and is located within the 2021 LRDP land use designation of Academics & Research. The project site is depicted into two areas. The School of Business Project Boundary is currently developed with surface parking (Parking Lot 8 and Parking Lot 43), a Plant Drying Building, Biocontrol Building, Genomics Shed, a headhouse storage building, lathhouses, and associated hardscape and landscape. Currently, there are no staff or students utilizing the Plant Drying Building, but the existing Biocontrol Building, Genomics Shed and lathhouses are currently being used. The Biocontrol Building Replacement Site is currently developed with landscape (see Figure 2-3).

Existing uses adjacent to the School of Business Project Boundary include greenhouses, roadways, landscape, and Open Space Reserve to the south; a water-storage basin, screenhouse botany, herbarium, landscape, avocado trees to the east; Anderson Hall, other academic/research facilities, roadway, hardscape, and landscape to the north; and Anderson Hall, roadway, surface parking, hardscape, and landscape to the west. Existing uses surrounding the Biocontrol Building include academic/research facilities, roadways, hardscape, and/or landscape (see Figure 2-3).

Figure 2-3 Project Site Location



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2.4 PROJECT FEATURES

2.4.1 Project Goals

UCR's vision for the project is to build "a world-class environment that transcends physical structure to play a pivotal role in our community's social and economic landscape." To that end, the proposed SBB project includes new classrooms and educational spaces; student support; academic and administrative office and support spaces; shared building resources; and building support. The goals of the proposed project are the following:

- Establish visibility and identity for the School of Business
- To operate in synergy with adjacent Anderson Hall
- To reinforce connections to the campus core
- To leverage natural site conditions
- To integrate the building into existing topography
- To relocate the storage sheds and Biocontrol Building functions

2.4.2 Project Objectives

A new SBB is needed to help advance the prominence, recognition, and core values of the School of Business. Currently, the School of Business facilities are split between two buildings on campus: Anderson Hall and Olmsted Hall. The new SBB will help consolidate the School of Business programs and help engage both undergraduate and graduate students. The proposed SBB would provide the campus with additional classrooms, lecture facilities, educational spaces, administrative offices, student support spaces, as well as landscaping, hardscaping, and associated site improvements.

Site Plan Summary

The SBB would encompass the area that is currently occupied by Parking Lot 8, the Plant Drying Building, the Biocontrol Building and the Genomics Shed (see Figure 2-3). Demolition of the Plant Drying Building, Biocontrol Building, and Genomics Shed is required to accommodate the development of the SBB. A new Genomics Shed is proposed in an area either south or west of the existing water-storage basin labeled as Option A or Option B in Figure 2-3; demolition of a headhouse storage building at Parking Lot 43, removal of asphalt/surface parking at Parking Lot 8, and associated hardscape, and landscape is also proposed (this area is herein referred to as the SBB Project Boundary). A new Biocontrol Building is proposed in an existing landscaped area adjacent to the Genomics Building, Entomology Building, School of Medicine Research Building, and Boyden Lab (referred to as the Biocontrol Building Replacement Site).

Student and Staffing

The 2021 LRDP assumed an approximately 46 percent increase in student population (approximately 11,000 students), with an approximately 60 percent increase in additional faculty and staff (approximately 2,800 new faculty and staff) by the 2035/2036 academic year. Of this future campus growth, the proposed project would accommodate approximately 570 additional new students and approximately 125 new faculty and staff. In 2021, the existing School of Business operations included approximately 2,100 students and 100 faculty and office staff. Upon completion, the overall School of Business program would accommodate a total of approximately 2,670 students and 225 faculty and staff.

Hours of operation at the SBB would be from 8:00 am to 10:00 pm daily, with occasional special events that would run until approximately 11:00 pm.

Building Characteristics

UCR proposes construction of a new, approximately 65 feet (as measured from street level), 75,000 gsf SBB. The proposed SBB would be taller than the existing buildings surrounding the project site but within the allowed height identified in the 2021 LRDP. The replacement Biocontrol Buildings and Genomics Shed would be similar in size (approximately 20 feet high; approximately 1,500 gsf and 2,500 gsf, respectively) as that of the existing structures. Building materials and colors for the SBB, Biocontrol Building, and Genomics Shed would be required to comply with Campus Construction and Design Standards and Architectural Design Precedent.

Landscape/Hardscape Improvements

Various landscape improvements including site flatwork, transitions at building entrances, pathways, ramps and sidewalks are proposed as part of the project. The planting design will be complementary to the existing landscape and thoughtfully integrated into the natural hillside landscape while creating usable and functional outdoor spaces. The plant material will be low water use, low maintenance and long-lived while maintaining the character of the campus and open spaces. Planting at Anderson Hall considers the character-defining features of Anderson Hall and existing mature trees and trees of value will be preserved and protected in place as much as possible or be required to comply with the Tree Preservation and Replacement Guidelines.

The proposed SBB may incorporate a retaining wall between the new building and the Open Space Reserve area due to the existing uphill topography south of the SBB Project Boundary.

Circulation and Accessibility

Pedestrian circulation and accessibility to and from the SBB would be provided via existing sidewalks and pathways along South Campus Drive with a potential pick-up and drop off along South Campus Drive or within the SBB Project Boundary. Some segments of the existing sidewalks and pathways would need to be improved to meet Americans with Disabilities Act (ADA) requirements. Accessible pathway improvements are anticipated from the Citrus Drive parking lot and from Parking Lot 43 to the SBB. In addition, other pathway improvements are anticipated from Anderson Hall to the SBB.

Bicycle lanes that currently exist on both sides of South Campus Drive will be maintained and improved with the addition of bicycle racks.

The campus is served by existing transit along Canyon Crest Drive and West Campus Drive. These existing services will continue to serve the campus in addition to the proposed SBB. A future transit stop along South Campus Drive near the project site would also serve the campus and project site.

Emergency Access and Accessibility

Emergency access to the SBB, Biocontrol Building, and Genomics Shed sites would be provided via ingress/egress routes along South Campus Drive, College Place, Science Walk, and/or Citrus Drive. Fire lane is proposed on the SBB site off South Campus Drive for fire response and other emergency vehicle access. Proposed emergency access on the SBB and Genomics Shed sites as well as firetruck hose pull requirements at the SBB, Biocontrol Building, and Genomics Shed sites, as required by the Fire Code, and would be reviewed and approved by the Campus Fire Marshal. Emergency vehicles could travel down Eucalyptus Drive to Science Walk or Citrus Drive if the South Campus Drive access were impeded during an emergency.

During project construction, to the extent feasible, one unobstructed lane would remain open along South Campus Drive and any detours will be identified for closures to South Campus Drive, College Place, Science Walk, and/or Citrus Drive, in accordance with the construction traffic control plan.

Parking

The SBB site can currently accommodate 55 parking spaces in Parking Lot 8. The proposed project would demolish this surface parking lot and the 55 parking spaces would be reallocated to other surface parking areas and parking structures on campus. Approximately seven accessible parking spaces (two of which would be van accessible) would be required for the project and would be provided along Citrus Drive or within the project boundary. In addition, accessible paths of travel would be provided along South Campus Drive and from the accessible parking to the SBB.

2.4.3 Utility and Service System Improvements

Water and Wastewater

The campus has a combined fire and domestic water system that is sufficient to serve the proposed project. Riverside Public Utilities (RPU) provides potable water to the campus, which is used both in buildings and for landscape irrigation. In addition, UCR has a private on-campus water system that conveys potable water throughout the campus, as needed. All potable water, fire water, and irrigation water supplies are distributed through the campus-wide system that would serve the project site as well. The proposed project would tie into these existing infrastructure.

The irrigation system will meet or exceed the State of California Model Efficient Landscape Ordinance (CA AB 1881 requirements) and the UCR requirements for a water efficient landscape. Submeter and point of connection with a new back flow will be incorporated for the proposed irrigation. Dedicated irrigation water for the SBB site will be provided from the existing 4-inch water line.

There are multiple existing 6-inch sanitary sewer mains located northeast and west of Parking Lot 8. These mains travel north, eventually connecting to a 15-inch main in University Avenue. A gravity main sanitary sewer system is incorporated to the project design to pick up domestic effluent from the SBB and will discharge to the west-most existing campus sanitary sewer main.

Project impacts on water and wastewater are further discussed in Section 4.1.19 of this Addendum.

Stormwater Management

All UC campuses are regulated under the Phase II Municipal Separate Storm Sewer System (MS4) General permit, and the campus is additionally regulated under the UCR's Storm Water Management Program (SWMP). Stormwater management measures (e.g., flow-through planters, bio-swales, bio filtration stormwater planters) would be incorporated into the project design.

The existing site generally drains from southeast to northwest. Drainage within the project limits currently sheet flows in this general direction towards South Campus Drive. A portion of the SBB site drainage is collected by the existing catch basin and 8-inch storm drain within Parking Lot 8. Stormwater from this portion of the campus ultimately discharges to the Gage Detention Basin, north of University Avenue. The project site shall generally be designed so storm water surface drains to a series of catch basins connected by underground storm drain pipes. Storm drain pipes will connect to existing campus storm drains or drainage devices and the existing pipes would be upsized. Project impacts on stormwater are further discussed in Section 4.1.10 of this Addendum.

Solid Waste

UCR's landfill-bound waste is picked up and hauled by UCR trucks to the CR&R Environmental Services facility in Perris, California (approximately 17 miles south from UCR). Materials for recycling are sorted out of the landfill waste stream and the remainder is used for waste-to-energy (the process of generating and capturing energy in the form of electricity and/or heat from the primary treatment of waste). UCR's recyclable materials are hauled to the UCR transfer station, just north of Parking Lot 30 on the West Campus. Compost, food waste, and the commingled recycle streams are picked up from the UCR transfer station by the current contracted vendor to be recycled or composted. Green waste is currently blended back into the soil by UCR's Agricultural Operations Course. The proposed project would continue to utilize these solid waste programs and facilities. Project impacts on solid waste are further discussed in Section 4.1.19 of this Addendum.

Energy

UCR currently purchases electricity for campus operations from RPU and through a power purchase agreement for on-site generation from the campus solar infrastructure, which produces approximately 11.6 megawatt-hours (MWh) of electricity (UCR 2021a). The campus supply of natural gas is derived from Southern California Gas (SCG), which currently delivers natural gas to the campus through high pressure distribution lines. UCR privately distributes medium pressure natural gas throughout the East and West Campuses. The project would continue to use RPU facilities. The proposed SBB would be electric and not use natural gas. Project impacts on energy resources and use are further discussed in Section 4.1.6.

2.4.4 Project Construction Activities

The proposed project entails the following:

- Demolition of the Plant Drying Facility, Biocontrol Building, and Genomics Shed, and associated hardscape and landscape removal;
- Construction of a new Biocontrol Building and Genomics Shed;
- Construction of a new School of Business Building; and
- New hardscape and landscape, and associated site improvements.

The demolition of these structures would require approximately 20 days to complete and would produce approximately 700 tons of debris to be hauled off site. In addition, approximately 15 worker trips a day, and 69 total haul trips are anticipated during demolition activities. Soil stockpiles on the project site are not anticipated; however, if the proposed project site demolition/construction did result in any unforeseen stockpiles, they would be located within the campus' existing undeveloped/disturbed areas. No rock crushing, blasting or asphalt pulverizing is anticipated under construction of the proposed project.

Site preparation for the proposed project is expected to require approximately 18 worker trips a day. Site grading is anticipated to require approximately 15 worker trips a day and 1,500 total haul trips. Due to the site topography, grading would occur at greater than five feet and approximately between 15 to 20 feet (depending on design). During grading, approximately 12,000 cubic yards (cy) would be exported and there would be a net zero cubic yard that would be imported. Site preparation and grading is anticipated to require a total of approximately 50 days to complete.

Building construction is anticipated to begin in the summer of 2022 and require approximately 24 months to complete. Anticipated construction staging and laydown area, construction worker parking, and mockup building would be located in existing parking areas such as Parking Lot 8, Parking Lot 43, Parking Lot 6, and/or the previously disturbed/undeveloped portion of North District. Construction crew access would be provided via I-215/SR 60 freeway, Martin Luther King Boulevard, Canyon Crest Drive, and Campus Drive. No backup emergency generators would be required on site and emergency lighting during construction activities would be battery powered. Paving and architectural coating would require approximately 36 days to complete.

Depending on the construction phase, implementation of the proposed project would require common equipment, such as concrete/industrial saws, excavators, rubber tired dozers, graders, tractors/loaders/backhoes, crane, forklifts, generator set, welder, cement and mortar mixers, paver, paving equipment, rollers, and air compressor.

A Storm Water Pollution Prevention Plan (SWPPP) containing appropriate construction site erosion and sedimentation control best management practices (BMPs) would be prepared and implemented at the beginning of the project construction phase. The SWPPP would be adapted regularly during project construction to reflect current conditions in the field and the weather. The SWPPP would also outline BMPs to be actively implemented during construction of the project, including, but not limited to: good housekeeping; trash management; construction material and waste management; stockpile management; rinse or wash water management; spill prevention and response; vehicle and equipment storage and maintenance; non-storm water discharge management; tracking controls; run-on and runoff controls; erosion controls such as use of wattles, sediment controls; inlet protection; stabilization of construction entrances; coverage of materials storage areas; inspections; and use of concrete washout areas. Since perimeter controls to prevent storm water pollution from exiting the construction site are particularly important along the site's perimeter with the adjacent open space, the project contractor would be responsible for implementing the project's approved erosion control plan, as well as cleanup of all BMP breaches into the adjacent vegetation (as applicable).

2.4.5 Sustainability Features

The UC Policy on Sustainable Practices, issued in 2004 and updated in 2022, covers the following sustainable practices: green building design, clean energy, climate protection, sustainable transportation, sustainable building and laboratory operations, zero waste, sustainable procurement, sustainable foodservices, and sustainable water systems.

The proposed project would comply with the UC Policy on Sustainable Practices as well as include minimum Leadership in Energy and Environmental Design (LEED) Silver features in its project design. The proposed project would also be 20 percent above the California State Building Energy Efficiency Standards (Title 24) requirements, which would ensure that the proposed SBB meets sustainable design and construction practices.

2.5 PROJECT APPROVALS AND SCHEDULE

The proposed project is anticipated to be constructed and occupied by Summer 2024, with the first full year of project operation anticipated to be in 2025. As a public agency principally responsible for approving or carrying out the proposed project, the University of California is considered the Lead

Agency under CEQA. The Addendum for this project would be considered by the University California Board of Regents (Regents) or their delegate, and the project may be approved at the Regents' (or their delegate's) discretion, and only if the Regents (or their delegate) determine that such approval complies with current CEQA Guidelines.

Since UCR is governed by the Regents, which under Article IX, Section 9 of the California Constitution has "full powers of organization and governance" subject only to very specific areas of legislative control, it is not subject to local land use jurisdiction or related policies, although certain federal and State laws or policies may apply to any proposed projects. UCR is responsible for project conformance with all applicable policies, laws, and regulations.

Anticipated approvals required by the Regents or its designee to implement the proposed project include, but are not limited to those listed below.

- Adoption of Addendum No. 1 to the 2021 LRDP EIR
- Make a condition of approval implementation of the Mitigation Monitoring and Reporting Program adopted in connection with the 2021 LRDP EIR
- Adoption of the CEQA Findings
- Approval of the Design of the proposed project
- Approval of the project Budget
- Approval of Financing

The proposed project may require permits/approval from other responsible agencies, including but not limited to:

- Division of the State Architect (accessibility compliance)
- State of California Fire Marshal (fire/life safety)
- City of Riverside Fire Department (access)

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3 CONSISTENCY WITH THE 2021 LRDP

To determine whether the proposed project is consistent with UCR's 2021 LRDP and 2021 LRDP EIR, the following questions must be answered:

- Are the objectives of the proposed project consistent with the objectives adopted for the 2021 LRDP?
- Are the changes to campus population associated with the proposed project included within the scope of the 2021 LRDP's population projections?
- Is the proposed location of the proposed project in an area designated for this type of use in the 2021 LRDP?
- Is the proposed project included in the amount of the development projected in the 2021 LRDP?
- Are the proposed project activities within the scope of the environmental analysis in the 2021 LRDP EIR?
- Have the conditions described in CEQA Guidelines Section 15162 calling for the preparation of a subsequent EIR occurred?

Sections 3.1 through 3.4 document the proposed project's consistency with the objectives, population projections, land use designations, and development projections contained in the 2021 LRDP.

Section 4 contains a detailed examination of environmental topics with the potential for significant impacts that had been addressed in the 2021 LRDP EIR, and includes analyses and discussions for whether the proposed project is consistent with, and within the scope of, the environmental impact analysis included in the 2021 LRDP EIR.

3.1 2021 LRDP OBJECTIVES

The 2021 LRDP identified key objectives to accommodate UCR's projected growth in both academic and non-academic programs. The key objectives of the 2021 LRDP, as outlined in the plan, include the following:

- Serve as good stewards of limited campus lands and natural resources as UCR continues to grow and accommodate enrollment projections of approximately 35,000 students.
- Develop approximately 5.5 million gsf of net new building space needed to accommodate student housing as well as academic and research facilities.
- Maintain existing land-based research operations on West Campus, while supporting facility modernization, research support facilities growth, and strategic partnerships and initiatives.
- Activate and enliven the East Campus through strategic mixed-use development, improved public spaces, expanded campus services, and additional on-campus housing to facilitate a living-learning campus environment.
- Accommodate approximately 40 percent of eligible students with on-campus housing, and replace aging low-density student housing units while considering demand, affordability, financial feasibility, and physical site constraints.
- Locate future growth generally adjacent to and outside of the campus loop road, thereby maintaining the character of the Mid-Century Modern Core.

- Incorporate efficient planning and design practices in support of minimizing the effects of climate change.

The proposed project would support the 2021 LRDP objectives listed above since it would be expanding the SBB onto an existing developed site on East Campus along the campus loop road and relocating the site's current uses to other locations on the campus, closer to their respective users. New pathways would connect the new structure to Anderson Hall and associated parking. Therefore, the proposed project would:

- Utilize limited campus lands and natural resources as UCR continues to grow and accommodate enrollment projections of approximately 35,000 students;
- Add to new building space on campus for additional academic and research facilities;
- Activate the East Campus through expanded campus services, improved public spaces, and facilitate a living-learning campus environment; and,
- Minimize the effects of climate change through efficient planning and design practices.

3.2 2021 LRDP CAMPUS POPULATION

The 2021 LRDP anticipated that the existing total campus population would grow by 13,884 students and faculty over the 2021 LRDP planning period, resulting in a total student population of 35,000 (Table 3-1) and a total faculty population of 7,545 by the planning horizon of 2035. Of this, in 2021, the School of Business had an enrollment of 2,100 students with 100 faculty and staff. The proposed SBB would be able to accommodate approximately 570 new students and approximately 125 new faculty/staff. Implementation of the proposed SBB project would not be entirely growth inducing, but rather, it would enable UCR to manage recent growth and accommodate additional students, and faculty/staff on campus. Therefore, it can be determined that the proposed project is consistent with the campus population projections contained in the 2021 LRDP.

Table 3-1
Total Campus Population Growth Projections

Category	2018/2019 (Baseline)[1]	Fall 2021 (Actual)	Fall 2035 (Projected)[1]
Students[2]	23,922	26,847	35,000
Faculty and Staff	4,739	4,733	7,545
Total Population	**28,661**	**31,580**	**42,545**

3.3 2021 LRDP LAND USE

The land use plan for the 2021 LRDP described functional land use categories for the campus that reflect activities that would be predominant and/or secondary permissible uses in any given area of campus (see Figure 2-3 in the 2021 LRDP EIR). Predominant uses are the primary programs, facilities, and/or activities in a general geographic area. Secondary permissible uses are those that are more supporting uses that are allowable within the designated land use area.

The approximate 1,108-acre UCR main campus has designated approximately 184.4 acres for Academics & Research on its East Campus. This land use designation consists of facilities dedicated to undergraduate and graduate learning and research environments, and daytime student life activities such as the student union or food services. The predominant Academics & Research uses may include classrooms; instructional and research laboratories and greenhouses; undergraduate, graduate, and professional schools and associated programs; libraries; advanced scientific research facilities; federal research partnerships; performance and cultural facilities; clinical facilities; and ancillary support facilities, such as general administrative offices, conference rooms, and meeting spaces. Ancillary uses could support core campus student life activities and food services, such as the Highlander Union Building and The Barn. Secondary permissible uses could include parking, utility infrastructure, and other campus support services.

The proposed project would allow UCR to provide for additional classroom, educational spaces, student support spaces, and office spaces for the existing School of Business and campus. Therefore, the proposed project would be consistent with the land use categories in the 2021 LRDP.

3.4 2021 LRDP DEVELOPMENT SPACE

The 2021 LRDP included general types of campus development and land uses to support the projected campus population growth and to enable expanded and new program initiatives related to academic, research, student life, and other support functions. It was envisioned that development under the 2021 LRDP would primarily be infill development or expansion of already developed areas on the East Campus, and would occur primarily within previously disturbed areas and/or adjacent to previously developed and surface parking areas. In 2018, the campus had approximately 4.8 million assignable square feet (asf) or approximately 7.2 million gsf of academic buildings and support facilities (UCR 2021a). The 2021 LRDP proposed additional development of approximately 5.5 million gsf of new building space on the campus to accommodate the projected student enrollment and increase in faculty and staff by 2035. This would result in a total of approximately 12.7 million gsf (approximately 8.5 million asf) for academic programs and support space under campus buildout by 2035, as shown in Table 3-2.

Table 3-2
Total Campus Space Projections

Facility Type	Baseline Fall 2018[1] (ASF/GSF)[2]	Projected Fall 2035 (ASF/GSF)
Academics & Research	1,220,283/1,830,425	1,700,852/2,551,277
Academic Support	1,458,975/2,188,463	2,355,204/3,532,806
Student Life	1,875,963/2,813,945	4,198,504/6,297,756
Other Facilities	248,279/372,419	248,279/372,419
Total Space	**4,803,500/7,205,252**	**8,502,839/12,754,258**

The construction of the SBB has been anticipated under the 2021 LRDP EIR. The proposed SBB is designed Academics & Research and would add approximately 75,000 gsf to the existing approximately 2,288,391 gsf, which is within the projected Academics & Research land use category campus space projections in the 2021 LRDP EIR. Since the proposed project would not exceed the building space projections contemplated in the 2021 LRDP, the proposed project would be consistent with the 2021 LRDP.

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4 CONSISTENCY WITH THE 2021 LRDP EIR

The evaluation contained in this consistency review was conducted in accordance with CEQA Guidelines Sections 15164 and 15168, which allow for an addendum to an EIR provided the project's effects have been addressed in a prior (or earlier) programmatic analysis. The 2021 LRDP EIR is a Programmatic EIR that comprehensively addressed the potential environmental effects of campus growth and development due to implementation of future projects and activities proposed under the 2021 LRDP. Therefore, given the consistency of the proposed project with the 2021 LRDP and project's effects being addressed in the 2021 LRDP EIR, an addendum is the appropriate level of CEQA review for the proposed project.

4.1 PROJECT ENVIRONMENTAL IMPACTS

Checklist Explanation

On the basis of the tiering and subsequent review concepts identified in the CEQA Guidelines, UCR has defined the following column headings in this Addendum:

Impact Examined in the 2021 LRDP EIR: This column is checked where the potential impacts of the proposed project were adequately examined in the certified 2021 LRDP EIR or the IS prepared for the 2021 LRDP. Where applicable, mitigation measures (MMs) identified in the 2021 LRDP EIR would mitigate the impacts of the proposed project. All applicable MMs from the 2021 LRDP EIR are incorporated into the proposed project as noted in Section 5 of this Addendum. The proposed project is consistent with the analyses evaluated in the 2021 LRDP EIR or IS prepared for the 2021 LRDP.

Impact Not Examined in the 2021 LRDP EIR: If a column is checked in this section, this indicates that potential effects of the proposed project were not adequately evaluated in the certified 2021 LRDP EIR. However, as described in the supporting text, the potential effects of the proposed project could result in: a) no impact in the category, b) less-than-significant impact in the category, or c) new potentially significant impact. In the instance that 'a)' or 'b)' is checked, no additional CEQA documentation would be necessary. In the instance that 'c)' is checked, additional CEQA documentation would be necessary to further address the potential impacts. All applicable MMs (2021 LRDP EIR and/or project-specific) would be incorporated into the proposed project as noted in Section 5 of this Addendum.

Environmental Topics Addressed

The following environmental resources, if checked below, would be potentially affected by the proposed project and would involve at least one significant impact that substantially exceeds or is otherwise outside the scope of activities evaluated for potential environmental effects in the 2021 LRDP EIR, as discussed below in Sections 4.1.1 through 4.1.21 of the Addendum. The IS prepared for the 2021 LRDP states that the 2021 LRDP would have less than significant impacts related to Land Use and Planning and no impacts related to Mineral Resources; therefore, further discussion of these issue areas is not required in the 2021 LRDP EIR. However, discussion of these two issue areas is included herein in consideration of the proposed project under the 2021 LRDP.

If “None” is checked below, this project is deemed entirely consistent with and covered by the environmental analysis contained in the 2021 LRDP EIR.

☐ Aesthetics	☐ Agricultural Resources	☐ Air Quality
☐ Biological Resources	☐ Cultural Resources	☐ Energy
☐ Geology and Soils	☐ Greenhouse Gas Emissions	☐ Hazards and Hazardous Materials
☐ Hydrology and Water Quality	☐ Land Use and Planning	☐ Mineral Resources
☐ Noise	☐ Population and Housing	☐ Public Services
☐ Recreation	☐ Transportation	☐ Tribal Cultural Resources
☐ Utilities and Service Systems	☐ Wildfire	☐ Mandatory Findings of Significances
☒ None		

4.1.1 Aesthetics

Section 4.1 of the 2021 LRDP EIR evaluates the aesthetic impacts of campus growth under the 2021 LRDP and concludes that implementation of future projects under the 2021 LRDP would result in significant and unavoidable impacts to scenic vistas. However, impacts to the existing visual character or quality of the campus and impacts due to light and glare would be less than significant for projects implemented under the 2021 LRDP. Since the campus is not located within the viewshed of an identified State Scenic Highway as stated in the IS prepared for the 2021 LRDP, the threshold related to this environmental topic was not further evaluated in the 2021 LRDP EIR.

MM AES-1 and MM AES-2 were identified in the 2021 LRDP EIR for future campus projects that would contribute to aesthetic impacts, specifically light and glare. The proposed project is not located adjacent to residential uses; therefore MM AES-2 does not apply to the proposed project.

The above mentioned applicable MM states the following:

MM AES-1: UCR shall incorporate site-specific consideration of the orientation of the building, use of landscaping materials, lighting design, and choice of primary façade materials to minimize potential off-site spillover of lighting and glare from new development. As part of this measure and prior to project approval, UCR shall require the incorporation of site- and project-specific design considerations (to be included in the lighting plans) to minimize light and glare, including, but not limited to, the following:

- New outdoor lighting adjacent to on-campus residences and adjacent off-campus sensitive uses shall utilize directional lighting methods with full cutoff type light fixtures (and shielding as applicable) to minimize glare and light spillover.

- All elevated light fixtures such as in parking lots, parking structures, and athletic fields shall be shielded to reduce glare.
- Provide landscaped buffers where on-campus student housing, uses identified as Open Space Reserve and UCR Botanic Gardens, and off-campus residential neighborhoods might experience noise or light from UCR activities.
- All lighting shall be consistent with the Illuminating Engineering Society of North America (IESNA) Lighting Handbook.
- The UCR Planning, Design, & Construction staff shall review all exterior lighting design for conformance with the Campus Design and Construction Standards.

Verification of inclusion in project design shall be provided at the time of design review and lighting plans shall be reviewed and approved prior to project-specific design and construction document approval.

AESTHETICS

Would the Project:	Impact Examined in 2021 LRDP EIR	Impact Not Examined in 2021 LRDP EIR: No Impact	Impact Not Examined in 2021 LRDP EIR: Less-than-Significant Impact	Impact Not Examined in 2021 LRDP EIR: Potentially Significant Impact
a) Have a substantial adverse effect on a scenic vista?	☒	☐	☐	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☒	☐	☐	☐
c) 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 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?	☒	☐	☐	☐

a) The 2021 LDRP EIR determines that although development under the 2021 LRDP could block views of some scenic vistas, particularly those of the Box Spring Mountains to the east, most future campus growth would be infill development or expansion of already established areas. Therefore, future development impacts to scenic vistas would be less than significant.

The project would be developed as an infill project on an existing parking lot, land that is currently developed with underutilized buildings, and/or previously disturbed areas. This is a development pattern for the campus that is anticipated pursuant to the 2021 LRDP and evaluated in the 2021 LRDP EIR. Proposed development of the SBB, relocation of the Biocontrol Building and Genomics Shed, and associated pedestrian and vehicular accessway improvements would occur within the footprint of existing developed/disturbed areas on the campus. Therefore, the project would be consistent with the scenic views/vistas analysis and determination in the 2021 LRDP EIR; and proposed project impacts to scenic vistas would remain **less than significant**.

b) The IS prepared for the 2021 LRDP states that the campus is not located within the viewshed of an identified State Scenic Highway, and this threshold was not further evaluated in the 2021 LRDP EIR. Any future campus development would not degrade the visual character of the campus or affect scenic resources, and any construction impacts for future projects would be limited and temporary. Thus, future projects would not result in permanent visual degradation of the existing visual character of the campus and impacts would be less than significant.

The project site is not located near or along a State Scenic Highway and there are no scenic resources located on the project site. Implementation of the project would not result in substantial damage to scenic resources due to existing development and conditions. Therefore, the project would be consistent with the scenic resources analysis and determination in the IS prepared for the 2021 LRDP; and proposed project impacts to scenic resources would remain **less than significant**.

c) The 2021 LRDP EIR states that physical changes to the campus under the 2021 LRDP would not degrade the visual character of the campus or surrounding areas. Therefore, future development impacts to the UCR visual character and quality would be less than significant.

The project site is located within an urbanized area in the City of Riverside and would result in infill development on the campus on an area that is currently utilized as a surface parking lot, academic research structures (one of which is vacant), and previously disturbed areas. As stated in Section 2.5, UCR is part of the University of California system, which is a constitutionally created entity of the State of California, with "full powers of organization and government" (Cal. Const. Art. IX, Section 9). As a constitutionally created state entity, UCR is not subject to municipal regulations of surrounding local governments, such as the City or County of Riverside general plans or land use ordinances. The applicable land use plan for the project and actions taken on the project site is accounted for in the 2021 LRDP. The project is also required to comply with UCR's Campus Construction and Design Standards. Therefore, the project would be consistent with applicable land use designation, allowed uses, and other regulations and guidelines pertaining to scenic quality and compatible design as analyzed and determined in the 2021 LRDP EIR; and proposed project impacts to complying with applicable regulations governing scenic quality would remain **less than significant**.

d) The 2021 LRDP EIR concludes that future campus development projects would result in increased levels of daytime glare and nighttime light with new exterior lighting fixtures and increased vehicle trips on campus. Therefore, project-specific light and glare impacts would be potentially significant, and **MM AES-1 and MM AES-2** would be required to reduce project impacts under the 2021 LRDP.

Current sources of light and glare on the project sites include glass and non-painted metal, roadway streetlights, headlights and taillights from vehicles traveling on South Campus Drive, College Place, Citrus Drive, and/or Science Walk, vehicles entering and exiting the surface parking area, security lighting in the parking lot, outside buildings, and pathways.

Temporary and intermittent glare during construction would be anticipated from sunlight reflecting from equipment or vehicle windshield or material staging areas; however, the amount of glare from such equipment is not anticipated to be substantial given the limited number of construction equipment on-site at any one time. Furthermore, the duration of construction equipment is temporary, and construction areas are routinely fenced (opaque screen mesh) from public view.

The proposed project would include the development of a four-story SBB on Parking Lot 8, development of the Biocontrol Building on an existing landscaped area surrounded by academic facilities; and development of the Genomics Shed on previously disturbed area either south or west of the water-storage basin. The proposed project has the potential to increase the existing sources of daytime glare from building surfaces and nighttime lighting on the project sites and vicinity with the incorporation of lighting such as building lighting, security lighting, walkway lighting, accent lighting, and vehicular headlights and taillights. However, the project sites are located adjacent to and within existing developed/disturbed areas of the campus that generally includes light and glare, and the proposed project is required to conform to UCR's Campus Construction and Design Standards and California Building Code (CBC) standards and guidelines.

Therefore, the proposed project would be consistent with the light and glare analyses and determination in the 2021 LRDP EIR; and proposed project impacts to light and glare would remain **less than significant** with incorporation of **MM AES-1**.

4.1.2 Agricultural Resources

Section 4.2 of the 2021 LRDP EIR addresses impacts to agricultural resources under the 2021 LRDP and concludes that impacts to Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland) would be significant and unavoidable, with no adequate MM that would substantially reduce impacts. The IS prepared for the 2021 LRDP found no impact from future campus development on land under current Williamson Act contracts, forest lands, or timber production lands (criterion b through e). Therefore, these issue areas were not addressed in the 2021 LRDP EIR.

AGRICULTURAL RESOURCES

		Impact Not Examined in 2021 LRDP EIR		
Would the Project:	Impact Examined in 2021 LRDP EIR	No Impact	Less-than-Significant Impact	Potentially Significant Impact
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☒	☐	☐	☐
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☒	☐	☐	☐
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?	☒	☐	☐	☐
d) Result in 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?	☒	☐	☐	☐

a, e) The 2021 LRDP EIR states that most of the land designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland) is located on West Campus in areas designated in the 2021 LRDP as Agricultural/Campus Research or Land-based Research. The 2021 LRDP reinforces the commitment to the densification of the existing Academic Center and existing urban environment on East Campus, limiting sprawl into existing open space and agricultural and land-based research areas on West Campus. The 2021 LRDP would impact fewer acres of Farmland than previous UCR LRDPs. However, implementation of the 2021 LRDP would still reduce land available for agricultural research on Farmland in comparison to the 2021 LRDP's baseline conditions. Consistent with the past UCR LRDP EIRs, the establishment of the Coachella Valley Agricultural Research Station (CVARS) as mitigation for impacts to Farmland does not fully offset the net reduction in farmland in the region as no new farmlands were being created in the vicinity of the campus. Therefore, impacts were considered to be significant and unavoidable even with the establishment of the CVARS as mitigation.

The 2021 LRDP EIR also establishes that while land on the East Campus is similarly categorized as Farmland of Statewide Importance (10.7 acres) and Unique Farmland (1.5 acres), the underlying land use designation for those area (which includes the USDA Salinity Laboratory) under the 2021 LRDP is Academics & Research. The USDA Salinity Laboratory has a 50-year lease agreement with UCR that expires March 2038, after the life of the 2021 LRDP, and therefore is not anticipated to be converted to non-agricultural use. Implementation of projects under the 2021 LRDP in areas with the Academics & Research designation allow for the expansion and development of new campus facilities in already developed/disturbed areas of the campus. The 2021 LRDP EIR concludes that UCR does not anticipate the areas in the East Campus to be converted to non-agricultural use through the 2035 planning horizon of the 2021 LRDP, and therefore there would be no impact.

The project sites are located within the 2021 LRDP land use designation of Academics & Research on UCR's East Campus and entails infill development. The project sites does not contain existing Farmland. The proposed SBB would be constructed on an existing parking lot; the proposed Biocontrol Building would be constructed on an existing landscaped area surrounded by academic facilities; and the proposed Genomics Shed would be constructed on previously disturbed area either south or west of the water-storage basin. Therefore, the proposed project would be consistent with the farmland use and loss analysis and determination in the 2021 LRDP EIR, specific to East Campus; and proposed project impacts related to Farmland would remain to have **no impacts**.

b – d) The 2021 LRDP EIR states that the campus does not contain land under current Williamson Act contracts, forest lands, or timber production lands. Therefore, the IS prepared for the 2021 LRDP determined that no impacts would occur to Williamson Act contracts, forest lands, or timber production lands for projects implemented under the 2021 LRDP; and these issue areas were not further evaluated in the 2021 LRDP EIR.

Similarly, the proposed project does not contain any forest land or timberland and is not under a Williamson Act contract. The proposed SBB would be constructed on an existing parking lot; the proposed Biocontrol Building would be constructed on an existing landscaped area surrounded by academic facilities; and the proposed Genomics Shed would be constructed on previously disturbed area either south or west of the water-storage basin. Therefore, the proposed project would be consistent with the Williamson Act contracts, forest lands, and timber production lands analysis and determination in the IS prepared for the 2021 LRDP, wherein no further analysis in the 2021 LRDP EIR was required; and proposed project impacts related to Williamson Act contracts, forest lands, or timber production lands would remain to have **no impacts**.

4.1.3 Air Quality

Section 4.3 of the 2021 LRDP EIR addresses the effects of the 2021 LRDP campus growth projections on air quality. The 2021 LRDP EIR concludes that the implementation of the 2021 LRDP would have less than significant impacts on population, housing, or employment growth exceeding forecasts in the 2016 Air Quality Management Plan (2016 AQMP); and would not expose sensitive receptors to substantial pollutant concentrations or toxic air contaminants (TACs). The IS prepared for the 2021 LRDP concludes that there would be a less than significant impact related to other emissions, such as odors, adversely affecting a substantial number of people and the topic was not discussed in the 2021 LRDP EIR.

However, construction and operation of the 2021 LRDP would generate emissions that exceed South Coast Air Quality Management District (SCAQMD) significance thresholds even with the implementation of **MM GHG-1**.

The above mentioned, MM states the following:

MM GHG-1 Implement On-Campus GHG Emissions Reduction Measures: UCR shall implement the following GHG emissions reduction measures by scope emissions category:

Scope 1 (Stationary Fuel Combustion, Refrigerant Use, Fleet Fossil Fuel Combustion)

- Measure [Energy] EN1: In order to meet 100 percent electrification of all new campus buildings and structures, UCR shall prioritize construction of all electric building design for new campus buildings and structures and discourage the construction and connection of new fossil fuel combustion infrastructure on campus. In addition, UCR shall focus on energy optimization through the Central Plant control systems by automating manual processes and initiating an engineering study focused on transitioning away from natural gas use at the Central Plant.
- Measure [Fuel] FL1: In order to decarbonize the campus vehicle fleet, UCR shall reduce emissions from the campus vehicle fleet by 25 percent by 2025, by 50 percent by 2030, and by 75 percent by 2035 through replacement of fleet vehicles with electric vehicles or low-emission alternative vehicles.

Scope 3 (Waste Generation, Business Air Travel, On-site Transportation, Water Consumption, Carbon Sequestration, and Construction)

- Measure [Waste Generation] WG1: UCR shall implement and enforce SB 1383 organics and recycling requirements to specifically reduce landfilled organics waste to 75 percent by 2025.
- Measure WG2: UCR shall reduce campus waste sent to landfills 90 percent by 2025 and 100 percent by 2035. In addition, UCR shall reduce waste generation at campus events 25 percent by 2025 and 50 percent by 2035, with goals of being zero waste and plastic free events. Furthermore, UCR shall establish purchasing and procurement policies and guidelines prioritizing vendors that limit packaging waste and purchase reusable and compostable goods.
- Measure [Transportation] TR1: In order to reduce GHG Emissions related to business air travel, UCR shall provide incentives to faculty for emission-reducing behaviors and utilizing travel options that are less carbon intensive, promote the use of virtual meetings, and encourage alternative forms of travel other than air travel.
- Measure TR2: UCR shall update the Transportation Demand Management (TDM) program for the campus to decrease single occupancy vehicle VMT 5 percent by 2025 and 20 percent by 2035. In addition, UCR shall evaluate trends of current programs to expand on existing programs and establish new initiatives that utilize proven successful strategies.

- Measure TR3: UCR shall develop and implement a Campus Active Transportation Plan to shift 2 percent of baseline (2018) passenger vehicle VMT to active transportation by 2025 and 8 percent by 2035. In addition, UCR shall update the Campus Bicycle and Pedestrian Network Map every five years, including routes from off campus to on campus.
- Measure TR4: UCR shall reduce GHG emissions associated with campus commuting 10 percent by 2025 and 25 percent by 2035.
- Measure [Water Consumption] WC1: UCR shall reduce per-capita water consumption 20 percent by 2025 and 35 percent by 2035 compared to academic year 2018/2019 per capita consumption.
- Measure [Construction] CR1: UCR shall reduce construction-related GHG emissions on campus 10 percent by 2025 and 25 percent by 2035 through emission reduction controls and/or electric equipment requirements in line with contract obligations. Specifically, UCR shall require off-road diesel-powered construction equipment greater than 50 horsepower to meet the Tier 4 emission standards as well as construction equipment to be outfitted with BACT devices certified by CARB and emissions control devices that are no less than what could be achieved by a Level 3 diesel emissions control strategy for a similar-sized engine. In addition, UCR shall develop zero waste procurement guidelines and process for campus construction projects and integrate into purchasing RFP language as part of campus procurement.

The UCR Office of Sustainability, Facilities Services, Environmental Health & Safety (EH&S), Transportation and Parking Services (TAPS), and/or Planning, Design & Construction (PD&C) shall annually monitor, track, and verify implementation of these GHG emissions reduction measures.

AIR QUALITY

Would the Project:	Impact Examined in 2021 LRDP EIR	Impact Not Examined in 2021 LRDP EIR: No Impact	Impact Not Examined in 2021 LRDP EIR: Less-than-Significant Impact	Impact Not Examined in 2021 LRDP EIR: Potentially Significant Impact
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 in 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?	☒	☐	☐	☐

a) The 2021 LRDP EIR states that implementation of the 2021 LRDP would not generate population, housing, or employment growth exceeding forecasts in the 2016 AQMP. The 2016 AQMP, the most recent AQMP adopted by the SCAQMD, incorporates local city general plans and the Southern California Association of Governments' (SCAG) 2016 Regional Transportation Plan/Sustainable Communities Strategy (2016 RTP/SCS) socioeconomic forecast projections of regional population, housing, and employment growth.

The 2021 LRDP assumes an approximately 46 percent increase in student population (approximately 11,000 students), with an approximately 60 percent increase in additional faculty and staff (approximately 2,800 new faculty and staff) by the 2035/2036 academic year. The SBB would accommodate approximately 570 new students and approximately 125 new faculty and staff; which would be within the growth assumptions used in the 2021 LRDP and 2021 LRDP EIR. Therefore, the proposed project would be consistent with the SCAG growth projections and SCAQMD's 2016 AQMP analysis and determination in the 2021 LRDP and 2021 LRDP EIR; and proposed project impacts to population and employment growth would remain **less than significant**.

b) The 2021 LRDP EIR reports significant and unavoidable regional air quality impacts with respect to the full development under the 2021 LRDP for construction as well as for operation.

The proposed demolition of the existing structures and construction of the new SBB, Biocontrol Building, and Genomics Shed was modeled for project-specific emissions. As shown in Table 4.1.3-1, construction emissions would be below regulatory thresholds for all criteria pollutants. As shown in Table 4.1.3-2, operational emissions would also be well below regulatory thresholds. However, **MM GHG-1** would still apply to the proposed project to ensure project air pollutant emissions contribute the least amount to the overall impacts of development under the 2021 LRDP. Therefore, the proposed project would result in lesser impacts than the air quality analysis and determination in the 2021 LRDP EIR; and proposed project impacts to air quality would be **less than significant**.

Table 4.1.3-1
Regional Construction Emissions

	Maximum Emissions (lbs/day)					
	ROG	**NO_x**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Construction Year 2022	8	78	69	0	8	5
Construction Year 2023 & 2024	44	27	33	0	2	2
Maximum Emissions	44	78	69	0	8	5
SCAQMD Regional Thresholds	75	100	550	150	150	55
Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**	**No**
Maximum On-site Emissions	N/A	38	29	N/A	10	6
SCAQMD Localized Significance Thresholds (LSTs)	N/A	221	1,311	N/A	11	6
Threshold Exceeded?	**N/A**	**No**	**No**	**N/A**	**No**	**No**

Notes: See Appendix A for modeling results. Some numbers may not add up precisely due to rounding considerations.
ROG = reactive organic gases; NO_x = nitrogen oxide; CO = carbon monoxide; SO_2 = Sulfur dioxide; PM_{10} = Particulate matter 10 micrometers in diameter or less; $PM_{2.5}$ = Fine particulate matter 2.5 micrometers in diameter or less

Table 4.1.3-2
Regional Operational Emissions

	Maximum Daily Emissions (lbs/day)					
Emission Source	**ROG**	**NO_X**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Area	2	<1	<1	<1	<1	<1
Energy	<1	<1	<1	<1	<1	<1
Mobile	3	5	33	<1	9	2
Project Emissions	5	5	34	<1	9	2
SCAQMD Regional Thresholds	55	55	550	150	150	55
Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**	**No**

Notes: See Appendix A for modeling results. Some numbers may not add up precisely due to rounding considerations.
ROG = reactive organic gases; NO_x = nitrogen oxide; CO = carbon monoxide; SO_2 = Sulfur dioxide; PM_{10} = Particulate matter 10 micrometers in diameter or less; $PM_{2.5}$ = Fine particulate matter 2.5 micrometers in diameter or less

c) The 2021 LRDP EIR states that localized air quality impacts generated from the full development under the 2021 LRDP for construction would be less than significant and implementation of the 2021 LRDP would not expose sensitive receptors to substantial pollutant concentrations from carbon monoxide (CO) hotspots or TACs. The 2021 LRDP does not analyze localized operational emissions.

The project-specific emissions for construction and operational emissions were modeled in the California Emissions Estimator Model (CalEEMod), version 2020.4.0 (model reports are included as Appendix A of this Addendum). The 2021 LRDP states that based on an 8-hour maximum CO concentration of 1.2 ppm (2021 LRDP for 2019 air emissions), campus CO emissions of approximately 513 pounds per day, and improving vehicle emissions standards for new cars in accordance with State and federal regulations, the proposed project would not create new CO hotspots or contribute substantially to existing hotspots, and impacts would be less than significant. As shown in Table 4.1.3-2, project CO emissions would be approximately 34 pounds per day. Due to the low background concentrations, minimal project emissions, and continually more efficient vehicle regulations, the proposed project would result in **less than significant** impacts to localized CO hotspots.

The 2021 LRDP states that construction TAC emissions would create unsafe or potentially hazardous conditions for sensitive receptors. Construction-related activities would result in temporary project-generated emissions of particulate matter (PM) exhaust emissions from off-road, heavy-duty diesel equipment for grading, building construction, and other construction activities. The project site is located approximately 3,500 feet from the nearest offsite sensitive receptors. The California Air Resources Board (CARB) recommends health risk assessments for potential sources that are within 1,000 feet of sensitive receptors (CARB 2005). Due to the distance between the project site and the nearest sensitive receptors, the proposed project would not be within the 1,000 feet buffer distance. Therefore, the proposed project would be consistent with the localized pollutants analysis and determination in the 2021 LRDP EIR; and project air quality impacts to sensitive receptors would be **less than significant**.

The 2021 LRDP includes a programmatic health risk assessment (HRA) for the existing and future scenarios of UCR’s campus operations. The HRA identified potential risk to both onsite and offsite receptors including residents, students, staff, and children at the UCR Child Development Center. The HRA found that incremental excess cancer risks attributable to the 2021 LRDP would not exceed the SCAQMD threshold of 10 in 1 million at the off- or on-campus receptors. Additionally, the HRA determined that chronic and acute hazard indices under the 2021 LRDP would not exceed the SCAQMD threshold of 1.0 at the on- or off-campus receptors. Therefore, the proposed project would be consistent with the HRA analysis and determination in the 2021 LRDP EIR; and proposed project impacts to sensitive receptors would be **less than significant**.

Table 4.1.3-3
Localized Construction Emissions

	Maximum Emissions (lbs/day)			
	NO_x	CO	PM_{10}	$PM_{2.5}$
Construction Year 2022	72	64	3	1
Construction Year 2023 & 24	27	30	1	<1
Maximum Emissions	72	64	3	1
SCAQMD Localized Significance Thresholds (LSTs)	*380*	*18,947*	*186*	*72*
Threshold Exceeded?	**No**	**No**	**No**	**No**

Notes: See Appendix A for modeling results. Some numbers may not add up precisely due to rounding considerations. Maximum on-site emissions are the highest emissions that would occur on the project site from on-site sources, such as heavy construction equipment and architectural coatings, and excludes off-site emissions from sources such as construction worker vehicle trips and haul truck trips.
NO_x = nitrogen oxide; CO = carbon monoxide; PM_{10} = Particulate matter 10 micrometers in diameter or less; $PM_{2.5}$ = Fine particulate matter 2.5 micrometers in diameter or less

Table 4.1.3-4
Localized Operational Emissions

	Maximum Emissions (lbs/day)			
	NO_x	CO	PM_{10}	$PM_{2.5}$
Maximum Emissions	<1	<1	<1	<1
SCAQMD Localized Significance Thresholds (LSTs)	*380*	*18,947*	*45*	*17*
Threshold Exceeded?	**No**	**No**	**No**	**No**

Notes: See Appendix A for modeling results. Some numbers may not add up precisely due to rounding considerations. Maximum on-site emissions are the highest emissions that would occur on the project site from on-site sources, such as area and energy sources and excludes off-site emissions from mobile sources.
NO_x = nitrogen oxide; CO = carbon monoxide; PM_{10} = Particulate matter 10 micrometers in diameter or less; $PM_{2.5}$ = Fine particulate matter 2.5 micrometers in diameter or less

d) The IS prepared for the 2021 LRDP states that there would be a less than significant impact related to other emissions, such as odors, adversely affecting a substantial number of people; therefore, this criterion was not further discussed in the 2021 LRDP EIR.

The land use and operational activities for the proposed project would be consistent with the land uses and operational activities identified in the 2021 LRDP and analyzed in the 2021 LRDP EIR. Odor sources generated by the proposed project and proposed uses are anticipated to be the same or less than the impacts identified in the IS prepared for the 2021 LRDP and 2021 LRDP EIR. Construction odor sources are associated with the equipment usage and vehicle trips and would be temporary. The proposed project, as well as development under the 2021 LRDP would be required to comply with SCAQMD rules on constructional and operational nuisance odor emissions. Therefore, the proposed project would be consistent with the odor impacts identified and analyzed in the IS prepared for the 2021 LRDP; and proposed project impacts would remain **less than significant**.

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4.1.4 Biological Resources

Section 4.4 of the 2021 LRDP EIR addresses the effects of the 2021 LRDP campus growth projections on biological resources. The 2021 LRDP EIR states that the campus is not located within one of the designated Riverside County Habitat Conservation Agency (RCHCA) reserve areas, and that implementation of the 2021 LRDP would not locate substantial development near Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) conservation areas that may contain potential wildlife habitat, movement corridors, or native nursery sites.[2]

However, UCR is still subject to compliance with Sections 6.1.2 (Protection of Species Associated with Riparian/Riverine Areas and Vernal Pools), Section 6.1.3 (Protection of Narrow Endemic Plant Species), Section 6.3.2 (Additional Survey Needs and Procedures), and Section 6.1.4 (Guidelines Pertaining to the Urban/Wildlands Interface) of the MSHCP when specific campus projects are proposed. In addition, UCR is not a permittee to the MSHCP, and therefore is not subject to the conservation efforts established in the plan. Therefore, the IS prepared for the 2021 LRDP concludes that impacts due to conflicts with local policies, ordinances, or adopted habitat conservation plans (criterion e and f) were considered less than significant, and this issue was not further discussed in the 2021 LRDP EIR.

The 2021 LRDP EIR concludes that potential impacts to burrowing owl, sensitive species or vegetation communities, and State or federally protected wetlands or jurisdictional delineated waters could be potentially significant as a result of implementing the 2021 LRDP. Therefore, **MM BIO-1 through MM BIO-9** were identified in the 2021 LRDP EIR for projects that would impact biological resources. Implementation of the measures would reduce potential project impacts and construction noise impacts to burrowing owls and birds, bats, special-status plants and wildlife species, sensitive wildlife and vegetation communities, and jurisdictional waters and wetlands to less than significant levels, consistent with the 2021 LRDP and 2021 LRDP EIR. The proposed project would avoid impacts to special-status plants and wildlife, sensitive vegetation communities, MSHCP Conservation Area, and jurisdictional delineation of waters and wetlands; therefore, MM BIO-5, MM BIO-7, MM BIO-8, and MM BIO-9 would not be applicable to the proposed project.

The above mentioned applicable MMs to the proposed project state the following:

MM BIO-1A Burrowing Owl Preconstruction Survey: Prior to construction activities, preconstruction presence/absence surveys for burrowing owls shall be conducted in the project survey area where suitable habitat is present prior to ground disturbance in new areas. Preconstruction surveys shall be conducted by a qualified biologist no more than 30 days prior to grading or other significant site disturbance. Surveys shall include the development footprint and consider up to a 500-foot buffer of adjacent areas to the extent feasible (e.g., a visual survey of adjacent areas will suffice for off-site areas not accessible). The surveys shall be conducted in accordance with the MSHCP burrowing owl survey guidelines. A burrow shall be considered occupied when there is confirmed use by burrowing owls based on observations made by a qualified biologist. If owls are not found to be occupying habitat in the survey area during the preconstruction survey, the proposed disturbance activities may proceed. Take of active nests shall be avoided.

MM BIO-1B Burrowing Owl Avoidance Measures: If owls are discovered on and/or within 500 feet of the proposed project site, avoidance measures shall be developed by the qualified biologist in

[2] The MSHCP is a comprehensive, multi-jurisdictional plan that focuses on the conservation of species and their associated habitats in Western Riverside County. The MSHCP is used to allow the participating jurisdictions to authorize the "take" of plant and wildlife species identified within the Plan Area. UCR is in the MSHCP area and is given the option of utilizing the MSHCP as a Participating Special Entity (PSE). Furthermore, a PSE is any regional public facility provider (e.g., a utility company, a public district or agency) that operates and/or owns land within the MSHCP Plan Area and that applies for Take Authorization pursuant to Section 11.8 of the Implementing Agreement. (County of Riverside. 2003. Final MSHCP, Volume 1: The Plan. https://rctlma.org/Portals/0/mshcp/volume1/index.html.)

compliance with the MSHCP and in coordination with the CDFW [California Department of Fish and Wildlife] and/or RCA [Western Riverside County Regional Conservation Authority]. Such measures will include, but not be limited to, the following:

- Burrowing owls shall not be disturbed on-site and/or within a 500-foot buffer or as determined by a biologist between February 1 and August 31 to avoid impacting nesting.
- Prior to any ground disturbance, all limits of project construction shall be delineated and marked to be clearly visible to personnel on foot and in heavy equipment. All construction-related activities shall occur inside the limits of construction and designated staging areas. Construction staging and equipment storage shall be situated outside of any occupied burrowing owl burrow locations. All construction-related movement shall be restricted to the limits of construction and staging areas.
- Avoidance measures shall include passive relocation by a qualified biologist to remove the owls between September 1 and January 31, which is outside of the typical nesting season.

MM BIO-2 Nesting Bird Avoidance: Prior to issuance of grading permits, the following measures shall be implemented:

- To avoid disturbance of nesting and special-status bird species protected by the MBTA [Migratory Bird Treaty Act] and California Fish and Game Code, activities related to the project, including but not limited to, vegetation removal, ground disturbance, and construction and demolition shall occur outside of the bird breeding season (February 15 through August 31). If construction must be initiated during the peak nesting season, vegetation removal and/or tree removal should be planned to occur outside the nesting season (September 1 to February 14), and a preconstruction nesting bird survey shall be conducted no more than 3 days prior to initiation of construction activities. The nesting bird preconstruction survey shall be conducted on foot inside the project site disturbance areas. If an active avian nest is discovered during the preconstruction clearance survey, construction activities shall stay outside of a 50- to 200-foot buffer for common nesting birds around the active nest, as determined by a biologist. For listed and raptor species, this buffer shall be expanded to 500 feet or as determined by a biologist.
- Inaccessible areas shall be surveyed from afar using binoculars to the extent practical. The survey shall be conducted by a qualified biologist familiar with the identification of avian species known to occur in western Riverside County. If nests are found, an appropriate avoidance buffer shall be determined by a qualified biologist and demarcated by a qualified biologist with bright orange construction fencing, flagging, construction lathe, or other means to mark the boundary. Effective buffer distances are highly variable and based on specific project stage, bird species, stage of nesting cycle, work type, and the tolerance of a particular bird pair. The buffer may be up to 500 feet in diameter, depending on the species of nesting bird found and the biologist's observations.
- If nesting birds are located adjacent to the project site with the potential to be affected by construction activity noise above 60 dBA Leq (see Section 4.11, Noise, of the LRDP EIR for definitions and discussion of noise levels), a temporary noise barrier shall be erected consisting of large panels designed specifically to be deployed on construction sites for reducing noise levels at sensitive receptors. If 60 dBA Leq is exceeded, an acoustician would require the construction contractor to make operational and barrier changes to reduce noise levels to 60 dBA during the breeding season (February 15 through August 31). Noise monitoring shall occur during operational changes and installation of barriers to ensure their effectiveness. All construction personnel shall be notified as to the existence of the buffer zone and to avoid entering the buffer zone during the nesting season. No parking, storage of materials, or construction activities shall occur within this buffer until the avian biologist has confirmed that breeding/nesting is completed, and the young have fledged the nest.

Encroachment into the buffer shall occur only at the discretion of the qualified biologist, if it is determined such encroachment will not adversely impact the nesting birds.

MM BIO-3 Bird Strike Avoidance: To reduce bird strike mortality and injury of special-status bird species from collisions with clear and reflective sheet glass and plastic, construction of glass-fronted buildings or other structures using exposed glass (e.g., glass-topped walls) shall incorporate measures to minimize the risk of bird strikes. This may include: (1) the use of opaque or uniformly textured/patterned/etched glass, (2) angling of glass downward so that the ground instead of the surrounding habitat or sky is reflected, (3) installation of one-way film that results in opaque or translucent covering when viewed from either side of the glass, (4) installation of a uniformly dense dot pattern created as ceramic frit on both sides of the glass, and/or (5) installation of a striped or grid pattern of clear ultraviolet-reflecting and ultraviolet-absorbing film applied to both sides of the glass. It should be noted that single decals (e.g., falcon silhouettes or large eye patterns) are ineffective and are not recommended unless the entire glass surface is uniformly covered with the objects or patterns.

MM BIO-4 Bat Preconstruction Survey: To avoid disturbance of special-status bat species during maternity season (approximately March through September), a preconstruction roosting bat survey shall be conducted by a qualified bat biologist on potential roost structures identified by the bat biologist and mature vegetation no more than 30 days prior to initiation of construction activities if construction activities must occur during the roosting season. If future projects would impact rocky outcrops, mature vegetation, existing buildings, or other structures that could be used for roosting, a passive acoustic survey shall identify the species using the area for day/night roosting. If special-status roosting bats are present and their roosts would be impacted, a qualified bat biologist should prepare a plan to identify the proper exclusionary methods. Removal of mature trees should be monitored by a qualified bat biologist and occur by pushing down the entire tree (without trimming or limb removal) using heavy equipment and leaving the felled tree on the ground untrimmed and undisturbed for a period of at least 24 hours. To exclude bats from buildings/structures or rocky outcrops, exclusion measures should be installed on crevices by placing one-way exclusionary devices that allow bats to exit but not enter the crevice.

MM BIO-6A Sensitive Communities Indirect Impact Avoidance – Construction: The following measure shall be required for construction activities that are proposed adjacent to the Open Space Reserve or lands supporting sensitive vegetation communities and/or biological resources:

- Prior to commencement of clearing or grading activities, fencing (e.g., silt fencing, orange construction fencing, and/or chain-link fencing as determined by campus planning) shall be installed around the approved limits of disturbance to prevent errant disturbance of sensitive biological resources by construction vehicles or personnel. All movement of construction contractors, including ingress and egress of equipment and personnel, shall be limited to designated construction zones. This fencing shall be removed upon completion of all construction activities.
- No temporary storage or stockpiling of construction materials shall be allowed in Open Space Reserve lands, and all staging areas for equipment and materials shall be located at least 50 feet where space permits on the site, or less as determined appropriate by a qualified biologist from the edge of these areas. This prohibition shall not be applied to facilities that are planned to traverse Open Space Reserve lands (e.g., trails and utilities). Staging areas and construction sites in proximity to the Open Space Reserve lands shall be kept free of trash, refuse, and other waste; no waste dirt, rubble, or trash shall be deposited in these areas.
- Appropriate setbacks or barriers (e.g., fencing) shall be implemented to minimize human activity impacts. Buffer areas shall be vegetated with native species to help screen these indirect effects.

- Active construction areas shall be sprayed with water periodically to minimize dust.
- Equipment to extinguish small brush fires (e.g., from trucks or other vehicles) shall be present on-site during all phases of project construction activities, along with personnel trained in the use of such equipment. Smoking shall be prohibited in construction areas adjacent to flammable vegetation.
- Temporary night lighting shall not be used during construction unless determined to be absolutely necessary (e.g., time sensitive construction activities). If night lighting is necessary, lights shall be directed away from sensitive vegetation communities and lands designated as Open Space Reserve and shielded to minimize temporary lighting of the surrounding habitat.

MM BIO-6B: Sensitive Communities Indirect Impact Avoidance – Operation. The following measure shall be required for operation activities adjacent to the Open Space Reserve or lands supporting sensitive vegetation communities and/or biological resources:

- Landscaping adjacent to Open Space Reserve lands shall comply with the following requirements to prevent the introduction of invasive species:
  - Appropriate landscaping shall be selected based on the vegetation communities in the portion of the Open Space Reserve adjacent to the project. In areas supporting native (or disturbed native) vegetation communities, revegetation of impacted slopes shall be with appropriate native plant materials.
- Permanent lighting in or adjacent to Open Space Reserve lands shall be selectively placed, shielded, and directed to minimize potential impacts to sensitive species. In addition, lighting from buildings or parking lots/structures abutting Open Space Reserve lands shall be shielded and/or screened by vegetation to the extent feasible.
- The following best management practices shall be implemented in Open Space Reserve lands and in areas that interface with Open Space Reserve lands to address runoff/water quality impacts from landscaping:
  - Integrated Pest Management principles (UC Integrated Pest Management Program) shall be implemented to the extent practicable for chemical pesticides, herbicides, and fertilizers. Examples of such measures may include, but are not limited to, alternative weed/pest control measures (e.g., removal by hand) and proper application techniques (e.g., conformance to manufacturer specifications and legal requirements).
  - Irrigation for project landscaping shall be minimized and controlled through efforts such as designing irrigation systems to match landscaping water needs, using sensor devices to prevent irrigation during and after precipitation, and using automatic flow reducers/shut-off valves that are triggered by a decrease in water pressure from broken sprinkler heads or pipes.
- Barriers (e.g., fencing or walls) and/or signage directing people away from sensitive vegetation communities and habitat shall be installed on designated pathways and trails in and adjacent to Open Space Reserve lands to minimize unauthorized human activity. Barriers (e.g., fencing or walls) shall consist of an approximately 3-foot-high wooden barrier. Chain-link fencing shall not be used for barrier.
- Projects adjacent to Open Space Reserve lands shall install signage along the boundary of the Open Space Reserve lands, indicating the presence of lands supporting sensitive habitat.
- Projects adjacent to Open Space Reserve lands shall install fencing or other visual/physical barriers (such as appropriate landscaping) to discourage human encroachment into the Open Space Reserve

lands in areas where trespass is likely to occur (gradual slopes; areas of low, open vegetation; areas of previous disturbance, etc.).

BIOLOGICAL RESOURCES

Would the Project:	Impact Examined in 2021 LRDP EIR	Impact Not Examined in 2021 LRDP EIR: No Impact	Impact Not Examined in 2021 LRDP EIR: Less-than-Significant Impact	Impact Not Examined in 2021 LRDP EIR: Potentially Significant Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or United States. 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 Wildlife 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?	☒	☐	☐	☐
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☒	☐	☐	☐

a) The project site is currently developed/disturbed (see Figure 2-3), and the 2021 LRDP EIR also recognizes the site as previously developed areas (refer to Figure 2-3 in the 2021 LRDP EIR). The project site is not located within a special-status species or burrowing owl habitat areas (see Figure 4.4-2 and Figure 4.4-3 in the 2021 LRDP EIR). The MSHCP identified areas of the campus as being located within the designated survey area for burrowing owl, requiring a burrowing owl suitability assessment to be conducted prior to construction activities.

Areas of potential habitat for special-status species include the southeastern portion of East Campus (mainly in lands designated Open Space Reserve) and scattered areas of West Campus, as shown in Figure 4.4-3 of the 2021 LRDP EIR. The project site itself is not located within the designated survey area for burrowing owls; rather, the SBB Project Boundary is adjacent to it. Due to the proximity to MSHCP areas, nesting birds and raptors, most of which are federally or State protected, have the potential to nest on buildings, in culverts, in shrubs and trees, in rocky outcrops, and on bare ground throughout the project site. Vegetation communities within and surrounding the campus, including the project site, have the potential to provide refuge cover from predators, perching sites, and favorable conditions for avian nesting that could be affected by the Project since there are trees on and around the project site. Furthermore, several bat species, including the special-status western yellow bat (*Lasiurus xanthinus*) and pallid bat (*Antrozous pallidus*), may forage and roost in areas in and around the project site and throughout campus on existing buildings, culverts, mature trees, and rock outcrops. Project construction activities may impact roost structures and mature vegetation.

Though the project site is not within the areas of potential habitat for special-status species, the proposed project may result in potentially significant impacts to burrowing owls, nesting birds, and/or bats due to its proximity to these areas and the presence of existing habitat opportunities. However, the proposed project would be consistent with the sensitive or special-status species analyses and determination in the 2021 LRDP EIR; and proposed project impacts to sensitive or special status species would remain **less than significant** with incorporation of **MM BIO-1A, MM BIO-1B, MM BIO-2 through MM BIO-4, MM BIO-6A, and MM BIO-6B**.

b) The 2021 LRDP EIR states that construction and operation of projects developed under the 2021 LRDP would potentially have substantial adverse effects on riparian habitat or other sensitive natural communities on the campus but would be reduced to less than significant levels with incorporation of MM BIO-6A, MM BIO-6B, and MM BIO-7.

The project site is developed with no aquatic, wetland, or riparian habitat and no open bodies of water. Psomas' biological resources assessment concluded that Least Bell's vireo is not expected to occur because no riparian or wetland vegetation occurred within the survey area and no suitable habitat for least Bell's vireo was present during the time of the survey effort. Psomas biologist concluded that none of the vegetation communities observed during the survey effort were considered a sensitive natural community (Appendix B). The area nearest to the project site with potential jurisdictional waters is located approximately 0.11 mile east, according to Figure 4.4-4 of the 2021 LRDP EIR. Therefore, the proposed project would not have a significant impact on aquatic habitats or sensitive natural communities. The SBB Project Boundary is adjacent to areas supporting sensitive vegetation communities. The proposed project would be consistent with the wetlands, aquatic resources, and sensitive habitats analyses and determination in the 2021 LRDP EIR; and proposed project impacts to wetlands and aquatic resources would remain **less than significant**, and proposed project impacts to sensitive vegetation communities would remain **less than significant** with incorporation of **MM BIO-6A and MM BIO-6B.**

c) The 2021 LRDP EIR states that the 2021 LRDP may result in significant adverse effects on State and federally protected wetlands; however, impacts would be reduced to less than significant with incorporation of MM BIO-9.

There are no recognized wetlands on or adjacent to the project site. One concrete-lined basin occurs adjacent to the eastern portion of the SBB Project Boundary. Based on Psomas biologist's survey effort, this basin does not support any vegetation, is typically inundated year-round to support campus facilities such as irrigation, and is filled and drained artificially using below-ground pipes and appears to be isolated from surface flows (Appendix B). This basin is not part of the project site and thus will be avoided. Therefore, the proposed project would be consistent with the wetlands analysis and determination in the 2021 LRDP EIR; and proposed project impacts to wetland areas and habitats would remain **less than significant**.

d) The 2021 LRDP EIR states that the campus is located at the edge of urban development in the eastern portion of the City and is well developed itself. As a result, the campus contains no regional connection to other open space areas to the north or west; while the southeast portion of the campus consists of undeveloped open space (Open Space Reserve and the UCR Botanic Gardens) that links the Box Springs Mountains to the northeast with Sycamore Canyon Wilderness Park to the southwest. Impacts were determined to be less than significant.

The project site is developed/disturbed, and existing structures are underutilized. Development of the proposed project would not preclude wildlife movement or impact wildlife corridors or linkages since such connections of physical space and resources are not present on the campus. Therefore, the proposed project would be consistent with the wildlife movement or native nursery analyses and determination in the 2021 LRDP EIR; and proposed project impacts to such wildlife linkage areas would remain **less than significant**.

e) The IS prepared for the 2021 LRDP states that there are no tree preservation policies or ordinances in place for campus projects, and that UCR's Tree Preservation and Replacement Guidelines is being drafted, which will include applicable tree replacement guidelines for the removal of specific trees. The IS prepared for the 2021 LRDP concludes that the 2021 LRDP would have a less than significant impact to local policies or ordinances protecting biological resources.

Development under the proposed project would adhere to UCR's Tree Preservation and Replacement Guidelines. Therefore, the proposed project would be consistent with the local biological resources policies and ordinances analyses and determination in the IS prepared for the 2021 LRDP; and proposed project impacts to such resources would remain **less than significant**.

f) The IS prepared for the 2021 LRDP states that UCR is not a Permittee to the Western Riverside County MSHCP and therefore is not subject to the Conservation efforts established in the plan. Impacts were determined to be less than significant.

The project site is not located within a MSHCP Criteria Cell and therefore is not subject to any Conservation efforts. The project site is located within developed/disturbed areas and not located within a drainage feature, riparian or riverine areas; thus, the proposed project does not conflict with Section 6.1.2 of the MSHCP. Though the project site is not within areas of potential habitat for special-status species, the proposed project may result in potentially significant impacts to burrowing owls, nesting birds, and/or bats due to its proximity to these areas and the presence of existing habitat opportunities and would incorporate mitigation measures **MM BIO-1A, MM BIO-1B, MM BIO-2 through MM BIO-4, MM BIO-6A, and MM BIO-6B**. As such, the proposed project does not conflict with Sections 6.1.3 and 6.3.2 of the MSHCP. The project site is not located adjacent to any existing or proposed MSHCP Conservation Area. Thus, the project is not subject to the MSHCP Urban/Wildlands Interface guidelines and does not conflict with Section 6.1.4 of the MSHCP. The IS prepared for the 2021 LRDP concludes that implementation of the 2021 LRDP would not conflict with the MSHCP and would have a less than significant impact. Therefore, the proposed project would be consistent with the analyses and determination of the applicability and consideration of the MSHCP to 2021 LRDP projects ; and proposed project impacts to the implementation of applicable adopted conservation plans would remain **less than significant** with the incorporation of **MM BIO-1A, MM BIO-1B, MM BIO-2 through MM BIO-4, MM BIO-6A, and MM BIO-6B** specified in criterion 4.1.4 a) above.

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4.1.5 Cultural Resources

Section 4.5 of the 2021 LRDP EIR address the effects of campus growth on cultural resources under the 2021 LRDP. The 2021 LRDP EIR concludes impacts to the built environment historical resources would be significant and unavoidable even with the adoption of MMs, while impacts to archaeological resources would be less than significant with the adoption of MMs. The 2021 LRDP determines that impacts resulting from ground disturbance associated with development facilitated by the 2021 LRDP would have a low potential to disturb or damage known or unknown human remains; existing regulations would further ensure impacts to unknown human remains are less than significant. To address potentially significant impacts to built environment historical resources and archaeological resources, **MM CUL-1 through MM CUL-4** would be incorporated.

The above mentioned MMs state the following:

MM CUL-1 Protection of Historical Resources: For purposes of MM CUL-1, “major exterior alterations” indicates a significant alteration/change to the exterior character-defining features or setting of a building or structure. Such projects might include, but not be limited to, additions, partial or complete demolition, relocation, window frame replacement different from existing, modifications to wall sheathing materials, changes to the roof shape, pitch, eaves, and other features, installment of wheelchair access ramps, and/or changes to the overall design configuration and composition of the building and the spatial relationships that define it. Major exterior alterations would require consultation to determine if these alterations noted above constitutes a major exterior alteration requiring further review from an architectural historian or whether the proposed alterations would qualify as a minor exterior alteration.

For purposes of MM CUL-1, “minor exterior alterations” indicates a minor alteration/change to the exterior of a building or structure and its setting that would not be likely to significantly alter its appearance. Such projects might include, but not be limited to, repainting, in-kind landscaping or hardscaping replacement, window pane replacement, reversible installation of HVAC [heating, ventilation, and air conditioning] units that does not obstruct or destroy character-defining features, installation of fencing, signage, or artwork that does not obstruct or destroy character-defining features. Minor exterior alterations are exempt from further review from an architectural historian.

During project-specific environmental review of development under the 2021 LRDP, UCR shall define the project’s area of effect for historic buildings and structures as early as possible. UCR shall implement the following procedures:

- Conduct project-specific surveys for buildings or structures (e.g., proposed for demolition, major exterior alterations, additions) that are 50 years of age or older that have (1) not been subject to an evaluation within the past 5 years, or (2) were not previously evaluated in the UCR Historic Resources Survey Report.
  - UCR shall retain a qualified architectural historian to record the property at professional standards and assess its significance under CEQA Guidelines Section 15064.4. The evaluation process shall include the historic context framework included in the UCR Historic Resources Survey Report as well as the development of additional background research as needed in order to assess the significance of the building, structure, district, or cultural landscape in the history of the UC system, the campus, and the region. For historic buildings, structures or features that do not meet the CEQA criteria as a historical resource, no further mitigation is required, and the impact would be less than significant.

- The assessment of the potential historical resource and its character-defining features shall be documented on the appropriate California Department of Parks and Recreation (DPR) 523 forms by a qualified architectural historian meeting the Secretary of the Interior's Professional Qualifications Standards (as codified in 36 CFR Part 61).

- For projects affecting any eligible historic buildings identified in the UCR Historic Resources Survey Report or determined to be eligible during the project-specific surveys, for a building or structure that qualifies for listing on the NRHP and/or CRHR, UCR shall implement the following procedures:
  - For major exterior repairs (different from that of existing), alterations, or building additions of buildings that are eligible historic resources, UCR shall retain a qualified architectural historian meeting the Secretary of the Interior's Professional Qualifications Standards (as codified in 36 CFR Part 61) to conduct Character-Defining Features and Impacts Screening in coordination with the design team to consider project design features and/or measures that would enable the project to avoid direct or indirect impacts to the building or structure. Conclusion of the screening consultation process shall be documented in a memorandum, including a statement of compliance with the Secretary's Standards. The purpose of the memorandum shall document avoidance/reduction of significant adverse impacts to historical resources, where feasible, through (1) identifying and documenting character-defining features, noncontributing elements/additions, and (2) providing historic preservation project review and preliminary impacts analysis screening to UCR as early as possible in the design process. The memorandum shall review preliminary and/or conceptual project objectives early in the design process and describe various project options capable of reducing and/or avoiding significant adverse direct or indirect impacts through compliance with the Secretary's Standards and/or application of the State Historic Building Code or any subsequent design guidelines prepared by UCR for the treatment of historic resources.

If major modifications, renovations, or relocation of a determined historic resource is proposed and the project is unable to comply with the Secretary's Standards or when a historic resource is to be demolished, then UCR shall ensure that documentation shall be carried out by a qualified architectural historian, as follows:

- UCR shall commission the preparation of HABS-like [Historic American Building Survey] documentation of the building, structure, district, feature, and its associated landscaping and setting prior to construction activities. The HABS-like package will document in photographs and descriptive and historic narrative the historical resources slated for modification/demolition. Documentation prepared for the package will draw upon primary- and secondary-source research and available studies previously prepared for the project.
- The specifications for the HABS-like package follow:
  - Photographs: Photographic documentation will focus on the historical resources/features slated for demolition, with overview and context photographs for the campus and adjacent setting. Photographs will be taken of the building using a professional-quality single lens reflex (SLR) digital camera with a minimum resolution of 10 megapixels. Photographs will include context views, elevations/exteriors, architectural details, overall interiors, and interior details (if warranted). Digital photographs will be provided in electronic format.
  - Descriptive and Historic Narrative: The architectural historian will prepare descriptive and historic narrative of the historical resources/features slated for demolition. Physical descriptions will detail each resource, elevation by elevation, with accompanying photographs, and information on how the resource fits within the broader campus during its period of

significance. The historic narrative will include available information on the campus design, history, architect/contractor/designer as appropriate, area history, and historic context. In addition, the narrative will include a methodology section specifying the name of researcher, date of research, and sources/archives visited, as well as a bibliography. Within the written history, statements shall be footnoted as to their sources, where appropriate.
  - Historic Documentation Package Submittal: The electronic package will be assembled by the architectural historian and submitted to UCR for review and comment.

- A copy of the HABS-like package shall be offered to the Special Collections and University Archives at the Tomás Rivera Library and the California Historical Resources Information System. The record shall be accompanied by a report containing site-specific history and appropriate contextual information. This information shall be gathered through site-specific and comparative archival research, and oral history collection as appropriate.
- If preservation and reuse at the site are not feasible, the historical building shall be documented as described above.

For new infill construction within the Mid-Century Modern Core Historic District that does not involve building demolition:

- Infill projects outside of the Mid-Century Modern Core Historic District would not need review by an architectural historian.
- Infill projects within the Mid-Century Modern Core Historic District will require review by an architectural historian for elements such as form, massing, and scale, to ensure visual compatibility with the historic district, and the review shall be conducted in compliance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings* (Weeks and Grimmer 1995).[1:]

MM CUL-2 Tribal Cultural Resources/Archaeological Monitoring: Prior to commencement of ground disturbing activities into an area with a medium or high potential to encounter undisturbed native soils including Holocene alluvium soils, as determined by UCR, UCR shall hire a qualified archaeological monitor meeting the Secretary of the Interior's Professional Qualification Standards for archaeology (National Park Service [NPS] 1983) to identify archaeological resources and cultural resources of potential Native American origin. Where development occurs in the southeastern quadrant of campus, and in areas containing Val Verde Pluton geologic features considered highly sensitive to prehistoric archaeological resources, UCR shall hire a qualified archaeologist and a Native American monitor to reduce impacts to potential archaeological and/or tribal cultural resources. The monitor(s) shall be on-site during any construction activities that involve ground disturbance. The on-site monitoring shall end when project-related ground disturbing activities are completed, or, in consultation with the lead agency and tribes as appropriate and based on observed conditions, monitoring may be reduced or eliminated prior to completion of ground-disturbing activities, when the monitor(s) has indicated that the project site has a low potential to encounter tribal cultural resources (TCR)/archaeological resources. Consolidated monitoring efforts (e.g., archaeological monitoring/tribal cultural/paleontological monitoring) may occur if the individual monitor meets the applicable qualifications, except for development in the southeastern quadrant as detailed above.

MM CUL-3 Construction Worker Training: For projects requiring TCR/archaeological monitoring, the monitor shall provide preconstruction training for all earthmoving construction personnel prior to the start of any ground disturbing activities, regarding how to recognize the types of TCRs and/or archaeological resources that may be encountered and to instruct personnel about actions to be taken in the event of a discovery. UCR Planning, Design & Construction Project Manager/contractor shall retain documentation showing when training of personnel was completed.

MM CUL-4 Unanticipated Discovery of Tribal Cultural Resources/Archaeological Resources: If previously undiscovered TCRs and/or archaeological resources are identified during construction, all ground disturbing activities within 100 feet of the resource shall halt, UCR Planning, Design & Construction staff shall be notified, and the find shall be evaluated by a qualified archaeologist meeting the Secretary of the Interior standards to determine whether it is a unique archaeological resource, as defined by CEQA. If the discovery appears to be Native American in origin, a tribal representative will be contacted within 24 hours of discovery to determine whether it is a TCR, as defined by CEQA. If the find is neither a unique archaeological resource nor a TCR, work may resume. If the find is determined to be a unique archaeological resource or TCR, the archaeologist and the tribal representative, as appropriate, shall make recommendations to UCR Planning, Design & Construction staff on the measures that will be implemented, including, but not limited to, preservation in place, excavation, relocation, and further evaluation of the discoveries pursuant to CEQA. Preservation in place (i.e., avoidance) is the preferred method of mitigation for impacts to TCRs/archaeological resources. If UCR determines that preservation in place is not feasible, the archaeologist shall design and implement a treatment plan, prepare a report, and salvage the material, as appropriate. Any important artifacts recovered during monitoring shall be cleaned, catalogued, and analyzed, with the results presented in a report of findings that meets professional standards. Work on-site may commence upon completion of any fieldwork components of the treatment plan.

CULTURAL RESOURCES

Would the Project:	Impact Examined in 2021 LRDP EIR	Impact Not Examined in 2021 LRDP EIR: No Impact	Impact Not Examined in 2021 LRDP EIR: Less-than-Significant Impact	Impact Not Examined in 2021 LRDP EIR: Potentially Significant Impact
a) Cause a substantial adverse change in the significance of a historical resource as 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?	☒	☐	☐	☐

a) The 2021 LRDP EIR and associated UCR Historic Resources Survey noted that implementation of the 2021 LRDP would adversely affect historical resources through the full and partial demolition of historical resources, renovation/rehabilitation of historical resources, and new construction adjacent to historical resources. Impacts were determined to be significant and unavoidable even with incorporation of MMs.

Based on the 2021 LRDP EIR and associated UCR Historic Resources Survey, Anderson Hall is the only historical resource within or adjacent to the project site. A Character-Defining Features Memorandum for Anderson Hall was prepared as part of this project, in compliance with **MM CUL-1**.

The proposed project entails the construction of a new building for the expansion of the School of Business programs and facilities, demolition of existing structures, relocation and replacement of structures (Biocontrol Building and Genomics Shed), hardscape, landscape, and off-site improvements that include circulation improvements to create a pedestrian connection to Anderson Hall. Neither the buildings proposed to be demolished or replacement sites for the Biocontrol Building and Genomics Shed have been identified as historical resources. Therefore, the proposed project would have no impact on historic resources related to the demolition, relation, and/or replacement of existing select structures within the SBB Project Boundary and Biocontrol Building Replacement Site.

The circulation improvements proposed for Anderson Hall, an eligible historical resource, may be considered a "major exterior alteration" as defined in **MM CUL-1**. To support compliance with **MM CUL-1**, a qualified architectural historian meeting the Secretary of the Interior's Professional Qualifications Standards (as codified in 36 CFR Part 61) from Rincon Consultants, Inc. prepared a Character-Defining Features Memorandum and subsequent Historical Resources Impacts Screening, dated February 2022 and included as Appendix D and Appendix E (Rincon 2022a and 2022b). The analyses identify those physical elements of Anderson Hall which convey its historical significance (character-defining features) and reviews the proposed project for conformance with Secretary of the Interior's Standards for the Treatment of Historic Properties (Standards).

Anderson Hall is significant for its historical associations with the early settlement and development in the City of Riverside, particularly the citrus industry and citriculture in Riverside and the founding of the Citrus Experiment Station. The Citrus Experiment Station was the impetus organization for what would become UCR and made an immeasurable contribution to the success of the citrus industry in Riverside, the region, and California. Anderson Hall is eligible for designation under National Register of Historic Places (NRHP) Criterion A and California Register of Historical Resources (CRHR) Criterion 1 for its association with the Citrus Experiment Station with a period of significance of 1916 through 1974 when the Citrus Experiment Station fell under the auspices of the College of Natural and Agricultural Sciences.

Anderson Hall is also significant for its architectural merit as a good example of Spanish Colonial/Mission Revival style architecture as applied to an educational building. Initially constructed in 1916 as the Horticulture Building (Anderson Hall 1) and the Irrigation Building (Anderson Hall 2), it was designed by Los Angeles-based architects Lester H. Hibbard and H.B. Cody. It was expanded in 1931 with the addition of the Soils and Plant Nutrition Wing (Chapman Hall), also designed in the Spanish Colonial/Mission Revival style by Riverside architect G. Stanley Wilson. It is eligible for designation under NRHP Criterion C and CRHR Criterion 3 for its architecture with a period of significance of 1916 and 1931.

The building's character-defining features, or those elements essential in conveying a property's historic significance, were outlined in the Character-Defining Features Memorandum (Rincon 2022a). Those which have the most potential to be impacted by the proposed project include its general site and landscape, among others. As defined in CEQA Guidelines Section 15064.5(b), a project would result in a significant adverse impact on the environment if it materially impaired a historical resource, that is, if it directly or indirectly alters in an adverse manner those characteristics that convey a resource's historical significance. Potential impacts under the proposed project therefore could occur through direct project actions, including the changes to the landscaping, hardscaping, and site features of Anderson Hall. Indirect impacts to the historical resource could also result from the new adjacent building and the resulting changes to the property's immediate setting. The CEQA Guidelines state that impacts to a historical resource are generally considered mitigated below a level of significance when the project conforms to the Standards.

In consideration of direct impacts, the proposed project does not include any direct physical impacts to the Anderson Hall 1 and Anderson Hall 2 buildings themselves, which would continue to be used for its historic purpose as an institutional building. The proposed project is also not anticipated to alter any significant site or circulation features, such as the sloped terrain above Citrus Drive, horseshoe drive at west elevation, concrete pathways in the western courtyard, or arcaded corridors among others. South Campus Drive and the eastern ancillary road are also considered character-defining due to their definition of the overall property boundaries; however, both these roads have been modified and it is their alignment which is significant, not their physical materials or associated features. The proposed project is not anticipated to result in the removal or modification of the road alignment such that they will no longer continue to define the historical property boundaries.

Project elements within the Anderson Hall property boundary are anticipated to be limited and concentrated at the rear, south/southeast spaces of the property, which is not highly character-defining or visible from the building's principal westerly-facing elevations. The proposed project includes pathway improvements to connect Anderson Hall to the SBB and to accommodate ADA requirements. As evidenced by historical aerial photographs and visual observation, the concrete pathways in this area of the property appear to have been developed in or subsequent to the 1990s, and therefore post-date Anderson's Hall period of significance (defined as 1916 through 1974). The existing rear pathways have not acquired significance in their own right and are not distinctive physical features that contribute to the historical or architectural significance of Anderson Hall. The replacement or alteration of the existing pathways therefore would not result in a significant impact on Anderson Hall.

Historical aerial photographs indicate the landscaping at the southeastern portion of the property has been replaced since the initial development of Anderson Hall. The current mature trees in this area appear to date the 1960s or later based on photographs and other documentary evidence. Although the trees themselves may not date to the period of significance, this area of the property has historically had trees and the general use of large trees and shrubs at the secondary portions of the property is considered character-defining. Campus Construction and Design Standards include measures to ensure any changes to the landscaping and setting of Anderson Hall would be consistent with the existing and historical character of the property.

In consideration of indirect impacts and changes to the general setting of Anderson Hall, potential impacts could occur through the development of the adjacent SBB. The construction of the new SBB across South Campus Drive would introduce a new visual element to the setting of Anderson Hall. However, the new building would be constructed outside of the historical property boundaries of Anderson Hall, and therefore would not affect its immediate setting. Further, the SBB would be located at the rear of the Anderson Hall property and therefore would not affect any of the principal views of the building which are concentrated on the western-facing elevations.

Although the SBB would add a new element to the larger surrounding setting, this setting has changed substantially since the initial development of Anderson Hall in 1916. Prior to the expansion of the campus beginning in 1954, the surrounding landscape was defined by orchards. However, since this time, the expansion of the campus has transformed into an educational setting and has continued this progression into the first decades of the twenty-first century. The changes to the setting have altered the surrounding landscape but have not reduced the integrity of Anderson Hall such that it is no longer able to convey its significant architectural and historical associations. The new building would be consistent with the general growth of the campus which has occurred since Anderson Hall was constructed. The new SBB would be taller than Anderson Hall; however, at four stories, the new building would exceed the height of Anderson Hall moderately and would be similar with other nearby buildings that are also multiple stories, such as the School of Medicine Research Building, Entomology Building, Psychology Building and the Genomics Building. Further, the new building would be designed in accordance with the Campus Construction and Design Standards and Architectural Design Precedent, which would work to ensure the design, materials, and overall architectural character are harmonious with Anderson Hall and the other surrounding buildings.

The character-defining features and impacts screening prepared in support of **MM CUL-1** concludes that the proposed project would comply with the Standards and result in a less than significant impact to historical resources pursuant to CEQA Guidelines Section 15064.5(b)(3). Therefore, the proposed project would be consistent with the historical resources analyses and determination in the 2021 LRDP EIR; and proposed project impacts to historical buildings would remain **less than significant** based on the findings summarized above from the historical resources impacts screening memorandum, prepared in compliance to **MM CUL-1**.

b) The 2021 LRDP EIR states that new development under the 2021 LRDP would generally avoid disturbance in areas of recorded historic-age or prehistoric archaeological resources on campus. However, development under the 2021 LRDP has the potential to damage or destroy unrecorded historic-age or prehistoric archaeological resources. It determined that impacts would be less than significant with incorporation of **MM CUL-2 through MM CUL-4.**

The proposed SBB would be constructed on an existing parking lot; the proposed Biocontrol Building would be constructed on an existing landscaped area surrounded by academic facilities; and the proposed Genomics Shed would be constructed on previously disturbed area either south or west of the water-storage basin. The proposed project avoids the Open Space Reserve areas thus avoiding the southeast hills where on-campus archaeological resources are most likely to be encountered. Nonetheless, due to the SBB Project Boundary's proximity to the Open Space Reserve, monitoring would occur during project construction to monitor for unknown archaeological resources and tribal cultural resources. UCR's standard contract specifications address the protection and recovery of buried archaeological resources, including human remains, as noted in **MM CUL-2 through MM CUL-4**. These measures identify steps to be taken in the event archaeological resources, including human remains, are discovered during ground disturbing activities. Therefore, the proposed project would be consistent with the archaeological resources analyses and determination in the 2021 LRDP EIR; and proposed project impacts to archaeological resources would remain **less than significant** with incorporation of **MM CUL-2 through MM CUL-4**.

c) The 2021 LRDP EIR states that no formal cemeteries are known to have occurred on the campus; therefore, the likelihood of encountering human remains is considered low. Ground-disturbing construction activities could uncover previously unknown human remains, which could be archaeologically or culturally significant. The 2021 LRDP anticipates new development and building improvements involving construction activities that may potentially disturb native terrain through activities such as excavation, grading, and soil removal. As such, the potential exists for previously undiscovered human remains to be discovered as a result of implementing projects under the 2021 LRDP. It determined that impacts would be less than significant.

California law recognizes the need to protect Native American human burials, skeletal remains, and items associated with Native American burials from vandalism and inadvertent destruction. The procedures for the treatment of Native American human remains are contained in California Health and Safety Code Sections 7050.5 and 7052 and California PRC Section 5097. If human remains are discovered during any construction activities, potentially damaging ground-disturbing activities in the area of the remains and a 100-foot-buffer area shall be halted immediately, and UCR shall notify the Riverside County Coroner and the Native American Heritage Commission (NAHC) immediately, according to PRC Section 5097.98 and Section 7050.5 of California's Health and Safety Code. If the remains are determined by the NAHC to be Native American, the guidelines of the NAHC shall be adhered to in the treatment and disposition of the remains. Following the Coroner's findings, UCR and the NAHC-designated most likely descendant shall recommend the ultimate treatment and disposition of the remains and take appropriate steps to ensure that additional human interments are not disturbed. The responsibilities for acting upon notification of a discovery of Native American human remains are identified in California PRC Section 5097.94. Compliance with California Health and Safety Code Sections 7050.5 and 7052 and California PRC Section 5097 would provide an opportunity to avoid or minimize the disturbance of human remains, and to appropriately treat any remains that are discovered. Therefore, the proposed project would be consistent with the human remains analyses and determination in the 2021 LRDP EIR; and proposed project impacts to previously unknown human remains would remain **less than significant** with adherence to existing California State laws and codes.

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4.1.6 Energy

Section 4.6 of the 2021 LRDP EIR addresses the impacts of the 2021 LRDP on wasteful, inefficient, or unnecessary consumption of energy resources during construction or operation and conflicts or obstructions with applicable plans for renewable energy and energy efficiency. The 2021 LRDP EIR concludes projects under the 2021 LRDP would have less than significant impacts to applicable plans, policies, or regulations adopted for the purpose of avoiding or mitigating environmental effects related to energy. The 2021 LRDP EIR also states that impacts related to construction energy consumption would be less than significant. However, the 2021 LRDP EIR concludes that implementation of future projects would consume electricity and natural gas during operation that would exceed the UCR 2018 per capita energy use and annualized regional 2018 per capita energy use thresholds. **MM GHG-1** (Measures EN3 and EN5) were identified in the 2021 LRDP EIR, to reduced operational stationary consumption of electricity and natural gas.

The above mentioned MM states the following:

MM GHG-1 Implement On-Campus GHG Emissions Reduction Measures: UCR shall implement the following GHG emissions reduction measures by scope emissions category:

Scope 2 (Electricity Consumption and Generation)

- Measure [Energy] EN3: UCR shall work to obtain 100 percent clean-sourced electricity through either Riverside Public Utilities (RPU) and/or through the installation of on-site clean-sourced electricity sources for all new buildings by 2025. In addition, UCR shall establish annual budgets that include funding to purchase 100 percent clean-sourced energy. Furthermore, all newly constructed building projects, other than wet lab research laboratories, shall be designed, constructed, and commissioned to outperform the California Building Code (CBC) (Title 24 portion of the California Code of Regulations [CCR]) energy efficiency standards by at least 20 percent. Finally, UCR shall incorporate solar photovoltaics (PV) as feasibly possible for newly constructed and majorly-renovated buildings with the maximum system size, highest solar panel efficiency, and greatest system performance.[3]
- Measure EN5 (Parts A, B, C): In order to prioritize energy efficiency and green building initiatives for building/facility upgrades and new construction as well as reduced energy use, UCR shall identify aging equipment throughout the campus such as equipment associated with the Central Plant, electrical distribution system, and building HVAC [heating, ventilation, and air conditioning] systems and develop a strategy and schedule to upgrade such equipment with high-energy efficiency systems and optimize HVAC systems through heat zoning, high-efficiency filters, and shut-down times expansion. The strategy shall include an evaluation and cost analysis related to upgrading/ retrofitting equipment versus retirement of equipment if no longer needed with future initiatives (i.e., Central Plant boiler retirement). The schedule and upgrade strategy must meet a 2 percent energy efficiency improvement annually through 2035. In addition, UCR shall require new buildings to incorporate occupancy sensors and controls such that lighting of shared spaces is on occupancy sensors, building temperature set points are widened and aligned with occupancy schedules, and ventilation systems are converted from constant volume to variable so ventilation rates are occupancy-based. Furthermore, UCR shall develop a plan to identify existing buildings and projects that could undergo upgrades to the control systems and establish a schedule for upgrade incorporation. Finally, UCR shall develop a tracking program to monitor and share campus energy efficiency activities and progress towards increased energy efficiency.

[3] The EIR GHG modeling efforts assume that clean energy is in line with California- defined renewable sources.

Energy

Would the Project:	Impact Examined in 2021 LRDP EIR	Impact Not Examined in 2021 LRDP EIR: No Impact	Impact Not Examined in 2021 LRDP EIR: Less-than-Significant Impact	Impact Not Examined in 2021 LRDP EIR: Potentially Significant Impact
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?	☒	☐	☐	☐

a) The 2021 LRDP EIR states that development under the 2021 LRDP would consume electricity, natural gas, and fuel during construction and operation that would exceed the UCR 2018 per capita energy use and annualized regional 2018 per capita energy use threshold. However, implementation of **MM GHG-1** would reduce energy impacts to less than significant.

Project construction activities would result in a temporary increase in energy consumption through the combustion of fossil fuels in construction vehicles, worker commute vehicles and construction equipment, and the use of electricity for temporary buildings, lighting, and other sources. The proposed project would also consume energy for building heating and cooling, refrigeration, lighting, electricity, and commercial equipment when occupied and in use. New student, visitor, and faculty vehicle trips and fleet vehicle trips associated with project operations would also be a source of energy consumption. However, the proposed project would be required to comply with the energy conservation strategies expressed in the UC Policy on Sustainable Practices. As stated in the Project Description, the proposed project would incorporate several project design features that would minimize energy usage, including the achievement of minimum LEED Silver certification. Indoor water use would be reduced with low-flow fixtures in kitchenettes, and façade and window insulation would be optimized for climate and reduced air-conditioning usage. Outdoor water use would be reduced through the selection of native and adapted plant species that reduce irrigation requirements. Building self-shading would also provide reductions in solar heat gains during peak cooling months thereby improving thermal comfort and reducing energy demand. Recycled materials and materials from regional sources would be used where possible. In addition, project-specific Vehicle Miles Traveled (VMT) would not exceed the Western Riverside Council of Governments (WRCOG) regional thresholds (further discussed in Section 4.1.17 of this Addendum). The proposed project would not result in wasteful, inefficient, or unnecessary use of energy during construction or operation, and is consistent with the energy analysis evaluated in the 2021 LRDP EIR. Therefore, the proposed project would be consistent with the energy demand analysis and determination in the 2021 LRDP EIR; and proposed project impacts to energy use would remain **less than significant** with incorporation of **MM GHG-1**.

b) The 2021 LRDP EIR states that projects under the 2021 LRDP would be required to comply with applicable State and UC energy policies and regulation, California Building Code (CBC) Title 24, Senate Bill 100 (SB 100), and the UC Policy on Sustainable Practices. However, implementation of **MM GHG-1** would reduce energy impacts to less than significant.

Consistent with the conclusion of the 2021 LRDP EIR, the proposed project would incorporate **MM GHG-1**; be required to comply with all building design standards set in CBC Title 24 which mandates implementation of energy efficient building design; abide by SB 100 standards as the proposed project would be powered by an existing State electricity grid; and comply with UC Policy on Sustainable Practices and other UC requirements related to energy reduction and carbon-free energy use. Construction of the SBB would also incorporate sustainability measures identified in Section 2.5.6 of this Addendum, and the project would not conflict with nor obstruct a State or local plan for renewable energy or energy efficiency. Therefore, the proposed project would be consistent with applicable plans related to renewable energy and energy efficiency as determined in the 2021 LRDP EIR; and proposed project impacts on the implementation of energy plans and policies would remain **less than significant** with incorporation of **MM GHG-1**.

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4.1.7 Geology and Soils

Section 4.7 of the 2021 LRDP EIR addresses the impacts of campus growth on the geology and soils for the campus and vicinity. The IS prepared for the 2021 LRDP concludes that there would be no impact or less than significant impacts for criterion b (soil erosion or topsoil loss), criterion d (expansive soils), and criterion e (soil adequacy to support alternative wastewater disposal systems); therefore, these thresholds were not further evaluated in the 2021 LRDP EIR.

The 2021 LRDP EIR concludes that implementation of future projects that comply with applicable regulations related to geologic and soils hazards would result in less than significant impacts to seismic hazards, and unstable geologic or soil conditions. The 2021 LRDP EIR also concludes that construction impacts to potential paleontological resources could be a potentially significant impact. To protect paleontological resources that could be discovered or disturbed during ground-disturbing activities from future campus development under the 2021 LRDP, the 2021 LRDP EIR identifies **MM GEO-1 and MM GEO-2** to reduce potential impacts to paleontological resources to less than significant levels**.**

The above mentioned MMs state the following:

MM GEO-1 Inadvertent Discovery of Paleontological Resources: If any paleontological resources are encountered during ground-disturbing activities, the contractor shall ensure that activities in the immediate area of the find are halted and that UCR is informed. UCR shall retain a qualified paleontologist to evaluate the discovery and recommend appropriate treatment options pursuant to guidelines developed by the Society of Vertebrate Paleontology, including development and implementation of a paleontological resource impact mitigation program by a qualified paleontologist for treatment of the particular resource, if applicable. These measures may include, but not limited to, the following:

- Salvage of unearthed fossil remains and/or traces (e.g., tracks, trails, burrows)
- Washing of screen to recover small specimens
- Preparation of salvaged fossils to a point of being ready for curation (e.g., removal of enclosing matrix, stabilization and repair of specimens, and construction of reinforced support cradles)
- Identification, cataloging, curation, and provisions for repository storage of prepared fossil specimens

MM GEO-2 Paleontological Resources Monitoring: UCR shall implement the following measures if projects are proposing earth-moving activities exceeding 5 feet below previously undisturbed alluvial-fan soils within "high paleontological sensitivity" (i.e., Qof and Qvof):

- Retain a qualified professional paleontologist to prepare and implement a Paleontological Resources Impact Mitigation Plan for the project. A qualified paleontologist is an individual who meets the education and professional experience standards as established by the SVP [Society of Vertebrate Paleontology] (2010), which recommends the paleontologist shall have at least a master's degree or equivalent work experience in paleontology, shall have knowledge of the local paleontology, and shall be familiar with paleontological procedures and techniques. The Paleontological Resources Impact Mitigation Plan shall describe mitigation recommendations in detail, including paleontological monitoring procedures; communication protocols to be followed in the event that an unanticipated fossil discovery is made during project development; and preparation, curation, and reporting requirements. Consolidated monitoring efforts (e.g., archaeological monitoring/tribal cultural/paleontological monitoring) may occur if the individual monitor has the applicable qualifications.

- Prior to the commencement of ground disturbing activities, the qualified paleontologist or their designee, shall conduct training for grading and excavation personnel regarding the appearance of fossils and the procedures for notifying paleontological staff if unanticipated fossils are discovered by construction staff. The Paleontological Worker Environmental Awareness Program shall be fulfilled at the time of a pre-construction meeting. In the event a fossil is discovered by construction personnel anywhere in the project area, all work in the immediate vicinity of the find shall cease and a qualified paleontologist shall be contacted to evaluate the find before re-starting work in the area. If it is determined that the fossil(s) is (are) scientifically significant, the qualified paleontologist shall complete the mitigation outlined below to mitigate impacts to significant fossil resources.
- If paleontological resources are encountered during ground-disturbing activities, MM GEO-1 shall apply.

GEOLOGY AND SOILS

Would the Project:	Impact Examined in 2021 LRDP EIR	Impact Not Examined in 2021 LRDP EIR: No Impact	Impact Not Examined in 2021 LRDP EIR: Less-than-Significant Impact	Impact Not Examined in 2021 LRDP EIR: Potentially Significant Impact
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?	☒	☐	☐	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☒	☐	☐	☐
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☒	☐	☐	☐
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☒	☐	☐	☐

a) According to the 2021 LRDP EIR, the campus is located approximately 5 miles southwest of the San Jacinto Fault Zone, 13.5 miles southwest of the San Andreas Fault Zone, 15 miles northeast of the Elsinore Fault Zone, and 20 miles southeast of the Cucamonga Fault Zone. The 2021 LRDP EIR concludes that at such distances, ground rupture events would unlikely occur on the campus and that no people or structures would be exposed to substantial adverse effect associated with fault rupture due to a seismic event. Therefore, future campus development under the 2021 LRDP, including the proposed project, would result in less than significant impacts related to seismic hazards.

However, the 2021 LRDP EIR also states that existing and proposed campus development have the potential to be subject to ground shaking generated from seismic events that originate from the above listed fault zones, and that these fault zones proximate to the campus have the potential to cause moderate to large earthquakes (DOC 2022). Ground shaking has the potential to dislodge objects from walls, ceilings, and shelves, and to damage and destroy buildings and other structures. People and property located within the LRDP area would be exposed to these potential hazards. The campus could minimize these seismic-induced risks through several requirements such as requiring future projects to conduct a site-specific geotechnical study and comply with all proposed project related to engineering design recommendations.

A Geotechnical Investigation Report was prepared for the proposed SBB (Appendix F) and a Preliminary Geotechnical Investigation Report was prepared for the proposed Biocontrol Building and Genomics Shed (Appendix G). The geotechnical recommendations outlined in these reports will be incorporated into the project design. Proper engineering design and construction in conformance with the CBC standards and project-specific geotechnical recommendations would ensure that seismic ground shaking would be reduced to less than significant levels.

Additionally, campus projects proposed under the 2021 LRDP would be required to comply with the UC Facilities Manual Seismic Program Guidelines, the UC Seismic Safety Policy Requirements, and CBC Title 24, Part 2. The UC Seismic Safety Policy addresses interior and exterior building elements that may fall or slide during an earthquake and requires anchorage for seismic resistance of nonstructural building elements such as furnishings, fixtures, material storage facilities, and utilities that could dislodge, fall, or rupture during an earthquake. The CBC Title 24, Part 2 provides building codes and standards for the design and construction of structures in California specially related to seismically resistant construction, and foundation. The CBC also establishes grading requirements that apply to excavation and fill activities and requires the implementation of erosion control measures. Therefore, future campus development projects under the 2021 LRDP, such as the proposed project, would have to comply with the UC Seismic Safety Policy and CBC which would reduce the potential operational impact related to seismic ground shaking. Therefore, all future projects under the 2021 LRDP, including the proposed project, would have **less than significant impacts**.

According to the 2021 LRDP EIR, most of the campus has a low potential for liquefaction, with portions of the East Campus adjacent to the I-215/SR 60 freeway between Blaine Street and University Avenue and from University Avenue east to the Box Springs Mountains, as well as areas on the southern portion of West Campus that are at moderate risk for liquefaction. However, project compliance with the CBC, the UC Facilities Manual Seismic Program Guidelines, and the UC Seismic Safety Policy would be required to reduce or eliminate seismic ground failure impacts, including liquefaction. Therefore, the proposed project would be consistent with the seismic hazards and ground failure analysis and determination in the 2021 LRDP EIR; and proposed project impacts from seismic hazards, ground failure, and liquefaction would remain **less than significant**.

According to the Geologic and Seismic Technical Background Report for the City's General Plan EIR, a few areas of the City could be prone to seismically induced landslides and rockfalls common during large earthquakes (City of Riverside 2007). Structures located in such hazard areas could be subject to severe damage. However, according to the Department of Conservation (DOC) Earthquake Zones of Required investigation, there are no areas within the campus that are prone to landslides (DOC 2020). Though the SBB Project Boundary is located on East Campus in proximity to natural hillsides, the 2021 LRDP EIR states that geologic materials on, and underlying the entire campus have very low potential for deep-seated landslides, even on natural slopes. Additionally, the proposed project would be designed and built in compliance with the latest CBC requirements and project-specific geotechnical recommendations which would reduce or eliminate potential risks associated with damage from landslides. Therefore, the proposed project would be consistent with the landslide hazard analysis and determination in the 2021 LRDP EIR; and proposed project impacts from landslide hazards would remain **less than significant**.

b) The 2021 LRDP EIR states that projects developed under the 2021 LRDP would comply with CBC building requirements and the UC Seismic Safety Policy to ensure seismic-related ground failure impacts are less than significant.

Similar to other development projects on campus, the proposed project would be required to comply with SCAQMD Rule 403 – Fugitive Dust during project construction, which would stabilize soils and prevent erosion by reducing dust generation (SCAQMD 2005). Project construction must comply with the UC Seismic Safety Policy and CBC which establishes grading requirements that apply to excavation and fill activities and requires the implementation of erosion control measures. Additionally, the proposed project would have to comply with the following: the campus' Statewide General Construction Activity Stormwater Permit that specifies the implementation of BMPs; the Campus Construction and Design Standards, which includes the incorporation of low impact development (LID) and erosion and sediment control BMPs; the UCR Stormwater Management Program and other regulatory requirements, as needed, to minimize erosion and topsoil loss; and relevant NPDES permits. The NPDES permits include the General Permit for Storm Water Discharges Associated with Construction Activity (General Construction Permit) and the General Permit for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems (Phase II Small MS4 Permit).

A Geotechnical Investigation Report was prepared for the proposed SBB (Appendix F) and a Preliminary Geotechnical Investigation Report was prepared for the proposed Biocontrol Building and Genomics Shed (Appendix G). The geotechnical recommendations outlined in these reports will be incorporated into the project design. Proper engineering design and construction in conformance with the CBC standards and project-specific geotechnical recommendations would ensure that soil erosion or loss of topsoil would be reduced to less than significant levels.

The proposed project would also be required to adhere to all applicable campus permits; reviews and approvals by UCR's Building and Safety Division, Fire Prevention, Facilities Services; and the UCR Plan Review and Building Permit Program would reduce and/or prevent erosion or loss of topsoil during and after project construction activities. Therefore, the proposed project would be consistent with the erosion and soil loss potential analysis and determination in the 2021 LRDP EIR; and proposed project impacts from erosion or soil loss would remain **less than significant**.

c) The 2021 LRDP EIR states that UCR is underlain by soils with low potential for liquefaction or other soil-related hazards. Furthermore, the older alluvium and bedrock that underlies large portions of the campus are non-liquefiable regardless of groundwater depth. Projects developed under the 2021 LRDP, including the proposed project, would be required to comply with CBC requirements as well as the UC Seismic Safety Policy. Impacts were determined to be less than significant.

A Geotechnical Investigation Report was prepared for the proposed SBB (Appendix F) and a Preliminary Geotechnical Investigation Report was prepared for the proposed Biocontrol Building and Genomics Shed (Appendix G). The project site consists of medium dense to very dense subsurface soils, which would result in stable soils with low risks for liquefaction or lateral spreading. The geotechnical recommendations outlined in these reports will be incorporated into the project design. Proper engineering design and construction in conformance with the CBC standards and project-specific geotechnical recommendations would ensure that potential for on- or off-site landslide, lateral spreading, subsidence, liquefaction and collapse would be reduced to less than significant levels. All project construction activities would comply with regulations and measures in the CBC and the UC Seismic Safety Policy, in combination with preconstruction surveys and monitoring. Therefore, the proposed project would be consistent with the soil stability and risk analyses and determination in the 2021 LRDP EIR; and proposed project impacts related to landslides, lateral spreading, subsidence, liquefaction, or collapse would remain **less than significant impact**.

d) The IS prepared for the 2021 LRDP states that soils found at the southeastern portion of the campus, which has relatively steeper slopes than other parts of the campus, have low shrink-swell characteristics; and that most soils on campus are not expansive. Development under the 2021 LRDP was determined to not be located on expansive soils and the IS prepared for the 2021 LRDP determined that impacts were less than significant, and the issue was not further analyzed in the 2021 LRDP EIR.

Consistent with the findings of the IS prepared for the 2021 LRDP, the Geotechnical Investigation Report prepared for the proposed SBB (Appendix F) and Preliminary Geotechnical Investigation Report prepared for the proposed Biocontrol Building and Genomics Shed (Appendix G) concludes that project site soils have very low expansion potential. Therefore, the proposed project would be consistent with the expansive soils analysis and determination in the IS prepared for the 2021 LRDP; and proposed project impacts related to expansive soils would remain **less than significant**.

e) The IS prepared for the 2021 LRDP states that the campus is served by the existing municipal sewer system and projects under the 2021 LRDP would not require the construction or use of septic tanks or other alternative wastewater disposal systems; the IS prepared for the 2021 LRDP determined there would be no impacts, and the issue was not further analyzed in the 2021 LRDP EIR.

The proposed project would also be served by the existing municipal sewer system and the project does not include the construction or use of septic tanks or other alternative wastewater disposal systems. Therefore, the proposed project would be consistent with the analyses and determination regarding geologic impacts of sewer and wastewater systems in the IS prepared for the 2021 LRDP; and proposed project impacts would remain to have **no impact**.

f) The 2021 LRDP EIR states that development under the 2021 LRDP could cause substantial adverse impacts to known or unknown paleontological resources due to construction activities. Therefore, **MM GEO-1 and MM GEO-2** would be required to reduce project impacts under the 2021 LRDP to less than significant.

Operation of the proposed project would have no impact on paleontological resources. Although the proposed project is an infill development primarily within and adjacent to previously developed/disturbed areas, the proposed project is located within an area with high paleontological sensitivity (Qvof – very old alluvial fan deposits). The proposed project entails the construction of a new building for the expansion of the School of Business programs and facilities, demolition of existing structures, relocation and replacement of structures (Biocontrol

Building and Genomics Shed), hardscape, landscape, and off-site improvements. Ground disturbing construction activities exceeding 5 feet below previously undisturbed alluvial-fan soils within high paleontological sensitivity (such as grading, excavation, etc.) have the potential to damage or destroy undiscovered, scientifically important paleontological resources. Consequently, construction monitoring in accordance with **MM GEO-2** would be required and compliance with **MM GEO-1** for inadvertent discovery of paleontological resources. Therefore, the proposed project would be consistent with the paleontological resources analyses and determination in the 2021 LRDP EIR; and project impacts to paleontological resources would remain **less than significant** with incorporation of **MM GEO-1 and MM GEO-2**.

4.1.8 Greenhouse Gas Emissions

Section 4.8 of the 2021 LRDP EIR addresses the effects of the 2021 LRDP campus growth projections on climate change and concludes that the 2021 LRDP would generate GHG emissions during construction and operation that would exceed the State targets and UC-derived GHG emission thresholds. As a result, the 2021 LRDP EIR states that implementation of the 2021 LRDP would conflict with the goals of the CARB 2017 Scoping Plan, SB 32, EO B-55-18, and UC Policy on Sustainable Practices. However, impacts would be less than significant with the implementation of **MM GHG-1 and MM GHG-2.**

The above-mentioned MMs state the following:

MM GHG-1 Implement On-Campus GHG Emissions Reduction Measures: UCR shall implement the following GHG emissions reduction measures by scope emissions category:

Scope 1 (Stationary Fuel Combustion, Refrigerant Use, Fleet Fossil Fuel Combustion)

- Measure [Energy] EN1: In order to meet 100 percent electrification of all new campus buildings and structures, UCR shall prioritize construction of all-electric building design for new campus buildings and structures and discourage the construction and connection of new fossil fuel combustion infrastructure on campus. In addition, UCR shall focus on energy optimization through the Central Plant control systems by automating manual processes and initiating an engineering study focused on transitioning away from natural gas use at the Central Plant.
- Measure EN2: In order to address on-campus natural gas combustion, starting in 2025 and continuing through 2035, UCR shall purchase biogas for at least 40 percent of the total on-campus natural gas usage.
- Measure [Global Warming Potential] GWP1: In order to reduce emissions from refrigerants used on campus, UCR shall phase out of high global warming potential chemical refrigerants on campus to achieve 100 percent relative carbon neutrality by 2045. This may include the replacement of chemical refrigerants with lower global warming potential in the interim of full phase out while an alternative technology is determined. Furthermore, UCR shall prohibit the use of equipment in new buildings or construction projects that do not utilize low global warming potential or Significant New Alternatives Policy Program accepted refrigerants.
- Measure [Fuel] FL1: In order to decarbonize the campus vehicle fleet, UCR shall reduce emissions from the campus vehicle fleet by 25 percent by 2025, by 50 percent by 2030, and by 75 percent by 2035 through replacement of fleet vehicles with electric vehicles or low-emission alternative vehicles.

Scope 2 (Electricity Consumption and Generation)

- Measure EN3: UCR shall work to obtain 100 percent clean-sourced electricity through either RPU and/or through the installation of on-site clean-sourced electricity sources for all new buildings by 2025. In addition, UCR shall establish annual budgets that include funding to purchase 100 percent clean-sourced energy. Furthermore, all newly constructed building projects, other than wet lab research laboratories, shall be designed, constructed, and commissioned to outperform the California Building Code (Title 24 portion of the CCR) energy efficiency standards by at least 20 percent. Finally, UCR shall incorporate solar PV as feasibly possible for newly constructed and majorly-renovated buildings with the maximum system size, highest solar panel efficiency, and greatest system performance.
- Measure EN4: In order to obtain electricity from 100 percent renewable source(s) for all existing buildings by 2045, UCR shall renegotiate its contractual agreement with RPU to establish a schedule and specific goals for obtaining 100 percent renewable electricity for the campus. In addition, UCR

shall conduct an evaluation of existing buildings for structural suitability in terms of accommodating a solar photovoltaic system capacity with highest energy generation yield and for installing energy storage technology on campus and then installing such systems on identified buildings and facilities.

- Measure EN5 (Parts A, B, C): In order to prioritize energy efficiency and green building initiatives for building/facility upgrades and new construction as well as reduced energy use, UCR shall identify aging equipment throughout the campus such as equipment associated with the Central Plant, electrical distribution system, and building HVAC systems and develop a strategy and schedule to upgrade such equipment with high-energy efficiency systems and optimize HVAC systems through heat zoning, high-efficiency filters, and shut-down times expansion. The strategy shall include an evaluation and cost analysis related to upgrading/retrofitting equipment versus retirement of equipment if no longer needed with future initiatives (i.e., Central Plant boiler retirement). The schedule and upgrade strategy must meet a 2 percent energy efficiency improvement annually through 2035. In addition, UCR shall require new buildings to incorporate occupancy sensors and controls such that lighting of shared spaces is on occupancy sensors, building temperature set points are widened and aligned with occupancy schedules, and ventilation systems are converted from constant volume to variable so ventilation rates are occupancy-based. Furthermore, UCR shall develop a plan to identify existing buildings and projects that could undergo upgrades to the control systems and establish a schedule for upgrade incorporation. Finally, UCR shall develop a tracking program to monitor and share campus energy efficiency activities and progress towards increased energy efficiency.

Scope 3 (Waste Generation, Business Air Travel, On-site Transportation, Water Consumption, Carbon Sequestration, and Construction)

- Measure (Waste Generation) WG1: UCR shall implement and enforce SB 1383 organics and recycling requirements to specifically reduce landfilled organics waste emissions to 75 percent by 2025.
- Measure WG2: UCR shall reduce campus waste sent to landfills 90 percent by 2025 and 100 percent by 2035. In addition, UCR shall reduce waste generation at campus events 25 percent by 2025 and 50 percent by 2035, with goals of being zero waste and plastic free events. Furthermore, UCR shall establish purchasing and procurement policies and guidelines prioritizing vendors that limit packaging waste and purchase reusable and compostable goods.
- Measure [Transportation] TR1: In order to reduce GHG Emissions related to business air travel, UCR shall provide incentives to faculty for emission-reducing behaviors and utilizing travel options that are less carbon intensive, promote the use of virtual meetings, and encourage alternative forms of travel other than air travel.
- Measure TR2: UCR shall update the Transportation Demand Management (TDM) program for the campus to decrease single occupancy vehicle VMT 5 percent by 2025 and 20 percent by 2035. In addition, UCR shall evaluate trends of current programs to expand on existing programs and establish new initiatives that utilize proven successful strategies.
- Measure TR3: UCR shall develop and implement a Campus Active Transportation Plan to shift 2 percent of baseline (2018) passenger vehicle VMT to active transportation by 2025 and 8 percent by 2035. In addition, UCR shall update the Campus Bicycle and Pedestrian Network Map every five years, including routes from off campus to on campus.
- Measure TR4: UCR shall reduce GHG emissions associated with campus commuting 10 percent by 2025 and 25 percent by 2035.
- Measure [Water Consumption] WC1: UCR shall reduce per-capita water consumption 20 percent by 2025 and 35 percent by 2035 compared to academic year 2018/2019 per capita consumption.

- Measure [Carbon Sequestration] CS1: UCR shall increase carbon sequestration through increasing tree planting and green space 5 percent by 2025 and 15 percent by 2035.
- Measure [Construction] CR1: UCR shall reduce construction-related GHG emissions on campus 10 percent by 2025 and 25 percent by 2035 through emission reduction controls and/or electric equipment requirements in line with contract obligations. Specifically, UCR shall require off-road diesel-powered construction equipment greater than 50 horsepower to meet the Tier 4 emission standards as well as construction equipment to be outfitted with BACT devices certified by CARB and emissions control devices that are no less than what could be achieved by a Level 3 diesel emissions control strategy for a similar-sized engine. In addition, UCR shall develop zero waste procurement guidelines and processes for campus construction projects and integrate into purchasing RFP language as part of campus procurement.

The UCR Office of Sustainability, Facilities Services, EH&S, TAPS, and/or PD&C shall annually monitor, track, and verify implementation of these GHG emissions reduction measures.

MM GHG-2 Purchase Carbon Offsets to Achieve GHG Emissions Reduction Balance: In order to achieve the necessary GHG emissions reduction balance after implementation of MM GHG-1 and in order to meet the UC Policy on Sustainable Practices and State targets, UCR shall annually track and purchase carbon offsets for the balance of GHG emissions after on-site reductions per MM GHG-1 that still meet or exceed the UCR emissions targets by year.

UCR shall sequester funds for carbon offset purchases into a restricted account such that any/all uses shall directly reduce carbon emissions and address UCR goals. Prior to the purchase of carbon offsets, UCR shall research and purchase carbon offsets that are real, permanent, quantifiable, verifiable, enforceable, supported by substantial evidence, and additional to any GHG emission reduction otherwise required by law or regulation and any other GHG emission reduction that otherwise would occur under MM GHG-1.

If any changes occur with regard to implementation of on-campus GHG reduction measures as part of MM GHG-1, UCR shall adjust the purchase of carbon offsets accordingly and keep respective accounting records. UCR Office of Sustainability, Facilities Services, EH&S, and PD&C shall annually monitor, track, and verify purchase of the required carbon offsets.

As part of this MM, UCR shall make the following separate, though overlapping, GHG emission reduction commitment including maintaining compliance with carbon offset accreditation requirements under the CARB Cap-and-Trade Program. Any carbon credits obtained for the purpose of compliance with the CARB's Cap-and-Trade Program shall be purchased from an accredited carbon credit market. Based on the current program as of 2021, such offset credits (or California Carbon Offsets) shall be registered with, and retired by an Offset Project Registry, as defined in 17 CCR Section 95802(a), that is approved by CARB, such as, but not limited to, Climate Action Reserve (CAR), American Carbon Registry, and Verra (formerly Verified Carbon Standard), that is recognized by The Climate Registry, a non-profit organization governed by the United States and Canadian provinces and territories.

GREENHOUSE GAS EMISSIONS

Would the Project:	Impact Examined in 2021 LRDP EIR	Impact Not Examined in 2021 LRDP EIR: No Impact	Impact Not Examined in 2021 LRDP EIR: Less-than-Significant Impact	Impact Not Examined in 2021 LRDP EIR: Potentially Significant Impact
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☒	☐	☐	☐
b) Conflict with an applicable plan, policy, or regulation adopted for the purpose or reducing the emissions of greenhouse gases?	☒	☐	☐	☐

a) The 2021 LRDP EIR states that implementation of the 2021 LRDP would generate GHG emissions that would have a potentially significant impact on the environment; and identifies construction and operational emissions for 2025, 2030, and 2035 from development over the planning horizon of the 2021 LRDP. Construction emissions from implementing the 2021 LRDP would equal approximately 1,618 metric tons of carbon dioxide equivalent ($MTCO_2e$) annually, and unmitigated campus wide operational emissions at 139,920 $MTCO_2e$ by 2025. The 2025 annual campus wide emissions include the annual 1,618 $MTCO_2e$ contribution from construction activities. Impacts to GHG emissions were determined to have a less than significant impact with incorporation of **MM GHG-1 and MM GHG-2**.

As shown in Table 4.1.8-1, construction emissions generated by the proposed project would result in a total of approximately 795 $MTCO_2e$ over the 24-month construction period, with average annual emissions of approximately 398 $MTCO_2e$. The proposed project's construction emissions would be less than the annual construction emissions identified in the 2021 LRDP EIR. As shown in Table 4.1.8-1, annual operational emissions from the proposed project would be approximately 1,660 $MTCO_2e$ without incorporation of the 20 percent beyond 2019 Title 24 Energy Efficiency, and approximately 1,643 $MTCO_2e$ with incorporation of the upgraded energy efficiency requirement that is part of the project design. As shown in Table 4.1.8-2, with incorporation of the applicable mitigation strategies from **MM-GHG-1**, project emissions would be reduced to approximately 1,119 $MTCO_2e$. These emissions are consistent with the emissions reduction requirements in the 2021 LRDP EIR. Additionally, as campus-wide emissions are monitored, the appropriate carbon offsets would be identified and purchased as indicated in **MM-GHG-2**. While this is not specific to the proposed project, the fact that the proposed project is part of the campus means that the emissions from the project would be counted towards the annual operational emissions and therefore would be included in the emissions quantifications used to determine any needed offsets to meet UCR's 2025 total emissions goal of 41,471 $MTCO_2e$. Therefore, the proposed project would be consistent with the construction and operational GHG emissions analysis and determination in the 2021 LRDP EIR; and proposed project impacts to GHG emissions would have **a less than significant impact** with incorporation of **MM GHG-1 and MM GHG-2**.

Table 4.1.8-1
Unmitigated Project Construction and Operational GHG Emissions

	Project Emissions Without Energy Efficiency Project Feature	Project Emissions With Energy Efficiency Project Feature
Construction		
2022	291	–
2023	369	–
2024	135	–
Total Project	**795**	–
Total Amortized (15 year) Project	**53**	**53**
Operational		
Scope 1	58	46
Area	0	0
Natural Gas	58	46
Scope 2	140	135
Electricity	108	103
Water	32	32
Scope 3	1,409	1,409
Mobile	1,116	1,116
Solid Waste	294	294
Total Project Operations	**1,607**	**1,590**
Total Project	**1,660**	**1,643**

Source: Calculations were made in CalEEMod, see Appendix A for full model output. Values have been rounded and therefore may not add directly.

Table 4.1.8-2
Mitigated Project Construction and Operational GHG Emissions

Emission Source	Project Emissions
Mitigation Reductions	
Scope 1	
Measure EN3:	58
Measure EN5:	12
Total Scope 1 Reductions:	70
Scope 2	
Measure EN3:	108
Total Scope 2 Reductions:	108
Scope 3	
Measures WG1 & WG2:	264
Measures TR1 through TR4	99
Total Scope 2 Reductions:	363
Total Reductions:	**541**
Operational	
Total Project:	1,660
Total Reductions:	541
Total Project	**1,119**

Source: Calculations were made in CalEEMod, see Appendix A for full model output. Values have been rounded.

b) The 2021 LRDP EIR states that the 2021 LRDP would be consistent with the CARB 2017 Scoping Plan, SB 32, EO B-55-18, and the UC Policy on Sustainable Practices with incorporation of **MM GHG-1 and MM GHG-2**. The CARB 2017 Scoping Plan outlines a pathway to achieving the reduction targets set under SB 32, which are considered interim targets toward meeting the long-term 2045 carbon neutrality goal established by EO B-55-18. Impacts were determined to be less than significant with incorporation of **MM GHG-1 and MM GHG-2.**

The implementation of the 2021 LRDP, including the proposed project, would impede "substantial progress" toward meeting the SB 32 and EO B-55-18 targets if GHG emissions generated by projects under the 2021 LRDP exceeded the State targets derived 2025 GHG emission thresholds. The UC Policy on Sustainable Practices commits UC campuses, including UCR, to achieving carbon neutrality in terms of Scopes 1 and 2 emissions by 2025 and carbon neutrality in terms of all scopes by 2050 or sooner. The plan-specific GHG emissions thresholds utilized for analyzing the 2021 LRDP in the 2021 LRDP EIR interpolated targets for 2025, 2030, and 2035 to comply with a net-zero Scopes 1 and 2 emissions date of 2025 and a net-zero Scope 3 emissions date of 2045. However, the proposed project would incorporate applicable measures outlined in **MM GHG-1** (Scope 1 pertaining to energy and fuel; Scope 2 pertaining to energy efficiency and green building initiatives for upgrades and new construction; Scope 3 pertaining to waste generation, transportation, and construction); and the proposed project would be considered in UCR's calculations for the purchase of proportional carbon offsets, if needed, in compliance with **MM GHG-2**.

Therefore, the proposed project would be consistent with applicable GHG emissions reduction plans and policies as analyzed and determined in the 2021 LRDP EIR; and proposed project impacts to implementing applicable GHG emissions reduction plans and policies would remain **less than significant** with incorporation of **MM GHG-1 and MM GHG-2**.

4.1.9 Hazards and Hazardous Materials

Section 4.9 of the 2021 LRDP EIR addresses the impacts of campus growth on hazards and hazardous materials for the campus area. The IS prepared for the 2021 LRDP concludes that there would be no impact for criterion a (construction hazards from routine transport, use, or disposal of materials) and criterion f (emergency response plan); therefore, these thresholds were not further evaluated in the 2021 LRDP EIR. It should be noted that criterion g [wildland fire] was also not discussed further in Section 4.9 of the 2021 LRDP EIR, but rather addressed in depth in Section 4.18, Wildfire, of the 2021 LRDP EIR.

The 2021 LRDP EIR concludes that future campus development would have a less than significant impact related to increased use, transport, or disposal of hazardous materials during facility operations. In addition, impacts related to airport-related safety hazards and excessive noise impacts to people residing or working on the campus would also be less than significant. The 2021 LRDP EIR states that facility construction and renovation under the 2021 LRDP could disturb or emit hazardous material during reasonably foreseeable upset and accident conditions; however, these impacts would be less than significant with implementation of **MM HAZ-1 through MM HAZ-4**. Furthermore, impacts related to handling hazardous materials within 0.25 mile of a school and impacts related to the development of sites listed on hazardous material sites pursuant to California Government Code Section 65926.5 (Cortese List) would be less than significant with implementation of **MM HAZ-1 through MM HAZ-4**. The proposed project is not located in areas with an abandoned in-place underground storage tanks (USTs) and is not located within the Department of Toxic Substances Control (DTSC) Certified Land Use Restriction; therefore MM HAZ-2 and MM HAZ-3 do not apply to the proposed project. Operations of facilities and materials under the 2021 LRDP would be subject to applicable federal, State, County and UCR policies designed to minimize upset and accident conditions and minimize hazardous emissions and spills.

The above mentioned applicable MMs state the following:

MM HAZ-1 Property Assessment – Phase I and II ESAs: During the pre-planning stage of campus projects on previously developed sites or on agricultural lands (current or historic), and in coordination with EH&S, UCR shall obtain documentation from EH&S or prepare a Phase I Environmental Site Assessment (ESA) assessing the land use history of the proposed project site and identify potential hazardous materials concerns, including, but not limited to, fuel tanks, chemical storage, presence of elemental mercury, elevator pistons and associated hydraulic oil reservoirs and piping, heating-oil USTs, or agricultural uses. If the Phase I ESAs, or similar documentation, identify recognized environmental conditions or potential concern areas, a Phase II ESA would be conducted in coordination with EH&S to determine whether the soil, groundwater, and/or soil vapor has been impacted at concentrations exceeding regulatory screening levels for residential or commercial/industrial type land uses (as applicable). If the Phase II ESA concludes that the site is or may be impacted and could affect the planned development, assessment, remediation, or corrective action (e.g., removal of contaminated soil, in-situ treatment, capping, engineering controls) would be conducted prior to or during construction under the oversight of federal, State, and/or local agencies (e.g., USEPA [United States Environmental Protection Agency], DTSC [Department of Toxic Substances Control], RWQCB [Regional Water Quality Control Board], RFD [City of Riverside Fire Department], RCDEH [Riverside County Department of Environmental Health]) and in full compliance with current and applicable federal and State laws and regulations, including but are not limited to the CEQA [California Environmental Quality Act]. Assessment, remediation, or corrective action must be evaluated under CEQA prior to commencing the assessment, remediation, or correction action. Additionally, Voluntary Cleanup Agreements may be used for parcels where remediation or long-term monitoring is necessary.

MM HAZ-4 Construction Site Management Plan: If impacted soils are identified pursuant to activities conducted through MM HAZ-1, MM HAZ-2, or MM HAZ-3; or encountered during construction (soil disturbance), UCR shall prepare a Construction Site Management Plan (SMP) for the proposed redevelopment project area to address potential issues that may be encountered during redevelopment activities involving subsurface work. The Construction SMP objectives shall include:

- Communicating information to proposed project construction workers about environmental conditions
- Presenting measures to mitigate potential risks to the environment, construction workers, and other nearby receptors from potential exposure to hazardous substances that may be associated with unknown conditions or unexpected underground structures
- Presenting protocols for management of known contaminated soil or groundwater encountered during construction activities

The Construction SMP shall identify the proposed project contacts, responsibilities, and notification requirements and outline the procedures for health and safety, soil management, contingency measures for discovery of unexpected underground structures, erosion, dust, and odor management, groundwater management, waste management, stormwater management, and written records and reporting. The Construction SMP shall be reviewed and approved by UCR prior to issuance of grading permits.

HAZARDS AND HAZARDOUS MATERIALS

Would the Project:	Impact Examined in 2021 LRDP EIR	Impact Not Examined in 2021 LRDP EIR: No Impact	Impact Not Examined in 2021 LRDP EIR: Less-than-Significant Impact	Impact Not Examined in 2021 LRDP EIR: Potentially Significant Impact
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☒	☐	☐	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the likely release of hazardous materials into the environment?	☒	☐	☐	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 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 Section 65962.5 and, as a result, create a significant hazard to the public or the environment?	☒	☐	☐	☐
e) Result in a safety hazard or excessive noise for people residing or working in the project area (or a project located within an airport land use plan or, where such a plan has not been adopted within 2 miles of a public airport or public use airport)?	☒	☐	☐	☐
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?	☒	☐	☐	☐

a) The 2021 LRDP EIR states that uses under the 2021 LRDP could result in an increased use, transport, or disposal of hazardous materials during facility operations; however, adherence to federal, State, and UCR policies would minimize risk of endangerment to the campus population, the public, and the environment. Impacts were determined to be less than significant.

The proposed project entails the construction of a new building for the expansion of the School of Business programs and facilities, demolition of existing structures, relocation and replacement of structures (Biocontrol Building and Genomics Shed), hardscape, landscape, and off-site improvements. UCR is currently a licensed generator of hazardous waste, which includes chemical, radioactive, and biohazardous (infectious) waste. However, the use, storage, transport, and disposal of hazardous materials in facilities developed under the 2021 LRDP would be guided by existing and future UCR, County, State, and federal regulations designed to maximize the safety of UCR personnel, students, the public, and the environment. Furthermore, the proposed project is not anticipated to increase the routine transport, use, or disposal of hazardous materials since the SBB would not contain any research laboratories or production facilities and the proposed replacement Biocontrol Building and Genomics Shed would be similar to that of existing operations. Therefore, the proposed project would be consistent with the hazardous materials analysis and determination in the 2021 LRDP EIR; and proopposed project impacts from hazardous materials would remain **less than significant**.

b) The 2021 LRDP EIR states that operations of facilities and materials would be subject to federal, State, County, and UCR policies designed to minimize upset and accident conditions. The 2021 LRDP EIR states that facility construction and renovation under the 2021 LRDP could disturb or emit hazardous material from impacted soil, soil vapor, or groundwater, which could emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste during reasonably foreseeable upset and accident conditions. Impacts were determined to be less than significant with mandatory compliance with existing regulations pertaining to the identification, handling, and disposing of hazardous materials and incorporation of **MM HAZ-1 through MM HAZ-4**.

Numerous buildings on the campus are assumed to contain some form of asbestos containing materials (ACM) or lead-based paints (LBP) due to their age, as well as fluorescent light ballasts containing polychlorinated biphenyls (PCBs). Building materials may also be contaminated by spills or aerosol releases of radioactive or chemical hazardous materials used in the building, and elemental mercury may be present in research laboratory sink traps, cupboard floor spaces, or in sewer pipes.

If such contamination is identified to be present during renovation and/or demolition of the existing structures on the SBB Project Boundary, exposure to potentially hazardous materials would be minimized through required worker training, appropriate engineering and administrative controls, in combination with the use of protective equipment in accordance with existing campus health and safety practices (such as the UCR Asbestos Management Plan), and federal and State regulations. In the event that LBP and other lead-containing materials are present during construction, protocol pursuant to California Division of Occupational Safety and Health (Cal/OSHA) regulations regarding LBPs and lead-containing materials would be followed. CCR Title 8, Section 1532.1, requires testing, monitoring, containment, and disposal of LBPs and lead-containing materials in a manner that exposure levels do not exceed Cal/OSHA standards. If potentially hazardous materials are encountered during construction or redevelopment, EH&S would conduct a comprehensive assessment of the situation in coordination with the appropriate regulatory authority, such as the RCDEH.

The proposed project includes the demolition of the Plant Drying Building, Biocontrol Building, and Genomics Shed. The 2021 LRDP EIR states that unanticipated hazardous materials may be encountered during demolition or redevelopment of previously developed sites on the campus. Disturbance of soil containing existing hazardous materials, soil vapor, or contaminated groundwater during construction could create a significant hazard to the public or the environment. In accordance with **MM HAZ-1** and coordination with EH&S, a Soil Sampling and Analysis Report was prepared for the proposed project (Appendix H). The soil sampling and analysis assessed potential impacts to soils on the SBB Project Boundary from leaching that may have occurred from the samples of soil-like material in containers located within the Plant Drying Building and to assess potential impacts from potential chemical usage associated with the nozzles/tubing south of the Biocontrol Building and Genomics Shed. Field investigation activities were conducted on February 21, 2022 and included collection of 45 soil samples at 15 locations. Based on the results of the soil sample analytical results, it was concluded that no further investigations or evaluations (Appendix H). Additionally, the proposed project would adhere to applicable UCR, County, State, and federal regulations for managing hazardous materials during project construction and operation. Therefore, the proposed project would be consistent with the hazardous materials analysis and determination in the 2021 LRDP EIR; and proposed project impacts from hazardous materials would remain **less than significant** with incorporation of **MM HAZ-4**.

c) The 2021 LRDP EIR states that implementation of the 2021 LRDP could disturb or emit hazardous materials or waste within 0.25 mile of an existing or proposed school; and concludes that impacts would be less than significant with compliance with existing regulations pertaining to hazardous wastes and materials and incorporation of **MM HAZ-1 through MM HAZ-4**.

Project construction may require occasional transport of hazardous materials, including oils, lubricants, paints, or other construction equipment chemicals. Use of such materials would be typical of construction projects and any transport, use, and storage of hazardous materials would be conducted in accordance with all applicable federal, State, and County regulations, and UCR policies. The closest schools to the project site are the UCR Child Development Center located approximately 0.90-mile to the northwest of the project site and Hyatt Elementary School located approximately 0.70-mile to the southeast. No schools are within 0.25-mile of the project site; therefore, the proposed project has low to no risk or impact related to hazardous emissions or handling of hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school. Compliance with applicable federal, State, and County regulations and UCR policies related to the use, storage, disposal, and transportation of hazardous materials and waste would ensure that risks associated with hazardous emissions or materials would be eliminated or reduced through proper handling techniques, disposal practices, and/or cleanup procedures. Therefore, the proposed project would be consistent with the school hazards analysis and determination in the 2021 LRDP EIR; and proposed project impacts to nearby schools would be **less than significant**.

d) The 2021 LRDP EIR states that the campus includes several closed listed UST release sites and is adjacent to a site with restricted land use covenants. However, it was found that impacts related to potential unknown hazards to the public or the environment through reasonably foreseeable upset and accident conditions during future facility construction and renovation would be less than significant with incorporation of **MM HAZ-1 through HAZ-4**.

According to the California State Water Resources Control Boards (SWRCB) GeoTracker database, there is a closed leaking underground storage tank cleanup site (Case number 91353) in Parking Lot 6, approximately 200 feet west of Anderson Hall (CSWRCB 2022). According to the Department of Toxic Substances Controls (DTSC) EnviroStor database, a State responsible agricultural cleanup site (Site code 400161) that is under land use restrictions is located approximately 0.7-mile southwest of the project site (DTSC 2022). There are no cleanup sites listed in the GeoTracker or EnviroStor database on the project site. Therefore, the proposed project would be consistent with the contaminated sites analysis and determination in the 2021 LRDP EIR; and proposed project impacts to contaminated sites would be **less than significant**.

e) The 2021 LRDP EIR states that the campus is in Area E of the March Air Reserve Base/Inland Port Airport Land Use Compatibility Plan (ALUCP) influence area, and noise levels in Area E of the March Air Reserve Base/Inland Port ALUCP are low and beyond the 55-Community Noise Equivalent Level (CNEL) corridor; safety risk level is also considered low. Area E has no limit on residential or other use population density or requirement for open space. Impacts were determined to be less than significant.
The project site is not within two miles of an airport. The closest airport, Flabob Airport, is located approximately five miles to the northwest. Furthermore, the 2021 LRDP EIR states that the campus is not located near principal airplane arrival or departure tracks. Therefore, the proposed project would not result in airport-related safety hazards and excessive noise impacts to construction workers, faculty/staff, students, and visitors. Therefore, the proposed project would be consistent with the airport and airfields hazards analysis and determination in the 2021 LRDP EIR; and proposed project impacts to airport and airfield hazards would remain **less than significant**.

f) The 2021 LRDP EIR discussed emergency response plans in Section 4.15, Transportation and Section 4.18, Wildfire; emergency response plans are not discussed in Section 4.9 of the 2021 LRDP EIR. As such, discussion pertaining to project impacts on emergency response plans are discussed in Section 4.1.17, Transportation and Section 4.1.20, Wildfire, of this Addendum.

g) The 2021 LRDP EIR discussed wildland fire impacts in Section 4.18, Wildfire; wildland fire impacts are not discussed in Section 4.9 of the 2021 LRDP EIR. As such, discussion pertaining to project impacts on wildland fire risks are discussed in Section 4.1.20, Wildfire, of this Addendum.

4.1.10 Hydrology and Water Quality

Section 4.10 of the 2021 LRDP EIR addresses hydrology and water quality impacts of the 2021 LRDP. The 2021 LRDP EIR concludes that the 2021 LRDP would have less than significant impacts in regards to violating any waste discharge requirements that would substantially degrade surface or groundwater, substantially decrease groundwater supplies, alter drainage in a manner which would result in a substantial erosion or increasing runoff resulting in flooding and conflicting with a water quality control plan or sustainable groundwater management plan. The 2021 LRDP EIR notes that the IS prepared for the 2021 LRDP concludes that the campus is not in a tsunami or seiche zone; therefore, the campus is not subject to inundation by either activity, and this issue area was not further analyzed in the 2021 LRDP EIR. Potential effects related to overall water supply or the potential need for construction of new or expanded water and wastewater infrastructure are discussed in Section 4.1.19 of this Addendum.

HYDROLOGY AND WATER QUALITY

		Impact Not Examined in 2021 LRDP EIR		
Would the Project:	Impact Examined in 2021 LRDP EIR	No Impact	Less-than-Significant Impact	Potentially Significant Impact
a) Violate any water quality standards or waste discharge requirements, or otherwise substantially degrade surface or groundwater 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 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 off-site; (iii) Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff; or (iv) Impede or redirect flood flows?	☒	☐	☐	☐
d) Risk release of pollutants due to project inundation in flood hazard, tsunami, or seiche zones?	☒	☐	☐	☐
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☒	☐	☐	☐

a) The 2021 LRDP EIR states that all operation and construction would be in compliance with applicable water quality standards and waste discharge requirements. All construction, including that for the proposed project, would be required to comply with the provisions of the NPDES Statewide General Construction Activity Stormwater Permit that specifies the implementation of BMPs through a SWPPP, which typically includes both source-control and treatment-control BMPs to reduce water quality impacts including but not limited to proper storage, use and disposal of construction materials; watering exposed soils; installing sandbags to minimize off-site runoff; creating temporary desilting basins; containing construction vehicle maintenance in staging areas to avoid leaks or spills of fuels, motor oil, coolant, and other hazardous materials; installation of silt fences and erosion control blankets; timing grading to avoid the rainy season (November through April); stabilizing cleared or graded slopes; protecting or stabilizing stockpiled soils; continual inspection and maintenance of all specified BMPs through the duration of construction. Additionally, General Construction Stormwater Permit requirements also require inspection, monitoring, and reporting; and corrective action is required within 72 hours of identifying any issue of non-compliance during monitoring and inspections. During operation of the proposed project, BMPs and SWMP requirements (which include LID measures, runoff reduction measures, and site design), source control, and treatment BMPs would be implemented and followed. Therefore, the proposed project would be consistent with the water quality and waste discharge analyses and determination in the 2021 LRDP EIR; and proposed project impacts to water quality and waste discharge would remain **less than significant**.

b) According to the 2021 LRDP EIR, the campus is presently characterized by large areas of impervious surfaces and there are existing stormwater drainage systems in place to convey surface flows across impermeable areas to permeable areas such as arroyos and vegetated swales, where the water is allowed to infiltrate to the subsurface. Impacts were determined to be less than significant.

Consistent with the 2021 LRDP EIR, temporary water supply would be required, primarily for dust suppression during grading and grubbing activities during project construction, as well as during equipment wheel washing, and concrete mixing and casting. Pursuant to the requirements of the SCAQMD Rule 403, all surfaces disturbed within the campus during construction activities would be watered appropriately to reduce fugitive dust generation and the associated air quality impacts. In the event of drought conditions, SCAQMD's Drought Management and Water Conservation Plan limits potable water dust suppression by increasing reliance on non-toxic chemical dust suppressants to stabilize soils, paving unpaved roadways, and using vacuum sweepers instead of water to remove dust from paved areas and increasing use of physical/mechanical barriers to contain or limit transport of fugitive dust. Impacts were determined to be less than significant.

The proposed project is an infill development primarily within and adjacent to previously developed/disturbed areas. Construction of the proposed project would not substantially decrease groundwater supplies, impede sustainable groundwater management, or interfere substantially with groundwater recharge with compliance with the Adjudication Judgement, availability of supplemental water supplies, and implementation of standard construction BMPs such as applicable to dewatering practices. Site-specific appropriate drainage features would be included in project design to convey surface flows across and around impermeable areas to those areas where flows may infiltrate to the subsurface. This would be achieved through implementation of LID methods, including Control Design Criteria for compliance with the NPDES program and the Phase II MS4 Permit. Through compliance with MS4 Permit requirements, implementation of LID methods, and implementation of an SWMP during operation of the project, potential impacts of new impervious surfaces of groundwater recharge rates and patterns would be less than significant. In addition, the proposed project would not impede the creation or implementation of a groundwater sustainability plan and would comply with existing groundwater sustainability plans. Therefore, the proposed project would be consistent with the groundwater analyses and determination in the 2021 LRDP EIR; and proposed project impacts to groundwater would remain **less than significant**.

c) The 2021 LRDP EIR concludes that construction and operation of projects under the 2021 LRDP would not alter the course of any streams of rivers and would not alter regional stormwater drainage patterns. During construction of the proposed project, excavation, grading, and stockpiling of soils may accelerate erosion and siltation if disturbed soils are not secured. A project specific SWPPP would detail BMPs to avoid or minimize erosion, siltation, and flooding associated with drainage pattern alternations. Additionally, as discussed above for criterion b, localized drainage pattern alterations would be addressed through site-specific drainage and flood control features, in accordance with the NPDES General Stormwater Permit for Small MS4s requirements. Therefore, the proposed project would be consistent with the drainage, erosion, and runoff analyses and determination in the 2021 LRDP EIR; and proposed project impacts to drainage, erosion, and runoff would remain **less than significant**.

d) The IS prepared for the 2021 LRDP EIR notes the campus is not located within a tsunami hazard area and is therefore not subject to inundation by tsunami. The UCR main campus is also not in proximity to a standing body of water that could experience a seiche, or large wave activity associated with a seismic event, and therefore is not subject to inundation by seiche. Impacts were determined to be less than significant.

The proposed project would not increase or otherwise alter the area's potential to be inundated by tsunami or seiche. Furthermore, the Federal Emergency Management Agency (FEMA) identifies the majority of the UCR main campus (and the City of Riverside as a whole) as Zone X, or an Area of Minimal Flood Hazard (FEMA 2021). The proposed project would not involve the storage or processing of pollutants such that they would be spilled or released due to inundation should a flood hazard occur and would comply with the MS4 Permit. Therefore, the proposed project would be consistent with the flood, tsunami, and seiche hazards analyses and determination in the 2021 LRDP EIR; and proposed project impacts to flood, tsunami, and seiche hazards would remain **less than significant**.

e) The campus is within the Santa Ana River Basin Water Quality Control Plan (Basin Plan) (Santa Ana Regional Water Quality Control Board 2016). The Basin Plan, as developed and implemented by the Santa Ana RWQCB in accordance with the federal Clean Water Act (CWA), designates beneficial uses for surface waters in the Santa Ana Region and associated water quality objectives to fulfill such uses. The 2021 LRDP EIR states that BMPs would be implemented for projects under the 2021 LRDP to avoid conflicting with a water quality control plan or sustainable groundwater management plan. Impacts were determined to be less than significant.

Since the SBB Project Boundary and Biocontrol Building Replacement Site is also located within the Santa Ana Basin Plan, project construction and operation would be conducted in compliance with applicable regulatory requirements related to stormwater runoff to minimize the potential for pollutants to enter receiving waters. The proposed project would also comply with the provisions of the Statewide General Construction Activity Stormwater Permit that specifies the implementation of BMPs as well as the NPDES Stormwater General Permit for Small MS4s. A project-specific SWPPP would be implemented during construction activities and a SWMP would be implemented during operation and maintenance of the proposed project. The proposed project would incorporate site design, source control, and treatment BMPs to prevent pollutants from reaching receiving waters. Storm drain infrastructure would also adhere to UCR requirements. Therefore, the proposed project would be consistent with the implementation of applicable water quality control plans as determined in the 2021 LRDP EIR; and proposed project impacts to water quality would remain **less than significant**.

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4.1.11 Land Use and Planning

Section 1.3 of the 2021 LRDP EIR states that impacts to land use and planning are not further analyzed in the 2021 LRDP EIR since analysis included in the IS prepared for the 2021 LRDP concludes that implementation of the 2021 LRDP would have less than significant impacts on land use and planning.

LAND USE AND PLANNING

			Impact Not Examined in 2021 LRDP EIR		
Would the Project:		Impact Examined in 2021 LRDP EIR	No Impact	Less-than-Significant Impact	Potentially Significant Impact
a)	Physically divide an established community?	☒	☐	☐	☐
b)	Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☒	☐	☐	☐

a) The campus is adjacent to and surrounded by single- and multi-family residential neighborhoods, office/commercial retail development, government facilities, and open space areas; and the campus itself is developed with academic, research, agricultural, recreational, athletic, maintenance, housing facilities, campus support facilities, and designated open space areas. The IS prepared for the 2021 LRDP estimates that the 2021 LRDP would add approximately 7,489 new beds in on-campus student housing by the academic year 2035/2036. The IS prepared for the 2021 LRDP also states that future development throughout the campus would build upon the existing campus framework to accommodate increases in potential new student housing; and new facility space for student life, administration and support, and academic and resource on the existing campus, and thus would not physically divide the established community around UCR or its on-campus community. Related impacts would be less than significant.

The proposed project entails the construction of the SBB on a site already developed with an existing parking lot and support buildings, the construction of the Biocontrol Building on an existing landscaped area surrounded by academic facilities, and the construction of the Genomics Shed on previously disturbed area either south or west of the water-storage basin. Since the proposed project would not involve any development outside of established campus properties or boundaries, and no incursion into or division of the surrounding residential communities would occur, the proposed project would not physically divide an established community. Therefore, the proposed project would be consistent with physical community analysis and determination in the IS prepared for the 2021 LRDP. Proposed project impacts to the campus and established adjacent communities would remain **less than significant**.

b) The City of Riverside General Plan, which includes the UCR main campus, identifies UCR as a public facility/institutional land use (City of Riverside 2019). UCR is part of the University of California school system, a constitutionally created entity of the State of California; as such, the campus is not subject to municipal regulations, such as the general plans for the County and City of Riverside. The IS prepared for the 2021 LRDP states that implementation of the 2021 LRDP would primarily affect existing land areas and facilities within the campus, particularly in the East Campus area. The 2021 LRDP EIR determined that implementation of the LRDP would be consistent with the SCAG's 2016

RTP/SCS, the 2016 Water Quality Control Plan for the Santa Ana Regional Water Quality Control Board, and the 2016 AQMP.

As described in Section 3 of this document, the proposed project is consistent with the designations, objectives, population forecasts, and building space projections in the 2021 LRDP, which is the applicable land use plan for the UCR main campus. As shown on Figure 2-1, Proposed 2021 LRDP Land Use Map, in the 2021 LRDP EIR, the project site is located in East Campus, in an area designated as Academics & Research, which allows for the development of the proposed project. Therefore, the proposed project would be consistent with the applicable land use plans, policies, and regulations as analyzed in the IS prepared for the 2021 LRDP and 2021 LRDP EIR; and proposed project impacts to applicable land use plans, policies, and regulations would remain **less than significant**.

4.1.12 Mineral Resources

Section 1.3 of the 2021 LRDP EIR states that impacts to mineral resources are not further analyzed in the 2021 LRDP EIR since analysis included in the IS prepared for the 2021 LRDP concludes that implementation of the 2021 LRDP would have no impact on mineral resources.

MINERAL RESOURCES

Would the Project:	Impact Examined in 2021 LRDP EIR	Impact Not Examined in 2021 LRDP EIR: No Impact	Impact Not Examined in 2021 LRDP EIR: Less-than-Significant Impact	Impact Not Examined in 2021 LRDP EIR: Potentially Significant Impact
a) Result in the loss of availability of a known mineral resource that would be a value to the region and the residents of the State?	☒	☐	☐	☐
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	☒	☐	☐	☐

a – b) The IS prepared for the 2021 LRDP states that the campus is located on lands classified as Mineral Resource Zone 3 (MRZ-3), which are areas of undetermined mineral resource significance. There are no known mineral resources on the campus and the 2021 LRDP would not allow for mining activities on the campus. It was determined that there would be no impact to mineral resources from future campus development.

The proposed project does not include mining activities or uses, and development of the project site would not result in the loss of available valuable or locally important mineral resources. Therefore, the proposed project would be consistent with the mineral resources analysis and determination in the IS prepared for the 2021 LRDP, wherein no further analysis in the 2021 LRDP EIR was required; proposed project impacts to such resources would remain **no impact**.

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4.1.13 Noise

Section 4.11 of the 2021 LRDP EIR evaluates the noise effects of campus growth under the 2021 LRDP. The 2021 LRDP EIR concludes that future projects under the 2021 LRDP would result in significant and unavoidable impacts related to construction noise even with the incorporation of **MM N-1** and less than significant impacts related to operational noise with incorporation of **MM N-2 through MM N-4**. The proposed project does not involve the relocation of the Corporation Yard; thus, MM N-4 would not be applicable to the proposed project. The 2021 LRDP EIR concludes that future projects under the 2021 LRDP would result in less than significant impacts related to groundborne vibration or groundborne noise levels with incorporation of **MM N-5**.

The 2021 LRDP EIR states that the nearest airport to the campus is the Flabob Airport, located approximately 4.7 miles west of the campus. The 2021 LRDP EIR concludes that projects under the 2021 LRDP would not expose people residing or working on the campus to excessive noise levels from an airport or airport influence area, and such impacts would be less than significant.

The above mentioned MMs state the following:

MM N-1 Construction Noise Reduction Measures: To reduce construction noise levels to on-campus and off-campus noise sensitive receivers, UCR shall implement the following measures:

- Hours of exterior construction activities shall be limited to 7:00 a.m. to 9:00 p.m. Monday through Friday and 8:00 a.m. to 6:00 p.m. on Saturday, as feasible, except under circumstances where such time limits are infeasible (e.g., for time sensitive construction work such as concrete pouring, excessive heat warnings/temperatures during the summer, operational emergencies). No exterior construction activities shall occur on federal holidays.
- Construction traffic shall follow routes so as to minimize the noise impact of this traffic on the surrounding community, to the greatest extent feasible.
- Contract specifications shall require that construction equipment be muffled or otherwise shielded, in accordance with manufacturers' recommendations. Contracts shall specify that engine-driven equipment be fitted with appropriate noise mufflers.
- Where available and feasible, construction equipment with back-up alarms shall be equipped with either audible self-adjusting backup alarms or alarms that only sound when an object is detected. Self-adjusting backup alarms shall automatically adjust to 10 dBA over the surrounding background levels. All non-self-adjusting backup alarms shall be set to the lowest setting required to be audible above the surrounding noise levels.
- Stationary construction equipment material and vehicle staging shall be placed to direct noise away from sensitive receivers to the greatest extent feasible.
- Meetings shall be conducted, as needed, with on campus constituents to provide advance notice of construction activities to coordinate these activities with the academic calendar, scheduled events, and other situations, as appropriate.
- Communication would be provided, as needed, with constituents that are affected by campus construction to provide advance notice of construction activities and ensure that the mutual needs of the particular construction project and of those impacted by construction noise are met, to the extent feasible.
- A sign shall be provided at the construction site entrance, or other conspicuous location, that includes a 24-hour telephone number for project information, and to report complaints. An inquiry and corrective action will be taken if necessary, in a timely manner.

- Where feasible, installation of temporary sound barriers/blankets of sufficient height to break the line-of-sight between the construction equipment and within proximity to exterior use areas of noise-sensitive receivers shall be required. Temporary sound barriers shall consist of either sound blankets or other sound barriers/techniques such as acoustic padding or acoustic walls placed near adjacent noise-sensitive receivers that have been manufactured to reduce noise by at least 10 dBA at ground level or meets ASTM E90 & E413 standards/ASTM C423 (or similar standards with equivalent 10 dBA noise reduction).

MM N-2 HVAC Noise Reduction Measures: The campus shall reduce HVAC equipment noise levels located in close proximity to noise-sensitive buildings and uses through noise control measures such as, but not limited to:

- Mechanical equipment screening (e.g., parapet walls)
- Equipment setbacks
- Silencers
- Acoustical louvers
- And other sound attenuation devices as made available

If a method other than mechanical equipment screening (e.g., parapet walls) is chosen, a project-specific design plan demonstrating that the noise level from operation of HVAC units does not generate noise levels that exceed 5 dBA above ambient at noise sensitive receivers shall be completed.

MM N-3 Loading Dock Noise Reduction Measures: The campus shall reduce loading dock noise levels through measures such as, but not limited to:

- Noise levels from loading docks at noise-sensitive receivers shall not exceed 5 dBA over ambient noise levels, the effectiveness of which shall be determined on a project-level basis by an acoustical professional.
- As feasible, design and build sound barriers near loading docks and delivery areas that block the line of sight between truck activity areas and noise-sensitive receivers. Sound barriers may consist of a wall, earthen berm, or combination thereof.

MM N-5 Construction Vibration Reduction Measures: If construction equipment were to be operated within the specified distances listed in Table 4.11-13 of the 2021 LRDP EIR, the campus shall reduce construction vibration levels through the following noise control measures:

- All academic and residential facilities within the listed distances shall be notified if the listed equipment is to be used during construction activities so that the occupants and/or researchers can take necessary precautionary measures to avoid negative effects to their activities and/or research.
- In addition, one of the following measures shall be implemented:
  - Use of the equipment shall not occur within the specified distances in Table 4.11-13 in Section 4.11, Noise, of the 2021 LRDP EIR, or
  - A project-specific vibration impact analysis shall be conducted that shall consider the type of equipment used and potential vibration levels at structures within the specified distances. If, after consideration of the type of equipment used and other factors of the environment, vibration levels do not exceed the applicable criteria (listed in the second column of Table 4.11-13), construction may proceed without additional measures. If, after consideration of the type of equipment used and other factors of the environment, vibration levels exceed the applicable criteria, additional measures shall be implemented to reduce vibration levels below threshold, if

feasible. These measures may include, but not limited to, use of different equipment that results in an acceptable vibration level as listed in Table 4.11-13 (presented below) in Section 4.11, Noise, of the 2021 LRDP EIR.

Table 4.11-13 of the 2021 LRDP Draft EIR – Screening Distances for Vibration-Sensitive Receiver Type and Source

Receiver Type	Vibration Threshold (in./sec. PPV)	Distance from Vibration Source (feet)[1] Vibratory Roller	Large Bulldozer[2]
Distinctly Perceptible Human Annoyance	0.24	25	15
Historic Sites	0.1	40	25
Residential Buildings	0.4	20	10
Laboratory[3]	0.032	90	50

[1] These distances are based upon typical vibration levels for a vibratory roller and large bulldozer of approximately 0.210 in./sec. PPV and 0.089 in./sec. PPV at 25 feet, respectively (FTA 2018).

[2] A large bulldozer conservatively represents all heavy-duty construction equipment, other than a vibratory roller.

[3] The FTA lists a "Residential Day" ISO use, which is vibration that is barely felt and adequate for low-power optical microscopes, as having a vibration criteria of 78 vibration decibels (equivalent to 0.032 in./sec. PPV). For the purposes of analysis, a "Residential Day" ISO use is considered representative of laboratory settings on campus.

In./sec – inches per second; PPV = peak particle velocity

NOISE

Would the Project:	Impact Examined in 2021 LRDP EIR	Impact Not Examined in 2021 LRDP EIR: No Impact	Impact Not Examined in 2021 LRDP EIR: Less-than-Significant Impact	Impact Not Examined in 2021 LRDP EIR: Potentially Significant Impact
a) Generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the LRDP in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☒	☐	☐	☐
b) Generate excessive groundborne vibration or groundborne noise levels?	☒	☐	☐	☐
c) Expose people residing or working in the project area to excessive noise levels where a project is located within the vicinity of a private airstrip or 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?	☒	☐	☐	☐

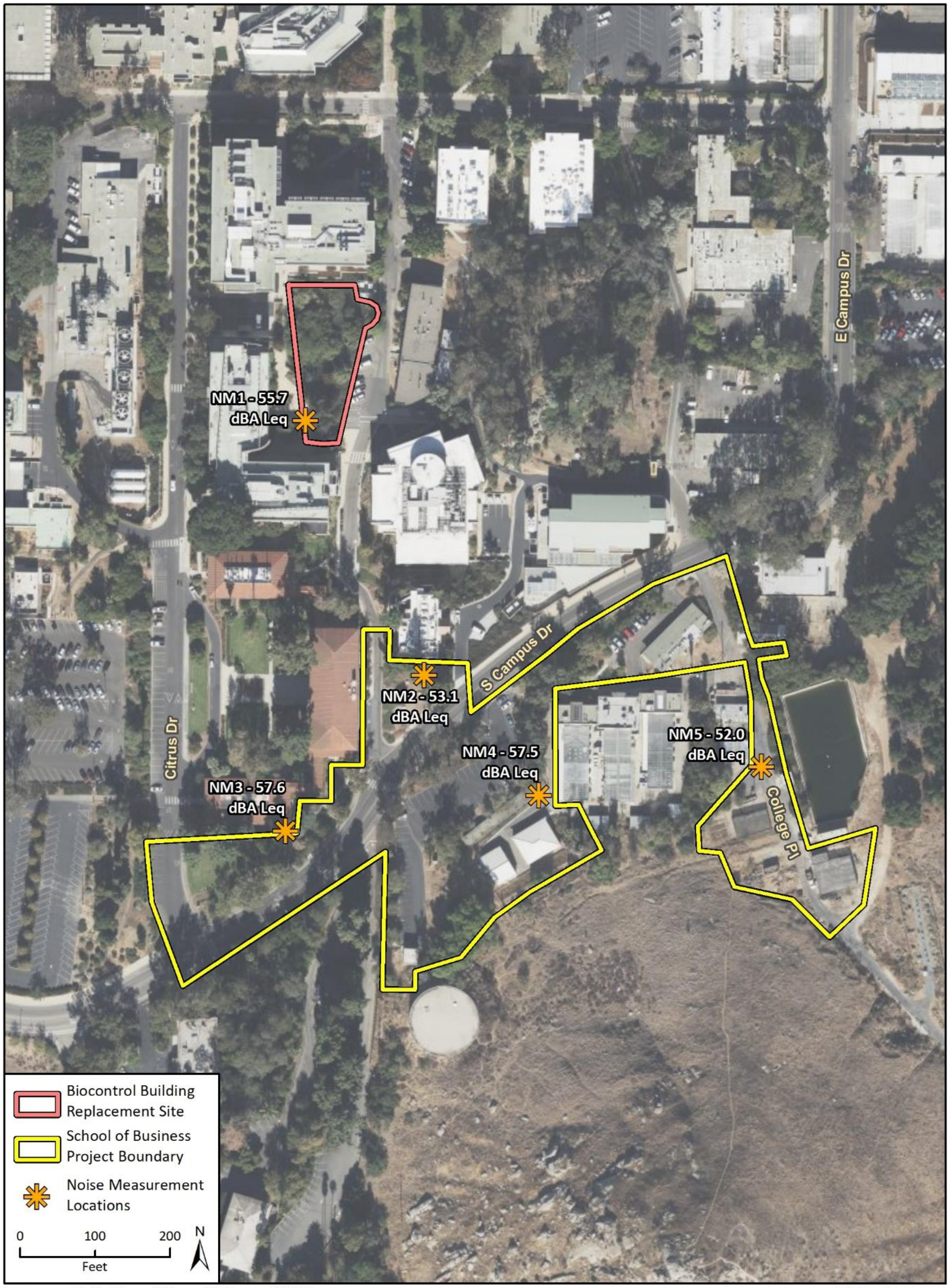
To provide a site-specific noise environment analysis, a site visit was completed on November 30, 2021. Five 15-minute noise level measurements were conducted during the site visit to characterize ambient noise levels at and near the SBB Project Boundary and Biocontrol Building Replacement Site. The noise meter was calibrated prior to measurements. Noise Measurement Short-Term (NM) 1 was conducted to capture the existing noise levels at the exterior area of the Entomology building; NM-2 was conducted to capture existing noise levels along South Camus Drive and the exterior area of the Entomology Museum; NM-3 was conducted to capture existing noise levels at the exterior area of Anderson Hall; NM-4 was conducted to capture existing noise levels at the exterior area west of the greenhouses; and NM-5 was conducted to capture existing noise levels at the exterior area between the greenhouse and water-storage basin. Noise measurement locations are shown in Figure 4.1.13-1. Table 4.1.13-1 summarizes the results of the short-term noise measurements. Sound levels varied from 52.0 to 57.6 A-weighted decibels equivalent noise level (dBA L_{eq}) at and near the SBB Project Boundary and Biocontrol Building Replacement Site.

Table 4.1.13-1
Project Site Vicinity Sound Level Monitoring Results

Measurement	Location	Sample Times	Approximate Distance to Primary Noise Source	L_{eq} (dBA)	L_{max} (dBA)	Noise Sources
NM-1	Adjacent to the on-campus Entomology building	11:05 a.m. – 11:20 a.m.	1,000 feet from I-215/ SR 60 freeway	55.7	57.7	I-215/SR 60 freeway traffic
NM-2	Adjacent to the on-campus Entomology Museum	11:29 a.m. – 11:44 a.m.	50 feet from S Campus Drive	53.1	62.5	S Campus Drive
NM-3	Adjacent to Anderson Hall	9:25 a.m. – 9:40 a.m.	685 feet from I-215/SR 60 freeway	57.6	69.4	I-215/SR 60 freeway traffic
NM-4	Adjacent to Greenhouses	10:17a.m. – 10:32 a.m.	1,000 feet from I-215/SR 60 freeway	57.5	70.8	I-215/ SR 60 freeway traffic
NM-5	Between the Greenhouse and Water-Storage Basin	9:52 a.m. – 10:06 a.m.	1,300 feet from I-215/SR 60 freeway	52.0	56.5	I-215/ SR 60 freeway traffic

dBA = A-weighted decibels; L_{eq} = average energy noise level; L_{max}= instantaneous maximum noise level; NM = Noise Measurement
Source: Rincon Consultants, field measurements conducted on November 30, 2021, using ANSI Type II Integrating sound level meter. See Appendix I.

Figure 4.1.13-1 Noise Measurement Locations



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a) The 2021 LRDP EIR concludes that construction equipment used during construction activities would result in noise level increases that would exceed applicable noise thresholds and with incorporation of **MM N-1** would remain significant and unavoidable. The 2021 LRDP EIR concludes incorporation of **MM N-2 through MM N-4** would reduce operational noise related to HVAC equipment, loading dock, and relocated Corporation Yard, respectively, to a level below significance.

Construction activities associated with the proposed project could temporarily increase noise levels that exceed applicable noise thresholds. Construction equipment used during the project construction activities would result in noise levels that exceed applicable noise thresholds, resulting in a potentially significant impact. Similar to the analysis completed in the 2021 LRDP EIR, construction may occur within 75 feet of the nearest noise-sensitive land uses (Anderson Hall for main project construction and Genomics Building for Biocontrol Building construction). Furthermore, construction noise levels are estimated to reach 76.4 dBA L_{eq} at Anderson Hall and the Genomics Building, which would exceed the ambient noise level measured at Anderson Hall by 18.8 dBA L_{eq} and the Genomics Building by 20.7 dBA L_{eq}. Consistent with the findings of the 2021 LRDP EIR, project construction impacts would be potentially significant. The proposed project would comply with **MM N-1**, which entails the integration of construction noise mitigation recommendations into the contractor specifications and its implementation during construction activities. With implementation of **MM N-1**, per manufacturer's specifications of sample equipment, construction noise levels would be reduced by at least 10 dBA to 66.4 dBA L_{eq} (8 hour) at the closest exterior use areas of noise-sensitive receivers. These noise levels would exceed ambient noise levels by 8.8 dBA at Anderson Hall which would not exceed the significance criteria of a 10 dBA increase over ambient. These noise levels would exceed ambient noise levels by 10.7 dBA at the Genomics Building which would exceed the significance criteria of a 10 dBA increase over ambient. Therefore, the proposed project would be consistent with the construction noise analyses and determination in the 2021 LRDP EIR; and proposed project impacts from construction noise would remain **significant and unavoidable** with incorporation of **MM N-1**.

The 2021 LRDP EIR concludes that operational noise from 2021 LRDP projects would result in noise level increases that would exceed applicable noise thresholds. Such operational noise impacts would be generated from stationary mechanical equipment (such as HVAC systems), loading docks, and the relocated Corporation Yard. The proposed SBB would include HVAC systems that may exceed noise thresholds for sensitive noise receptors, such as the open space located south of the SBB Project Boundary; and the SBB would include a loading dock area and associated driveways. Implementation of **MM N-2 and MM N-3** would ensure that project operation-related noise impacts related to mechanical equipment and loading docks would be less than significant. Therefore, the proposed project would be consistent with the operational noise analyses and determination in the 2021 LRDP EIR; and proposed project impacts from operational noise would remain **less than significant** with incorporation of **MM N-2 and MM N-3**.

b) The 2021 LRDP EIR states that groundborne vibration or groundborne noise levels from construction activities for projects under the 2021 LRDP may exceed thresholds for vibration-sensitive receptors from the use of vibratory rollers during paving activities and/or operation of large bulldozers and result in potentially significant impacts, but would be reduced to less than significant levels with implementation of **MM N-5**.

It is assumed that a large bulldozer will be used in the project-specific vibration analysis to conservatively represent all other heavy-duty construction equipment (other than a vibratory roller). Due to the developed/disturbed nature of the SBB Project Boundary, the use of heavy equipment that would generate substantial vibration impacts are not anticipated to be required for project construction. For main project construction, heavy equipment may operate as close as 95 feet to the nearest structures not slated for demolition or relation (Anderson Hall). As such, construction equipment would not operate within the screening distances identified in Table 4.11-13 of the 2021 LRDP EIR which range between 15 to 50 feet for large bulldozers and 25 to 90 feet for vibratory rollers; and **MM N-5** would not apply to the proposed project. For construction at the Biocontrol Building, equipment may operate as close as 75 feet to the nearest buildings; however, vibratory rollers would not be used in this construction. Therefore, the proposed project would be consistent with the vibration impact analyses and determination in the 2021 LRDP EIR; and proposed project impacts from construction vibration would remain **less than significant with mitigation incorporated**.

c) The 2021 LRDP EIR concludes that projects under the 2021 LRDP would not expose people residing or working on the campus to excessive noise levels from an airport or airport influence area, and such impacts would be less than significant. The 2021 LRDP EIR states that are no airstrips within two miles of the campus and the campus is not within the 60 dBA CNEL contour of any airport. Impacts would be less than significant.

The nearest airports include the Flabob Airport (approximately 5 miles west of the project site) and March Air Reserve Base (approximately six miles southeast of the campus). The proposed project would not exacerbate flights patterns and their associated noise, due to the distance from the Flabob Airport and March Air Reserve Base. New development on campus, including the proposed project, would comply with CBC Title 24 pertaining to noise insulation. Therefore, the proposed project would be consistent with the airport and airfield noise impact analyses and determination in the 2021 LRDP EIR; and proposed project impacts on people residing near the project site and the UCR community occupying the SBB from excessive noise levels from airport or airfield operations would remain **less than significant**.

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4.1.14 Population and Housing

Section 4.12 of the 2021 LRDP EIR addresses the population and housing impacts from implementing the 2021 LRDP and concludes that full buildout under the 2021 LRDP will accommodate the anticipated regional population forecast. However, the 2021 LRDP would not result in indirect inducement of substantial population growth due to the extension of roads or other infrastructure. All development undertaken to implement the 2021 LRDP would occur within the existing footprint of the campus.

The 2021 LRDP EIR also states that campus projects under the 2021 LRDP would not displace substantial numbers of existing people or housing. Under the 2021 LRDP, no housing would be permanently removed nor would students be displaced. Rather, the 2021 LRDP anticipates projects that include student housing to support the growing student population attending UCR.

POPULATION AND HOUSING

Would the Project:	Impact Examined in 2021 LRDP EIR	Impact Not Examined in 2021 LRDP EIR: No Impact	Impact Not Examined in 2021 LRDP EIR: Less-than-Significant Impact	Impact Not Examined in 2021 LRDP EIR: Potentially Significant Impact
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?	☒	☐	☐	☐

a – b) The 2021 LRDP assumes an approximately 46 percent increase in student population (approximately 11,000 students), with an approximately 60 percent increase in additional faculty and staff (approximately 2,800 new faculty and staff) by the 2035/2036 academic year. Implementation of the 2021 LRDP entails a variety of projects throughout the campus that fit the needs and allowable uses to accommodate growth in the student, faculty, and staff population. The proposed project is a prime example of expanding UCR's academic programming, specifically the School of Business (currently split between two buildings on campus, Anderson Hall and Olmsted Hall) in order to fulfill UCR's educational goals. Impacts would range from less than significant to no impact.

UCR's vision for the project is to build "a world-class environment that transcends physical structure to play a pivotal role in our community's social and economic landscape." The proposed SBB would add approximately 75,000 gsf of educational, student support, and office/support spaces to the campus, and the new SBB would accommodate approximately 570 new students and approximately 125 new faculty and staff. The SBB would also continue to serve the existing approximately 2,100 business school students and 100 faculty/office staff. While the proposed project could directly induce some population growth and require new housing due to the increased student, faculty, and staff capacity within the SBB, potential new student housing needs evaluated under the 2021 LRDP EIR conclude that the campus could accommodate this future growth through strategic infill and selective replacement of existing housing facilities in the northern half of East Campus. Furthermore, the campus, including the project site, is within a heavily urbanized area that contains existing infrastructure that includes roadways, electricity, sanitary sewer, potable water, telecommunications, and natural gas. The proposed project would be developed on the campus on a site that contains existing roadways and utility infrastructure, and therefore would not indirectly result in substantial population growth due to expanding roadways and infrastructure. Therefore, the proposed project would be consistent with the population growth analysis and determination in the 2021 LRDP EIR; and direct and indirect project impacts from anticipated student, faculty, and staff population growth would remain **less than significant**.

The proposed project entails the construction of the SBB on a site already developed with an existing parking lot and support buildings, the construction of the Biocontrol Building on an existing landscaped area surrounded by academic facilities, and the construction of the Genomics Shed on previously disturbed area either south or west of the water-storage basin. There are no housing units present on the SBB Project Boundary or Biocontrol Building Replacement Site that serve the UCR student population or City residents. Implementation of the proposed project would not displace any UCR or City residents, and construction of replacement housing would not be necessary. Therefore, the proposed project would be consistent with the housing displacement analysis and determination in the 2021 LRDP EIR; and proposed project impacts remain to have **no impact**.

4.1.15 Public Services

Section 4.13 of the 2021 LRDP EIR addresses the physical effects of providing public services to meet the needs of the campus growth under the 2021 LRDP.

The 2021 LRDP EIR states that the campus growth under the 2021 LRDP would not increase demand to a level that would require new fire protection facilities or substantial alterations to existing facilities; and would not result in the need for or alteration of schools.

The IS prepared for the 2021 LRDP concludes that the need for police services and public facilities (such as libraries) on the campus would increase with the implementation of projects under the 2021 LRDP. New facility space to accommodate additional on-campus police protection services and public programs are expected to be a part of the approximately 896,229 asf (1,344,344 gsf) of new administrative and support facility space in the buildout of the 2021 LRDP. A project that includes space specifically for on-campus police services or public program uses would undergo its own environmental review, but the 2021 LRDP EIR states that no additional environmental impacts beyond those analyzed as part of the 2021 LRDP are anticipated for such a project. Therefore, the impacts of the 2021 LRDP on police protection service and other public facilities were not further analyzed in the 2021 LRDP EIR since the IS prepared for the 2021 LRDP concludes implementation of the 2021 LRDP would have a less than significant impact.

Impacts to parks and recreational facilities are addressed in Section 4.1.16, Recreation, of this Addendum.

PUBLIC SERVICES

		Impact Not Examined in 2021 LRDP EIR		
Would the Project:	Impact Examined in 2021 LRDP EIR	No Impact	Less-than-Significant Impact	Potentially Significant Impact
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:				
i) Fire protection?	☒	☐	☐	☐
ii) Police protection?	☒	☐	☐	☐
iii) Schools?	☒	☐	☐	☐
iv) Parks?	☒	☐	☐	☐
v) Other public facilities	☒	☐	☐	☐

a-i) The 2021 LRDP EIR concludes that implementation of the 2021 LRDP, including construction activities, would not increase demand or response time to a level that would require new fire protection facilities or substantial alterations to existing facilities. Operation of projects under the 2021 LRDP would incrementally increase fire protection demands due to the anticipated campus population growth. However, the 2021 LRDP EIR notes that emergency responders maintain response plans which include use of alternate routes, sirens, and other methods to bypass congestion and minimize response times. Furthermore, California law requires drivers to yield to the right-of-way to emergency vehicles and remain stopped until the emergency vehicle passes. Therefore, fire service response times are not expected to be notably affect by campus development under the 2021 LRDP. Impacts would be less than significant.

The City of Riverside Fire Department (RFD) provides fire protection, fire inspection services, community education, and emergency preparedness and training for the City, including UCR. While UCR has a Fire Prevention Program for its campus, the campus also maintains a Memorandum of Understanding (MOU) with the State Fire Marshal to allow UC personnel to serve as local campus fire marshals, deputy fire marshals, and fire inspectors. The need for additional fire personnel may increase with the addition of new facilities on campus and was considered in the 2021 LRDP EIR. Implementation of the proposed project would incrementally increase the demand for fire protection services, but not to a level that would require new facilities beyond those that exist or are already planned under the 2021 LRDP since the project site is already primarily developed and within RFD’s service area. Additionally, the construction and operation of the proposed project would be required to comply with local and State fire safety regulations. The proposed project would include fire hydrants and fire department access would be provided within and around the project area in accordance with the Campus Fire Marshal and RFD standards and requirements. Other fire protection systems such as smoke detectors, fire sprinklers, fire extinguishers, appropriate building access, and emergency response notification systems are incorporated with the proposed project. Therefore, the proposed project would be consistent with the fire protection services analysis and determination in the 2021 LRDP EIR; and proposed project impacts to fire protection services would remain **less than significant**.

a-ii) As mentioned above, police protection services were not further discussed in the 2021 LRDP EIR based on the analysis completed in the IS prepared for the 2021 LRDP. The campus is served by the University of California Police Department (UCPD) which has sufficient officers and staff to respond to all police related incidents on the campus. UCPD continuously evaluates the need for new officers necessary due to campus population increases. This would continue through the implementation of the 2021 LRDP to ensure that adequate levels of police services are provided. Additionally, UCPD is able to supplement its staff with officers from other agencies who have arrest authority under mutual aid agreements. Although the need for police services would incrementally increase in association with the increase in students, faculty, and staff under the 2021 LRDP, inclusive of the proposed project, the UCPD could meet these future needs with adequate facility space and collaboration with the Riverside Police Department (RPD) to provide police services on campus. The proposed project would add approximately 570 new students and approximately 125 new faculty and staff to the campus population on a site that is currently developed and within UCPD’s service area. Therefore, the proposed project would be consistent with the police protection services analysis and determination in the IS prepared for the 2021 LRDP; and proposed project impacts to police protection services would remain **less than significant**.

a-iii) The 2021 LRDP EIR concludes that future expansions on the campus would result in less than significant impacts on school facilities. Any future campus construction projects would be temporary and not require the relocation of construction workers or need for school facilities for their family members. The 2021 LRDP EIR also estimates that the growth in UCR students and faculty/staff under the 2021 LRDP could incrementally result in approximately 2,575 total new school age children by full buildout in 2035 that would attend schools in the Inland Southern California area. The 2021 LRDP EIR notes that it is likely that some of these students would already attend schools prior to their parent/guardian attending UCR as a student or employed as a member of faculty of staff or live in areas across the region and be distributed across school districts. Impacts were determined to be less than significant. The existing Anderson Hall and Olmsted Hall, that comprises the current UCR School of Business, accommodates approximately 2,100 students and 100 faculty and staff members. Since these students, faculty, and staff either reside on campus or in the Inland Southern California area, their school-aged children are either already in school, or would be distributed across school districts. The proposed project would increase the campus population by adding approximately 570 new students and 125 additional faculty and staff when completed and in operation. The number of school-aged that would increase as a result of the proposed project's growth would be minimal and anticipated to be accommodated by the school districts in the Inland Southern California area. Therefore, the proposed project would be consistent with the school services analysis and determination in the 2021 LRDP EIR; and proposed project impacts to public school services would remain **less than significant**.

a-iv) The 2021 LRDP impacts to parks and recreational facilities were discussed in Section 4.14, Recreation, of the 2021 LRDP EIR. Likewise, proposed project impacts on parks and recreational facilities are also analyzed in Section 4.1.16, Recreation, of this Addendum.

a-v) The IS prepared for the 2021 LRDP concludes that the increased population anticipated under the 2021 LRDP would not require new or altered library or other public facilities beyond those facilities already proposed as part of the 2021 LRDP. Therefore, the impact of the 2021 LRDP on other public facilities would be less than significant and was not further evaluated in the 2021 LRDP EIR. The proposed project would increase the campus population by adding approximately 570 new students and 125 additional faculty and staff upon project completion. All UCR students, faculty, and staff have access to the libraries on the campus (Tomás Rivera Library, the Orbach Science Library, and the Special Collections and University Archives) in addition to the City of Riverside Main Library and its seven library branches, as well as the 39 libraries in the Riverside County Library System. Existing and future students, faculty, and staff would continue to have access to all on-campus and off-campus libraries with implementation of the proposed project. Therefore, the proposed project would be consistent with the public facilities analysis and determination in the 2021 LRDP EIR; and proposed project impacts to public facilities, such as libraries on- and off campus, would remain **less than significant**.

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4.1.16 Recreation

Section 4.14 of the 2021 LRDP EIR addresses the environmental effects associated with modifying recreational facilities to meet the needs of campus growth under the 2021 LRDP. The 2021 LRDP EIR concludes that despite the increase in the usage of on- and off-campus recreational facilities anticipated from campus growth, implementation of the 2021 LRDP would not increase the use of neighborhood and regional parks or other recreational facilities such that substantial deterioration of existing facilities would occur or be accelerated.

The 2021 LRDP includes approximately 28.7 acres of land within the campus that is specifically designated Recreation & Athletics use, which would be developed to include new on-campus recreational facilities over the LRDP planning horizon to meet the anticipated needs of a larger campus population.

RECREATION

		Impact Not Examined in 2021 LRDP EIR		
Would the Project:	Impact Examined in 2021 LRDP EIR	No Impact	Less-than-Significant Impact	Potentially Significant Impact
a) 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) Require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☒	☐	☐	☐

a – b) The 2021 LRDP includes a Recreation & Athletics land use category that permits construction or expansion of recreational facilities to accommodate intercollegiate athletics and campus recreation, such as large-scale indoor and outdoor athletic facilities, playfields, and courts. The proposed Student Neighborhood and Canyon Crest Gateway land use designations in the northern portions of East Campus could accommodate appropriately scaled recreation and athletic facilities. The 2021 LRDP includes the UCR Botanic Gardens land use category that maintains the existing use that contains a series of pedestrian pathways. Additionally, the 2021 LRDP includes extensions of key bicycle and pedestrian networks to serve the needs of the campus community. The 2021 LRDP EIR concludes that improvements to existing facilities and development of new facilities would have a less than significant impact since all changes would occur on the campus with the intent of serving the UCR community.

The proposed project entails the construction of the SBB on a site already developed with an existing parking lot and support buildings, the construction of the Biocontrol Building on an existing landscaped area surrounded by academic facilities, and the construction of the Genomics Shed on previously disturbed area either south or west of the water-storage basin. The proposed project does not include recreational uses or facilities on the project site or on the campus. The proposed project would accommodate approximately 570 new students and approximately 125 new faculty and staff, in addition to the existing approximately 2,100 business school students and 100 faculty/office staff. Growth in the number of the SBB students, faculty, and staff was considered and evaluated as part of the 2021 LRDP buildout and would not exceed the total 35,000 student and 7,545 faculty/staff anticipated under full buildout of the 2021 LRDP in 2035. The 2021 LRDP EIR states that future increases in UCR student, faculty, and staff population would be accommodated by neighborhood and regional parks in combination with the renovation and expansion of existing recreation facilities on the campus.

Project construction activities would increase the number of construction workers on the campus. However, these workers would likely be existing construction employees and residents in the Riverside region and they would not potentially relocate their households as a consequence of the proposed project. Therefore, project construction workers would not generate a corresponding demand for parks and recreational facilities in and around the campus, such that it would result in the accelerated physical deterioration of an existing park or recreation facility.

The proposed project entails the construction of the SBB on a site already developed with an existing parking lot and support buildings, the construction of the Biocontrol Building on an existing landscaped area surrounded by academic facilities, and the construction of the Genomics Shed on previously disturbed area either south or west of the water-storage basin. Implementation of the proposed project would not require the construction or expansion of recreational facilities since there are no residential uses included as part of the project, such that direct impacts to recreational facilities would occur from resident students, faculty, or staff. Therefore, the proposed project would be consistent with the recreational facilities analysis and determination in the 2021 LRDP EIR; and proposed project impacts to recreational facilities would remain **less than significant**.

4.1.17 Transportation

Section 4.15 of the 2021 LRDP EIR evaluates transportation impacts of campus growth under the 2021 LRDP. The 2021 LRDP EIR concludes that implementation of future projects under the 2021 LRDP would result in less than significant impacts to conflicts with policies addressing roadway, transit, bicycle, and pedestrian facilities; less than significant impacts to conflicts with CEQA Guidelines Section 15064.3, subdivision (b); and less than significant impacts to adequate emergency access. However, implementation of the 2021 LRDP would result in significant and unavoidable impacts due to a substantial increase in hazards related to vehicle queueing at the I-215/SR 60 freeway southbound ramps at Martin Luther King Boulevard. The 2021 LRDP EIR states that an increase in campus population under AM Peak Hour Cumulative Plus Project conditions would result in an exceedance of freeway off-ramp queuing storage length. **MM T-1** would be required to reduce the impacts of the 2021 LRDP buildout to less than significant. However, UCR does not have jurisdiction over the identified intersection and freeway ramps, and any alteration would require an agreement from Caltrans. Therefore, physical improvements to the ramp queuing storage length could not be guaranteed at the time of 2021 LRDP EIR approval, and the potential impact was determined to remain significant and unavoidable under the 2021 LRDP EIR.

The above mentioned MM states the following:

MM T-1 Intersection Queuing Improvement: Improvements to the intersection of I-215/SR 60 freeway southbound ramps at Martin Luther King Boulevard shall consist of reconfiguring the southbound approach from one left-turn lane and one shared through/right-turn lane to one shared left/through/right-turn lane and one right-turn lane. Optimizing the signal-timings with the geometric improvements shall also be required.

TRANSPORTATION

Would the Project:	Impact Examined in 2021 LRDP EIR	Impact Not Examined in 2021 LRDP EIR: No Impact	Impact Not Examined in 2021 LRDP EIR: Less-than-Significant Impact	Impact Not Examined in 2021 LRDP EIR: Potentially Significant Impact
a) Conflict with an applicable program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☒	☐	☐	☐
b) Conflict or be inconsistent with CEQA Guidelines Section 15064.3(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?	☒	☐	☐	☐

The following analysis is based on a Vehicle Miles Traveled (VMT) Assessment Memorandum prepared for the project by Fehr & Peers, dated March 2022 and included as Appendix J.

a) The 2021 LRDP EIR states that implementation of the 2021 LRDP would not physically disrupt existing pedestrian or bicycle facilities or interfere with implementation of planned pedestrian or bicycle facilities. There would be less than significant impact.

The proposed project would increase bicycle and pedestrian travel with the additional student, faculty, and staff population, but the additional bicycle and pedestrian traffic would not physically disrupt existing pedestrian or bicycle facilities within and around the project site and the campus, nor interfere with the implementation of a planned pedestrian or bicycle facilities under the 2021 LRDP. Pedestrian circulation and access to and from the project site would be provided by existing sidewalks and pathways along South Campus Drive and Science Walk with improvements to meet ADA requirements and to facilitate safer movement for pedestrians. ADA-compliant accessible pathway improvements would be incorporated on and around the Citrus Drive parking lot and Parking Lot 43 as required by the CBC, and other pathway improvements would provide pedestrian connectivity between the greater campus and Anderson Hall to the proposed SBB. Bicycle lanes that currently exist on both sides of South Campus Drive would be maintained and improved with the addition of bicycle racks. Existing transit service on Canyon Crest Drive and West Campus Drive would continue to serve the campus and project site as well as a proposed future transit stop along South Campus Drive near the project site that would serve the campus and project site, upon completion of the SBB. Such project improvements that enhance and encourage alternative transportation facilities (for cyclists and pedestrians) within and in the vicinity of the project site would be aligned and consistent with the UCR Transportation Demand Management Program and select objectives and policies of the 2021 LRDP. Therefore, the proposed project would be consistent with the applicable programs, plans, ordinances, and policies that address the circulation system as analyzed and determined in the 2021 LRDP EIR; and proposed project impacts to transportation and circulation systems would remain **less than significant**.

b) In accordance with CEQA Guidelines Section 15064.3(b), the following thresholds of significance were used in the 2021 LRDP EIR to determine VMT impacts associated with the 2021 LRDP, as well as the proposed project (Appendix J):

> A project would result in a significant project generated VMT impact if either of the following conditions are satisfied:
>
> - The Baseline Plus Project-generated VMT per Service Population exceeds 15 percent below the Western Riverside Council of Governments (WRCOG) baseline VMT per Service Population.
> - The Cumulative Plus Project-generated VMT per Service Population exceeds 15 percent below the WRCOG baseline VMT per Service Population.
>
> The proposed project's effect on VMT would be considered significant if it resulted in the following condition being satisfied:
>
> - The cumulative link-level boundary WRCOG region VMT per Service Population increases under the Cumulative Plus Project condition compared to Cumulative (2035) conditions.

The VMT analysis completed for the 2021 LRDP EIR reflects the number of vehicle-trips generated by the campus and the expected distance that drivers will travel to/from UCR for their work/school trips as well as other trips generated by campus visitors and students living in on-campus housing.

The Riverside Traffic Analysis Model (RivTAM)[4] was used to develop VMT forecasts. UCR campus wide VMT was calculated for the following four scenarios:

- *Baseline (2018)* – A Fall 2018 baseline was selected for the transportation analysis. Campus population (student enrollment, on-campus residents, and faculty/staff employment) was incorporated in the Base Year RivTAM to establish the Baseline conditions for the transportation assessment.
- *Baseline Plus Project* – The net new increases in campus population associated with the 2021 LRDP were added to the Baseline conditions to develop Baseline Plus Project conditions.
- *Cumulative (2035) Without Project* – The Cumulative (2035) Without Project conditions were developed by including the 2018 Baseline campus conditions in combination with future cumulative growth outside of UCR using the Future Year RivTAM model.
- *Cumulative Plus Project* – The net new increases in campus development and population associated with the 2021 LRDP were added to the Future Year RivTAM to develop Cumulative Plus Project conditions.

The metric identified for the transportation analysis in the 2021 LRDP EIR is Total VMT per Service Population. This represents the daily VMT generated by UCR divided by the total number of employees, residential students, and commuter (nonresidential) students on the campus. The Baseline Plus Project and Cumulative Plus Project VMT per Service Population calculations were determined by measuring the UCR campus wide VMT with the inclusion of the 2021 LRDP population growth. These VMT measurements and associated calculations of VMT per Service Population were used to evaluate the VMT impact of the campus with the addition of the buildout conditions for the 2021 LRDP. This calculation methodology is reflective of the VMT generation characteristics of the campus with the inclusion of more students, faculty, and staff such as with implementation of the proposed project.

Since the new students, faculty, and staff generated by the proposed project were also included in the growth projections for the 2021 LRDP, the project specific VMT results are expected to be consistent with those reported in the 2021 LRDP EIR as follows:

- The Baseline 2021 LRDP-generated VMT per Service Population of 17.65 does not exceed the threshold of 15 percent below WRCOG VMT per Service Population of 24.35, resulting in a less than significant impact in the 2021 LRDP EIR; therefore, the proposed project VMT impact is also considered less than significant.
- The Cumulative 2021 LRDP-generated VMT per Service Population of 19.93 does not exceed the threshold of 15 percent below WRCOG VMT per Service Population of 24.35, resulting in a less than significant impact in the 2021 LRDP EIR; therefore, the proposed cumulative project VMT impact is also considered less than significant.
- The 2021 LRDP effect on VMT per Service Population of 18.05 does not cause total VMT for the WRCOG region to exceed the future forecast from the Southern California Association of Governments Regional Transportation Plan/Sustainable Communities Strategy (SCAG RTP/SCS) of 18.10 VMT per Service Population, resulting in a less than significant impact in the 2021 LRDP EIR; therefore, the proposed project VMT impact is also considered less than significant.

[4] The RivTAM is consistent with the 2016 SCAG Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) as described in the 2021 LRDP EIR.

Similar to the 2021 LRDP, operation of the project would result in additional vehicular travel associated with increased population on the campus, but VMT would continue to be below regional thresholds. Therefore, the proposed project would be consistent with the operational VMT analysis and determination in the 2021 LRDP EIR; and proposed project impacts to regional VMT would remain **less than significant**.

c) The 2021 LRDP EIR states that development and circulation improvements would be completed such that changes would remain consistent with surrounding geometric design features and any redesign or construction of on-campus circulation paths would be designed and constructed to meet the Campus Construction and Design Standards. Project-specific construction management plans would be prepared in accordance with the California Manual on Uniform Traffic Control Devices which includes information related to truck routes and construction site access. It is anticipated that construction access would be provided by the I-215/SR 60 freeways, Martin Luther King Boulevard, Canyon Crest Drive, and Campus Drive. Therefore, the proposed project would be consistent with the construction roadway analysis and determination in the 2021 LRDP EIR; and proposed project impacts to construction site access management would remain **less than significant**.

The 2021 LRDP EIR states that existing farm equipment movement processes, procedures, and safety measures would remain the same as existing conditions as under the 2021 LRDP; and impacts to roadway compatibility between existing and anticipated uses under the 2021 LRDP would be less than significant. The proposed project would not result in incompatible roadway or circulation system use since anticipated modes of project-specific transportation (vehicular, pedestrian, and bicycle) are compatible with and supported by existing roadway and transportation facilities within the project site and campus. Therefore, the proposed project would be consistent with the incompatible uses analysis and determination in the 2021 LRDP EIR; and proposed project impacts to existing on- and off campus circulation systems would remain **less than significant**.

The proposed project would be constructed in such a way that roadway and accessway changes would remain consistent to the surrounding geometric design features, and would be designed and constructed to meet the Campus Construction and Design Standards in a manner that is consistent with the intent of the 2021 LRDP. The 2021 LRDP EIR also considers transportation impacts resulting from freeway off-ramp queueing. Under *Baseline (2018)* conditions, the I-215/SR 60 freeway southbound ramp queueing with the 2021 LRDP was found not to exceed 85 percent of the storage length for any of the freeway off-ramps. Since new students, faculty, and staff generated by the project were also included in the 2021 LRDP analysis, proposed project impacts on the I-215/SR 60 freeway southbound ramp queueing would be consistent with the conclusions in the 2021 LRDP EIR and would also not exceed 85 percent of the storage length for any of the freeway off-ramps under *Baseline (2018)* conditions. Under *Cumulative (2035)* conditions with the 2021 LRDP, freeway ramp queueing was found to exceed 85 percent of the storage length at the I-215/SR 60 freeway southbound ramps at Martin Luther King Boulevard. Since the proposed project would contribute to an increase in UCR campus-generated traffic under *Cumulative (2035)* conditions, the proposed project would also contribute to the impact related to AM peak hour queueing at the I-215/SR 60 freeway southbound ramps at Martin Luther King Boulevard. The 2021 LRDP EIR identifies **MM T-1**, which is intended to improve the intersection of the I-215/SR 60 freeway southbound ramps and reduce the severity of the queuing storage deficiency; however, the implementation of **MM T-1** remains uncertain as the 2021 LRDP EIR states since UCR does not have jurisdictional control over the I-215/SR 60 freeway southbound ramp intersection and any physical improvement would require an agreement with Caltrans. Therefore, the proposed project would be consistent with the geometric design features analysis and determination in the 2021 LRDP EIR; however, project transportation impacts related to geometric design features would remain **significant and unavoidable** as identified in the 2021 LRDP EIR.

d) Similar to the 2021 LRDP EIR analysis, the proposed project would not include major changes to existing access points or on-campus circulation paths that would result in inadequate emergency access and would adhere to Campus Construction and Design Standards. Emergency access to the SBB, Biocontrol Building, and Genomics Shed sites would be provided via ingress/egress routes along South Campus Drive, College Place, Science Walk, and/or Citrus Drive. Proposed emergency access on the SBB and Genomics Shed sites as well as firetruck hose pull requirements at the SBB, Biocontrol Building, and Genomics Shed sites, as required by the Fire Code, would be reviewed and approved by the Campus Fire Marshal. Emergency vehicles could travel down Eucalyptus to Science Walk or Citrus Drive if the South Campus Drive access were impeded during an emergency. In accordance with **CBP WF-1**, during project construction, to the extent feasible, one unobstructed lane would remain open along South Campus Drive and any detours will be identified for closures to South Campus Drive, College Place, Science Walk, and/or Citrus Drive, in accordance with the construction traffic control plan. The Campus Fire Marshal would disclose roadway closures to the City Fire Department and identify alternative travel routes, if necessary (**CBP WF-2**). Therefore, the proposed project would be consistent with the emergency access analysis and determination in the 2021 LRDP EIR; and proposed project impacts to emergency access roads would remain **less than significant**.

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4.1.18 Tribal Cultural Resources

Section 4.16 of the 2021 LRDP EIR evaluates tribal cultural resources (TCR) impacts with development facilitated by the 2021 LRDP. The 2021 LRDP EIR concludes that implementation of future projects under the 2021 LRDP would result in potential impacts to TCR but would be reduced to a level below significance with incorporation of **MM CUL-2 through MM CUL-4**.

The above mentioned MMs state the following:

MM CUL-2 Tribal Cultural Resources/Archaeological Monitoring: Prior to commencement of ground disturbing activities into an area with a medium or high potential to encounter undisturbed native soils including Holocene alluvium soils, as determined by UCR, UCR shall hire a qualified archaeological monitor meeting the Secretary of the Interior's Professional Qualification Standards for archaeology (National Park Service [NPS] 1983) to identify archaeological resources and cultural resources of potential Native American origin. Where development occurs in the southeastern quadrant of campus, and in areas containing Val Verde Pluton geologic features considered highly sensitive to prehistoric archaeological resources, UCR shall hire a qualified archaeologist and a Native American monitor to reduce impacts to potential archaeological and/or tribal cultural resources. The monitor(s) shall be on-site during any construction activities that involve ground disturbance. The on-site monitoring shall end when project-related ground disturbing activities are completed, or, in consultation with the lead agency and tribes as appropriate and based on observed conditions, monitoring may be reduced or eliminated prior to completion of ground-disturbing activities, when the monitor(s) has indicated that the project site has a low potential to encounter tribal cultural resources (TCR)/archaeological resources. Consolidated monitoring efforts (e.g., archaeological monitoring/tribal cultural/paleontological monitoring) may occur if the individual monitor meets the applicable qualifications, except for development in the southeastern quadrant as detailed above.

MM CUL-3 Construction Worker Training: For projects requiring TCR/archaeological monitoring, the monitor shall provide preconstruction training for all earthmoving construction personnel prior to the start of any ground disturbing activities, regarding how to recognize the types of TCRs and/or archaeological resources that may be encountered and to instruct personnel about actions to be taken in the event of a discovery. UCR Planning, Design & Construction Project Manager/contractor shall retain documentation showing when training of personnel was completed.

MM CUL-4 Unanticipated Discovery of Tribal Cultural Resources/Archaeological Resources: If previously undiscovered TCRs and/or archaeological resources are identified during construction, all ground disturbing activities within 100 feet of the resource shall halt, UCR Planning, Design & Construction staff shall be notified, and the find shall be evaluated by a qualified archaeologist meeting the Secretary of the Interior standards to determine whether it is a unique archaeological resource, as defined by CEQA. If the discovery appears to be Native American in origin, a tribal representative will be contacted within 24 hours of discovery to determine whether it is a TCR, as defined by CEQA. If the find is neither a unique archaeological resource nor a TCR, work may resume. If the find is determined to be a unique archaeological resource or TCR, the archaeologist and the tribal representative, as appropriate, shall make recommendations to UCR Planning, Design & Construction staff on the measures that will be implemented, including, but not limited to, preservation in place, excavation, relocation, and further evaluation of the discoveries pursuant to CEQA. Preservation in place (i.e., avoidance) is the preferred method of mitigation for impacts to TCRs/archaeological resources. If UCR determines that preservation in place is not feasible, the archaeologist shall design and implement a treatment plan, prepare a report, and salvage the material, as appropriate. Any important artifacts recovered during monitoring shall be cleaned, catalogued, and analyzed, with the results presented in a report of findings that meets professional standards. Work on-site may commence upon completion of any fieldwork components of the treatment plan.

TRIBAL CULTURAL RESOURCES

Would the Project:	Impact Examined in 2021 LRDP EIR	Impact Not Examined in 2021 LRDP EIR: No Impact	Impact Not Examined in 2021 LRDP EIR: Less-than-Significant Impact	Impact Not Examined in 2021 LRDP EIR: Potentially Significant Impact
a) Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
1) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k)?	☒	☐	☐	☐
2) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe?	☒	☐	☐	☐

Criterion 4.1.18 a)1) noted above is addressed in Section 4.1.5, Cultural Resources of this Addendum.

a) 2) The 2021 LRDP EIR states that the eastern portion of the LRDP area, especially the southeast, is considered to have high sensitivity for encountering TCR. The majority of the areas considered to have a high sensitivity for encountering cultural resources are within the 2021 LRDP land use designation of Open Space Reserve or UCR Botanic Gardens. Areas within the northern portions of East Campus, where a majority of infill development or expansion under the 2021 LRDP is anticipated, has low TCR sensitivity. The 2021 LRDP EIR determined that TCR impacts would be less than significant with incorporation of **MM CUL-2 through MM CUL-4**.

The SBB Project Boundary is located adjacent to areas designated as Open Space Reserve under the 2021 LRDP which are areas with high cultural sensitivity. The Biocontrol Building Replacement Site is located in areas designated as Academics & Research in areas designated with low cultural sensitivity. Due to the SBB Project Boundary's proximity to the Open Space

Reserve, monitoring would occur during project construction to monitor for unknown archaeological resources and tribal cultural resources. **MM CUL-2 through MM CUL-4** as identified in the 2021 LRDP EIR and measures included in the Campus Construction and Design Standards pertaining to the treatment of any previously undiscovered TCR would apply to the SBB Project Boundary to ensure proper handling, notification, and documentation for any discovered TCR. Incorporation of **MM CUL-4** would also ensure proper handling, notification, and documentation for any discovered TCR within the Biocontrol Building Replacement Site. Therefore, the proposed project would be consistent with the TCR analyses and determination in the 2021 LRDP EIR; and proposed project impacts to TCR would remain **less than significant** with incorporation of **MM CUL-2 through MM CUL-4**.

4.1.19 Utilities and Service Systems

Section 4.17 of the 2021 LRDP EIR addresses the impacts of campus growth on water supplies, wastewater conveyance, treatment, and disposal, solid waste disposal, stormwater management, and telecommunications facilities. The 2021 LRDP EIR concludes that any future development under the 2021 LRDP would result in less than significant impacts to utilities as any construction-related impacts to expanded facilities would be temporary, increased water demands are accounted for under the Riverside Public Utilities (RPU) 2015 Urban Water Management Plan (UWMP), the Riverside Water Quality Control Plant has adequate capacity to treat anticipated wastewater generation, and the 2021 LRDP would not generate solid waste in excess of State or local standards (RPU 2016). Potential effects related to water quality, groundwater, and drainage patterns are discussed in Section 4.1.10, *Hydrology and Water Quality*.

UTILITIES AND SERVICE SYSTEMS

		Impact Not Examined in 2021 LRDP EIR		
Would the Project:	Impact Examined in 2021 LRDP EIR	No Impact	Less-than-Significant Impact	Potentially Significant Impact
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 waste water 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 providers 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?	☒	☐	☐	☐
e) Comply with federal, State, and local management and reduction statues and regulations related to solid waste?	☒	☐	☐	☐

a) The 2021 LRDP EIR states that implementation of the 2021 LRDP may require the relocation or construction of new or expanded utilities infrastructures to support anticipated growth in the number of students, faculty, and staff as well as UCR programs. Impacts were determined to be less than significant.

Development of the proposed project would be adjacent to existing campus development and would connect to existing utility facilities where feasible, including for water supply, wastewater treatment, storm water drainage, electric power, and telecommunications. The proposed SBB would be electric and not use natural gas. All connections would be implemented during project construction which would result in only temporary impacts, be located within developed/disturbed areas, and not substantially increase the disturbance area within the 2021 LRDP. All project construction activities would comply with BMPs which would minimize any environmental impacts. Wastewater generated from the proposed project would be treated at the City's Regional Water Quality Control Plant (RWQCP) which has a treatment capacity of 46 million gallons per day (MGD). The City projected a wastewater flow of 39 MGD by the year 2037 which is beyond the anticipated 2035/2036 buildout year for the 2021 LRDP, and project-generated wastewater would be adequately treated.

Water and Wastewater Facilities

The campus has a combined fire and domestic water system that is sufficient to serve the proposed project. RPU provides potable water to the campus, which is used both in buildings and for landscape irrigation. In addition, UCR has a private on-campus water system that conveys potable water throughout the campus, as needed. All potable water, fire water, and irrigation water supplies are distributed through the campus-wide system that would serve the project site as well. The proposed project would tie into these existing infrastructure.

The irrigation system will meet or exceed the State of California Model Efficient Landscape Ordinance (CA AB 1881 requirements) and the UCR requirements for a water efficient landscape. Submeter and point of connection with a new back flow will be incorporated for the proposed irrigation. Dedicated irrigation water for the SBB site will be provided from the existing 4-inch water line.

There are multiple existing 6-inch sanitary sewer mains located northeast and west of Parking Lot 8. These mains travel north, eventually connecting to a 15-inch main in University Avenue. A gravity main sanitary sewer system is incorporated to the project design to pick up domestic effluent from the SBB and will discharge to the west-most existing campus sanitary sewer main.

Stormwater Drainage Facilities

Please refer to the analysis of drainage provided under Section 4.1.10, Hydrology and Water Quality, of this Addendum. In summary, the analysis concluded that operation of the proposed project would not exceed the capacity of the existing storm drain system, and there would be a less than significant impact.

All UC campuses are regulated under the Phase II MS4 General permit, and the campus is additionally regulated under the UCR's SWMP. Stormwater management measures (e.g., flow-through planters, bio-swales, bio filtration stormwater planters) would be incorporated into the project design.

The existing site generally drains from southeast to northwest. Drainage within the project limits currently sheet flows in this general direction towards South Campus Drive. A portion of the SBB site drainage is collected by the existing catch basin and 8-inch storm drain within Parking Lot 8. Stormwater from this portion of the campus ultimately discharges to the Gage Detention Basin, north of University Avenue. The project site shall generally be designed so storm water surface drains to a series of catch basins connected by underground storm drain pipes. Storm drain pipes will connect to existing campus storm drains or drainage devices and the existing pipes would be upsized.

Electric Power and Natural Gas Facilities

The proposed project is estimated to generate a total electric demand of 578,122 kWh/yr (see Appendix A), , which is not anticipated to require additional electricity substations or construction or relocation of electrical infrastructure that would cause significant environmental effects. The proposed project is required to follow energy conservation policies listed in the UC Policy on Sustainable Practices, minimize energy use in order for the campus to attain the GHG reduction goals, and comply with any future conservation goals or programs enacted by the UC.

The proposed project would be equipped with infrastructure that would allow it to use solar power at a future time. Other project design features implemented to attain a minimum LEED Silver designation would further decrease electricity demand. Therefore, the electric demand and required infrastructure of the proposed project has been determined taking these requirements into consideration. Therefore, there would be a less than significant impact related to construction of new or expanded electrical infrastructure or the inefficient use of energy.

No natural gas consumption would occur as part of the proposed project. Therefore, no impacts would occur.

Telecommunications Infrastructure

The proposed project would include telecommunications/signals from distribution lines to building services and would include minor telecommunications improvements such as undergrounding telephone lines in previously disturbed areas.

Therefore, the proposed project would be consistent with the utilities services analysis and determination in the 2021 LRDP EIR; and project impacts to utilities services would remain **less than significant**.

b) The 2021 LRDP EIR states that full buildout of the 2021 LRDP would result in a net increase in water demand on the campus, and that this increase is accounted for in the RPU's 2015 UWMP. At the time of the preparation of the 2021 LRDP EIR, RPU was updating its UWMP for 2020 but had not yet released the plan. The UWMP is required to be updated every five years to meet requirements of the California Water Code. While the 2015 UWMP estimated 95,221 acre feet per year (AFY), the actual demand in 2020 was 81,338 AFY (RPU 2021). The 2020 UWMP anticipates a supply average of approximately 23,000 AFY greater than demand for normal, one dry year, and multiple dry years until the year 2045 (RPU 2021). The 2021 LRDP anticipates an 825 AFY increase in potable water consumption at the anticipated buildout year of 2035/2036. Impacts were determined to be less than significant.

Implementation of the proposed project would increase potable water usage on the campus; however, not beyond levels anticipated in the 2021 LRDP EIR, and any increase in potable water usage from the proposed project is accounted for within the 2020 UWMP. Additionally, RPU provided a future water demand letter during the 2021 LRDP EIR efforts which noted that it anticipates RPU will have adequate water supplies to meet UCR's proposed 2021 LRDP increased demand. Furthermore, the proposed project would comply with the UC Policy on Sustainable Practices by including minimum LEED Silver features in project design. Therefore, the proposed project would be consistent with the water demand analysis and determination in the 2021 LRDP EIR; and proposed project impacts to water demand and use would remain **less than significant**.

c) The 2021 LRDP EIR states that wastewater generated by full buildout of the 2021 LRDP would be treated at the RWQCP, which has adequate capacity to serve the 2021 LRDP's anticipated wastewater generation in addition to existing treatment commitments. Impacts were determined to be less than significant.

Project implementation would increase the amount of on-campus building space and wastewater generation. However, the proposed project would connect to existing sewer systems which would be treated by the RWQCP. The design capacity of the RWQCP is 46 MGD, which is well above the anticipated 39 MGD wastewater flow by the year 2037. The 2021 LRDP approximates a per-capita wastewater generation rate of approximately 20 gallons per person per day. As discussed in Section 4.1.14, *Population and Housing*, the proposed project would accommodate an increase of approximately 570 students and 125 faculty and staff, resulting in an approximately 13,900 gallons per day increase of wastewater generation, or approximately 5,073,500 gallons per year. This increase is within the treatment capacity at the RWQCP facility. Therefore, the proposed project would be consistent with the wastewater analysis and determination in the 2021 LRDP EIR; and proposed project impacts to wastewater treatment would remain **less than significant**.

d, e) The 2021 LRDP EIR states that the 2021 LRDP would not generate solid waste in excess of State or local standards, or in excess of the existing infrastructure capacity. Furthermore, the 2021 LRDP would not impair UCR's attainment of solid waste reduction goals, and projects under the 2021 LRDP would comply with federal, State, and applicable local statutes and regulations pertaining to solid waste. Impacts were determined to be less than significant.

Project implementation would require demolition and grading activities that would produce excavated soils, green waste, asphalt/concrete, and other construction and demolition waste. Project operations would contribute to additional non-recyclable/non-reusable waste which would be deposited at the CR&R Perris Transfer Station and Material Recovery Facility which has a maximum permitted daily capacity of approximately 3,287 tons per day. Project grading is expected to produce approximately 700 tons of debris which is well within the daily permitted capacity of the facility. Additionally, the handling of all debris and waste generated during construction would be subject to latest California Green Building Standards Code (CalGreen) requirements and the California Integrated Waste Management Act of 1989.

Project operations would result in an increase of solid waste generation, but the proposed project's anticipated increase of 570 students and 125 faculty and staff would generate approximately 1.62 tons per day. This value is well within the anticipated 9.7 tons per day of solid waste anticipated within the 2021 LRDP, and these values do not account for UCR's waste/source reduction and recycling program which includes sorting and separating wastes and the expansion of composting procedures. UCR implements a waste/source reduction and recycling program that includes sorting and separating wastes to simplify the removal of recyclable materials and the expansion of composting procedures associated with landscaping and agriculture to reduce the solid waste flow. The campus has constructed a transfer station on the West Campus north of Parking Lot 30, where UCR collects the recyclables and waste on campus, including from the project site, and delivers these materials to the transfer station for hauling. A third-party vendor picks up the recyclable material for recycling. UCR delivers waste in UCR haul trucks to the Nelson Transfer Station from which Burrtec Waste Industries then transports 100 percent of the non-recyclable material to waste-to-energy facility. UCR composts all green waste on campus.

The proposed project would implement features of the UC Policy on Sustainable Practices which directs UCR to reduce total per capita municipal solid waste generation by 25 percent and 50 percent from 2015/2016 levels by 2025 and 2030, respectively. The proposed project would comply with all federal, State, and UC statues and regulations related to solid waste. The proposed project would not generate solid waste in excess of State or local standards or negatively impact the provision of solid waste services or impair attainment of solid waste goals, and the proposed project would comply with all federal, State, and local management regulations related to solid waste. Therefore, the proposed project would be consistent with the solid waste management analysis and determination in the 2021 LRDP EIR; and proposed project impacts to solid waste management would remain **less than significant**.

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4.1.20 Wildfire

Section 4.18 of the 2021 LRDP EIR addresses impacts to wildfire and concludes that impacts to wildfire would be less than significant with implementation of Continuing Best Practice **(CBP) WF-1, CBP WF-2**, and **MM WF-1**. Implementation of the CBPs and MM would reduce future impacts related to wildfire to less than significant levels.

The above mentioned CBPs and MM state the following:

CBP WF-1 Construction – Traffic Control: To the extent feasible, the campus shall maintain at least one unobstructed lane in both directions on campus roadways. At any time only a single lane is available, the campus shall provide a temporary traffic signal, signal carriers (i.e., flag persons), or other appropriate traffic controls to allow travel in both directions. If construction activities require the complete closure of a roadway segment, the campus shall provide alternate routes and appropriate signage.

CBP WF-2 Construction – Alternative Travel Routes: Prior to campus construction activities and/or roadway closures, the Campus Fire Marshal, as delegated by the State Fire Marshal, and in cooperation with the City of Riverside Fire Department shall ensure that adequate access for emergency vehicles is provided or identify alternative travel routes.

MM WF-1: UCR shall incorporate into its Emergency Operations and Response Plan erosion control measures to be deployed in the event of a catastrophic wildfire. Erosion control measures shall be implemented as soon as possible after the event and shall include one or more of the following, as applicable:

- Install mulch to cover the soil and reduce rain drop impact, overland flow, and soil particle movement. This can be certified weed-free straw, slash, and geotextile fabrics and should be installed as quickly as possible after the fire event.
- Apply hydro-mulch mixture of water, fiber mulch, and tackifier on burned slopes to prevent soil erosion and foster revegetation. Seed, fertilizer, or soil stabilizing polymers can also be applied with the hydro-mulch.
- Implement aerial seeding of grasses or legumes with a layer of straw mulch over seeded grasses. Ensure the mix of seed includes native grasses and plants with value for local wildlife.

WILDFIRE

If located in or near State Responsibility Area or lands classified as Very High Fire Hazard Severity Zone (VHFHSZ), would the Project:	Impact Examined in 2021 LRDP EIR	Impact Not Examined in 2021 LRDP EIR: No Impact	Impact Not Examined in 2021 LRDP EIR: Less-than-Significant Impact	Impact Not Examined in 2021 LRDP EIR: Potentially Significant Impact
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	☒	☐	☐	☐
b) Exacerbate wildfire risks due to slope, prevailing winds, and other factors 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?	☒	☐	☐	☐

a) The 2021 LRDP EIR states that implementation of the 2021 LRDP could result in temporary lane or roadway closures on the edges of and within the campus during construction activities. Operation of new facilities developed under the 2021 LRDP would not substantially impair an adopted emergency response or evacuation plan.

As shown on Figure 4.18-1, Area Fire Hazard Severity Zones, in the 2021 LRDP EIR, the SBB Project Boundary and Biocontrol Building Replacement Site is located within a VHFHSZ in Local Responsibility Area (CAL FIRE 2009). The proposed project would be developed on a site that has access from South Campus Drive, Citrus Drive, and College Place. As stated in the 2021 LRDP EIR, roadways within the campus are not designated evacuation routes in the City's General Plan Public Safety Element. Therefore, construction and operation of the proposed project would not substantially alter or otherwise interfere with evacuation routes or public rights of-way, although project construction could result in temporary road closures on- and off campus. Consistent with the 2021 LRDP EIR, the proposed project would be required to comply with the UCR Emergency Operations Plan/Emergency Action Plan (UCR 2016) and to develop and maintain a construction management plan that should include information related to truck route details, potential road closures/detours, and emergency access. The Campus Fire Marshal would review this plan along with all plans during the plan review process to ensure adequate ingress/egress of emergency vehicles on the project site during construction activities and adequate fire lanes and access as well as adequate fire protection (e.g., fire hydrants, sprinklers) with development of the proposed project. Impacts were determined to be less than significant.

Operation of the proposed project would not alter or interfere with public rights-of-way and would provide access for emergency response vehicles to the SBB Project Boundary and Biocontrol Building Replacement Site. Development and construction of the SBB, Biocontrol

Building, and Genomics Shed would comply with CBC/California Fire Code and with all existing regulations for on-site vegetation and fuel management to maintain clearance around the proposed buildings and structures. Therefore, the proposed project would be consistent with the emergency response and evacuation plan analysis and determination in the 2021 LRDP EIR; and proposed project impacts would remain **less than significant**.

Though no MMs are required for the 2021 LRDP, UCR has included **CBP WF-1 and CBP WF-2** as noted in Section 4.1.19 to ensure traffic controls and alternative travel routes are available during construction activities. These CBPs, as included in the 2021 LRDP EIR, would apply to the proposed project.

b) The 2021 LRDP EIR concludes that construction and operation of future development projects in the East Campus area have a less than significant impact from wildfire pollutants. This is primarily because most areas of the East Campus that are within the VHFHSZ have been designated as Open Space Reserve and UCR Botanic Gardens under the 2021 LRDP which limits development within these areas. Other areas where future campus development could occur would be on relatively flat or slightly hilly areas of the campus rather than in steep and vegetated slopes, which have a greater risk of fire hazards. Future development under the 2021 LRDP would be primarily infill projects and would be required to follow most current fire code and safety standards.

As shown on Figure 4.18-1, Area Fire Hazard Severity Zones, in the 2021 LRDP EIR, the SBB Project Boundary and Biocontrol Building Replacement Site is located within a VHFHSZ in Local Responsibility Area (CAL FIRE 2009). The construction and operation of the proposed project would be an infill development project on the campus and would be subject to UCR's wildfire prevention actions, such as fuel clearance and new Fire Codes; thus providing increased fire safety and reducing the potential for wildfire risk. The proposed SBB would be constructed on an existing parking lot and would involve the demolition of existing structures; the proposed Biocontrol Building would be constructed on an existing landscaped area surrounded by academic facilities; and the proposed Genomics Shed would be constructed on previously disturbed area either south or west of the water-storage basin. The plant material for the proposed project would generally consist of native and adaptive species that require low water use and low maintenance and any proposed plant list would be consistent with the Campus Design and Construction Standards; UCR Facilities Services – Landscape Services would review and approve all tree and plant palettes to ensure the selected species are acceptable tree and plant materials given the proximity to the Open Space Reserve area.

The Campus Fire Marshal would ensure that there is proper storage, handling, and use of any hazardous materials during construction activities. Additionally, construction activities would be required to follow fire safety protocols including but not limited to on-site fire extinguishing equipment and compliance with Fire Code Chapter 33, and all construction equipment would be subject to standard operating procedures that would limit sources of ignition that could generate a wildfire. The proposed project would also have to be designed and constructed in adherence to Campus Construction and Design Standards and building codes, including the UCR Fire Prevention and Life Safety Policy and would be subject to Fire Code review and inspection by UCR's Building and Safety Division, Fire Prevention, EH&S, Office of Emergency Management, the Campus Fire Marshal, and/or other applicable UCR departments and staff. This includes approval of plans and specifications to verify compliance with applicable codes including updated fire safety standards. The proposed project includes fire protection (e.g., fire hydrants, fire sprinklers) and fire access for emergency vehicles. The proposed project would therefore not exacerbate wildfire risks over existing conditions related to exposing project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire. Therefore, the proposed project would be consistent with the wildfire risk analysis and determination in the 2021 LRDP EIR; and proposed project impacts would remain **less than significant**.

c) The 2021 LRDP EIR states that new or updated infrastructure would be concentrated on developed portions of the campus, and that the installation of underground utilities would ensure fire risks from buildout of the 2021 LRDP would be less than significant.

As shown on Figure 4.18-1, Area Fire Hazard Severity Zones, in the 2021 LRDP EIR, the SBB Project Boundary and Biocontrol Building Replacement Site is located within a VHFHSZ in Local Responsibility Area(CAL FIRE 2009). The proposed project entails the construction of the SBB on a site already developed with an existing parking lot and support buildings, the construction of the Biocontrol Building on an existing landscaped area surrounded by academic facilities, and the construction of the Genomics Shed on previously disturbed area either south or west of the water-storage basin. The proposed SBB can be accessed from South Campus Drive and College Place, the proposed Biocontrol Building can be accessed from Citrus Drive and Science Walk, and the proposed Genomics Shed can be accessed from College Place.

Development of the proposed project would include new pedestrian pathways, pick-up/drop-off area, accessible parking, fire and service access, underground utility connections, emergency water sources, fuel breaks, and other associated infrastructure. Future access connections to the project sites would be developed at these existing roadways and these roadways would remain with implementation of the proposed project. All utilities connections needed to serve the proposed project would be installed in accordance with the current building codes and safety standards to reduce the risk of fires. New electrical connections would be installed underground in accordance with UCR Campus Construction and Design Standards. The existing and proposed fire hydrants, standpipes, and fire sprinklers in buildings would reduce fire risk by providing increased access to emergency services and fire protection. All of these measures, in addition to **CBP WF-1 and CBP WF-2**, would minimize potential fire risks on the campus and the proposed project would have less than significant impacts related to infrastructure that exacerbates fire risk. Therefore, the proposed project would be consistent with the wildfire risk management analysis and determination in the 2021 LRDP EIR; and proposed project impacts to wildfire risk management would remain **less than significant**.

d) The 2021 LRDP EIR concludes that slope stability hazards are considered negligible on UCR's campus due to its very flat to moderately flat topography. Even areas of the East Campus, though adjacent to natural hillsides, have low landslide risks due to the alluvial soils and bedrock that underlie most of the campus. The 2021 LRDP EIR incorporates **MM WF-1** to minimize landslide risks to a less than significant impact.

As shown on Figure 4.18-1, Area Fire Hazard Severity Zones, in the 2021 LRDP EIR, the SBB Project Boundary and Biocontrol Building Replacement Site is located within a VHFHSZ in Local Responsibility Area(CAL FIRE 2009). The proposed SBB would be constructed on an existing parking lot; the proposed Biocontrol Building would be constructed on an existing landscaped area surrounded by academic facilities; and the proposed Genomics Shed would be constructed on previously disturbed area either south or west of the water-storage basin. Although the proposed SBB and Genomics Shed would be located in proximity to the Open Space Reserve area that has steep slopes, the proposed building and structure would be set back and comply with all the requirements from the Geotechnical Report. Additionally, all project construction activities would have to comply with NPDES requirements and prepare and implement a SWPPP for site stormwater discharges; which would further ensure that the proposed project would not destabilize soils such that there are significant risks from post-fire landslides or debris flow. Should slope stability be compromised on the project sites due to a severe wildfire, **MM WF-1** would ensure that impacts from potential landslides and excessive erosion would be less than significant. Therefore, the proposed project would be consistent with the slope stability and post-fire management analyses and determination in the 2021 LRDP EIR; and proposed project impacts to slope stability and post-fire management would remain **less than significant** with incorporation of **MM WF-1**.

4.1.21 Mandatory Findings of Significance

	Impact Examined in 2021 LRDP EIR	Impact Not Examined in 2021 LRDP EIR		
		No Impact	Less-than-Significant Impact	Potentially Significant Impact
a) Does the project have the potential to substantially 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 considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☒	☐	☐	☐
c) Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	☒	☐	☐	☐

a) All applicable MMs identified in the 2021 LRDP EIR to avoid and reduce impacts will be integrated into the proposed project and with the integration of these measures, the proposed project would not substantially degrade the quality of the environment. As described in Section 4.1.4, *Biological Resources*, of this Addendum, the proposed project would not significantly affect fish or wildlife habitat or species. The project site is developed and/or previously disturbed and mostly devoid of sensitive biological resources, except potential nest trees and roost structures for burrowing owls, nesting birds, and bat, which would be addressed by 2021 LRDP EIR MMs. Per **MM BIO-1A**, **MM BIO-2**, **and MM BIO-4**, the proposed project would be reviewed during the planning process to determine if it would directly impact burrowing owls, nesting birds, or bats. If any of these wildlife species are determined to be present on the project site, subsequent measures, such as avoidance, passive relocation, temporary noise barriers, etc. outlined in **MM BIO-1B, MM BIO-2, and MM BIO-4** would be implemented. Impacts to biological resources would have **less than significant impacts with mitigation incorporated** and would be consistent with the biological resources analysis evaluated in the 2021 LRDP EIR.

As described in Section 4.1.5, *Cultural Resources,* of this Addendum, the SBB project site is adjacent to one historical resource – Anderson Hall. As the 2021 LDRP EIR states, impacts to historical resources are evaluated by determining the potential for development to impair material such that a historic resource eligible for listing in the CRHR would no longer be eligible for the National Register of Historic Places or local historical registers. While pedestrian pathway improvements adjacent to Anderson Hall were potentially considered a “major exterior alteration”, as defined in **MM CUL-1**, a memorandum and subsequent historical resources impact screening determined that the proposed project does not include any direct physical impacts to Anderson Hall itself, which would continue to be used for its historic purpose as an institutional building. The proposed project would not remove or modify the alignment of South Campus Drive or the eastern ancillary road such that they will no longer define historical property boundaries of Anderson Hall. Additionally, project elements within the Anderson Hall property boundary are anticipated to be concentrated at the rear and south/southeast spaces of the property, which is not considered highly character-defining or visible from westerly-facing elevations. For these reasons, the proposed project would have a **less than significant impact** on historical resources and would be consistent with the cultural resources analysis evaluated in the 2021 LRDP EIR. In addition, the proposed project avoids the Open Space Reserve areas thus avoiding the southeast hills where on-campus archaeological resources are most likely to be encountered. Nonetheless, due to the SBB Project Boundary’s proximity to the Open Space Reserve, monitoring would occur during ground disturbing construction activities to monitor for unknown archaeological resources, tribal cultural resources, and paleontological resources. UCR’s standard contract specifications address the protection and recovery of buried archaeological resources, including human remains, and paleontological resources as noted in **MM CUL-2 through MM CUL-4, MM GEO-1, and MM GEO-2**. These measures identify steps to be taken in the event archaeological resources, tribal cultural resources, including human remains, and paleontological resources are discovered during ground disturbing activities. As such, the proposed project would have a **less than significant impact with mitigation incorporated** on archaeological resources, tribal cultural resources, and paleontological resources and would be consistent with these resource analysis evaluated in the 2021 LRDP EIR.

b) The 2021 LRDP EIR identifies cumulatively significant impacts to aesthetics (impacts to scenic vistas), agriculture (loss of Farmland), air quality (contribution of ROG and NO_x from construction emissions; contribution of ROG, NO_x and PM_{10} from operational emissions), cultural resources (impacts to historical resources), noise (construction noise), and transportation (intersection queuing). As part of implementing the 2021 LRDP, the proposed project would contribute to some of these **significant and unavoidable cumulative impacts**, such as air quality, noise, and transportation. However, the proposed project is within the scope of campus development and population evaluated in the 2021 LRDP EIR, as noted in Section 3 of this Addendum.

These impacts were also addressed in the Findings and Statement of Overriding Considerations adopted by the Regents with their certification of the 2021 LRDP EIR. No conditions have changed, and no new information has become available since certification of the 2021 LRDP EIR that would alter the previous analysis. No additional mitigation is required to reduce the project’s contribution to these previously identified impacts.

c) As described above, the proposed project would incrementally contribute to cumulative air quality (ROG and NO_x from construction emissions and contribution of ROG, NO_x, and PM_{10} during operational emissions) and construction noise which was identified as significant and unavoidable as well as cumulatively significant in the 2021 LRDP EIR. The project’s construction and operation emissions are within the scope of impacts examined in the 2021 LRDP EIR. These impacts were also addressed in the Findings and Statement of Overriding Considerations adopted by the Regents in connection with their approval of the 2021 LRDP EIR.

Project-generated air quality impacts would not result in substantial adverse effects on human beings beyond those analyzed in the 2021 LRDP EIR. No conditions have changed, and no new information has become available since certification of the 2021 LRDP EIR that would alter this analysis. The proposed project would incorporate the relevant 2021 LRDP EIR mitigation measures noted in Section 4.1 of this Addendum. No additional mitigation is available to reduce the project's contribution to these impacts. Other impacts with the potential to affect human beings were determined to be less than significant.

5 APPLICABLE MITIGATION MEASURES

The following MMs from the certified 2021 LRDP EIR Mitigation Monitoring and Reporting Program would be applicable to the impacts associated with the proposed project. No new significant impacts or increased severity in impacts that were not analyzed in the 2021 LRDP EIR have been identified; therefore, no additional project-specific mitigation is required.

5.1 AESTHETICS

MM AES-1: UCR shall incorporate site-specific consideration of the orientation of the building, use of landscaping materials, lighting design, and choice of primary façade materials to minimize potential off-site spillover of lighting and glare from new development. As part of this measure and prior to project approval, UCR shall require the incorporation of site- and project-specific design considerations (to be included in the lighting plans) to minimize light and glare, including, but not limited to, the following:

- New outdoor lighting adjacent to on-campus residences and adjacent off-campus sensitive uses shall utilize directional lighting methods with full cutoff type light fixtures (and shielding as applicable) to minimize glare and light spillover.
- All elevated light fixtures such as in parking lots, parking structures, and athletic fields shall be shielded to reduce glare.
- Provide landscaped buffers where on-campus student housing, uses identified as Open Space Reserve and UCR Botanic Gardens, and off-campus residential neighborhoods might experience noise or light from UCR activities.
- All lighting shall be consistent with the Illuminating Engineering Society of North America (IESNA) Lighting Handbook.
- The UCR Planning, Design, & Construction staff shall review all exterior lighting design for conformance with the Campus Design and Construction Standards.

Verification of inclusion in project design shall be provided at the time of design review and lighting plans shall be reviewed and approved prior to project-specific design and construction document approval.

5.2 AIR QUALITY

Please refer to **MM GHG-1** (Measures EN1, FL1, TR2 through TR4, WC1, and CR1) in Section 5.7.

5.3 BIOLOGICAL RESOURCES

MM BIO-1A Burrowing Owl Preconstruction Survey: Prior to construction activities, preconstruction presence/absence surveys for burrowing owls shall be conducted in the project survey area where suitable habitat is present prior to ground disturbance in new areas. Preconstruction surveys shall be conducted by a qualified biologist no more than 30 days prior to grading or other significant site disturbance. Surveys shall include the development footprint and consider up to a 500-foot buffer of adjacent areas to the extent feasible (e.g., a visual survey of adjacent areas will suffice for off-site areas not accessible). The surveys shall be conducted in accordance with the MSHCP burrowing owl survey guidelines. A burrow shall be considered occupied when there is confirmed use by burrowing owls based on observations made by a qualified biologist. If owls are not found to be occupying habitat in the survey area during the preconstruction survey, the proposed disturbance activities may proceed. Take of active nests shall be avoided.

MM BIO-1B Burrowing Owl Avoidance Measures: If owls are discovered on and/or within 500 feet of the proposed project site, avoidance measures shall be developed by the qualified biologist in compliance with the MSHCP and in coordination with the CDFW and/or RCA. Such measures will include, but not limited to, the following:

- Burrowing owls shall not be disturbed on-site and/or within a 500-foot buffer or as determined by a biologist between February 1 and August 31 to avoid impacting nesting.
- Prior to any ground disturbance, all limits of project construction shall be delineated and marked to be clearly visible to personnel on foot and in heavy equipment. All construction-related activities shall occur inside the limits of construction and designated staging areas. Construction staging and equipment storage shall be situated outside of any occupied burrowing owl burrow locations. All construction-related movement shall be restricted to the limits of construction and staging areas.
- Avoidance measures shall include passive relocation by a qualified biologist to remove the owls between September 1 and January 31, which is outside of the typical nesting season.

MM BIO-2 Nesting Bird Avoidance: Prior to issuance of grading permits, the following measures shall be implemented:

- To avoid disturbance of nesting and special-status bird species protected by the MBTA and California Fish and Game Code, activities related to the project, including but not limited to, vegetation removal, ground disturbance, and construction and demolition shall occur outside of the bird breeding season (February 15 through August 31). If construction must be initiated during the peak nesting season, vegetation removal and/or tree removal should be planned to occur outside the nesting season (September 1 to February 14), and a preconstruction nesting bird survey shall be conducted no more than 3 days prior to initiation of construction activities. The nesting bird preconstruction survey shall be conducted on foot inside the project site disturbance areas. If an active avian nest is discovered during the preconstruction clearance survey, construction activities shall stay outside of a 50- to 200-foot buffer for common nesting birds around the active nest, as determined by a biologist. For listed and raptor species, this buffer shall be expanded to 500 feet or as determined by a biologist.
- Inaccessible areas shall be surveyed from afar using binoculars to the extent practical. The survey shall be conducted by a qualified biologist familiar with the identification of avian species known to occur in western Riverside County. If nests are found, an appropriate avoidance buffer shall be determined by a qualified biologist and demarcated by a qualified biologist with bright orange construction fencing, flagging, construction lathe, or other means to mark the boundary. Effective buffer distances are highly variable and based on specific project stage, bird species, stage of nesting cycle, work type, and the tolerance of a particular bird pair. The buffer may be up to 500 feet in diameter, depending on the species of nesting bird found and the biologist's observations.
- If nesting birds are located adjacent to the project site with the potential to be affected by construction activity noise above 60 dBA Leq (see Section 4.11, Noise, of the LRDP EIR for definitions and discussion of noise levels), a temporary noise barrier shall be erected consisting of large panels designed specifically to be deployed on construction sites for reducing noise levels at sensitive receptors. If 60 dBA Leq is exceeded, an acoustician would require the construction contractor to make operational and barrier changes to reduce noise levels to 60 dBA during the breeding season

(February 15 through August 31). Noise monitoring shall occur during operational changes and installation of barriers to ensure their effectiveness. All construction personnel shall be notified as to the existence of the buffer zone and to avoid entering the buffer zone during the nesting season. No parking, storage of materials, or construction activities shall occur within this buffer until the avian biologist has confirmed that breeding/nesting is completed, and the young have fledged the nest. Encroachment into the buffer shall occur only at the discretion of the qualified biologist, if it is determined such encroachment will not adversely impact the nesting birds.

MM BIO-3 Bird Strike Avoidance: To reduce bird strike mortality and injury of special-status bird species from collisions with clear and reflective sheet glass and plastic, construction of glass-fronted buildings or other structures using exposed glass (e.g., glass-topped walls) shall incorporate measures to minimize the risk of bird strikes. This may include: (1) the use of opaque or uniformly textured/patterned/etched glass, (2) angling of glass downward so that the ground instead of the surrounding habitat or sky is reflected, (3) installation of one-way film that results in opaque or translucent covering when viewed from either side of the glass, (4) installation of a uniformly dense dot pattern created as ceramic frit on both sides of the glass, and/or (5) installation of a striped or grid pattern of clear ultraviolet-reflecting and ultraviolet-absorbing film applied to both sides of the glass. It should be noted that single decals (e.g., falcon silhouettes or large eye patterns) are ineffective and are not recommended unless the entire glass surface is uniformly covered with the objects or patterns.

MM BIO-4 Bat Preconstruction Survey: To avoid disturbance of special-status bat species during maternity season (approximately March through September), a preconstruction roosting bat survey shall be conducted by a qualified bat biologist on potential roost structures identified by the bat biologist and mature vegetation no more than 30 days prior to initiation of construction activities if construction activities must occur during the roosting season. If future projects would impact rocky outcrops, mature vegetation, existing buildings, or other structures that could be used for roosting, a passive acoustic survey shall identify the species using the area for day/night roosting. If special-status roosting bats are present and their roosts would be impacted, a qualified bat biologist should prepare a plan to identify the proper exclusionary methods. Removal of mature trees should be monitored by a qualified bat biologist and occur by pushing down the entire tree (without trimming or limb removal) using heavy equipment and leaving the felled tree on the ground untrimmed and undisturbed for a period of at least 24 hours. To exclude bats from buildings/structures or rocky outcrops, exclusion measures should be installed on crevices by placing one-way exclusionary devices that allow bats to exit but not enter the crevice.

MM BIO-6A Sensitive Communities Indirect Impact Avoidance – Construction: The following measure shall be required for construction activities that are proposed adjacent to the Open Space Reserve or lands supporting sensitive vegetation communities and/or biological resources:

- Prior to commencement of clearing or grading activities, fencing (e.g., silt fencing, orange construction fencing, and/or chain-link fencing as determined by campus planning) shall be installed around the approved limits of disturbance to prevent errant disturbance of sensitive biological resources by construction vehicles or personnel. All movement of construction contractors, including ingress and egress of equipment and personnel, shall be limited to designated construction zones. This fencing shall be removed upon completion of all construction activities.
- No temporary storage or stockpiling of construction materials shall be allowed in Open Space Reserve lands, and all staging areas for equipment and materials shall be located at least 50 feet where space permits on the site, or less as determined appropriate by a qualified biologist from the edge of these areas. This prohibition shall not be applied to facilities that are planned to traverse

Open Space Reserve lands (e.g., trails and utilities). Staging areas and construction sites in proximity to the Open Space Reserve lands shall be kept free of trash, refuse, and other waste; no waste dirt, rubble, or trash shall be deposited in these areas.

- Appropriate setbacks or barriers (e.g., fencing) shall be implemented to minimize human activity impacts. Buffer areas shall be vegetated with native species to help screen these indirect effects.
- Active construction areas shall be sprayed with water periodically to minimize dust.
- Equipment to extinguish small brush fires (e.g., from trucks or other vehicles) shall be present on-site during all phases of project construction activities, along with personnel trained in the use of such equipment. Smoking shall be prohibited in construction areas adjacent to flammable vegetation.
- Temporary night lighting shall not be used during construction unless determined to be absolutely necessary (e.g., time sensitive construction activities). If night lighting is necessary, lights shall be directed away from sensitive vegetation communities and lands designated as Open Space Reserve and shielded to minimize temporary lighting of the surrounding habitat.

MM BIO-6B Sensitive Communities Indirect Impact Avoidance – Operation: The following measure shall be required for operation activities adjacent to the Open Space Reserve or lands supporting sensitive vegetation communities and/or biological resources:

- Landscaping adjacent to Open Space Reserve lands shall comply with the following requirements to prevent the introduction of invasive species:
  - Appropriate landscaping shall be selected based on the vegetation communities in the portion of the Open Space Reserve adjacent to the project. In areas supporting native (or disturbed native) vegetation communities, revegetation of impacted slopes shall be with appropriate native plant materials.
- Permanent lighting in or adjacent to Open Space Reserve lands shall be selectively placed, shielded, and directed to minimize potential impacts to sensitive species. In addition, lighting from buildings or parking lots/structures abutting Open Space Reserve lands shall be shielded and/or screened by vegetation to the extent feasible.
- The following best management practices shall be implemented in Open Space Reserve lands and in areas that interface with Open Space Reserve lands to address runoff/water quality impacts from landscaping:
  - Integrated Pest Management principles (UC Integrated Pest Management Program) shall be implemented to the extent practicable for chemical pesticides, herbicides, and fertilizers. Examples of such measures may include, but are not limited to, alternative weed/pest control measures (e.g., removal by hand) and proper application techniques (e.g., conformance to manufacturer specifications and legal requirements).
  - Irrigation for project landscaping shall be minimized and controlled through efforts such as designing irrigation systems to match landscaping water needs, using sensor devices to prevent irrigation during and after precipitation, and using automatic flow reducers/shut-off valves that are triggered by a decrease in water pressure from broken sprinkler heads or pipes.
- Barriers (e.g., fencing or walls) and/or signage directing people away from sensitive vegetation communities and habitat shall be installed on designated pathways and trails in and adjacent to Open Space Reserve lands to minimize unauthorized human activity. Barriers (e.g., fencing or walls)

shall consist of an approximately 3-foot-high wooden barrier. Chain-link fencing shall not be used for barrier.

- Projects adjacent to Open Space Reserve lands shall install signage along the boundary of the Open Space Reserve lands, indicating the presence of lands supporting sensitive habitat.
- Projects adjacent to Open Space Reserve lands shall install fencing or other visual/physical barriers (such as appropriate landscaping) to discourage human encroachment into the Open Space Reserve lands in areas where trespass is likely to occur (gradual slopes; areas of low, open vegetation; areas of previous disturbance, etc.).

5.4 CULTURAL RESOURCES

MM CUL-1 Protection of Historical Resources: For purposes of MM CUL-1, "major exterior alterations" indicates a significant alteration/change to the exterior character-defining features or setting of a building or structure. Such projects might include, but not be limited to, additions, partial or complete demolition, relocation, window frame replacement different from existing, modifications to wall sheathing materials, changes to the roof shape, pitch, eaves, and other features, installment of wheelchair access ramps, and/or changes to the overall design configuration and composition of the building and the spatial relationships that define it. Major exterior alterations would require consultation to determine if these alterations noted above constitutes a major exterior alteration requiring further review from an architectural historian or whether the proposed alterations would qualify as a minor exterior alteration.

For purposes of MM CUL-1, "minor exterior alterations" indicates a minor alteration/change to the exterior of a building or structure and its setting that would not be likely to significantly alter its appearance. Such projects might include, but not be limited to, repainting, in-kind landscaping or hardscaping replacement, window pane replacement, reversible installation of HVAC units that does not obstruct or destroy character-defining features, installation of fencing, signage, or artwork that does not obstruct or destroy character-defining features. Minor exterior alterations are exempt from further review from an architectural historian.

During project-specific environmental review of development under the proposed 2021 LRDP, UCR shall define the project's area of effect for historic buildings and structures as early as possible. UCR shall implement the following procedures:

- Conduct project-specific surveys for buildings or structures (e.g., proposed for demolition, major exterior alterations, additions) that are 50 years of age or older that have (1) not been subject to an evaluation within the past 5 years, or (2) were not previously evaluated in the UCR Historic Resources Survey Report.
    - UCR shall retain a qualified architectural historian to record the property at professional standards and assess its significance under CEQA Guidelines Section 15064.4. The evaluation process shall include the historic context framework included in the UCR Historic Resources Survey Report as well as the development of additional background research as needed in order to assess the significance of the building, structure, district, or cultural landscape in the history of the UC system, the campus, and the region. For historic buildings, structures or features that do not meet the CEQA criteria as a historical resource, no further mitigation is required, and the impact would be less than significant.
    - The assessment of the potential historical resource and its character-defining features shall be documented on the appropriate California Department of Parks and Recreation (DPR) 523 forms

by a qualified architectural historian meeting the Secretary of the Interior's Professional Qualifications Standards (as codified in 36 CFR Part 61).

- For projects affecting any eligible historic buildings identified in the UCR Historic Resources Survey Report or determined to be eligible during the project-specific surveys, for a building or structure that qualifies for listing on the NRHP and/or CRHR, UCR shall implement the following procedures:
  - For major exterior repairs (different from that of existing), alterations, or building additions of buildings that are eligible historic resources, UCR shall retain a qualified architectural historian meeting the Secretary of the Interior's Professional Qualifications Standards (as codified in 36 CFR Part 61) to conduct Character-Defining Features and Impacts Screening in coordination with the design team to consider project design features and/or measures that would enable the project to avoid direct or indirect impacts to the building or structure. Conclusion of the screening consultation process shall be documented in a memorandum, including a statement of compliance with the Secretary's Standards. The purpose of the memorandum shall document avoidance/reduction of significant adverse impacts to historical resources, where feasible, through (1) identifying and documenting character-defining features, noncontributing elements/additions, and (2) providing historic preservation project review and preliminary impacts analysis screening to UCR as early as possible in the design process. The memorandum shall review preliminary and/or conceptual project objectives early in the design process and describe various project options capable of reducing and/or avoiding significant adverse direct or indirect impacts through compliance with the Secretary's Standards and/or application of the State Historic Building Code or any subsequent design guidelines prepared by UCR for the treatment of historic resources.

If major modifications, renovations, or relocation of a determined historic resource is proposed and the project is unable to comply with the Secretary's Standards or when a historic resource is to be demolished, then UCR shall ensure that documentation shall be carried out by a qualified architectural historian, as follows:

- UCR shall commission the preparation of HABS-like documentation of the building, structure, district, feature, and its associated landscaping and setting prior to construction activities. The HABS-like package will document in photographs and descriptive and historic narrative the historical resources slated for modification/demolition. Documentation prepared for the package will draw upon primary- and secondary-source research and available studies previously prepared for the project.
- The specifications for the HABS-like package follow:
  - Photographs: Photographic documentation will focus on the historical resources/features slated for demolition, with overview and context photographs for the campus and adjacent setting. Photographs will be taken of the building using a professional-quality single lens reflex (SLR) digital camera with a minimum resolution of 10 megapixels. Photographs will include context views, elevations/exteriors, architectural details, overall interiors, and interior details (if warranted). Digital photographs will be provided in electronic format.
  - Descriptive and Historic Narrative: The architectural historian will prepare descriptive and historic narrative of the historical resources/features slated for demolition. Physical descriptions will detail each resource, elevation by elevation, with accompanying photographs, and information on how the resource fits within the broader campus during its period of significance. The historic narrative will include available information on the campus design, history, architect/contractor/designer as appropriate, area history, and historic context. In

addition, the narrative will include a methodology section specifying the name of researcher, date of research, and sources/archives visited, as well as a bibliography. Within the written history, statements shall be footnoted as to their sources, where appropriate.

- Historic Documentation Package Submittal: The electronic package will be assembled by the architectural historian and submitted to UCR for review and comment.

- A copy of the HABS-like package shall be offered to the Special Collections and University Archives at the Tomás Rivera Library and the California Historical Resources Information System. The record shall be accompanied by a report containing site-specific history and appropriate contextual information. This information shall be gathered through site-specific and comparative archival research, and oral history collection as appropriate.
- If preservation and reuse at the site are not feasible, the historical building shall be documented as described above.

For new infill construction within the Mid-Century Modern Core Historic District that does not involve building demolition:

- Infill projects outside of the Mid-Century Modern Core Historic District would not need review by an architectural historian.
- Infill projects within the Mid-Century Modern Core Historic District will require review by an architectural historian for elements such as form, massing, and scale, to ensure visual compatibility with the historic district, and the review shall be conducted in compliance with the Secretary of the Interior's Standards for the Treatment of Historic Properties with *Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings* (Weeks and Grimmer 1995).

MM CUL-2 Tribal Cultural Resources/Archaeological Monitoring: Prior to commencement of ground disturbing activities into an area with a medium or high potential to encounter undisturbed native soils including Holocene alluvium soils, as determined by UCR, UCR shall hire a qualified archaeological monitor meeting the Secretary of the Interior's Professional Qualification Standards for archaeology (National Park Service [NPS] 1983) to identify archaeological resources and cultural resources of potential Native American origin. Where development occurs in the southeastern quadrant of campus, and in areas containing Val Verde Pluton geologic features considered highly sensitive to prehistoric archaeological resources, UCR shall hire a qualified archaeologist and a Native American monitor to reduce impacts to potential archaeological and/or tribal cultural resources. The monitor(s) shall be on-site during any construction activities that involve ground disturbance. The on-site monitoring shall end when project-related ground disturbing activities are completed, or, in consultation with the lead agency and tribes as appropriate and based on observed conditions, monitoring may be reduced or eliminated prior to completion of ground-disturbing activities, when the monitor(s) has indicated that the project site has a low potential to encounter tribal cultural resources (TCR)/archaeological resources. Consolidated monitoring efforts (e.g., archaeological monitoring/tribal cultural/paleontological monitoring) may occur if the individual monitor meets the applicable qualifications, except for development in the southeastern quadrant as detailed above.

MM CUL-3 Construction Worker Training: For projects requiring TCR/archaeological monitoring, the monitor shall provide preconstruction training for all earthmoving construction personnel prior to the start of any ground disturbing activities, regarding how to recognize the types of TCRs and/or archaeological resources that may be encountered and to instruct personnel about actions to be taken in the event of a discovery. UCR Planning, Design & Construction Project Manager/contractor shall retain documentation showing when training of personnel was completed.

MM CUL-4 Unanticipated Discovery of Tribal Cultural Resources/Archaeological Resources: If previously undiscovered TCRs and/or archaeological resources are identified during construction, all ground disturbing activities within 100 feet of the resource shall halt, UCR Planning, Design & Construction staff shall be notified, and the find shall be evaluated by a qualified archaeologist meeting the Secretary of the Interior standards to determine whether it is a unique archaeological resource, as defined by CEQA. If the discovery appears to be Native American in origin, a tribal representative will be contacted within 24 hours of discovery to determine whether it is a TCR, as defined by CEQA. If the find is neither a unique archaeological resource nor a TCR, work may resume. If the find is determined to be a unique archaeological resource or TCR, the archaeologist and the tribal representative, as appropriate, shall make recommendations to UCR Planning, Design & Construction staff on the measures that will be implemented, including, but not limited to, preservation in place, excavation, relocation, and further evaluation of the discoveries pursuant to CEQA. Preservation in place (i.e., avoidance) is the preferred method of mitigation for impacts to TCRs/archaeological resources. If UCR determines that preservation in place is not feasible, the archaeologist shall design and implement a treatment plan, prepare a report, and salvage the material, as appropriate. Any important artifacts recovered during monitoring shall be cleaned, catalogued, and analyzed, with the results presented in a report of findings that meets professional standards. Work on-site may commence upon completion of any fieldwork components of the treatment plan.

5.5 ENERGY

Please refer to **MM GHG-1** (Measures EN3 and EN5) in Section 5.7.

5.6 GEOLOGY AND SOILS

MM GEO-1 Inadvertent Discovery of Paleontological Resources: If any paleontological resources are encountered during ground-disturbing activities, the contractor shall ensure that activities in the immediate area of the find are halted and that UCR is informed. UCR shall retain a qualified paleontologist to evaluate the discovery and recommend appropriate treatment options pursuant to guidelines developed by the Society of Vertebrate Paleontology, including development and implementation of a paleontological resource impact mitigation program by a qualified paleontologist for treatment of the particular resource, if applicable. These measures may include, but not limited to, the following:

- Salvage of unearthed fossil remains and/or traces (e.g., tracks, trails, burrows)
- Washing of screen to recover small specimens
- Preparation of salvaged fossils to a point of being ready for curation (e.g., removal of enclosing matrix, stabilization and repair of specimens, and construction of reinforced support cradles)
- Identification, cataloging, curation, and provisions for repository storage of prepared fossil specimens

MM GEO-2 Paleontological Resources Monitoring: UCR shall implement the following measures if projects are proposing earth-moving activities exceeding 5 feet below previously undisturbed alluvial-fan soils within “high paleontological sensitivity” (i.e., Qof and Qvof):

- Retain a qualified professional paleontologist to prepare and implement a Paleontological Resources Impact Mitigation Plan for the project. A qualified paleontologist is an individual who meets the education and professional experience standards as established by the SVP (2010), which recommends the paleontologist shall have at least a master's degree or equivalent work experience in paleontology, shall have knowledge of the local paleontology, and shall be familiar with paleontological procedures and techniques. The Paleontological Resources Impact Mitigation Plan shall describe mitigation recommendations in detail, including paleontological monitoring procedures; communication protocols to be followed in the event that an unanticipated fossil discovery is made during project development; and preparation, curation, and reporting requirements. Consolidated monitoring efforts (e.g., archaeological monitoring/tribal cultural/paleontological monitoring) may occur if the individual monitor has the applicable qualifications.

- Prior to the commencement of ground disturbing activities, the qualified paleontologist or their designee, shall conduct training for grading and excavation personnel regarding the appearance of fossils and the procedures for notifying paleontological staff if unanticipated fossils are discovered by construction staff. The Paleontological Worker Environmental Awareness Program shall be fulfilled at the time of a pre-construction meeting. In the event a fossil is discovered by construction personnel anywhere in the project area, all work in the immediate vicinity of the find shall cease and a qualified paleontologist shall be contacted to evaluate the find before re-starting work in the area. If it is determined that the fossil(s) is (are) scientifically significant, the qualified paleontologist shall complete the mitigation outlined below to mitigate impacts to significant fossil resources.
- If paleontological resources are encountered during ground-disturbing activities, MM GEO-1 shall apply.

5.7 GREENHOUSE GAS EMISSIONS

MM GHG-1 Implement On-Campus GHG Emissions Reduction Measures: UCR shall implement the following GHG emissions reduction measures by scope emissions category:

Scope 1 (Stationary Fuel Combustion, Refrigerant Use, Fleet Fossil Fuel Combustion)

- Measure [Energy] EN1: In order to meet 100 percent electrification of all new campus buildings and structures, UCR shall prioritize construction of all-electric building design for new campus buildings and structures and discourage the construction and connection of new fossil fuel combustion infrastructure on campus. In addition, UCR shall focus on energy optimization through the Central Steam Plant control systems by automating manual processes and initiating an engineering study focused on transitioning away from natural gas use at the Central Plant.
- Measure EN2: In order to address on-campus natural gas combustion, starting in 2025 and continuing through 2035, UCR shall purchase biogas for at least 40 percent of the total on-campus natural gas usage.
- Measure [Global Warming Potential] GWP1: In order to reduce emissions from refrigerants used on campus, UCR shall phase out of high global warming potential chemical refrigerants on campus to achieve 100 percent relative carbon neutrality by 2045. This may include the replacement of chemical refrigerants with lower global warming potential in the interim of full phase out while an alternative technology is determined. Furthermore, UCR shall prohibit the use of equipment in new buildings or construction projects that do not utilize low global warming potential or Significant New Alternatives Policy Program accepted refrigerants.
- Measure [Fuel] FL1: In order to decarbonize the campus vehicle fleet, UCR shall reduce emissions from the campus vehicle fleet by 25 percent by 2025, by 50 percent by 2030, and by 75 percent by 2035 through replacement of fleet vehicles with electric vehicles or low-emission alternative vehicles.

Scope 2 (Electricity Consumption and Generation)

- Measure EN3: UCR shall work to obtain 100 percent clean-sourced electricity through either RPU and/or through the installation of on-site clean-sourced electricity sources for all new buildings by 2025. In addition, UCR shall establish annual budgets that include funding to purchase 100 percent clean-source energy. Furthermore, all newly constructed building projects, other than wet lab research laboratories, shall be designed, constructed, and commissioned to outperform the California Building Code (Title 24 portion of the CCR) energy efficiency standards by at least 20 percent. Finally, UCR shall incorporate solar PV as feasibly possible for newly constructed and majorly-renovated buildings with the maximum system size, highest solar panel efficiency, and greatest system performance.
- Measure EN4: In order to obtain electricity from 100 percent renewable source(s) for all existing buildings by 2045, UCR shall renegotiate its contractual agreement with RPU to establish a schedule and specific goals for obtaining 100 percent renewable electricity for the campus. In addition, UCR shall conduct an evaluation of existing buildings for structural suitability in terms of accommodating a solar photovoltaic system capacity with highest energy generation yield and for installing energy storage technology on campus and then installing such systems on identified buildings and facilities.
- Measure EN5 (Parts A, B, C): In order to prioritize energy efficiency and green building initiatives for building/facility upgrades and new construction as well as reduced energy use, UCR shall identify aging equipment throughout the campus such as equipment associated with the Central Plant, electrical distribution system, and building HVAC systems and develop a strategy and schedule to upgrade such equipment with high-energy efficiency systems and optimize HVAC systems through heat zoning, high-efficiency filters, and shut-down times expansion. The strategy shall include an evaluation and cost analysis related to upgrading/retrofitting equipment versus retirement of equipment if no longer needed with future initiatives (i.e., Central Plant boiler retirement). The schedule and upgrade strategy must meet a 2 percent energy efficiency improvement annually through 2035. In addition, UCR shall require new buildings to incorporate occupancy sensors and controls such that lighting of shared spaces is on occupancy sensors, building temperature set points are widened and aligned with occupancy schedules, and ventilation systems are converted from constant volume to variable so ventilation rates are occupancy-based. Furthermore, UCR shall develop a plan to identify existing buildings and projects that could undergo upgrades to the control systems and establish a schedule for upgrade incorporation. Finally, UCR shall develop a tracking program to monitor and share campus energy efficiency activities and progress towards increased energy efficiency.

Scope 3 (Waste Generation, Business Air Travel, On-site Transportation, Water Consumption, Carbon Sequestration, and Construction)

- Measure (Waste Generation) WG1: UCR shall implement and enforce SB 1383 organics and recycling requirements to specifically reduce landfilled organics waste to 75 percent by 2025.
- Measure WG2: UCR shall reduce campus waste sent to landfills 90 percent by 2025 and 100 percent by 2035. In addition, UCR shall reduce waste generation at campus events 25 percent by 2025 and 50 percent by 2035, with goals of being zero waste and plastic free events. Furthermore, UCR shall establish purchasing and procurement policies and guidelines prioritizing vendors that limit packaging waste and purchase reusable and compostable goods.
- Measure [Transportation] TR1: In order to reduce GHG Emissions related to business air travel, UCR shall provide incentives to faculty for emission-reducing behaviors and utilizing travel options that are less carbon intensive, promote the use of virtual meetings, and encourage alternative forms of travel other than air travel.

- Measure TR2: UCR shall update the Transportation Demand Management (TDM) program for the campus to decrease single occupancy vehicle VMT 5 percent by 2025 and 20 percent by 2035. In addition, UCR shall evaluate trends of current programs to expand on existing programs and establish new initiatives that utilize proven successful strategies.
- Measure TR3: UCR shall develop and implement a Campus Active Transportation Plan to shift 2 percent of baseline (2018) passenger vehicle VMT to active transportation by 2025 and 8 percent by 2035. In addition, UCR shall update the Campus Bicycle and Pedestrian Network Map every five years, including routes from off campus to on campus.
- Measure TR4: UCR shall reduce GHG emissions associated with campus commuting 10 percent by 2025 and 25 percent by 2035.
- Measure [Water Consumption] WC1: UCR shall reduce per-capita water consumption 20 percent by 2025 and 35 percent by 2035 compared to academic year 2018/2019 per capita consumption.
- Measure [Carbon Sequestration] CS1: UCR shall increase carbon sequestration through increasing tree planting and green space 5 percent by 2025 and 15 percent by 2035.
- Measure [Construction] CR1: UCR shall reduce construction-related GHG emissions on campus 10 percent by 2025 and 25 percent by 2035 through emission reduction controls and/or electric equipment requirements in line with contract obligations. Specifically, UCR shall require off-road diesel-powered construction equipment greater than 50 horsepower to meet the Tier 4 emission standards as well as construction equipment to be outfitted with BACT devices certified by CARB and emissions control devices that are no less than what could be achieved by a Level 3 diesel emissions control strategy for a similar-sized engine. In addition, UCR shall develop zero waste procurement guidelines and processes for campus construction projects and integrate into purchasing RFP language as part of campus procurement.

The UCR Office of Sustainability, Facilities Services, EH&S, TAPS, and/or PD&C shall annually monitor, track, and verify implementation of these GHG emissions reduction measures.

MM GHG-2 Purchase Carbon Offsets to Achieve GHG Emissions Reduction Balance: In order to achieve the necessary GHG emissions reduction balance after implementation of MM GHG-1 and in order to meet the UC Policy on Sustainable Practices and State targets, UCR shall annually track and purchase carbon offsets for the balance of GHG emissions after on-site reductions per MM GHG-1 that still meet or exceed the UCR emissions targets by year.

UCR shall sequester funds for carbon offset purchases into a restricted account such that any/all uses shall directly reduce carbon emissions and address UCR goals. Prior to the purchase of carbon offsets, UCR shall research and purchase carbon offsets that are real, permanent, quantifiable, verifiable, enforceable, supported by substantial evidence, and additional to any GHG emission reduction otherwise required by law or regulation and any other GHG emission reduction that otherwise would occur under MM GHG-1.

If any changes occur with regard to implementation of on-campus GHG reduction measures as part of MM GHG-1, UCR shall adjust the purchase of carbon offsets accordingly and keep respective accounting records. UCR Office of Sustainability, Facilities Services, EH&S, and PD&C shall annually monitor, track, and verify purchase of the required carbon offsets.

As part of this MM, UCR shall make the following separate, though overlapping, GHG emission reduction commitment including maintaining compliance with carbon offset accreditation requirements under the CARB Cap-and-Trade Program. Any carbon credits obtained for the purpose of compliance with the CARB’s Cap-and-Trade Program shall be purchased from an accredited carbon credit market. Based on the current program as of 2021, such offset credits (or California Carbon Offsets) shall be registered with, and retired by an Offset Project Registry, as defined in 17 CCR Section 95802(a), that is approved by CARB, such as, but not limited to, Climate Action Reserve (CAR), American Carbon Registry, and Verra (formerly Verified Carbon Standard), that is recognized by The Climate Registry, a non-profit organization governed by United States and Canadian provinces and territories.

5.8 HAZARDS AND HAZARDOUS MATERIALS

MM HAZ-1 Property Assessment – Phase I and II ESAs: During the pre-planning stage of campus projects on previously developed sites or on agricultural lands (current or historic), and in coordination with EH&S, UCR shall obtain documentation from EH&S or prepare a Phase I Environmental Site Assessment (ESA) assessing the land use history of the proposed project site and identify potential hazardous materials concerns, including, but not limited to, fuel tanks, chemical storage, presence of elemental mercury, elevator pistons and associated hydraulic oil reservoirs and piping, heating-oil USTs, or agricultural uses. If the Phase I ESAs, or similar documentation, identify recognized environmental conditions or potential concern areas, a Phase II ESA would be conducted in coordination with EH&S to determine whether the soil, groundwater, and/or soil vapor has been impacted at concentrations exceeding regulatory screening levels for residential or commercial/industrial type land uses (as applicable). If the Phase II ESA concludes that the site is or may be impacted and could affect the planned development, assessment, remediation, or corrective action (e.g., removal of contaminated soil, in-situ treatment, capping, engineering controls) would be conducted prior to or during construction under the oversight of federal, State, and/or local agencies (e.g., USEPA, DTSC, RWQCB, RFD, RCDEH) and in full compliance with current and applicable federal and State laws and regulations, including but are not limited to the CEQA. Assessment, remediation, or corrective action must be evaluated under CEQA prior to commencing the assessment, remediation, or corrective action. Additionally, Voluntary Cleanup Agreements may be used for parcels where remediation or long-term monitoring is necessary.

MM HAZ-4 Construction Site Management Plan: If impacted soils are identified pursuant to activities conducted through Mitigation Measures MM HAZ-1, MM HAZ-2, or MM HAZ-3; or encountered during construction (soil disturbance), UCR shall prepare a Construction Site Management Plan (SMP) for the proposed redevelopment project area to address potential issues that may be encountered during redevelopment activities involving subsurface work. The Construction SMP objectives shall include:

- Communicating information to proposed project construction workers about environmental conditions
- Presenting measures to mitigate potential risks to the environment, construction workers, and other nearby receptors from potential exposure to hazardous substances that may be associated with unknown conditions or unexpected underground structures
- Presenting protocols for management of known contaminated soil or groundwater encountered during construction activities

The Construction SMP shall identify the proposed project contacts, responsibilities, and notification requirements and outline the procedures for health and safety, soil management, contingency measures for discovery of unexpected underground structures, erosion, dust, and odor management, groundwater management, waste management, stormwater management, and written records and reporting. The Construction SMP shall be reviewed and approved by UCR prior to issuance of grading permits.

5.9 NOISE

MM N-1 Construction Noise Reduction Measures: To reduce construction noise levels to on-campus and off-campus noise sensitive receivers, UCR shall implement the following measures:

- Hours of exterior construction activities shall be limited to 7:00 a.m. to 9:00 p.m. Monday through Friday and 8:00 a.m. to 6:00 p.m. on Saturday, as feasible, except under circumstances where such time limits are infeasible (e.g., for time sensitive construction work such as concrete pouring, excessive heat warnings/temperatures during the summer, operational emergencies). No exterior construction activities shall occur on federal holidays.
- Construction traffic shall follow routes so as to minimize the noise impact of this traffic on the surrounding community, to the greatest extent feasible.
- Contract specifications shall require that construction equipment be muffled or otherwise shielded, in accordance with manufacturers' recommendations. Contracts shall specify that engine-driven equipment be fitted with appropriate noise mufflers.
- Where available and feasible, construction equipment with back-up alarms shall be equipped with either audible self-adjusting backup alarms or alarms that only sound when an object is detected. Self-adjusting backup alarms shall automatically adjust to 10 dBA over the surrounding background levels. All non-self-adjusting backup alarms shall be set to the lowest setting required to be audible above the surrounding noise levels.
- Stationary construction equipment material and vehicle staging shall be placed to direct noise away from sensitive receivers to the greatest extent feasible.
- Meetings shall be conducted, as needed, with on-campus constituents to provide advance notice of construction activities to coordinate these activities with the academic calendar, scheduled events, and other situations, as appropriate.
- Communication would be provided, as needed, with constituents that are affected by campus construction to provide advance notice of construction activities and ensure that the mutual needs of the particular construction project and of those impacted by construction noise are met, to the extent feasible.
- A sign shall be provided at the construction site entrance, or other conspicuous location, that includes a 24-hour telephone number for project information, and to report complaints. An inquiry and corrective action will be taken if necessary, in a timely manner.
- Where feasible, installation of temporary sound barriers/blankets of sufficient height to break the line-of-sight between the construction equipment and within proximity to exterior use areas of noise-sensitive receivers shall be required. Temporary sound barriers shall consist of either sound blankets or other sound barriers/techniques such as acoustic padding or acoustic walls placed near adjacent noise-sensitive receivers that have been manufactured to reduce noise by at least 10 dBA at ground level or meets ASTM E90 & E413 standards/ASTM C423 (or similar standards with equivalent 10 DBA noise reduction).

MM N-2 HVAC Noise Reduction Measures: The campus shall reduce HVAC equipment noise levels located in close proximity to noise-sensitive buildings and uses through noise control measures such as, but not limited to:

- Mechanical equipment screening (e.g., parapet walls)
- Equipment setbacks

- Silencers
- Acoustical louvers
- And other sound attenuation devices as made available

If a method other than mechanical equipment screening (e.g., parapet walls) is chosen, a project specific design plan demonstrating that the noise level from operation of HVAC units does not generate noise levels that exceed 5 dBA above ambient at noise sensitive receivers shall be completed.

MM N-3 Loading Dock Noise Reduction Measures: The campus shall reduce loading dock noise levels through measures such as, but not limited to:

- Noise levels from loading docks at noise-sensitive receivers shall not exceed 5 dBA over ambient noise levels, the effectiveness of which shall be determined on a project-level basis by an acoustical professional.
- As feasible, design and build sound barriers near loading docks and delivery areas that block the line of sight between truck activity areas and noise-sensitive receivers. Sound barriers may consist of a wall, earthen berm, or combination thereof.

MM N-5 Construction Vibration Reduction Measures: If construction equipment were to be operated within the specified distances listed in Table 4.11 13 of the 2021 LRDP EIR, the campus shall reduce construction vibration levels through the following noise control measures:

- All academic and residential facilities within the listed distances shall be notified if the listed equipment is to be used during construction activities so that the occupants and/or researchers can take necessary precautionary measures to avoid negative effects to their activities and/or research.
- In addition, one of the following measures shall be implemented:
  - Use of the equipment shall not occur within the specified distances in Table 4.11-13 in Section 4.11. Noise, of the 2021 LRDP EIR or
  - A project-specific vibration impact analysis shall be conducted that shall consider the type of equipment used and potential vibration levels at structures within the specified distances. If, after consideration of the type of equipment used and other factors of the environment, vibration levels do not exceed the applicable criteria (listed in the second column of Table 4.11-13), construction may proceed without additional measures. If, after consideration of the type of equipment used and other factors of the environment, vibration levels exceed the applicable criteria, additional measures shall be implemented to reduce vibration levels below threshold, if feasible. These measures may include, but not limited to, use of different equipment that results in an acceptable vibration level as listed in second column of Table 4.11 13 in Section 4.11, Noise of the 2021 LRDP EIR.

Table 4.11-13 of the 2021 LRDP Draft EIR – Screening Distances for Vibration-Sensitive Receiver Type and Source

Receiver Type	Vibration Threshold (in./sec. PPV)	Distance from Vibration Source (feet)[1]	
		Vibratory Roller	Large Bulldozer[2]
Distinctly Perceptible Human Annoyance	0.24	25	15
Historic Sites	0.1	40	25
Residential Buildings	0.4	20	10
Laboratory[3]	0.032	90	50

[1] These distances are based upon typical vibration levels for a vibratory roller and large bulldozer of approximately 0.210 in./sec. PPV and 0.089 in./sec. PPV at 25 feet, respectively (FTA 2018).

[2] A large bulldozer conservatively represents all heavy-duty construction equipment, other than a vibratory roller.

[3] The FTA lists a "Residential Day" ISO use, which is vibration that is barely felt and adequate for low-power optical microscopes, as having a vibration criteria of 78 vibration decibels (equivalent to 0.032 in./sec. PPV). For the purposes of analysis, a "Residential Day" ISO use is considered representative of laboratory settings on campus.

In./sec – inches per second; PPV = peak particle velocity

5.10 TRANSPORTATION

Refer to **CBP WF-1 and CBP WF-2** in Section 5.12, Wildfire.

MM T-1: Improvements to the intersection of I-215/SR-60 freeway southbound ramps at Martin Luther King Boulevard shall consist of reconfiguring the southbound approach from one left-turn lane and one shared through/right-turn lane to one shared left/through/right-turn lane and one right-turn lane. Optimizing the signal-timings with the geometric improvements shall also be required.

5.11 TRIBAL CULTURAL RESOURCES

Refer to **MM CUL-2 through MM CUL-4** in Section 5.4, Cultural Resources.

5.12 WILDFIRE

CBP WF-1 Construction – Traffic Control: To the extent feasible, the campus shall maintain at least one unobstructed lane in both directions on campus roadways. At any time only a single lane is available, the campus shall provide a temporary traffic signal, signal carriers (i.e., flagpersons), or other appropriate traffic controls to allow travel in both directions. If construction activities require the complete closure of a roadway segment, the campus shall provide alternate routes and appropriate signage.

CBP WF-2 Construction – Alternative Travel Routes: Prior to campus construction activities and/or roadway closures, the Campus Fire Marshal, as delegated by the State Fire Marshal, and in cooperation with the City of Riverside Fire Department shall ensure that adequate access for emergency vehicles is provided or identify alternative travel routes.

MM WF-1 Implement Post-Fire Erosion Control Plan and Application: UCR shall incorporate into its Emergency Operations and Response Plan erosion control measures to be deployed in the event of a catastrophic wildfire. Erosion control measures shall be implemented as soon as possible after the event and shall include one or more of the following, as applicable:

- Install mulch to cover the soil and reduce rain drop impact, overland flow, and soil particle movement. This can be certified weed-free straw, slash, and geotextile fabrics and should be installed as quickly as possible after the fire event.
- Apply hydro-mulch mixture of water, fiber mulch, and tackifier on burned slopes to prevent soil erosion and foster revegetation. Seed, fertilizer, or soil stabilizing polymers can also be applied with the hydro-mulch.
- Implement aerial seeding of grasses or legumes with a layer of straw mulch over seeded grasses. Ensure the mix of seed includes native grasses and plants with value for local wildlife.

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Appendix A

CalEEMod Reports

UCR - School of Business Expansion
Assumptions

CalEEMod Inputs that are not modeling defaults:

Project Location	County			
	Riverside - South Coast			
Climate Zone	10			
Operational Year (Buildout)	1-Jun-22			
Construction Year	2025			
Utility Company	Southern California Edison			

Project Description

		Existing		
Site Area		4.8	AC	
Project		#units		Sqft/floor
	4 Year University	570	new students	75,000
		125	new staff	
		7	parking spaces	
	Structures			
	New Buildings	75,000	sqft	
	Bio Control	1,500	sqft	
	Genomics	2,500	sqft	
		79,000		

UCR - School of Business Expansion
Assumptions

Construction Assumptions

Demolition

Bio Control Building	1,500	sqft
Headhouse	2,760	sqft
Storage 6	530	sqft
Geonomics Shet	2,500	sqft
Plant Drying Facility	1,584	sqft
Total	8,874	
	700	tons of debris
	15	worker trips per day
	69	haul trips per day

Construction Schedule:

	# Days	Start	End
Demolition:	20	6/1/22	6/28/2022
Grading:	40	6/28/22	8/22/2022
Building Construction:	450	8/22/22	5/10/2024
Paving:	18	8/23/22	9/15/2022
Architectural Coating:	18	8/23/22	9/15/2022
	510		

Export	12,000	cubic yards
Import	0	cubic yards

Defaults use for all other construction sources.

UCR - School of Business Expansion
Assumptions

Operational Assumptions

Transportation UCR Riverside 2021 Long Range Development Plan CEQA Transportation Impact Analysis, June 2021.

19.55	**VMT Per service population**	
695	Service Population	
13,587	VMT	per day
3,396,813	VMT	per year

Area CalEEMOd Defaults Used

Energy Use

Electricity Provider SCE

Proposed to use Default Values

Title 24 Compilance

20% above 2019 Title 24

LEED Silver

Water Use based on Default percentage of indoor (see wastewater) and outdoor usage.

	Default	%	Project
Indoor	1,220,427		5,073,500
Outdoor	1,908,873	1.5641	7,935,474

Wastewater 5,073,500 gallons per year (Utilities section)

Solid Waste 1.6 tons/day Utilities Section

584 tons/year

UCR - School of Business Expansion
Emissions Summary Tables

Unmitigated Regional Daily Construction Emissions

Emissions Source		Estimated Emissions (lbs/day)					
		ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
	2022	8	78	69	0	8	5
	2023	44	27	33	0	2	2
	2024	44	27	33	0	2	2
Maximum Daily		44	78	69	0	8	5
SCAQMD Thresholds		*75*	*100*	*550*	*150*	*150*	*55*
Threshold Exceeded?		**No**	**No**	**No**	**No**	**No**	**No**

Unmitigated Localized Daily Construction Emissions

Emissions Source		Estimated Emissions (lbs/day)				
		NO_X	CO	PM_{10}	$PM_{2.5}$	acre
	2022	72	64	3	1	2
	2023	27	30	1	0	
	2024	27	30	1	0	
SCAQMD Thresholds		*380*	*18,947*	*186*	*72*	

SRA 23
2 acre; 500 meters

UCR - School of Business Expansion
Emissions Summary Tables

Daily Unmitigated Operational Emissions - Net Regional

Emissions Source	Estimated Emissions (lbs/day)					
	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Area	2	<1	<1	<1	<1	<1
Energy	<1	<1	<1	<1	<1	<1
Mobile	3	5	33	<1	9	2
Project Total	5	5	34	<1	9	2
SCAQMD Thresholds	*55*	*55*	*550*	*150*	*150*	*55*
Threshold Exceeded?	**No**	**No**	**No**	**Yes**	**No**	**No**

Unmitigated Localized Operational Emissions

Emissions Source	Estimated Emissions (lbs/day)				
	NO_X	CO	PM_{10}	$PM_{2.5}$	acre
	0.23	0.25	0.02	0.02	2
SCAQMD Thresholds	380	18,947	45	17	0.91
Threshold Exceeded?	**No**	**No**	**No**	**No**	13.2

SRA 23

UCR - School of Business Expansion
Emissions Summary Tables

Unmitigated Construction Annual Emissions MT CO_2e/year

	Annual	
2022	291	
2023	369	
2024	135	
Total	**795**	**398**
Amortized	**53**	

Table 8 Combined Annual Emissions MT CO_2e/year

	w/o 20%	w 20%	
Construction	53	53	
Operational			
Area	0.0151	0.0151	Scope 1
Electricity	108.0134	103.0563	Scope 2
NG	58.0565	46.4537	Scope 1
Mobile	1115.545	1115.545	Scope 3
Solid Waste	293.6945	293.6945	Scope 3
Water	31.7024	31.7024	Scope 2
Total	**1,660**	**1,643**	

		w/o 20%	w 20%
Scope 1		58	46
	Area	0	0
	Natural Gas	58	46
Scope 2		140	135
	Electricity	108	103
	Water	32	32
Scope 3		1,409	1,409
	Mobile	1,116	1,116
	Solid Waste	294	294
Total Project Operations		**1,607**	**1,590**
	Total Project	***1,660***	***1,643***

UCR - School of Business Expansion
Emissions Summary Tables

Reductions

Scope 1	
EN1	Supportive of other measures
EN3	58
EN5	12
Total Scope 1	70
Scope 2	
EN3	108
Total Scope 2	108
Scope 3	
WG1 & WG2	264
TR2 to TR4	99
Total Scope 3	363
Total Reductions	541
Total Mitigated Project	1,119

LRDP Reduction Measures

WG1		
	2022	50%
	2025	75%
TR2	1,484	$MTCO_2e$ reduced
TR3	104	$MTCO_2e$ reduced
TR4	1,380	$MTCO_2e$ reduced
Total Emissions	2,968	$MTCO_2e$ reduced
	8.88%	% total Emissions

Total Onroad Emissions	$MTCO_2e$
On-Road Transportation (Passenger)	29,684
On-Road Transportation (Commercial)	3,121
Public Transit	608
	33,413

UCR - School of Business Expansion
Unmitigated Construction
CalEEMod - Winter

Unmitigated Construction
Max Daily

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Category	lbs/day									
Onsite	48.16	73.1207	66.2378	0.11727	3.0036	3.562	6.5656	1.4762	3.3142	4.7904
Offsite	0.5054	6.3342	4.9421	0.03508	1.8062	0.0738	1.8798	0.4874	0.07043	0.5577
Max Daily	**48.6654**	**79.4549**	**71.1799**	**0.15235**	**4.8098**	**3.6358**	**8.4454**	**1.9636**	**3.38463**	**5.3481**

Max Daily **Winter**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Category	lbs/day									
Demolition	2.7048	26.224	21.1794	0.04217	0.5503	1.24867	1.7989	0.1099	1.16098	1.2708
Onsite	2.6392	25.7194	20.5941	0.0388	0.3222	1.2427	1.5649	0.0488	1.1553	1.2041
Offsite	0.0656	0.5046	0.5853	0.00337	0.2281	0.00597	0.234	0.0611	0.00568	0.0667
Grading	2.1167	25.9465	16.8516	0.05268	3.5055	0.99744	4.5029	1.6518	0.91967	2.5715
Onsite	1.9486	20.8551	15.2727	0.0297	2.6814	0.9409	3.6223	1.4274	0.8656	2.293
Offsite	0.1681	5.0914	1.5789	0.02298	0.8241	0.05654	0.8806	0.2244	0.05407	0.2785
Building Const	1.848	16.2822	17.6281	0.03231	0.4522	0.81879	1.2709	0.1218	0.77049	0.8923
Onsite	1.7062	15.6156	16.3634	0.0269	0	0.809	0.809	0	0.7612	0.7612
Offsite	0.1418	0.6666	1.2647	0.00541	0.4522	0.00979	0.4619	0.1218	0.00929	0.1311
Paving	1.0501	9.5751	12.8402	0.02074	0.2236	0.48881	0.7124	0.0593	0.45143	0.5107
Onsite	0.9765	9.5221	12.194	0.0189	0	0.4877	0.4877	0	0.4504	0.4504
Offsite	0.0736	0.053	0.6462	0.00184	0.2236	0.00111	0.2247	0.0593	0.00103	0.0603
Architectural Coat	40.9153	1.4271	2.0398	0.00361	0.0782	0.08209	0.1603	0.0208	0.08206	0.1028
Onsite	40.8895	1.4085	1.8136	0.00297	0	0.0817	0.0817	0	0.0817	0.0817
Offsite	0.0258	0.0186	0.2262	0.00064	0.0782	0.00039	0.0786	0.0208	0.00036	0.0211
	Max Daily (lbs/day)									
Onsite	48.16	73.1207	66.2378	0.11727	3.0036	3.562	6.5656	1.4762	3.3142	4.7904
Offsite	0.4749	6.3342	4.3013	0.03424	1.8062	0.0738	1.8798	0.4874	0.07043	0.5577
Max Daily	**43.8134**	**27.2844**	**32.5081**	**0.05666**	**3.5055**	**1.38969**	**4.5029**	**1.6518**	**1.30398**	**2.5715**

UCR - School of Business Expansion
Unmitigated Construction
CalEEMod - Winter

Demolition

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Category	lbs/day									
Fugitive Dust					0.3222	0	0.3222	0.0488	0	0.0488
Off-Road	2.6392	25.7194	20.5941	0.0388		1.2427	1.2427		1.1553	1.1553
Hauling	0.0104	0.4648	0.1007	1.99E-03	0.0604	5.13E-03	0.0655	0.0166	4.91E-03	0.0215
Vendor	0	0	0	0	0	0	0	0	0	0
Worker	0.0552	0.0398	0.4846	1.38E-03	0.1677	8.40E-04	0.1685	0.0445	7.70E-04	0.0452
Total	**2.7048**	**26.224**	**21.1794**	**0.04217**	**0.5503**	**1.24867**	**1.7989**	**0.1099**	**1.16098**	**1.2708**

Grading

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Category	lbs/day									
Fugitive Dust					2.6814	0	2.6814	1.4274	0	1.4274
Off-Road	1.9486	20.8551	15.2727	0.0297		0.9409	0.9409		0.8656	0.8656
Hauling	0.1129	5.0516	1.0943	0.0216	0.6564	0.0557	0.7121	0.1799	0.0533	0.2333
Vendor	0	0	0	0	0	0	0	0	0	0
Worker	0.0552	0.0398	0.4846	1.38E-03	0.1677	8.40E-04	0.1685	0.0445	7.70E-04	0.0452
Total	**2.1167**	**25.9465**	**16.8516**	**0.05268**	**3.5055**	**0.99744**	**4.5029**	**1.6518**	**0.91967**	**2.5715**

Building Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Category	lbs/day									
Fugitive Dust										
Off-Road	1.7062	15.6156	16.3634	0.0269		0.809	0.809		0.7612	0.7612
Hauling	0	0	0	0	0	0	0	0	0	0
Vendor	0.0203	0.5791	0.1985	2.37E-03	0.0833	7.95E-03	0.0912	0.024	7.60E-03	0.0316
Worker	0.1215	0.0875	1.0662	3.04E-03	0.3689	1.84E-03	0.3707	0.0978	1.69E-03	0.0995
Total	**1.848**	**16.2822**	**17.6281**	**0.03231**	**0.4522**	**0.81879**	**1.2709**	**0.1218**	**0.77049**	**0.8923**

UCR - School of Business Expansion
Unmitigated Construction
CalEEMod - Winter

Paving

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Category	lbs/day									
Off-Road	0.9765	9.5221	12.194	0.0189		0.4877	0.4877		0.4504	0.4504
Paving	0					0	0		0	0
Hauling	0	0	0	0	0	0	0	0	0	0
Vendor	0	0	0	0	0	0	0	0	0	0
Worker	0.0736	0.053	0.6462	1.84E-03	0.2236	1.11E-03	0.2247	0.0593	1.03E-03	0.0603
Total	**1.0501**	**9.5751**	**12.8402**	**0.02074**	**0.2236**	**0.48881**	**0.7124**	**0.0593**	**0.45143**	**0.5107**

Architectural Coating

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Category	lbs/day									
Arch. Coat	40.685					0	0		0	0
Off-Road	0.2045	1.4085	1.8136	2.97E-03		0.0817	0.0817		0.0817	0.0817
Hauling	0	0	0	0	0	0	0	0	0	0
Vendor	0	0	0	0	0	0	0	0	0	0
Worker	0.0258	0.0186	0.2262	6.40E-04	0.0782	3.90E-04	0.0786	0.0208	3.60E-04	0.0211
Total	**40.9153**	**1.4271**	**2.0398**	**0.00361**	**0.0782**	**0.08209**	**0.1603**	**0.0208**	**0.08206**	**0.1028**

UCR - School of Business Expansion
Unmitigated Construction
CalEEMod - Summer

Max Daily **Summer**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Category	lbs/day									
Demolition	2.7092	26.1983	21.2901	0.0423	0.5503	1.24866	1.7989	0.1099	1.16097	1.2708
Onsite	2.6392	25.7194	20.5941	0.0388	0.3222	1.2427	1.5649	0.0488	1.1553	1.2041
Offsite	0.07	0.4789	0.696	0.0035	0.2281	0.00596	0.234	0.0611	0.00567	0.0667
Grading	2.1263	25.6827	16.9357	0.05282	3.5055	0.99744	4.5028	1.6518	0.91967	2.5714
Onsite	1.9486	20.8551	15.2727	0.0297	2.6814	0.9409	3.6223	1.4274	0.8656	2.293
Offsite	0.1777	4.8276	1.663	0.02312	0.8241	0.05654	0.8805	0.2244	0.05407	0.2784
Building Const	1.8575	16.2496	17.8701	0.03262	0.4522	0.81877	1.2709	0.1218	0.77047	0.8923
Onsite	1.7062	15.6156	16.3634	0.0269	0	0.809	0.809	0	0.7612	0.7612
Offsite	0.1513	0.634	1.5067	0.00572	0.4522	0.00977	0.4619	0.1218	0.00927	0.1311
Paving	1.0553	9.5732	12.9913	0.02093	0.2236	0.48881	0.7124	0.0593	0.45143	0.5107
Onsite	0.9765	9.5221	12.194	0.0189	0	0.4877	0.4877	0	0.4504	0.4504
Offsite	0.0788	0.0511	0.7973	0.00203	0.2236	0.00111	0.2247	0.0593	0.00103	0.0603
Architectural Coat	40.9171	1.4264	2.0927	0.00368	0.0782	0.08209	0.1603	0.0208	0.08206	0.1028
Onsite	40.8895	1.4085	1.8136	0.00297	0	0.0817	0.0817	0	0.0817	0.0817
Offsite	0.0276	0.0179	0.2791	0.00071	0.0782	0.00039	0.0786	0.0208	0.00036	0.0211
	Max Daily (lbs/day)									
Onsite	48.16	73.1207	66.2378	0.11727	3.0036	3.562	6.5656	1.4762	3.3142	4.7904
Offsite	0.5054	6.0095	4.9421	0.03508	1.8062	0.07377	1.8797	0.4874	0.0704	0.5576
Max Daily	**43.8299**	**27.2492**	**32.9541**	**0.05723**	**3.5055**	**1.38967**	**4.5028**	**1.6518**	**1.30396**	**2.5714**

UCR - School of Business Expansion
Unmitigated Construction
CalEEMod - Summer

Demolition

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Category	lbs/day									
Fugitive Dust					0.3222	0	0.3222	0.0488	0	0.0488
Off-Road	2.6392	25.7194	20.5941	0.0388		1.2427	1.2427		1.1553	1.1553
Hauling	0.0109	0.4406	0.098	1.98E-03	0.0604	5.12E-03	0.0655	0.0166	4.90E-03	0.0215
Vendor	0	0	0	0	0	0	0	0	0	0
Worker	0.0591	0.0383	0.598	1.52E-03	0.1677	8.40E-04	0.1685	0.0445	7.70E-04	0.0452
Total	**2.7092**	**26.1983**	**21.2901**	**0.0423**	**0.5503**	**1.24866**	**1.7989**	**0.1099**	**1.16097**	**1.2708**

Grading

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Category	lbs/day									
Fugitive Dust					2.6814	0	2.6814	1.4274	0	1.4274
Off-Road	1.9486	20.8551	15.2727	0.0297		0.9409	0.9409		0.8656	0.8656
Hauling	0.1186	4.7893	1.065	0.0216	0.6564	0.0557	0.712	0.1799	0.0533	0.2332
Vendor	0	0	0	0	0	0	0	0	0	0
Worker	0.0591	0.0383	0.598	1.52E-03	0.1677	8.40E-04	0.1685	0.0445	7.70E-04	0.0452
Total	**2.1263**	**25.6827**	**16.9357**	**0.05282**	**3.5055**	**0.99744**	**4.5028**	**1.6518**	**0.91967**	**2.5714**

Building Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Category	lbs/day									
Fugitive Dust										
Off-Road	1.7062	15.6156	16.3634	0.0269		0.809	0.809		0.7612	0.7612
Hauling	0	0	0	0	0	0	0	0	0	0
Vendor	0.0212	0.5497	0.1911	2.37E-03	0.0833	7.93E-03	0.0912	0.024	7.58E-03	0.0316
Worker	0.1301	0.0843	1.3156	3.35E-03	0.3689	1.84E-03	0.3707	0.0978	1.69E-03	0.0995
Total	**1.8575**	**16.2496**	**17.8701**	**0.03262**	**0.4522**	**0.81877**	**1.2709**	**0.1218**	**0.77047**	**0.8923**

UCR - School of Business Expansion
Unmitigated Construction
CalEEMod - Summer

Paving

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Category	lbs/day									
Off-Road	0.9765	9.5221	12.194	0.0189		0.4877	0.4877		0.4504	0.4504
Paving	0					0	0		0	0
Hauling	0	0	0	0	0	0	0	0	0	0
Vendor	0	0	0	0	0	0	0	0	0	0
Worker	0.0788	0.0511	0.7973	2.03E-03	0.2236	1.11E-03	0.2247	0.0593	1.03E-03	0.0603
Total	**1.0553**	**9.5732**	**12.9913**	**0.02093**	**0.2236**	**0.48881**	**0.7124**	**0.0593**	**0.45143**	**0.5107**

Architectural Coating

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Category	lbs/day									
Fugitive Dust	40.685					0	0		0	0
Off-Road	0.2045	1.4085	1.8136	2.97E-03		0.0817	0.0817		0.0817	0.0817
Hauling	0	0	0	0	0	0	0	0	0	0
Vendor	0	0	0	0	0	0	0	0	0	0
Worker	0.0276	0.0179	0.2791	7.10E-04	0.0782	3.90E-04	0.0786	0.0208	3.60E-04	0.0211
Total	**40.9171**	**1.4264**	**2.0927**	**0.00368**	**0.0782**	**0.08209**	**0.1603**	**0.0208**	**0.08206**	**0.1028**

UCR - School of Business Expansion
Operational CalEEMod Output Summaries

Overall operational Emissions - With 20% beyond Title 24

		ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Category						lb/day					
Area		1.7702	0.00053	0.0581	0	0	0.00021	0.00021	0	0.00021	0.00021
Energy		0.0256	0.2324	0.1953	0.00139	0	0.0177	0.0177	0	0.0177	0.0177
Mobile		3.034	4.5759	33.4645	0.0812	8.6117	0.0611	8.6728	2.2973	0.0572	2.3545
Total		**4.8298**	**4.80883**	**33.7179**	**0.08259**	**8.6117**	**0.07901**	**8.69071**	**2.2973**	**0.07511**	**2.37241**

Overall operational - Witner

		ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Category						lb/day					
Area		1.7702	5.30E-04	0.0581	0		2.10E-04	2.10E-04		2.10E-04	2.10E-04
Energy		0.0256	0.2324	0.1953	1.39E-03		0.0177	0.0177		0.0177	0.0177
Mobile		2.6333	4.5759	29.2651	0.0753	8.6117	0.0611	8.6728	2.2973	0.0572	2.3545
Total		**4.4291**	**4.80883**	**29.5185**	**0.07669**	**8.6117**	**0.07901**	**8.69071**	**2.2973**	**0.07511**	**2.37241**

Overall operational - Summer

		ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Category						lb/day					
Area		1.7702	5.30E-04	0.0581	0		2.10E-04	2.10E-04		2.10E-04	2.10E-04
Energy		0.0256	0.2324	0.1953	1.39E-03		0.0177	0.0177		0.0177	0.0177
Mobile		3.034	4.3102	33.4645	0.0812	8.6117	0.061	8.6727	2.2973	0.0572	2.3545
Total		**4.8298**	**4.54313**	**33.7179**	**0.08259**	**8.6117**	**0.07891**	**8.69061**	**2.2973**	**0.07511**	**2.37241**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

UCR - School of Business

Riverside-South Coast County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
University/College (4yr)	570.00	Student	4.80	79,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.4	**Precipitation Freq (Days)**	28
Climate Zone	10			**Operational Year**	2025
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	390.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - See Assumptions

Land Use - See Assumptions

Construction Phase - See Assumptions

Grading - See Assumptions

Demolition -

Trips and VMT - See Assumptions (700 tons of debris used as it results in more vehicle trips)

Water And Wastewater - See Assumptions

Solid Waste - See Assumptions

Construction Off-road Equipment Mitigation - See Assumptions

Energy Mitigation - Based on Project Design. This is the unmitigated scenario with LEED Silver certification.

Vehicle Trips - See Assumptions

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	FuelType	Diesel	Electrical
tblConstEquipMitigation	FuelType	Diesel	Electrical
tblConstEquipMitigation	FuelType	Diesel	Electrical
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	7.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final

tblConstructionPhase	NumDays	230.00	450.00
tblConstructionPhase	NumDays	8.00	40.00
tblConstructionPhase	PhaseEndDate	7/24/2023	9/15/2022
tblConstructionPhase	PhaseEndDate	6/2/2023	5/10/2024
tblConstructionPhase	PhaseEndDate	7/15/2022	8/22/2022
tblConstructionPhase	PhaseEndDate	6/28/2023	9/15/2022
tblConstructionPhase	PhaseStartDate	6/29/2023	8/23/2022
tblConstructionPhase	PhaseStartDate	7/16/2022	8/22/2022
tblConstructionPhase	PhaseStartDate	7/6/2022	6/28/2022
tblConstructionPhase	PhaseStartDate	6/3/2023	8/23/2022
tblGrading	AcresOfGrading	40.00	8.00
tblGrading	MaterialExported	0.00	12,000.00
tblLandUse	LandUseSquareFeet	104,764.56	79,000.00
tblLandUse	LotAcreage	2.41	4.80
tblSolidWaste	SolidWasteGenerationRate	104.02	584.00
tblVehicleTrips	CC_TL	8.40	12.82
tblVehicleTrips	CNW_TL	6.90	10.53
tblVehicleTrips	CW_TL	16.60	25.33
tblWater	AerobicPercent	87.46	97.58
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	2.42
tblWater	IndoorWaterUseRate	1,220,427.00	5,073,500.00
tblWater	OutdoorWaterUseRate	1,908,873.00	7,935,474.00
tblWater	SepticTankPercent	10.33	0.00

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					
2022	43.8134	52.1704	38.0310	0.0948	8.0778	2.2460	10.3239	3.7384	2.0806	5.8190	0.0000	9,413.2734	9,413.2734	2.0226	0.4124	9,584.1623
2023	1.6993	14.9126	17.4078	0.0322	0.4521	0.7052	1.1573	0.1218	0.6636	0.7854	0.0000	3,097.5244	3,097.5244	0.6178	0.0436	3,125.9721
2024	1.5906	13.9631	17.2665	0.0320	0.4521	0.6187	1.0708	0.1218	0.5820	0.7038	0.0000	3,087.0917	3,087.0917	0.6137	0.0425	3,115.0886
Maximum	**43.8134**	**52.1704**	**38.0310**	**0.0948**	**8.0778**	**2.2460**	**10.3239**	**3.7384**	**2.0806**	**5.8190**	**0.0000**	**9,413.2734**	**9,413.2734**	**2.0226**	**0.4124**	**9,584.1623**

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					
2022	41.3935	9.1728	43.1967	0.0948	4.0556	0.1726	4.2282	1.7736	0.1698	1.9314	0.0000	9,413.2734	9,413.2734	2.0226	0.4124	9,584.1623
2023	0.3448	1.4734	13.0709	0.0230	0.4521	0.0345	0.4867	0.1218	0.0342	0.1561	0.0000	2,267.0121	2,267.0121	0.5678	0.0436	2,294.2087
2024	0.3373	1.4650	13.0067	0.0229	0.4521	0.0344	0.4866	0.1218	0.0342	0.1560	0.0000	2,256.5794	2,256.5794	0.5673	0.0425	2,283.4166
Maximum	**41.3935**	**9.1728**	**43.1967**	**0.0948**	**4.0556**	**0.1726**	**4.2282**	**1.7736**	**0.1698**	**1.9314**	**0.0000**	**9,413.2734**	**9,413.2734**	**2.0226**	**0.4124**	**9,584.1623**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	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	10.67	85.06	4.72	11.48	44.78	93.23	58.56	49.34	92.84	69.30	0.00	10.65	10.65	2.96	0.00	10.51

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	1.7702	5.3000e-004	0.0581	0.0000		2.1000e-004	2.1000e-004		2.1000e-004	2.1000e-004		0.1248	0.1248	3.2000e-004		0.1329
Energy	0.0320	0.2905	0.2440	1.7400e-003		0.0221	0.0221		0.0221	0.0221		348.5931	348.5931	6.6800e-003	6.3900e-003	350.6646
Mobile	2.6333	4.5759	29.2651	0.0753	8.6117	0.0611	8.6728	2.2973	0.0572	2.3545		7,862.4349	7,862.4349	0.3681	0.3676	7,981.1921
Total	**4.4354**	**4.8669**	**29.5672**	**0.0771**	**8.6117**	**0.0833**	**8.6951**	**2.2973**	**0.0795**	**2.3768**		**8,211.1527**	**8,211.1527**	**0.3751**	**0.3740**	**8,331.9895**

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	1.7702	5.3000e-004	0.0581	0.0000		2.1000e-004	2.1000e-004		2.1000e-004	2.1000e-004		0.1248	0.1248	3.2000e-004		0.1329
Energy	0.0256	0.2324	0.1953	1.3900e-003		0.0177	0.0177		0.0177	0.0177		278.9254	278.9254	5.3500e-003	5.1100e-003	280.5829
Mobile	2.6333	4.5759	29.2651	0.0753	8.6117	0.0611	8.6728	2.2973	0.0572	2.3545		7,862.4349	7,862.4349	0.3681	0.3676	7,981.1921
Total	**4.4290**	**4.8088**	**29.5184**	**0.0767**	**8.6117**	**0.0789**	**8.6906**	**2.2973**	**0.0751**	**2.3724**		**8,141.4850**	**8,141.4850**	**0.3738**	**0.3727**	**8,261.9078**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	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	0.14	1.19	0.16	0.45	0.00	5.29	0.05	0.00	5.55	0.19	0.00	0.85	0.85	0.35	0.34	0.84

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	6/1/2022	6/28/2022	5	20	
2	Grading	Grading	6/28/2022	8/22/2022	5	40	
3	Building Construction	Building Construction	8/22/2022	5/10/2024	5	450	
4	Paving	Paving	8/23/2022	9/15/2022	5	18	
5	Architectural Coating	Architectural Coating	8/23/2022	9/15/2022	5	18	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 8

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 118,500; Non-Residential Outdoor: 39,500; 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	2	6.00	9	0.56
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Cranes	1	7.00	231	0.29
Demolition	Excavators	3	8.00	158	0.38
Grading	Excavators	1	8.00	158	0.38

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Grading	Graders	1	8.00	187	0.41
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	2	6.00	132	0.36
Paving	Rollers	2	6.00	80	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45

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	69.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	1,500.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	33.00	13.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	8	20.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	7.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Alternative Fuel for Construction Equipment

Use Cleaner Engines for Construction Equipment

Replace Ground Cover

Water Exposed Area

3.2 Demolition - 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					
Fugitive Dust					0.7536	0.0000	0.7536	0.1141	0.0000	0.1141			0.0000			0.0000
Off-Road	2.6392	25.7194	20.5941	0.0388		1.2427	1.2427		1.1553	1.1553		3,746.781 2	3,746.781 2	1.0524		3,773.092 0
Total	**2.6392**	**25.7194**	**20.5941**	**0.0388**	**0.7536**	**1.2427**	**1.9962**	**0.1141**	**1.1553**	**1.2694**		**3,746.781 2**	**3,746.781 2**	**1.0524**		**3,773.092 0**

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	0.0104	0.4648	0.1007	1.9900e-003	0.0604	5.1300e-003	0.0655	0.0166	4.9100e-003	0.0215		211.7680	211.7680	2.8400e-003	0.0334	221.7800
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
Worker	0.0552	0.0398	0.4846	1.3800e-003	0.1677	8.4000e-004	0.1685	0.0445	7.7000e-004	0.0452		140.4261	140.4261	3.8100e-003	3.9000e-003	141.6847
Total	**0.0656**	**0.5045**	**0.5853**	**3.3700e-003**	**0.2280**	**5.9700e-003**	**0.2340**	**0.0610**	**5.6800e-003**	**0.0667**		**352.1940**	**352.1940**	**6.6500e-003**	**0.0373**	**363.4647**

3.2 Demolition - 2022

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					0.3222	0.0000	0.3222	0.0488	0.0000	0.0488			0.0000			0.0000
Off-Road	0.4623	2.0032	23.2798	0.0388		0.0616	0.0616		0.0616	0.0616	0.0000	3,746.7812	3,746.7812	1.0524		3,773.0920
Total	**0.4623**	**2.0032**	**23.2798**	**0.0388**	**0.3222**	**0.0616**	**0.3838**	**0.0488**	**0.0616**	**0.1104**	**0.0000**	**3,746.7812**	**3,746.7812**	**1.0524**		**3,773.0920**

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	0.0104	0.4648	0.1007	1.9900e-003	0.0604	5.1300e-003	0.0655	0.0166	4.9100e-003	0.0215		211.7680	211.7680	2.8400e-003	0.0334	221.7800
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
Worker	0.0552	0.0398	0.4846	1.3800e-003	0.1677	8.4000e-004	0.1685	0.0445	7.7000e-004	0.0452		140.4261	140.4261	3.8100e-003	3.9000e-003	141.6847
Total	**0.0656**	**0.5045**	**0.5853**	**3.3700e-003**	**0.2280**	**5.9700e-003**	**0.2340**	**0.0610**	**5.6800e-003**	**0.0667**		**352.1940**	**352.1940**	**6.6500e-003**	**0.0373**	**363.4647**

3.3 Grading - 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					
Fugitive Dust					6.2722	0.0000	6.2722	3.3389	0.0000	3.3389			0.0000			0.0000
Off-Road	1.9486	20.8551	15.2727	0.0297		0.9409	0.9409		0.8656	0.8656		2,872.046 4	2,872.046 4	0.9289		2,895.268 4
Total	**1.9486**	**20.8551**	**15.2727**	**0.0297**	**6.2722**	**0.9409**	**7.2130**	**3.3389**	**0.8656**	**4.2045**		**2,872.046 4**	**2,872.046 4**	**0.9289**		**2,895.268 4**

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	0.1129	5.0516	1.0943	0.0216	0.6564	0.0557	0.7121	0.1799	0.0533	0.2333		2,301.825 7	2,301.825 7	0.0308	0.3626	2,410.652 6
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
Worker	0.0552	0.0398	0.4846	1.3800e-003	0.1677	8.4000e-004	0.1685	0.0445	7.7000e-004	0.0452		140.4261	140.4261	3.8100e-003	3.9000e-003	141.6847
Total	**0.1682**	**5.0914**	**1.5789**	**0.0230**	**0.8240**	**0.0566**	**0.8806**	**0.2244**	**0.0541**	**0.2785**		**2,442.251 8**	**2,442.251 8**	**0.0347**	**0.3665**	**2,552.337 2**

3.3 Grading - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.6814	0.0000	2.6814	1.4274	0.0000	1.4274			0.0000			0.0000
Off-Road	0.3632	1.5737	17.7527	0.0297		0.0484	0.0484		0.0484	0.0484	0.0000	2,872.0464	2,872.0464	0.9289		2,895.2684
Total	**0.3632**	**1.5737**	**17.7527**	**0.0297**	**2.6814**	**0.0484**	**2.7298**	**1.4274**	**0.0484**	**1.4758**	**0.0000**	**2,872.0464**	**2,872.0464**	**0.9289**		**2,895.2684**

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	0.1129	5.0516	1.0943	0.0216	0.6564	0.0557	0.7121	0.1799	0.0533	0.2333		2,301.8257	2,301.8257	0.0308	0.3626	2,410.6526
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
Worker	0.0552	0.0398	0.4846	1.3800e-003	0.1677	8.4000e-004	0.1685	0.0445	7.7000e-004	0.0452		140.4261	140.4261	3.8100e-003	3.9000e-003	141.6847
Total	**0.1682**	**5.0914**	**1.5789**	**0.0230**	**0.8240**	**0.0566**	**0.8806**	**0.2244**	**0.0541**	**0.2785**		**2,442.2518**	**2,442.2518**	**0.0347**	**0.3665**	**2,552.3372**

3.4 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	1.7062	15.6156	16.3634	0.0269		0.8090	0.8090		0.7612	0.7612		2,554.3336	2,554.3336	0.6120		2,569.6322
Total	**1.7062**	**15.6156**	**16.3634**	**0.0269**		**0.8090**	**0.8090**		**0.7612**	**0.7612**		**2,554.3336**	**2,554.3336**	**0.6120**		**2,569.6322**

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	0.0000
Vendor	0.0203	0.5791	0.1985	2.3700e-003	0.0833	7.9500e-003	0.0912	0.0240	7.6000e-003	0.0316		251.1025	251.1025	2.6100e-003	0.0373	262.2733
Worker	0.1215	0.0875	1.0662	3.0400e-003	0.3689	1.8400e-003	0.3707	0.0978	1.6900e-003	0.0995		308.9374	308.9374	8.3900e-003	8.5900e-003	311.7062
Total	**0.1417**	**0.6666**	**1.2647**	**5.4100e-003**	**0.4521**	**9.7900e-003**	**0.4619**	**0.1218**	**9.2900e-003**	**0.1311**		**560.0399**	**560.0399**	**0.0110**	**0.0459**	**573.9795**

3.4 Building Construction - 2022

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	0.2182	0.9457	11.9070	0.0178		0.0291	0.0291		0.0291	0.0291	0.0000	1,723.8213	1,723.8213	0.5575		1,737.7593
Total	**0.2182**	**0.9457**	**11.9070**	**0.0178**		**0.0291**	**0.0291**		**0.0291**	**0.0291**	**0.0000**	**1,723.8213**	**1,723.8213**	**0.5575**		**1,737.7593**

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	0.0000
Vendor	0.0203	0.5791	0.1985	2.3700e-003	0.0833	7.9500e-003	0.0912	0.0240	7.6000e-003	0.0316		251.1025	251.1025	2.6100e-003	0.0373	262.2733
Worker	0.1215	0.0875	1.0662	3.0400e-003	0.3689	1.8400e-003	0.3707	0.0978	1.6900e-003	0.0995		308.9374	308.9374	8.3900e-003	8.5900e-003	311.7062
Total	**0.1417**	**0.6666**	**1.2647**	**5.4100e-003**	**0.4521**	**9.7900e-003**	**0.4619**	**0.1218**	**9.2900e-003**	**0.1311**		**560.0399**	**560.0399**	**0.0110**	**0.0459**	**573.9795**

3.4 Building Construction - 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	1.5728	14.3849	16.2440	0.0269		0.6997	0.6997		0.6584	0.6584		2,555.2099	2,555.2099	0.6079		2,570.4061
Total	**1.5728**	**14.3849**	**16.2440**	**0.0269**		**0.6997**	**0.6997**		**0.6584**	**0.6584**		**2,555.2099**	**2,555.2099**	**0.6079**		**2,570.4061**

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	0.0000
Vendor	0.0136	0.4504	0.1808	2.2800e-003	0.0833	3.7100e-003	0.0870	0.0240	3.5500e-003	0.0275		241.4500	241.4500	2.4100e-003	0.0357	252.1516
Worker	0.1130	0.0773	0.9831	2.9400e-003	0.3689	1.7300e-003	0.3706	0.0978	1.5900e-003	0.0994		300.8644	300.8644	7.5600e-003	7.9200e-003	303.4145
Total	**0.1266**	**0.5277**	**1.1638**	**5.2200e-003**	**0.4521**	**5.4400e-003**	**0.4576**	**0.1218**	**5.1400e-003**	**0.1270**		**542.3145**	**542.3145**	**9.9700e-003**	**0.0436**	**555.5661**

3.4 Building Construction - 2023

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	0.2182	0.9457	11.9070	0.0178		0.0291	0.0291		0.0291	0.0291	0.0000	1,724.6976	1,724.6976	0.5578		1,738.6427
Total	**0.2182**	**0.9457**	**11.9070**	**0.0178**		**0.0291**	**0.0291**		**0.0291**	**0.0291**	**0.0000**	**1,724.6976**	**1,724.6976**	**0.5578**		**1,738.6427**

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	0.0000
Vendor	0.0136	0.4504	0.1808	2.2800e-003	0.0833	3.7100e-003	0.0870	0.0240	3.5500e-003	0.0275		241.4500	241.4500	2.4100e-003	0.0357	252.1516
Worker	0.1130	0.0773	0.9831	2.9400e-003	0.3689	1.7300e-003	0.3706	0.0978	1.5900e-003	0.0994		300.8644	300.8644	7.5600e-003	7.9200e-003	303.4145
Total	**0.1266**	**0.5277**	**1.1638**	**5.2200e-003**	**0.4521**	**5.4400e-003**	**0.4576**	**0.1218**	**5.1400e-003**	**0.1270**		**542.3145**	**542.3145**	**9.9700e-003**	**0.0436**	**555.5661**

3.4 Building Construction - 2024

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	1.4716	13.4438	16.1668	0.0270		0.6133	0.6133		0.5769	0.5769		2,555.6989	2,555.6989	0.6044		2,570.8077
Total	**1.4716**	**13.4438**	**16.1668**	**0.0270**		**0.6133**	**0.6133**		**0.5769**	**0.5769**		**2,555.6989**	**2,555.6989**	**0.6044**		**2,570.8077**

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	0.0000
Vendor	0.0133	0.4505	0.1788	2.2400e-003	0.0833	3.6900e-003	0.0870	0.0240	3.5300e-003	0.0275		237.7329	237.7329	2.4900e-003	0.0351	248.2566
Worker	0.1057	0.0689	0.9209	2.8500e-003	0.3689	1.6500e-003	0.3705	0.0978	1.5200e-003	0.0994		293.6599	293.6599	6.8600e-003	7.3600e-003	296.0244
Total	**0.1190**	**0.5194**	**1.0997**	**5.0900e-003**	**0.4521**	**5.3400e-003**	**0.4575**	**0.1218**	**5.0500e-003**	**0.1269**		**531.3928**	**531.3928**	**9.3500e-003**	**0.0425**	**544.2810**

3.4 Building Construction - 2024

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	0.2182	0.9457	11.9070	0.0178		0.0291	0.0291		0.0291	0.0291	0.0000	1,725.1866	1,725.1866	0.5580		1,739.1356
Total	**0.2182**	**0.9457**	**11.9070**	**0.0178**		**0.0291**	**0.0291**		**0.0291**	**0.0291**	**0.0000**	**1,725.1866**	**1,725.1866**	**0.5580**		**1,739.1356**

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	0.0000
Vendor	0.0133	0.4505	0.1788	2.2400e-003	0.0833	3.6900e-003	0.0870	0.0240	3.5300e-003	0.0275		237.7329	237.7329	2.4900e-003	0.0351	248.2566
Worker	0.1057	0.0689	0.9209	2.8500e-003	0.3689	1.6500e-003	0.3705	0.0978	1.5200e-003	0.0994		293.6599	293.6599	6.8600e-003	7.3600e-003	296.0244
Total	**0.1190**	**0.5194**	**1.0997**	**5.0900e-003**	**0.4521**	**5.3400e-003**	**0.4575**	**0.1218**	**5.0500e-003**	**0.1269**		**531.3928**	**531.3928**	**9.3500e-003**	**0.0425**	**544.2810**

3.5 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	0.9765	9.5221	12.1940	0.0189		0.4877	0.4877		0.4504	0.4504		1,805.129 7	1,805.129 7	0.5672		1,819.309 1
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9765**	**9.5221**	**12.1940**	**0.0189**		**0.4877**	**0.4877**		**0.4504**	**0.4504**		**1,805.129 7**	**1,805.129 7**	**0.5672**		**1,819.309 1**

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	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
Worker	0.0736	0.0530	0.6462	1.8400e-003	0.2236	1.1100e-003	0.2247	0.0593	1.0300e-003	0.0603		187.2348	187.2348	5.0800e-003	5.2000e-003	188.9129
Total	**0.0736**	**0.0530**	**0.6462**	**1.8400e-003**	**0.2236**	**1.1100e-003**	**0.2247**	**0.0593**	**1.0300e-003**	**0.0603**		**187.2348**	**187.2348**	**5.0800e-003**	**5.2000e-003**	**188.9129**

3.5 Paving - 2022

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	0.2194	0.9509	13.5323	0.0179		0.0293	0.0293		0.0293	0.0293	0.0000	1,729.355 2	1,729.355 2	0.5593		1,743.337 9
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.2194**	**0.9509**	**13.5323**	**0.0179**		**0.0293**	**0.0293**		**0.0293**	**0.0293**	**0.0000**	**1,729.355 2**	**1,729.355 2**	**0.5593**		**1,743.337 9**

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	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
Worker	0.0736	0.0530	0.6462	1.8400e-003	0.2236	1.1100e-003	0.2247	0.0593	1.0300e-003	0.0603		187.2348	187.2348	5.0800e-003	5.2000e-003	188.9129
Total	**0.0736**	**0.0530**	**0.6462**	**1.8400e-003**	**0.2236**	**1.1100e-003**	**0.2247**	**0.0593**	**1.0300e-003**	**0.0603**		**187.2348**	**187.2348**	**5.0800e-003**	**5.2000e-003**	**188.9129**

3.6 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	40.6850					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	**40.8895**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**		**281.4481**	**281.4481**	**0.0183**		**281.9062**

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	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
Worker	0.0258	0.0186	0.2262	6.4000e-004	0.0782	3.9000e-004	0.0786	0.0208	3.6000e-004	0.0211		65.5322	65.5322	1.7800e-003	1.8200e-003	66.1195
Total	**0.0258**	**0.0186**	**0.2262**	**6.4000e-004**	**0.0782**	**3.9000e-004**	**0.0786**	**0.0208**	**3.6000e-004**	**0.0211**		**65.5322**	**65.5322**	**1.7800e-003**	**1.8200e-003**	**66.1195**

3.6 Architectural Coating - 2022

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	40.6850					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0297	0.1288	1.8324	2.9700e-003		3.9600e-003	3.9600e-003		3.9600e-003	3.9600e-003	0.0000	281.4481	281.4481	0.0183		281.9062
Total	**40.7147**	**0.1288**	**1.8324**	**2.9700e-003**		**3.9600e-003**	**3.9600e-003**		**3.9600e-003**	**3.9600e-003**	**0.0000**	**281.4481**	**281.4481**	**0.0183**		**281.9062**

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	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
Worker	0.0258	0.0186	0.2262	6.4000e-004	0.0782	3.9000e-004	0.0786	0.0208	3.6000e-004	0.0211		65.5322	65.5322	1.7800e-003	1.8200e-003	66.1195
Total	**0.0258**	**0.0186**	**0.2262**	**6.4000e-004**	**0.0782**	**3.9000e-004**	**0.0786**	**0.0208**	**3.6000e-004**	**0.0211**		**65.5322**	**65.5322**	**1.7800e-003**	**1.8200e-003**	**66.1195**

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	2.6333	4.5759	29.2651	0.0753	8.6117	0.0611	8.6728	2.2973	0.0572	2.3545		7,862.434 9	7,862.434 9	0.3681	0.3676	7,981.192 1
Unmitigated	2.6333	4.5759	29.2651	0.0753	8.6117	0.0611	8.6728	2.2973	0.0572	2.3545		7,862.434 9	7,862.434 9	0.3681	0.3676	7,981.192 1

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
University/College (4yr)	889.20	741.00	0.00	3,397,032	3,397,032
Total	889.20	741.00	0.00	3,397,032	3,397,032

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)	25.33	12.82	10.53	6.40	88.60	5.00	91	9	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
University/College (4yr)	0.540541	0.056458	0.173793	0.136090	0.025268	0.007074	0.011525	0.018705	0.000610	0.000304	0.023606	0.001094	0.004932

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 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	0.0256	0.2324	0.1953	1.3900e-003		0.0177	0.0177		0.0177	0.0177		278.9254	278.9254	5.3500e-003	5.1100e-003	280.5829
NaturalGas Unmitigated	0.0320	0.2905	0.2440	1.7400e-003		0.0221	0.0221		0.0221	0.0221		348.5931	348.5931	6.6800e-003	6.3900e-003	350.6646

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)	2963.04	0.0320	0.2905	0.2440	1.7400e-003		0.0221	0.0221		0.0221	0.0221		348.5931	348.5931	6.6800e-003	6.3900e-003	350.6646
Total		**0.0320**	**0.2905**	**0.2440**	**1.7400e-003**		**0.0221**	**0.0221**		**0.0221**	**0.0221**		**348.5931**	**348.5931**	**6.6800e-003**	**6.3900e-003**	**350.6646**

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)	2.37087	0.0256	0.2324	0.1953	1.3900e-003		0.0177	0.0177		0.0177	0.0177		278.9254	278.9254	5.3500e-003	5.1100e-003	280.5829
Total		**0.0256**	**0.2324**	**0.1953**	**1.3900e-003**		**0.0177**	**0.0177**		**0.0177**	**0.0177**		**278.9254**	**278.9254**	**5.3500e-003**	**5.1100e-003**	**280.5829**

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	1.7702	5.3000e-004	0.0581	0.0000		2.1000e-004	2.1000e-004		2.1000e-004	2.1000e-004		0.1248	0.1248	3.2000e-004		0.1329
Unmitigated	1.7702	5.3000e-004	0.0581	0.0000		2.1000e-004	2.1000e-004		2.1000e-004	2.1000e-004		0.1248	0.1248	3.2000e-004		0.1329

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	0.2006					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.5642					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	5.3400e-003	5.3000e-004	0.0581	0.0000		2.1000e-004	2.1000e-004		2.1000e-004	2.1000e-004		0.1248	0.1248	3.2000e-004		0.1329
Total	**1.7702**	**5.3000e-004**	**0.0581**	**0.0000**		**2.1000e-004**	**2.1000e-004**		**2.1000e-004**	**2.1000e-004**		**0.1248**	**0.1248**	**3.2000e-004**		**0.1329**

6.2 Area by SubCategory

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	0.2006					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.5642					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	5.3400e-003	5.3000e-004	0.0581	0.0000		2.1000e-004	2.1000e-004		2.1000e-004	2.1000e-004		0.1248	0.1248	3.2000e-004		0.1329
Total	**1.7702**	**5.3000e-004**	**0.0581**	**0.0000**		**2.1000e-004**	**2.1000e-004**		**2.1000e-004**	**2.1000e-004**		**0.1248**	**0.1248**	**3.2000e-004**		**0.1329**

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

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

UCR - School of Business

Riverside-South Coast County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
University/College (4yr)	570.00	Student	4.80	79,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.4	**Precipitation Freq (Days)**	28
Climate Zone	10			**Operational Year**	2025
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	390.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - See Assumptions

Land Use - See Assumptions

Construction Phase - See Assumptions

Grading - See Assumptions

Demolition -

Trips and VMT - See Assumptions (700 tons of debris used as it results in more vehicle trips)

Water And Wastewater - See Assumptions

Solid Waste - See Assumptions

Construction Off-road Equipment Mitigation - See Assumptions

Energy Mitigation - Based on Project Design. This is the unmitigated scenario with LEED Silver certification.

Vehicle Trips - See Assumptions

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	FuelType	Diesel	Electrical
tblConstEquipMitigation	FuelType	Diesel	Electrical
tblConstEquipMitigation	FuelType	Diesel	Electrical
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	7.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblConstructionPhase	NumDays	230.00	450.00
tblConstructionPhase	NumDays	8.00	40.00
tblConstructionPhase	PhaseEndDate	7/24/2023	9/15/2022
tblConstructionPhase	PhaseEndDate	6/2/2023	5/10/2024
tblConstructionPhase	PhaseEndDate	7/15/2022	8/22/2022
tblConstructionPhase	PhaseEndDate	6/28/2023	9/15/2022
tblConstructionPhase	PhaseStartDate	6/29/2023	8/23/2022
tblConstructionPhase	PhaseStartDate	7/16/2022	8/22/2022
tblConstructionPhase	PhaseStartDate	7/6/2022	6/28/2022
tblConstructionPhase	PhaseStartDate	6/3/2023	8/23/2022
tblGrading	AcresOfGrading	40.00	8.00
tblGrading	MaterialExported	0.00	12,000.00
tblLandUse	LandUseSquareFeet	104,764.56	79,000.00
tblLandUse	LotAcreage	2.41	4.80
tblSolidWaste	SolidWasteGenerationRate	104.02	584.00
tblVehicleTrips	CC_TL	8.40	12.82
tblVehicleTrips	CNW_TL	6.90	10.53
tblVehicleTrips	CW_TL	16.60	25.33
tblWater	AerobicPercent	87.46	97.58
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	2.42
tblWater	IndoorWaterUseRate	1,220,427.00	5,073,500.00
tblWater	OutdoorWaterUseRate	1,908,873.00	7,935,474.00
tblWater	SepticTankPercent	10.33	0.00

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					
2022	43.8299	51.8811	38.2258	0.0951	8.0778	2.2460	10.3238	3.7384	2.0805	5.8189	0.0000	9,440.5655	9,440.5655	2.0230	0.4117	9,611.3184
2023	1.7080	14.8841	17.6295	0.0325	0.4521	0.7052	1.1573	0.1218	0.6636	0.7854	0.0000	3,128.1092	3,128.1092	0.6179	0.0433	3,156.4694
2024	1.5984	13.9349	17.4733	0.0323	0.4521	0.6186	1.0708	0.1218	0.5819	0.7037	0.0000	3,116.8746	3,116.8746	0.6138	0.0422	3,144.7888
Maximum	**43.8299**	**51.8811**	**38.2258**	**0.0951**	**8.0778**	**2.2460**	**10.3238**	**3.7384**	**2.0805**	**5.8189**	**0.0000**	**9,440.5655**	**9,440.5655**	**2.0230**	**0.4117**	**9,611.3184**

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					
2022	41.4100	8.8834	43.3915	0.0951	4.0556	0.1725	4.2281	1.7736	0.1698	1.9313	0.0000	9,440.5655	9,440.5655	2.0230	0.4117	9,611.3184
2023	0.3535	1.4449	13.2925	0.0233	0.4521	0.0345	0.4867	0.1218	0.0342	0.1560	0.0000	2,297.5969	2,297.5969	0.5678	0.0433	2,324.7060
2024	0.3451	1.4368	13.2135	0.0232	0.4521	0.0344	0.4866	0.1218	0.0341	0.1559	0.0000	2,286.3623	2,286.3623	0.5674	0.0422	2,313.1167
Maximum	**41.4100**	**8.8834**	**43.3915**	**0.0951**	**4.0556**	**0.1725**	**4.2281**	**1.7736**	**0.1698**	**1.9313**	**0.0000**	**9,440.5655**	**9,440.5655**	**2.0230**	**0.4117**	**9,611.3184**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	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	10.67	85.42	4.68	11.42	44.78	93.24	58.56	49.34	92.84	69.30	0.00	10.59	10.59	2.96	0.00	10.45

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	1.7702	5.3000e-004	0.0581	0.0000		2.1000e-004	2.1000e-004		2.1000e-004	2.1000e-004		0.1248	0.1248	3.2000e-004		0.1329
Energy	0.0320	0.2905	0.2440	1.7400e-003		0.0221	0.0221		0.0221	0.0221		348.5931	348.5931	6.6800e-003	6.3900e-003	350.6646
Mobile	3.0340	4.3102	33.4645	0.0812	8.6117	0.0610	8.6727	2.2973	0.0572	2.3545		8,472.1729	8,472.1729	0.3639	0.3603	8,588.6333
Total	**4.8361**	**4.6012**	**33.7665**	**0.0829**	**8.6117**	**0.0833**	**8.6950**	**2.2973**	**0.0795**	**2.3768**		**8,820.8907**	**8,820.8907**	**0.3709**	**0.3667**	**8,939.4307**

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	1.7702	5.3000e-004	0.0581	0.0000		2.1000e-004	2.1000e-004		2.1000e-004	2.1000e-004		0.1248	0.1248	3.2000e-004		0.1329
Energy	0.0256	0.2324	0.1953	1.3900e-003		0.0177	0.0177		0.0177	0.0177		278.9254	278.9254	5.3500e-003	5.1100e-003	280.5829
Mobile	3.0340	4.3102	33.4645	0.0812	8.6117	0.0610	8.6727	2.2973	0.0572	2.3545		8,472.1729	8,472.1729	0.3639	0.3603	8,588.6333
Total	**4.8297**	**4.5432**	**33.7178**	**0.0826**	**8.6117**	**0.0789**	**8.6906**	**2.2973**	**0.0751**	**2.3724**		**8,751.2230**	**8,751.2230**	**0.3695**	**0.3654**	**8,869.3490**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	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	0.13	1.26	0.14	0.42	0.00	5.29	0.05	0.00	5.55	0.19	0.00	0.79	0.79	0.36	0.35	0.78

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	6/1/2022	6/28/2022	5	20	
2	Grading	Grading	6/28/2022	8/22/2022	5	40	
3	Building Construction	Building Construction	8/22/2022	5/10/2024	5	450	
4	Paving	Paving	8/23/2022	9/15/2022	5	18	
5	Architectural Coating	Architectural Coating	8/23/2022	9/15/2022	5	18	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 8

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 118,500; Non-Residential Outdoor: 39,500; 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	2	6.00	9	0.56
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Cranes	1	7.00	231	0.29
Demolition	Excavators	3	8.00	158	0.38
Grading	Excavators	1	8.00	158	0.38

Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Grading	Graders	1	8.00	187	0.41
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	2	6.00	132	0.36
Paving	Rollers	2	6.00	80	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45

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	69.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	1,500.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	33.00	13.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	8	20.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	7.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Alternative Fuel for Construction Equipment

Use Cleaner Engines for Construction Equipment

Replace Ground Cover

Water Exposed Area

3.2 Demolition - 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					
Fugitive Dust					0.7536	0.0000	0.7536	0.1141	0.0000	0.1141			0.0000			0.0000
Off-Road	2.6392	25.7194	20.5941	0.0388		1.2427	1.2427		1.1553	1.1553		3,746.781 2	3,746.781 2	1.0524		3,773.092 0
Total	**2.6392**	**25.7194**	**20.5941**	**0.0388**	**0.7536**	**1.2427**	**1.9962**	**0.1141**	**1.1553**	**1.2694**		**3,746.781 2**	**3,746.781 2**	**1.0524**		**3,773.092 0**

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	0.0109	0.4406	0.0980	1.9800e-003	0.0604	5.1200e-003	0.0655	0.0166	4.9000e-003	0.0215		211.6064	211.6064	2.8600e-003	0.0333	221.6115
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
Worker	0.0591	0.0383	0.5980	1.5200e-003	0.1677	8.4000e-004	0.1685	0.0445	7.7000e-004	0.0452		155.0309	155.0309	3.8400e-003	3.8100e-003	156.2632
Total	**0.0700**	**0.4789**	**0.6960**	**3.5000e-003**	**0.2280**	**5.9600e-003**	**0.2340**	**0.0610**	**5.6700e-003**	**0.0667**		**366.6373**	**366.6373**	**6.7000e-003**	**0.0371**	**377.8746**

3.2 Demolition - 2022

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					0.3222	0.0000	0.3222	0.0488	0.0000	0.0488			0.0000			0.0000
Off-Road	0.4623	2.0032	23.2798	0.0388		0.0616	0.0616		0.0616	0.0616	0.0000	3,746.7812	3,746.7812	1.0524		3,773.0920
Total	**0.4623**	**2.0032**	**23.2798**	**0.0388**	**0.3222**	**0.0616**	**0.3838**	**0.0488**	**0.0616**	**0.1104**	**0.0000**	**3,746.7812**	**3,746.7812**	**1.0524**		**3,773.0920**

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	0.0109	0.4406	0.0980	1.9800e-003	0.0604	5.1200e-003	0.0655	0.0166	4.9000e-003	0.0215		211.6064	211.6064	2.8600e-003	0.0333	221.6115
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
Worker	0.0591	0.0383	0.5980	1.5200e-003	0.1677	8.4000e-004	0.1685	0.0445	7.7000e-004	0.0452		155.0309	155.0309	3.8400e-003	3.8100e-003	156.2632
Total	**0.0700**	**0.4789**	**0.6960**	**3.5000e-003**	**0.2280**	**5.9600e-003**	**0.2340**	**0.0610**	**5.6700e-003**	**0.0667**		**366.6373**	**366.6373**	**6.7000e-003**	**0.0371**	**377.8746**

3.3 Grading - 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					
Fugitive Dust					6.2722	0.0000	6.2722	3.3389	0.0000	3.3389			0.0000			0.0000
Off-Road	1.9486	20.8551	15.2727	0.0297		0.9409	0.9409		0.8656	0.8656		2,872.046 4	2,872.046 4	0.9289		2,895.268 4
Total	**1.9486**	**20.8551**	**15.2727**	**0.0297**	**6.2722**	**0.9409**	**7.2130**	**3.3389**	**0.8656**	**4.2045**		**2,872.046 4**	**2,872.046 4**	**0.9289**		**2,895.268 4**

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	0.1186	4.7893	1.0650	0.0216	0.6564	0.0557	0.7120	0.1799	0.0533	0.2332		2,300.069 8	2,300.069 8	0.0311	0.3623	2,408.820 3
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
Worker	0.0591	0.0383	0.5980	1.5200e-003	0.1677	8.4000e-004	0.1685	0.0445	7.7000e-004	0.0452		155.0309	155.0309	3.8400e-003	3.8100e-003	156.2632
Total	**0.1777**	**4.8276**	**1.6630**	**0.0231**	**0.8240**	**0.0565**	**0.8805**	**0.2244**	**0.0540**	**0.2784**		**2,455.100 6**	**2,455.100 6**	**0.0350**	**0.3661**	**2,565.083 4**

3.3 Grading - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.6814	0.0000	2.6814	1.4274	0.0000	1.4274			0.0000			0.0000
Off-Road	0.3632	1.5737	17.7527	0.0297		0.0484	0.0484		0.0484	0.0484	0.0000	2,872.046 4	2,872.046 4	0.9289		2,895.268 4
Total	**0.3632**	**1.5737**	**17.7527**	**0.0297**	**2.6814**	**0.0484**	**2.7298**	**1.4274**	**0.0484**	**1.4758**	**0.0000**	**2,872.046 4**	**2,872.046 4**	**0.9289**		**2,895.268 4**

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	0.1186	4.7893	1.0650	0.0216	0.6564	0.0557	0.7120	0.1799	0.0533	0.2332		2,300.069 8	2,300.069 8	0.0311	0.3623	2,408.820 3
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
Worker	0.0591	0.0383	0.5980	1.5200e-003	0.1677	8.4000e-004	0.1685	0.0445	7.7000e-004	0.0452		155.0309	155.0309	3.8400e-003	3.8100e-003	156.2632
Total	**0.1777**	**4.8276**	**1.6630**	**0.0231**	**0.8240**	**0.0565**	**0.8805**	**0.2244**	**0.0540**	**0.2784**		**2,455.100 6**	**2,455.100 6**	**0.0350**	**0.3661**	**2,565.083 4**

3.4 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	1.7062	15.6156	16.3634	0.0269		0.8090	0.8090		0.7612	0.7612		2,554.3336	2,554.3336	0.6120		2,569.6322
Total	**1.7062**	**15.6156**	**16.3634**	**0.0269**		**0.8090**	**0.8090**		**0.7612**	**0.7612**		**2,554.3336**	**2,554.3336**	**0.6120**		**2,569.6322**

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	0.0000
Vendor	0.0212	0.5497	0.1911	2.3700e-003	0.0833	7.9300e-003	0.0912	0.0240	7.5800e-003	0.0316		250.8289	250.8289	2.6500e-003	0.0372	261.9800
Worker	0.1301	0.0843	1.3156	3.3500e-003	0.3689	1.8400e-003	0.3707	0.0978	1.6900e-003	0.0995		341.0679	341.0679	8.4500e-003	8.3900e-003	343.7789
Total	**0.1512**	**0.6340**	**1.5067**	**5.7200e-003**	**0.4521**	**9.7700e-003**	**0.4619**	**0.1218**	**9.2700e-003**	**0.1311**		**591.8969**	**591.8969**	**0.0111**	**0.0456**	**605.7589**

3.4 Building Construction - 2022

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	0.2182	0.9457	11.9070	0.0178		0.0291	0.0291		0.0291	0.0291	0.0000	1,723.821 3	1,723.821 3	0.5575		1,737.759 3
Total	**0.2182**	**0.9457**	**11.9070**	**0.0178**		**0.0291**	**0.0291**		**0.0291**	**0.0291**	**0.0000**	**1,723.821 3**	**1,723.821 3**	**0.5575**		**1,737.759 3**

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	0.0000
Vendor	0.0212	0.5497	0.1911	2.3700e-003	0.0833	7.9300e-003	0.0912	0.0240	7.5800e-003	0.0316		250.8289	250.8289	2.6500e-003	0.0372	261.9800
Worker	0.1301	0.0843	1.3156	3.3500e-003	0.3689	1.8400e-003	0.3707	0.0978	1.6900e-003	0.0995		341.0679	341.0679	8.4500e-003	8.3900e-003	343.7789
Total	**0.1512**	**0.6340**	**1.5067**	**5.7200e-003**	**0.4521**	**9.7700e-003**	**0.4619**	**0.1218**	**9.2700e-003**	**0.1311**		**591.8969**	**591.8969**	**0.0111**	**0.0456**	**605.7589**

3.4 Building Construction - 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	1.5728	14.3849	16.2440	0.0269		0.6997	0.6997		0.6584	0.6584		2,555.2099	2,555.2099	0.6079		2,570.4061
Total	**1.5728**	**14.3849**	**16.2440**	**0.0269**		**0.6997**	**0.6997**		**0.6584**	**0.6584**		**2,555.2099**	**2,555.2099**	**0.6079**		**2,570.4061**

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	0.0000
Vendor	0.0147	0.4247	0.1749	2.2700e-003	0.0833	3.7000e-003	0.0870	0.0240	3.5400e-003	0.0275		240.8523	240.8523	2.4600e-003	0.0356	251.5198
Worker	0.1206	0.0745	1.2106	3.2400e-003	0.3689	1.7300e-003	0.3706	0.0978	1.5900e-003	0.0994		332.0470	332.0470	7.5800e-003	7.7400e-003	334.5436
Total	**0.1352**	**0.4992**	**1.3855**	**5.5100e-003**	**0.4521**	**5.4300e-003**	**0.4576**	**0.1218**	**5.1300e-003**	**0.1269**		**572.8993**	**572.8993**	**0.0100**	**0.0433**	**586.0633**

3.4 Building Construction - 2023

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	0.2182	0.9457	11.9070	0.0178		0.0291	0.0291		0.0291	0.0291	0.0000	1,724.6976	1,724.6976	0.5578		1,738.6427
Total	**0.2182**	**0.9457**	**11.9070**	**0.0178**		**0.0291**	**0.0291**		**0.0291**	**0.0291**	**0.0000**	**1,724.6976**	**1,724.6976**	**0.5578**		**1,738.6427**

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	0.0000
Vendor	0.0147	0.4247	0.1749	2.2700e-003	0.0833	3.7000e-003	0.0870	0.0240	3.5400e-003	0.0275		240.8523	240.8523	2.4600e-003	0.0356	251.5198
Worker	0.1206	0.0745	1.2106	3.2400e-003	0.3689	1.7300e-003	0.3706	0.0978	1.5900e-003	0.0994		332.0470	332.0470	7.5800e-003	7.7400e-003	334.5436
Total	**0.1352**	**0.4992**	**1.3855**	**5.5100e-003**	**0.4521**	**5.4300e-003**	**0.4576**	**0.1218**	**5.1300e-003**	**0.1269**		**572.8993**	**572.8993**	**0.0100**	**0.0433**	**586.0633**

3.4 Building Construction - 2024

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	1.4716	13.4438	16.1668	0.0270		0.6133	0.6133		0.5769	0.5769		2,555.6989	2,555.6989	0.6044		2,570.8077
Total	**1.4716**	**13.4438**	**16.1668**	**0.0270**		**0.6133**	**0.6133**		**0.5769**	**0.5769**		**2,555.6989**	**2,555.6989**	**0.6044**		**2,570.8077**

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	0.0000
Vendor	0.0144	0.4248	0.1729	2.2400e-003	0.0833	3.6700e-003	0.0869	0.0240	3.5100e-003	0.0275		237.1403	237.1403	2.5400e-003	0.0350	247.6307
Worker	0.1124	0.0664	1.1336	3.1400e-003	0.3689	1.6500e-003	0.3705	0.0978	1.5200e-003	0.0994		324.0354	324.0354	6.8700e-003	7.1900e-003	326.3505
Total	**0.1268**	**0.4911**	**1.3065**	**5.3800e-003**	**0.4521**	**5.3200e-003**	**0.4575**	**0.1218**	**5.0300e-003**	**0.1268**		**561.1757**	**561.1757**	**9.4100e-003**	**0.0422**	**573.9811**

3.4 Building Construction - 2024

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	0.2182	0.9457	11.9070	0.0178		0.0291	0.0291		0.0291	0.0291	0.0000	1,725.186 6	1,725.186 6	0.5580		1,739.135 6
Total	**0.2182**	**0.9457**	**11.9070**	**0.0178**		**0.0291**	**0.0291**		**0.0291**	**0.0291**	**0.0000**	**1,725.186 6**	**1,725.186 6**	**0.5580**		**1,739.135 6**

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	0.0000
Vendor	0.0144	0.4248	0.1729	2.2400e-003	0.0833	3.6700e-003	0.0869	0.0240	3.5100e-003	0.0275		237.1403	237.1403	2.5400e-003	0.0350	247.6307
Worker	0.1124	0.0664	1.1336	3.1400e-003	0.3689	1.6500e-003	0.3705	0.0978	1.5200e-003	0.0994		324.0354	324.0354	6.8700e-003	7.1900e-003	326.3505
Total	**0.1268**	**0.4911**	**1.3065**	**5.3800e-003**	**0.4521**	**5.3200e-003**	**0.4575**	**0.1218**	**5.0300e-003**	**0.1268**		**561.1757**	**561.1757**	**9.4100e-003**	**0.0422**	**573.9811**

3.5 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	0.9765	9.5221	12.1940	0.0189		0.4877	0.4877		0.4504	0.4504		1,805.1297	1,805.1297	0.5672		1,819.3091
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9765**	**9.5221**	**12.1940**	**0.0189**		**0.4877**	**0.4877**		**0.4504**	**0.4504**		**1,805.1297**	**1,805.1297**	**0.5672**		**1,819.3091**

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	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
Worker	0.0788	0.0511	0.7973	2.0300e-003	0.2236	1.1100e-003	0.2247	0.0593	1.0300e-003	0.0603		206.7078	206.7078	5.1200e-003	5.0800e-003	208.3509
Total	**0.0788**	**0.0511**	**0.7973**	**2.0300e-003**	**0.2236**	**1.1100e-003**	**0.2247**	**0.0593**	**1.0300e-003**	**0.0603**		**206.7078**	**206.7078**	**5.1200e-003**	**5.0800e-003**	**208.3509**

3.5 Paving - 2022

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	0.2194	0.9509	13.5323	0.0179		0.0293	0.0293		0.0293	0.0293	0.0000	1,729.355 2	1,729.355 2	0.5593		1,743.337 9
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.2194**	**0.9509**	**13.5323**	**0.0179**		**0.0293**	**0.0293**		**0.0293**	**0.0293**	**0.0000**	**1,729.355 2**	**1,729.355 2**	**0.5593**		**1,743.337 9**

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	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
Worker	0.0788	0.0511	0.7973	2.0300e-003	0.2236	1.1100e-003	0.2247	0.0593	1.0300e-003	0.0603		206.7078	206.7078	5.1200e-003	5.0800e-003	208.3509
Total	**0.0788**	**0.0511**	**0.7973**	**2.0300e-003**	**0.2236**	**1.1100e-003**	**0.2247**	**0.0593**	**1.0300e-003**	**0.0603**		**206.7078**	**206.7078**	**5.1200e-003**	**5.0800e-003**	**208.3509**

3.6 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	40.6850					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	**40.8895**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**		**281.4481**	**281.4481**	**0.0183**		**281.9062**

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	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
Worker	0.0276	0.0179	0.2791	7.1000e-004	0.0782	3.9000e-004	0.0786	0.0208	3.6000e-004	0.0211		72.3477	72.3477	1.7900e-003	1.7800e-003	72.9228
Total	**0.0276**	**0.0179**	**0.2791**	**7.1000e-004**	**0.0782**	**3.9000e-004**	**0.0786**	**0.0208**	**3.6000e-004**	**0.0211**		**72.3477**	**72.3477**	**1.7900e-003**	**1.7800e-003**	**72.9228**

3.6 Architectural Coating - 2022

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	40.6850					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0297	0.1288	1.8324	2.9700e-003		3.9600e-003	3.9600e-003		3.9600e-003	3.9600e-003	0.0000	281.4481	281.4481	0.0183		281.9062
Total	**40.7147**	**0.1288**	**1.8324**	**2.9700e-003**		**3.9600e-003**	**3.9600e-003**		**3.9600e-003**	**3.9600e-003**	**0.0000**	**281.4481**	**281.4481**	**0.0183**		**281.9062**

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	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
Worker	0.0276	0.0179	0.2791	7.1000e-004	0.0782	3.9000e-004	0.0786	0.0208	3.6000e-004	0.0211		72.3477	72.3477	1.7900e-003	1.7800e-003	72.9228
Total	**0.0276**	**0.0179**	**0.2791**	**7.1000e-004**	**0.0782**	**3.9000e-004**	**0.0786**	**0.0208**	**3.6000e-004**	**0.0211**		**72.3477**	**72.3477**	**1.7900e-003**	**1.7800e-003**	**72.9228**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	3.0340	4.3102	33.4645	0.0812	8.6117	0.0610	8.6727	2.2973	0.0572	2.3545		8,472.172 9	8,472.172 9	0.3639	0.3603	8,588.633 3
Unmitigated	3.0340	4.3102	33.4645	0.0812	8.6117	0.0610	8.6727	2.2973	0.0572	2.3545		8,472.172 9	8,472.172 9	0.3639	0.3603	8,588.633 3

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
University/College (4yr)	889.20	741.00	0.00	3,397,032	3,397,032
Total	889.20	741.00	0.00	3,397,032	3,397,032

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)	25.33	12.82	10.53	6.40	88.60	5.00	91	9	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
University/College (4yr)	0.540541	0.056458	0.173793	0.136090	0.025268	0.007074	0.011525	0.018705	0.000610	0.000304	0.023606	0.001094	0.004932

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 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	0.0256	0.2324	0.1953	1.3900e-003		0.0177	0.0177		0.0177	0.0177		278.9254	278.9254	5.3500e-003	5.1100e-003	280.5829
NaturalGas Unmitigated	0.0320	0.2905	0.2440	1.7400e-003		0.0221	0.0221		0.0221	0.0221		348.5931	348.5931	6.6800e-003	6.3900e-003	350.6646

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)	2963.04	0.0320	0.2905	0.2440	1.7400e-003		0.0221	0.0221		0.0221	0.0221		348.5931	348.5931	6.6800e-003	6.3900e-003	350.6646
Total		**0.0320**	**0.2905**	**0.2440**	**1.7400e-003**		**0.0221**	**0.0221**		**0.0221**	**0.0221**		**348.5931**	**348.5931**	**6.6800e-003**	**6.3900e-003**	**350.6646**

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)	2.37087	0.0256	0.2324	0.1953	1.3900e-003		0.0177	0.0177		0.0177	0.0177		278.9254	278.9254	5.3500e-003	5.1100e-003	280.5829
Total		**0.0256**	**0.2324**	**0.1953**	**1.3900e-003**		**0.0177**	**0.0177**		**0.0177**	**0.0177**		**278.9254**	**278.9254**	**5.3500e-003**	**5.1100e-003**	**280.5829**

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	1.7702	5.3000e-004	0.0581	0.0000		2.1000e-004	2.1000e-004		2.1000e-004	2.1000e-004		0.1248	0.1248	3.2000e-004		0.1329
Unmitigated	1.7702	5.3000e-004	0.0581	0.0000		2.1000e-004	2.1000e-004		2.1000e-004	2.1000e-004		0.1248	0.1248	3.2000e-004		0.1329

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	0.2006					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.5642					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	5.3400e-003	5.3000e-004	0.0581	0.0000		2.1000e-004	2.1000e-004		2.1000e-004	2.1000e-004		0.1248	0.1248	3.2000e-004		0.1329
Total	**1.7702**	**5.3000e-004**	**0.0581**	**0.0000**		**2.1000e-004**	**2.1000e-004**		**2.1000e-004**	**2.1000e-004**		**0.1248**	**0.1248**	**3.2000e-004**		**0.1329**

6.2 Area by SubCategory

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	0.2006					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.5642					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	5.3400e-003	5.3000e-004	0.0581	0.0000		2.1000e-004	2.1000e-004		2.1000e-004	2.1000e-004		0.1248	0.1248	3.2000e-004		0.1329
Total	**1.7702**	**5.3000e-004**	**0.0581**	**0.0000**		**2.1000e-004**	**2.1000e-004**		**2.1000e-004**	**2.1000e-004**		**0.1248**	**0.1248**	**3.2000e-004**		**0.1329**

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

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

UCR - School of Business

Riverside-South Coast County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
University/College (4yr)	570.00	Student	4.80	79,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.4	**Precipitation Freq (Days)**	28
Climate Zone	10			**Operational Year**	2025
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	390.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - See Assumptions

Land Use - See Assumptions

Construction Phase - See Assumptions

Grading - See Assumptions

Demolition -

Trips and VMT - See Assumptions (700 tons of debris used as it results in more vehicle trips)

Water And Wastewater - See Assumptions

Solid Waste - See Assumptions

Construction Off-road Equipment Mitigation - See Assumptions

Energy Mitigation - Based on Project Design. This is the unmitigated scenario with LEED Silver certification.

Vehicle Trips - See Assumptions

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	FuelType	Diesel	Electrical
tblConstEquipMitigation	FuelType	Diesel	Electrical
tblConstEquipMitigation	FuelType	Diesel	Electrical
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	7.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final

tblConstructionPhase	NumDays	230.00	450.00
tblConstructionPhase	NumDays	8.00	40.00
tblConstructionPhase	PhaseEndDate	7/24/2023	9/15/2022
tblConstructionPhase	PhaseEndDate	6/2/2023	5/10/2024
tblConstructionPhase	PhaseEndDate	7/15/2022	8/22/2022
tblConstructionPhase	PhaseEndDate	6/28/2023	9/15/2022
tblConstructionPhase	PhaseStartDate	6/29/2023	8/23/2022
tblConstructionPhase	PhaseStartDate	7/16/2022	8/22/2022
tblConstructionPhase	PhaseStartDate	7/6/2022	6/28/2022
tblConstructionPhase	PhaseStartDate	6/3/2023	8/23/2022
tblGrading	AcresOfGrading	40.00	8.00
tblGrading	MaterialExported	0.00	12,000.00
tblLandUse	LandUseSquareFeet	104,764.56	79,000.00
tblLandUse	LotAcreage	2.41	4.80
tblSolidWaste	SolidWasteGenerationRate	104.02	584.00
tblVehicleTrips	CC_TL	8.40	12.82
tblVehicleTrips	CNW_TL	6.90	10.53
tblVehicleTrips	CW_TL	16.60	25.33
tblWater	AerobicPercent	87.46	97.58
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	2.42
tblWater	IndoorWaterUseRate	1,220,427.00	5,073,500.00
tblWater	OutdoorWaterUseRate	1,908,873.00	7,935,474.00
tblWater	SepticTankPercent	10.33	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.5345	1.6536	1.5235	3.2300e-003	0.1753	0.0765	0.2517	0.0794	0.0714	0.1508	0.0000	287.3308	287.3308	0.0588	9.0300e-003	291.4903
2023	0.2202	1.9383	2.2695	4.1900e-003	0.0578	0.0917	0.1495	0.0156	0.0863	0.1019	0.0000	366.0881	366.0881	0.0729	5.1600e-003	369.4465
2024	0.0753	0.6631	0.8224	1.5200e-003	0.0211	0.0294	0.0505	5.7000e-003	0.0276	0.0333	0.0000	133.3061	133.3061	0.0265	1.8300e-003	134.5137
Maximum	**0.5345**	**1.9383**	**2.2695**	**4.1900e-003**	**0.1753**	**0.0917**	**0.2517**	**0.0794**	**0.0863**	**0.1508**	**0.0000**	**366.0881**	**366.0881**	**0.0729**	**9.0300e-003**	**369.4465**

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					
2022	0.4020	0.2454	1.4005	2.7900e-003	0.0991	4.9300e-003	0.1041	0.0405	4.8600e-003	0.0453	0.0000	250.9241	250.9241	0.0564	9.0300e-003	255.0233
2023	0.0441	0.1912	1.7057	3.0000e-003	0.0578	4.4900e-003	0.0623	0.0156	4.4500e-003	0.0201	0.0000	268.1422	268.1422	0.0670	5.1600e-003	271.3531
2024	0.0158	0.0695	0.6200	1.0900e-003	0.0211	1.6400e-003	0.0228	5.7000e-003	1.6200e-003	7.3200e-003	0.0000	97.5182	97.5182	0.0245	1.8300e-003	98.6758
Maximum	**0.4020**	**0.2454**	**1.7057**	**3.0000e-003**	**0.0991**	**4.9300e-003**	**0.1041**	**0.0405**	**4.8600e-003**	**0.0453**	**0.0000**	**268.1422**	**268.1422**	**0.0670**	**9.0300e-003**	**271.3531**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	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	44.36	88.11	19.27	23.04	29.95	94.40	58.13	38.64	94.10	74.58	0.00	21.63	21.63	6.52	0.00	21.42

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	6-1-2022	8-31-2022	1.0802	0.3116
2	9-1-2022	11-30-2022	0.8728	0.2899
3	12-1-2022	2-28-2023	0.5508	0.0601
4	3-1-2023	5-31-2023	0.5454	0.0593
5	6-1-2023	8-31-2023	0.5452	0.0591
6	9-1-2023	11-30-2023	0.5397	0.0589
7	12-1-2023	2-29-2024	0.5172	0.0588
8	3-1-2024	5-31-2024	0.3941	0.0454
		Highest	1.0802	0.3116

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	0.3228	7.0000e-005	7.2600e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0142	0.0142	4.0000e-005	0.0000	0.0151
Energy	5.8300e-003	0.0530	0.0445	3.2000e-004		4.0300e-003	4.0300e-003		4.0300e-003	4.0300e-003	0.0000	165.1725	165.1725	0.0102	2.1600e-003	166.0698
Mobile	0.4038	0.6988	4.5974	0.0116	1.2846	9.2500e-003	1.2938	0.3431	8.6700e-003	0.3518	0.0000	1,099.1187	1,099.1187	0.0506	0.0509	1,115.5454
Waste						0.0000	0.0000		0.0000	0.0000	118.5467	0.0000	118.5467	7.0059	0.0000	293.6945
Water						0.0000	0.0000		0.0000	0.0000	1.7950	27.3511	29.1462	0.0531	4.1800e-003	31.7204
Total	**0.7324**	**0.7519**	**4.6492**	**0.0119**	**1.2846**	**0.0133**	**1.2979**	**0.3431**	**0.0127**	**0.3559**	**120.3417**	**1,291.6565**	**1,411.9982**	**7.1199**	**0.0572**	**1,607.0452**

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	0.3228	7.0000e-005	7.2600e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0142	0.0142	4.0000e-005	0.0000	0.0151
Energy	4.6700e-003	0.0424	0.0356	2.5000e-004		3.2200e-003	3.2200e-003		3.2200e-003	3.2200e-003	0.0000	148.7066	148.7066	9.5400e-003	1.9000e-003	149.5099
Mobile	0.4038	0.6988	4.5974	0.0116	1.2846	9.2500e-003	1.2938	0.3431	8.6700e-003	0.3518	0.0000	1,099.1187	1,099.1187	0.0506	0.0509	1,115.5454
Waste						0.0000	0.0000		0.0000	0.0000	118.5467	0.0000	118.5467	7.0059	0.0000	293.6945
Water						0.0000	0.0000		0.0000	0.0000	1.7950	27.3511	29.1462	0.0531	4.1800e-003	31.7204
Total	**0.7313**	**0.7413**	**4.6403**	**0.0119**	**1.2846**	**0.0125**	**1.2971**	**0.3431**	**0.0119**	**0.3551**	**120.3417**	**1,275.1906**	**1,395.5323**	**7.1192**	**0.0570**	**1,590.4853**

	ROG	NOx	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	**0.16**	**1.41**	**0.19**	**0.59**	**0.00**	**6.09**	**0.06**	**0.00**	**6.36**	**0.23**	**0.00**	**1.27**	**1.17**	**0.01**	**0.45**	**1.03**

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	6/1/2022	6/28/2022	5	20	
2	Grading	Grading	6/28/2022	8/22/2022	5	40	
3	Building Construction	Building Construction	8/22/2022	5/10/2024	5	450	

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

4	Paving	Paving	8/23/2022	9/15/2022	5	18	
5	Architectural Coating	Architectural Coating	8/23/2022	9/15/2022	5	18	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 8

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 118,500; Non-Residential Outdoor: 39,500; 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	2	6.00	9	0.56
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Cranes	1	7.00	231	0.29
Demolition	Excavators	3	8.00	158	0.38
Grading	Excavators	1	8.00	158	0.38
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Grading	Graders	1	8.00	187	0.41
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	2	6.00	132	0.36
Paving	Rollers	2	6.00	80	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45

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	69.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	1,500.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	33.00	13.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	8	20.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	7.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Alternative Fuel for Construction Equipment

Use Cleaner Engines for Construction Equipment

Replace Ground Cover

Water Exposed Area

3.2 Demolition - 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					
Fugitive Dust					7.5400e-003	0.0000	7.5400e-003	1.1400e-003	0.0000	1.1400e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0264	0.2572	0.2059	3.9000e-004		0.0124	0.0124		0.0116	0.0116	0.0000	33.9902	33.9902	9.5500e-003	0.0000	34.2289
Total	**0.0264**	**0.2572**	**0.2059**	**3.9000e-004**	**7.5400e-003**	**0.0124**	**0.0200**	**1.1400e-003**	**0.0116**	**0.0127**	**0.0000**	**33.9902**	**33.9902**	**9.5500e-003**	**0.0000**	**34.2289**

3.2 Demolition - 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	1.1000e-004	4.6500e-003	9.9000e-004	2.0000e-005	6.0000e-004	5.0000e-005	6.5000e-004	1.6000e-004	5.0000e-005	2.1000e-004	0.0000	1.9203	1.9203	3.0000e-005	3.0000e-004	2.0111
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.2000e-004	4.1000e-004	5.1100e-003	1.0000e-005	1.6500e-003	1.0000e-005	1.6600e-003	4.4000e-004	1.0000e-005	4.5000e-004	0.0000	1.3037	1.3037	3.0000e-005	4.0000e-005	1.3153
Total	**6.3000e-004**	**5.0600e-003**	**6.1000e-003**	**3.0000e-005**	**2.2500e-003**	**6.0000e-005**	**2.3100e-003**	**6.0000e-004**	**6.0000e-005**	**6.6000e-004**	**0.0000**	**3.2240**	**3.2240**	**6.0000e-005**	**3.4000e-004**	**3.3264**

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					3.2200e-003	0.0000	3.2200e-003	4.9000e-004	0.0000	4.9000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.6200e-003	0.0200	0.2328	3.9000e-004		6.2000e-004	6.2000e-004		6.2000e-004	6.2000e-004	0.0000	33.9902	33.9902	9.5500e-003	0.0000	34.2289
Total	**4.6200e-003**	**0.0200**	**0.2328**	**3.9000e-004**	**3.2200e-003**	**6.2000e-004**	**3.8400e-003**	**4.9000e-004**	**6.2000e-004**	**1.1100e-003**	**0.0000**	**33.9902**	**33.9902**	**9.5500e-003**	**0.0000**	**34.2289**

3.2 Demolition - 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	1.1000e-004	4.6500e-003	9.9000e-004	2.0000e-005	6.0000e-004	5.0000e-005	6.5000e-004	1.6000e-004	5.0000e-005	2.1000e-004	0.0000	1.9203	1.9203	3.0000e-005	3.0000e-004	2.0111
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.2000e-004	4.1000e-004	5.1100e-003	1.0000e-005	1.6500e-003	1.0000e-005	1.6600e-003	4.4000e-004	1.0000e-005	4.5000e-004	0.0000	1.3037	1.3037	3.0000e-005	4.0000e-005	1.3153
Total	**6.3000e-004**	**5.0600e-003**	**6.1000e-003**	**3.0000e-005**	**2.2500e-003**	**6.0000e-005**	**2.3100e-003**	**6.0000e-004**	**6.0000e-005**	**6.6000e-004**	**0.0000**	**3.2240**	**3.2240**	**6.0000e-005**	**3.4000e-004**	**3.3264**

3.3 Grading - 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					
Fugitive Dust					0.1254	0.0000	0.1254	0.0668	0.0000	0.0668	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0390	0.4171	0.3055	5.9000e-004		0.0188	0.0188		0.0173	0.0173	0.0000	52.1095	52.1095	0.0169	0.0000	52.5309
Total	**0.0390**	**0.4171**	**0.3055**	**5.9000e-004**	**0.1254**	**0.0188**	**0.1443**	**0.0668**	**0.0173**	**0.0841**	**0.0000**	**52.1095**	**52.1095**	**0.0169**	**0.0000**	**52.5309**

3.3 Grading - 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	2.3200e-003	0.1010	0.0215	4.3000e-004	0.0129	1.1100e-003	0.0141	3.5500e-003	1.0700e-003	4.6200e-003	0.0000	41.7451	41.7451	5.6000e-004	6.5800e-003	43.7189
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	1.0500e-003	8.2000e-004	0.0102	3.0000e-005	3.3000e-003	2.0000e-005	3.3100e-003	8.8000e-004	2.0000e-005	8.9000e-004	0.0000	2.6074	2.6074	7.0000e-005	7.0000e-005	2.6306
Total	**3.3700e-003**	**0.1018**	**0.0318**	**4.6000e-004**	**0.0162**	**1.1300e-003**	**0.0174**	**4.4300e-003**	**1.0900e-003**	**5.5100e-003**	**0.0000**	**44.3525**	**44.3525**	**6.3000e-004**	**6.6500e-003**	**46.3495**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0536	0.0000	0.0536	0.0286	0.0000	0.0286	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.2600e-003	0.0315	0.3551	5.9000e-004		9.7000e-004	9.7000e-004		9.7000e-004	9.7000e-004	0.0000	52.1095	52.1095	0.0169	0.0000	52.5308
Total	**7.2600e-003**	**0.0315**	**0.3551**	**5.9000e-004**	**0.0536**	**9.7000e-004**	**0.0546**	**0.0286**	**9.7000e-004**	**0.0295**	**0.0000**	**52.1095**	**52.1095**	**0.0169**	**0.0000**	**52.5308**

3.3 Grading - 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	2.3200e-003	0.1010	0.0215	4.3000e-004	0.0129	1.1100e-003	0.0141	3.5500e-003	1.0700e-003	4.6200e-003	0.0000	41.7451	41.7451	5.6000e-004	6.5800e-003	43.7189
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	1.0500e-003	8.2000e-004	0.0102	3.0000e-005	3.3000e-003	2.0000e-005	3.3100e-003	8.8000e-004	2.0000e-005	8.9000e-004	0.0000	2.6074	2.6074	7.0000e-005	7.0000e-005	2.6306
Total	**3.3700e-003**	**0.1018**	**0.0318**	**4.6000e-004**	**0.0162**	**1.1300e-003**	**0.0174**	**4.4300e-003**	**1.0900e-003**	**5.5100e-003**	**0.0000**	**44.3525**	**44.3525**	**6.3000e-004**	**6.6500e-003**	**46.3495**

3.4 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	0.0811	0.7417	0.7773	1.2800e-003		0.0384	0.0384		0.0362	0.0362	0.0000	110.0695	110.0695	0.0264	0.0000	110.7287
Total	**0.0811**	**0.7417**	**0.7773**	**1.2800e-003**		**0.0384**	**0.0384**		**0.0362**	**0.0362**	**0.0000**	**110.0695**	**110.0695**	**0.0264**	**0.0000**	**110.7287**

3.4 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	9.8000e-004	0.0274	9.2400e-003	1.1000e-004	3.9000e-003	3.8000e-004	4.2800e-003	1.1300e-003	3.6000e-004	1.4900e-003	0.0000	10.8135	10.8135	1.1000e-004	1.6000e-003	11.2945
Worker	5.4800e-003	4.2700e-003	0.0534	1.5000e-004	0.0172	9.0000e-005	0.0173	4.5700e-003	8.0000e-005	4.6600e-003	0.0000	13.6234	13.6234	3.6000e-004	3.8000e-004	13.7449
Total	**6.4600e-003**	**0.0317**	**0.0626**	**2.6000e-004**	**0.0211**	**4.7000e-004**	**0.0216**	**5.7000e-003**	**4.4000e-004**	**6.1500e-003**	**0.0000**	**24.4369**	**24.4369**	**4.7000e-004**	**1.9800e-003**	**25.0394**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0104	0.0449	0.5656	8.5000e-004		1.3800e-003	1.3800e-003		1.3800e-003	1.3800e-003	0.0000	74.2816	74.2816	0.0240	0.0000	74.8822
Total	**0.0104**	**0.0449**	**0.5656**	**8.5000e-004**		**1.3800e-003**	**1.3800e-003**		**1.3800e-003**	**1.3800e-003**	**0.0000**	**74.2816**	**74.2816**	**0.0240**	**0.0000**	**74.8822**

3.4 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	9.8000e-004	0.0274	9.2400e-003	1.1000e-004	3.9000e-003	3.8000e-004	4.2800e-003	1.1300e-003	3.6000e-004	1.4900e-003	0.0000	10.8135	10.8135	1.1000e-004	1.6000e-003	11.2945
Worker	5.4800e-003	4.2700e-003	0.0534	1.5000e-004	0.0172	9.0000e-005	0.0173	4.5700e-003	8.0000e-005	4.6600e-003	0.0000	13.6234	13.6234	3.6000e-004	3.8000e-004	13.7449
Total	**6.4600e-003**	**0.0317**	**0.0626**	**2.6000e-004**	**0.0211**	**4.7000e-004**	**0.0216**	**5.7000e-003**	**4.4000e-004**	**6.1500e-003**	**0.0000**	**24.4369**	**24.4369**	**4.7000e-004**	**1.9800e-003**	**25.0394**

3.4 Building Construction - 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	0.2045	1.8700	2.1117	3.5000e-003		0.0910	0.0910		0.0856	0.0856	0.0000	301.3462	301.3462	0.0717	0.0000	303.1383
Total	**0.2045**	**1.8700**	**2.1117**	**3.5000e-003**		**0.0910**	**0.0910**		**0.0856**	**0.0856**	**0.0000**	**301.3462**	**301.3462**	**0.0717**	**0.0000**	**303.1383**

3.4 Building Construction - 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	1.8300e-003	0.0579	0.0231	3.0000e-004	0.0107	4.8000e-004	0.0112	3.0800e-003	4.6000e-004	3.5400e-003	0.0000	28.4343	28.4343	2.9000e-004	4.2000e-003	29.6945
Worker	0.0139	0.0103	0.1347	3.9000e-004	0.0472	2.2000e-004	0.0474	0.0125	2.1000e-004	0.0127	0.0000	36.3076	36.3076	8.9000e-004	9.5000e-004	36.6137
Total	**0.0158**	**0.0683**	**0.1578**	**6.9000e-004**	**0.0578**	**7.0000e-004**	**0.0585**	**0.0156**	**6.7000e-004**	**0.0163**	**0.0000**	**64.7420**	**64.7420**	**1.1800e-003**	**5.1500e-003**	**66.3082**

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	0.0284	0.1229	1.5479	2.3200e-003		3.7800e-003	3.7800e-003		3.7800e-003	3.7800e-003	0.0000	203.4003	203.4003	0.0658	0.0000	205.0449
Total	**0.0284**	**0.1229**	**1.5479**	**2.3200e-003**		**3.7800e-003**	**3.7800e-003**		**3.7800e-003**	**3.7800e-003**	**0.0000**	**203.4003**	**203.4003**	**0.0658**	**0.0000**	**205.0449**

3.4 Building Construction - 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	1.8300e-003	0.0579	0.0231	3.0000e-004	0.0107	4.8000e-004	0.0112	3.0800e-003	4.6000e-004	3.5400e-003	0.0000	28.4343	28.4343	2.9000e-004	4.2000e-003	29.6945
Worker	0.0139	0.0103	0.1347	3.9000e-004	0.0472	2.2000e-004	0.0474	0.0125	2.1000e-004	0.0127	0.0000	36.3076	36.3076	8.9000e-004	9.5000e-004	36.6137
Total	**0.0158**	**0.0683**	**0.1578**	**6.9000e-004**	**0.0578**	**7.0000e-004**	**0.0585**	**0.0156**	**6.7000e-004**	**0.0163**	**0.0000**	**64.7420**	**64.7420**	**1.1800e-003**	**5.1500e-003**	**66.3082**

3.4 Building Construction - 2024

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	0.0699	0.6386	0.7679	1.2800e-003		0.0291	0.0291		0.0274	0.0274	0.0000	110.1283	110.1283	0.0260	0.0000	110.7794
Total	**0.0699**	**0.6386**	**0.7679**	**1.2800e-003**		**0.0291**	**0.0291**		**0.0274**	**0.0274**	**0.0000**	**110.1283**	**110.1283**	**0.0260**	**0.0000**	**110.7794**

3.4 Building Construction - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.6000e-004	0.0212	8.3400e-003	1.1000e-004	3.9000e-003	1.7000e-004	4.0800e-003	1.1300e-003	1.7000e-004	1.2900e-003	0.0000	10.2294	10.2294	1.1000e-004	1.5100e-003	10.6822
Worker	4.7500e-003	3.3600e-003	0.0461	1.4000e-004	0.0172	8.0000e-005	0.0173	4.5700e-003	7.0000e-005	4.6500e-003	0.0000	12.9484	12.9484	3.0000e-004	3.2000e-004	13.0521
Total	**5.4100e-003**	**0.0245**	**0.0544**	**2.5000e-004**	**0.0211**	**2.5000e-004**	**0.0214**	**5.7000e-003**	**2.4000e-004**	**5.9400e-003**	**0.0000**	**23.1778**	**23.1778**	**4.1000e-004**	**1.8300e-003**	**23.7343**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0104	0.0449	0.5656	8.5000e-004		1.3800e-003	1.3800e-003		1.3800e-003	1.3800e-003	0.0000	74.3404	74.3404	0.0240	0.0000	74.9415
Total	**0.0104**	**0.0449**	**0.5656**	**8.5000e-004**		**1.3800e-003**	**1.3800e-003**		**1.3800e-003**	**1.3800e-003**	**0.0000**	**74.3404**	**74.3404**	**0.0240**	**0.0000**	**74.9415**

3.4 Building Construction - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.6000e-004	0.0212	8.3400e-003	1.1000e-004	3.9000e-003	1.7000e-004	4.0800e-003	1.1300e-003	1.7000e-004	1.2900e-003	0.0000	10.2294	10.2294	1.1000e-004	1.5100e-003	10.6822
Worker	4.7500e-003	3.3600e-003	0.0461	1.4000e-004	0.0172	8.0000e-005	0.0173	4.5700e-003	7.0000e-005	4.6500e-003	0.0000	12.9484	12.9484	3.0000e-004	3.2000e-004	13.0521
Total	**5.4100e-003**	**0.0245**	**0.0544**	**2.5000e-004**	**0.0211**	**2.5000e-004**	**0.0214**	**5.7000e-003**	**2.4000e-004**	**5.9400e-003**	**0.0000**	**23.1778**	**23.1778**	**4.1000e-004**	**1.8300e-003**	**23.7343**

3.5 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	8.7900e-003	0.0857	0.1098	1.7000e-004		4.3900e-003	4.3900e-003		4.0500e-003	4.0500e-003	0.0000	14.7383	14.7383	4.6300e-003	0.0000	14.8540
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**8.7900e-003**	**0.0857**	**0.1098**	**1.7000e-004**		**4.3900e-003**	**4.3900e-003**		**4.0500e-003**	**4.0500e-003**	**0.0000**	**14.7383**	**14.7383**	**4.6300e-003**	**0.0000**	**14.8540**

3.5 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	6.3000e-004	4.9000e-004	6.1300e-003	2.0000e-005	1.9800e-003	1.0000e-005	1.9900e-003	5.3000e-004	1.0000e-005	5.3000e-004	0.0000	1.5644	1.5644	4.0000e-005	4.0000e-005	1.5784
Total	**6.3000e-004**	**4.9000e-004**	**6.1300e-003**	**2.0000e-005**	**1.9800e-003**	**1.0000e-005**	**1.9900e-003**	**5.3000e-004**	**1.0000e-005**	**5.3000e-004**	**0.0000**	**1.5644**	**1.5644**	**4.0000e-005**	**4.0000e-005**	**1.5784**

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	1.9700e-003	8.5600e-003	0.1218	1.6000e-004		2.6000e-004	2.6000e-004		2.6000e-004	2.6000e-004	0.0000	14.1196	14.1196	4.5700e-003	0.0000	14.2338
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.9700e-003**	**8.5600e-003**	**0.1218**	**1.6000e-004**		**2.6000e-004**	**2.6000e-004**		**2.6000e-004**	**2.6000e-004**	**0.0000**	**14.1196**	**14.1196**	**4.5700e-003**	**0.0000**	**14.2338**

3.5 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	6.3000e-004	4.9000e-004	6.1300e-003	2.0000e-005	1.9800e-003	1.0000e-005	1.9900e-003	5.3000e-004	1.0000e-005	5.3000e-004	0.0000	1.5644	1.5644	4.0000e-005	4.0000e-005	1.5784
Total	**6.3000e-004**	**4.9000e-004**	**6.1300e-003**	**2.0000e-005**	**1.9800e-003**	**1.0000e-005**	**1.9900e-003**	**5.3000e-004**	**1.0000e-005**	**5.3000e-004**	**0.0000**	**1.5644**	**1.5644**	**4.0000e-005**	**4.0000e-005**	**1.5784**

3.6 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	0.3662					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.8400e-003	0.0127	0.0163	3.0000e-005		7.4000e-004	7.4000e-004		7.4000e-004	7.4000e-004	0.0000	2.2979	2.2979	1.5000e-004	0.0000	2.3017
Total	**0.3680**	**0.0127**	**0.0163**	**3.0000e-005**		**7.4000e-004**	**7.4000e-004**		**7.4000e-004**	**7.4000e-004**	**0.0000**	**2.2979**	**2.2979**	**1.5000e-004**	**0.0000**	**2.3017**

3.6 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	2.2000e-004	1.7000e-004	2.1500e-003	1.0000e-005	6.9000e-004	0.0000	7.0000e-004	1.8000e-004	0.0000	1.9000e-004	0.0000	0.5475	0.5475	1.0000e-005	2.0000e-005	0.5524
Total	**2.2000e-004**	**1.7000e-004**	**2.1500e-003**	**1.0000e-005**	**6.9000e-004**	**0.0000**	**7.0000e-004**	**1.8000e-004**	**0.0000**	**1.9000e-004**	**0.0000**	**0.5475**	**0.5475**	**1.0000e-005**	**2.0000e-005**	**0.5524**

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	0.3662					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.7000e-004	1.1600e-003	0.0165	3.0000e-005		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	2.2979	2.2979	1.5000e-004	0.0000	2.3017
Total	**0.3664**	**1.1600e-003**	**0.0165**	**3.0000e-005**		**4.0000e-005**	**4.0000e-005**		**4.0000e-005**	**4.0000e-005**	**0.0000**	**2.2979**	**2.2979**	**1.5000e-004**	**0.0000**	**2.3017**

3.6 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	2.2000e-004	1.7000e-004	2.1500e-003	1.0000e-005	6.9000e-004	0.0000	7.0000e-004	1.8000e-004	0.0000	1.9000e-004	0.0000	0.5475	0.5475	1.0000e-005	2.0000e-005	0.5524
Total	**2.2000e-004**	**1.7000e-004**	**2.1500e-003**	**1.0000e-005**	**6.9000e-004**	**0.0000**	**7.0000e-004**	**1.8000e-004**	**0.0000**	**1.9000e-004**	**0.0000**	**0.5475**	**0.5475**	**1.0000e-005**	**2.0000e-005**	**0.5524**

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	0.4038	0.6988	4.5974	0.0116	1.2846	9.2500e-003	1.2938	0.3431	8.6700e-003	0.3518	0.0000	1,099.1187	1,099.1187	0.0506	0.0509	1,115.5454
Unmitigated	0.4038	0.6988	4.5974	0.0116	1.2846	9.2500e-003	1.2938	0.3431	8.6700e-003	0.3518	0.0000	1,099.1187	1,099.1187	0.0506	0.0509	1,115.5454

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
University/College (4yr)	889.20	741.00	0.00	3,397,032	3,397,032
Total	889.20	741.00	0.00	3,397,032	3,397,032

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)	25.33	12.82	10.53	6.40	88.60	5.00	91	9	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
University/College (4yr)	0.540541	0.056458	0.173793	0.136090	0.025268	0.007074	0.011525	0.018705	0.000610	0.000304	0.023606	0.001094	0.004932

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

	ROG	NOx	CO	SO2	Fugitive 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	102.5274	102.5274	8.6500e-003	1.0500e-003	103.0563
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	107.4590	107.4590	9.0700e-003	1.1000e-003	108.0134
NaturalGas Mitigated	4.6700e-003	0.0424	0.0356	2.5000e-004		3.2200e-003	3.2200e-003		3.2200e-003	3.2200e-003	0.0000	46.1792	46.1792	8.9000e-004	8.5000e-004	46.4537
NaturalGas Unmitigated	5.8300e-003	0.0530	0.0445	3.2000e-004		4.0300e-003	4.0300e-003		4.0300e-003	4.0300e-003	0.0000	57.7135	57.7135	1.1100e-003	1.0600e-003	58.0565

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)	1.08151e+006	5.8300e-003	0.0530	0.0445	3.2000e-004		4.0300e-003	4.0300e-003		4.0300e-003	4.0300e-003	0.0000	57.7135	57.7135	1.1100e-003	1.0600e-003	58.0565
Total		**5.8300e-003**	**0.0530**	**0.0445**	**3.2000e-004**		**4.0300e-003**	**4.0300e-003**		**4.0300e-003**	**4.0300e-003**	**0.0000**	**57.7135**	**57.7135**	**1.1100e-003**	**1.0600e-003**	**58.0565**

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)	865366	4.6700e-003	0.0424	0.0356	2.5000e-004		3.2200e-003	3.2200e-003		3.2200e-003	3.2200e-003	0.0000	46.1792	46.1792	8.9000e-004	8.5000e-004	46.4537
Total		**4.6700e-003**	**0.0424**	**0.0356**	**2.5000e-004**		**3.2200e-003**	**3.2200e-003**		**3.2200e-003**	**3.2200e-003**	**0.0000**	**46.1792**	**46.1792**	**8.9000e-004**	**8.5000e-004**	**46.4537**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
University/College (4yr)	605930	107.4590	9.0700e-003	1.1000e-003	108.0134
Total		**107.4590**	**9.0700e-003**	**1.1000e-003**	**108.0134**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
University/College (4yr)	578122	102.5274	8.6500e-003	1.0500e-003	103.0563
Total		**102.5274**	**8.6500e-003**	**1.0500e-003**	**103.0563**

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	0.3228	7.0000e-005	7.2600e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0142	0.0142	4.0000e-005	0.0000	0.0151
Unmitigated	0.3228	7.0000e-005	7.2600e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0142	0.0142	4.0000e-005	0.0000	0.0151

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	0.0366					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.2855					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	6.7000e-004	7.0000e-005	7.2600e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0142	0.0142	4.0000e-005	0.0000	0.0151
Total	**0.3228**	**7.0000e-005**	**7.2600e-003**	**0.0000**		**3.0000e-005**	**3.0000e-005**		**3.0000e-005**	**3.0000e-005**	**0.0000**	**0.0142**	**0.0142**	**4.0000e-005**	**0.0000**	**0.0151**

6.2 Area by SubCategory

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	0.0366					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.2855					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	6.7000e-004	7.0000e-005	7.2600e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0142	0.0142	4.0000e-005	0.0000	0.0151
Total	**0.3228**	**7.0000e-005**	**7.2600e-003**	**0.0000**		**3.0000e-005**	**3.0000e-005**		**3.0000e-005**	**3.0000e-005**	**0.0000**	**0.0142**	**0.0142**	**4.0000e-005**	**0.0000**	**0.0151**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	29.1462	0.0531	4.1800e-003	31.7204
Unmitigated	29.1462	0.0531	4.1800e-003	31.7204

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
University/College (4yr)	5.0735 / 7.93547	29.1462	0.0531	4.1800e-003	31.7204
Total		**29.1462**	**0.0531**	**4.1800e-003**	**31.7204**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
University/College (4yr)	5.0735 / 7.93547	29.1462	0.0531	4.1800e-003	31.7204
Total		**29.1462**	**0.0531**	**4.1800e-003**	**31.7204**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	118.5467	7.0059	0.0000	293.6945
Unmitigated	118.5467	7.0059	0.0000	293.6945

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
University/College (4yr)	584	118.5467	7.0059	0.0000	293.6945
Total		**118.5467**	**7.0059**	**0.0000**	**293.6945**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
University/College (4yr)	584	118.5467	7.0059	0.0000	293.6945
Total		**118.5467**	**7.0059**	**0.0000**	**293.6945**

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

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Appendix B

Biological Resources Constraints Report

January 18, 2022

Stephanie Tang
Campus Environmental Planner
Planning, Design & Construction
University of California, Riverside
1223 University Avenue, Suite 240
Riverside, California 92507

VIA EMAIL
Stephanie.Tang@ucr.edu

Subject: Biological Resources Constraints Report for the School of Business Building Project, University of California, Riverside

Dear Ms. Tang:

This Letter Report presents the findings of a biological resources assessment for the University of California, Riverside's (UCR's) proposed School of Business Building Project, demolition of existing structures, replacement of structures, and off-site improvements (hereafter collectively referred to as "proposed project"). The purpose of the survey is to evaluate the potential project constraints as it relates to biological resources with construction and operation of the proposed project.

PROJECT DESCRIPTION AND LOCATION

The proposed project will involve construction of the School of Business Building, demolition of existing structure(s) (Biocontrol Building, Genomics Shed, Soils Storage Building, Headhouse Storage Building, and Storage 6), replacement of structures (Biocontrol Building and Genomics Shed), and off-site improvements anticipated to occur generally along South Campus Drive between Citrus Drive and College Place, and within previously disturbed or paved areas. The School of Business Building will be an approximately 75,000-gross-square-foot multi-story facility located in the southern portion of East Campus, south of South Campus Drive on Parking Lot 8, within proximity to Anderson Hall, which currently houses the School of Business Administrative functions, faculty offices, and classrooms. The Genomics Shed Replacement Site Options are also located on the southern portion of East Campus, south of South Campus Drive. An approximately 0.7-acre area near the Entomology Building and Boyden Laboratories is proposed for the Biocontrol Building Replacement Site. The project design has not been finalized, but the proposed project and associated construction activities will occur on approximately 5 acres, hereafter referred to as the "project site". The proposed project will be consistent with the environmental guidelines and protection measures found in UCR's 2021 Long Range Development Plan (2021 LRDP) (UCR 2021).

The project site is comprised of two adjacent polygons located in the southeastern portion of the UCR campus, which is located in the City of Riverside, California (Exhibit 1). It occurs on the U.S. Geological Survey's (USGS') Riverside East 7.5-minute quadrangle in Section 29 of Township 2 South, Range 4 West (Exhibit 2). The School of Business Building and Genomics Shed Replacement Site Options are generally bordered by UCR academic and/or research facilities to the north; Box Springs Mountains open space and landscaped areas to the south; research orchard and large water-storage basin, and Box Springs Mountains open space to the east; and a portion of Anderson Hall, internal roadways and surface parking lot to the west. The Biocontrol Building Replacement Site is generally bordered on all sides by academic and/or research facilities.

Elevations on the project site range between 1,095 and 1,210 feet above mean sea level with the site generally sloping down to the northwest. A variety of soils are mapped on campus, including loam and sandy loam soils of the Arlington, Buren, Cieneba, Hanford, and Vista series (USDA NRCS 2021a).

SURVEY METHODS

Psomas Senior Biologist Steve Norton conducted a general plant and wildlife survey and verified previously mapped vegetation types for the approximately 5-acre project site and a 100-foot buffer (collectively approximately 16 acres and hereafter referred to as "survey area") on September 14, 2021. Representative photographs are provided in Attachment A-1 through A-4.

Prior to the survey, a literature review was conducted to identify special status plants, wildlife, and habitats that have been reported to occur in the vicinity of the survey area. Resources reviewed included the California Native Plant Society's (CNPS') Inventory of Rare and Endangered Plants (CNPS 2021a), the California Department of Fish and Wildlife's (CDFW's) California Natural Diversity Database (CDFW 2021a), the 2021 Draft Environmental Impact Report (EIR) for UCR's Long Range Development Plan (LRDP) (UCR 2021), and the 2019 Biological Resources Constraints Letter Report supporting the LRDP EIR (Psomas 2019).

The vegetation types in the survey area were previously mapped in the 2019 Biological Resources Constraints Letter Report for the 2021 LRDP. During the 2021 survey efforts, the vegetation types previously mapped were verified and any edits necessary (due to the establishment or loss of different or new vegetation types) were mapped on a 1-inch equals 350 feet (1″=350′) scale color aerial photograph with the minimum mapping unit remaining at approximately 0.25 acre. Nomenclature for vegetation types generally follows that of *A Manual of California Vegetation* (CNPS 2021b). All plant species observed were recorded in field notes. Plant species were identified in the field or collected for subsequent identification using keys in Baldwin et al. (2012). Nomenclature of plant taxa conform to the *Special Vascular Plants, Bryophytes, and Lichens List* (CDFW 2021b) for special status species and the Jepson eFlora (Jepson Flora Project 2021) for all other taxa. It should be noted that, since the general plan survey occurred in the fall season, many annual species were not detectable (because they will not germinate until closer to spring) or were not identifiable to species because they were not blooming. Surveys conducted in the spring or summer would likely record higher diversity of annual species. Perennial species and vegetation types were observable and are sufficient for the purposes of this report.

All wildlife species detected during the course of the surveys were documented in field notes. Active searches for reptiles and amphibians included lifting, overturning, and carefully replacing rocks and debris. Birds were identified by visual and auditory recognition. Surveys for mammals were conducted during the day and included searching for and identifying diagnostic sign, including scat, guano, footprints, scratch-outs, dust bowls, burrows, and trails. Taxonomy and nomenclature for wildlife generally follows the *Special Animals List* (CDFW 2021c) for special status species and, for other species, Center for North American Herpetology (2015) for amphibians and reptiles, the American Ornithological Society (2021) for birds, and the Bradley et al. 2014) for mammals.

Potential jurisdictional water resources on the project site were previously mapped as part of the 2021 LRDP; however, any evidence of new, shifted, or altered water resources were documented during the general survey and the results are reported in this report. Resources reviewed to assist in the assessment of potential jurisdictional waters included the U.S. Department of Agriculture, Natural Resources

Conservation Service's (USDA NRCS') Web Soil Survey (USDA NRCS 2021a), the USDA NRCS' State Soil Data Access Hydric Soils List (USDA NRCS 2021b), and the USFWS' National Wetlands Inventory (NWI) Wetland Mapper (USFWS 2021).

SURVEY RESULTS

Vegetation Types and Other Areas

The 2021 LRDP Draft EIR described on-campus biological resources as natural, naturalistic, landscaped, and agricultural areas (UCR 2021). For continuity, vegetation types mapped in the survey area have been grouped into these broad categories. Generally, unvegetated areas have been mapped as other areas and include basins, disturbed areas, and developed areas. The project site occurs on landscaped and developed areas only: no vegetation types in the natural, naturalistic, or agricultural categories occur on the project site. The areas adjacent to the project site (within the 100-foot buffer survey area) include brittle bush scrub, annual grassland, orchard, basin, landscaped, and developed areas. Exhibit 3 and Table 1 show the vegetation types and other landcover on the project site.

TABLE 1
VEGETATION TYPES AND OTHER AREAS ON THE PROJECT SITE

Vegetation Type and Other Area	Amount in the Project Site (acres)	CNPS 2019 Equivalent	CDFW Sensitive Natural Community
Natural Areas			
Brittle Bush Scrub	0	*Encelia farinosa* Shrubland Alliance	No
Annual Grassland	0	Varies, including the *Bromus* (*diandrus*, *hordeaceus*) – *Brachypodium distachyon* Herbaceous Semi-natural Alliance, *Bromus rubens* – *Schismus* (*arabicus*, *barbatus*) Herbaceous Semi-natural Alliance, or *Avena* (*barbata*, *fatua*) Herbaceous Semi-natural Alliance	No
Landscaped Areas			
Landscaped Area	1.3	Not a natural community; no equivalent	No
Agricultural Areas			
Orchard	0	Not a natural community; no equivalent	No
Other Areas			
Basin	0	Not a natural community; no equivalent	No
Developed	3.5	Not a natural community; no equivalent	No
	4.8	**Total acres in the Project Site**	

Natural Areas

Vegetation types adjacent to the project site include brittle bush scrub, rock outcrop, and annual grassland, which are in the Natural Areas category. Natural areas are defined as undeveloped open space areas that are composed of native and naturally occurring plant species.

Brittle Bush Scrub

Brittle bush scrub occurs outside of the project site on the hillsides and open space areas in the southeast portion of the survey area. This area is relatively undeveloped, with dirt access roads/trails closer to campus. The dominant shrub is brittlebush (*Encelia farinosa*). Native shrubs present in lower amounts include California sagebrush (*Artemisia californica*) and California buckwheat (*Eriogonum fasciculatum*). Other scattered natives include wishbone bush (*Mirabilis laevis* var. *crassifolia*), filago-leaved sand-aster (*Corethrogyne filaginifolia*), phacelia (*Phacelia* sp.), and cryptantha (*Cryptantha* sp.). The shrub canopy is relatively open over most of the area. At the time of the survey, the understory and spaces between shrubs were either bare or contained annual species such as redstem filaree (*Erodium cicutarium*), eastern sisymbrium (*Sisymbrium orientale*), and non-native grasses (senescent, but likely including species such as cheat grass [*Bromus tectorum*], ripgut grass [*Bromus diandrus*], red brome [*Bromus madritensis* ssp. *rubens*], Mediterranean grass [*Schismus* sp.], or oat [*Avena* sp.]). Other annual understory species expected to occur based on previous documentation includes tidy-tips (*Layia platyglossa*), cream cups (*Platystemon californicus*), California poppy (*Eschscholzia californica*), ovate plantain (*Plantago ovata*), splendid mariposa lily (*Calochortus splendens*), and blue dicks (*Dichelostema capitatum*) (EIP 2005).

<u>Annual Grassland</u>

Annual grassland is patchily distributed on slopes on the southern portion of the survey area outside of the project site. This vegetation type is dominated by non-native grasses that were senescent at the time of the survey. Species composition likely includes cheat grass, ripgut grass, red brome, Mediterranean grass, and/or oat. Redstem filaree and eastern sisymbrium were also observed in these areas. Other annual understory species expected to occur based on previous documentation includes common fiddleneck (*Amsinckia intermedia*), common goldenstar (*Bloomeria crocea*), baby blue-eyes (*Nemophila menziesii*), and California croton (*Croton californicus*) (EIP 2005).

Landscaped Areas

Landscaped areas occur on and adjacent to the project site. Landscaped areas are considered open spaces that have been developed with turf-covered lawn areas or groundcover, mature trees, and shrubs.

<u>Landscaped Area</u>

Landscaped areas occur throughout the main campus and consist of ornamental vegetation planted in open areas between buildings, in road medians, and along the edges of walkways and roads. This vegetation type includes a variety of mature trees including shamel ash (*Fraxinus uhdei*), Australian willow (*Geijera parviflora*), Mexican fan palm (*Washingtonia robusta*), blue gum (*Eucalyptus globulus*), Canary Island pine (*Pinus canariensis*), Aleppo pine (*Pinus halepensis*), and Brazilian pepper tree (*Schinus terebinthifolius*). Understory vegetation has limited species diversity and, if present, is kept low-growing by landscaping activities. The primary groundcover is either turf grass or low-growing, ornamental shrubs; other areas contain rock, leaf litter, bare ground, or mulch.

Agricultural Areas

Agricultural areas occur adjacent to the project site and are used for agricultural teaching and research and are dominated by row crops and orchards.

<u>Orchard</u>

Orchard occurs outside of the project site on the eastern portion of the survey area and is primarily comprised of mature avocado (*Persea americana*) trees.

Other Areas

Other areas include basins and developed areas. These areas are generally unvegetated, though they may include ornamental landscaping that is closely associated with a structure and smaller than the 0.25-acre minimum mapping unit. A basin borders the eastern boundary of the project site but is outside of the development footprint. Developed areas occur throughout the project site and occur adjacent to the project site.

Basin

One concrete-lined basin occurs outside the project site in the eastern portion of the survey area. This basin does not support any vegetation and is typically inundated year-round to support campus facilities, such as irrigation (Jones 2021). A review of historic aerial photographs on Google Earth supports this finding that the basin is likely kept full year-round.

Developed

Developed areas occur throughout the campus and include structures (such as buildings, water tanks, greenhouses, laboratories, etc.) and paved surfaces (such as paved roads and parking lots). Ornamental vegetation that is closely associated with these structures (i.e., not meeting the 0.25-acre minimum mapping unit) was not mapped separately.

Jurisdictional Resources

One concrete-lined basin occurs adjacent to the eastern boundary of the project site in the eastern portion of the survey area. This basin is filled and drained artificially using below-ground pipes and appears to be isolated from surface flows. Regardless of the jurisdictional status of this feature, it would not be impacted as a result of the proposed project. No other drainage features or water retention features occur in the survey area.

Wildlife Habitat

The wildlife habitat on the project site consists of patches of landscaped, ornamental vegetation among otherwise developed areas, which is suitable for urban-tolerant wildlife species. The habitat south of the project site but within the survey area includes Natural Areas (undeveloped areas with native vegetation) that can provide higher quality habitat, although these areas are immediately adjacent to developed areas that experience substantial human activity. The basin and orchard areas east of the project site provide moderate-quality habitat: the basin is concrete lined and does not support any vegetation, and the orchard has little to no understory and does not support any native vegetation. The presence of non-native vegetation, human activity, and surrounding urban development generally decrease the wildlife value relative to undisturbed areas. Wildlife species present in the survey area are expected to be relatively urban-tolerant and acclimated to human activity.

Two unidentified fish species (likely the non-native western mosquitofish [*Gambusia affinis*] and green sunfish [*Lepomis cyanellus*]) were observed in the basin east of the project site but within the survey area. Because the basin is isolated from all naturally occurring drainage features, no native fish species are anticipated to occur in the basin or remainder of the survey area. No other waterbodies or drainage features were observed during the survey and no other fish habitat is likely present.

No amphibian species were observed during the survey. The walls of the basin are concrete and vertical for a minimum of one foot at the top. Furthermore, no platforms, islands, or other basking structures are present in the basin. Therefore, the basin contains no habitat suitable for any toad or turtle species. Amphibian species with potential to occur are restricted to those able to ascend vertical surfaces, such as Baja California treefrog (*Pseudacris hypochondriaca*).

Reptile species observed in the survey area include western fence lizard (*Sceloporus occidentalis*) and side-blotched lizard (*Uta stansburiana*). Another common reptile species expected to occur in the survey area includes southern alligator lizard (*Elgaria multicarinata*).

Bird species observed in the survey area include Anna's hummingbird (*Calypte anna*), great horned owl (*Bubo virginianus*), red-shouldered hawk (*Buteo lineatus*), mourning dove (*Zenaida macroura*), common raven (*Corvus corax*), house wren (*Troglodytes aedon*), northern mockingbird (*Mimus polyglottos*), house finch (*Haemorhous mexicanus*), lesser goldfinch (*Spinus psaltria*), spotted towhee (*Pipilo maculatus*), California towhee (*Melozone crissalis*), white-crowned sparrow (*Zonotrichia leucophrys*), and yellow-rumped warbler (*Setophaga coronata*).

One mammal species, California ground squirrel (*Otospermophilus beecheyi*), was directly observed during the survey and evidence of two additional mammal species, coyote (*Canis latrans*) and Botta's pocket gopher (*Thomomys bottae*), was observed via presence of scat and burrows, respectively. Other mammal species that may occur include common raccoon (*Procyon lotor*), Virginia opossum (*Didelphia virginiana*), and striped skunk (*Mephitis mephitis*). Common bat species with potential to forage in the survey area include big brown bat (*Eptesicus fuscus*) and Mexican free-tailed bat (*Tadarida brasiliensis*). Bats may also roost in trees, buildings, and rock crevices in the survey area.

Wildlife Movement

Within large, open space areas where few or no man-made or naturally occurring physical constraints to wildlife movement are present, wildlife corridors may not yet exist. However, once open space areas become constrained and/or fragmented as a result of urban development or the construction of physical obstacles (e.g., roads and highways), the remaining landscape features or travel routes that connect the larger open space areas become corridors as long as they provide adequate space, cover, food, and water and do not contain obstacles or distractions (e.g., man-made noise, lighting) that would generally hinder wildlife movement.

Although the project site is located adjacent to an area of open space, the site is bordered to the north and west by development. The project site itself is also developed or otherwise landscaped with ornamental plant species and no native habitat would be removed as part of the project. The project site does not likely function as a travel route for wildlife and development of the project site is not expected to affect regional wildlife movement.

Special Status Vegetation Types

The CDFW provides a list of vegetation Alliances, Associations, and Special Stands that are considered "Sensitive Natural Communities" based on their rarity and threat (CDFW 2021d). None of the vegetation communities located within the survey area are considered a sensitive natural community and no avoidance or mitigation is necessary.

Special Status Plant and Wildlife Species

Plants or wildlife may be considered "special status" due to declining populations, vulnerability to habitat change, or restricted distributions. Certain special status species have been listed as Threatened or Endangered under the State and/or Federal Endangered Species Acts.

Special Status Plants

Eighteen special status plant species are identified in the 2021 LRDP Draft EIR as having a low potential to occur in the Natural vegetation types located within the UCR main campus. Four of these species are federally and/or State-listed Endangered or Threatened: Munz's onion (*Allium munzii*), San Diego ambrosia (*Ambrosia pumila*), Nevin's barberry (*Berberis nevinii*), and slender-horned spineflower (*Dodecahema leptoceras*). The remaining fourteen species have a California Rare Plant Rank (CRPR) of 1A, 1B, or 2B, which may also be considered constraints on development per Section 15380 of the California Environmental Quality Act (CEQA) Guidelines. These 14 species are chaparral sand-verbena (*Abronia villosa* var. *aurita*), smooth tarplant (*Centromadia pungens* ssp. *laevis*), Parry's spineflower (*Chorizanthe parryi* var. *parryi*), long-spined spineflower (*Chorizanthe polygonoides* var. *longispina*), snake cholla (*Cylindropuntia californica* var. *californica*), many-stemmed dudleya (*Dudleya multicaulis*), mesa horkelia (*Horkelia cuneata* var. *puberula*), California satintail (*Imperata brevifolia*), Parish's desert-thorn (*Lycium parishii*), Brand's star phacelia (*Phacelia stellaris*), chaparral ragwort (*Senecio aphanactis*), salt spring checkerbloom (*Sidalcea neomexicana*), prairie wedge grass (*Sphenopholis obtusata*), and San Bernardino aster (*Symphyotrichum defoliatum*).

Plant species with a CRPR of 3 or 4 are not typically considered constraints on development. One CRPR 4 species, Robinson's pepper-grass (*Lepidium virginicum* ssp. *robinsonii*) has been reported from the southeastern portion of the survey area (CCH 2019).

The project site is located entirely within Developed or Landscaped areas only: no Natural areas occur within the project site. Therefore, no suitable or marginally suitable habitat for any of the special-status plant species discussed occurs within the project site and none of the species are anticipated to occur. No mitigation or avoidance measures are recommended.

Special Status Wildlife

Thirty-two special status wildlife species are identified in the 2021 LRDP Draft EIR as having a potential to occur within the UCR main campus. Of these, five species are federally and/or State-listed Endangered or Threatened: Riverside fairy shrimp (*Streptocephalus woottoni*), Swainson's hawk (*Buteo swainsoni*), least Bell's vireo (*Vireo bellii pusillus*), coastal California gnatcatcher (*Polioptila californica californica*), and Stephens' kangaroo rat (*Dipodomys stephensi*). Any potential impact on Threatened or Endangered wildlife species and/or its habitat, would require mitigation and additional consultation/permitting with the resource agencies under the federal or State Endangered Species Acts. None of these species are expected to occur within the project site; however, one species, Stephens' kangaroo rat, has potential to occur in the annual grasslands adjacent to the site. Because Stephens' kangaroo rat is not within the project site, no impacts to the species are anticipated. Riverside fairy shrimp is not expected to occur because the artificial basin adjacent to the project site supports non-native fish species and is typically inundated year-round. Therefore, this basin is not suitable habitat for Riverside fairy shrimp. Least Bell's vireo is not expected to occur because no riparian or wetland vegetation occurs within the survey area and no suitable habitat for least Bell's vireo is present. The brittle bush scrub vegetation type adjacent to the project site supports vegetation characteristic of coastal California gnatcatcher habitat; however, the stands of characteristic vegetation adjacent to the project site and in the immediate vicinity (in the line-of-sight of the project site) are sparsely scattered and do not collectively exceed one-acre in size. Coastal California gnatcatchers generally require a minimum of two acres of foraging habitat to support a nest and the species is, subsequently, not expected to occur for nesting. Swainson's hawk may temporarily forage in the annual grassland adjacent to the project site; however, the species is not expected to occur outside of migration season because the survey area is not within the established nesting region for the species.

In addition to species formally listed by the resource agencies, 27 special status species (California Species of Special Concern, Watch List, and Fully Protected species) were identified as having potential to occur on the UCR main campus. Of the 27 species listed, only two have potential to occur within the project site: Cooper's hawk (*Accipiter cooperii*) and western yellow bat (*Lasiurus xanthinus*). Cooper's hawk has potential to nest in the large native and ornamental trees located in the Landscaped and Developed areas. Western yellow bats typically develop maternity roosts in tall, unmaintained fan palms with long skirts, such as those located in some portions of the Landscaped area onsite (Attachment A). Impacts to both species may occur as a result of proposed project tree removal or construction activities. Mitigation Measures MM BIO-2 and MM BIO-4 from the 2021 LRDP EIR should be implemented to minimize potential impacts to Cooper's hawk and bat species, respectively.

Of the remaining 25 special status wildlife species identified with potential to occur in the UCR main campus, the following 17 species have potential to occur in the Natural areas (annual grassland and/or brittle bush scrub) south of the project site: San Diego banded gecko (*Coleonyx variegatus abbottii*), coast horned lizard (*Phrynosoma blainvillii*), orange-throated whiptail (*Aspidoscelis hyperythra*), coastal whiptail (*Aspidoscelis tigris stejnegeri*), California glossy snake (*Arizona elegans occidentalis*), coast patch-nosed snake (*Salvadora hexalepis virgultea*), red-diamond rattlesnake (*Crotalus ruber*), burrowing owl (*Athene cunicularia*), white-tailed kite (*Elanus leucurus*), loggerhead shrike (*Lanius ludovicianus*), southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*), Bell's sage sparrow (*Artemisiospiza belli belli*), northwestern San Diego pocket mouse (*Chaetodipus fallax fallax*), southern grasshopper mouse (*Onychomys torridus ramona*), San Diego black-tailed jackrabbit (*Lepus californicus bennettii*), pallid bat (*Antrozous pallidus*), and American badger (*Taxidea taxus*).

None of these species are anticipated to be directly impacted by the project; however, the project may indirectly impact the following species during the avian nesting season, if they are present: burrowing owl, white-tailed kite, loggerhead shrike, southern California rufous-crowned sparrow, and Bell's sage sparrow. Furthermore, any impact (direct or indirect) to either white-tailed kite or burrowing owl regardless of the nesting bird season could be significant per Section 15380 of the CEQA Guidelines (Rare species) for burrowing owl and per Section 3511 of the California Fish and Game Code (California fully protected bird species). Mitigation Measures MM BIO-1A, MM BIO-1B, and MM BIO-2 from the 2021 LRDP EIR should be implemented prior to construction activities within 500 feet of any natural areas (i.e. the School of Business Building and Genomics Shed) to avoid and minimize potential impacts to special status bird species.

Critical Habitat

Critical Habitat is designated for the survival and recovery of species listed as Threatened or Endangered under the Federal Endangered Species Act (FESA). The survey area is not located in areas designated or proposed as Critical Habitat.

OTHER CONSIDERATIONS

<u>Western Riverside County Multiple Species Habitat Conservation Plan</u>

UCR is located within the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) area. The MSHCP is a comprehensive, multi-jurisdictional plan that focuses on conservation of species and their associated habitats in Western Riverside County. The relationship of the project site to the MSHCP is shown on Exhibit 4. The project site is located in the Cities of Riverside/Norco Area Plan portion of the MSHCP but is not located within any Criteria Cell or associated conservation area. The project site also occurs outside of any MSHCP-designated survey area for Criteria Area plant species;

however, the southeastern portion of the project site occurs within the designated survey area for burrowing owl.

The MSHCP is used to allow the participating jurisdictions to authorize "take" of plant and wildlife species identified within the Plan Area. UCR is given the option of utilizing the MSHCP as a "Participating Special Entity" (PSE).[1] If processing a project under the MSHCP, UCR would need to follow all aspects of the MSHCP for that project. However, if choosing not to process a project under the MSHCP, the project would have to be processed under traditional consultation/permitting mechanisms. The project is not expected to impact suitable habitat for any federally or State-listed Threatened or Endangered species and participation in the MSHCP for this project is not necessary to mitigate potential impacts to listed species.

The MSHCP also provides guidelines pertaining to the urban/wildlands interface. These indirect effects (i.e., "edge effects") are associated with locating development in proximity to the MSHCP Conservation Area. These impacts affect the quality of nearby wildlife habitat resulting from disturbance by construction (such as noise, dust, night lighting, spread of invasive species, and urban pollutants), and/or the long-term use of the site. Regardless of the project's inclusion into the MSHCP, measures to avoid or minimize these indirect effects on the open space areas to the south of the project site are recommended. Relevant indirect effects are discussed below.

Stephens' Kangaroo Rat

In response to the federal listing of Stephens' kangaroo rat, the Riverside County Habitat Conservation Agency (RCHCA) was formed. Its purpose is to acquire and manage habitat for the Stephens' kangaroo rat and other associated special status species. The RCHCA Stephens' Kangaroo Rat Habitat Conservation Plan (HCP) was developed to meet the requirements of the program's Federal Endangered Species Act Section 10(a) permit. The HCP for this species is managed by the RCHCA. The HCP establishes a Reserve System where activities in the core reserve areas are limited and/or restricted. Areas outside the Reserve System are within a designated Fee Area.

The project site is located outside of the HCP Reserve System. Although suitable habitat for Stephens' kangaroo rat is present south of the project site, no suitable habitat for the species is located on the project site and no impacts to the species are anticipated as a result of the project. No further measures are recommended.

Water Quality

The proposed project and its construction could impact water quality. Discharges or runoff from the construction site may carry excessive silt, petroleum, or other chemical contaminants. The impact on water quality could affect habitat quality and the species using the waters. The UCR campus is a permittee under the Phase II MS4 Small Statewide General Stormwater Permit, which requires UCR to prevent construction site discharges of pollutants through the installation, implementation, and maintenance of Best Management Practices (BMPs) and ensure compliance with Construction General Permit (State Water Resources Control Board Order 2009-0009-DWQ, as amended). The project would be required to comply with the provisions of the NPDES Statewide General Construction Activity

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1 A "Participating Special Entity" is any regional public facility provider (e.g., a utility company, a public district or agency) that operates and/or owns land within the MSHCP Plan Area and that applies for Take Authorization pursuant to Section 11.8 of the Implementing Agreement.

Stormwater Permit that specifies the implementation of BMPs. Therefore, potential project-related impacts to water quality would be less than significant and no mitigation is recommended.

Noise

Construction of the proposed project would increase the noise in adjacent habitat areas. During construction, equipment noise would temporarily increase noise levels in adjacent areas. Increased noise could discourage use by wildlife that are not urban-tolerant and/or has the potential to disrupt foraging and/or nesting activities. This impact would be temporary but could adversely affect wildlife in the adjacent open space. Mitigation Measures MM BIO-1A, MM BIO-1B, and MM BIO-2from the 2021 LRDP EIR should be used to avoid and minimize effects on wildlife from noise.

Dust

Grading activities would disturb soils and result in the accumulation of dust on the surface of the leaves of trees, shrubs, and herbs in adjacent open space areas. The respiratory function of the plants in the area could be impaired when dust accumulation is excessive. This impact could represent an adverse effect on native plants in the vicinity of active construction. Mitigation Measure MM BIO-6A from the 2021 LRDP EIR should be used to avoid and minimize effects from dust.

Night Lighting

Night lighting of new facilities, roads, or pathways could result in an indirect impact on the behavioral patterns of nocturnal and crepuscular (i.e., active at dawn and dusk) wildlife adjacent to the lighted areas. Of greatest concern is the effect on small ground-dwelling animals that use the darkness to hide from predators (e.g., owls), which are specialized night foragers. Additional night lighting in areas that are currently developed is not expected to adversely impact wildlife species. However, new lighting in areas adjacent to undeveloped open space, such as the project, could adversely affect wildlife. Mitigation Measures MM BIO-6A and MM BIO-6B from the 2021 LRDP EIR should be used to avoid and minimize effects from night lighting.

Human Activity

An increase in human activity may impact wildlife species in the adjacent open space through increased human use of the open space for hiking or walking dogs. Human disturbance could disrupt normal foraging and breeding behavior of wildlife remaining in the area adjacent to the development, diminishing the value of the habitat. Wildlife stressed by human activity may be extirpated from the natural open space adjacent to the project, leaving only wildlife tolerant of human activity. Given the high level of human activity presently on the campus, an increase in human activity is not expected to impact adjacent wildlife.

Invasive Species

Landscaping that includes the use of non-native, invasive plant species (e.g., species listed in the California Invasive Plant Council's [Cal-IPC's] invasive plant inventory) can be detrimental to surrounding native habitat. Invasive species have the potential to spread into the surrounding natural open space and displace native species, hybridize with native species (thereby impacting the genetic integrity of the native species), alter biological communities, or alter ecosystem processes. This would degrade the quality of the adjacent vegetation, including vegetation communities that provide suitable habitat for Threatened or Endangered species. Mitigation Measure MM BIO-6B from the 2021 LRDP EIR should be used to minimize the spread of non-native, invasive plant species.

Nesting Birds and Raptors

The Migratory Bird Treaty Act (MBTA) protects migratory birds and their nests and eggs, both common and special status. Bird species protected under the provisions of the MBTA are identified by the List of Migratory Birds (50 *Code of Federal Regulations* [CFR] §10.13, as amended). Since the 1970s, the MBTA has been interpreted to prohibit the accidental or "incidental" take of migratory birds.

Multiple sections of *California Fish and Game Code* provide protection for nesting birds and raptors unless the *California Fish and Game Code* or its implementing regulations provide otherwise. Section 3503 makes it unlawful to take, possess, or needlessly destroy the nest or eggs of any bird. Section 3503.5 specifically addresses raptors (i.e., birds of prey in the orders *Falconiformes* and *Strigiformes*) and makes it unlawful to take, possess, or destroy these birds or their nest or eggs. Section 3513 prohibits the take or possession of migratory non-game birds as designated by the MBTA or any part of such bird.

Nesting birds and raptors have the potential to nest on buildings, in culverts, in shrubs and trees, in rocky outcrops, and on bare ground throughout the survey area. To the extent possible, construction should be initiated outside the peak nesting season (February 1 to August 31 for burrowing owls and February 15 to August 31 for nesting birds). If timing requires that construction be initiated during the peak nesting season, vegetation removal and/or tree removal should be planned to occur outside the nesting season (September 1 to January 31 for burrowing owls and September 1 to February 14 for nesting birds). If construction and/or vegetation removal must occur during the peak breeding season, a pre-construction nesting bird survey should be conducted prior to vegetation removal, building demolition, and/or the initiation of construction activities. Mitigation Measures MM BIO-1A, BIO-1B, and MM BIO-2 from the 2021 LRDP EIR should be implemented to avoid and minimize impacts to nesting bird species.

Bird Strikes

A potential long-term, operational impact of future development concerns bird strike mortality and injury. Ornithologists estimate that up to a billion birds are killed or injured annually by collisions with clear and reflective sheet glass and plastic (Klem 2009). It is thought that birds cannot distinguish between the reflection on the glass/plastic surface and the natural landscape. Construction of glass-fronted buildings or other structures using exposed glass (e.g., glass-topped walls) has the potential to result in bird strikes, especially if the structures are located adjacent to natural areas. The use of ultraviolet patterns in the glass are not detectable to humans but can substantially reduce bird strikes. Mitigation Measure MM BIO-3 from the 2021 LRDP EIR should be used to avoid and minimize bird strikes.

Roosting Bats

Several bat species may forage and roost throughout the survey area. Impacts on a small amount of foraging habitat are not expected to decrease the regional population below self-sustaining levels. Therefore, impacts on foraging habitat would be less than significant. Bat species may also roost in buildings, culverts, mature trees, and in rock outcrops throughout the survey area. Impacts on active bat maternity roosts may be considered significant. Mitigation Measure MM BIO-4 from the 2021 LRDP EIR should be used to avoid and minimize impacts to roosting bat species.

RECOMMENDATIONS

This section provides recommendations to avoid and minimize impacts to biological resources. The recommendations match the relevant mitigation measures detailed in the 2021 LRDP EIR and associated mitigation measure number (ex. MM BIO-#) are also listed.

MM BIO-1A Burrowing Owl Preconstruction Survey

Prior to construction activities, preconstruction presence/absence surveys for burrowing owls shall be conducted in the project survey area where suitable habitat is present prior to ground disturbance in new areas. Preconstruction surveys shall be conducted by a qualified biologist no more than 30 days prior to grading or other significant site disturbance. Surveys shall include the development footprint and consider up to a 500-foot buffer of adjacent areas to the extent feasible (e.g., a visual survey of adjacent areas will suffice for off-site areas not accessible). The surveys shall be conducted in accordance with the MSHCP burrowing owl survey guidelines. A burrow shall be considered occupied when there is confirmed use by burrowing owls based on observations made by a qualified biologist. If owls are not found to be occupying habitat in the survey area during the preconstruction survey, the proposed disturbance activities may proceed. Take of active nests shall be avoided.

MM BIO-1B Burrowing Owl Avoidance Measures

If owls are discovered on and/or within 500 feet of the proposed project site, avoidance measures shall be developed by the qualified biologist in compliance with the MSHCP and in coordination with the CDFW and/or RCA. Such measures will include but not be limited to the following:

- Burrowing owls shall not be disturbed on-site and/or within a 500-foot buffer or as determined by a biologist between February 1 and August 31 to avoid impacting nesting.
- Prior to any ground disturbance, all limits of project construction shall be delineated and marked to be clearly visible to personnel on foot and in heavy equipment. All construction-related activities shall occur inside the limits of construction and designated staging areas. Construction staging and equipment storage shall be situated outside of any occupied burrowing owl burrow locations. All construction-related movement shall be restricted to the limits of construction and staging areas.
- Avoidance measures shall include passive relocation by a qualified biologist to remove the owls between September 1 and January 31, which is outside of the typical nesting season.

MM BIO-2 Nesting Bird Avoidance

Prior to issuance of grading permits, the following measures shall be implemented:

- To avoid disturbance of nesting and special-status bird species protected by the MBTA and California Fish and Game Code, activities related to the project, including but not limited to, vegetation removal, ground disturbance, and construction and demolition shall occur outside of the bird breeding season (February 15 through August 31). If construction must be initiated during the peak nesting season, vegetation removal and/or tree removal should be planned to occur outside the nesting season (September 1 to February 14), and a preconstruction nesting bird survey shall be conducted no more than 3 days prior to initiation of construction activities. The nesting bird preconstruction survey shall be conducted on foot inside the project site disturbance areas. If an active avian nest is discovered during the preconstruction clearance survey, construction activities shall stay outside of a 50- to 200-foot buffer for common nesting birds around the active nest, as determined by a biologist. For listed and raptor species, this buffer shall be expanded to 500 feet or as determined by a biologist.
- Inaccessible areas shall be surveyed from afar using binoculars to the extent practical. The survey shall be conducted by a qualified biologist familiar with the identification of avian species known to occur in western Riverside County. If nests are found, an appropriate avoidance buffer shall be determined by a qualified biologist and demarcated by a qualified biologist with bright orange

construction fencing, flagging, construction lathe, or other means to mark the boundary. Effective buffer distances are highly variable and based on specific project stage, bird species, stage of nesting cycle, work type, and the tolerance of a particular bird pair. The buffer may be up to 500 feet in diameter, depending on the species of nesting bird found and the biologist's observations.

- If nesting birds are located adjacent to the project site with the potential to be affected by construction activity noise above 60 dBA Leq (see Section 4.11, Noise, for definitions and discussion of noise levels), a temporary noise barrier shall be erected consisting of large panels designed specifically to be deployed on construction sites for reducing noise levels at sensitive receptors. If 60 dBA Leq is exceeded, an acoustician would require the construction contractor to make operational and barrier changes to reduce noise levels to 60 dBA during the breeding season (February 15 through August 31). Noise monitoring shall occur during operational changes and installation of barriers to ensure their effectiveness. All construction personnel shall be notified as to the existence of the buffer zone and to avoid entering the buffer zone during the nesting season. No parking, storage of materials, or construction activities shall occur within this buffer until the avian biologist has confirmed that breeding/nesting is completed, and the young have fledged the nest. Encroachment into the buffer shall occur only at the discretion of the qualified biologist, if it is determined such encroachment will not adversely impact the nesting birds.

MM BIO-3 Bird Strike Avoidance

To reduce bird strike mortality and injury of special-status bird species from collisions with clear and reflective sheet glass and plastic, construction of glass-fronted buildings or other structures using exposed glass (e.g., glass-topped walls) shall incorporate measures to minimize the risk of bird strikes. This may include: (1) the use of opaque or uniformly textured/patterned/etched glass, (2) angling of glass downward so that the ground instead of the surrounding habitat or sky is reflected, (3) installation of one-way film that results in opaque or translucent covering when viewed from either side of the glass, (4) installation of a uniformly dense dot pattern created as ceramic frit on both sides of the glass, and/or (5) installation of a striped or grid pattern of clear ultraviolet-reflecting and ultraviolet-absorbing film applied to both sides of the glass. It should be noted that single decals (e.g., falcon silhouettes or large eye patterns) are ineffective and are not recommended unless the entire glass surface is uniformly covered with the objects or patterns.

MM BIO-4 Bat Preconstruction Survey

To avoid disturbance of special-status bat species during maternity season (approximately March-September), a preconstruction roosting bat survey shall be conducted by a qualified bat biologist on potential roost structures identified by the bat biologist and mature vegetation no more than 30 days prior to initiation of construction activities if construction activities must occur during the roosting season. If future projects would impact rocky outcrops, mature vegetation, existing buildings, or other structures that could be used for roosting, a passive acoustic survey shall identify the species using the area for day/night roosting. If special-status roosting bats are present and their roosts would be impacted, a qualified bat biologist should prepare a plan to identify the proper exclusionary methods. Removal of mature trees should be monitored by a qualified bat biologist and occur by pushing down the entire tree (without trimming or limb removal) using heavy equipment and leaving the felled tree on the ground untrimmed and undisturbed for a period of at least 24 hours. To exclude bats from buildings/structures or rocky outcrops, exclusion measures should be installed on crevices by placing one-way exclusionary devices that allow bats to exit but not enter the crevice.

MM BIO-6A Sensitive Communities Indirect Impact Avoidance – Construction

The following measure shall be required for construction activities that are proposed adjacent to the Open Space Reserve or lands supporting sensitive vegetation communities and/or biological resources:

- Prior to commencement of clearing or grading activities, fencing (e.g., silt fencing, orange construction fencing, and/or chain-link fencing as determined by campus planning) shall be installed around the approved limits of disturbance to prevent errant disturbance of sensitive biological resources by construction vehicles or personnel. All movement of construction contractors, including ingress and egress of equipment and personnel, shall be limited to designated construction zones. This fencing shall be removed upon completion of all construction activities.
- No temporary storage or stockpiling of construction materials shall be allowed in Open Space Reserve lands, and all staging areas for equipment and materials shall be located at least 50 feet where space permits on the site, or less as determined appropriate by a qualified biologist from the edge of these areas. This prohibition shall not be applied to facilities that are planned to traverse Open Space Reserve lands (e.g., trails and utilities). Staging areas and construction sites in proximity to the Open Space Reserve lands shall be kept free of trash, refuse, and other waste; no waste dirt, rubble, or trash shall be deposited in these areas.
- Appropriate setbacks or barriers (e.g., fencing) shall be implemented to minimize human activity impacts. Buffer areas shall be vegetated with native species to help screen these indirect effects.
- Active construction areas shall be sprayed with water periodically to minimize dust.
- Equipment to extinguish small brush fires (e.g., from trucks or other vehicles) shall be present on-site during all phases of project construction activities, along with personnel trained in the use of such equipment. Smoking shall be prohibited in construction areas adjacent to flammable vegetation.
- Temporary night lighting shall not be used during construction unless determined to be absolutely necessary (e.g., time sensitive construction activities). If night lighting is necessary, lights shall be directed away from sensitive vegetation communities and lands designated as Open Space Reserve and shielded to minimize temporary lighting of the surrounding habitat.

MM BIO-6B Sensitive Communities Indirect Impact Avoidance – Operation

The following measure shall be required for operation activities adjacent to the Open Space Reserve or lands supporting sensitive vegetation communities and/or biological resources:

- Landscaping adjacent to Open Space Reserve lands shall comply with the following requirements to prevent the introduction of invasive species:
    - Appropriate landscaping shall be selected based on the vegetation communities in the portion of the Open Space Reserve adjacent to the project. In areas supporting native (or disturbed native) vegetation communities, revegetation of impacted slopes shall be with appropriate native plant materials.
- Permanent lighting in or adjacent to Open Space Reserve lands shall be selectively placed, shielded, and directed to minimize potential impacts to sensitive species. In addition, lighting from buildings or parking lots/structures abutting Open Space Reserve lands shall be shielded and/or screened by vegetation to the extent feasible.

- The following best management practices shall be implemented in Open Space Reserve lands and in areas that interface with Open Space Reserve lands to address runoff/water quality impacts from landscaping:
    - Integrated Pest Management principles (UC Integrated Pest Management Program) shall be implemented to the extent practicable for chemical pesticides, herbicides, and fertilizers. Examples of such measures may include, but are not limited to, alternative weed/pest control measures (e.g., removal by hand) and proper application techniques (e.g., conformance to manufacturer specifications and legal requirements).
    - Irrigation for project landscaping shall be minimized and controlled through efforts such as designing irrigation systems to match landscaping water needs, using sensor devices to prevent irrigation during and after precipitation, and using automatic flow reducers/shut-off valves that are triggered by a decrease in water pressure from broken sprinkler heads or pipes.
- Barriers (e.g., fencing or walls) and/or signage directing people away from sensitive vegetation communities and habitat shall be installed on designated pathways and trails in and adjacent to Open Space Reserve lands to minimize unauthorized human activity. Barriers (e.g., fencing or walls) shall consist of an approximately 3-foot-high wooden barrier. Chain-link fencing shall not be used for barrier.
- Projects adjacent to Open Space Reserve lands shall install signage along the boundary of the Open Space Reserve lands, indicating the presence of lands supporting sensitive habitat.
- Projects adjacent to Open Space Reserve lands shall install fencing or other visual/physical barriers (such as appropriate landscaping) to discourage human encroachment into the Open Space Reserve lands in areas where trespass is likely to occur (gradual slopes; areas of low, open vegetation; areas of previous disturbance, etc.).

If you have any questions or comments, please contact Steve Norton at (714) 751-7373.

Sincerely,

PSOMAS

Steve Norton
Senior Biologist

Enclosures: Exhibits 1–4
Attachment A – Representative Photographs

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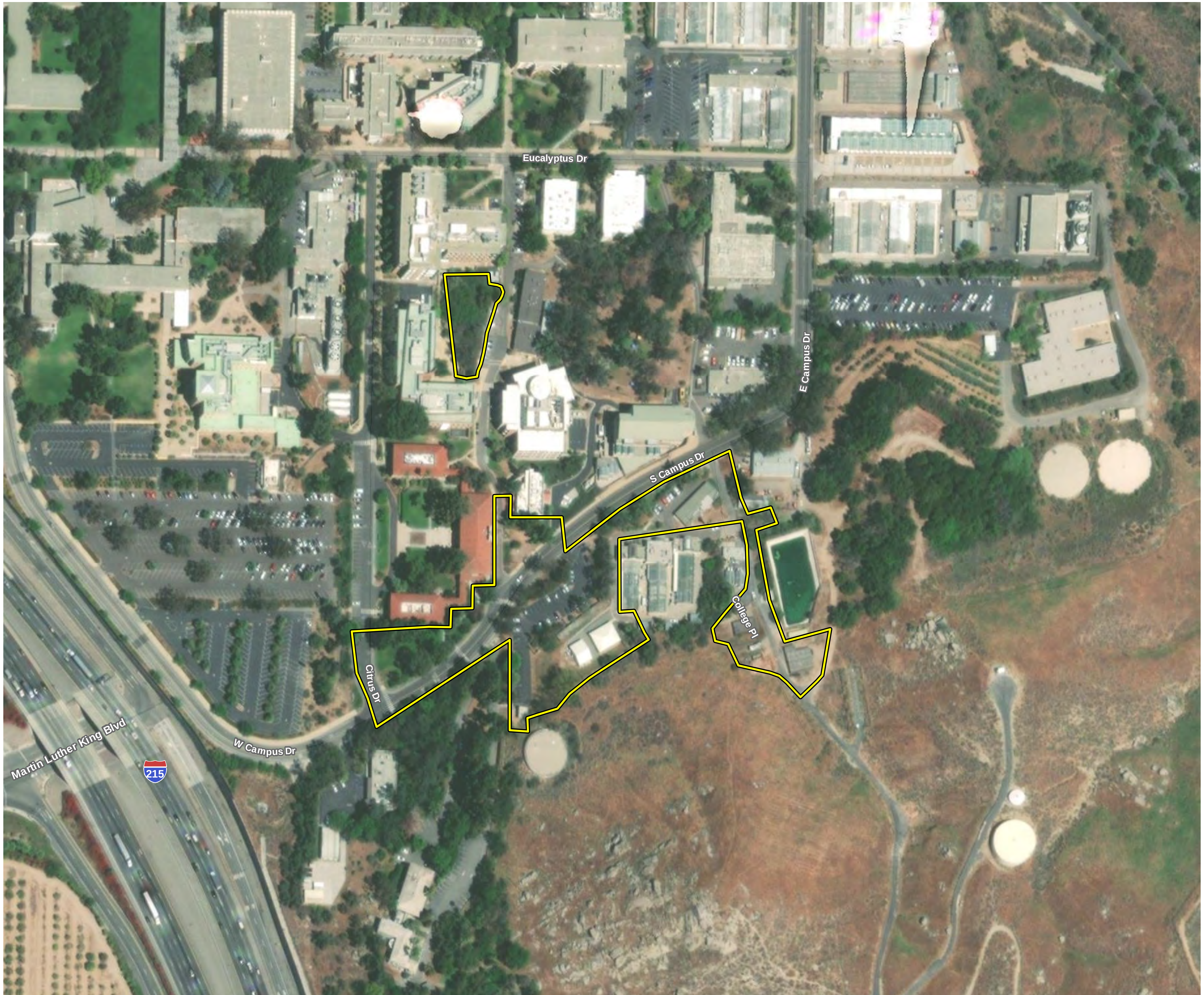

Project Site

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Aerial Source: ESRI, Maxar 2021

Project Location

Exhibit 1

School of Business Building for the University of California, Riverside

PSOMAS

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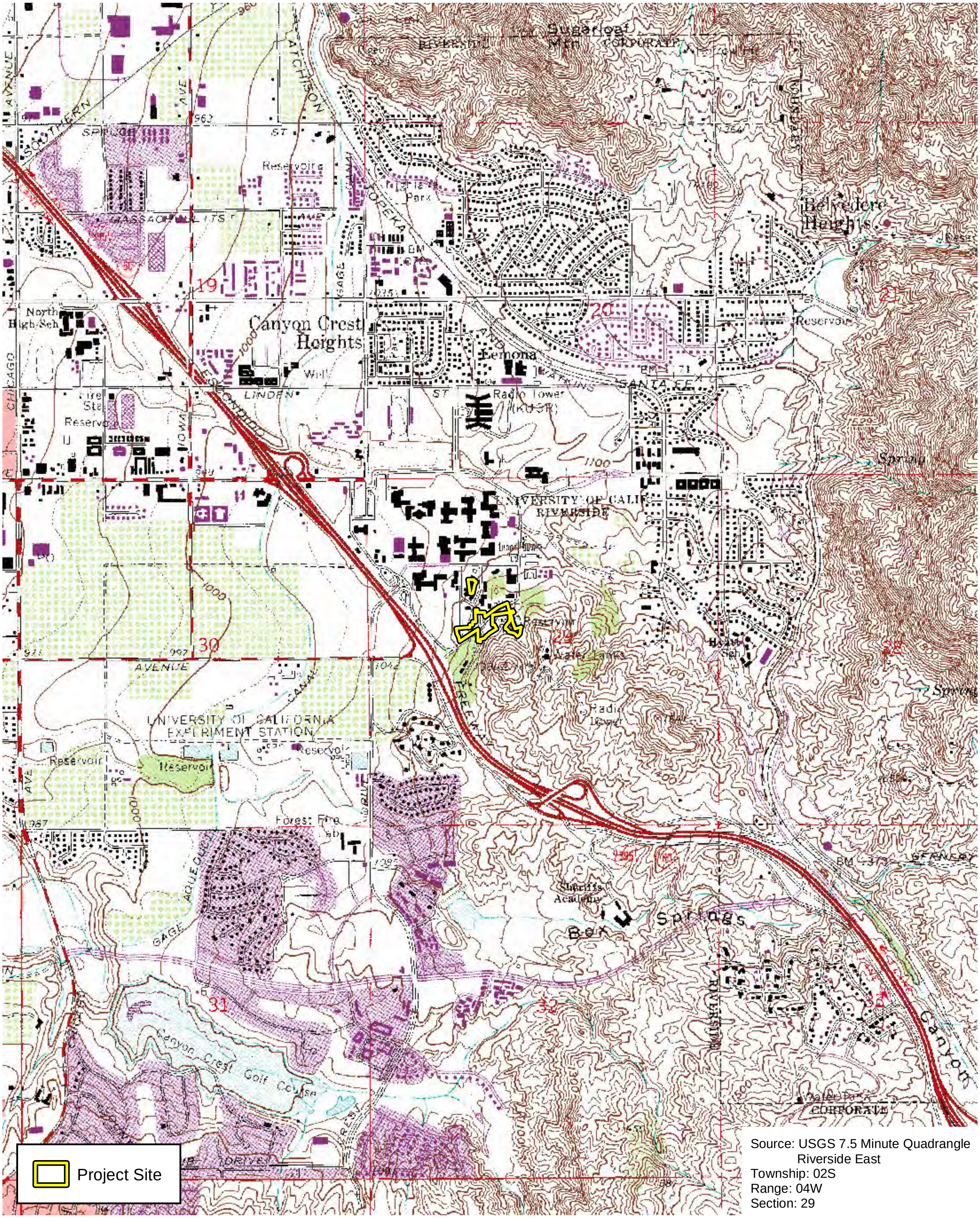

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USGS 7.5-Minute Digital Quadrangle

Exhibit 2

School of Business Building for the University of California, Riverside

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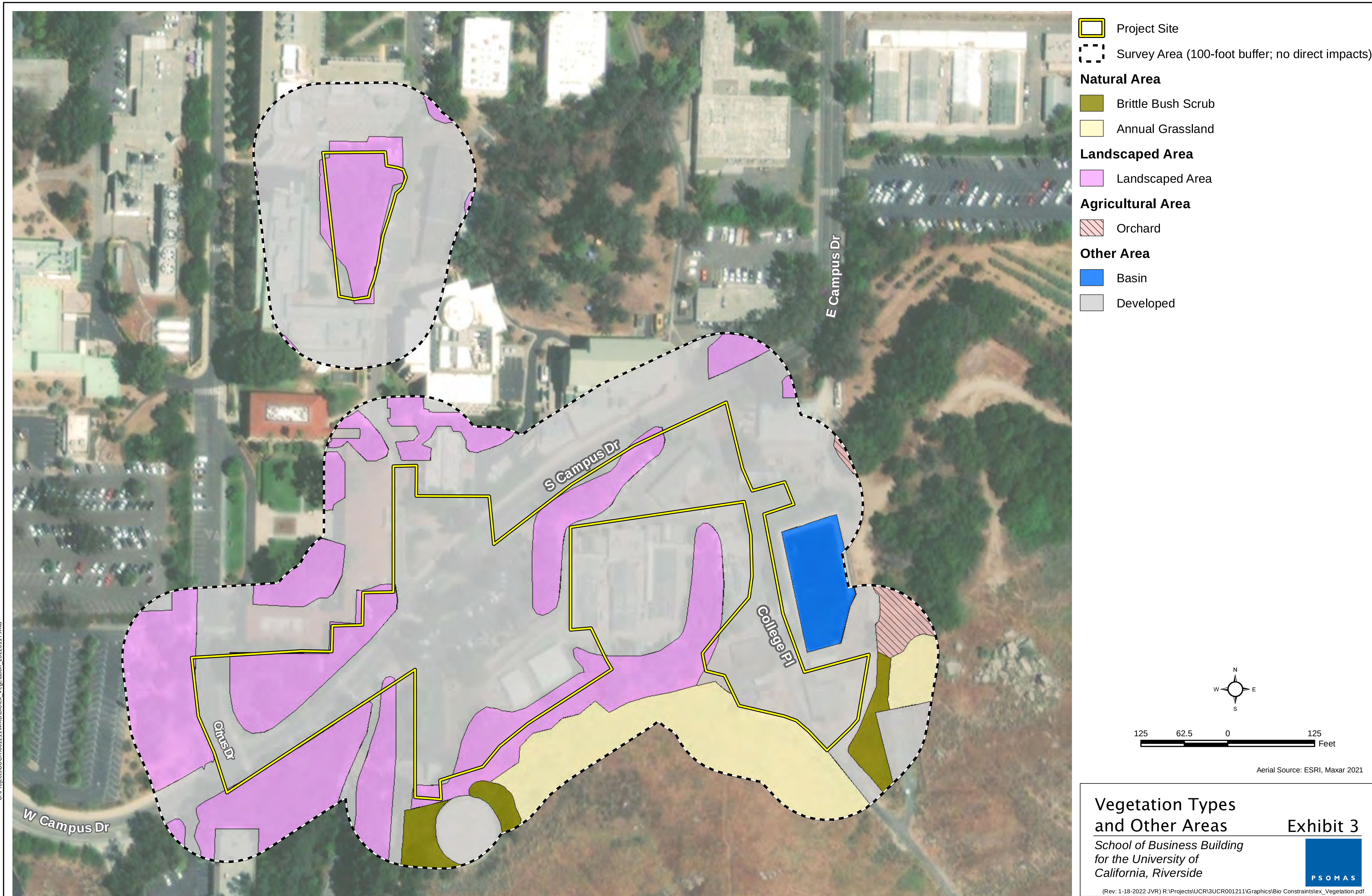

Vegetation Types and Other Areas

Exhibit 3

School of Business Building for the University of California, Riverside

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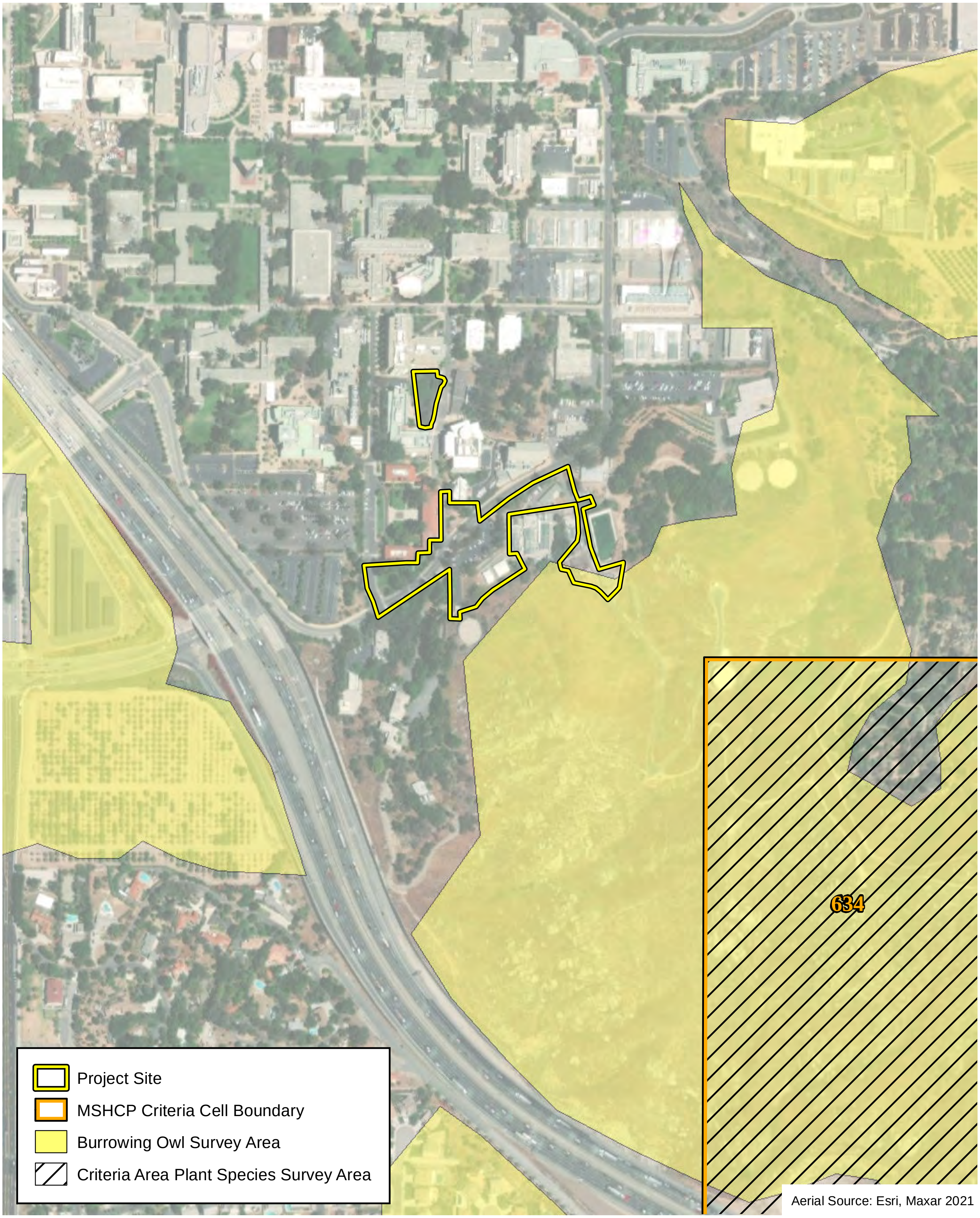

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Relationship to MSHCP

Exhibit 4

School of Business Building for the University of California, Riverside

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ATTACHMENT A

REPRESENTATIVE SITE PHOTOGRAPHS

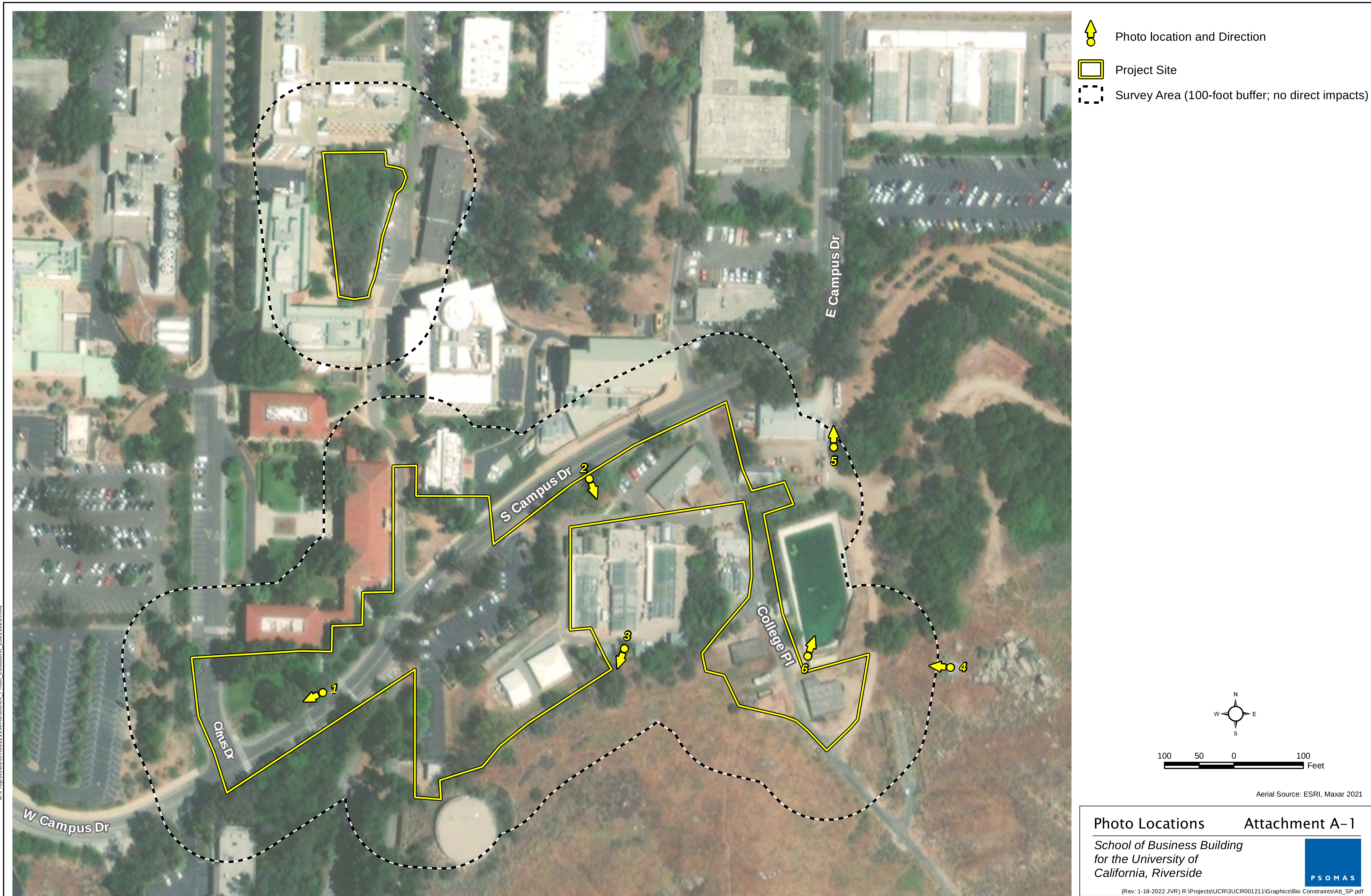

Photo Locations Attachment A-1

School of Business Building for the University of California, Riverside

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Photo 1. View of a Landscaped Area between buildings facing west.

Photo 2. View of a Landscaped Area adjacent to the roadway facing south. The palm tree in the center of the photograph is not considered suitable bat roosting habitat.

Representative Site Photographs

Attachment A-2

School of Business Building for the University of California, Riverside

PSOMAS

Photo 3. View of unmaintained palm trees in the Landscaped Area facing south. The trees in the photo are considered suitable bat roosting habitat.

Photo 4. View of the southeastern boundary of the project site facing west. The structures in the center of the photo are within the project site, but the Annual Grassland on the left, the brittle bush scrub in foreground, and the Orchard and Basin on the right of the photo are outside of the project site.

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Photo 5. View of the Orchard on the eastern boundary of the project site facing north.

Photo 6. View of the Basin on the eastern boundary of the project site facing northeast.

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Representative Site Photographs

Attachment A-4

School of Business Building for the University of California, Riverside

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Appendix C

Tree Inventory Report

PSOMAS

Balancing the Natural and Built Environment

January 11, 2022

Stephanie Tang
Campus Environmental Planner
Planning, Design & Construction
University of California, Riverside
1223 University Avenue, Suite 240
Riverside, California 92507

VIA EMAIL
Stephanie.Tang@ucr.edu

Subject: Tree Inventory Report for the School of Business Building Project, University of California, Riverside

Dear Ms. Tang:

Psomas is pleased to provide the following Tree Inventory Report for the School of Business Building Project (Project) site located on the campus of the University of California, Riverside (UCR) (Exhibit 1). The purpose of this Tree Inventory Report is to identify trees that occur within the limits of the Project site and to support preparation of environmental documentation pursuant to the California Environmental Quality Act.

PROJECT LOCATION

The Project site is located in the southern portion of the UCR East Campus, generally along South Campus Drive, between Citrus Drive and College Place and consists of two separate survey areas. The survey area along South Campus Drive measures approximately 6 acres and contains the proposed School of Business Building location and the Genomics Shed Replacement Site Options (noted as sites A and B on Exhibit 2). Additionally, the survey area includes an approximate 0.7-acre area near the Entomology Building and Boyden Laboratories as a potential area for the proposed Biocontrol Building Replacement Site.

METHODS

Psomas Certified Arborist David Hughes (International Society of Arboriculture Certificate No. WE-7752A) visited the Project site on September 20, 2021 and September 27, 2021 to document the type, quantity, and condition of trees that exist in the survey area.

During the survey, each tree was assigned an individual number and the following data were collected: trunk diameter at breast height (dbh), tree height, and canopy width. The health and aesthetic quality of each tree were assessed and rated on a scale of 1 (poor) to 5 (excellent).

EXISTING TREE RESOURCES

During the field survey, a total of 175 trees were documented in the survey area. The trees in the survey area comprise 55 different species. Of the 175 individual trees, 143 are in the survey area along South Campus Drive that contains the proposed School of Business

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Building location and the Genomics Shed Replacement Site Options. The remaining 32 trees are in the proposed Biocontrol Building Replacement Site adjacent to the Entomology Building and Boyden Laboratories. A summary of these trees is provided in Table 1. Representative photos of the trees in the survey area are provided in Attachment A and a complete summary of collected tree data is provided in Attachment B.

TABLE 1
SUMMARY OF TREES IN SURVEY AREA

Tree Species		Quantity	DBH Size Range (in)[a]
Scientific Name	**Common Name**		
Proposed School of Business and the Genomics Shed Replacement Site Options Area			
Acacia baileyana	Bailey acacia	5	1.5–3.5
Aesculus X carnea 'Fort McNair'	Fort McNair red horsechestnut	1	0.5
Afrocarpus falcatus	fern pine	1	20.5
Agathis robusta	Queensland kauri	2	24.5–38.3
Auranticarpa rhombifolia	Queensland pittosporum	4	9.4–14.6
Callistemon viminalis	weeping bottlebrush	3	17.5–21.9
Calocedrus decurrens	incense cedar	1	13.2
Calodendrum capense	Cape chestnut	1	6.1
Carya illinoinensis	pecan	2	18.0–25.0
Cedrus deodara	deodar cedar	5	13.2–18.1
Ceratonia siliqua	carob	1	11.6
Cinnamomum camphora	camphor	2	9.5–17.9
Corymbia citriodora	lemon-scented gum	9	9.2–25.9
Cycas revoluta	sago palm	1	8.0
Eucalyptus globulus	blue gum	15	5.8–27.1
Eucalyptus sideroxylon	red ironbark	2	17.4–21.0
Eucalyptus sp.	gum tree	6	14.5–26.8
Ficus carica	common fig	1	9.3
Ficus elastica	rubber tree	1	8.1
Ficus microcarpa	Indian laurel fig	1	17.0
Fraxinus uhdei	shamel ash	3	8.0–14.5
Geijera parviflora	Australian willow	12	4.0–11.4
Gingko biloba	gingko	2	1.4–13.1
Harpephyllum caffrum	South African wild plum	1	21.2
Heteromeles arbutifolia[b]	toyon	8	5.6–15.6
Jacaranda mimosifolia	jacaranda	6	24.3–38.5
Ligustrum lucidum	glossy privet	4	3.6–11.3
Lophostemon confertus	Brisbane box	1	4.9
Melia azedarach	Chinaberry	1	16.0
Morus sp.	mulberry	2	9.6–15.0
Pinus canariensis	Canary Island pine	10	9.0–37.5
Pinus halepensis	Aleppo pine	1	23.5
Platanus racemosa[b]	western sycamore	1	25.7
Pyrus kawakamii	evergreen pear	3	6.4–12.2
Sambucus nigra ssp. *caerulea*[b]	blue elderberry	1	12.0

TABLE 1
SUMMARY OF TREES IN SURVEY AREA

Tree Species			DBH
Scientific Name	**Common Name**	**Quantity**	**Size Range (in)[a]**
Schinus molle	Peruvian pepper	4	12.2–17.5
Searsia lancea	African sumac	2	13.5–14.5
Taxodium mucronatum	Montezuma cypress	1	24.9
Thevetia peruviana	yellow oleander	1	14.4
Ulmus parviflora	Chinese elm	2	4.8–14.4
Washingtonia robusta	Mexican fan palm	10	15.0–38.0
unidentified species		3	7.2–8.6
	Subtotal	***143***	
Proposed Biocontrol Building Replacement Site			
Acer palmatum	Japanese maple	1	10.3
Arbutus 'Marina'	strawberry tree	6	5.7–6.8
Geijera parviflora	Australian willow	3	8.8-28.0
Jacaranda mimosifolia	jacaranda	3	10.5–14.1
Koelreuteria bipinnata	Chinese flame tree	1	9.6
Koelreuteria paniculata	goldenrain tree	2	4.5–6.2
Lagerstromia indica	crape myrtle	4	4.0–9.5
Melaleuca quinquenervia	paperbark	4	4.5–11.8
Prosopis sp.	mesquite	1	50.5
Quercus wislizeni[b]	interior live oak	1	13.9
Robinia sp.	locust	1	8.2
Schinus terebinthifolius	Brazilian pepper tree	1	11.0
Searsia lancea	African sumac	2	9.0–18.1
Ulmus parviflora	Chinese elm	1	11.5
unidentified species		1	17.5
	Subtotal	***32***	

DBH: trunk diameter at breast height; in: inches
[a] The DBH of multi-trunk trees are represented as the sum of the largest two trunks.
[b] Native tree species.

It should be noted that the survey area contains several individuals that are commonly considered large shrubs rather than trees. This includes 8 toyon (*Heteromeles arbutifolia*), 1 blue elderberry (*Sambucus nigra* ssp. *caerulea*), 1 yellow oleander (*Thevetia peruviana*), and 4 other individuals that could not be identified. Though these plants may be considered large shrubs, they are included in the tree inventory where they have been trained into a tree-like form and where they were specifically planted as part of the site landscaping. Additional individuals of these species occur in other portions of the survey area but are not maintained and occur in a grouping of other shrubs. In such situations, these plants were considered shrubs and are not included in this inventory.

Several species could not be properly identified during the field survey. This includes 4 large shrubs/ small trees described above as well as other trees that could only be identified to the genus level. This includes 6 gum trees (*Eucalyptus* sp.), 2 mulberries (*Morus* sp.), 1 locust tree (*Robinia* sp.), and 1 mesquite tree (*Prosopis* sp.). Flowers and fruits of these trees that are necessary for a definitive species determination were not present at the time of the survey.

Trees were generally observed to be in fair or good health. Some trees had access to regular irrigation and are predictably in better health than many others that had been through the stress of the hot summer months and ongoing drought conditions. Two trees in particular, number 27, a deodar cedar (*Cedrus deodara*), and number 134, an Australian willow (*Geijera parviflora*), were in particularly bad condition, severely drought stressed and in a likely irreversible state of decline.

Several noteworthy trees occur in the survey area due to their large size and/or prominent position in the landscape. These include:

- Trees 1 through 4 are Canary Island pines (*Pinus canariensis*) that are impressively large trees located immediately east of Citrus Drive.
- Tree 29 is a western sycamore (*Platanus racemosa*) located south of Anderson Hall 1. This tree is approximately 40 feet tall and has a wide canopy of 45 feet that overhangs South Campus Drive.
- Tree 37 is an Aleppo pine (*Pinus halepensis*) located south of the Entomology Museum. This is a large tree (approximately 65 feet tall with a canopy width of 35 feet) and is prominently located along South Campus Drive.
- Trees 69 through 74 are jacaranda trees (*Jacaranda mimosifolia*) that are located southwest of the Biocontrol Building along the southern edge of the survey area. These are very large but poorly maintained trees that are located on a moderately steep slope. These trees are in the No Impact Zone indicated in Exhibit 2 and are not expected to be impacted.
- Tree 102 is a Montezuma cypress (*Taxodium mucronatum*) located near the eastern end of the survey area south of South Campus Drive. This tree is approximately 50 feet tall with a canopy width of 25 feet. This is the only specimen of this species located on the UCR campus.
- Trees 103 and 104 are Queensland kauri trees (*Agathis robusta*). These are extremely large specimens of an uncommon species (measuring 24.5 and 38.3 inches dbh and approximately 70 feet tall). These trees are located along South Campus Drive at the entrance to Parking Lot 43. Consideration should be given to avoidance of these trees due to their size and rarity. Their size makes relocation an unlikely option.
- Tree 151 is a three-trunk mesquite tree (*Prosopis* sp.) located in the center of the Biocontrol Building Replacement Site portion of the survey area. This tree is the largest tree in this portion of the survey area, with a canopy width of approximately 60 feet.

Three recently planted trees are included in the tree inventory. These include Tree 32, a gingko tree (*Gingko biloba*); Tree 92, a Bailey acacia tree; and Tree 106, a Fort McNair red horsechestnut tree (*Aesculus* X *carnea 'Fort McNair'*). These trees are all less than two inches in trunk diameter but are located prominently in the landscape. The Fort McNair red horsechestnut is an uncommon variety of chestnut tree. Due to its small size, it can be easily relocated.

RECOMMENDATIONS

The following measures are recommended to avoid or minimize impacts to trees in the survey area that may result from Project construction activities:

1. Prior to the initiation of construction activities, a Certified Arborist should be consulted to discuss methods of tree protection (e.g., protective fencing) for any trees that are to be protected in place

during construction activities. Ground disturbing activities under any tree's canopy should be overseen by a Certified Arborist.

2. The draft UCR Tree Preservation and Replacement Guidelines will be used to determine the appropriate tree replacement ratio and to identify measures to protect trees that are identified in the survey area to remain.

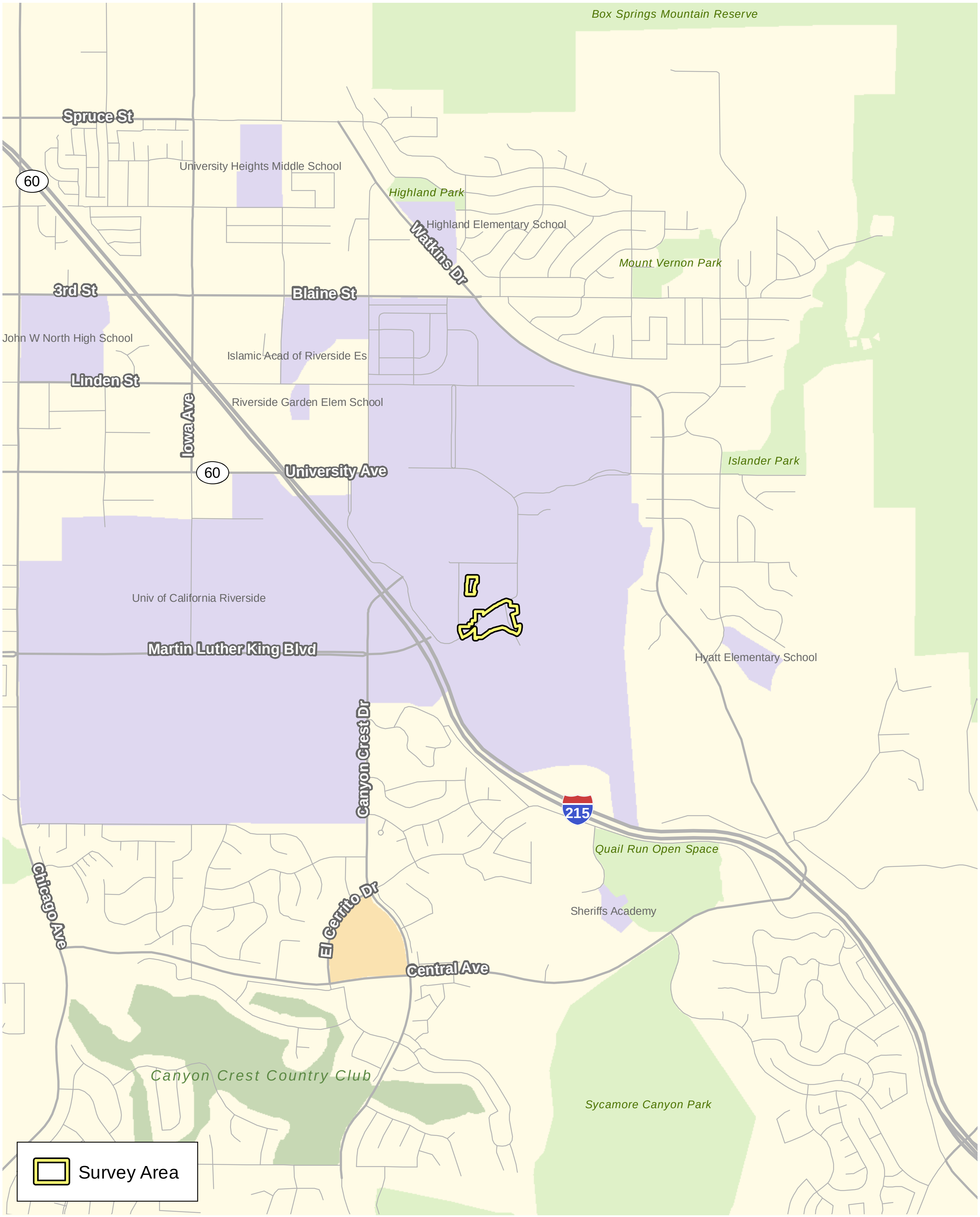
Please call David Hughes at (626) 204-6530 with any questions related to this report.

Sincerely,
PSOMAS

Brad R. Blood, PhD
Senior Project Manager

David T. Hughes
Certified Arborist

Attachments: Exhibits 1 through 3
A – Site Photos
B – Tree Survey Data



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Project Location

Exhibit 1

Tree Inventory Report for the School of Business Building Project

N W E S

2,000 1,000 0 2,000 Feet

PSOMAS

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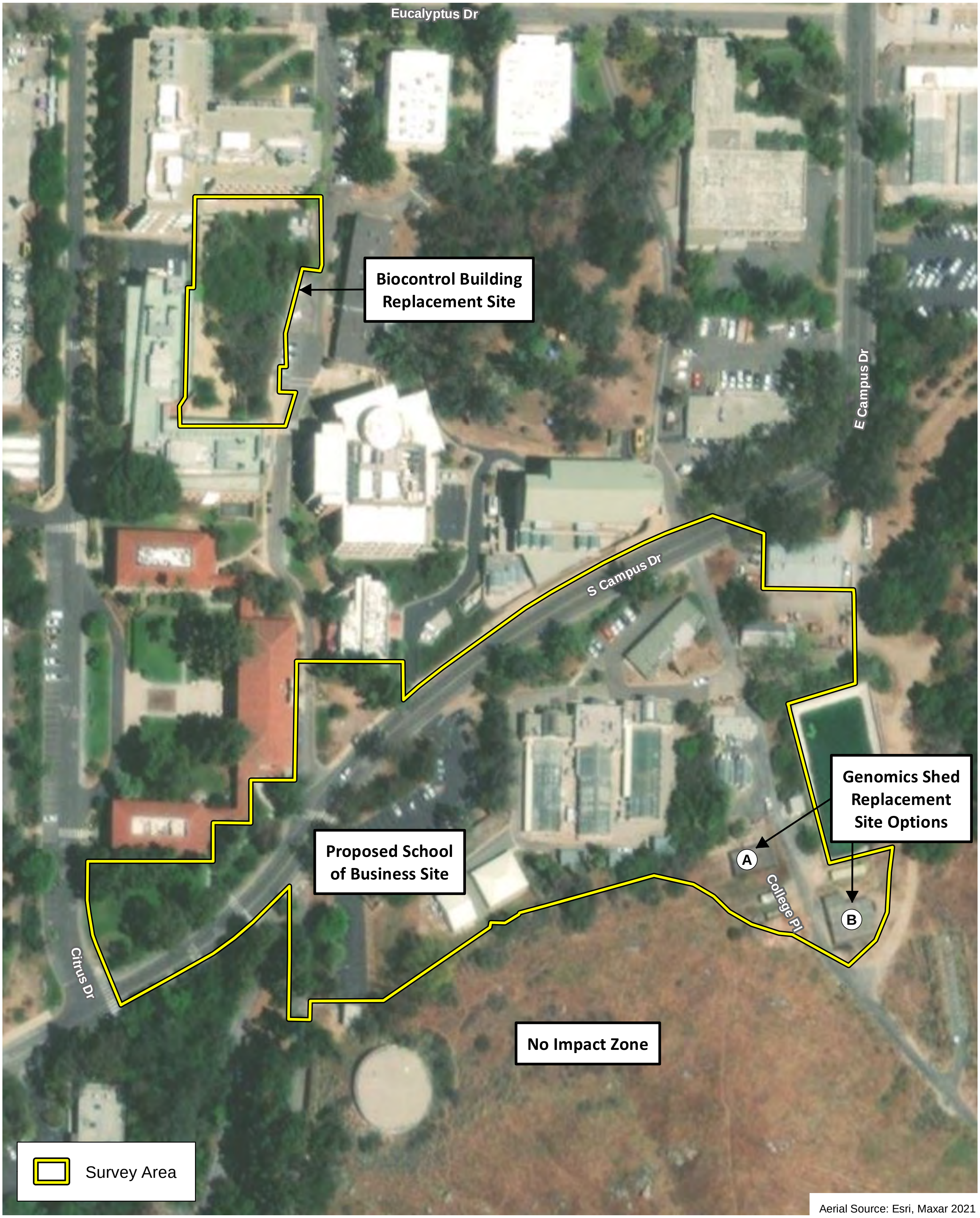


Project Areas

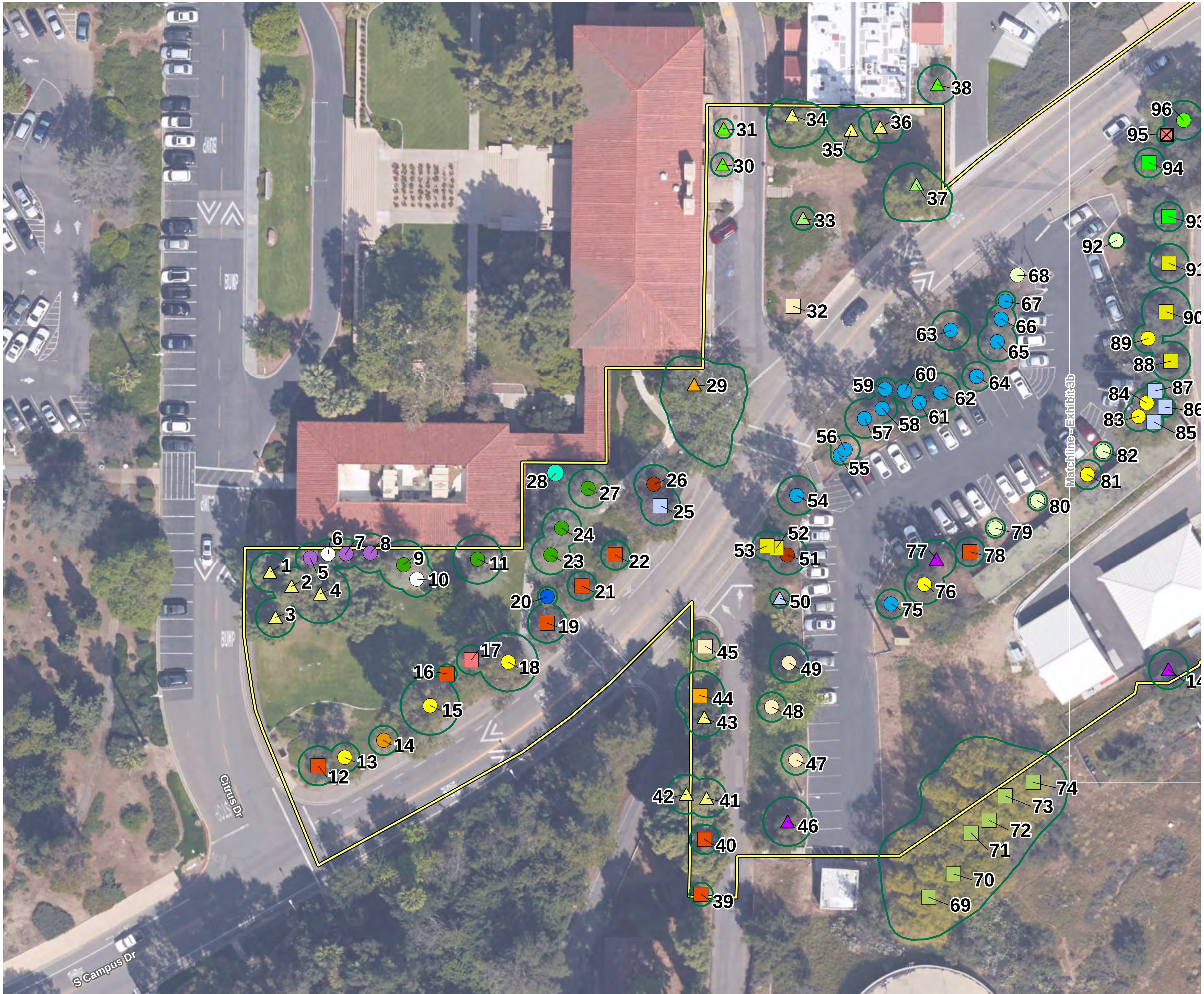
Exhibit 2

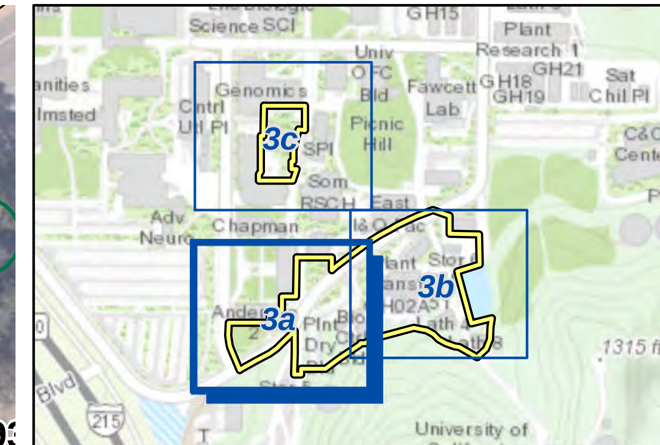
Tree Inventory Report for the School of Business Building Project

N W E S

150 75 0 150 Feet

PSOMAS





- Survey Area
- Tree Canopy
- Bailey acacia *(Acacia baileyana)*
- Japanese maple *(Acer palmatum)*
- chestnut *(Aesculus sp.)*
- fern pine *(Afrocarpus falcatus)*
- Queensland kauri *(Agathis robusta)*
- strawberry tree *(Arbutus 'Marina')*
- Queensland pittosporum *(Auranticarpa rhombifolia)*
- weeping bottlebrush *(Callistemon viminalis)*
- incense cedar *(Calocedrus decurrens)*
- Cape chestnut *(Calodendrum capense)*
- pecan *(Carya illinoinensis)*
- deodar cedar *(Cedrus deodara)*
- carob *(Ceratonia siliqua)*
- camphor *(Cinnamomum camphora)*
- lemon-scented gum *(Corymbia citriodora)*
- sago palm *(Cycas revoluta)*
- blue gum *(Eucalyptus globulus)*
- red ironbark *(Eucalyptus sideroxylon)*
- gum tree *(Eucalyptus sp.)*
- common fig *(Ficus carica)*
- rubber tree *(Ficus elastica)*
- Indian laurel fig *(Ficus microcarpa)*
- shamel ash *(Fraxinus uhdei)*
- Australian willow *(Geijera parviflora)*
- gingko *(Gingko biloba)*
- South African wild plum *(Harpephyllum caffrum)*
- toyon *(Heteromeles arbutifolia)*
- jacaranda *(Jacaranda mimosifolia)*
- Chinese flame tree *(Koelreuteria bipinnata)*
- goldenrain tree *(Koelreuteria paniculata)*
- crape myrtle *(Lagerstromia indica)*
- glossy privet *(Ligustrum lucidum)*
- Brisbane box *(Lophostemon confertus)*
- paperbark *(Melaleuca quinquenervia)*
- Chinaberry *(Melia azedarach)*
- mulberry *(Morus sp.)*
- Canary Island pine *(Pinus canariensis)*
- Aleppo pine *(Pinus halepensis)*
- western sycamore *(Platanus racemosa)*
- mesquite *(Prosopis sp.)*
- evergreen pear *(Pyrus kawakamii)*
- interior live oak *(Quercus wislizeni)*
- locust *(Robinia sp.)*
- blue elderberry *(Sambucus nigra ssp. caerulea)*
- Peruvian pepper tree *(Schinus molle)*
- Brazilian pepper tree *(Schinus terebinthifolius)*
- African sumac *(Searsia lancea)*
- Montezuma cypress *(Taxodium mucronatum)*
- yellow oleander *(Thevetia peruviana)*
- Chinese elm *(Ulmus parviflora)*
- Mexican fan palm *(Washingtonia robusta)*
- unidentified species

50 25 0 50
Feet

N E S W

Aerial Source: Esri, Maxar 2021

Tree Locations

Exhibit 3a

Tree Inventory Report for the School of Business Building Project

PSOMAS

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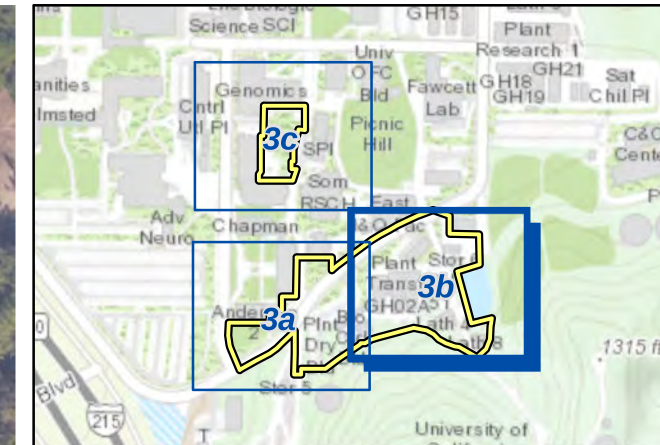

- Survey Area
- Tree Canopy
- Bailey acacia (*Acacia baileyana*)
- Japanese maple (*Acer palmatum*)
- chestnut (*Aesculus sp.*)
- fern pine (*Afrocarpus falcatus*)
- Queensland kauri (*Agathis robusta*)
- strawberry tree (*Arbutus 'Marina'*)
- Queensland pittosporum (*Auranticarpa rhombifolia*)
- weeping bottlebrush (*Callistemon viminalis*)
- incense cedar (*Calocedrus decurrens*)
- Cape chestnut (*Calodendrum capense*)
- pecan (*Carya illinoinensis*)
- deodar cedar (*Cedrus deodara*)
- carob (*Ceratonia siliqua*)
- camphor (*Cinnamomum camphora*)
- lemon-scented gum (*Corymbia citriodora*)
- sago palm (*Cycas revoluta*)
- blue gum (*Eucalyptus globulus*)
- red ironbark (*Eucalyptus sideroxylon*)
- gum tree (*Eucalyptus sp.*)
- common fig (*Ficus carica*)
- rubber tree (*Ficus elastica*)
- Indian laurel fig (*Ficus microcarpa*)
- shamel ash (*Fraxinus uhdei*)
- Australian willow (*Geijera parviflora*)
- gingko (*Gingko biloba*)
- South African wild plum (*Harpephyllum caffrum*)
- toyon (*Heteromeles arbutifolia*)
- jacaranda (*Jacaranda mimosifolia*)
- Chinese flame tree (*Koelreuteria bipinnata*)
- goldenrain tree (*Koelreuteria paniculata*)
- crape myrtle (*Lagerstromia indica*)
- glossy privet (*Ligustrum lucidum*)
- Brisbane box (*Lophostemon confertus*)
- paperbark (*Melaleuca quinquenervia*)
- Chinaberry (*Melia azedarach*)
- mulberry (*Morus sp.*)
- Canary Island pine (*Pinus canariensis*)
- Aleppo pine (*Pinus halepensis*)
- western sycamore (*Platanus racemosa*)
- mesquite (*Prosopis sp.*)
- evergreen pear (*Pyrus kawakamii*)
- interior live oak (*Quercus wislizeni*)
- locust (*Robinia sp.*)
- blue elderberry (*Sambucus nigra ssp. caerulea*)
- Peruvian pepper tree (*Schinus molle*)
- Brazilian pepper tree (*Schinus terebinthifolius*)
- African sumac (*Searsia lancea*)
- Montezuma cypress (*Taxodium mucronatum*)
- yellow oleander (*Thevetia peruviana*)
- Chinese elm (*Ulmus parviflora*)
- Mexican fan palm (*Washingtonia robusta*)
- unidentified species

50 25 0 50
Feet

Aerial Source: Esri, Maxar 2021

Tree Locations — Exhibit 3b

Tree Inventory Report for the School of Business Building Project

PSOMAS

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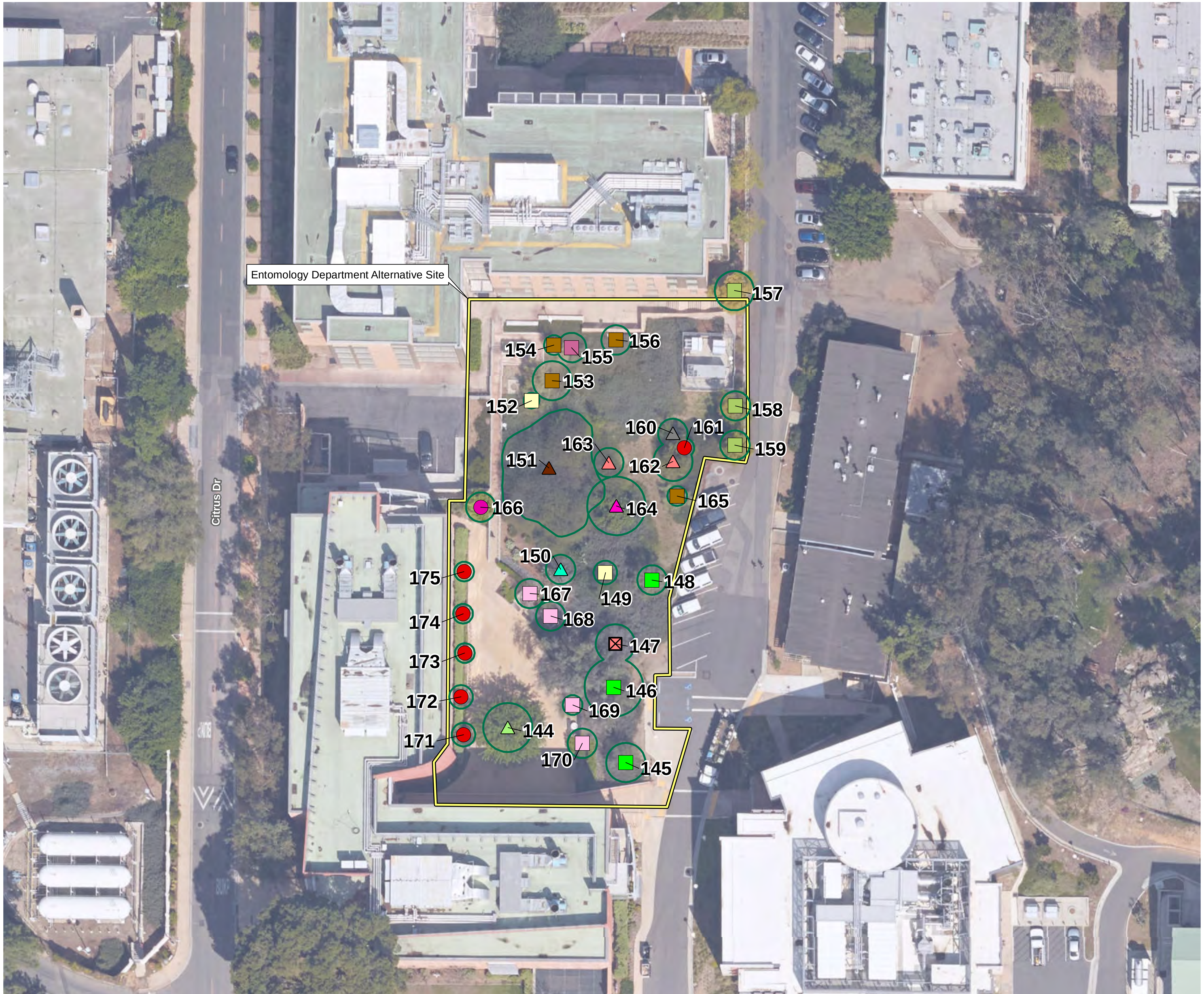

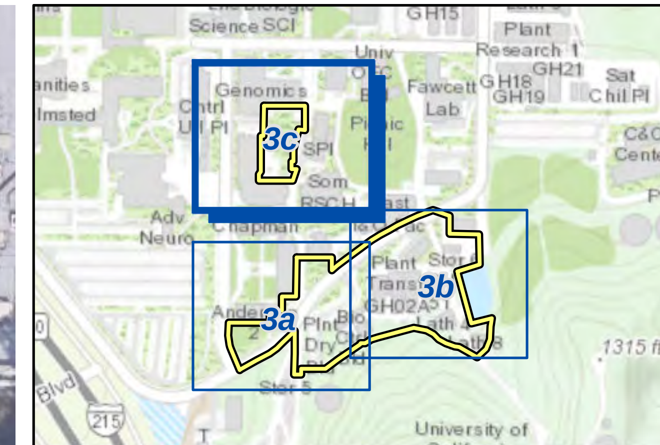

- Survey Area
- Tree Canopy
- Bailey acacia *(Acacia baileyana)*
- Japanese maple *(Acer palmatum)*
- chestnut *(Aesculus sp.)*
- fern pine *(Afrocarpus falcatus)*
- Queensland kauri *(Agathis robusta)*
- strawberry tree *(Arbutus 'Marina')*
- Queensland pittosporum *(Auranticarpa rhombifolia)*
- weeping bottlebrush *(Callistemon viminalis)*
- incense cedar *(Calocedrus decurrens)*
- Cape chestnut *(Calodendrum capense)*
- pecan *(Carya illinoinensis)*
- deodar cedar *(Cedrus deodara)*
- carob *(Ceratonia siliqua)*
- camphor *(Cinnamomum camphora)*
- lemon-scented gum *(Corymbia citriodora)*
- sago palm *(Cycas revoluta)*
- blue gum *(Eucalyptus globulus)*
- red ironbark *(Eucalyptus sideroxylon)*
- gum tree *(Eucalyptus sp.)*
- common fig *(Ficus carica)*
- rubber tree *(Ficus elastica)*
- Indian laurel fig *(Ficus microcarpa)*
- shamel ash *(Fraxinus uhdei)*
- Australian willow *(Geijera parviflora)*
- gingko *(Gingko biloba)*
- South African wild plum *(Harpephyllum caffrum)*
- toyon *(Heteromeles arbutifolia)*
- jacaranda *(Jacaranda mimosifolia)*
- Chinese flame tree *(Koelreuteria bipinnata)*
- goldenrain tree *(Koelreuteria paniculata)*
- crape myrtle *(Lagerstromia indica)*
- glossy privet *(Ligustrum lucidum)*
- Brisbane box *(Lophostemon confertus)*
- paperbark *(Melaleuca quinquenervia)*
- Chinaberry *(Melia azedarach)*
- mulberry *(Morus sp.)*
- Canary Island pine *(Pinus canariensis)*
- Aleppo pine *(Pinus halepensis)*
- western sycamore *(Platanus racemosa)*
- mesquite *(Prosopis sp.)*
- evergreen pear *(Pyrus kawakamii)*
- interior live oak *(Quercus wislizeni)*
- locust *(Robinia sp.)*
- blue elderberry *(Sambucus nigra ssp. caerulea)*
- Peruvian pepper tree *(Schinus molle)*
- Brazilian pepper tree *(Schinus terebinthifolius)*
- African sumac *(Searsia lancea)*
- Montezuma cypress *(Taxodium mucronatum)*
- yellow oleander *(Thevetia peruviana)*
- Chinese elm *(Ulmus parviflora)*
- Mexican fan palm *(Washingtonia robusta)*
- unidentified species

N S E W

50 25 0 50 Feet

Aerial Source: Esri, Maxar 2021

Tree Locations Exhibit 3c

Tree Inventory Report for the School of Business Building Project

PSOMAS

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ATTACHMENT A

SITE PHOTOS

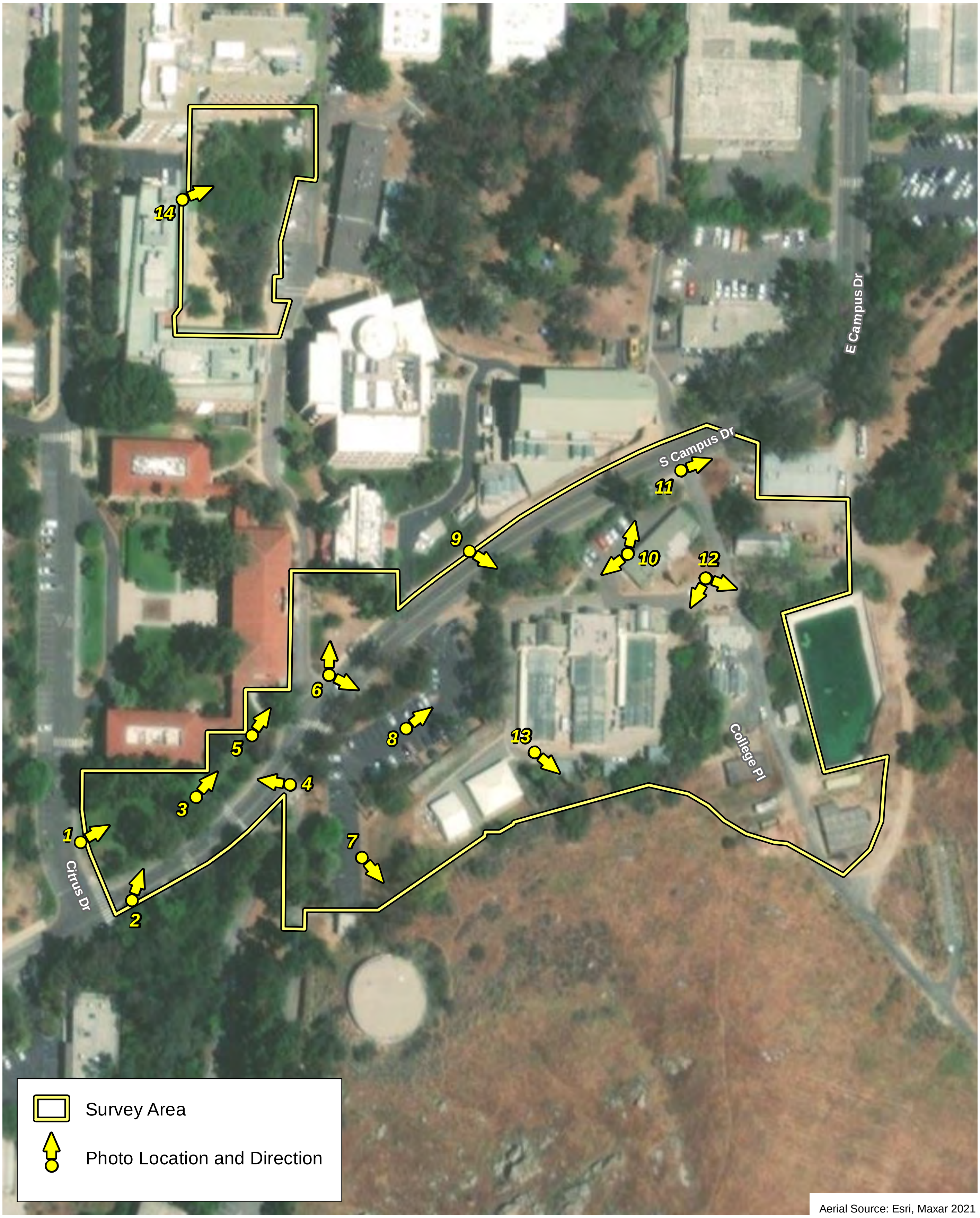

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Photo Locations

Exhibit A-1

Tree Inventory Report for the School of Business Building Project

N W E S

150 75 0 150 Feet

PSOMAS

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Photo Location 1, facing east. September 27, 2021. View of trees 1 through 4 and 10 (to the left) and trees 12 through 18 (to the right), from Citrus Drive.

Photo Location 2, facing northeast. September 27, 2021. View of trees 12 through 18 from South Campus Drive.

Site Photos

Exhibit A-2

Tree Inventory Report for the School of Business Building Project

PSOMAS

Photo Location 3, facing east. September 27, 2021. View of trees 23 and 24, both deodar cedars (*Cedrus deodara*).

Photo Location 4, facing northwest. September 27, 2021. View of trees 19 through 26 from South Campus Drive.

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Site Photos

Exhibit A-3

Tree Inventory Report for the School of Business Building Project

PSOMAS

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Photo Location 5, facing northeast. September 27, 2021. View of tree 29, western sycamore (*Platanus racemosa*).

Photo Location 6, facing north. September 27, 2021. View of trees 33 through 37 that are located south of the entomology museum.

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Site Photos

Exhibit A-4

Tree Inventory Report for the School of Business Building Project

PSOMAS

(01/10/2022 MMD) R:\Projects\UCR\3UCR001211\Graphics\Tree\ex_SP.pdf

Photo Location 6, facing southeast. September 27, 2021. View of eucalyptus trees 55 through 67 that are north of Parking Lot 8.

Photo Location 7, facing southeast. September 27, 2021. View of trees 69 through 74, all jacaranda trees (*Jacaranda mimosifolia*).

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Photo Location 8, facing east. September 27, 2021. View of trees 83 through 92 from Parking Lot 8.

Photo Location 9, facing southeast. September 27, 2021. View of trees 96 through 102, from South Campus Drive.

Photo Location 10, facing northeast. September 27, 2021. View of trees 103 and 104, both Queensland kauri trees (*Agathis robusta*).

Photo Location 10, facing southwest. September 27, 2021. View of tree 116, Brisbane box (*Lophostemon confertus*).

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Site Photos

Exhibit A-7

Tree Inventory Report for the School of Business Building Project

PSOMAS

(01/10/2022 MMD) R:\Projects\UCR\3UCR001211\Graphics\Tree\ex_SP.pdf

Photo Location 11, facing east. September 27, 2021. View of tree 105, Chinaberry (*Melia azedarach*).

Photo Location 12, facing southeast. September 27, 2021. View of trees 109 through 112.

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Site Photos

Exhibit A-8

Tree Inventory Report for the School of Business Building Project

PSOMAS

Photo Location 12, facing south. September 27, 2021. View of trees 117 and 118.

Photo Location 13, facing southeast. September 27, 2021. View of trees 132 through 139.

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Site Photos

Exhibit A-9

Tree Inventory Report for the School of Business Building Project

PSOMAS

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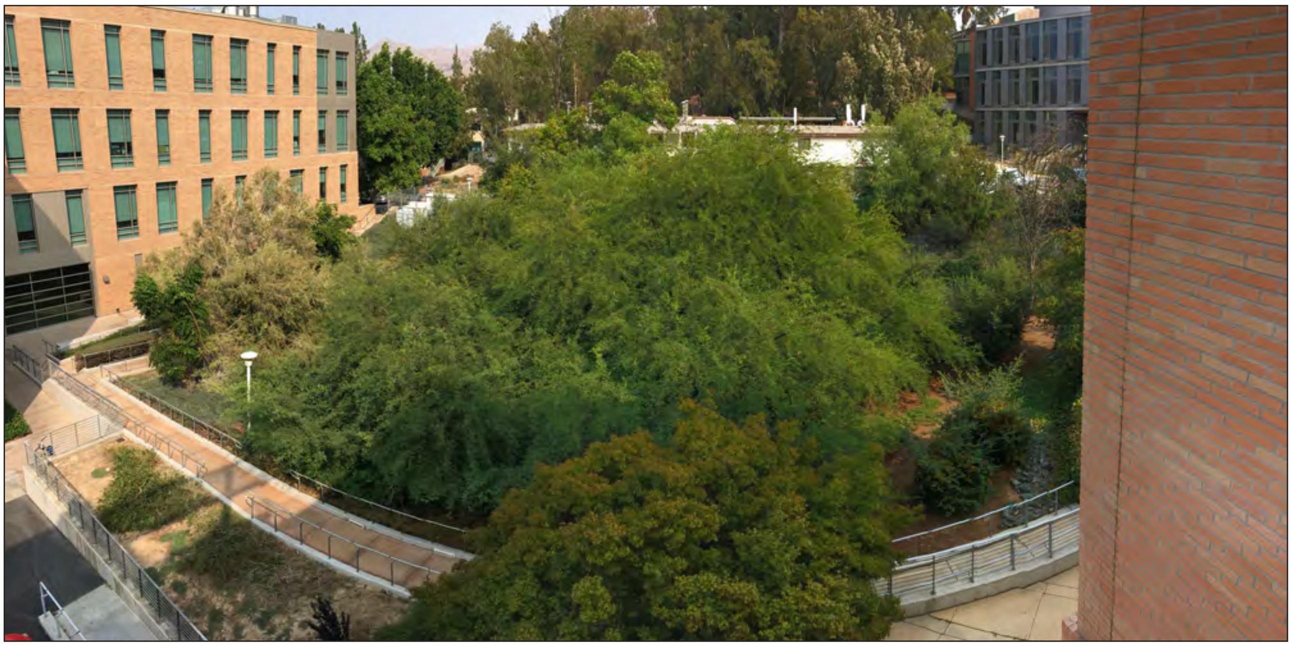

Photo Location 14, facing east. September 27, 2021. Overview of Biocontrol Building Replacement Site, facing east.

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ATTACHMENT B

TREE SURVEY DATA

TABLE B-1
SUMMARY OF COLLECTED TREE DATA

Tree No.	Tree Species		# Main Trunks	D.B.H. (in)	Height (ft)	Canopy Diameter (ft)	Health Rating	Aesthetic Rating
	Common name	Botanical Name						
1	Canary Island pine	*Pinus canariensis*	1	18.3	70	20	5	4
2	Canary Island pine	*Pinus canariensis*	1	16.5	70	20	5	4
3	Canary Island pine	*Pinus canariensis*	1	22.8	70	20	5	4
4	Canary Island pine	*Pinus canariensis*	1	31.3	70	30	5	4
5	weeping bottlebrush	*Callistemon viminalis*	2	13.8, 8.1	35	15	3	3
6	camphor	*Cinnamomum camphora*	1	9.5	30	15	2	2
7	weeping bottlebrush	*Callistemon viminalis*	2	8.9, 8.6	35	15	2	2
8	weeping bottlebrush	*Callistemon viminalis*	2	11.4, 10.1	30	20	3	2
9	deodar cedar	*Cedrus deodara*	1	18.1	80	25	4	4
10	camphor	*Cinnamomum camphora*	4	9.9, 8.0, 7.7, 6.9	30	18	4	3
11	deodar cedar	*Cedrus deodara*	1	17.5	70	25	4	4
12	toyon	*Heteromeles arbutifolia*	3	6.2, 6.0, 5.1	15	20	3	3
13	lemon-scented gum	*Corymbia citriodora*	1	9.2	30	15	4	4
14	carob	*Ceratonia siliqua*	6	6.2, 5.4, 4.1, 4.0, 3.5, 2.5	15	15	3	2
15	lemon-scented gum	*Corymbia citriodora*	1	25.9	70	30	4	4
16	toyon	*Heteromeles arbutifolia*	1	5.6	15	10	2	2
17	rubber tree	*Ficus elastica*	1	8.1	25	15	4	3
18	lemon-scented gum	*Corymbia citriodora*	1	23.2	75	30	4	4
19	toyon	*Heteromeles arbutifolia*	2	7.7, 6.6	20	20	2	3
20	Cape chestnut	*Calodendrum capense*	1	6.1	20	10	4	3
21	toyon	*Heteromeles arbutifolia*	5	5.1, 4.3, 3.3, 2.7, 2.0	20	15	2	3
22	toyon	*Heteromeles arbutifolia*	3	6.9, 5.5, 3.5	18	15	2	3
23	deodar cedar	*Cedrus deodara*	1	13.2	60	20	4	4
24	deodar cedar	*Cedrus deodara*	1	18.1	60	20	4	4
25	glossy privet	*Ligustrum lucidum*	5	5.8, 5.5, 4.9, 4.5, 3.5	30	20	4	4
26	red ironbark	*Eucalyptus sideroxylon*	1	17.4	50	20	4	4
27	deodar cedar	*Cedrus deodara*	1	14.7	50	20	1	1
28	sago palm	*Cycas revoluta*	1	8.0	7	6	3	3
29	western sycamore	*Platanus racemosa*	1	25.7	40	45	4	4
30	evergreen pear	*Pyrus kawakamii*	1	9.1	30	12	2	3

TABLE B-1
SUMMARY OF COLLECTED TREE DATA

Tree No.	Tree Species		# Main Trunks	D.B.H. (in)	Height (ft)	Canopy Diameter (ft)	Health Rating	Aesthetic Rating
	Common name	Botanical Name						
31	evergreen pear	*Pyrus kawakamii*	1	6.4	20	10	2	3
32	gingko	*Gingko biloba*	1	1.4	6	3	3	3
33	Chinese elm	*Ulmus parviflora*	1	4.8	18	12	4	4
34	Canary Island pine	*Pinus canariensis*	1	18.3	45	25	4	4
35	Canary Island pine	*Pinus canariensis*	1	21.5	70	30	5	5
36	Canary Island pine	*Pinus canariensis*	1	9.0	35	15	4	4
37	Aleppo pine	*Pinus halepensis*	1	23.5	65	35	5	5
38	evergreen pear	*Pyrus kawakamii*	1	12.2	30	20	4	4
39	toyon	*Heteromeles arbutifolia*	8	4.0, 4.0, 3.0, 3.0, 3.0, 2.0, 2.0, 2.0	12	12	3	3
40	toyon	*Heteromeles arbutifolia*	3	7.1, 5.1, 4.0	15	15	3	3
41	Canary Island pine	*Pinus canariensis*	1	35.5	60	20	3	3
42	Canary Island pine	*Pinus canariensis*	1	37.5	60	20	3	3
43	Canary Island pine	*Pinus canariensis*	1	26.5	75	20	4	4
44	South African wild plum	*Harpephyllum caffrum*	1	21.2	35	25	4	4
45	gingko	*Gingko biloba*	1	13.1	40	15	4	4
46	Peruvian pepper tree	*Schinus molle*	1	13.5	30	25	3	2
47	Queensland pittosporum	*Auranticarpa rhombifolia*	1	10.7	30	15	4	4
48	Queensland pittosporum	*Auranticarpa rhombifolia*	1	9.4	30	15	4	4
49	Queensland pittosporum	*Auranticarpa rhombifolia*	1	13.7	30	20	4	4
50	Mexican fan palm	*Washingtonia robusta*	1	16.0	35	10	4	3
51	red ironbark	*Eucalyptus sideroxylon*	1	21.0	35	20	3	3
52	gum tree	*Eucalyptus* sp.	1	16.2	35	15	3	3
53	gum tree	*Eucalyptus* sp.	1	14.5	30	15	3	3
54	blue gum	*Eucalyptus globulus*	1	23.5	45	20	3	3
55	blue gum	*Eucalyptus globulus*	1	5.8	40	10	3	3
56	blue gum	*Eucalyptus globulus*	1	11.0	40	15	3	3
57	blue gum	*Eucalyptus globulus*	1	22.1	60	20	3	3
58	blue gum	*Eucalyptus globulus*	1	9.7	40	15	3	3
59	blue gum	*Eucalyptus globulus*	1	14.5	40	12	3	3

TABLE B-1
SUMMARY OF COLLECTED TREE DATA

Tree No.	Tree Species		# Main Trunks	D.B.H. (in)	Height (ft)	Canopy Diameter (ft)	Health Rating	Aesthetic Rating
	Common name	Botanical Name						
60	blue gum	*Eucalyptus globulus*	1	13.0	40	12	3	3
61	blue gum	*Eucalyptus globulus*	1	12.5	45	15	3	3
62	blue gum	*Eucalyptus globulus*	1	26.2	60	20	3	3
63	blue gum	*Eucalyptus globulus*	1	27.1	70	20	3	3
64	blue gum	*Eucalyptus globulus*	1	8.4	40	15	3	3
65	blue gum	*Eucalyptus globulus*	1	22.4	50	20	3	3
66	blue gum	*Eucalyptus globulus*	1	12.9	35	15	3	3
67	blue gum	*Eucalyptus globulus*	1	10.7	30	10	3	3
68	Bailey acacia	*Acacia baileyana*	1	1.5	6	4	3	2
69	jacaranda	*Jacaranda mimosifolia*	2	16.2, 8.1	60	25	3	3
70	jacaranda	*Jacaranda mimosifolia*	2	20.5, 12.5	60	25	3	3
71	jacaranda	*Jacaranda mimosifolia*	2	13.0, 12.0	60	25	3	3
72	jacaranda	*Jacaranda mimosifolia*	2	17.0, 15.0	60	25	3	3
73	jacaranda	*Jacaranda mimosifolia*	2	15.0, 13.0	60	25	3	3
74	jacaranda	*Jacaranda mimosifolia*	2	22.5, 16.0	60	25	3	3
75	blue gum	*Eucalyptus globulus*	3	6.2, 4.9, 3.7	30	15	3	2
76	lemon-scented gum	*Corymbia citriodora*	1	14.8	40	20	4	3
77	Peruvian pepper tree	*Schinus molle*	1	12.2	30	20	3	2
78	toyon	*Heteromeles arbutifolia*	2	9.2, 6.4	15	15	3	3
79	Bailey acacia	*Acacia baileyana*	1	3.2	15	10	3	3
80	Bailey acacia	*Acacia baileyana*	1	3.5	15	10	3	3
81	lemon-scented gum	*Corymbia citriodora*	2	9.3, 8.7	50	15	3	3
82	Bailey acacia	*Acacia baileyana*	1	2.2	12	10	3	3
83	lemon-scented gum	*Corymbia citriodora*	1	11.6	40	15	4	4
84	lemon-scented gum	*Corymbia citriodora*	1	18.1	40	15	4	4
85	glossy privet	*Ligustrum lucidum*	3	3.4, 3.3, 3.0	12	10	3	3
86	glossy privet	*Ligustrum lucidum*	2	4.3, 4.0	10	10	3	3
87	glossy privet	*Ligustrum lucidum*	1	3.6	10	10	3	3
88	gum tree	*Eucalyptus* sp.	1	17.5	40	20	2	3
89	lemon-scented gum	*Corymbia citriodora*	1	11.4	40	15	4	4

TABLE B-1
SUMMARY OF COLLECTED TREE DATA

Tree No.	Tree Species: Common name	Tree Species: Botanical Name	# Main Trunks	D.B.H. (in)	Height (ft)	Canopy Diameter (ft)	Health Rating	Aesthetic Rating
90	gum tree	*Eucalyptus* sp.	1	16.4	45	25	3	3
91	gum tree	*Eucalyptus* sp.	1	14.8	45	20	3	3
92	Bailey acacia	*Acacia baileyana*	1	2.0	12	8	3	3
93	Australian willow	*Geijera parviflora*	1	11.4	20	15	4	4
94	Australian willow	*Geijera parviflora*	1	11.3	20	15	4	4
95	unidentified species		5	4.5, 4.1, 4.0, 3.4, 3.0	15	10	3	3
96	fern pine	*Afrocarpus falcatus*	1	20.5	50	20	3	4
97	gum tree	*Eucalyptus* sp.	2	14.0, 12.8	50	20	3	2
98	Mexican fan palm	*Washingtonia robusta*	1	18.0	60	10	3	3
99	yellow oleander	*Thevetia peruviana*	4	7.7, 6.7, 4.1, 2.4	20	18	4	4
100	incense cedar	*Calocedrus decurrens*	1	13.2	45	15	3	3
101	unidentified species		5	4.5, 4.0, 3.3, 3.0, 2.0	25	15	3	3
102	Montezuma cypress	*Taxodium mucronatum*	1	24.9	50	25	5	5
103	Queensland kauri	*Agathis robusta*	1	38.3	70	25	3	4
104	Queensland kauri	*Agathis robusta*	1	24.5	70	15	4	4
105	Chinaberry	*Melia azedarach*	1	16.0	25	25	4	4
106	Fort McNair red horse chestnut	*Aesculus × carnea 'Fort McNair'*	1	0.5	5	1	2	2
107	Indian laurel fig	*Ficus microcarpa*	1	17.0	30	30	4	4
108	lemon-scented gum	*Corymbia citriodora*	1	19.5	70	20	4	4
109	pecan	*Carya illinoinensis*	1	18.0	45	25	3	3
110	pecan	*Carya illinoinensis*	1	25.0	45	30	3	3
111	African sumac	*Searsia lancea*	2	8.0, 6.5	20	20	2	2
112	African sumac	*Searsia lancea*	2	8.5, 5.0	20	20	2	2
113	blue elderberry	*Sambucus nigra* ssp. *caerulea*	1	12.0	15	15	1	1
114	mulberry	*Morus* sp.	1	15.0	35	30	3	3
115	Mexican fan palm	*Washingtonia robusta*	1	16.0	40	8	3	3
116	Brisbane box	*Lophostemon confertus*	1	4.9	25	10	4	4
117	Mexican fan palm	*Washingtonia robusta*	1	16.0	40	8	3	3
118	Australian willow	*Geijera parviflora*	1	11.4	25	20	3	3

TABLE B-1
SUMMARY OF COLLECTED TREE DATA

Tree No.	Tree Species		# Main Trunks	D.B.H. (in)	Height (ft)	Canopy Diameter (ft)	Health Rating	Aesthetic Rating
	Common name	Botanical Name						
119	mulberry	*Morus* sp.	1	9.6	20	15	3	3
120	Queensland pittosporum	*Auranticarpa rhombifolia*	4	8.5, 6.1, 5.5, 4.5	25	15	3	2
121	Mexican fan palm	*Washingtonia robusta*	1	20.0	40	10	3	3
122	shamel ash	*Fraxinus uhdei*	1	8.0	20	10	3	2
123	shamel ash	*Fraxinus uhdei*	2	8.5, 6.0	30	15	3	2
124	Mexican fan palm	*Washingtonia robusta*	1	15.0	30	10	3	3
125	Australian willow	*Geijera parviflora*	1	9.3	30	15	3	3
126	Australian willow	*Geijera parviflora*	1	7.6	25	15	3	3
127	Australian willow	*Geijera parviflora*	1	4.0	15	10	3	3
128	Australian willow	*Geijera parviflora*	1	7.0	2	10	3	3
129	Australian willow	*Geijera parviflora*	1	5.5	20	15	3	3
130	Australian willow	*Geijera parviflora*	1	10.8	25	15	3	3
131	common fig	*Ficus carica*	1	9.3	20	15	2	2
132	Chinese elm	*Ulmus parviflora*	1	14.4	30	25	2	2
133	shamel ash	*Fraxinus uhdei*	2	6.3, 5.7	25	12	3	2
134	Australian willow	*Geijera parviflora*	1	7.5	20	15	1	1
135	Australian willow	*Geijera parviflora*	2	4.5, 3.0	20	15	3	2
136	Australian willow	*Geijera parviflora*	1	6.7	20	15	3	2
137	Peruvian pepper tree	*Schinus molle*	1	15.3	30	20	3	2
138	unidentified species		1	7.2	25	15	3	2
139	Mexican fan palm	*Washingtonia robusta*	4	20.0, 18.0, 18.0, 15.0	40	20	3	2
140	Mexican fan palm	*Washingtonia robusta*	1	18.0	30	10	3	3
141	Mexican fan palm	*Washingtonia robusta*	1	18.0	60	10	3	3
142	Mexican fan palm	*Washingtonia robusta*	1	16.0	30	10	3	3
143	Peruvian pepper tree	*Schinus molle*	2	11.3, 6.2	20	20	3	2
144	Chinese elm	*Ulmus parviflora*	1	11.5	30	25	4	4
145	Australian willow	*Geijera parviflora*	1	9.5	30	20	4	4
146	Australian willow	*Geijera parviflora*	2	15.4, 12.6	40	30	3	3
147	unidentified species		4	10.0, 7.5, 5.2, 4.1	20	20	2	2
148	Australian willow	*Geijera parviflora*	1	8.8	25	15	3	3

TABLE B-1
SUMMARY OF COLLECTED TREE DATA

Tree No.	Tree Species		# Main Trunks	D.B.H. (in)	Height (ft)	Canopy Diameter (ft)	Health Rating	Aesthetic Rating
	Common name	Botanical Name						
149	goldenrain tree	*Koelreuteria paniculata*	1	6.2	15	12	3	3
150	locust	*Robinia* sp.	1	8.2	25	15	2	2
151	mesquite	*Prosopis* sp.	3	28.5, 22.0, 18.4	25	60	4	4
152	goldenrain tree	*Koelreuteria paniculata*	1	4.5	20	8	3	3
153	paperbark	*Melaleuca quinquenervia*	1	11.8	25	20	3	3
154	paperbark	*Melaleuca quinquenervia*	1	7.8	15	10	3	2
155	Chinese flame tree	*Koelreuteria bipinnata*	2	5.5, 4.1	12	15	3	3
156	paperbark	*Melaleuca quinquenervia*	1	4.5	15	15	3	2
157	jacaranda	*Jacaranda mimosifolia*	1	12.5	30	20	4	4
158	jacaranda	*Jacaranda mimosifolia*	1	10.5	30	15	4	4
159	jacaranda	*Jacaranda mimosifolia*	1	14.1	30	15	4	4
160	interior live oak	*Quercus wislizeni*	2	10.5, 3.6	25	15	4	4
161	strawberry tree	*Arbutus 'Marina'*	1	6.1	20	10	3	3
162	African sumac	*Searsia lancea*	2	12.2, 5.9	25	20	3	3
163	African sumac	*Searsia lancea*	1	9.0	25	15	3	3
164	Brazilian pepper tree	*Schinus terebinthifolius*	1	11.0	30	30	4	3
165	paperbark	*Melaleuca quinquenervia*	3	4.5, 3.3, 3.0	15	10	3	2
166	Japanese maple	*Acer palmatum*	5	5.5, 4.8, 4.5, 4.0, 3.0	15	15	4	4
167	crape myrtle	*Lagerstromia indica*	4	4.8, 4.0, 3.0, 3.0	25	15	4	4
168	crape myrtle	*Lagerstromia indica*	3	5.5, 4.0, 3.2	20	15	4	4
169	crape myrtle	*Lagerstromia indica*	3	2.0, 2.0, 1.0	12	10	3	3
170	crape myrtle	*Lagerstromia indica*	1	6.5	25	15	4	4
171	strawberry tree	*Arbutus 'Marina'*	1	6.8	20	12	4	4
172	strawberry tree	*Arbutus 'Marina'*	1	6.1	20	12	4	4
173	strawberry tree	*Arbutus 'Marina'*	1	5.8	18	10	4	4
174	strawberry tree	*Arbutus 'Marina'*	1	6.3	18	10	4	4
175	strawberry tree	*Arbutus 'Marina'*	1	5.7	15	10	4	4
Aesthetics/Health Rating: 1=Very Poor, 2=Poor, 3=Fair, 4=Good, and 5=Excellent								

Appendix D

Cultural Resources: Character Defining Features Memorandum

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February 4, 2022
Project No: 21-11859

Stephanie Tang, Campus Environmental Planner
University of California, Riverside
1223 University Avenue, Suite 240
Riverside, California 92507
Via email: stephanie.tang@ucr.edu

Subject: Character-Defining Features Memorandum, UCR School of Business, Anderson Hall, UC Riverside, Riverside, California

Dear Ms. Tang:

This memorandum presents the results of the character-defining features analysis completed by Rincon Consultants, Inc. (Rincon) on behalf of University of California, Riverside (UCR). This analysis was prepared to support future project planning efforts in compliance with the mitigation measures of the 2021 Long Range Development Plan (LRDP). Specifically, this memorandum was prepared in partial fulfillment of Mitigation Measure MM CUL-1, which addresses potential impacts to historical resources. UCR is proposing to expand the School of Business through the development of new outbuildings and pathways connecting to Anderson Hall.[1] Per the 2021 UCR Historic Resources Survey, Anderson Hall is an eligible historical resource and the proposed pathways may be considered a "major exterior alteration" as defined in MM CUL-1 (Rincon 2021). As such, this character-defining features analysis was prepared to identify the physical features which convey the significance of Anderson Hall and to inform project planning so that these important physical features can be avoided to the greatest extent feasible.

The analysis and findings presented in this memorandum are based on a site visit and inspection of the exterior and interior of the subject property and archival and building-specific research. This memorandum includes the following sections: (1) discussion of previous evaluations of the subject property's historical significance; (2) review of the site history and construction chronology; (3) narrative and pictorial description of the property's principal exterior and interior features; (3) overview of primary and secondary character-defining features on the interior and exterior; (4) conclusion; and (5) references.

This memorandum was written by Rincon Architectural Historian JulieAnn Murphy. Architectural History Program Manager Steven Treffers, MHP, provided oversight for the project. Principal Architectural Historian Shannon Carmack provided oversight and QA/QC review. Ms. Carmack, Mr. Treffers, and Ms. Murphy all meet and exceed the Secretary of the Interior's Professional Qualification Standards for architectural history and history (36 CFR Part 61).

[1] Anderson Hall as referenced in this document is in fact three interconnected buildings, Anderson Hall 1, Anderson Hall 2, and Chapman Hall.

Background

As part of the background research for this study, Rincon reviewed the National Register of Historic Places (NRHP), California Register of Historical Resources (CRHR), City of Riverside Historic Resources Inventory, UCR Long Range Development Plans for 1991, 2005 and 2021, County of Riverside Landmarks, and the Office of Historic Preservation Built Environment Resource Directory (BERD), to locate and review previous evaluations of Anderson Hall's historical significance. Additional archival documentation, including historic photographs and buildings plans were provided by UCR.

Anderson Hall (the Citrus Experiment Station) was listed as a California Point of Historical Interest in June 1969. It was also listed as a County Historical Landmark by the County of Riverside. The Long Range Development Plan Environmental Impact Report (EIR) completed in 1991 inventoried a number of historic structures that were part of the Citrus Experiment Station Complex as part of the historical survey completed in support of that EIR (Converse Environmental West 1991). Anderson Hall was nominated to the NRHP in May 1989. The nomination, however, remains incomplete and according to the BERD it was withdrawn in December 1990 for unknown reasons. The 2005 Long Range Development Plan EIR reiterated that Anderson Hall is eligible or potentially eligible for listing in the NRHP and/or CRHR and is a historical resource for the purposes of CEQA.

The property was most recently determined eligible for inclusion in the NRHP and the CRHR as part of the UCR Historic Resources Survey Report completed by Rincon in May 2021. Anderson Hall is significant for its historical associations with the early settlement and development in Riverside, particularly the citrus industry and citriculture in Riverside and the founding of the Citrus Experiment Station. Beginning in the mid-1910s, the Citrus Experiment Station provided a multidisciplinary research center and clearing house for the study of citrus hybridization, crop maintenance, and productivity. The Citrus Experiment Station was the impetus organization for what would become UCR and made immeasurable contribution to the success of the citrus industry in Riverside, the region, and California. Anderson Hall is eligible for designation under NRHP Criterion A and CRHR Criterion 1 for its association with the Citrus Experiment Station with a period of significance of 1916 through 1974, when the Citrus Experiment Station fell under the auspices of the College of Natural and Agricultural Sciences.

Anderson Hall is also significant for its architectural merit as a good example of Spanish Colonial/Mission Revival style architecture as applied to an educational building. Initially constructed in 1916 as the Horticulture Building (Anderson 1) and the Irrigation Building (Anderson 2), it was designed by Los Angeles-based architects Lester H. Hibbard and H.B. Cody. It was expanded in 1931 with the addition of the Soils and Plant Nutrition Wing (Chapman Hall), also designed in the Spanish Colonial/Mission Revival style by Riverside architect G. Stanley Wilson. It is eligible for designation under NRHP Criterion C and CRHR Criterion 3 for its architecture with a period of significance of 1916 and 1931.

Site History

Construction History

Anderson Hall was first constructed in 1916, as part of the Citrus Experiment Station, a project created to address the challenges of the citrus industry including invasive pests and diseases that damaged and killed crops (Rincon 2021). Established by legislation passed in the State Assembly, the Citrus Experiment Station opened in March 1918 in Riverside (Figure 1).

Figure 1 1917 View of Citrus Experiment Station

Source: UC Riverside Archives

Designed by Los Angeles based architects, Lester H. Hibbard and H.B. Cody the first phase of development included the $125,000 complex comprised of the Horticulture Building, now referred to as Anderson Hall 1, the Irrigation Building, now referred to as Anderson Hall 2 as well as the director's home and the Barn Group. The director's home, now known as College Building South, has been heavily altered including a substantial 1963 addition at its north end. The Barn Group, northeast of the project area, was also heavily altered, including partial reconstruction after a fire in 1969 (EIP 2005). According to the *San Bernardino News,* the architectural character of the new facilities "suggest[ed] the Spanish inheritance of California, through their graceful lines, tiled roofs, plastered façade, and picturesque open arcades from building to building. Everything is planned as part of a group capable of expansion by future generations" (San Bernardino News 1916). Anderson Hall 1 was known as the main laboratory building, housing offices for the director, faculty, and researchers, the library, laboratories for plan breeding and insect work, and the entomological collection (Figure 1).

By the 1920s, the Citrus Experiment Station had expanded and conducted research and advised growers on how to address crop issues, including looking to other countries for guidance. During the Great Depression, the station continued to expand and the Soils/Plant Nutrition Wing, now referred to as

Chapman Hall was constructed in 1931. Designed by well-known Riverside architect G. Stanley Wilson, it followed the Spanish Colonial/Mission Revival architecture of the other portions of the building (Figure 2).

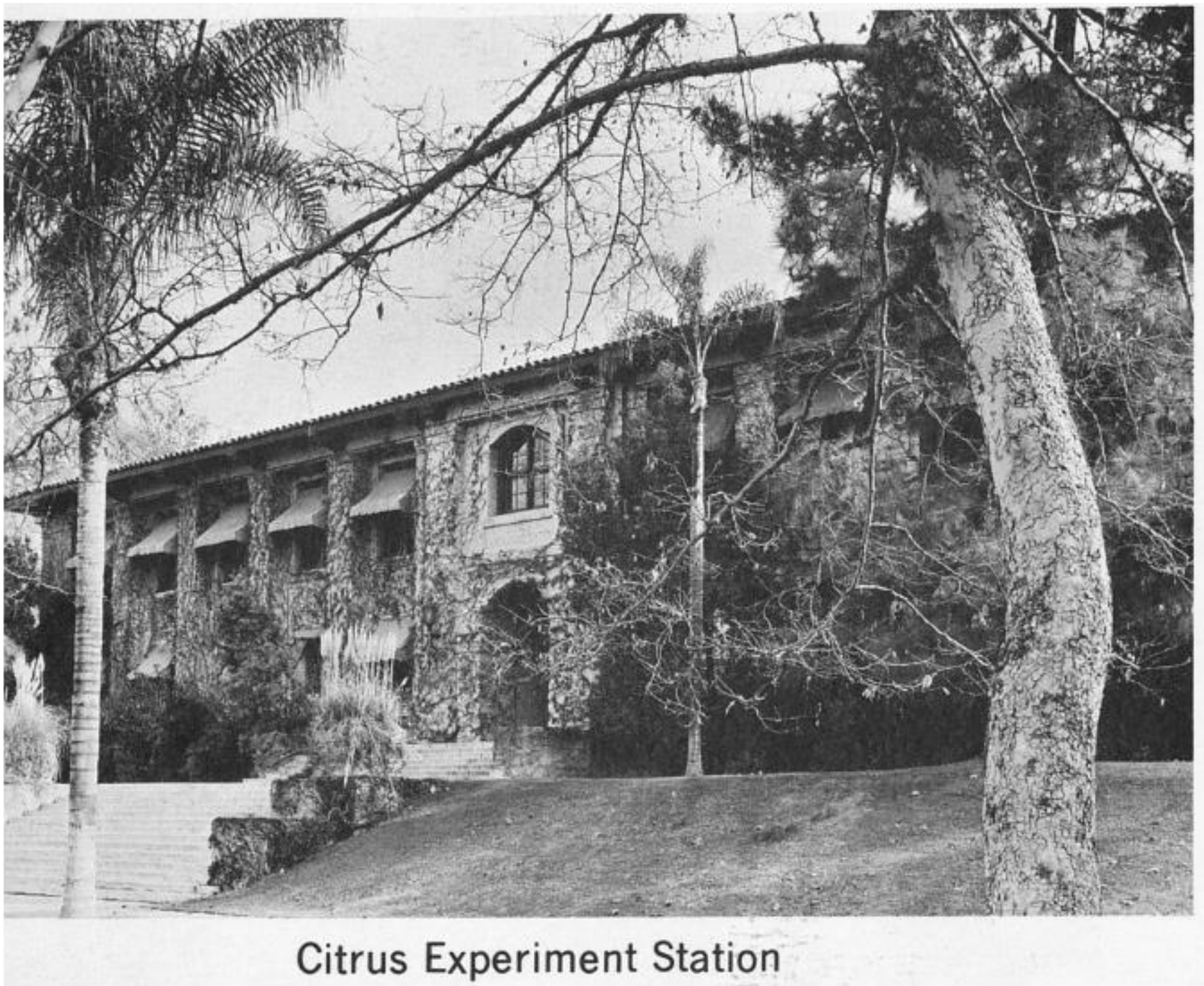
Figure 2 Citrus Experiment Station Shortly After 1931 Addition

Source: UC Riverside Archives

In the 1950s the Citrus Experiment Station had grown from 30 to 1,000 acres and agricultural lands planted with citrus characterized land to the north, west, and south of the buildings by 1953. At this time the postwar boom was burdened by returning servicemembers looking to take advantage of their G.I. Bill. California Governor Early Warren granted $2 million in funding for a new liberal arts college in 1948. The presence of the Citrus Experiment Station provided a logical location for a new university to meet the demand and the College of Letters and Sciences, marking the founding of UCR opened in 1954. In the following years, the campus expanded on the north side of the Anderson Hall 1. Its experimental orchards, spanning over 22 acres on UCR's West Campus, have been guided by the College of Natural and Agricultural Sciences since 1974. Now known as the Citrus Research Center and Agricultural Experiment Station (CRC-AES), it is still home to one of the most extensive citrus diversity collections.

Since its construction in 1917 and 1931, the building has undergone several changes for accommodating the growing campus, updated needs, and changing uses. According to available historical images and plans, the portion of the building now known as Anderson Hall 1, had canvas awnings over windows by 1926, which appear to have remained into the 1930s and were repeated on the portion of the building now known as Anderson Hall 2 and Chapman Hall. Also, by that time, Anderson Hall 1 and Anderson Hall 2 were partially covered on the exterior by creeping ivy. By the 1950s, it appears all portions of the building were covered in ivy (Figure 3). At an unknown date before 1965 the Anderson Hall 1's second floor windows at the north and south elevations were modified for exterior egress stairs.

Figure 3 1976 View of Anderson Hall 1 with Ivy Covered Walls



Source: *The Tartan,* 1976

In 1965, Anderson Hall 1 was updated for research labs, graduate student offices, and staff offices and otherwise retained its exterior appearance until 1991. At that time that portion of the building received interior updates for use as office space and no longer included labs. It also received seismic updates that included replacing the concrete cheek walls at the entry stairs, replacing the existing exterior stairs at the second floor, removing the vegetation from the building exterior and repairing damaged stucco, and installing a new roof. Anderson Hall 2 received similar updates includes vegetation removal, interior updates for classroom space, and a new roof. Additionally, the arcade structure between the two buildings was rebuilt from the studs. In 1986 Chapman Hall’s interior was update for improved lab space. Its exterior vegetation was removed by the early 1990s. In 1997, its lighting was updated and it received a new roof in 2019.

The most notable changes that have occurred are to the surrounding landscape. When constructed, the building was set within an immense landscape of orchards that have since been reduced with the growth of the campus beginning in 1954. Since that time the plantings that front Citrus Drive and surround the building have matured and been replanted several times. Orchards to the west of the building, opposite Citrus Drive began to be replaced with surface parking lots by 1966, and were extended northward and southward by 1978. It reached its general configuration by 2004, when the new Psychology Building was constructed at the north end of the surface lot.

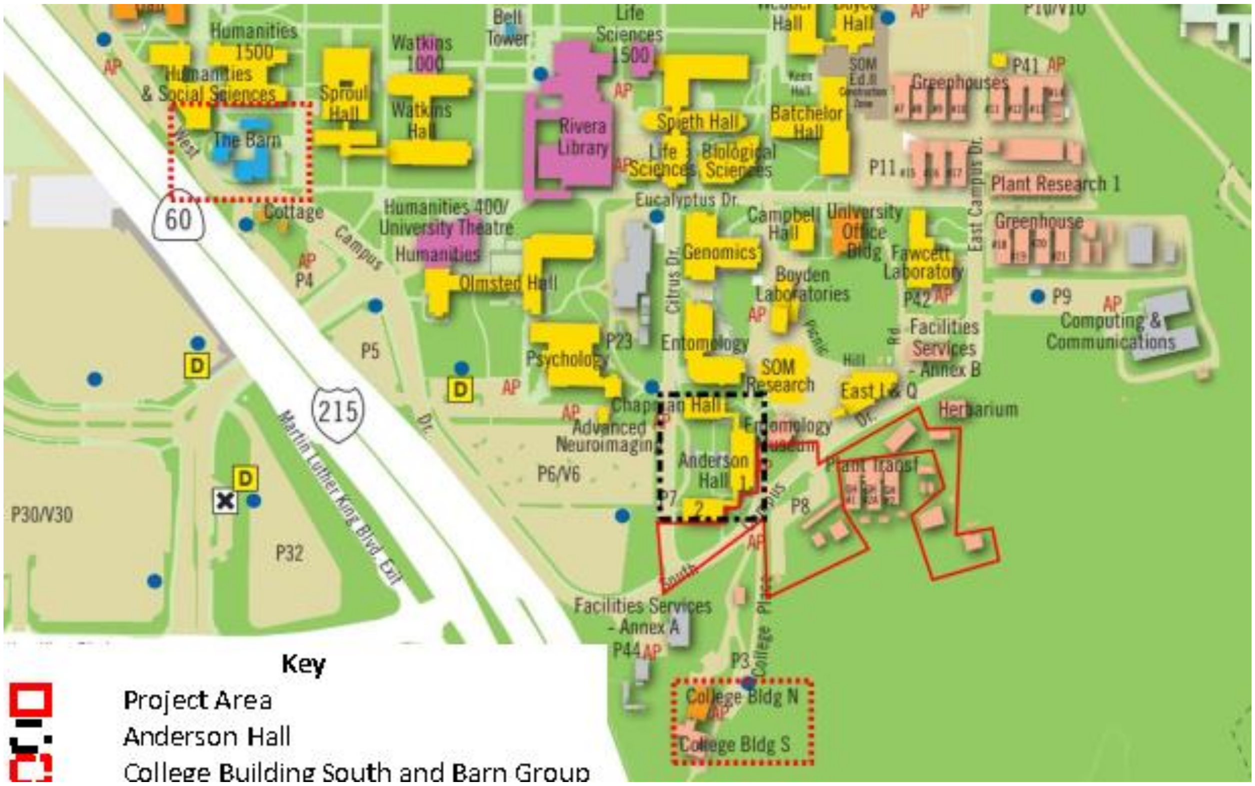
Circulation changes have also occurred. By 1951, the looped drive at the rear of the building that connected back to Citrus Drive was widened and by 2002 was truncated and no longer connected to Citrus Drive, instead continuing into the campus. Campus Drive was also developed in 1963, creating a new visual feature which physically separated Anderson Hall from buildings to the east. Perpendicular parking along Citrus Drive, opposite the horseshoe drive was present by 1955. Additional parking, including ADA parking spots were installed on the east side of Anderson Hall 1 in 1991. Walking paths in the western lawn area between the buildings of the property have generally been in place since 1931 when Chapman Hall was completed. Historical aerial photographs and visual observation suggests the sidewalks to the south and east of the building appear to have been established in the 1990s.

Results

Architectural Description and Current Conditions

The purpose of this letter report is to identify the building's character-defining features. This was accomplished through a site visit to the subject property to confirm existing conditions and an examination of available historical archival materials for the property. Rincon Architectural Historian Rachel Perzel, MA inspected the building on December 15, 2021. Each the building exterior and interior was examined to identify the character-defining features of the building and assess its overall condition and integrity. The following section provides an overview of the existing conditions of Anderson Hall's exterior and interior features and a series of photographs illustrating these features.

Figure 4 Project Location



Exterior

Located on the UCR East Campus, Anderson Hall is situated on the corner of Citrus Drive and South Campus Drive, set on a slightly sloped terrain overlooking the former orchard land. The property, originally part of the Citrus Experiment Station, is comprised of three buildings built over two periods, resulting in a U-shaped plan with Anderson Hall 1 at the center, Anderson Hall 2 to the south, and Chapman Hall to the north. All portions of the building are built in the Spanish Colonial/Mission Revival style and feature rectangular plans, smooth stucco exteriors, red barrel tile roofing, and are connected by arcaded corridors. The building is fronted by a horseshoe drive with lawn areas flanking each side (Figure 4).

Anderson Hall 1

Anderson Hall 1 is the center portion of the building with its primary, or west, elevation fronting Citrus Drive (Figure 5). Built in 1916, it is two stories above a basement and features a rectangular plan and a hipped roof with open eaves and brackets. It accessed from the horseshoe drive by a series of concrete steps to a landscaped terrace section. Concrete paths from the terrace continue to a second set of concrete stairs with broad concrete cheek walls to the main entrance. The primary elevation is symmetrical with five bays separated by piers flanking the central main entry bay, which projects slightly and features pilasters at each side with gothic sconces. The main entry is characterized by an arched recessed opening at the first floor and a Mission-shaped surround detail and at the second-floor window with an etched relief that reads “Citrus Experiment Station”. First floor windows are six-by-six paired wood casements. Windows on the second floor generally repeat the same pattern, but feature larger openings and include two-over-two transom windows above each casement. The basement level is partially visible at grade below a molded waterline detail and features rectangular three-over-three wood windows aligned with each bay above.

The rear, or east, elevation generally repeats the same pattern described above and fronts a vehicular drive that continues through the campus. The central bay features a central mission parapet detail with molded coping and a central arch detail between two piers. The piers continue to grade level, flanking the rear entry, which is slightly recessed and features an arched opening with a gothic sconce above. The piers feature narrow window openings, though the southern ones have been infilled for a blind opening. The window configuration is generally the same as the primary elevation with the exception of three bays at the southern end that include large windows similar to those on the second floor. The basement level has small square ventilation openings at the southern end and area wells at basement level openings on the northern end.

The north and south elevations are symmetrical and have five openings separated by pilasters topped with large, smooth corbel details. Openings at the second floor have the same paired casement window configuration described on other elevations except for the central bay which has been modified with a dropped sill for a door that continues to a contemporary metal exterior stair for egress. The first floor is topped with a pent roof with red barrel tiles over an arched arcade that continues to connecting arcades on each side of the building. On the south elevation the first floor has a central paired multilite wood door with a transom above and two window openings to the east. The north elevation repeats the same central door configuration and includes windows on each side.

Figure 5 Primary Elevation of Anderson Hall 1, View East

Anderson Hall 2

The arched arcade at the south of Anderson Hall 1 continues to Anderson Hall 2 to the south. Oriented east-west and perpendicular to Anderson Hall 1, it forms the south arm of the U-shaped floorplan that comprise the three sections of the property (Figure 6). Also constructed in 1916 it is a simpler interpretation of the Spanish Colonial/Mission Revival style. It is one story over basement and features a rectangular plan, smooth stucco exterior, and a gabled roof with a flat central portion concealing rooftop systems. Its primary, or east, elevation is accessed from the covered arcade from Anderson Hall 1 and features a central paired door with the same wood multilite configuration seen at Anderson Hall 1. It is flanked by wood casement windows that correspond with windows on the second floor as Anderson Hall 1.

The west elevation fronts Citrus Drive. Due to the slope of the site, the building's basement level is at grade at this elevation and features a man-door entry at the center of the elevation with two small rectangular mulitilite windows on each side. The basement level is topped with molded waterline detail. The first story is five bays and features a rectangular wood casement window at each bay, separated by simple pilaster details.

The south elevation fronts south Campus Drive and is largely obscured by a row of trees and landscaping. It continues for eight bays. The first floor repeats the same wood casement windows and pilaster configuration described at the west elevation. The basement is partially visible, following the slope of the site, and is topped with the same waterline detail described above and features small rectangular windows at each bay and an area well with stair access to the basement at the east end. The elevation continues to the covered arcade to the east. The north elevation fronts the lawn between the buildings and generally repeats the same configuration described on the south elevation.

Figure 6 West Elevation of Anderson Hall 2, View East

Chapman Hall

Located to the north of Anderson 1, the Chapman Hall portion of the building comprises the north wing of Anderson Hall's U-shaped plan. Constructed in 1931 and built in the Spanish Colonial/Mission Revival style, it largely mirrors Anderson Hall 2 and is one story over basement, with a rectangular floorplan, smooth stucco exterior, and a gabled roof with a flat central portion concealing rooftop systems (Figure 7). Its primary, or west, elevation fronts Citrus Drive and spans for five bays. Its main, basement-level, entry is accessed via a short concrete stair from the west as well as an accessible ramp from the north that continues to a paired multilite wood door with a transom above and is flanked by two modern globe sconces. The elevation continues for two bays on each side of the entry and features rectangular multilite casement windows with transoms above. The basement level is topped with a moulded watercourse. The first-floor level is five bays, each with a paired mulitlite casement and two-over-two transom above separated by simple pilasters. All windows are covered by two-over-two storm screens.

The north and south elevations generally repeat the same pattern. Each elevation is eight bays. As on the primary elevation, the basement level is topped with a molded course and each bay is separated by a pilaster. The window configuration repeats that which is described above and the basement level is visible for only a portion of each elevation as it slopes upward, following the terrain of the site. There are area wells at the east side of the building and windows on the south elevation have the same two-over-two storm screens at window exteriors. Several basement windows at both elevations have louvered portions for ventilation.

The east elevation is connected to Anderson Hall 1, via a covered arcade, repeating the arcade plan to the south wing. The first floor is covered by a pent roof that connects to the arcade. The area below the roofline is five bays with a central paired multilite wood door with a transom above and two paired windows at each end. The basement level is not visible at this elevation.

Figure 7 Primary Elevation of Chapman Hall, View East

Interior

The property's interior has been highly altered throughout. Anderson Hall 2 and Chapman Hall have the same general floorplan at each level with a central double-loaded corridor. Rooms have been reconfigured over time for different uses and all interior finishes, including ceilings and floors have been updated with non-historic materials. In both sections, the only intact interior feature is the general layout and vertical circulation (Figure 8).

Similarly, Anderson Hall 1 has been modified over time. It also features a double-loaded corridor on each floor with rooms off the corridor. A central stair at the east side of the building provides access from the basement to the second floor. As described above, exterior stairs at each end of the second-floor corridor provide secondary egress. Rooms have been reconfigured over time through the removal and addition of partition walls. All finishes are modern and non-historic and include tile and carpeted floors, dropped ceilings, and replacement interior doors. Similar to the other buildings, the only intact feature is the general layout and vertical circulation (Figure 9).

Figure 8 Interior View of Anderson Hall 2 Corridor, View East

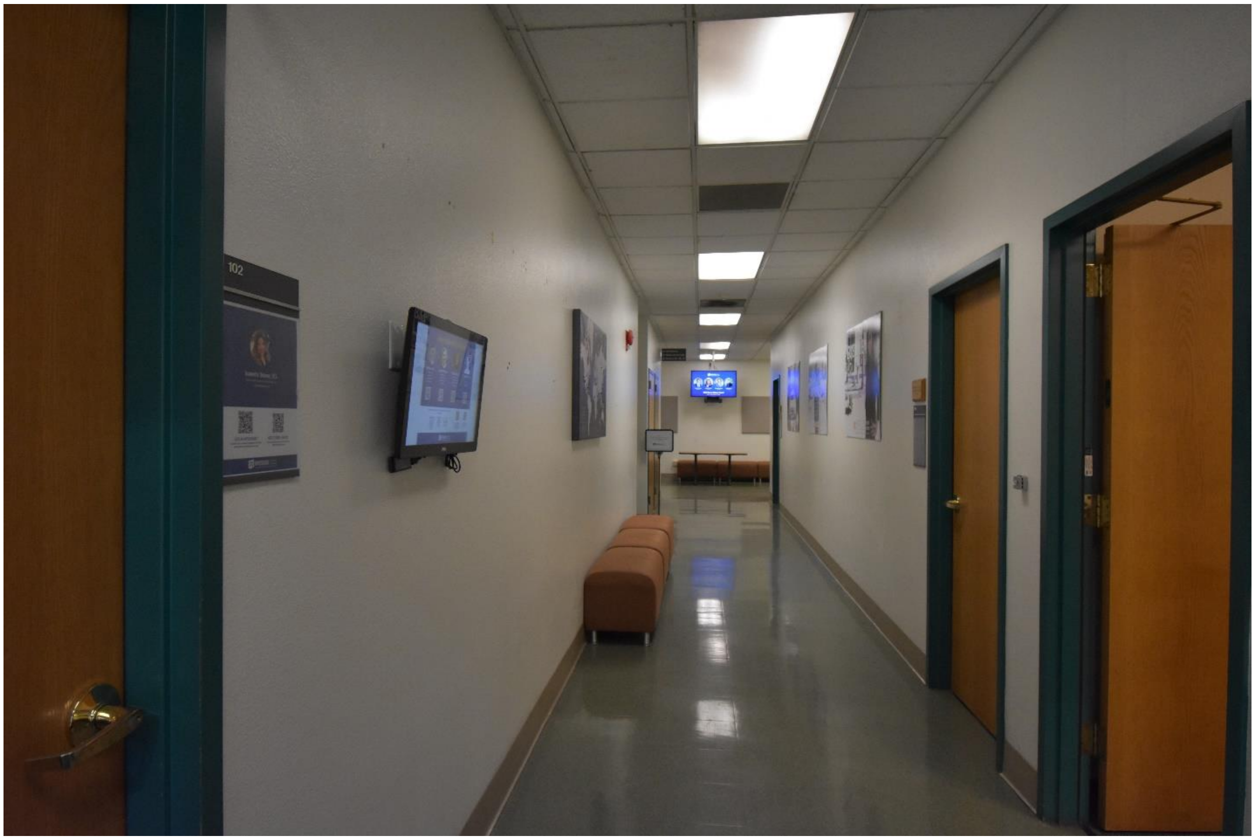
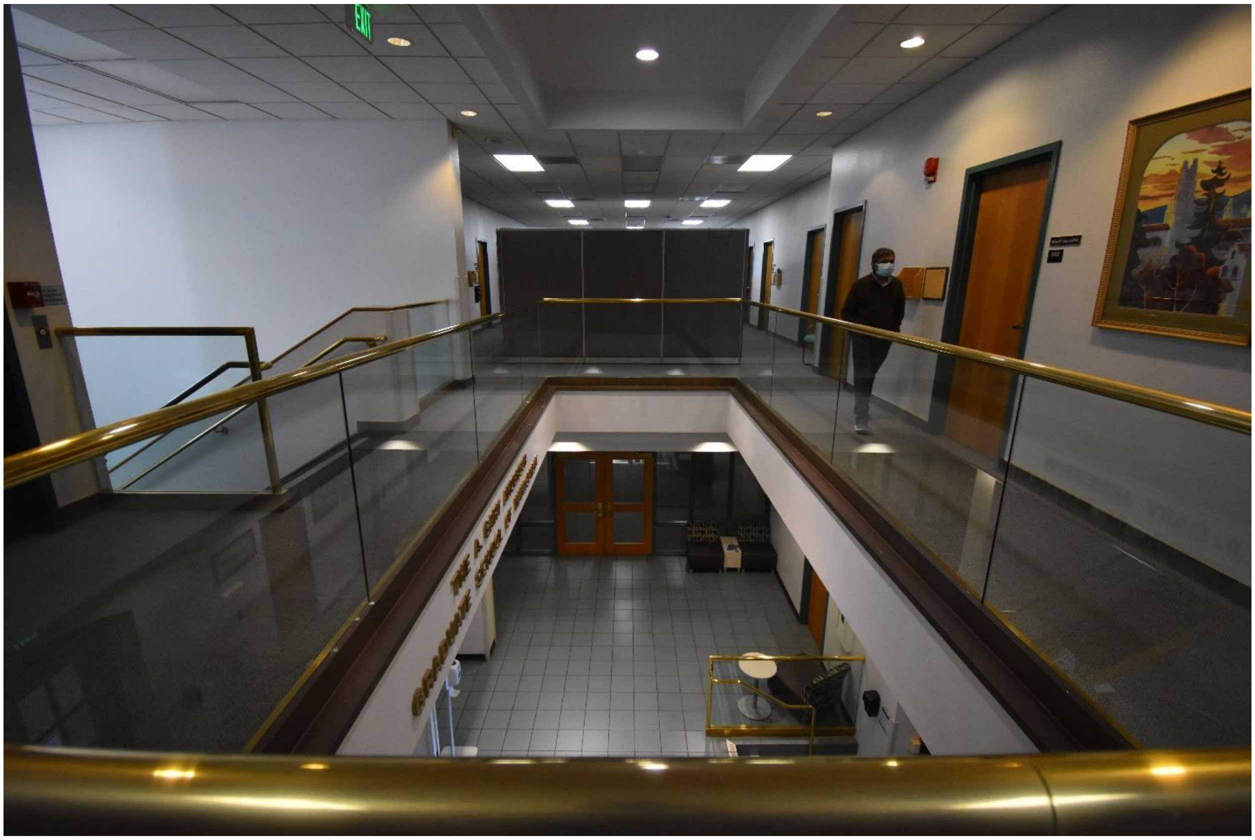


Figure 9 Interior View of Anderson Hall 1 Second Floor Corridor, View North



Overview of Exterior and Interior Character-Defining Features

Character-defining features are the physical characteristics—materials, spaces, finishes, architectural detailing, mass, setting—that convey the significance of the historic property.

According to Preservation Brief 17, *Architectural Character: Identifying the Visual Aspects of Historic Buildings as an Aid to Preserving Their Character*, there is a three-step process to identifying character-defining features.[2] Step 1 involves assessing the distinguishing physical aspects of the exterior of the building as a whole, including its setting, shape and massing, orientation, roof and roof features, projections, and openings. Step 2 looks at the building more closely—at materials, trim, secondary features, and craftsmanship. Step 3 encompasses the interior, including individual spaces, relations or sequences of spaces (floor plan), surface finishes and materials, exposed structure, and interior features and details.

Anderson Hall is significant for its historical associations with the early settlement and development in Riverside, particularly the citrus industry and citriculture in Riverside and the founding of the Citrus Experiment Station. Its period of significance spans from the station's founding in 1916 until 1974, when it was subsumed by the College of Natural and Agricultural Sciences. It is also significant for its architectural merit as a good example of Spanish Colonial/Mission Revival style architecture. Initially constructed in 1916 as the Horticulture Building (Anderson 1) and the Irrigation Building (Anderson 2), it

[2] Lee H. Nelson, *Architectural Character: Identifying the Visual Aspects of Historic Buildings as an Aid to Preserving Their Character*, Preservation Brief No. 17. U.S. Department of the Interior, National Park Service, Technical Preservation Services.

was designed by Los Angeles-based architects Lester H. Hibbard and H.B. Cody. It was expanded in 1931 with the addition of the Soils and Plant Nutrition Wing (Chapman Hall), also designed in the Spanish Colonial/Mission Revival style by Riverside architect G. Stanley Wilson. The building's period of significance is 1916 and 1931.

Exterior Character-Defining Features

Overall Physical Aspects

The overall physical aspects of the subject property are important in the building's ability to convey its historical significance. Spanning the buildings two major periods of construction, 1916 through 1931, several aspects are representative of Spanish Colonial/Mission Revival architecture. As an important research property, the building's setting and terrain are important elements of its character. Other elements such as stucco clad exterior, exterior courtyard, and arched openings also contribute to the overall character of the property Table 1**Error! Reference source not found.**. Primary historic elements and character-defining features of the building's character that should be retained are:

- Sloped terrain above Citrus Drive
- Horseshoe drive at west elevation
- Campus Drive and ancillary road to east, which define the eastern and southern boundaries of the property
- U-Shaped footprint with Anderson Hall 1 at the center, Anderson Hall 2 to the south, and Chapman Hall to the north, creating an interior courtyard
- Central exterior stair with broad concrete cheek walls with a landscape terrace section between portions of the building
- Concrete paths between buildings at western courtyard
- Arcaded corridors between Anderson Hall 1, Anderson Hall 2, and Chapman Hall
- Symmetrical, rectangular floorplans
- Punched window openings with slightly recessed casement configuration and smooth concrete aprons
- Hipped and gabled roofs with red barrel tile roofing
- Smooth stucco exteriors
- Gothic exterior lighting
- Generally low landscaping between buildings with larger trees and shrubs at secondary elevations of the building

Table 1 Overall Physical Aspects

Sloped terrain above Citrus Drive

Horseshoe drive at west elevation

Ancillary road at the east elevation

U-Shaped footprint

Central stair with broad concrete walls and landscape terrace section

Concrete paths between buildings at western courtyard

Arcaded corridors

Rectangular footprint

Punched window openings with recessed casement windows and smooth concrete apron

Smooth stucco exteriors

Gothic exterior lighting

Generally low landscaping between buildings with larger trees at secondary elevations

Visual Character

Trim, architectural detailing, secondary features, and materials are important in defining the visual character of the building that should be retained and preserved where feasible. These features are limited to elements of the design that date to 1916 and 1931 and include arched openings, molded waterline details, decorative pilasters, and open eaves and brackets (Table 2 Table 3 Table 4). Significant trim, architectural detailing, secondary features and materials that are primary historic elements include:

Anderson Hall 1

- Two story over basement massing
- Central recessed, arched entry with Mission shaped surround details and etched relief signage at primary elevation
- Decorative pilasters separating each bay
- Molded waterline detail above basement
- Rectangular wood casement windows, with larger windows with transoms at second floor at primary elevation
- Mission parapet detail and surround with molded coping at east elevation
- Recessed arched rear entry
- Multilite exterior wood doors
- Open eaves and brackets
- Large corbel details at north and south elevations
- First floor pent roofs with arched details at north and south elevations

Anderson Hall 2

- One story over basement massing following site slope
- Simplified pilasters separating each bay
- Molded waterline above basement
- Area wells at select basement level openings
- Pent roof at east elevation entry

Chapman Hall

- One story over basement massing following site slope
- Globe sconces at Citrus Drive elevation entry
- Simplified pilasters separating each bay
- Molded waterline above basement
- Area wells at select basement level openings
- Pent roof at east elevation entry

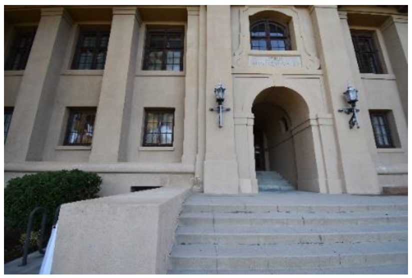
Table 2 Visual Character – Anderson Hall 1


Two story over basement massing


Central recessed arched entry

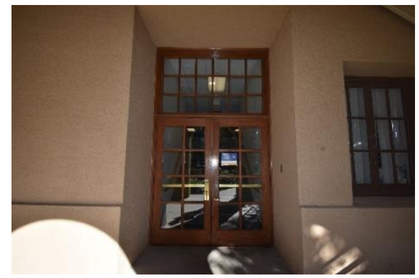

Decorative pilasters separating each bay

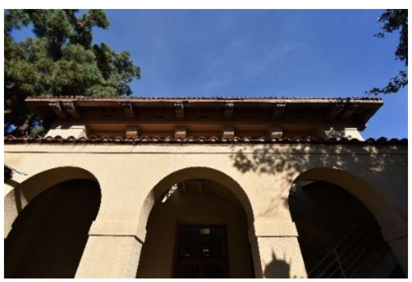

Molded waterline above basement


Rectangular wood casement windows with larger windows with transoms at second floor at primary elevation


Mission parapet detail and surround with molded coping at east elevation


Recessed arched rear entry


Multilite exterior wood doors


Open eaves and brackets


Large corbel details at north and south elevations


First floor pent roofs with arched details at north and south elevations

Table 3 Visual Character – Anderson Hall 2

One story over basement massing

Simplified pilasters separating each bay

Molded waterline above basement

Area wells at select basement level openings

Pent roof at east elevation entry

Table 4 Visual Character – Chapman Hall

One story over basement massing

Globe sconces at Citrus Drive elevation

Simplified pilasters separating each bay

Molded waterline above basement

Area wells at select basement level openings

Pent roof at east elevation entry

Interior Character-Defining Features

According to the Standards, the size, configuration, proportion, and relationship of rooms and corridors is important in defining the building's overall historic character. As described above, the building has undergone significant alterations over time, including updating the interior lab space for office and classroom space. Character-defining interior features that remain include the double-loaded corridor and central stair configuration repeated in each portion of the building.

Non-Character-Defining Features

As described above, the building has undergone several updates through the years to accommodate changing needs of the campus. Some resulting features, spaces, and finishes may be considered to be non-character-defining features, and their replacement would not distract from the overall character of the building if completed with in-kind or compatible materials. A summary list of such features include the following:

- Replacement interior doors throughout
- New concrete path on the south side of Anderson Hall 2
- Exterior north and south entries and stairs at the second story of Anderson Hall 1
- Partitions in common areas, operational spaces, and offices constructed during the 1990s conversion of lab space for office and administrative space

Conclusion

As defined above, Anderson Hall is eligible for inclusion in the NRHP and the California Register of Historical CRHR. Its historical significance derives from architectural merit as a good example of Spanish Colonial/Mission Revival style architecture and from historical associations with the early settlement and development in Riverside, particularly the citrus industry and citriculture in Riverside and the founding of the Citrus Experiment Station. As a result of its eligibility for the NRHP and the CRHR, the subject property is considered a historical resource per the 2021 LRDP. Future projects which may be include any "major exterior alterations" as defined by the 2021 LRDP should therefore consider and take efforts to avoid potential impact to the character-defining features defined in this memorandum. Should you have any questions or comments regarding this report, please do not hesitate to contact me at (951) 782-0061, or jmurphy@rinconconsultants.com.

Sincerely,

Rincon Consultants, Inc.

JulieAnn Murphy
Architectural Historian Project Manager

Steven Treffers, M.H.P.
Architectural Historian Program Manager

Shannon Carmack
Principal/Architectural Historian

Attachments

Attachment 1 Maps/Figures

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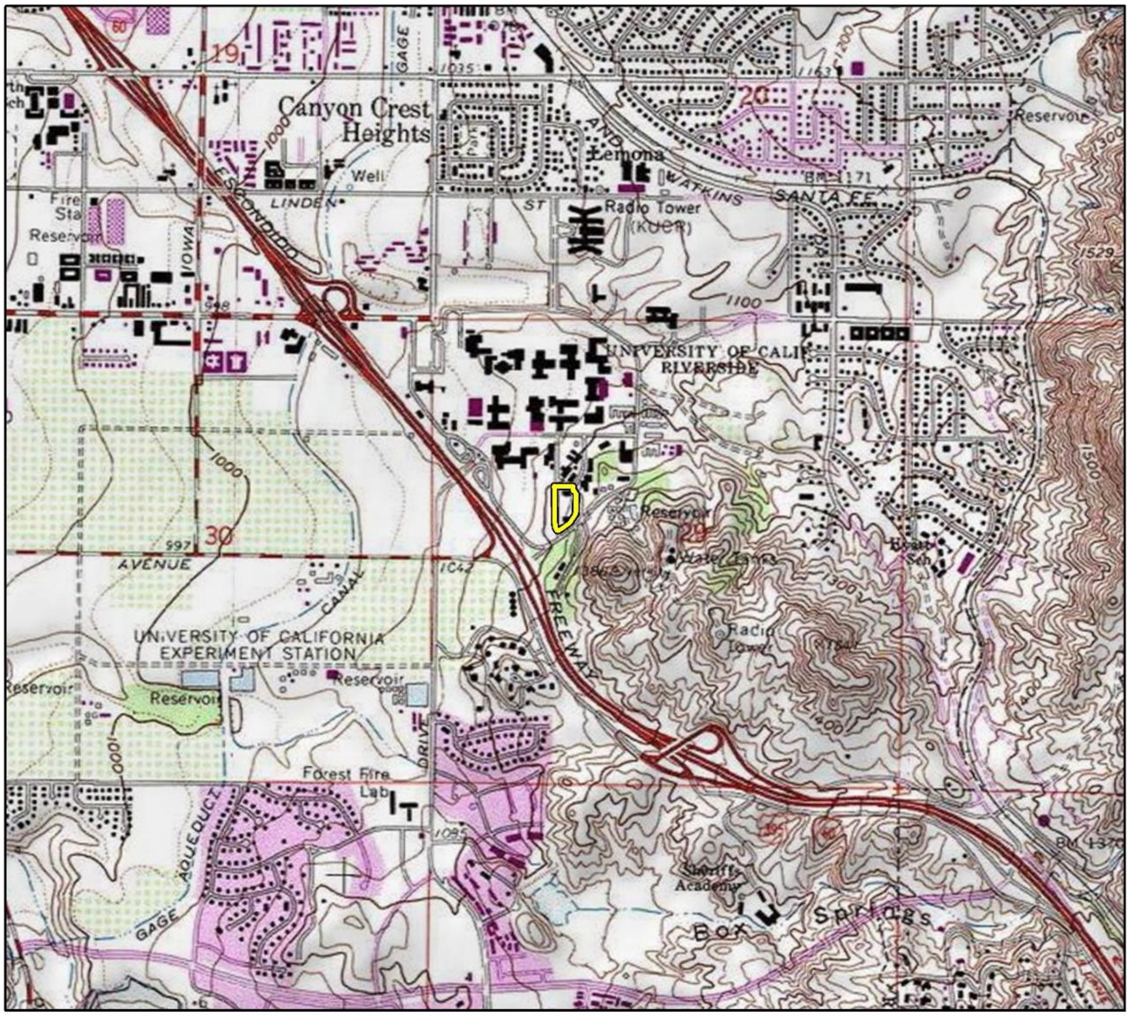
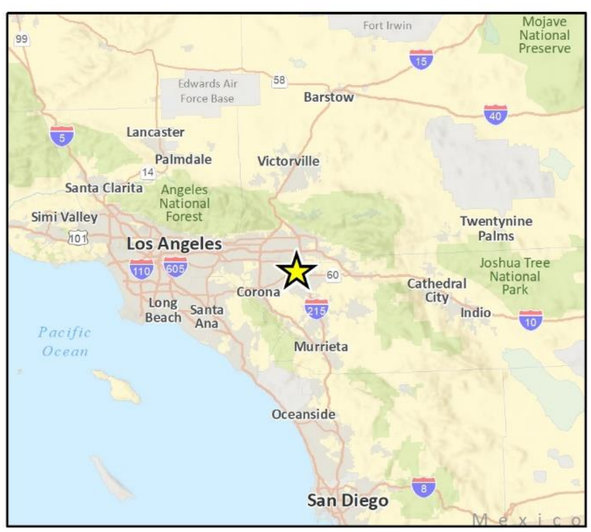
Attachment 1

Maps/Figures

Regional Location of Anderson Hall



Basemap provided by National Geographic Society, Esri and their licensors © 2022. Riverside East Quadrangle. T02.0S, R04.0W, S29. The topographic representation depicted in this map may not portray all of the features currently found in the vicinity today and/or features depicted in this map may have changed since the original topographic map was assembled.



Project Location

0 1,000 2,000 Feet

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CRFig 1 Proj Locn Map

Site Map of Anderson Hall

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Appendix E

Historical Resources Impacts Screening

Rincon Consultants, Inc.

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June 30, 2022

Stephanie Tang, Campus Environmental Planner
University of California, Riverside
1223 University Avenue, Suite 240
Riverside, California 92507
Via email: stephanie.tang@ucr.edu

Subject: Historical Resources Impacts Screening, School of Business Building Project, University of California, Riverside, Riverside, California

Dear Ms. Tang:

This memorandum presents the results of a historical resources impacts screening completed by Rincon Consultants, Inc. (Rincon) on behalf of University of California, Riverside (UCR). This impacts screening was prepared to support compliance with the mitigation measures of the 2021 Long Range Development Plan (LRDP) Environmental Impact Report (EIR) for the proposed UCR School of Business Building Project (project). The proposed project involves the construction of a new building for the expansion of the School of Business programs and facilities[1], demolition of existing structure(s) (Biocontrol Building, Genomics Shed, Plant Drying Building, Headhouse Storage Building, and Storage 6), replacement of structures (Biocontrol Building and Genomics Shed), and off-site improvements that include circulation improvements to create a pedestrian connection to Anderson Hall. Per the 2021 LRDP EIR and associated UCR Historic Resources Survey, Anderson Hall is an eligible historical resource and the proposed project, specifically the circulation improvements may be considered a "major exterior alteration" as defined in Mitigation Measure (MM) CUL-1 (Rincon 2021). Building on a previous character-defining features analysis completed by Rincon in February 2022, the current impacts screening was prepared to determine if the proposed project generally conforms to the Secretary of the Interior's Standards for the Treatment of Historic Properties (Standards), thereby mitigating historical resources impacts to a less than significant level (Weeks and Grimmer 2017). Methods for the current assessment included a review of relevant project information, review of the character-defining features memorandum previously prepared by Rincon, and preparation of this memorandum to present the results.

This impacts screening was conducted by Rincon Architectural Historian JulieAnn Murphy, MSHP. Architectural History Program Manager Steven Treffers, MHP, provided oversight for the project. Principal Architectural Historian Shannon Carmack provided oversight and QA/QC review. Ms. Carmack, Mr. Treffers, and Ms. Murphy all meet and exceed the Secretary of the Interior's Professional Qualification Standards for architectural history and history (36 CFR Part 61).

[1] Currently, the School of Business facilities are split between two buildings on campus: Anderson Hall and Olmsted Hall.

Project Description

The proposed project will involve construction of the School of Business Building that would include education space, student support spaces and office and support; demolition of existing structure(s) (Biocontrol Building, Genomics Shed, Plant Drying Building, Headhouse Storage Building, and Storage 6); replacement of structures (Biocontrol Building and Genomics Shed); hardscape, landscape, and off-site improvements anticipated to occur generally along South Campus Drive between Citrus Drive and College Place. The new SBB would be located on the south side of South Campus Drive, opposite Anderson Hall and predominately in the location of what is currently Parking Lot 8. Although still in the early stages of design, the new building will be approximately 75,000 gross square feet and up to five stories with a maximum height of approximately 65 feet as measured from street level. Building materials and colors for the proposed project and replacement structures would be required to comply with Campus Construction and Design Standards and Architectural Design Precedent.

In order to accommodate the proposed project, the existing Biocontrol Building, Genomics Shed, Plant Drying Building, Headhouse Storage Building, and Storage 6 would be demolished (none of these buildings are considered historical resources per the 2021 LRDP EIR and associated UCR Historic Resources Survey). The Biocontrol Building is assumed to be replaced on campus approximately 0.13 mile to the northwest, immediately east of the Genomics and Entomology buildings (similarly none of these buildings are considered historical resources per the 2021 LRDP EIR and associated UCR Historic Resources Survey). The Genomics Shed is assumed to be replaced on campus south or west of the existing water-storage basin (southeast of the SBB site) and would not be located within proximity to any historical resources per the 2021 LRDP EIR and associated UCR Historic Resources Survey.

In addition to construction of the new SBB, the proposed project includes circulation and accessibility improvements, and landscape/hardscape improvements. Some segments of the existing sidewalks/pathway would need to be improved to meet Americans with Disabilities Act (ADA) requirements. This work is anticipated to include pathway improvements to connect the Anderson Hall to the SBB. Landscape and hardscape improvements are still in the early stages of design at this time.

Project Background

Anderson Hall (which includes three interconnected buildings: Anderson Hall 1, Anderson Hall 2, and Chapman Hall) was identified in the 2021 LRDP EIR and associated UCR Historic Resources Survey as an eligible historical resource as defined by the California Environmental Quality Act (CEQA). Pursuant to the 2021 LRDP EIR and Section 15064.5(b) of the CEQA Guidelines, impacts to a historical resource occurs when there is a substantial adverse change in the significance of a historical resource such that it is materially impaired. Construction of the new SBB and its resulting change in setting, in addition to the new connecting pathways, may be considered a “major exterior alteration” per MM CUL-1 in the 2021 LRDP EIR and therefore must be considered further to ensure impacts to Anderson Hall are avoided to the greatest extent feasible. Rincon previously prepared a character-defining features memorandum in partial support of MM CUL-1, which identified the important physical characteristics which convey the significance of Anderson Hall. This impacts screening builds on the previous character-defining features memorandum and aims to fulfill MM CUL-1 presenting an impacts screening of the UCR School of Business Building Project. Per the 2021 LRDP EIR, Anderson Hall is the only identified historical resource within the project area and therefore is the only property considered as part of this impacts screening.

Character-Defining Features

Anderson Hall is significant for its historical associations with the early settlement and development in Riverside, particularly the citrus industry and citriculture in Riverside and the founding of the Citrus Experiment Station. The Citrus Experiment Station was the impetus organization for what would become UCR and made an immeasurable contribution to the success of the citrus industry in Riverside, the region, and California. Anderson Hall is eligible for designation under National Register of Historic Places (NRHP) Criterion A and California Register of Historical Resources (CRHR) Criterion 1 for its association with the Citrus Experiment Station with a period of significance of 1916 through 1974 when the Citrus Experiment Station fell under the auspices of the College of Natural and Agricultural Sciences.

Anderson Hall is also significant for its architectural merit as a good example of Spanish Colonial/Mission Revival style architecture as applied to an educational building. Initially constructed in 1916 as the Horticulture Building (Anderson Hall 1) and the Irrigation Building (Anderson Hall 22), it was designed by Los Angeles-based architects Lester H. Hibbard and H.B. Cody. It was expanded in 1931 with the addition of the Soils and Plant Nutrition Wing (Chapman Hall), also designed in the Spanish Colonial/Mission Revival style by Riverside architect G. Stanley Wilson. It is eligible for designation under NRHP Criterion C and CRHR Criterion 3 for its architecture with a period of significance of 1916 and 1931.

The building's character-defining features, or those elements essential in conveying a property's historic significance, were outlined in the *Character-Defining Features Memorandum.* The following character-defining features are those that have the most potential to be impacted by the proposed project and include the following:

Overall Physical Aspects

- Sloped terrain above Citrus Drive
- Horseshoe drive at west elevation
- Campus Drive and ancillary road to the east, which define the eastern and southern boundaries of the property
- U-Shaped footprint with Anderson Hall 1 at the center, Anderson Hall 2 to the south, and Chapman Hall to the north, creating an interior courtyard
- Central exterior stair with broad concrete cheek walls with a landscape terrace section between portions of the building
- Concrete paths between buildings at western courtyard
- Arcaded corridors between Anderson Hall 1, Anderson Hall 2, and Chapman Hall
- Symmetrical, rectangular floorplans
- Punched window openings with slightly recessed casement configuration and smooth concrete aprons
- Hipped and gabled roofs with red barrel tile roofing
- Smooth stucco exteriors
- Gothic exterior lighting
- Generally low landscaping between buildings with larger trees and shrubs at secondary elevations of the building

Visual Character

Anderson Hall 1

- Two-stories over basement massing
- Central recessed, arched entry with Mission shaped surround details and etched relief signage at primary elevation
- Recessed arched rear entry
- First-floor pent roofs with arched details at north and south elevations

Anderson Hall 2

- One story over basement massing following site slope
- Pent roof at east elevation entry

Chapman Hall

- One story over basement massing following site slope
- Pent roof at east elevation entry

Standards for Rehabilitation

Generally, a project that is found to conform with the Secretary of the Interior's Standards for the Treatment of Historic Properties is found to mitigate impacts to a historical resource to a less than significant level (pursuant to Section 15064.5(b)(3) of the CEQA Guidelines). The Standards make broad-brush recommendations for maintaining, repairing, and replacing historic materials, as well as designing new additions or making alterations. They cannot, in and of themselves, be used to make essential decisions about which features of a historic property should be saved and which might be changed. Rather, they provide philosophical consistency to the work. There are Standards for four distinct, but interrelated, approaches to the treatment of historic properties: preservation, rehabilitation, restoration, and reconstruction.

The Rehabilitation Standards are the most commonly used treatment for historic buildings and therefore have been utilized in the review of the current project. Following the guidance of the Standards, the Standards for Rehabilitation are most appropriate for the current project because of the building's current physical condition. The Secretary's Standards for Rehabilitation state:

1. A property will be used as it was historically or be given a new use that requires minimal change to its distinctive materials, features, spaces, and spatial relationships.
2. The historic character of a property will be retained and preserved. The removal of distinctive materials or alteration of features, spaces, and spatial relationships that characterize a property will be avoided.
3. Each property will be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or elements from other historic properties, will not be undertaken.

4. Changes to a property that have acquired historic significance in their own right will be retained and preserved.
5. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.
6. Deteriorated historic features will be repaired rather than replaced. Where the severity of deterioration requires the replacement of a distinctive feature, the new feature will match the old in design, color, texture, and, where possible, materials. Replacement of missing features will be substantiated by documentary and physical evidence.
7. Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.
8. Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.
9. New additions, exterior alterations, or related new construction will not destroy historic materials, features, and spatial relationships that characterize the property. The new work shall be differentiated from the old and will be compatible with the historic materials, features, size, scale and proportion, and massing to protect the integrity of the property and its environment.
10. New additions and adjacent or related new construction will be undertaken in such a manner that, if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

In companion to the Standards, the *Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings*, were developed to provide guidance on how to apply the Standards.

Project Impacts Screening

As identified in the UCR Historic Resources Survey, Anderson Hall is the only historical resource within or adjacent to the project site. Neither the buildings proposed to be demolished (Biocontrol Building, Genomics Shed, Plant Drying Building, Headhouse Storage Building, and Storage 6 or replacement sites for the Biocontrol Building (adjacent to the Genomics and Entomology buildings) and Genomics Shed (adjacent to the water-storage basin) have been identified as historical resources; these project elements, therefore, would not result in any project impacts.

As defined in Section 15064.5(b) of the CEQA Guidelines, a project would result in a significant adverse impact on the environment if it materially impaired a historical resource, that is, if it directly or indirectly alters in an adverse manner those characteristics that convey a resource's historical significance. Potential impacts under the current project therefore could occur through direct project actions, including the changes to the landscaping, hardscaping, and site features of Anderson Hall. Indirect impacts to the historical resource could also result from the new adjacent building and the resulting changes to the property's immediate setting. The CEQA Guidelines state that impacts to a historical resource are generally considered mitigated below a level of significance when the project conforms to the Standards. The following considers these potential direct and indirect impacts in consideration of the CEQA Guidelines and the Standards.

In consideration of direct impacts, the proposed project does not include any direct physical impacts to the building itself, which would continue to be used for its historic purpose as an institutional building. The project is also not anticipated to alter any significant site or circulation features, such as the sloped terrain above Citrus Drive, horseshoe drive at west elevation, concrete pathways in the western courtyard, or arcaded corridors among others. Campus Drive and the eastern ancillary road are also considered character-defining due to their definition of the overall property boundaries; however, both these roads have been modified and it is their alignment which is significant, not their physical materials or associated features. It is not anticipated the project will remove or modify the alignment of road, such that they will no longer continue to define the historical property boundaries.

Project elements within the Anderson Hall property boundary are anticipated to be limited and concentrated at the rear, south/southeast spaces of the property, which is not highly character-defining or visible from the building's principal westerly-facing elevations. Although still in the early stages of design, the proposed project includes pathway improvements to connect Anderson Hall to the SBB and to accommodate ADA requirements. As evidenced by historical aerial photographs and visual observation, the concrete pathways in this area of the property appear to have been developed in or subsequent to the 1990s, and therefore post-date Anderson's Hall period of significance (defined as 1916 through 1974). The existing rear pathways do not appear to have acquired significance in their own right and are not distinctive physical features that contribute to the historical or architectural significance of Anderson Hall. The replacement of alteration of the existing pathways therefore would be unlikely to result in an impact on Anderson Hall. However, to ensure the new pathways and other circulation improvements do not impact Anderson Hall, Rincon has included recommendations below to guide the further refinement of project plans.

Historical aerial photographs indicate the landscaping at the southeastern portion of the property has been replaced since the initial development of Anderson Hall. The current mature trees in this area appear to date the 1960s or later based on photographs and other documentary evidence. Although the trees themselves may not date to the period of significance, this area of the property has historically had trees and the general use of large trees and shrubs at the secondary portions of the property is considered character-defining. The landscaping plans are still being developed; however, it is not anticipated that any improvements would be made which would be inconsistent with the existing and historical character of the property. To ensure landscaping improvements do not negatively impact the setting of Anderson Hall, Rincon has included recommendations below to guide the refinement of plans.

In consideration of indirect impacts and changes to the general setting of Anderson Hall, potential impacts could occur through the development of the adjacent SBB. The construction of the new SBB across South Campus Drive will introduce a new visual element to the setting of Anderson Hall. However, the development of this new building will allow Anderson Hall to continue its historic use as an institutional building and avoid alterations or additions to the historic building. The new building will also be constructed outside of the historical property boundaries of Anderson Hall, and therefore will not affect its immediate setting. Further, the SBB will be located at the rear of the Anderson Hall property and therefore will not affect any of the principal views of the building which are concentrated on the western-facing elevations.

Although the SBB will add a new element to the larger surrounding setting, this setting has changed substantially since the initial development of Anderson Hall in 1916. Prior to the expansion of the campus beginning in 1954, the surrounding landscape was defined by orchards. However, since this time, the expansion of the campus has transformed into an educational setting and has continued this progression into the first decades of the twenty-first century. The changes to the setting have altered the surrounding landscape but have not reduced the integrity of Anderson Hall such that it is no longer able to convey its significant architectural and historical associations. The new building will be consistent with the general growth of the campus which has occurred since Anderson Hall was constructed. The new SBB would be taller than Anderson Hall; however, at four stories, the new building will exceed the height of Anderson Hall moderately and will be similar with other nearby buildings that are also multiple stories, such as the School of Medicine Research Building, Entomology Building, Psychology Building, and the Genomics Building. Further, the new building will be designed in accordance with the Campus Construction and Design Standards and Architectural Design Precedent, which will work to ensure the design, materials, and overall architectural character is harmonious with Anderson Hall and the other surrounding buildings.

Conclusions and Recommendations

This memorandum was prepared to fulfill Mitigation Measure MM CUL-1 as outlined in the 2021 LRDP EIR. As detailed above, the proposed project is not anticipated to result in any significant impacts to Anderson Hall. The project is anticipated to comply with the Standards as it will allow the property to continue its historic use as an institutional building and does not propose any substantial changes which would result in the loss or inappropriate treatment of the distinctive materials, features, spaces, and spatial relationships which characterize the property. However, because the project design is still in its early stages, Rincon has included the following recommendations to ensure the project continues to comply with the Standards:

- Those spatial relationships that characterize the property, including the character-defining ancillary road at the east side of Anderson Hall, that connects to future Science Walk, should be retained and continue to provide access and define the eastern boundary of the property.
- The character-defining concrete paths at the western courtyard should be retained.
- New paths proposed should avoid the historic sidewalks between buildings on the western courtyard and be differentiated from the historic through design or use of materials.
- New circulation proposed should not interrupt or alter the character-defining arcaded walkways between Anderson Hall 1, Anderson Hall 2, and Chapman Hall and should not result in loss of historic materials.
- Circulation updates should retain the building's west elevation as the primary entrance.
- The existing low landscaping between buildings with larger trees and shrubs at secondary elevation should be retained and any landscape work that disrupts the existing configuration should be replanted in the same general character as is present.
- Proposed landscape changes, such as additional lighting or wayfinding should be differentiated from the historic, including the character-defining gothic exterior lighting. New lighting or signage should be compatible with the historic, but should not create a false sense of historical development by replicating existing historic designs.
- An architectural historian or historic architect meeting the Secretary of the Interior's Professional Qualification Standards (36 CFR Part 61) should be retained to provide ongoing input to the design team to ensure any changes outside of the above analysis and recommendations remain consistent with the Standards.

With adherence to these recommendations, impacts to historical resources will remain less than significant pursuant to Section 15064.5(b) of the CEQA Guidelines. Should you have any questions or comments regarding this impacts screening, please do not hesitate to contact me at (951) 782-0061 or at jmurphy@rinconconsultants.com.

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Architectural Historian Project Manager

Steven Treffers, M.H.P.
Architectural Historian Program Manager

Shannon Carmack
Principal/Architectural Historian

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Appendix F

Geotechnical Investigation Report

TWINING

Engineering a Better Tomorrow

Geotechnical Investigation Report

Proposed School of Business
UCR Project No. 958101
University of California, Riverside
Riverside, California

Prepared for:

University of California, Riverside
1223 University Avenue, Suite 240
Riverside, California 92507

January 25, 2021
Project No.: 200563.3

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January 25, 2021
Project No.: 200563.3

Mr. Rowan Reid
Project Manager
University of California, Riverside
1223 University Avenue, Suite 240
Riverside, California 92507

Subject: Geotechnical Investigation Report
Proposed School of Business
University of California, Riverside
Riverside, California

Dear Mr. Reid,

In accordance with your request and authorization, we are presenting the results of our geotechnical investigation for the Proposed School of Business project located at University of California, Riverside in Riverside, California. The purpose of our investigation has been to evaluate the subsurface conditions at the site, to identify seismic and geologic hazards present at the site, and to provide geotechnical engineering recommendations for the proposed improvements. This report was prepared in accordance with the requirements of the 2019 California Building Code (2019 CBC) and ASCE 7-16 (ASCE 2017).

Based on our findings, the proposed project is geotechnically feasible, provided that the recommendations in this report are incorporated into the design and are implemented during construction of the project.

We appreciate the opportunity to be of service on this project. Should you have any questions regarding this report or if we can be of further service, please do not hesitate to contact the undersigned.

Respectfully submitted,
TWINING, INC.

REGISTERED PROFESSIONAL ENGINEER
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Appendices

1. INTRODUCTION

This report presents the results of the geotechnical investigation performed by Twining, Inc. (Twining) for the Proposed School of Business project located at University of California, Riverside (UCR) in Riverside, California. A description of the site and the proposed improvements is provided in the following section. The objectives of this investigation have been to evaluate subsurface conditions at the site, to identify seismic and geologic hazards present at the site, and to provide geotechnical recommendations for design and construction of the proposed development, including recommendations for foundations and earthwork.

This report was prepared in accordance with the requirements of the 2019 California Building Code (2019 CBC) and ASCE 7-16 (ASCE 2017).

2. SITE DESCRIPTION AND PROPOSED DEVELOPMENT

The Proposed School of Business project is on the campus of the University of California, Riverside, as shown on Figure 1 – Site Location Map, and located in the currently existing Parking Lot 8 at the southeast corner of S Campus Drive and College Place. The site and surrounding vicinity are shown on Figure 2 – Site Plan and Boring Location Map.

The site is bounded by S Campus Drive on the north, greenhouses on the east, a hillside on the south, and college place on the west. The site is currently occupied by Parking Lot 8.

The site descends toward the north, with a highest surface elevation of approximately 1,165 feet above mean sea level (msl) on the north side and approximately 1,143 feet msl on the south side adjacent to S Campus Drive.

The approximate site coordinates are latitude 33.969439°N and longitude 117.325368°W, and the site is located on the Riverside East, California 7½-Minute Quadrangle, based on the United States Geological Survey (USGS) topographic map (USGS 2018).

Based on preliminary information provided to us by UCR, it is our understanding that the proposed project will consist of a new building with a footprint of approximately 20,000 square feet. No specific design information is available at the time this report was prepared. Based on information provided during the proposal phase, no basement levels are anticipated. The project will also include a stormwater infiltration system.

3. SCOPE OF WORK

Our scope of work included review of background information, pre-field activities and field exploration, laboratory testing, engineering analyses and report preparation. These tasks are described in the following subsections.

3.1. Literature Review

We reviewed readily available background data relevant to the subject site in preparation of this report, including available previous geotechnical investigation reports, published and unpublished geologic literature contained in our files, published geologic maps, topographic maps, aerial photos, and other publications prepared by the California Geological Survey (CGS) and the United States

Geological Survey (USGS). In particular, we reviewed the geotechnical investigation report for the "Preliminary Geotechnical Investigation/Engineering Geologic Report, Proposed Campus Buildings, UCR, City of Riverside, CA" provided by UCR, and prepared by Soil Exploration Company, Inc. (2019). A partial list of literature reviewed is presented in the "Selected References" section of this report. Relevant information has been incorporated into this report.

3.2. Pre-Field Activities and Field Exploration

Before starting our exploration program, we performed a site reconnaissance to observe the general surficial conditions at the site, to select field exploration locations, and to plan field logistics including health and safety. After exploration locations were delineated, Underground Service Alert was notified of the planned locations a minimum of 72 hours prior to excavation.

The field exploration was conducted on December 21, 2020 and consisted of drilling, testing, sampling, and logging 6 hollow-stem-auger (HSA) borings (B-1 through B-4 and P-1 and P-2). The borings were advanced to approximately 5 to 35 feet below ground surface (bgs) using a CME-75 truck-mounted drill rigs equipped with 8-inch-diameter HSAs. The approximate locations of the borings are shown on Figure 2 – Site Plan and Boring Location Map.

Drive samples of the subsurface materials were obtained from the borings using a Standard Penetration Test (SPT) sampler without liners and a modified California split spoon sampler. The samplers were driven using a 140-pound automatic hammer falling approximately 30 inches. The blow-counts to drive the samplers were recorded, and subsurface conditions encountered in the borings were logged by a California Certified Engineering Geologist. Samples obtained from the borings were transported to Twining's geotechnical engineering laboratory for examination and testing.

Percolation testing was performed on December 21, 2020 in borings P-1 and P-2 according to the boring percolation test guidance provided in the Riverside County Design Handbook for Low Impact Development Best Management Practices. The tests were performed to provide an estimate of the infiltration rate of the site soils for use in preliminary design of a storm water management system.

Upon completion of drilling, sampling and testing, the borings were backfilled by the drilling subcontractor using drilled soil cuttings. The surface where drilling encountered a pavement section was repaired with quickset concrete.

Detailed descriptions of the borings, soils encountered during drilling, and the percolation tests are presented in Appendix A.

3.3. Geotechnical Laboratory Testing

Laboratory tests were performed on selected samples obtained from the borings to aid in the soil classification and to evaluate the engineering properties of site soils. The following tests were performed in general accordance with ASTM standards:

- In-situ moisture and density;
- #200 Wash;
- Atterberg Limits;
- Expansion Index;
- Consolidation;
- Maximum dry density and optimum moisture content;

- Corrosivity;
- Direct shear; and
- R-Value.

Detailed laboratory test procedures and results are presented in Appendix B – Laboratory Testing.

3.4. Engineering Analyses and Report Preparation

We compiled and analyzed the data collected from our field exploration and laboratory testing. We performed engineering analyses based on our literature review and data from field exploration and laboratory testing programs. Our analyses included the following:

- Site geology and subsurface conditions;
- Groundwater conditions;
- Geologic hazards and seismic design parameters;
- Liquefaction potential and seismic settlement;
- Soil corrosion potential;
- Soil collapse and expansion potential;
- Site preparation and earthwork;
- Temporary excavations;
- Project feasibility and suitability of on-site soils for foundation support;
- Foundation design parameters including bearing capacity, settlement, and lateral resistance;
- Modulus of subgrade reaction for mat foundation and concrete slab-on-grade design;
- Lateral earth pressures for retaining wall and shoring design;
- Concrete slab-on-grade support; and
- Pavement section recommendations.

We prepared this report to present our conclusions and recommendations from this investigation.

4. GEOLOGY AND SUBSURFACE CONDITIONS

The geology and subsurface conditions at the site are based on the results of our field investigation (Appendix A) and our review of published geologic maps (Figure 3).

4.1. Regional Geologic Setting

According to geologic mapping published by the United States Geologic Survey (Morton and Miller, 2006), the project site is underlain by middle to early Pleistocene, “very old alluvial fan deposits” (map symbol: Qvof). These sediments are described as “mostly well-dissected, well-indurated, reddish-brown alluvial fan deposits” consisting of grain sizes that are “chiefly sand and gravel.” A portion of this geologic map is reproduced as Figure 3 – Regional Geologic Map.

4.2. Subsurface Earth Materials

Before advancing into subsurface earth materials, borings B-2 through B-3 encountered a pavement section consisting of 3 to 5 inches of asphaltic concrete over up to 9 inches of base. Borings B-1, P-1, and P-2 were drilled in unpaved areas.

Boring B-1 encountered approximately one foot of undocumented fill consisting of silty sand. No fill was identified in other borings.

Earth materials encountered during our subsurface investigation consisted predominantly of up to 20 to 25 feet of older alluvium over bedrock described as undifferentiated tonalite (map symbol: Kt, Morton and Miller, 2006). The older alluvium encountered in our borings consisted of silty sand.

Detailed information regarding the exploratory excavations is presented in Appendix A – Field Exploration.

4.3. Groundwater Conditions

Groundwater was not encountered within any of the borings drilled to depths between approximately 5 and 35 feet bgs. Based on our review of the California Water Resource website, the groundwater level is reportedly situated at a depth greater than 50 feet bgs.

Groundwater conditions may vary across the site due to stratigraphic and hydrologic conditions and may change over time as a consequence of seasonal and meteorological fluctuations, or of activities by humans at this and nearby sites.

5. GEOLOGIC HAZARDS AND SEISMIC DESIGN CONSIDERATIONS

The site is located in a seismically active area, as is the majority of southern California, and the potential for strong ground motion in the project area is considered high during the design life of the proposed development. The hazards associated with seismic activity in the vicinity of the site area discussed in the following sections.

5.1. Active Faulting and Surface Fault Rupture

It is our opinion that the likelihood of surface fault rupture and earthquake-induced landslides at the site during the life of the proposed improvements is low. The site is not located within or adjacent to an Alquist-Priolo Earthquake Fault Zone (EFZ) (CGS 2016). The boundary of the closest Alquist-Priolo EFZ is located approximately 5.5 miles northeast of the site associated with the San Jacinto fault zone. Based on our search of the 2008 national fault database (Petersen et al., 2008), the closest known active fault is the San Jacinto fault, located approximately 5.5 miles northeast of the site.

5.2. Liquefaction Potential and Seismic Settlement

Liquefaction is the phenomenon in which loosely deposited granular soils with silt and clay contents of less than approximately 35 percent, and non-plastic silts located below the water table undergo rapid loss of shear strength when subjected to strong earthquake-induced ground shaking. Ground shaking of sufficient duration results in the loss of grain-to-grain contact due to a rapid rise in pore water pressure and causes the soil to behave as a fluid for a short period of time.

Liquefaction is generally known to occur in loose, saturated, relatively clean, fine-grained cohesionless soils at depths shallower than approximately 50 feet. Factors to consider in the evaluation of soil liquefaction potential include groundwater conditions, soil type, grain size distribution, relative density, degree of saturation, and both the intensity and duration of ground motion. Other phenomena associated with soil liquefaction include sand boils, ground oscillation, and loss of foundation bearing capacity.

The area of the project site has not been evaluated for liquefaction by CGS. According to the liquefaction zones map in the General Plan 2025 of the City of Riverside, the site has low liquefaction susceptibility. Based on the presence of a groundwater table greater than 50 feet and the relatively dense soils encountered at the site, it is our opinion that the potential for liquefaction at this site is low.

Seismic settlement can occur when loose to medium dense granular materials densify during seismic shaking and liquefaction. Seismically-induced settlement may occur in dry, unsaturated, as well as saturated soils. Based on the fairly uniform and medium dense to very dense subsurface soil profile and the low liquefaction potential, the anticipated seismically-induced settlement is negligible.

5.3. Lateral Spread

The potential of liquefaction-induced lateral spread at the site is considered low because the site has low liquefaction susceptibility.

5.4. Landslides

The area of the project site is not within a CGS mapped area with the potential for earthquake-induced landslides. The potential for earthquake-induced landslides to occur at the site is considered low.

5.5. Flooding, Inundation, Tsunami and Seiche

According to the Flood Hazard Areas map in the Public Safety Element of the City of Riverside, the site is not located within a 100- or 500-year floodplain.

Tsunamis are waves generated by massive landslides near or under sea water. The site is not located within a coastal area or within an Inundation & Tsunami Hazard Area mapped by the state of California.

Seiches are standing wave oscillations of an enclosed water body (e.g., a lake, reservoir, or bay) after the original driving force has dissipated. Resulting oscillation could cause waves up to tens of feet high, which in turn could cause extensive damage along the shoreline. The most serious consequences of a seiche would be the overtopping and failure of a dam. The site is not located downstream of any large bodies of water that could adversely affect the property in the event of earthquake failures or seiches.

Therefore, flood-, inundation-, tsunami- and seiche-hazard at the site is considered remote.

5.6. Deaggregated Seismic Source Parameters

We performed a seismic hazard de-aggregation analysis for the peak ground acceleration with a probability of exceedance of 2% in 50 years. The analysis used the USGS Unified Hazard Tool based on the 2014 USGS seismic source model. The results of the analysis indicate the controlling modal moment magnitude Mw and fault distance R are 8.1 and 6 miles (9.6 km), respectively.

5.7. Site Class for Seismic Design

Based on the site subsurface conditions, average field standard penetration test blow-counts (Section 4.2 and Appendix A) for the upper 100 feet of soil is expected to be greater than 50, we have determined Site Class C for the project seismic design according to Chapter 20 of ASCE 7-16.

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5.8. CBC Seismic Design Parameters

Our recommendations for seismic design parameters have been developed in accordance with the 2019 CBC and ASCE 7-16 (ASCE 2017) standards. Table 1 presents the seismic design parameters developed using the general mapped procedure for the site based on coordinates of latitude 33.969439°N and longitude 117.325368°W and Site Class C conditions.

Table 1 – 2019 California Building Code Seismic Design Parameters

Design Parameters	Value
Site Class	C
Mapped Spectral Acceleration Parameter at Period of 0.2-Second, S_s (g)	1.5
Mapped Spectral Acceleration Parameter at Period 1-Second, S_1 (g)	0.6
Site Coefficient, F_a	1.2
Site Coefficient, F_v	1.4
Adjusted MCE_R[1] Spectral Response Acceleration Parameter, S_{MS} (g)	1.8
Adjusted MCE_R[1] Spectral Response Acceleration Parameter, S_{M1} (g)	0.84
Design Spectral Response Acceleration Parameter, S_{DS} (g)	1.2
Design Spectral Response Acceleration Parameter, S_{D1} (g)	0.56
Risk Coefficient C_{RS}	0.932
Risk Coefficient C_{R1}	0.907
Peak Ground Acceleration, PGA_M[2] (g)	0.732
Seismic Design Category[3]	D
Long-Period Transition Period, T_L (seconds)	8
$Ts = S_{D1} / S_{DS}$	0.467

Notes: [1] Risk-Targeted Maximum Considered Earthquake.
[2] Peak Ground Acceleration adjusted for site effects.
[3] For S_1 greater than or equal to 0.75 g, the Seismic Design Category is E for risk category I, II, and III structures and F for risk category IV structures.

6. GEOTECHNICAL ENGINEERING RECOMMENDATIONS

Based on the results of our literature review and the field exploration, laboratory testing, and engineering analyses, it is our opinion that the proposed construction is feasible from a geotechnical standpoint, provided that the recommendations in this report are incorporated into the design plans and are implemented during construction.

6.1. General Considerations

Geotechnical engineering recommendations presented in this report for the proposed project are based on our understanding of the proposed development, subsurface conditions encountered during our field exploration, the results of laboratory testing on soil samples taken from the site, and our engineering analyses.

The following sections present our conclusions and recommendations pertaining to the engineering design for this project. If final specific design is substantially different from conditions assumed in this report, then our geotechnical engineering recommendations would be subject to revision based on our evaluation of the changes.

6.2. Soil Collapse and Expansion Potential

Based on our laboratory expansion potential index test results and our field soil classification, site soils have very low expansion potential.

Results of laboratory consolidation tests on alluvial soil samples when the samples were inundated indicate site alluvial deposits have a collapse potential of approximately 4%. Typically, soils with collapse potential less than 3% do not require special consideration. Considering the greater depth of groundwater, the risk of soil collapse may be mitigated by extending foundation excavation to at least 5 feet below the finished grade and placing the foundation bottom at least 2 feet below the lowest adjacent finished grade.

6.3. Corrosive Soil Evaluation

Corrosive soil may be defined as the soil has minimum electrical resistivity less than 1,000 ohm-centimeters, or chloride concentration greater than 500 parts per million (ppm), or sulfate concentration in soils greater than 2,000 ppm, or a pH less than 5.5 (e.g., based on the County of Los Angeles criteria or the California Department of Transportation criteria).

The potential for the near-surface on-site materials to corrode buried steel and concrete improvements was evaluated. Laboratory testing was performed on one selected near-surface soil to evaluate pH and electrical resistivity, as well as chloride and sulfate contents. The pH and electrical resistivity tests were performed in accordance with California Test 643, and the sulfate and chloride tests were performed in accordance with California Tests 417 and 422, respectively. These laboratory test results are presented in Appendix B.

Discussions of corrosion protection for reinforced concrete and buried metal is provided below. Further interpretation of the corrosivity test results and associated corrosion design and construction recommendations are within the purview of a corrosion specialist. It is recommended that a qualified corrosion engineer be retained to review our corrosivity test results, to evaluate the general corrosion potential with respect to construction materials at the site, and to review the proposed design.

6.3.1. Reinforced Concrete

Laboratory tests indicate that the soil has 366 ppm or 0.0366% of water soluble sulfate (SO_4) by weight. Based on ACI 318, concrete in contact with the site soils will have a sulfate exposure class S0. As a minimum, we recommend that Type II cement and a water-cement ratio of no greater than 0.50 be used on the project.

Test results indicate that the soil has 126 ppm of water soluble chlorides by weight and the potential for chloride attack of reinforcing steel in concrete structures and pipes in contact with soil is negligible. However, if needed, a corrosion specialist may be consulted for protection from chloride attack.

6.3.2. Buried Metal

A factor for evaluating corrosivity to buried metal is electrical resistivity. The electrical resistivity of a soil is a measure of resistance to electrical current. Corrosion of buried metal is directly proportional to the flow of electrical current from the metal into the soil. As resistivity of the soil decreases, the corrosivity generally increases. Test results indicate the site soils have minimum electrical resistivity value of 1,300 ohm-centimeters. Based on the criteria of the County of Los Angeles and the California Department of Transportation, the soils are not consisdered to be corossive to buried metals.

Correlations between resistivity and corrosion potential published by the National Association of Corrosion Engineers (NACE, 1984) indicate that the soils are moderately corrosive to buried metals. Corrosion protection may include the use of epoxy or asphalt coatings. A corrosion specialist should be consulted regarding appropriate protection for buried metals and suitable types of piping.

6.4. Site Preparation and Earth Work

In general, earthwork should be performed in accordance with the recommendations presented in this report. Twining should be contacted for questions regarding the recommendations or guidelines presented herein.

6.4.1. Site Preparation

Site preparation should begin with the removal of utility lines, asphalt, concrete, vegetation, topsoil, and other deleterious debris from areas to be graded. Tree stumps and roots should be removed to such a depth that organic material is not present. Clearing and grubbing should extend to the outside edges of the proposed excavation and fill areas. We recommend that unsuitable materials such as organic matter or oversized material be removed and disposed offsite. The debris and unsuitable material generated during clearing and grubbing should be removed from areas to be graded and disposed at a legal dump site away from the project area.

6.4.2. Temporary Excavations

Temporary excavations for the demolishing, earthwork, footing and utility trench are expected. Unsurcharged temporary excavations less than with vertical sides less than 4 feet high are generally expected stable; however, some sloughing of cohesionless sandy materials encountered at the site should be expected.

Where space is available, temporary, un-surcharged excavation sides over 4 feet in height should be sloped back at 1.5H:1V (horizontal:vertical) or flatter. Where sloped excavations are created, the tops of the excavation sides should be barricaded so that vehicles and storage loads are away from the top edge of the excavated slopes with a distance at least equal to the height of the slopes. A greater setback may be necessary when considering heavy vehicles, such as concrete trucks and cranes. Twining should be advised of such heavy vehicle loadings so that specific setback requirements can be established. If the temporary construction slopes are to be maintained during the rainy season, berms are recommended to be graded along the tops of the slopes in order to prevent runoff water from entering the excavation and eroding the slope faces.

Excavations shall not undermine existing adjacent footings. We recommend that excavations for the proposed improvements do not encroach within a 1:1 plane projected from the bottom edge of any existing foundations of at-grade or below-grade existing facilities including foundations of existing structures, trenches, underground pipelines. Where space for sloped excavations is not available, temporary shoring or slot-cut may be utilized. For temporary excavations that are less than 6 feet in height adjacent to existing buildings where the excavation extends deeper than the 1:1 plane, slot cuts may be utilized. The slots should be no wider than 8 feet and should be excavated in an A-B-C sequence so that there are at least 16 feet spacing between any two excavated slots. The excavated slots should not be left open overnight and should be backfilled on the same day it was excavated before the next set of slots are excavated.

Personnel from Twining should observe the excavations so that any necessary modifications based on variations in the encountered soil conditions can be made. All applicable safety requirements and regulations, including CalOSHA requirements, should be met. Stability of temporary excavations is the responsibility of the contractor.

6.4.3. Subgrade Preparation

The proposed building may be supported by footings founded on compacted fill or native soils. As discussed earlier in Section 6.2, to mitigate the risk of soil collapse, foundations should have a minimum embedment of 2 feet. Over-excavation and compacted fill should extend at least 5 feet below finished grade. Compacted fill should be placed in accordance with the recommendations of Section 6.4.5.

Boring B-1 encountered approximately one foot of undocumented fill consisting of silty sand. No fill was identified in other borings. Any undocumented fill encountered during foundation excavation should be removed to its full depth. Should undocumented fill be encountered during excavation for minor structures and slabs-on-grade that are structurally separated from the building, the excavation should extend at least 2 feet below the bottom of the footing of the minor structures and slabs-on-grade. Excavation for pavements and hardscape should be over-excavated at least 1 foot as measured from the bottom of the pavement or hardscape section.

Laterally, foundation excavation should extend beyond the limits of the foundation a minimum distance equal to two feet or the depth of over-excavation, whichever is greater. Excavation for other improvements (e.g., concrete walkways, flatwork, pavement, and slab-on-grade that are structurally separated from the building) should extend laterally at least two feet beyond the limits of the improvements.

The extent and depths of all removal should be evaluated by Twining's representative in the field based on the materials exposed. Should excavations expose soft or soils considered as unsuitable for use as fill by a Twining representative, additional removals may be recommended.

For example, deeper removal may be required in areas where soft, saturated, or organic materials are encountered.

The exposed excavation bottom should be evaluated and approved by Twining. The bottoms of foundation excavations should be recompacted to at least 90 percent of the maximum dry density as determined from ASTM D 1557 prior to placement of reinforcing steel or concrete for footings. The excavation bottom to receive fill or to be placed with foundation should be scarified to a minimum depth of 6 inches and moisture conditioned to achieve generally consistent moisture contents approximately 2 percent above the optimum moisture content. The scarified bottom should be compacted to at least 90 percent relative compaction in accordance with the latest version of ASTM Test Method D1557 and then evaluated and approved by Twining.

Fill and backfill materials should be compacted fill in accordance with Sections 6.4.4 and 6.4.5 of this report. Prior to placement of any fill, the geotechnical engineer or their representative should review the bottom of the excavation for conformance with the recommendations of this report.

6.4.4. Materials for Fill

In general, on-site soils are considered suitable for use as fill materials. Soil material to be used as fill should be free of organics, debris, rocks or lumps over 3 inches in largest dimension, other deleterious material, and not more than 40 percent larger than ¾ inch. Larger chunks, if generated during excavation, may be broken into acceptably sized pieces or may be disposed offsite.

Any imported fill material should consist of granular soil having a “very low” expansion potential (i.e., expansion index of 20 or less). Import material should also have low corrosion potential (that is, chloride content less than 500 ppm, soluble sulfate content of less than 0.1 percent, and pH of 5.5 or higher).

All materials to be used as fill should be evaluated and approved by a Twining representative prior to importing or filling.

6.4.5. Compacted Fill

Unless otherwise recommended, the exposed excavation bottom to receive fill should be prepared in accordance with Section 6.4.3 of this report. Prior to placement of compacted fill, the contractor should request Twining to evaluate the exposed excavation bottoms.

Compacted fill should be placed in horizontal lifts of approximately 8 to 10 inches in loose thickness, depending on the equipment used. Prior to compaction, each lift should be moisture conditioned, mixed, and then compacted by mechanical methods. The moisture content should be approximately 2 percent above the optimum moisture content. Fill materials should be compacted to a minimum relative compaction of 95 percent within the upper one foot below new vehicle trafficked pavement sections, and 90 percent in all other areas, unless indicated otherwise. The relative compaction should be determined by ASTM D1557. Successive lifts should be treated in the same manner until the desired finished grades are achieved.

6.4.6. Excavation Bottom Stability

In general, we anticipate that the bottoms of the excavations will be stable and should provide suitable support to the proposed improvements. Unstable bottom conditions if encountered may be mitigated by over-excavation of the bottom to suitable depths, and/or replacement with a one-foot-thick gravel or lean concrete base. The aggregate base should be compacted in one lift. Any loose, soft, or deleterious material should be removed prior to placement of gravel or lean concrete. Recommendations for stabilizing excavation bottoms should be based on evaluation in the field by the geotechnical consultant at the time of construction.

6.4.7. Utility Lines and Backfill for Utility Trench

Utility lines should not be located below any footings or the 1:1 plane drawn down from the closest bottom edge of any footings; otherwise, the utility lines should be encased. The encasement should have a minimum clearance of one inch all-around between the protected utility lines and the casing pipe. The casing pipe should be sealed at both ends.

Utility trench excavations to receive backfill shall be free of trash, debris or other unsatisfactory materials at the time of backfill placement.

At locations where the trench bottom is yielding or otherwise unstable, pipe support may be improved by placing a minimum 6 inches of bedding materials. Remedial earthwork at the trench bottom should be performed where oversize materials (rocks or clods greater than 3 inches) are present. Removal of oversize materials to a depth of 6 inches below the bottom of the pipeline and replacement with fill material compacted to at least 90 percent relative compaction is recommended. The trench should be backfilled with bedding material extending to at least one foot over the top of pipe. The bedding material should be placed over the full width of the trench. After placement of the pipe, the bedding should be brought up uniformly on both sides of the pipe to reduce the potential for unbalanced loads. No void or uncompacted areas should be left beneath the pipe haunches.

The bedding materials may consist of clean sand having a minimum sand equivalent (SE) of 30, crushed rock, or 2-sack sand-cement slurry, and should meet the specifications provided in the latest edition of the "Greenbook" Standard Specifications for Public Works Construction. Samples of materials proposed for use as bedding material should be provided to the project geotechnical engineer for inspection and testing before the material is imported for use on the project. The onsite materials can only be used following the requirement of "Greenbook" bedding specification when the SE is not less than 30.

Above pipe bedding, trench backfill may be onsite soils with low expansion potential and should not contain rocks or lumps over 3 inches in largest dimension. Larger chunks, if generated during excavation, may be broken into acceptably sized pieces or may be disposed offsite. The moisture content should be approximately 2 percent above the optimum moisture content.

Backfill may be placed and compacted by mechanical means and should be compacted to 90 percent of the laboratory maximum dry density as per ASTM Standard D1557. Where pavement is planned, the top 12 inches of subgrade soils and the overlying aggregate base should be compacted to 95 percent.

Jetting or flooding of pipe bedding and backfill material is not recommended.

6.4.8. Rippability

The earth materials underlying the site should be generally excavatable with heavy-duty earthwork equipment in good working condition. Some gravels, cobbles and artificial fill should be anticipated.

6.4.9. Construction Dewatering

During field investigation, groundwater was not encountered in borings extending depths ranging from 5 to 31.5 feet bgs and the groundwater at the site is estimated to be greater than 50 feet bgs. Construction of the project is anticipated to occur above the groundwater, and the need for dewatering is not anticipated.

6.5. Footing Foundation Recommendations

Based upon the excavation/over-excavation, backfill, and ground improvement recommendations, the proposed building may be supported by footing foundations, designed in accordance with the geotechnical recommendations presented in this section. It is assumed that foundation dimensions are up to 10 feet for square footings and up to 8 feet for continuous strip footings. Twining should be contacted for footings with other dimensions.

Structural design of footings should be performed by the structural engineer and should conform to the 2019 California Building Code.

6.5.1. Bearing Capacity and Settlement

Continuous strip footings or isolated footings for the proposed building should be placed on the subgrade prepared in accordance with the requirements for the building pad as described in Section 6.4. Geotechnical design parameters presented in Table 2 are recommended for these footings.

6.5.2. Lateral Resistance

Lateral loads may be resisted by footing base friction and by the passive resistance of the soils based on recommendations provided in Table 2. The total lateral resistance can be taken as the sum of the friction at the base of the footing and passive resistance.

Table 2 - Geotechnical Foundation Design Parameters

Minimum Footing Dimensions	• Width: 18 inches for continuous footing and 24 inches for square footing. • Embedment: 24 inches measured from the lowest adjacent grade to the bottom of the footing.
Allowable Bearing Pressure	• Continuous Footing: an allowable bearing pressure of 3,000 pounds per square foot (psf) may be used. The allowable may be increased by 500 psf for each additional foot of width and 1,000 psf for each additional foot of embedment, up to a maximum allowable capacity of 5,000 psf. • Square Footing: an allowable bearing pressure of 3,000 pounds per square foot (psf) may be used. The allowable may be increased by 400 psf for each additional foot of width and 1,000 psf for each additional foot of embedment, up to a maximum allowable capacity of 6,000 psf. • The allowable bearing values correspond to a factor of safety of 3. • The allowable bearing values may be increased by one-third for transient loads from wind or earthquake.
Estimated Static Settlement	• Approximately one inch of total settlement with differential settlement estimated to be on the order of ½ inch over 50 feet. • The majority of static settlement is expected to occur upon initial application of loading.
Allowable Coefficient of Friction	• 0.4 • The allowable bottom friction values correspond to a factor of safety of 1.5.
Allowable Lateral Passive Resistance	• 360 psf per foot of depth (i.e., 360 pcf equivalent fluid pressure). • The allowable passive resistance corresponds to a factor of safety of 2. • The upper one foot of soil should be neglected when calculating the passive resistance. • The allowable passive resistance value may be increased by one-third for transient loads such as wind or earthquake loads.

6.6. Modulus of Subgrade Reaction

The modulus of subgrade reaction k for design of mat foundations, combined footing, and slabs-on-grade may be obtained from the following equation.

$$k = k_1 \left(\frac{B+1}{2B}\right)^2 \left(\frac{2L+B}{3L}\right)$$

where: k_1 = modulus for a 1-foot by 1-foot plate = 200 pounds per cubic inch (pci);
B = width of combined footing or slab in feet;
L = length of combined footing or slab in feet, and L ≥ B.

6.7. Slab-On-Grade

Slabs should be supported on non-expansive engineered fill in accordance with Section 6.4 of this report. For design of concrete slabs, the subgrade modulus k calculated from Section 6.6 may be used.

Floor slabs should be designed and reinforced in accordance with the structural engineer's recommendations. However, for slabs not supporting heavy loads, we recommend that the concrete should have a thickness of at least 4 inches, a 28-day compressive strength of at least 3,000 pounds per square inch (psi), a water-cement ratio of 0.50 or less, and a slump of 4 inches or less. Slabs should be reinforced with at least No. 3 reinforcing bars placed longitudinally at 18 inches on center. The reinforcement should extend through the control joints to reduce the potential for differential movement. Control joints should be constructed in accordance with recommendations from the structural engineer or architect. For slabs supporting equipment, a minimum thickness of 5 inches is recommended. Additional thickness and reinforcement recommendations may be provided by the structural engineer.

The topmost 8 inches below the slab subgrade should be maintained in a moisture condition of approximately 0 to 2 percent above optimum moisture content. The slab subgrade should be tested for moisture and compaction immediately prior to placement of the gravel or sand base, if any. All underslab materials should be adequately compacted prior to the placement of concrete. Care should be taken during placement of the concrete to prevent displacement of the underslab materials. The underslab material should be dry or damp and should not be saturated prior to the placement of concrete. The concrete slab should be allowed to cure properly and should be tested for moisture transmission prior to placing vinyl or other moisture-sensitive floor covering. The floor slabs should be dampproofed in accordance with Section 1805A.2 of 2019 CBC. Specific recommendations can be provided by a waterproofing consultant.

Table 3 provides general recommendations for various levels of protection against vapor transmission through concrete floor slabs placed over a properly prepared subgrade. Care should be taken not to puncture the plastic membrane during placement of the membrane itself and the overlying silty sand.

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Table 3 - Options for Subgrade Preparation below Concrete Floor Slabs

Primary Objective	Recommendation
Enhanced protection against vapor transmission	• Concrete floor slab-on-grade placed directly on a 15-mil-thick moisture vapor retarder that meets the requirements of ASTM E1745 Class C (Stego Wrap or similar) • The moisture vapor retarder membrane should be placed directly on the subgrade (ACI302.1R-67); if required for either leveling of the subgrade or for protection of the membrane from protruding gravel, then place about 2 inches of silty sand[1] under the membrane
Above-standard protection against vapor transmission	This option is available if the slab perimeter is bordered by continuous footings at least 24 inches deep, OR if the area adjacent and extending at least 10 feet from the slab is covered by hardscape without planters: • 2 inches of dry silty sand[1]; over • Waterproofing plastic membrane 10 mils in thickness; over • At least 4 inches of ¾-inch crushed rock[2] or clean gravel[3] to act as a capillary break
Standard protection against vapor transmission	• 2 inches of dry silty sand[1]; over • Waterproofing plastic membrane 10 mils in thickness • If required for either leveling of the subgrade or for protection of the membrane from protruding gravel, place at least 2 inches of silty sand[1] under the membrane.

Notes:

[1] The silty sand should have a gradation between approximately 15 and 40 percent passing the No. 200 sieve and a plasticity index of less than 4. The on-site sandy soils appear to meet these criteria.

[2] The ¾-inch crushed rock should conform to Section 200-1.2 of the latest edition of the "Greenbook" Standard Specifications for Public Works Construction (Public Works Standards, Inc., 2012).

[3] The gravel should contain less than 10 percent of material passing the No. 4 sieve and less than 3 percent passing the No. 200 sieve.

The above recommendations are intended to reduce the potential for cracking of slabs; however, even with the incorporation of the recommendations presented herein, slabs may still exhibit some cracking. The occurrence of concrete shrinkage cracks is independent of the supporting soil characteristics.

6.8. Below-Grade Walls and Lateral Earth Pressure Recommendations

For walls below grade, recommendations for wall lateral loads, backfill, and drainage are provided below. Bearing pressure and lateral resistance may be based on Section 6.5 of this report. Retaining walls should be designed to have a factor of safety of 1.5 for static stability and 1.1 for stability due to transient loads from wind or seismic.

6.8.1. Backfill and Drainage of Walls

The backfill material behind walls should consist of granular non-expansive material and be approved by the project geotechnical engineer. Based on the soil materials encountered during our exploration, most on-site soils will meet this requirement, provided that wall backfill is adequately drained.

Wall backfill should be adequately drained. Adequate backfill drainage is essential to provide a free-drained backfill condition and to limit hydrostatic buildup behind walls. Drainage behind walls may be provided by a geosynthetic drainage composite such as TerraDrain, MiraDrain, or equivalent, attached to the outside perimeter of the wall and installed in accordance with the manufacturer's recommendations. The drainage system should meet the minimum requirements of Sections 1805.4.2 and 1805.4.3 of 2019 CBC.

6.8.2. Lateral Earth Pressure

The values presented below assume that the supported grade is level and that surcharge loads are not applied. The recommended design lateral earth pressure is calculated assuming that a drainage system will be installed behind retaining walls in accordance with Sections 1805.4.2 and 1805.4.3 of 2019 CBC and that external hydrostatic pressure will not develop behind the walls.

Walls that are free to move and rotate at the top (such as cantilevered walls) and have adequate drainage may be designed for the active earth pressure equivalent to a fluid weighing 40 pcf.

Walls that are restricted to move horizontally at the top (such as by a floor deck) and have adequate drainage may be designed for the "at-rest" earth pressure equivalent to a fluid weighing 61 pcf.

Additional lateral earth pressures due to vertical surcharge behind walls may be estimated as approximately 31% and 47% of the vertical surcharge pressures for the "active" and "at-rest" conditions, respectively.

6.8.3. Seismic Lateral Earth Pressure

Walls retaining more than 6 feet high earth should be designed for seismic lateral earth pressure. The seismic pressure distribution may be considered a triangle with the maximum pressure at the bottom. We estimated the seismic earth pressure increment for walls retaining level ground based on Seed and Whitman (1970) and a horizontal seismic coefficient (k_h) equal to one-half of two-thirds of PGA_M provided in Table 1. The combination of static and incremental seismic pressures shown in Diagram 1 below may be used for seismic design for both cantilever and restrained walls.

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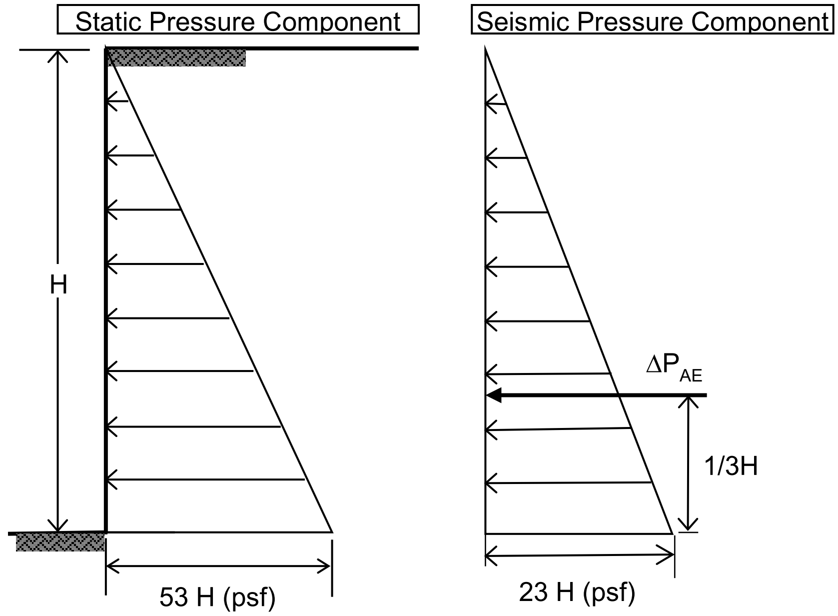

where H is in feet

Diagram 1 - Seismic Earth Pressure Distribution on Walls

6.9. Permanent Slopes

Permanent slopes may be constructed with a maximum gradient of 2:1 (horizontal:vertical). Faces of fill slopes should be compacted either by rolling with a sheepsfoot roller or other suitable equipment or constructed by overfilling and cutting back to design grade. Fill materials placed on sloping ground inclined steeper than 5:1 (horizontal:vertical) and the depth of fill exceeds 5 feet should be properly benched and keyed into undisturbed native in accordance with Figure J107.3 in Appendix J of the 2018 IBC. The key should not be less than 10 feet in width and 2 feet in depth. It is our opinion that cut slopes constructed no steeper than 2:1 (horizontal:vertical) at the site will possess an adequate factor of safety. An engineering geologist should observe all cut slopes during grading to ascertain that no unforeseen adverse geologic conditions are encountered that require revised recommendations. All slopes are susceptible to surficial slope failure and erosion. Water should not be allowed to flow over the top of slope. Additionally, slope face should be protected to reduce the potential for erosion. The protection may be implemented by planting with vegetation or using other engineering means.

6.10. Pole Foundations

Pole foundations for flagpoles, fences, and signposts may be designed using an allowable unit skin friction f_{all} and a net allowable end bearing resistance of 2,000 psf. The allowable skin friction f_{all} may be estimated using the following equation.

$$f_{all} = 60\,Z\,(1.5 - 0.135\sqrt{Z})$$

where Z is depth in feet below ground surface, and f_{all} is allowable unit skin friction in psf at depth Z. The upper one foot of soil should be ignored when calculating the allowable skin friction.

Lateral resistance for conditions with and without lateral constraint provided at the ground surface conditions are provided below based on 2019 CBC.

6.10.1. Non-Constrained Ground

The embedment of pole foundations where no lateral constraint is provided at or above the ground surface should be calculated using Equation 18-1 of 2019 IBC (shown below) or a minimum 3 feet below the ground surface, whichever is deeper.

$$d = \frac{A}{2}\left(1 + \sqrt{1 + \frac{4.36h}{A}}\right) \qquad \text{(Equation 18-1 of 2019 IBC)}$$

where:

- A = $2.34P/(S_1 * b)$
- b = Diameter of round post or footing or diagonal dimension of square post or footing, feet
- d = Depth of embedment in earth in feet but not over 12 feet for purpose of computing lateral pressure.
- h = Distance in feet from ground surface to point of application of "P".
- P = Applied lateral force in pounds.
- S_1 = Allowable lateral soil-bearing pressure based on a depth of one-third the depth of embedment in pounds per square foot.

An allowable passive earth pressure of 400 pcf up to a maximum of 4,000 psf may be used for design provided the upper one foot of passive resistance is neglected in the structural design.

6.10.2. Constrained Ground

The embedment of pole foundations where lateral constraint is provided at the ground surface, such as by a rigid floor or pavement, should be calculated using Equation 18-2 of 2019 IBC (shown below) or a minimum 3 feet below the ground surface, whichever is deeper.

$$d = \sqrt{\frac{4.24Ph}{S_3 b}} \qquad \text{(Equation 18-2 of 2019 IBC)}$$

where:

- b = Diameter of round post or footing or diagonal dimension of square post or footing, feet
- d = Depth of embedment in earth in feet but not over 12 feet for purpose of computing lateral pressure.
- h = Distance in feet from ground surface to point of application of "P".
- P = Applied lateral force in pounds.
- S_3 = Allowable lateral soil-bearing pressure based on a depth of one-third the depth of embedment in pounds per square foot.

An allowable passive earth pressure of 400 pcf up to a maximum of 4,000 psf may be used for design provided the upper one foot of passive resistance is neglected in the structural design.

6.11. Pavement Recommendations

Pavement section should be constructed on top of properly prepared subgrade in accordance with Section 6.4 of this report and aggregate base (AB) section compacted to 95 percent of the maximum dry density in accordance with ASTM D1557.

We performed laboratory R-value testing for preliminary pavement section design. The test indicates an R value of 27, and it was used in our pavement structural calculations. Sections 6.11.1 and 6.11.2 present our recommendations for preliminary design of flexible and rigid pavement sections, respectively. Final pavement design should be based on field observations, additional R-value tests during construction should the materials exposed differ than what is expected based on our field exploration, and the anticipated traffic index as determined by the project civil engineer.

6.11.1. Flexible Pavement Design

Our flexible pavement structural design is in accordance with Chapter 630 of the Caltrans Highway Design Manual, which is based on a relationship between the gravel equivalent (GE) of the pavement structural materials, the traffic index (TI), and the R-value of the underlying subgrade soil. For preliminary design of flexible pavement section, Table 4 provides recommended minimum thicknesses for hot mix asphalt (HMA) and aggregate base sections for different traffic indices.

Table 4 – Recommended Minimum HMA and Base Section Thicknesses

Traffic Index	5.0	6.0	7.0
HMA Thickness (in)	4	5	6
Aggregate Base Thickness (in)	5	6	9

6.11.2. Rigid Pavement Design

For preliminary design of rigid pavement section, Table 5 provides recommended minimum thicknesses for Portland cement concrete (PCC) pavement section and Class 2 Aggregate Base (AB) section for different traffic indices. The recommended values are based on a minimum 28-day concrete compressive strength of 3,500 psi. Positive drainage should be provided away from all pavement areas to prevent seepage of surface and/or subsurface water into the pavement base and/or subgrade.

Table 5 – Recommended Minimum Rigid Pavement Thicknesses

Traffic Index	5.0	6.0	7.0
JPCP Thickness (in)	4	5	6
Aggregate Base Thickness (in)	6	6	6

6.12. Temporary Shoring Recommendations

If the project involves excavations that lack sufficient space for sloped excavations, cantilever or braced shoring should be considered. However, cantilevered shoring should only be utilized where some deflection is acceptable (away from existing structures and improvements). A braced shoring system should be utilized to support adjacent improvements or structures to prevent loss of support and/or significant settlement.

For vertical excavations less than approximately 15 feet in height, cantilevered shoring may be used. Where cantilevered shoring is used for deeper excavations, the total deflection at the top of the wall tends to exceed acceptable magnitudes. Excavations deeper than approximately 15 feet may need to be accomplished using tieback shoring or internally braced shoring.

The shoring design should be provided by a California Registered Civil Engineer experienced in the design and construction of shoring under similar conditions. Once the final excavation and shoring plans are complete, the plans and the design should be reviewed by Twining for conformance with the design intent and recommendations. Further, the shoring system should satisfy applicable requirements of CalOSHA.

6.12.1. Lateral Pressures for Shoring

For design of cantilevered shoring, a triangular distribution of lateral earth pressure may be used. It may be assumed that the drained soils, with a level surface and without hydrostatic pressure behind the cantilevered shoring, will exert an equivalent fluid pressure of 40 pcf.

Tied-back or braced shoring should be designed to resist a trapezoidal distribution of lateral earth pressure. The recommended pressure distribution, for the case with a level surface and without hydrostatic pressure behind the shoring, is provided in Diagram 2 below. Where there is hydrostatic pressure behind the cantilevered shoring, the full hydrostatic pressure should be added to the trapezoidal pressure.

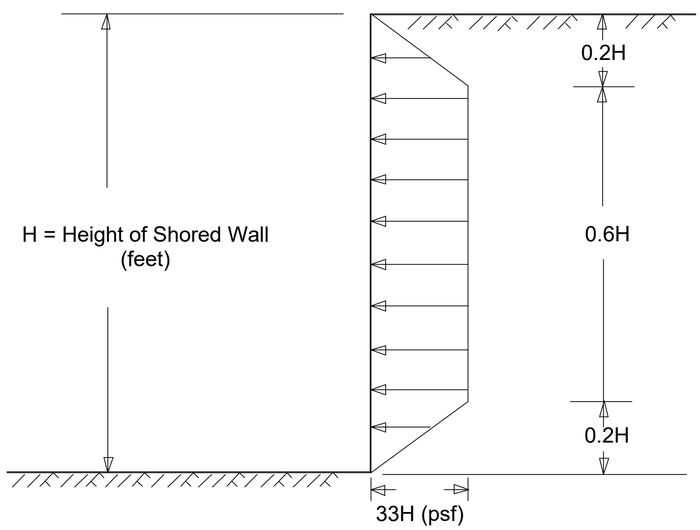

Diagram 2 – Earth Pressure Distribution for Tieback or Braced Shoring Wall

6.12.2. Surcharge for Shoring

Any surcharge (live, including traffic, or dead load) located within a 1:1 plane projected upward from the base of the shored excavation, including adjacent structures, should be added to the lateral earth pressures. The lateral contribution of a uniform surcharge load located immediately behind the temporary shoring may be calculated by multiplying the vertical surcharge pressure by 0.31 for cantilevered shoring and by 0.47 for Tieback or braced shoring. At a minimum, a 250 psf vertical uniform surcharge is recommended to account for nominal construction and/or traffic loads.

More detailed lateral pressure and loading information can be provided, if needed, for specific loading scenarios as recognized through the design process.

6.13. Stormwater Infiltration Facility

Additional percolation testing may be required based on the actual location and depth of the planned system. The design of stormwater infiltration facility should be based on percolation test results with an appropriate factor of safety.

Our percolation test results may be used in preliminary design. Details of the percolation test are presented in Appendix A. Infiltration rates with a factor of safety of 3 from our percolation tests are summarized in Table 6.

Any proposed infiltration facility should have a minimum setback from property lines and foundations recommended in Table 7. In addition, the bottom of the infiltration facility should be at least 10 feet above the seasonal high groundwater. We recommend that we review the proposed groundwater infiltration system prior to implementation or finalizing design.

Table 6 – Infiltration Rate with a Factor of Safety of 3

Test Location	Depth of Test Borehole (feet)	Infiltration Rate (inch/hour)
P-1	5	1.5
P-2	5	0.9

Table 7 – Recommended Minimum Infiltration Facility Setback

Setback from	Distance
Property lines	10 feet
Foundations	15 feet or outside of 1:1 plane drawn up from the bottom of foundation, whichever is greater.

6.14. Drainage Control

The control of surface water is essential to the satisfactory performance of the building and site improvements. Surface water should be controlled so that conditions of uniform moisture are maintained beneath the improvements, even during periods of heavy rainfall. The following recommendations are considered minimal:

- Ponding and areas of low flow gradients should be avoided.
- If bare soil within 5 feet of the structure is not avoidable, then a gradient of 5 percent or more should be provided sloping away from the improvement. Corresponding paved surfaces should be provided with a gradient of at least 1 percent.
- The remainder of the unpaved areas should be provided with a drainage gradient of at least 2 percent.
- Positive drainage devices, such as graded swales, paved ditches, and/or catch basins should be employed to accumulate and to convey water to appropriate discharge points.
- Concrete walks and flatwork should not obstruct the free flow of surface water.
- Brick flatwork should be sealed by mortar or be placed over an impermeable membrane.
- Area drains should be recessed below grade to allow free flow of water into the basin.
- Enclosed raised planters should be sealed at the bottom and provided with an ample flow gradient to a drainage device. Recessed planters and landscaped areas should be provided with area inlet and subsurface drainpipes.
- Planters should not be located adjacent to the structures wherever possible. If planters are to be located adjacent to the structures, the planters should be positively sealed, should incorporate a subdrain, and should be provided with free discharge capacity to a drainage device.
- Planting areas at grade should be provided with positive drainage. Wherever possible, the grade of exposed soil areas should be established above adjacent paved grades. Drainage devices and curbing should be provided to prevent runoff from adjacent pavement or walks into planted areas.
- Gutter and downspout systems should be provided to capture discharge from roof areas. The accumulated roof water should be conveyed to off-site disposal areas by a pipe or concrete swale system.

Landscape watering should be performed judiciously to preclude either soaking or desiccation of soils. The watering should be such that it just sustains plant growth without excessive watering. Sprinkler systems should be checked periodically to detect leakage and they should be turned off during the rainy season.

7. DESIGN REVIEW AND CONSTRUCTION MONITORING

Geotechnical review of plans and specifications is of paramount importance in engineering practice. The poor performance of many structures has been attributed to inadequate geotechnical review of construction documents. Additionally, observation and testing of the subgrade will be important to the performance of the proposed development. The following sections present our recommendations relative to the review of construction documents and the monitoring of construction activities.

7.1. Plans and Specifications

The design plans and specifications should be reviewed by Twining, Inc. prior to bidding and construction, as the geotechnical recommendations may need to be reevaluated in the light of the actual design configuration and loads. This review is necessary to evaluate whether the recommendations contained in this report and future reports have been properly incorporated into the project plans and specifications. Based on the work already performed, this office is best qualified to provide such review.

7.2. Preconstruction Surveys

We recommend that preconstruction surveys be performed on the adjacent improvements prior to commencement of excavation activities for the subject project. The surveys should include written and photographic (or videographic) documentation of the existing conditions, as well as performance of floor level surveys or establishment of elevation monuments. Documentation of other structures and sensitive instruments within approximately 50 feet of the excavation(s) should also be performed.

7.3. Construction Monitoring

Site preparation, removal of unsuitable soils, assessment of imported fill materials, fill placement, foundation installation, and other site grading operations should be observed and tested, as appropriate. The substrata exposed during the construction may differ from that encountered in the test excavations. Continuous observation by a representative of Twining, Inc. during construction allows for evaluation of the soil conditions as they are encountered and allows the opportunity to recommend appropriate revisions where necessary.

8. LIMITATIONS

The recommendations and opinions expressed in this report are based on Twining, Inc.'s review of available background documents, on information obtained from field explorations, and on laboratory testing. It should be noted that this study did not evaluate the possible presence of hazardous materials on any portion of the site. In the event that any of our recommendations conflict with recommendations provided by other design professionals, we should be contacted to aid in resolving the discrepancy.

Due to the limited nature of our field explorations, conditions not observed and described in this report may be present on the site. Uncertainties relative to subsurface conditions can be reduced through additional subsurface exploration. Additional subsurface evaluation and laboratory testing can be performed upon request. It should be understood that conditions different from those anticipated in this report may be encountered during grading operations, for example, the extent of removal of unsuitable soil, and that additional effort may be required to mitigate them.

Site conditions, including groundwater elevation, can change with time as a result of natural processes or the activities of man at the subject site or at nearby sites. Changes to the applicable laws, regulations, codes, and standards of practice may occur as a result of government action or the broadening of knowledge. The findings of this report may, therefore, be invalidated over time, in part or in whole, by changes over which Twining, Inc. has no control.

Twining's recommendations for this site are, to a high degree, dependent upon appropriate quality control of subgrade preparation, fill placement, and foundation construction. Accordingly, the recommendations are made contingent upon the opportunity for Twining to observe grading operations and foundation excavations for the proposed construction. If parties other than Twining are engaged to provide such services, such parties must be notified that they will be required to assume complete responsibility as the geotechnical engineer of record for the geotechnical phase of the project by concurring with the recommendations in this report and/or by providing alternative recommendations.

This document is intended to be used only in its entirety. No portion of the document, by itself, is designed to completely represent any aspect of the project described herein. Twining should be contacted if the reader requires additional information or has questions regarding the content, interpretations presented, or completeness of this document.

This report has been prepared for the exclusive use by the client and its agents for specific application to the proposed project. Land use, site conditions, or other factors may change over time, and additional work may be required with the passage of time. Based on the intended use of this report and the nature of the new project, Twining may require that additional work be performed and that an updated report be issued. Non-compliance with any of these requirements by the Client or anyone else will release Twining from any liability resulting from the use of this report by any unauthorized party.

Twining performed its evaluation using the degree of care and skill ordinarily exercised under similar circumstances by reputable geotechnical professionals with experience in this area in similar soil conditions. No other warranty, either express or implied, is made as to the conclusions and recommendations contained in this report.

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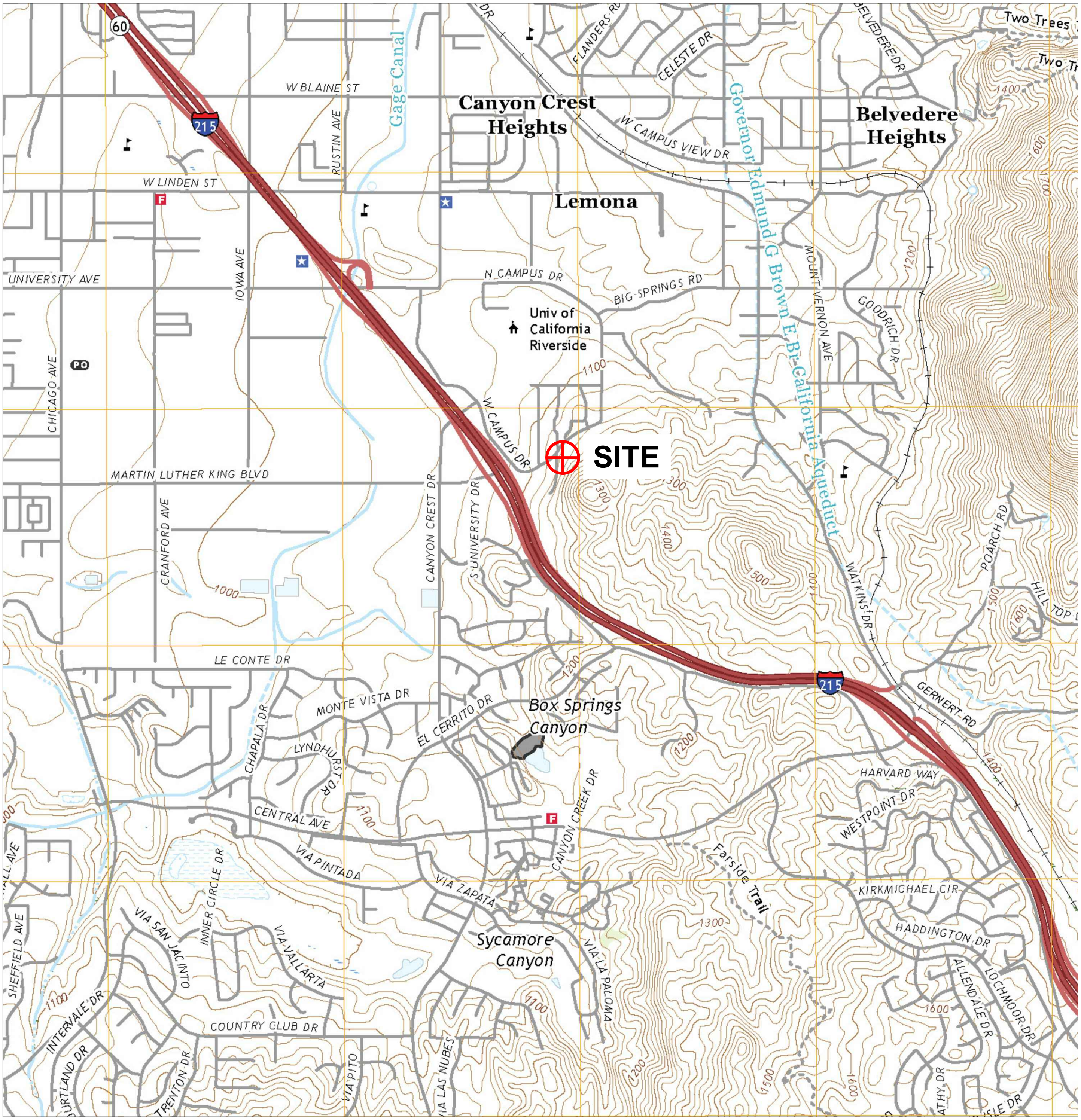
FIGURES



APPROXIMATE LOCATION OF PROJECT

SCALE IN FEET

0 2000 4000

REFERENCE: USGS (2018)

TWINING

SITE LOCATION MAP

SCHOOL OF BUSINESS
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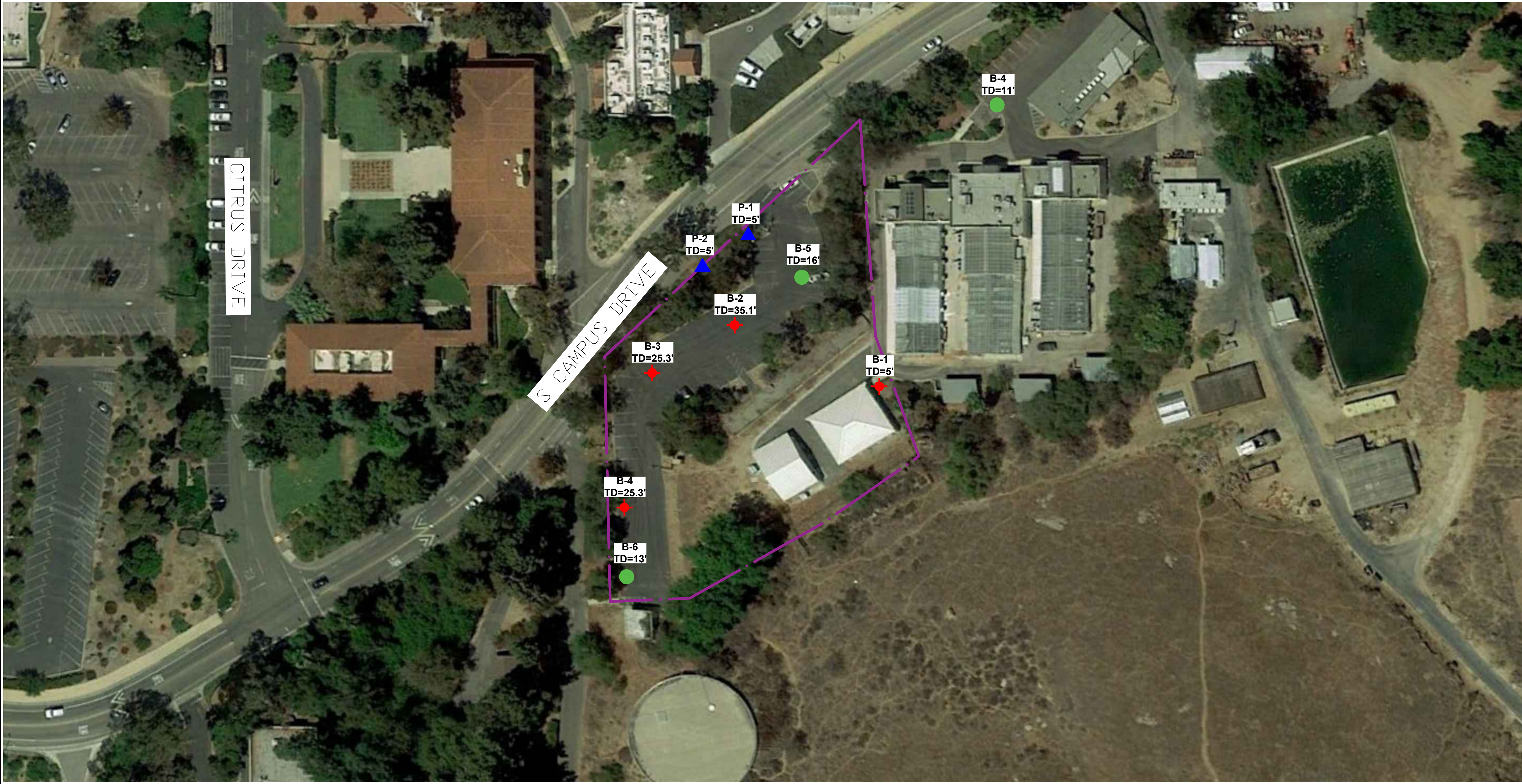
RIVERSIDE, CA

PROJECT NO.	REPORT DATE	FIGURE 1
200563.3	January 2021	



0 80 160

NOTE: ALL DIMENSIONS AND LOCATIONS ARE APPROXIMATE

LEGEND

B-1 TD=5' — APPROXIMATE LOCATION OF BORING BY TWINING TOTAL DEPTH IN FEET

P-1 TD=5' — APPROXIMATE LOCATION OF PERCOLATION TEST BY TWINING TOTAL DEPTH IN FEET

B-4 TD=25' — APPROXIMATE LOCATION OF BORING BY SOIL EXPLORATION CO. (2019) TOTAL DEPTH IN FEET

APPROXIMATE PROJECT BOUNDARY

TWINING

N

REFERENCE: GOOGLE EARTH (2021)

SITE PLAN AND BORING LOCATION MAP

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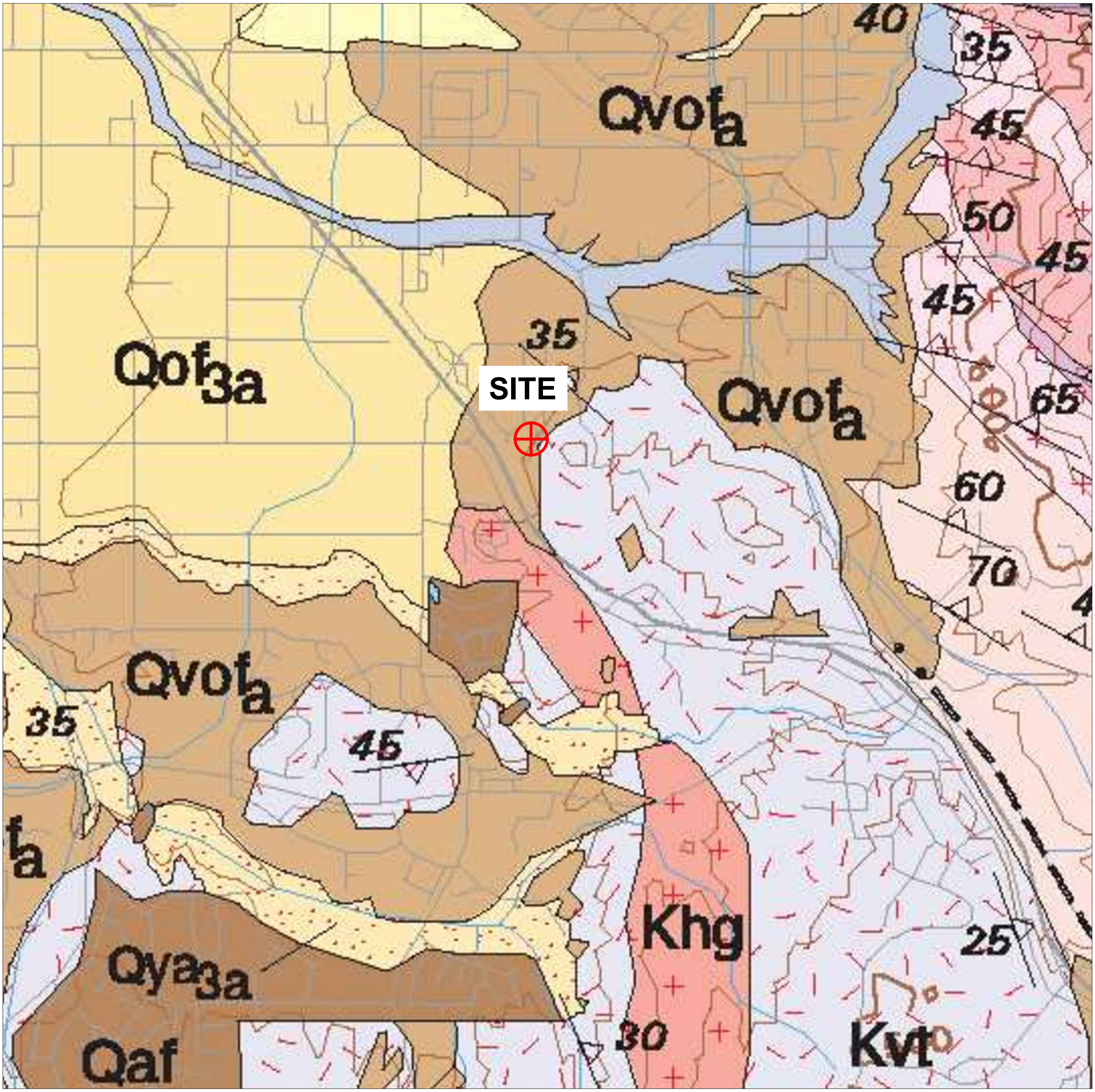
PROJECT No.	REPORT DATE	
200563.3	January 2021	FIGURE 2



Qvof Very old alluvial fan deposits
Kvt Val Verde tonalite
Qof Old alluvial fan deposits
Khg Heterogeneous granitic rocks

SCALE IN FEET
0 2000 4000

REFERENCE: MORTON AND MILLER (2006)

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GEOLOGIC MAP

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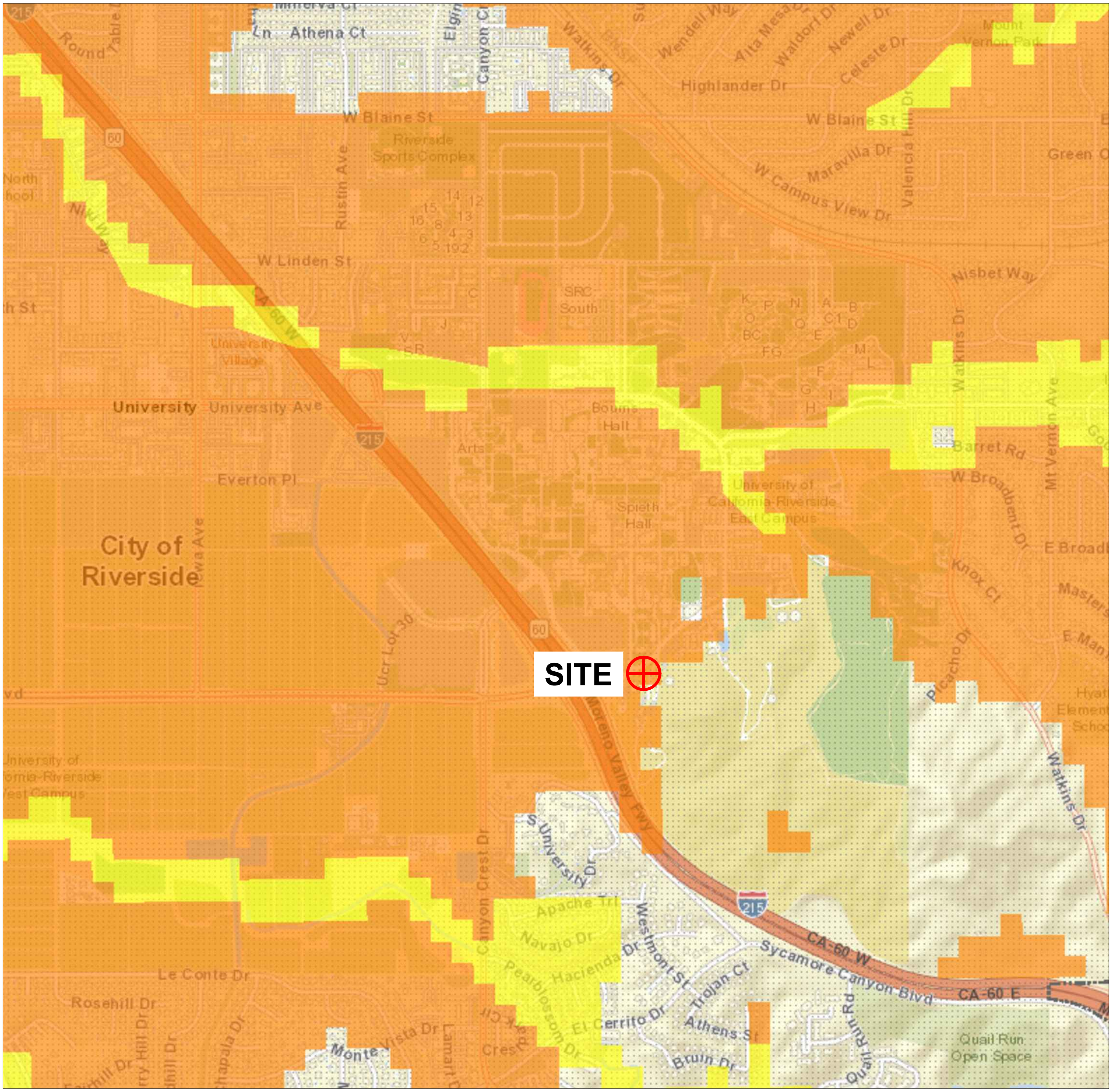
PROJECT NO.	REPORT DATE	FIGURE 3
200563.3	January 2021	



SUSCEPTIBILITY TO LIQUEFACTION

- Other Susceptibility
- High
- Low
- Moderate
- Very High
- Very low

REFERENCE: COUNTY OF RIVERSIDE (2020)

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SEISMIC HAZARD ZONES MAP

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PROJECT NO.	REPORT DATE	FIGURE 4
200563.3	January 2021	

APPENDIX A
FIELD EXPLORATION

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Appendix A
Field Exploration

General

The subsurface exploration program for the proposed project consisted of drilling, testing, sampling and logging 5 hollow-stem-auger (HSA) exploratory borings (B-1 through B-4 and P-1 and P-2), and percolation testing in borings P-1 and P-2 at the site on December 21, 2021.

The HSA borings were advanced to depths of approximately 5 to 35 feet below the existing ground surface (bgs). Drilling operation for the HSA borings was performed by Baja Exploration, Inc. of Escondido, California using a CME-75 truck-mounted drill rig equipped with 8-inch diameter hollow-stem-augers.

The approximate locations of the borings are shown on Figure 2 – Site Plan and Boring Location Map.

Drilling and Sampling

An explanation of the boring logs is presented as Figure A-1. The boring logs are presented as Figures A-2 through A-7. The boring logs describe the earth materials encountered, samples obtained, and show the field and laboratory tests performed. The logs also show the boring number, drilling date, and the name of the logger and drilling subcontractor. The borings were logged by an engineer using the Unified Soil Classification System under the supervision of a registered California Geotechnical Engineer. The boundaries between soil types shown on the logs are approximate because the transition between different soil layers may be gradual. Drive and bulk samples of representative earth materials were obtained from the borings.

Disturbed samples were obtained from select depths using a Standard Penetration Test (SPT) sampler. This sampler consists of a 2-inch O.D., 1.4-inch I.D. split barrel shaft with room for liner but liner was not used. Soil samples obtained by the SPT sampler were retained in plastic bags. A California modified sampler was also used to obtain drive samples of the soils from select depths. This sampler consists of a 3-inch outside diameter (O.D.), 2.4-inch inside diameter (I.D.) split barrel shaft. The samples were retained in brass rings for laboratory testing.

When the boring was drilled to select depths, the sampler was lowered to the bottom of the boring and then driven a total of 18-inches into the soil using an automatic hammer weighing 140 pounds dropped from a height of 30 inches. The number of blows required to drive the samplers the final 12 inches is presented on the boring logs. Where sampler refusal is encountered and the sampler does not advance 18-inches, the total number of blows per number of inches advanced is presented. The blow counts given are field raw blow counts that have not been modified to account for field and/or depth conditions.

During drilling, groundwater was not encountered within any of the borings drilled to depths between approximately 5 and 35 feet bgs.

Upon completion of the borings or percolation testing, the boreholes were backfilled with drilled soil cuttings, and the surface was repaired with quickset concrete dyed black.

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Percolation Testing

Percolation testing was performed on December 21, 2020 in borings P-1 and P-2 drilled to 5 feet bgs. Testing was performed according to the boring percolation test guidance provided in the Riverside County Design Handbook for Low Impact Development Best Management Practices.

After installing pipe and filter rock, the boreholes were filled with water to near the ground surface and presoaked for two 25-minute sessions prior to testing.

After presoaking, the boreholes were filled with water to near the ground surface again. Measurements were recorded at 10-minute intervals for a total of 8 readings. The last reading was used to determine the percolation rate.

Our calculated design infiltration rates are presented in Table A-1 below with a factor of safety of 3. Detailed test data is attached at the end of this appendix.

Table A-1 – Infiltration Rate with a Factor of Safety of 3

Test Location	Depth of Test Borehole (feet)	Infiltration Rate (inch/hour)
P-1	5	1.5
P-2	5	0.9

UNIFIED SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		(LITTLE OR NO FINES)		GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
		(APPRECIABLE AMOUNT OF FINES)		GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		(LITTLE OR NO FINES)		SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES		SM	SILTY SANDS, SAND - SILT MIXTURES
		(APPRECIABLE AMOUNT OF FINES)		SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

COARSE-GRAINED SOILS			FINE-GRAINED SOILS	
Relative Density	SPT (blows/ft)	Relative Density (%)	Consistency	SPT (blows/ft)
Very Loose	<4	0 - 15	Very Soft	<2
Loose	4 - 10	15 - 35	Soft	2 - 4
Medium Dense	10 - 30	35 - 65	Medium Stiff	4 - 8
Dense	30 - 50	65 - 85	Stiff	8 - 15
Very Dense	>50	85 - 100	Very Stiff	15 - 30
			Hard	>30

NOTE: SPT blow counts based on 140 lb. hammer falling 30 inches

Sample Symbol	Sample Type	Description
	SPT	1.4 in I.D., 2.0 in. O.D. driven sampler
	California Modified	2.4 in. I.D., 3.0 in. O.D. driven sampler
	Bulk	Retrieved from soil cuttings
	Thin-Walled Tube	Pitcher or Shelby Tube

LABORATORY TESTING ABBREVIATIONS

ATT	Atterberg Limits
C	Consolidation
CORR	Corrosivity Series
DS	Direct Shear
EI	Expansion Index
GS	Grain Size Distribution
K	Permeability
MAX	Moisture/Density (Modified Proctor)
O	Organic Content
RV	Resistance Value
SE	Sand Equivalent
SG	Specific Gravity
TX	Triaxial Compression
UC	Unconfined Compression

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EXPLANATION FOR LOG OF BORINGS

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PROJECT NO.	REPORT DATE	
200563.3	January 2021	FIGURE A-1

STANDARD LOG EXPLANATION 200563.3 - UCR SCHOOL OF BUSINESS.GPJ TWINING LABS.GDT 1/5/21

DATE DRILLED	12/21/2020	LOGGED BY	JAB	**BORING NO.**	**B-1**
DRIVE WEIGHT	N/A	DROP	N/A	DEPTH TO GROUNDWATER (ft.)	N/E
DRILLING METHOD	5-inch Hand Auger	DRILLER	Baja Exploration	SURFACE ELEVATION (ft.)	1170 ±(MSL)

ELEVATION (feet)	DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS / FOOT	MOISTURE (%)	DRY DENSITY (pcf)	ADDITIONAL TESTS	GRAPHIC LOG	U.S.C.S. CLASSIFICATION	DESCRIPTION
									SM	**LANDSCAPE AREA (Af):** Silty SAND; loose; brown; dry; fine to medium sand; some fine coarse angular gravel
							#200, ATT		SM	**VERY OLD ALLUVIAL FAN DEPOSITS (Qvof):** Silty SAND; medium dense; light reddish brown; slightly moist; fine to medium sand; some clay @ 3 ft becomes reddish brown; medium dense to dense
1165	5									Total Depth = 5.0 feet Backfilled on 12/21/2020 Groundwater not encountered. Backfilled with cuttings.
1160	10									
1155	15									
1150	20									
1145	25									
1140	30									
1135	35									

TWINING

LOG OF BORING

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Riverside, California

PROJECT NO.	REPORT DATE	
200563.3	January 2021	FIGURE A - 2

DATE DRILLED	12/21/2020	LOGGED BY	JAB	**BORING NO.**	**B-2**
DRIVE WEIGHT	140 lbs.	DROP	30 inches	DEPTH TO GROUNDWATER (ft.)	N/E
DRILLING METHOD	8-inch HSA	DRILLER	Baja Exploration	SURFACE ELEVATION (ft.)	1151 ±(MSL)

ELEVATION (feet)	DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS / FOOT	MOISTURE (%)	DRY DENSITY (pcf)	ADDITIONAL TESTS	GRAPHIC LOG	U.S.C.S. CLASSIFICATION	DESCRIPTION
										3 inches of asphalt concrete over 9 inches of base
							CORR, EI		SM	**VERY OLD ALLUVIAL FAN DEPOSITS (Qvof):** Silty SAND; dense; reddish brown; slightly moist to moist; fine to medium sand; some clay; some mica
1146	5			30			#200		SM	-- same; medium dense; light reddish brown to light brown; dry to slightly moist; trace clay
1141	10			59	1.6	126.2	C		SM	-- same; dense; light brown; dry
1136	15			32			#200, ATT		SM	-- same; dense
1131	20			51	1.8	124.3			SM	-- same; dense
1126	25			50 for 3"					SM	**BEDROCK (Kt):** Silty SAND; very dense; mottled white to brown; dry; fine to coarse sand; trace iron oxide staining
1121	30			50 for 1"					SM	-- same; very dense
1116	35									

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LOG OF BORING

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PROJECT NO.	REPORT DATE	
200563.3	January 2021	FIGURE A - 3

DATE DRILLED	12/21/2020	LOGGED BY	JAB	**BORING NO.**	**B-2**
DRIVE WEIGHT	140 lbs.	DROP	30 inches	DEPTH TO GROUNDWATER (ft.)	N/E
DRILLING METHOD	8-inch HSA	DRILLER	Baja Exploration	SURFACE ELEVATION (ft.)	1151 ±(MSL)

ELEVATION (feet)	DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS / FOOT	MOISTURE (%)	DRY DENSITY (pcf)	ADDITIONAL TESTS	GRAPHIC LOG	U.S.C.S. CLASSIFICATION	DESCRIPTION
			X	50 for 1"					SM	-- same; very dense Total Depth = 35.1 feet Backfilled on 12/21/2020 Groundwater not encountered. Backfilled with cuttings.
1111	40									
1106	45									
1101	50									
1096	55									
1091	60									
1086	65									
1081	70									

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LOG OF BORING

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PROJECT NO.	REPORT DATE	
200563.3	January 2021	FIGURE A - 3

DATE DRILLED	12/21/2020	LOGGED BY	JAB	**BORING NO.**	**B-3**
DRIVE WEIGHT	140 lbs.	DROP	30 inches	DEPTH TO GROUNDWATER (ft.)	N/E
DRILLING METHOD	8-inch HSA	DRILLER	Baja Exploration	SURFACE ELEVATION (ft.)	1142 ±(MSL)

ELEVATION (feet)	DEPTH (feet)	SAMPLES (Bulk / Driven)	BLOWS / FOOT	MOISTURE (%)	DRY DENSITY (pcf)	ADDITIONAL TESTS	GRAPHIC LOG	U.S.C.S. CLASSIFICATION	DESCRIPTION
									4.5 inches over 5 inches of base
		Bulk						SM	**VERY OLD ALLUVIAL FAN DEPOSITS (Qvof):** Silty SAND; medium dense; light reddish brown; dry to slightly moist; fine to medium sand; some clay; some mica
1137	5	Driven	26	1.7	119.3	DS		SM	-- same; medium dense
1132	10	Driven	27					SM	-- same; medium dense
1127	15	Driven	50 for 6"	3.1	119.4			SM	-- same; very dense
1122	20	Driven	50 for 3"					SM	**BEDROCK (Kt):** Silty SAND; very dense; light gray; dry; fine to coarse sand; trace iron oxide staining
1117	25	Driven	50 for 4"					SM	-- same; very dense
									Total Depth = 25.3 feet Backfilled on 12/21/2020 Groundwater not encountered. Backfilled with cuttings.
1112	30								
1107	35								

DATE DRILLED	12/21/2020	LOGGED BY	JAB	**BORING NO.**	**B-4**
DRIVE WEIGHT	140 lbs.	DROP	30 inches	DEPTH TO GROUNDWATER (ft.)	N/E
DRILLING METHOD	8-inch HSA	DRILLER	Baja Exploration	SURFACE ELEVATION (ft.)	1150 ±(MSL)

ELEVATION (feet)	DEPTH (feet)	SAMPLES (Bulk / Driven)	BLOWS / FOOT	MOISTURE (%)	DRY DENSITY (pcf)	ADDITIONAL TESTS	GRAPHIC LOG	U.S.C.S. CLASSIFICATION	DESCRIPTION
	0								5 inches of asphalt concrete over 6 inches of base
		Bulk		9.9		DS, MAX		SM	**VERY OLD ALLUVIAL FAN DEPOSITS (Qvof):** Silty SAND; medium dense; reddish brown; slightly moist; fine to medium sand; some clay
1145	5	Driven	51					SM	-- same; very dense; light brown
1140	10	Driven	50 for 6"	3.6	116.9	DS		SM	-- same; very dense; light reddish brown
1135	15	Driven	22			#200		SM	-- same; medium dense; reddish brown; moist
1130	20	Driven	43	5.9	120.2			SM	-- same; medium dense
								SM	**BEDROCK (Kt):** Silty SAND; very dense; light gray; dry; fine to coarse sand; trace iron oxide staining
1125	25	Driven	50 for 1"					SM	-- same; very dense
1120	30								
1115	35								

Total Depth = 25.3 feet
Backfilled on 12/21/2020
Groundwater not encountered.
Backfilled with cuttings.

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LOG OF BORING

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PROJECT NO.	REPORT DATE	
200563.3	January 2021	FIGURE A - 5

DATE DRILLED	12/21/2020	LOGGED BY	JAB	**BORING NO.**	**P-1**
DRIVE WEIGHT	N/A	DROP	N/A	DEPTH TO GROUNDWATER (ft.)	N/E
DRILLING METHOD	5-inch Hand Auger	DRILLER	Baja Exploration	SURFACE ELEVATION (ft.)	1149 ±(MSL)

ELEVATION (feet)	DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS / FOOT	MOISTURE (%)	DRY DENSITY (pcf)	ADDITIONAL TESTS	GRAPHIC LOG	U.S.C.S. CLASSIFICATION	DESCRIPTION
							RV		SM	**VERY OLD ALLUVIAL FAN DEPOSITS (Qvof):** Silty SAND; dense; reddish brown; moist; fine to medium sand; some mica
1144	5									Total Depth = 5.0 feet Backfilled on 12/21/2020 Groundwater not encountered. Backfilled with cuttings.
1139	10									
1134	15									
1129	20									
1124	25									
1119	30									
1114	35									

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LOG OF BORING

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Riverside, California

PROJECT NO.	REPORT DATE	
200563.3	January 2021	FIGURE A - 6

DATE DRILLED	12/21/2020	LOGGED BY	JAB	**BORING NO.**	**P-2**
DRIVE WEIGHT	N/A	DROP	N/A	DEPTH TO GROUNDWATER (ft.)	N/E
DRILLING METHOD	5-inch Hand Auger	DRILLER	Baja Exploration	SURFACE ELEVATION (ft.)	1145 ±(MSL)

ELEVATION (feet)	DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS / FOOT	MOISTURE (%)	DRY DENSITY (pcf)	GRAPHIC LOG	U.S.C.S. CLASSIFICATION	DESCRIPTION
								SM	**VERY OLD ALLUVIAL FAN DEPOSITS (Qvof):** Silty SAND; medium dense; light reddish brown; moist; fine to medium sand; some mica
1140	5								Total Depth = 5.0 feet Backfilled on 12/21/2020 Groundwater not encountered. Backfilled with cuttings.
1135	10								
1130	15								
1125	20								
1120	25								
1115	30								
1110	35								

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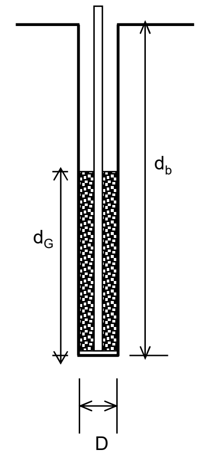
Riverside, California

PROJECT NO.	REPORT DATE	
200563.3	January 2021	FIGURE A - 7

PERCOLATION TEST DATA

Project No.: 200563.3
Project Name: UCR School of Business
Test Date: December 21, 2020
Test Boring No.: **P-1**
Diameter of Boring (D): 0.50 feet
Depth of Boring (d_b): 5.0 feet
Test Performer: EA



Sandy Soil Criteria Test

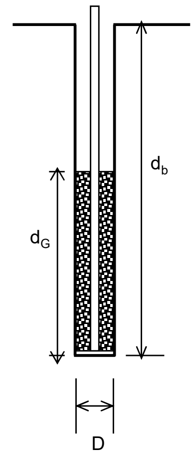
Time of Testing			Water Level Measurements			
Start Time T_i	Stop Time T_f	Time Interval ΔT (min)	Initial depth to water d_1 (feet)	Final depth to water d_2 (feet)	Drop of water column $\Delta d = d_i - d_f$ (inches)	Greater than or Equal to 6"? (Yes/No)
11:02:00 AM	11:27:00 AM	25.00	0.00	4.80	57.60	Yes
11:28:00 AM	11:53:00 AM	25.00	1.10	4.30	38.40	Yes

Time of Testing			Water Level Measurements		Water Level Calculations			Infiltration Rate Calculations	
Start Time T_i	Stop Time T_f	Time Interval ΔT (min)	Initial depth to water d_1 (feet)	Final depth to water d_2 (feet)	Initial height of water column d_i (feet)	Final height of water column d_f (feet)	Drop of water column $\Delta d = d_i - d_f$ (inches)	Tested Infiltration Rate *It* (inch/hr)	Infiltration Rate w/ Factor of Safety of 3 *It/3* (inch/hr)
Percolation Test									
11:54:00 AM	12:04:00 PM	10.00	1.00	3.10	4.00	1.90	25.20	6.15	2.05
12:05:00 PM	12:15:00 PM	10.00	1.10	3.00	3.90	2.00	22.80	5.56	1.85
12:16:00 PM	12:26:00 PM	10.00	1.00	2.90	4.00	2.10	22.80	5.39	1.80
12:27:00 PM	12:37:00 PM	10.00	0.90	2.80	4.10	2.20	22.80	5.22	1.74
12:38:00 PM	12:48:00 PM	10.00	1.00	2.70	4.00	2.30	20.40	4.67	1.56
12:50:00 PM	1:00:00 PM	10.00	0.70	2.70	4.30	2.30	24.00	5.26	1.75
1:02:00 PM	1:12:00 PM	10.00	1.00	2.80	4.00	2.20	21.60	5.02	1.67
1:13:00 PM	1:23:00 PM	10.00	1.00	2.65	4.00	2.35	19.80	4.50	1.50

***Infiltration Rate: 1.50 (inch/hr)**

Reference: Riverside County Low Impact Development BMP Design Handbook
*Based on the last dropped obtained in the final 10 minutes

PERCOLATION TEST DATA



Project No.: 200563.3
Project Name: UCR School of Business
Test Date: December 21, 2020
Test Boring No.: **P-2**
Diameter of Boring (D): 0.50 feet
Depth of Boring (d_b): 5.0 feet
Test Performer: EA

Sandy Soil Criteria Test

Time of Testing			Water Level Measurements			
Start Time T_i	Stop Time T_f	Time Interval ΔT (min)	Initial depth to water d_1 (feet)	Final depth to water d_2 (feet)	Drop of water column $\Delta d = d_i - d_f$ (inches)	Greater than or Equal to 6"? (Yes/No)
8:27:00 AM	8:52:00 AM	25.00	1.00	3.80	33.60	Yes
8:53:00 AM	9:18:00 AM	25.00	0.80	3.35	30.60	Yes

Time of Testing			Water Level Measurements		Water Level Calculations			Infiltration Rate Calculations	
Start Time T_i	Stop Time T_f	Time Interval ΔT (min)	Initial depth to water d_1 (feet)	Final depth to water d_2 (feet)	Initial height of water column d_i (feet)	Final height of water column d_f (feet)	Drop of water column $\Delta d = d_i - d_f$ (inches)	Tested Infiltration Rate It (inch/hr)	Infiltration Rate w/ Factor of Safety of 3 $It/3$ (inch/hr)
Percolation Test									
9:19:00 AM	9:29:00 AM	10.00	0.60	2.15	4.40	2.85	18.60	3.72	1.24
9:30:00 AM	9:40:00 AM	10.00	0.50	2.05	4.50	2.95	18.60	3.62	1.21
9:45:00 AM	9:55:00 AM	10.00	0.80	2.10	4.20	2.90	15.60	3.18	1.06
9:56:00 AM	10:06:00 AM	10.00	0.60	2.00	4.40	3.00	16.80	3.29	1.10
10:16:00 AM	10:26:00 AM	10.00	1.10	2.20	3.90	2.80	13.20	2.85	0.95
10:27:00 AM	10:37:00 AM	10.00	1.25	2.25	3.75	2.75	12.00	2.67	0.89
10:38:00 AM	10:48:00 AM	10.00	1.25	2.20	3.75	2.80	11.40	2.51	0.84
10:49:00 AM	10:59:00 AM	10.00	1.10	2.15	3.90	2.85	12.60	2.70	0.90

***Infiltration Rate:** **0.90** **(inch/hr)**

Reference: Riverside County Low Impact Development BMP Design Handbook
*Based on the last dropped obtained in the final 10 minutes

APPENDIX B
LABORATORY TESTING

TWINING
2883 East Spring Street
Suite 300
Long Beach CA 90806
Tel 562.426.3355
Fax 562.426.6424

Appendix B
Laboratory Testing

Laboratory Moisture Content and Density Tests

The moisture content and dry densities of selected driven samples obtained from the exploratory borings were evaluated in general accordance with the latest version of ASTM D 2937. The results are shown on the boring logs in Appendix A, and also summarized in Table B-1.

No. 200 Wash Sieve

The fines content passing the No. 200 sieve was evaluated in accordance with ASTM D 1140. The results are presented in Table B-2.

Atterberg Limits

Tests were performed on selected representative fine-grained soil samples to evaluate the liquid limit, plastic limit, and plasticity index in general accordance with ASTM D 4318. These test results were utilized to evaluate the soil classification in accordance with the Unified Soil Classification System. The test results are summarized in on Table B-3.

Resistance Value (R-value)

R-value testing was performed on a select bulk sample of the near-surface soils encountered at the site. The test was performed in general accordance with ASTM D 2844. The result is summarized in Table B-4.

Expansion Index

The expansion index of a select soil sample was evaluated in general accordance with ASTM D 4829. The specimen was molded under a specified compactive energy at approximately 50 percent saturation. The prepared 1-inch thick by 4-inch diameter specimen was loaded with a surcharge of 144 pounds per square foot (psf) and was inundated with tap water. Readings of volumetric swell were made for a period of 24 hours. The result of expansion index test is presented in Table B-5.

Consolidation

Consolidation tests were performed on a select modified-California soil sample in general accordance with the latest version of ASTM D2435. The sample was inundated during testing to represent adverse field conditions. The percent consolidation for each load cycle was recorded as a ratio of the amount of vertical compression to the original height of the sample. The results of the test are presented on Figure B-1.

Direct Shear

Direct shear tests were performed on remolded and representative intact soil samples in general accordance with the latest version of ASTM D 3080 to evaluate the shear strength characteristics of the selected materials. The samples were inundated during shearing to represent adverse field conditions. Test results are presented on Figures B-2 through B-4.

Corrosivity

Soil pH and resistivity tests were performed by Anaheim Test Lab, Inc. (ATLI) of Anaheim, California on representative soil samples. The resistivity of the soil assumes saturated soil conditions. The chloride and sulfate contents of the selected samples were evaluated in general accordance with the latest versions of Caltrans test methods CT417, CT422, and CT 643. The test results are presented on Table B-6 and the ATLI report included in this appendix.

Maximum Density and Optimum Moisture

Modified Proctor testing was performed on near-surface soils to determine the maximum dry density and optimum water content for compaction. The test was performed in accordance with ASTM D 1557 Method A. The curve is attached to this appendix on Figure B-5.

Table B-1
Moisture Content and Dry Density

Boring No.	Depth (feet)	Moisture Content (%)	Dry Density (pcf)
B-2	10	1.6	126.2
B-2	20	1.8	124.3
B-3	5	1.7	119.3
B-3	15	3.1	119.4
B-4	10	3.6	116.9
B-4	20	5.9	120.2

Table B-2
Number 200 Wash Results

Boring No.	Depth (feet)	Percent Passing #200
B-1	2-3	29.9
B-2	5	24.9
B-2	15	15.6
B-4	15	19.4

Table B-3
Atterberg Limits Results

Boring No.	Depth (feet)	Liquid Limit	Plastic Limit	Plasticity Index	U.S.C.S. Classification
B-1	2-3	NP	NP	NP	Silty SAND (SM)
B-2	15	NP	NP	NP	Silty SAND (SM)

Table B-4
Resistance Value (R-value)

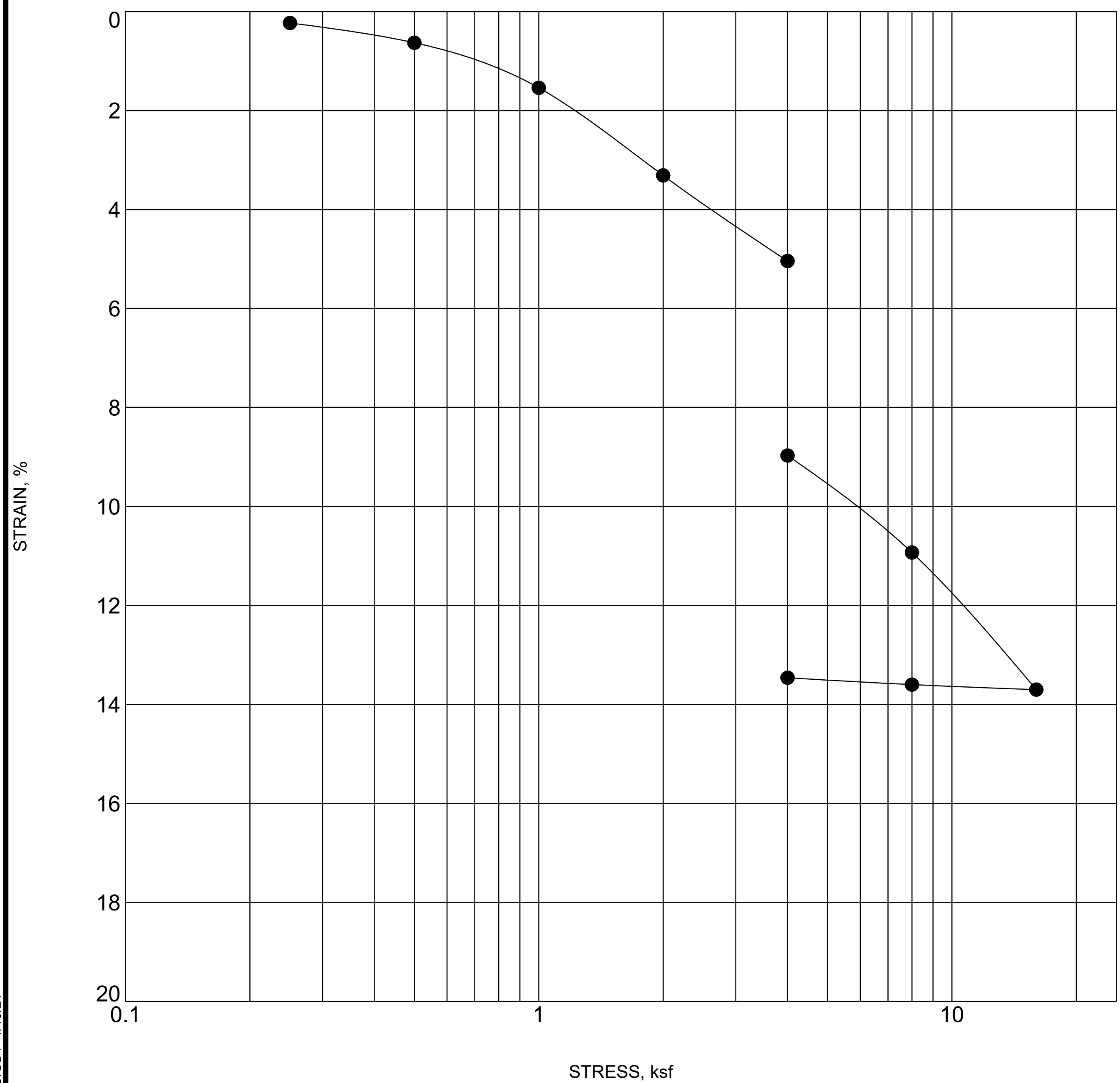
Boring No.	Depth (feet)	R Value
P-1	1 – 5	27

Table B-5
Expansion Index

Boring No.	Depth (feet)	Expansion Index	Expansion Potential
B-2	1 – 5	0	Very Low

Table B-6
Corrosivity Test Results

Boring No.	Depth (feet)	pH	Water Soluble Sulfate (ppm)	Water Soluble Chloride (ppm)	Minimum Resistivity (ohm-cm)
B-2	1-5	9.5	366	126	1,300



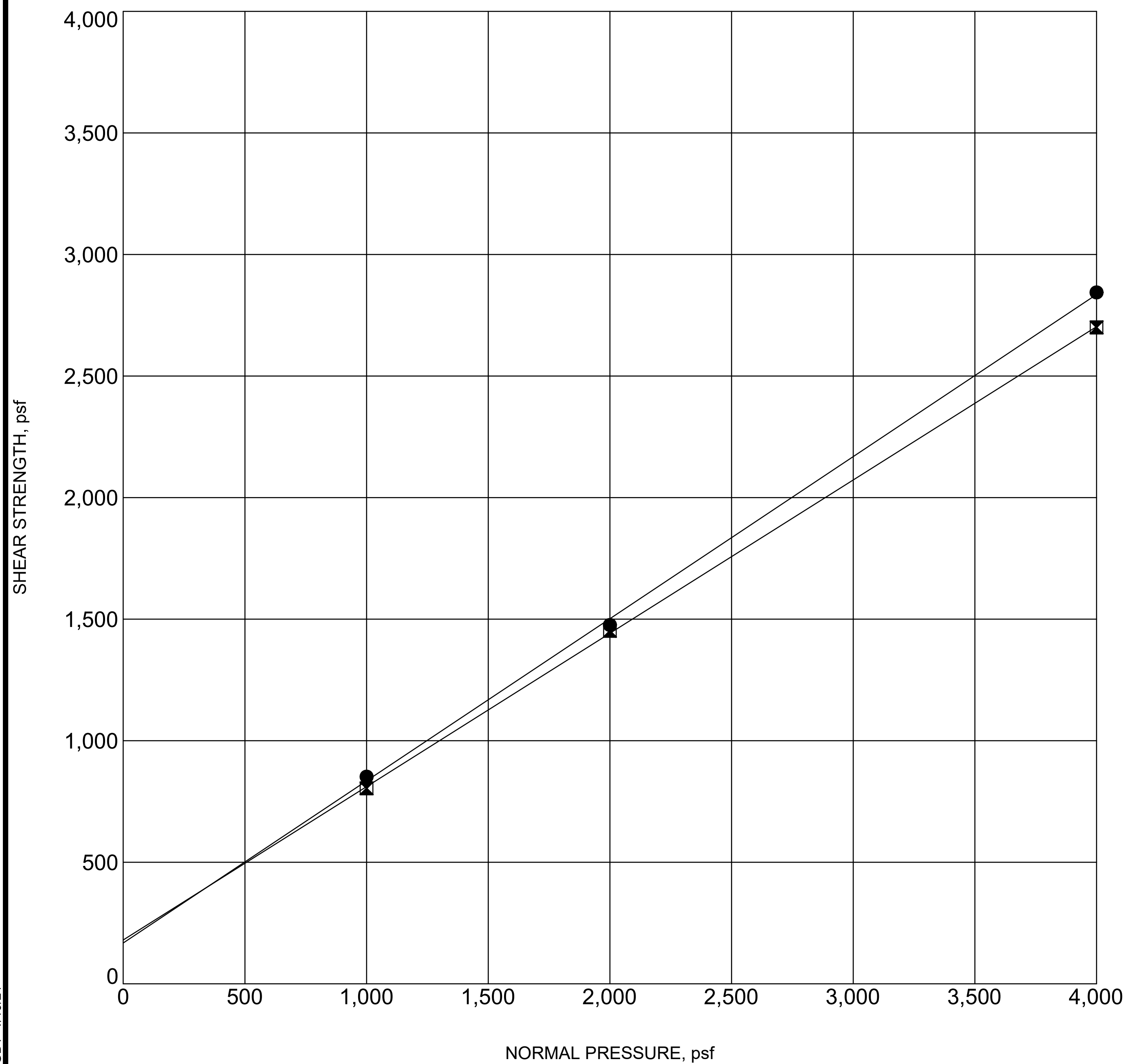
	Sample Location	Soil Description	Dry Density (pcf)	Moisture Content (%)
●	**B-2 at 10 ft**	**Silty SAND**	**126.2**	**1.6**

TWINING

CONSOLIDATION TEST

School of Business
University of California, Riverside
Riverside, California

PROJECT NO.	REPORT DATE	FIGURE B-1
200563.3	January 2021	



Shear Strength Parameters

	Peak	Ultimate
Cohesion, C (psf):	168	180
Friction Angle, Ø (deg):	34	32
Initial Moisture (%):	1.7	
Final Moisture (%):	11.4	

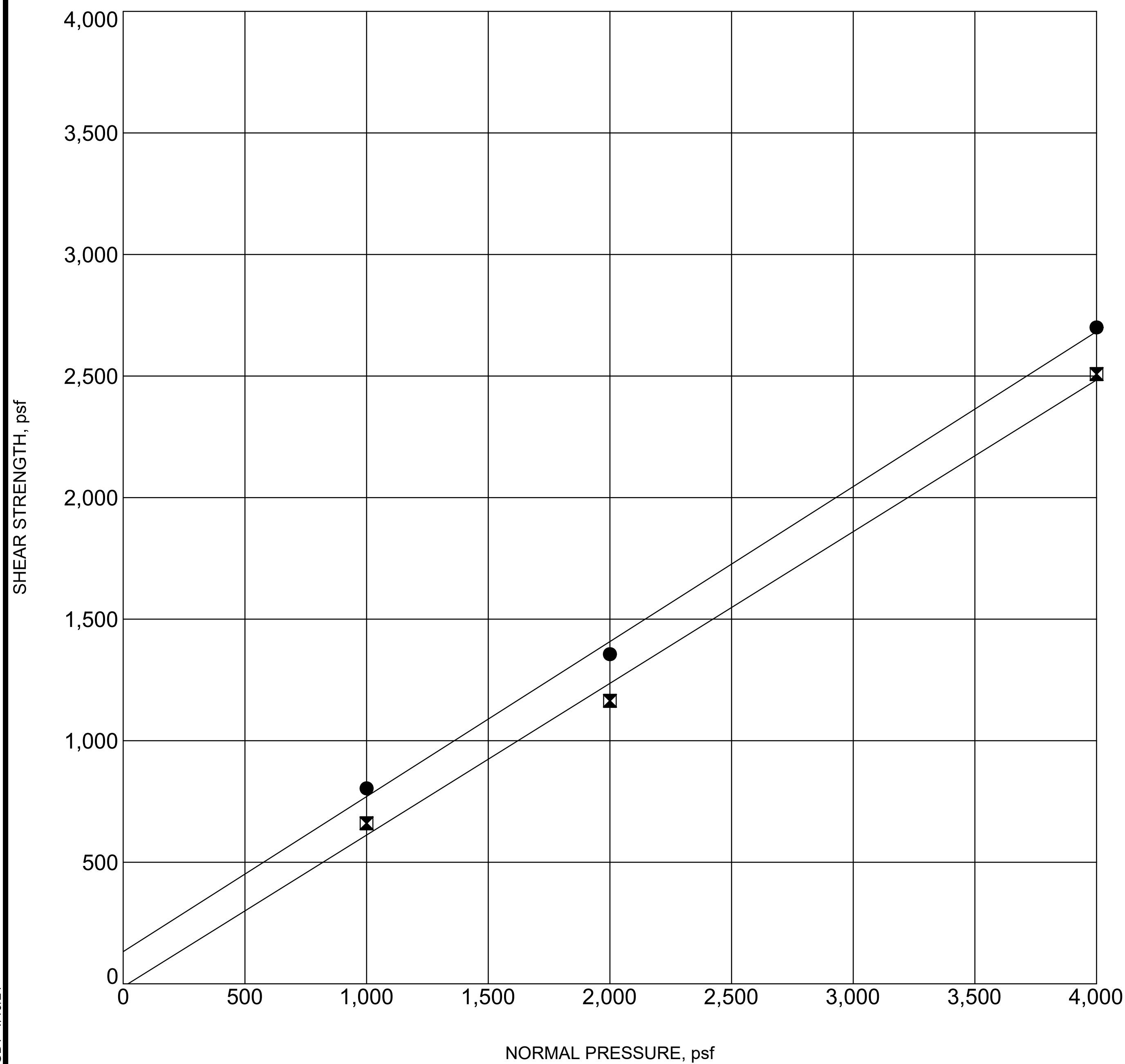
Boring No.: B-3
Sample Depth (ft): 5
Sample Description: Silty SAND
Strain Rate (in./min): 0.005
Dry Density (pcf): 119.3

TWINING

DIRECT SHEAR TEST

School of Business
University of California, Riverside
Riverside, California

PROJECT NO.	REPORT DATE	FIGURE B-2
200563.3	January 2021	



Shear Strength Parameters

	Peak	Ultimate
Cohesion, C (psf):	132	0
Friction Angle, Ø (deg):	33	32

Boring No.: B-4
Sample Depth (ft): 1-4' BULK
Sample Description: Silty SAND
Strain Rate (in./min): 0.005
Dry Density (pcf): 122.0

Initial Moisture (%): 6.4
Final Moisture (%): 9.9

Remolded to 90% Relative Compaction

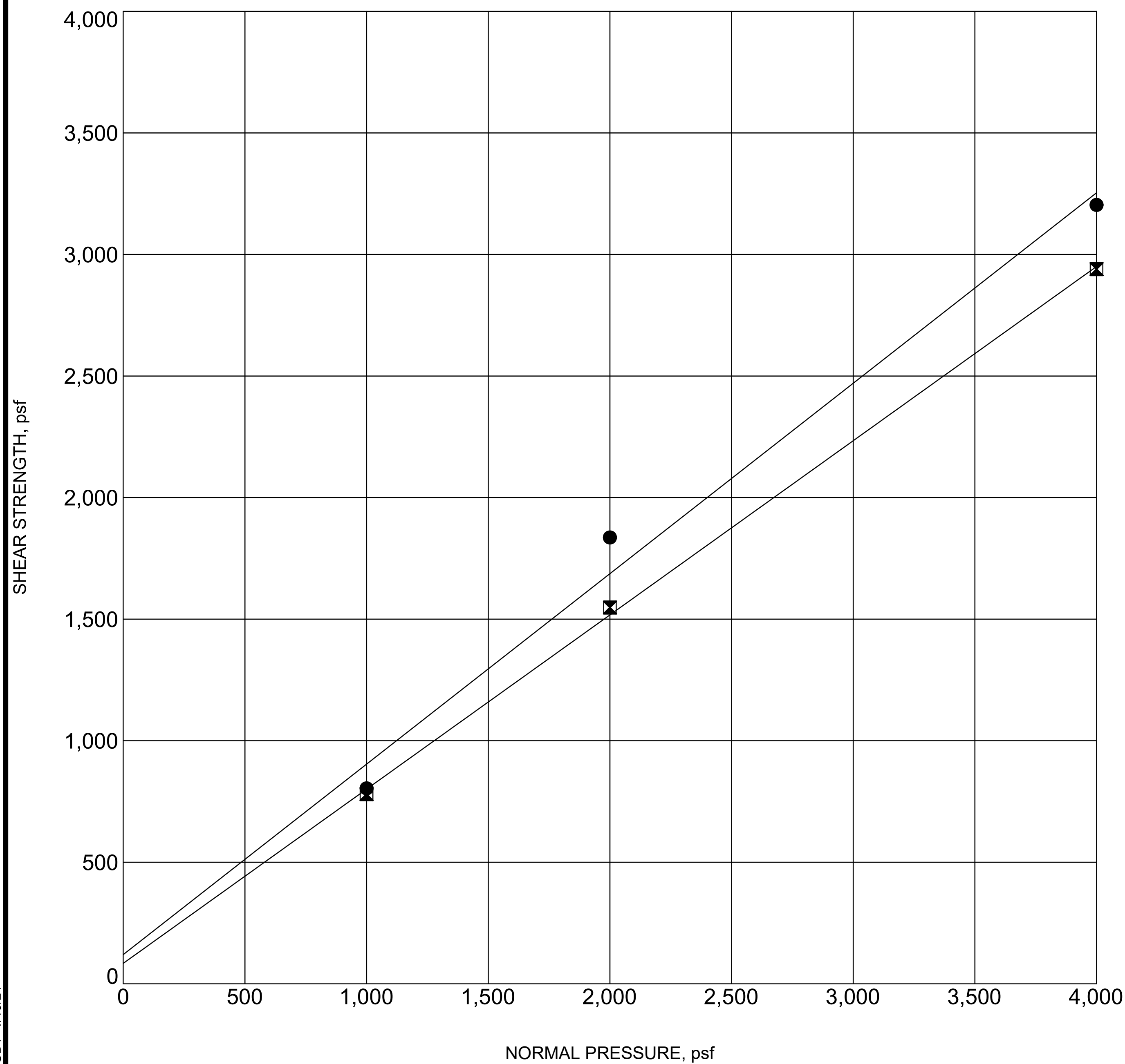
TWINING

DIRECT SHEAR TEST

School of Business
University of California, Riverside
Riverside, California

PROJECT NO.	REPORT DATE	FIGURE B-3
200563.3	January 2021	

DIRECT SHEAR 200563.3 - UCR SCHOOL OF BUSINESS.GPJ TWINING LABS.GDT 1/19/21



Boring No.: B-4
Sample Depth (ft): 10
Sample Description: Silty SAND
Strain Rate (in./min): 0.005
Dry Density (pcf): 116.9

Shear Strength Parameters

	Peak	Ultimate
Cohesion, C (psf):	120	84
Friction Angle, Ø (deg):	38	36

Initial Moisture (%): 3.6
Final Moisture (%): 12.4

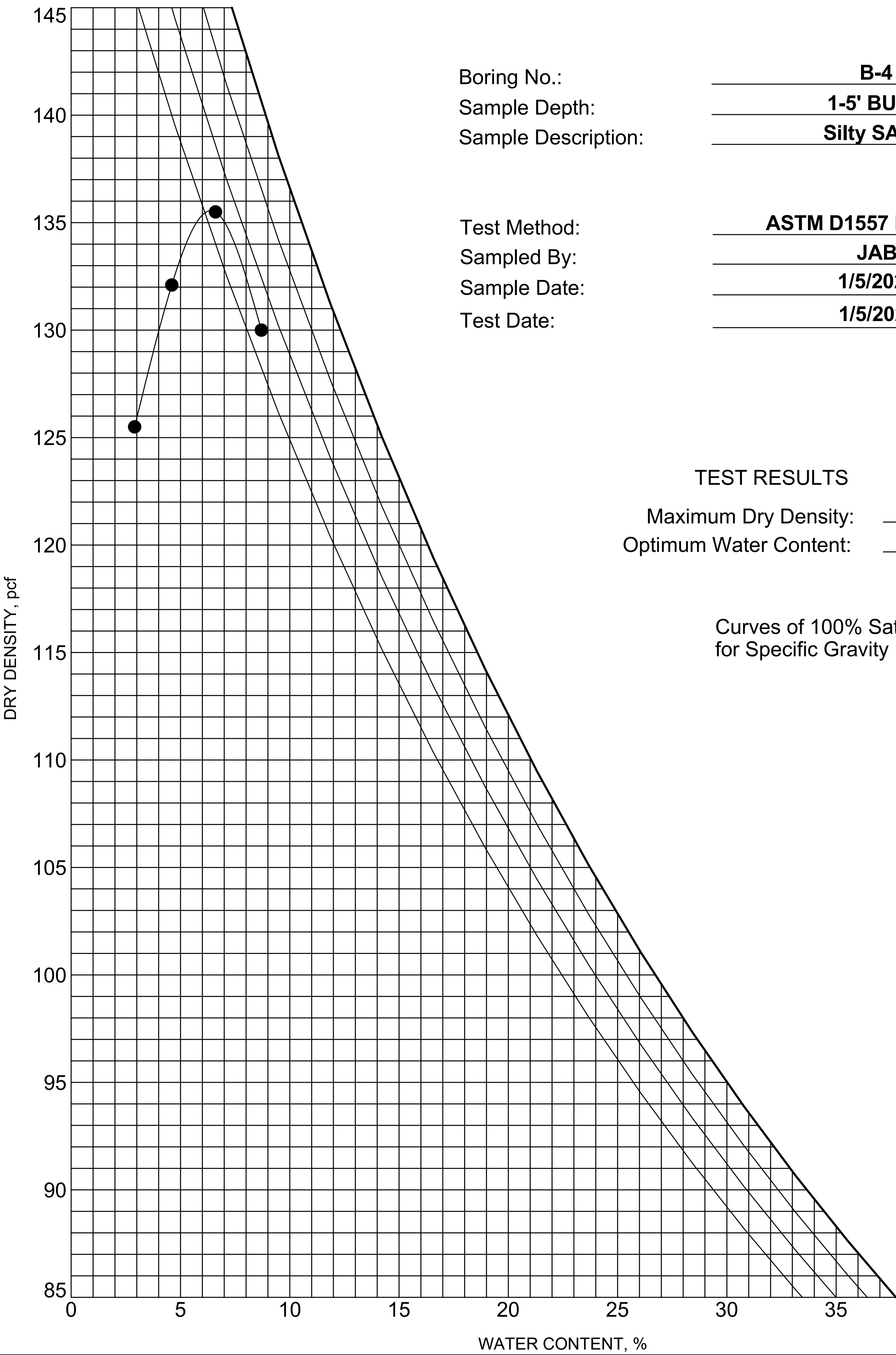
DIRECT SHEAR 200563.3 - UCR SCHOOL OF BUSINESS.GPJ TWINING LABS.GDT 1/19/21

TWINING

DIRECT SHEAR TEST

School of Business
University of California, Riverside
Riverside, California

PROJECT NO.	REPORT DATE	
200563.3	January 2021	FIGURE B-4



Boring No.:	**B-4**
Sample Depth:	**1-5' BULK**
Sample Description:	**Silty SAND**
Test Method:	**ASTM D1557 Method A**
Sampled By:	**JAB**
Sample Date:	**1/5/2021**
Test Date:	**1/5/2021**

TEST RESULTS

Maximum Dry Density: **135.5** **pcf**

Optimum Water Content: **6.5** **%**

Curves of 100% Saturation
for Specific Gravity Equal to:

2.80

2.70

2.60

2.50

COMPACTION (MODIFIED BY PAUL) 200563.3 - UCR SCHOOL OF BUSINESS.GPJ TWINING LABS.GDT 1/19/21

TWINING

MOISTURE-DENSITY RELATIONSHIP

School of Business
University of California, Riverside
Riverside, California

PROJECT NO.	REPORT DATE	FIGURE B-5
200563.3	January 2021	

ANAHEIM TEST LAB, INC.

196 Technology Drive, Unit D
Irvine, CA 92618
Phone (949)336-6544

DATE: 1/11/2021

TWINING LABS
3310 AIRPORT WAY
LONG BEACH, CA 90806

P.O. NO: Soils01052021

LAB NO: C-4413

SPECIFICATION: CTM-643/417/422

MATERIAL: Soil

Project No.: 200563.3
Project Name: UCR School of Business
WO#: W01-21-00127
Date sampled: 12/21/2020
Sample ID: Bag of Soil

ANALYTICAL REPORT

CORROSION SERIES

SUMMARY OF DATA

pH	MIN. RESISTIVITY per CT. 643 ohm-cm	SOLUBLE SULFATES per CT. 417 ppm	SOLUBLE CHLORIDES per CT. 422 ppm
9.5	1,300	366	126

RESPECTFULLY SUBMITTED

WES BRIDGER LAB MANAGER

Appendix G

Preliminary Geotechnical Investigation

PRELIMINARY GEOTECHNICAL INVESTIGATION
PROPOSED BIOCONTROL BUILDING AND
GENOMICS SHED RELOCATION PROJECT
UNIVERSITY OF CALIFORNIA, RIVERSIDE

PROJECT NO. 53805.1
APRIL 1, 2022

Prepared For:

TKE Engineering, Inc.
2305 Chicago Avenue
Riverside, California 92507

Attention: Ms. Jeannette Barlow

April 1, 2022

TKE Engineering, Inc.
2305 Chicago Avenue
Riverside, California 92507

Project No. 53805.1

Attention: Ms. Jeannette Barlow

Subject: Preliminary Geotechnical Investigation, Proposed Biocontrol Building and Genomics Shed Relocation Project, University of California, Riverside.

LOR Geotechnical Group, Inc., is pleased to present this report of our geotechnical investigation for the subject project. In summary, it is our opinion that the proposed development is feasible from a geotechnical perspective, provided the recommendations presented in the attached report are incorporated into design and construction. However, the contents of this summary should not be solely relied upon.

To provide adequate support for the proposed structures, we recommend that a compacted fill mat be constructed beneath footings and slabs. The compacted fill mat will provide a dense, high-strength soil layer to uniformly distribute the anticipated foundation loads over the underlying soils. Any undocumented fill material and any loose colluvial materials should be removed from structural areas and areas to receive engineered compacted fills. The data developed during this investigation indicates that removals on the order of approximately 3 feet deep will be required from proposed Genomics Shed development area in order to encounter competent colluvium and/or bedrock upon which engineered compacted fill can be placed. The data developed during this investigation indicates that removals on the order of 10 to 15 feet deep will be required from proposed Biocontrol Building development area in order to encounter competent colluvium and/or bedrock upon which engineered compacted fill can be placed. The given removal depths are preliminary and the actual depths of the removals should be determined during the grading operation by observation and/or in-place density testing.

Very low expansion potential and negligible soluble sulfate content generally characterize the onsite materials tested. Near completion and/or at the completion of site grading, additional foundation and subgrade soils should be tested, as necessary, to verify their expansion potential and soluble sulfate content.

LOR Geotechnical Group, Inc.

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INTRODUCTION

During March and April of 2022, a Preliminary Geotechnical Investigation was performed by LOR Geotechnical Group, Inc., for the proposed Biocontrol Building and Genomics Shed relocation project within the University of California, Riverside campus. The purpose of this investigation was to provide a technical evaluation of the geologic setting of the site and to provide geotechnical design recommendations for the proposed development. The scope of our services included:

- Review of available geotechnical literature, reports, maps, and agency information pertinent to the study area;
- Interpretation of aerial photographs of the site and surrounding regions dated 1948 through 2021;
- Geologic field reconnaissance mapping to verify the aerial distribution of earth units and significance of surficial features as compiled from documents, literature, and reports reviewed;
- A subsurface field investigation to determine the physical soil conditions pertinent to the proposed development;
- Laboratory testing of selected soil samples obtained during the field investigation;
- Development of geotechnical recommendations for site grading and foundation design; and
- Preparation of this report summarizing our findings, and providing conclusions and recommendations for site development.

The approximate location of the site areas are shown on the attached Index Map, Enclosure A-1, within Appendix A.

PROJECT CONSIDERATIONS

To orient our investigation at the site, a partial campus map prepared was furnished for our use. The existing improvements such as buildings, driveways, and parking lots were indicated on this plan. This plan was utilized as a base map for our field investigation and is presented as Enclosure A-2, within Appendix A.

Specific details regarding the proposed structures; i.e. footprint, specific location, foundation type, etc., are not known at this time. However, the buildings are anticipated to be constructed utilizing conventional foundation systems and light to moderate foundation loads are anticipated with such structures.

Grading plans have not yet been developed. However, based on the current topography of the site and adjacent areas, minor cuts and fills are anticipated to create a level surface for the proposed Genomics Shed while moderate cuts and fills are anticipated to create a level surface for the proposed Biocontrol Building.

AERIAL PHOTO ANALYSIS

The aerial photographs reviewed consisted of vertical aerial photograph images of varying scales. We reviewed imagery available from Google Earth Pro (2022) computer software and from online Historic Aerials (2022).

To summarize briefly, the location of the proposed Genomics Shed has been vacant land used as storage throughout the years from 1959, the earliest photograph available, until the 2021 photograph.

The location of the proposed Biocontrol Building has had a more extensive history. The 1948 photograph shows several structures partially within the area; one within the far north portion, another structure in the far western portion, and a smaller structure within the eastern portion. The 2002 photograph shows only the structure partially located on the site in the north portion as being present. The existing Entomology Building was built prior to 2002 in its current day location to the south and west of the project area. The structure which was partially within the northern portion of the area was removed prior to 2004. The current day Genomics Building was present in the 2009 photograph and since that time, the remaining photographs show the area in a condition similar to that seen today.

No evidence for the presence of faults traversing the site areas or mass movement features was noted during our review of the photographs covering the site areas and nearby vicinity.

EXISTING SITE CONDITIONS

The area of the proposed Genomics Shed lies along the northern edge of an existing bedrock knob. The area has been cut down a few feet and is relatively planar with a lower, approximately 1 foot terraced northern portion. A trash truck, dumpster, and plant debris were currently present in this area. College Place, a small paved roadway bounds the site on the east with a structure beyond (Lath House #8). A structure is present to the north (Lath House #4). The area to the west is vacant, native land along the toe of a bedrock knob that ascends southward approximately 100 feet above the site area.

The area of the proposed Biocontrol Building consists of gently sloping topography with abundant landscaping comprised of heavy low lying shrubs and trees. The topography descends westward at gentle gradients of approximately 5 horizontal to 1 vertical. Retaining walls bound the area on the north, west, and south. An access drive with parking stalls bounds the site on the east.

SUBSURFACE FIELD INVESTIGATION

Our subsurface field exploration program was conducted on March 18, 2022. The work consisted of advancing a total of 4 exploratory borings using a truck-mounted drill rig equipped with 8-inch diameter hollow stem augers. The approximate locations of our exploratory borings are presented on Enclosure A-2, within Appendix A.

The subsurface conditions encountered in the exploratory borings were logged by a geologist from this firm. The borings were drilled to maximum depths of approximately 16 to 25 feet below the existing ground surface. Relatively undisturbed and bulk samples were obtained at a maximum depth interval of 5 feet, and returned to our geotechnical laboratory in sealed containers for further testing and evaluation.

A detailed description of the subsurface field exploration program and the boring logs are presented in Appendix B.

LABORATORY TESTING PROGRAM

Selected soil samples obtained during the field investigation were subjected to geotechnical laboratory testing to evaluate their physical and engineering properties. Laboratory testing included in-place moisture content and dry density, laboratory compaction characteristics, direct shear, expansion index, and corrosion. A detailed description of the geotechnical laboratory testing program and the test results are presented in Appendix C.

GEOLOGIC CONDITIONS

Regional Geologic Setting

The subject site is situated along the far northern portion of the Peninsular Ranges Geomorphic Province of southern California. The Peninsular Ranges Geomorphic Province is composed of a series of northwest trending mountain ranges, such as the Santa Ana Mountains and the San Jacinto Mountains, separated by longitudinal valleys. Locally, the site is located within the Perris plain which is the central valley within the two aforementioned mountain ranges. The Perris plan is generally defined as valley area west of the San Jacinto fault zone and east of the Elsinore fault zone. The Perris plain is considered to be a relatively stable area underlain predominately by Cretaceous aged plutonic rocks which are part of the Peninsular Ranges batholith. These contain a wide variety of composition ranging from the monzongranite to gabbro. However, the predominate igneous rock tends to be of a tonalite composition, a hard igneous rock similar to granite but with very little alkali felspar minerals. While the Perris plain is generally described as a valley, it does contain many smaller mountain ranges and large hilly regions which are erosional remnants of more resistant igneous rocks like the area of the site, the Box Springs Mountains to the east and Jurupa Hills to the west. Erosion of these areas has resulted in the deposition of various units of alluvial materials across the lower lying portions of the valley region.

The nearest known active fault in relation to the site is San Jacinto fault located approximately 8.2 kilometers (5.1 miles) to the northeast. Other active faults in the region include the San Andreas fault zone, the Elsinore fault zone, and the Cucamonga fault zone.

The regional geologic setting on the site, as mapped by the USGS (Morton and Cox, 2001) is shown on Enclosure A-5, within Appendix A.

Site Geologic Conditions

Genomics Shed

Fill: Fill materials were encountered within our exploratory borings to depths of approximately 0.5 feet. The fill materials are believed to be associated with current use as a storage area for landscape debris. As encountered, the fill materials were comprised of silty sand which was predominantly brown, dry, and in a loose state.

Colluvium: Colluvial materials were encountered underlying the fill materials described above within our exploratory borings. The colluvial soils were encountered to a maximum depth of approximately 15 feet and rest upon igneous bedrock materials. These units were noted to mainly consist of silty sand in a relatively medium dense to very dense state based on our equivalent Standard Penetration Test (SPT) data and in-place density testing. Expansion index testing indicates that these materials will have a very low expansion potential when used as compacted fill.

Bedrock: Igneous bedrock materials were encountered within our exploratory borings at depths of approximately 6.5 to 15 feet. The igneous bedrock was typically coarse grained, slightly to moderately weathered upon first encounter becoming less weathered with depth, dry to damp, and in a hard to very hard state based on our equivalent Standard Penetration Test (SPT) data and in-place density testing.

Biocontrol Building

Fill: Fill materials were encountered within our exploratory borings to depths of approximately 5 to 15 feet. The fill materials are believed to be associated with past grading of the site which previously contained structures. As encountered, the fill materials were comprised of silty sand which was predominantly brown, dry, and contained some gravel size concrete debris.

Colluvium: Colluvial materials were encountered underlying the fill materials described above within our exploratory borings. The colluvial soils were encountered to a maximum depth of approximately 18 feet and rest upon igneous bedrock materials. These units were noted to mainly consist of silty sand in a relatively loose to dense state based on our equivalent Standard Penetration Test (SPT) data and in-place density testing. Expansion index testing indicates that these materials will have a very low expansion potential when used as compacted fill.

Bedrock: Igneous bedrock materials were encountered within our exploratory borings at depths of approximately 16 to 18 feet. The igneous bedrock was typically coarse grained, slightly to moderately weathered upon first encounter becoming less weathered with depth, dry to damp, and in a hard to very hard state based on our equivalent Standard Penetration Test (SPT) data and in-place density testing.

A detailed description of the subsurface soil conditions as encountered within our exploratory borings, is presented on the Boring Logs within Appendix B.

Groundwater Hydrology

Groundwater was not encountered within any of our exploratory borings as advanced to a maximum depth of approximately 25 feet below the existing ground surface nor was any groundwater seepage observed during our site reconnaissance.

In order to estimate the approximate depth to groundwater in the site area, a search was conducted for local groundwater (well) level measurements within the Cooperative Well Measuring Program, Spring 2021 (Watermaster Support Services et al., 2021). This database contains depth to groundwater measurements dating back to 1993. We also conducted a search of the water well database information provided in the California Department of Water Resources (CDWR) Water Library Data website (CDWR, 2022).

No nearby water wells were found from either database.

Because the site is underlain by bedrock at shallow depths, groundwater may be present only as groundwater seeps within bedrock fractures at the site. Groundwater may seep into the bedrock beneath the site region along fractures and joints within the bedrock, the presence of hard bedrock beneath the site generally precludes the development of groundwater conditions or a groundwater table in these areas. Any groundwater that might be encountered during site development would likely be the result of infiltration of surface waters/irrigation waters traveling downward into the bedrock along these joints and fractures.

Mass Movement

The project area lies on a relatively flat surface. The occurrence of mass movement failures such as landslides, rockfalls, or debris flows within such areas is generally not considered common, and no evidence of mass movement was observed on the site. The adjacent hill side to the south of the proposed Genomics Shed contains numerous boulder outcrops. The occurrence of mass movement failures such as landslides, rockfalls of debris flows within such areas cannot be completely ruled out. However, no landslides or debris flows were noted on the referenced geologic map of the site, nor was any geomorphic evidence of such noted during our site reconnaissance nor aerial photograph review. The regional bedrock is composed predominately of massive igneous bedrock. Such units typically have high strength characteristics which tends to lessen the occurrence of mass movements. It should be noted that during our study there were no large rocks lying loose on the site or in the immediate area. This would appear to indicate that rockfalls /rolling boulders are not a common occurrence on these slopes.

Faulting

No active or potentially active faults are known to exist at the subject site. In addition, the subject site does not lie within a current State of California Earthquake Fault Zone (Hart and Bryant, 2003) nor does the site lie within a County of Riverside fault zone (CRTLMA, 2022). No evidence of faulting projecting into or crossing the site was noted during our aerial photograph review or our review of published geologic maps.

As previously mentioned, the closest known active earthquake fault with a documented location is the San Jacinto fault located approximately 8.2 kilometers (5.1 miles) to the northeast. In addition, other relatively close active faults include the San Andreas fault located approximately 22.0 kilometers (13.6 miles) to the northeast, the Cucamonga fault located approximately 25.4 kilometers (15.8 miles) to the north-northwest, and the Elsinore fault located approximately 26.6 kilometers (16.5 miles) to the southwest.

The closest fault to the site, the San Jacinto fault, is one of the major tectonic features in the region, second only to the San Andreas in terms of length, slip rate, and potential earthquakes. The San Jacinto fault zone is a sub-parallel branch of the San Andreas fault zone, extending from the northwestern San Bernardino area, southward into the El Centro region. Within the Peninsular Ranges Province, this fault serves as the eastern boundary of the aforementioned Perris Block. It is one of the most active faults in California with several large magnitude events in recent time. It is believed that the San Jacinto fault is capable of producing an earthquake magnitude on the order of 6.7 or greater.

The San Andreas fault is considered to be the major tectonic feature of California, separating the Pacific Plate and the North American Plate. While estimates vary, the San Andreas fault is generally thought to have an average slip rate on the order of 24mm/yr and capable of generating large magnitude events on the order of 7.5.

The Cucamonga fault is considered to be part of the Sierra Madre fault system which marks the southern boundary of the San Gabriel Mountains. This is a north dipping thrust fault which is believed to be responsible for the uplift of the San Gabriel Mountains. It is believed that the Cucamonga fault is capable of producing an earthquake magnitude on the order of 7.0 or greater.

The Elsinore fault zone is one of the largest in southern California. At its northern end it splays into two segments and at its southern end it is cut by the Yuba Wells fault. The primary sense of slip along the Elsinore fault is right lateral strike-slip. It is believed that the Elsinore fault zone is capable of producing an earthquake magnitude on the order of 6.5 to 7.5.

Current standards of practice included a discussion of all potential earthquake sources within a 100 kilometer (62 mile) radius. However, while there are other large earthquake faults within a 100 kilometer (62-mile) radius of the site, none of these are considered as relevant to the site as the faults described above, due to their closer distance and larger anticipated magnitudes.

Historical Seismicity

In order to obtain a general perspective of the historical seismicity of the site and surrounding region a search was conducted for seismic events at and around the area within various radii. This search was conducted utilizing the historical seismic search website of the U.S.G.S. (2022). This website conducts a search of a user selected cataloged seismic events database, within a specified radius and selected magnitudes, and then plots the events onto a map. At the time of our search, the database contained data from January 1, 1932 through March 29, 2022. A point located between the two proposed development areas was chosen as the center point for the data.

In our first search, the general seismicity of the region was analyzed by selecting an epicenter map listing all events of magnitude 4.0 and greater, recorded since 1932, within a 100 kilometer (62 mile) radius of the site, in accordance with guidelines of the California Division of Mines and Geology. This map illustrates the regional seismic history of moderate to large events. As depicted on Enclosure A-4, within Appendix A, the site lies within a relatively active region associated with the San Jacinto fault to the northeast.

In the second search, the micro seismicity of the area lying within a 10 kilometer (6.2 miles) radius of the site was examined by selecting an epicenter map listing events on the order of 2.0 and greater since 1978. In addition, only the “A” events, or most accurate events were selected. Caltech indicates the accuracy of the “A” events to be approximately 1 kilometer. The result of this search is a map that presents the seismic history around the area of the site with much greater detail, not permitted on the larger map. The reason for limiting the time period for the events on the detail map is to enhance the accuracy of the map. Events recorded prior to the mid to late1970's are generally considered to be less accurate due to advancements in technology. As depicted on this map, Enclosure A-5, the Elsinore fault zone to the southwest and the San Jacinto fault zone to the northeast appears to be the source of numerous events.

In summary, the historical seismicity of the site entails numerous small to medium magnitude earthquake events occurring in the region around the subject site. Any future developments at the subject site should anticipate that moderate to large seismic events could occur very near the site.

Secondary Seismic Hazards

Other secondary seismic hazards generally associated with severe ground shaking during an earthquake include liquefaction, seismic-induced settlement, seiches and tsunamis, earthquake induced flooding, landsliding, and rockfalls.

Liquefaction: The proposed area of the Biocontrol Building lies within an area mapped by the County of Riverside as having a low potential for liquefaction while the proposed area of the Geonomics Shed is mapped by the same source as having no potential for liquefaction (CRTLMA, 2022). The City of Riverside mapped both areas as having a low potential for liquefaction.

The potential for liquefaction generally occurs during strong ground shaking within granular loose sediments where the groundwater is usually less than 50 feet below the ground surface. As found during this investigation, the site is underlain by relatively shallow igneous bedrock in the upper 50 feet, therefore, the possibility of liquefaction at the site is considered nil.

Seiches/Tsunamis: The potential for the site to be affected by a seiche or tsunami (earthquake generated wave) is considered nil due to absence of any large bodies of water near the site. An open, in-ground reservoir is present approximately 50 feet to the northeast of the proposed Genomics Shed site and lies approximately 10 feet lower when full than the proposed Genomics Shed site. However, due to the distance and lower elevation, a seiche from this source to adversely affect the proposed Geonomics Shed site is considered very low.

Flooding (Water Storage Facility Failure): There are no large water storage facilities located on or above the sites which could possibly rupture during in earthquake and affect the site by flooding. When full, the existing open, in-ground reservoir near the proposed Genomics Shed is approximately 10 feet lower than the Genomics Shed site.

Seismically-Induced Landsliding: Due to the low relief of the proposed Biocontrol Building site and surrounding region, the potential for landslides to occur at the site is considered nil.
As previously mentioned, the proposed Genomics Shed site is situated along the northern toe of an adjacent hillside. The occurrence of mass movement failures such as landslides, rockfalls or debris flows within such areas cannot be completely ruled out. However, no landslides or debris flows were noted on the referenced geologic map of the site, nor was any geomorphic evidence for such noted during our site reconnaissance and aerial

photograph review. The regional bedrock is composed predominately of igneous bedrock and these materials typically have high strength characteristics which tend to lessen the occurrence of mass movements.

Rockfalls: No large, exposed, loose or unrooted boulders are present above the proposed Biocontrol Building site that could affect the integrity of that site. However, the hillside adjacent to the proposed Genomics Shed site on the south was noted to be covered with numerous moderate to very large exposed, rounded, boulders. Therefore, there is a potential that these may become loosened by weathering of the underlying soils and bedrock units and/or become dislodged during a large earthquake and roll down the hillside. It should be noted that during our study we did not observe any large rocks lying loose on the site. This indicates that rockfalls/rolling boulders are not a common occurrence on these slopes. However, the potential for a rockfall or rolling boulder at the site cannot be completely ruled out.

Seismically-Induced Settlement: Settlement generally occurs within areas of loose, granular soils with relatively low density. Since the site is underlain by hard igneous bedrock and the recommended earthwork operations to be conducted during the development of the site will mitigate any near surface loose soil conditions, the potential for settlement is considered very low.

SOILS AND SEISMIC DESIGN CRITERIA (California Building Code 2019)

Design requirements for structures can be found within Chapter 16 of the 2019 California Building Code (CBC) based on building type, use, and/or occupancy. The classification of use and occupancy of all proposed structures at the site, shall be the responsibility of the building official.

Site Classification

Chapter 20 of the ASCE 7-16 defines six possible site classes for earth materials that underlie any given site. Bedrock is assigned one of three of these six site classes and these are: A, B, or C. Soil is assigned as C, D, E, or F. Per ASCE 7-16, Site Class A and Site Class B shall be measured on-site or estimated by a geotechnical engineer, engineering geologist or seismologist for competent rock with moderate fracturing and weathering. Site Class A and Site Class B shall not be used if more than 10 feet of soil is between the rock surface and bottom of the spread footing or mat foundation. Site Class C can be used for very dense soil and soft rock with Ñ values greater than 50 blows per foot. Site Class D can be used for stiff soil with Ñ values ranging from 15 to 50 blows per foot. Site Class E is for soft clay soils with Ñ values less than 15 blows per foot. Our current investigation, mapping by others, and our experience in the site region indicates that the materials beneath the site are considered Site Class C very dense soil/soft rock.

CBC Earthquake Design Summary

Earthquake design criteria have been formulated in accordance with the 2019 CBC and ASCE 7-16 for the site based on the results of our investigation to determine the Site Class and an assumed Risk Category II. However, these values should be reviewed and the final design should be performed by a qualified structural engineer familiar with the region. In addition, the building official should confirm the Risk Category utilized in our design (Risk Category II). Our design values are provided below:

CBC 2019 SEISMIC DESIGN SUMMARY* Site Location** (USGS WGS84) 33.97008, -117.32489, Risk Category II	
Site Class Definition Chapter 20 ASCE 7	C
$\mathbf{S_s}$ Mapped Spectral Response Acceleration at 0.2s Period	1.5
$\mathbf{S_1}$ Mapped Spectral Response Acceleration at 1s Period	0.6
$\mathbf{S_{MS}}$ Adjusted Spectral Response Acceleration at 0.2s Period	1.8
$\mathbf{S_{M1}}$ Adjusted Spectral Response Acceleration at 1s Period	0.84
$\mathbf{S_{DS}}$ Design Spectral Response Acceleration at 0.2s Period	1.2
$\mathbf{S_{D1}}$ Design Spectral Response Acceleration at 1s Period	0.56
$\mathbf{F_a}$ Short Period Site Coefficient at 0.2s Period	1.2
$\mathbf{F_v}$ Long Period Site Coefficient at 1s Period	1.4
$\mathbf{PGA_M}$ Site-modified peak ground acceleration	0.735
Seismic Design Category	D
*Values obtained from OSHPD Seismic Design Maps tool **Midpoint between the two proposed development areas	

CONCLUSIONS

This investigation provides a broad overview of the geotechnical and geologic factors which are expected to influence future site planning and development. On the basis of our field investigation and testing program, it is the opinion of LOR Geotechnical Group, Inc., that the proposed development of the site for the proposed use is feasible from a geotechnical standpoint, provided the recommendations presented in this report are incorporated into design and implemented during grading and construction.

It should be noted that the subsurface conditions encountered in our exploratory borings are indicative of the locations explored and the subsurface conditions may vary. If conditions are encountered during the construction of the project that differ significantly from those presented in this report, this firm should be notified immediately so we may assess the impact to the recommendations provided.

Rippability of Bedrock Units

The rippability of the bedrock units at the subject site was estimated based on the relative ease, or lack of, excavation during our boring exploration. The bedrock units that underlie the site are anticipated to be rippable by conventional earthmoving equipment down to the depths explored. Excavations deeper than this may require specialized methods, such as D8R or larger dozer using a multi or single shank ripper. It is also anticipated that some larger non-rippable rock "floaters" may be encountered. These may require special handling. Excavations in these materials may require specialized methods.

If a more precise estimation of the rippability of the bedrock units is required, a seismic refraction investigation should be conducted at the site. Such a study should involve the measuring of the seismic velocities of the underlying bedrock units, as they increase with depth, then comparing these to estimates of velocities verses ease of excavation charts.

In summary, the most important consideration for the proposed grading should include selecting an experienced, well-qualified contractor. The success to excavating the bedrock materials at the site will require the contractor to have knowledge of the appropriate ripper-equipment selection (i.e., down pressure available at the tip, tractor flywheel horsepower, tractor gross weight, etc.), ripping techniques (i.e., single- or multi-shank teeth, pass spacing, tandem pushing, etc.). It should also be noted that while in some areas where deeper cuts may be possible with standardized earthmoving equipment, specialized methods may increase the speed of the excavations at the site.

Foundation Support

To provide adequate support for the proposed structure we recommend that a compacted fill mat be constructed beneath footings and slabs. The compacted fill mat will provide a dense, high-strength soil layer to uniformly distribute the anticipated foundation loads over the underlying soils. The construction of this compacted fill mat will allow for the removal of the existing fill material which was loose and any current subsurface improvements, such as utilities, foundations, etc., that may be present locally.

Conventional foundation systems utilizing either individual spread footings and/or continuous wall footings will provide adequate support for the anticipated downward and lateral loads when utilized in conjunction with the recommended fill mat.

Soil Expansiveness

Our expansion index testing of representative samples of the on-site soils indicates a very low expansion potential. Therefore, specialized foundation design and construction procedures to specifically resist expansive soil activity are anticipated at this time and are provided within.

Careful evaluation of onsite soils and any import fill for their expansion potential should be conducted during the grading operation.

Soil Corrosion

The results of the corrosion tests conducted on selected subgrade soils expected to be encountered at foundation levels indicates exposure class S0 for sulfate and C1 for chlorides. Therefore, mitigation measures are necessary for concrete elements to be in contact with the onsite soils due to the exposure class for chlorides. In addition, the soils are considered moderately corrosive to ferrous metals and potentially aggressive towards copper.

LOR Geotechnical Group, Inc., does not practice corrosion engineering. If further information concerning the corrosion characteristics, or interpretation of the results submitted herein, is required, then a competent corrosion engineer should be consulted.

Geologic Mitigations

No special mitigation methods are deemed necessary at this time, other than the geotechnical recommendations provided in the following sections.

Seismicity

Seismic ground rupture is generally considered most likely to occur along pre-existing active faults. Since no known faults are known to exist at, or project into the site, the probability of ground surface rupture occurring at the site is considered nil.

Due to the site's close proximity to the faults described above, it is reasonable to expect a relatively strong ground motion seismic event to occur during the lifetime of the proposed development on the site. Large earthquakes could occur on other faults in the general area, but because of their lesser anticipated magnitude and/or greater distance, they are considered less significant than the faults described above from a ground motion standpoint.

The effects of ground shaking anticipated at the subject site should be mitigated by the seismic design requirements and procedures outlined in Chapter 16 of the California Building Code. However, it should be noted that the current building code requires the minimum design to allow a structure to remain standing after a seismic event, in order to allow for safe evacuation. A structure built to code may still sustain damage which might ultimately result in the demolishing of the structure (Larson and Slosson, 1992).

No secondary seismic hazards are anticipated to impact the proposed development.

RECOMMENDATIONS

Geologic Recommendations

No special geologic recommendations are deemed necessary at this time, other than the geotechnical recommendations provided in the following sections.

General Site Grading

It is imperative that no clearing and/or grading operations be performed without the presence of a qualified geotechnical engineer. An onsite, pre-job meeting with the developer, the contractor, the jurisdictional agency, and the geotechnical engineer should occur prior to all grading related operations.

Operations undertaken at the site without the geotechnical engineer present may result in exclusions of affected areas from the final compaction report for the project.

Grading of the subject site should be performed in accordance with the following recommendations as well as applicable portions of the California Building Code, and/or applicable local ordinances.

All areas to be graded should be stripped of significant vegetation and other deleterious materials.

Any undocumented fill encountered during grading should be completely removed, cleaned of significant deleterious materials, and may be reused as compacted fill. It is our recommendation that any existing fills under any proposed flatwork and paved areas be removed and replaced with engineered compacted fill. If this is not done, premature structural distress (settlement) of the flatwork and pavement may occur.

Cavities created by removal of subsurface obstructions should be thoroughly cleaned of loose soil, organic matter and other deleterious materials, shaped to provide access for construction equipment, and backfilled as recommended in the following Engineered Compacted Fill section of this report.

Initial Site Preparation

The existing fill material, as well as any loose colluvial soils and any loose bedrock, if encountered, should be removed from all proposed structural and/or fill areas. The data developed during this investigation indicates that removals on the order of 3 feet deep will be required from proposed Genomics Shed development area in order to encounter competent colluvium and/or bedrock upon which engineered compacted fill can be placed. The data developed during this investigation indicates that removals on the order of 10 to 15 feet deep will be required from proposed Biocontrol Building development area in order to encounter competent colluvium and/or bedrock upon which engineered compacted fill can be placed. The given removal depths are preliminary. Deeper fills may be present, primarily in areas of both current and past improvements. Removals should expose colluvial materials with an in-situ relative compaction of at least 85 percent (ASTM D 1557) or relatively unweathered, hard bedrock. The actual depths of the removals should be determined during the grading operation by observation and/or in-place density testing.

Preparation of Fill Areas

Prior to placing fill, the surfaces of all areas to receive fill underlain by colluvial materials should be scarified to a minimum depth of 6 inches. The scarified materials should be brought to near optimum moisture content and recompacted to a relative compaction of at least 90 percent (ASTM D 1557).

Engineered Compacted Fill

The onsite soils should provide adequate quality fill material, provided they are free from oversized and/or organic matter and other deleterious materials. Unless approved by the geotechnical engineer, rock or similar irreducible material with a maximum dimension greater than 6 inches should not be buried or placed in fills.

If required, import fill should be inorganic, non-expansive granular soils free from rocks or lumps greater than 6 inches in maximum dimension. Sources for import fill should be approved by the geotechnical engineer prior to their use. Fill should be spread in maximum 8-inch uniform, loose lifts, each lift brought to near optimum moisture content, and compacted to a relative compaction of at least 90 percent in accordance with ASTM D 1557.

For fills placed against existing slopes steeper than 5 horizontal to 1 vertical, the slopes should be properly keyed and benched into to expose competent native materials. Benches should be constructed at two to four foot vertical intervals.

Preparation of Foundation Areas

All footings should rest upon at least 24 inches of properly compacted fill material placed over competent colluvial soils and/or bedrock. In areas where the required fill thickness is not accomplished by the recommended removals or by site rough grading, the footing areas should be further subexcavated to a depth of at least 24 inches below the proposed footing base grade, with the subexcavation extending at least 5 feet beyond the footing lines. The bottom of all excavations exposing colluvial soils should be scarified to a depth of 6 inches, brought to near optimum moisture content, and recompacted to at least 90 percent relative compaction (ASTM D 1557) prior to the placement of compacted fill.

It should also be noted that no structure should be placed across any areas where the maximum depth of fill to minimum depth of fill is greater than a 3 to 1 ratio as measured from the bottom of the footing. For example, if grading of the building pad results in remedial removals and fill placements up to a depth of 12 feet below the base of the proposed footings, no structural areas should contain less than 4 feet of engineered fills below the base of footings.

Concrete floor slabs should bear on a minimum of 24 inches of compacted soil. This should be accomplished by the recommendations provided above. The final pad surfaces should be rolled to provide smooth, dense surfaces upon which to place the concrete.

Short-Term Excavations

Following the California Occupational and Safety Health Act (CAL-OSHA) requirements, excavations 5 feet deep and greater should be sloped or shored. All excavations and shoring should conform to CAL-OSHA requirements. Short-term excavations of 5 feet deep and greater shall conform to Title 8 of the California Code of Regulations, Construction Safety Orders, Section 1504 and 1539 through 1547. Based upon the findings from our exploratory borings, it appears that Type C soils are the predominant type of soil on the project and all short-term excavations should be based on this type of soil.

Deviation from the standard short-term slopes are permitted using option 4, Design by a Registered Professional Engineer (Section 1541.1).

Short-term excavation construction and maintenance are the responsibility of the contractor and should be a consideration of his methods of operation and the actual soil conditions encountered.

Slope Construction

Preliminary data indicates that cut and fill slopes should be constructed no steeper than two horizontal to one vertical. Fill slopes should be overfilled during construction and then cut back to expose fully compacted soil. A suitable alternative would be to compact the slopes during construction, then roll the final slopes to provide dense, erosion-resistant surfaces.

Slope Protection

Since the site soil materials are susceptible to erosion by running water, measures should be provided to prevent surface water from flowing over slope faces. Slopes at the project should be planted with a deep rooted ground cover as soon as possible after completion. The use of succulent ground covers such as iceplant or sedum is not recommended. If watering is necessary to sustain plant growth on slopes, then the watering operation should be monitored to assure proper operation of the irrigation system and to prevent over watering.

Soil Expansiveness

The upper materials encountered during this investigation were tested and found to have a very low expansion potential. Therefore, specialized foundation design and construction procedures to specifically resist expansive soil activity are anticipated at this time and are provided within.

Additional evaluation of on-site and any imported soils for their expansion potential should be conducted following completion of the grading operation.

Foundation Design

If the site is prepared as recommended, the proposed structure may be safely founded on conventional shallow foundations, either individual spread footings or continuous wall footings, bearing on a minimum of 24 inches of engineered compacted fill placed over competent older alluvial materials. Foundations should have a minimum width of 12 inches and should be established a minimum of 12 inches below lowest adjacent grade.

For the minimum width and depth, footings may be designed using a maximum soil bearing pressure of 2,000 pounds per square foot (psf) for dead plus live loads. Footings at least 15 inches wide, placed at least 18 inches below the lowest adjacent final grade, may be designed for a maximum soil bearing pressure of 2,400 psf for dead plus live loads.

The above values are net pressures; therefore, the weight of the foundations and the backfill over the foundations may be neglected when computing dead loads. The values apply to the maximum edge pressure for foundations subjected to eccentric loads or overturning. The recommended pressures apply for the total of dead plus frequently applied live loads, and incorporate a factor of safety of at least 3.0. The allowable bearing pressures may be increased by one-third for temporary wind or seismic loading. The resultant of the combined vertical and lateral seismic loads should act within the middle one-third of the footing width. The maximum calculated edge pressure under the toe of foundations subjected to eccentric loads or overturning should not exceed the increased allowable pressure. The buildings should be setback from slopes as indicted within the California Building Code (2019).

Resistance to lateral loads will be provided by passive earth pressure and base friction. For footings bearing against compacted fill, passive earth pressure may be considered to be developed at a rate of 290 pounds per square foot per foot of depth. Base friction may be computed at 0.29 times the normal load. Base friction and passive earth pressure may be combined without reduction. These values are for dead load plus live load and may be increased by one-third for wind or seismic loading.

Settlement

Total settlement of individual foundations will vary depending on the width of the foundation and the actual load supported. Maximum settlement of shallow foundations designed and constructed in accordance with the preceding recommendations are estimated to be on the order of 0.5 inch. Differential settlements between adjacent footings should be about one-half of the total settlement. Settlement of all foundations is expected to occur rapidly, primarily as a result of elastic compression of supporting soils as the loads are applied, and should be essentially completed shortly after initial application of the loads.

Building Area Slab-on-Grade

To provide adequate support, concrete floor slabs-on-grade should bear on a minimum of 24 inches of engineered fill compacted soil. The final pad surfaces should be rolled to provide smooth, dense surfaces.

Slabs to receive moisture-sensitive coverings should be provided with a moisture vapor retarder/barrier. We recommend that a vapor retarder/barrier be designed and constructed according to the American Concrete Institute 302.1R, Concrete Floor and Slab Construction, which addresses moisture vapor retarder/barrier construction. At a minimum, the vapor retarder/barrier should comply with ASTM E1745 and have a nominal thickness of at least 10 mils. The vapor retarder/barrier should be properly sealed, per the manufacturer's recommendations, and protected from punctures and other damage. Per the Portland Cement Association, for slabs with vapor-sensitive coverings, a layer of dry, granular material (sand) should be placed under the vapor retarder/barrier.

For slabs in humidity-controlled areas, a layer of dry, granular material (sand) should be placed above the vapor retarder/barrier.

The slabs should be protected from rapid and excessive moisture loss which could result in slab curling. Careful attention should be given to slab curing procedures, as the site area is subject to large temperature extremes, humidity, and strong winds.

Exterior Flatwork

To provide adequate support, exterior flatwork improvements should rest on a minimum of 12 inches of soil compacted to at least 90 percent (ASTM D 1557).

Flatwork surface should be sloped a minimum of 1 percent away from buildings and slopes, to approved drainage structures.

Wall Pressures

The design of footings for retaining walls should be performed in accordance with the recommendations described earlier under Preparation of Foundation Areas and Foundation Design. For design of retaining wall footings, the resultant of the applied loads should act in the middle one-third of the footing, and the maximum edge pressure should not exceed the basic allowable value without increase.

For design of retaining walls unrestrained against movement at the top, we recommend an active pressure of 45 pounds per square foot (psf) per foot of depth be used.

This assumes level backfill consisting of compacted, non-expansive, soils placed against the structures and within the back cut slope extending upward from the base of the stem at 35 degrees from the vertical or flatter. Non-expansive import soils may be required. Retaining structures subject to uniform surcharge loads within a horizontal distance behind the structures equal to the structural height should be designed to resist additional lateral loads equal to 0.44 times the surcharge load. Any isolated or line loads from adjacent foundations or vehicular loading will impose additional wall loads and should be considered individually.

To avoid over stressing or excessive tilting during placement of backfill behind walls, heavy compaction equipment should not be allowed within the zone delineated by a 45 degree line extending from the base of the wall to the fill surface. The backfill directly behind the walls should be compacted using light equipment such as hand operated vibrating plates and rollers. No material larger than three inches in diameter should be placed in direct contact with the wall.

Wall pressures should be verified prior to construction, when the actual backfill materials and conditions have been determined. Recommended pressures are applicable only to level, non-expansive, properly drained backfill with no additional surcharge loadings. If inclined backfills are proposed, this firm should be contacted to develop appropriate active earth pressure parameters.

Corrosion Potential

The results from the soil corrosivity testing completed by Project X Corrosion Engineering are presented within Appendix C and summarized in the table below:

SOIL CORROSIVITY RESULTS					
Boring	**Depth (feet)**	**pH**	**Sulfate (% by weight)**	**Chloride (% by weight)**	**Saturated Resistivity (ohm-cm)**
B-1	0-3	8.3	0.0163	0.0106	2,948
B-3	0-3	8.7	0.0186	0.0063	2,412

The corrosivity test results indicate that soluble sulfate concentrations in the samples were low (below 0.10). These low concentrations indicate an exposure class S0 for sulfate. No special mitigations methods necessary.

The corrosivity test results indicate that chloride concentrations in one sample was below 500 ppm. This concentration indicates an exposure class C1 for chloride. Mitigation measures necessary.

Soil pH for the sample was 8.3 and 8.7, mildly basic, respectively, therefore, the need for specialized design is not anticipated.

Concentrations of ammonium and nitrate indicate the soil may be slightly aggressive towards copper.

The electrical resistivity (resistance to the flow of electric current) is a major factor in determining the corrosivity of a soil sample. Corrosion currents are inversely proportional to soil resistivity, thus a lower resistivity value for a selected sample translates to a more corrosive material. A qualitative table of this correlation is presented below.

RESISTIVITY – CORROSIVITY CORRELATION	
Soil Resistivity (ohm-cm)	Corrosivity Category
10,000<	Mildly Corrosive
2,000 to 10,000	Moderately Corrosive
1,000 to 2,000	Corrosive
<1,000	Severely Corrosive

When soil is saturated, resistivity is at approximately its lowest value. Therefore, for the laboratory testing, measurements of resistivity were taken after saturation with distilled water. As shown in the table above, resistivity for the samples were on the order of 2,400 to 3,000 ohm-cm, which is considered moderately corrosive.

Based on the resistivity results above, this soil is classified as moderately corrosive to ferrous metals and potentially aggressive towards copper. The laboratory data above should be reviewed and corrosion design should be completed by a qualified corrosion engineer.

LOR Geotechnical Group, Inc., does not practice corrosion engineering. If further information concerning the corrosion characteristics, or interpretation of the results submitted herein, is required, then a competent corrosion engineer should be consulted

Construction Monitoring

Post investigative services are an important and necessary continuation of this investigation. Project plans and specifications should be reviewed by the project geotechnical consultant prior to construction to confirm that the intent of the recommendations presented in this report have been incorporated into the design.

Additional expansion and soluble sulfate content testing may be needed after/during site rough grading.

During construction, sufficient and timely geotechnical observation and testing should be provided to correlate the findings of this investigation with the actual subsurface conditions exposed during construction. Items requiring observation and testing include, but are not necessarily limited to, the following:

1. Site preparation-stripping and removals.

2. Excavations, including approval of the bottom of excavations prior to the processing and preparation of the bottom areas for fill placement.

3. Scarifying and recompacting prior to fill placement.

4. Placement of engineered compacted fill and backfill, including approval of fill materials and the performance of sufficient density tests to evaluate the degree of compaction being achieved

5. Foundation excavations.

6. Subgrade preparation for pavements and slabs-on-grade.

LIMITATIONS

This report contains geotechnical conclusions and recommendations developed solely for use by TKE Engineering, Inc., and their design consultants for the purposes described earlier. It may not contain sufficient information for other uses or the purposes of other parties. The contents should not be extrapolated to other areas or used for other facilities without consulting LOR Geotechnical Group, Inc.

The recommendations are based on interpretations of the subsurface conditions concluded from information gained from subsurface explorations and a surficial site reconnaissance. The interpretations may differ from actual subsurface conditions, which can vary horizontally and vertically across the site. If conditions are encountered during the construction of the project, which differ significantly from those presented in this report, this firm should be notified immediately so we may assess the impact to the recommendations provided. Due to possible subsurface variations, all aspects of field construction addressed in this report should be observed and tested by the project geotechnical consultant.

If parties other than LOR Geotechnical Group, Inc., provide construction monitoring services, they must be notified that they will be required to assume responsibility for the geotechnical phase of the project being completed by concurring with the recommendations provided in this report or by providing alternative recommendations.

The report was prepared using generally accepted geotechnical engineering practices under the direction of a state licensed geotechnical engineer. No warranty, expressed or implied, is made as to conclusions and professional advice included in this report. Any persons using this report for bidding or construction purposes should perform such independent investigations as deemed necessary to satisfy themselves as to the surface and subsurface conditions to be encountered and the procedures to be used in the performance of work on this project.

TIME LIMITATIONS

The findings of this report are valid as of this date. Changes in the condition of a property can, however, occur with the passage of time, whether they be due to natural processes or the work of man on this or adjacent properties. In addition, changes in the Standards-of-Practice and/or Governmental Codes may occur. Due to such changes, the findings of this report may be invalidated wholly or in part by changes beyond our control. Therefore, this report should not be relied upon after a significant amount of time without a review by LOR Geotechnical Group, Inc., verifying the suitability of the conclusions and recommendations.

CLOSURE

It has been a pleasure to assist you with this project. We look forward to being of further assistance to you as construction begins. Should conditions be encountered during construction that appear to be different than indicated by this report, please contact this office immediately in order that we might evaluate their effect.

Should you have any questions regarding this report, please do not hesitate to contact our office at your convenience.

Respectfully submitted,
LOR Geotechnical Group, Inc.

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Staff Geologist

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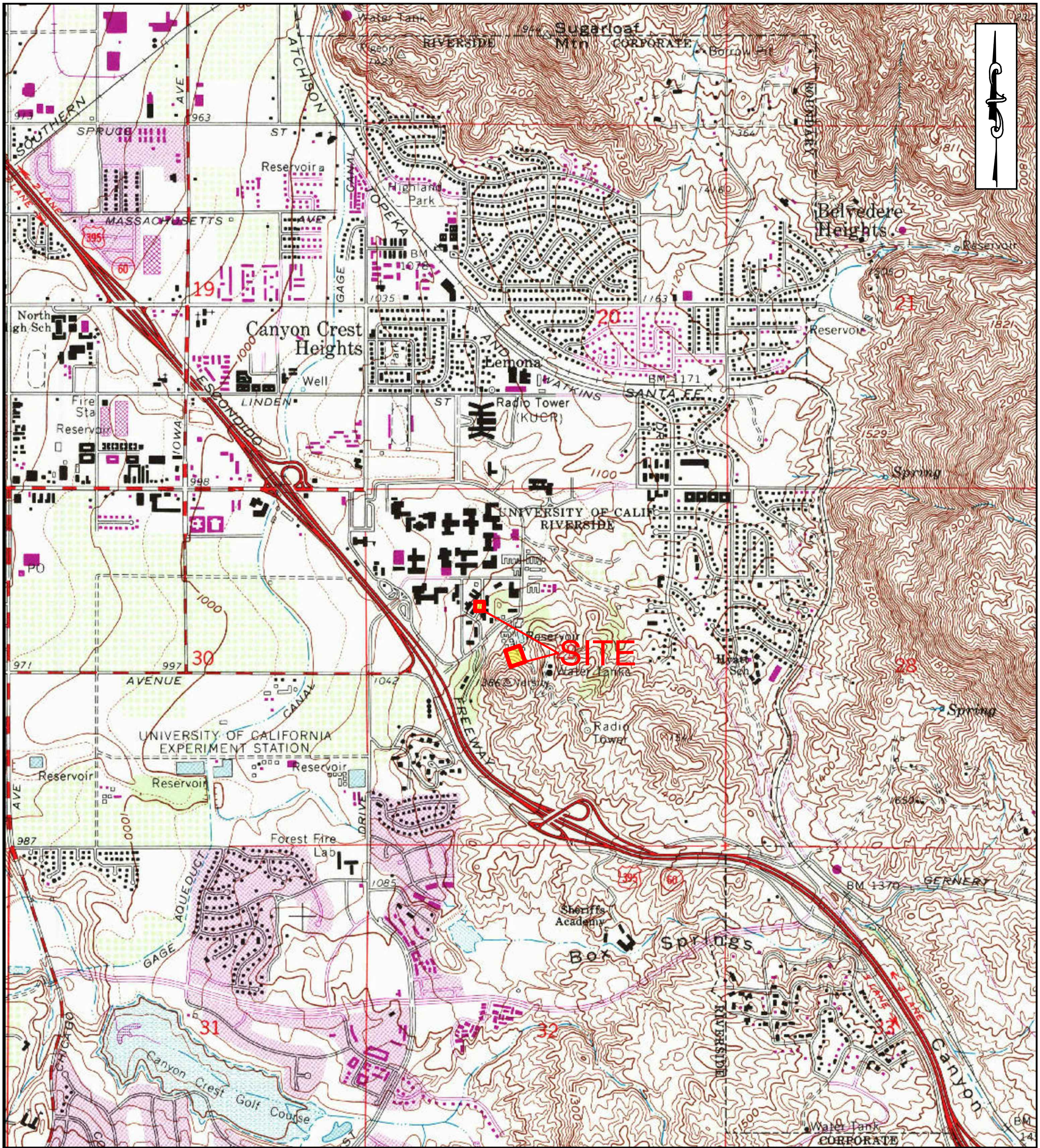
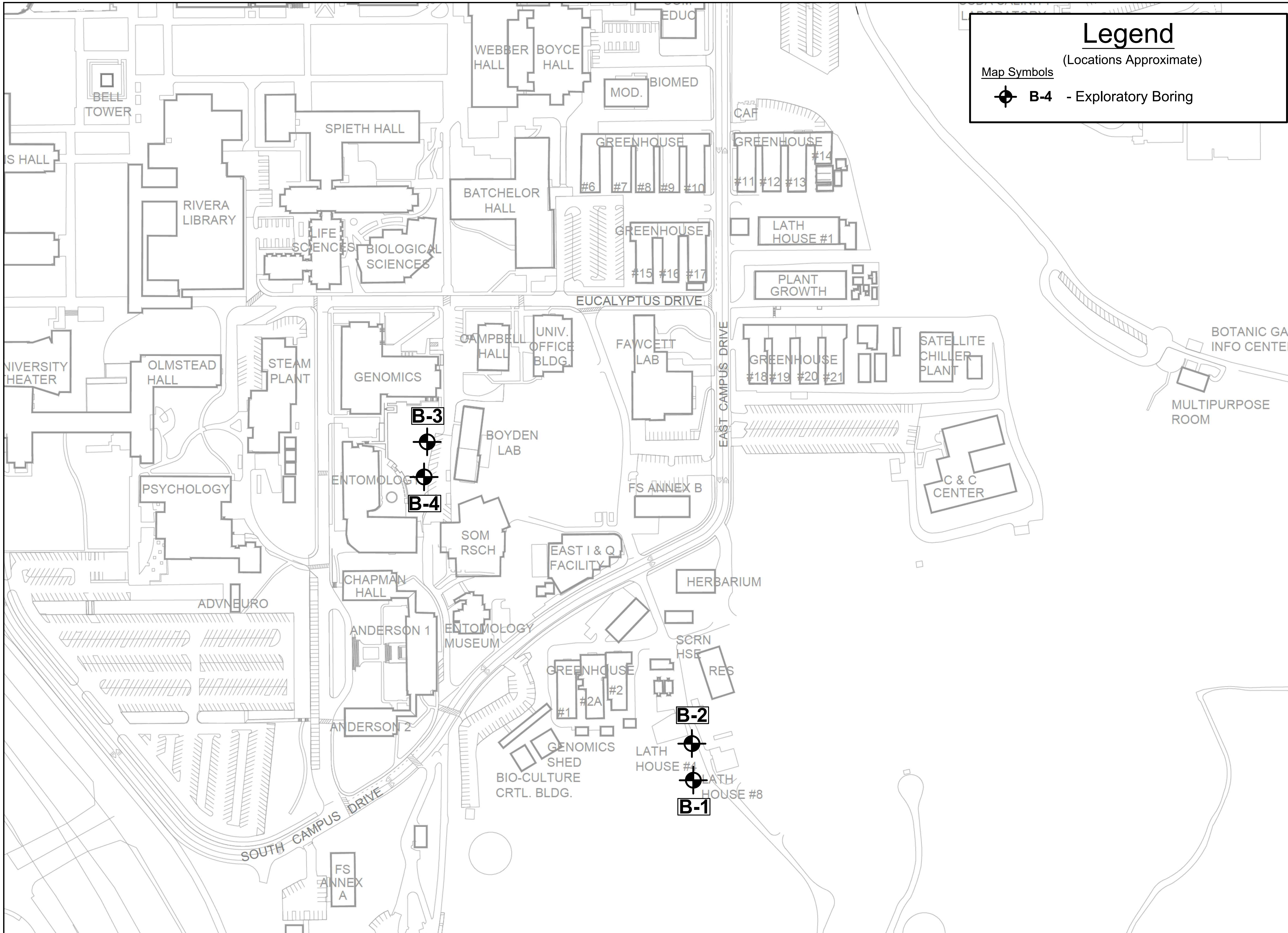
APPENDIX A

Index Map, Site Plan, Regional Geologic Map, and Historical Seismicity Maps



INDEX MAP

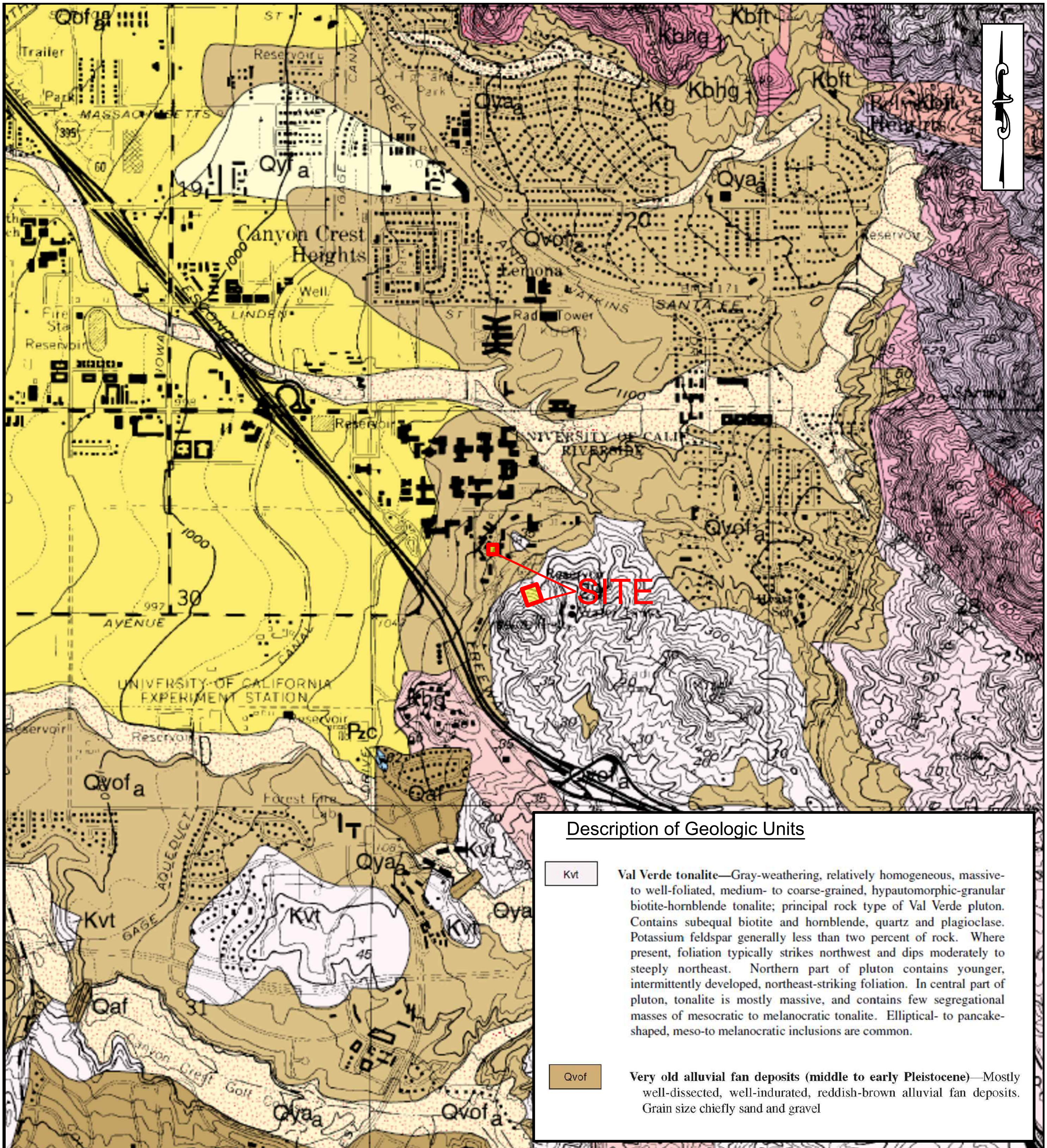
PROJECT:	Proposed Biocontrol Building and Geonomics Shed, UCR, Riverside, California	**PROJECT NO.:**	53805.1
CLIENT:	TKE Engineering, Inc.	**ENCLOSURE:**	A-1
LOR GEOTECHNICAL GROUP, INC.		**DATE:**	April 2022
		SCALE:	1" ≈ 2,000'



SITE PLAN

PROJECT:	Proposed Biocontrol Building and Geonomics Shed, UCR, Riverside, California
CLIENT:	TKE Engineering, Inc.
PROJECT NO.:	53805.1
ENCLOSURE:	A-2
DATE:	April 2022
SCALE:	1" ≈ 200'

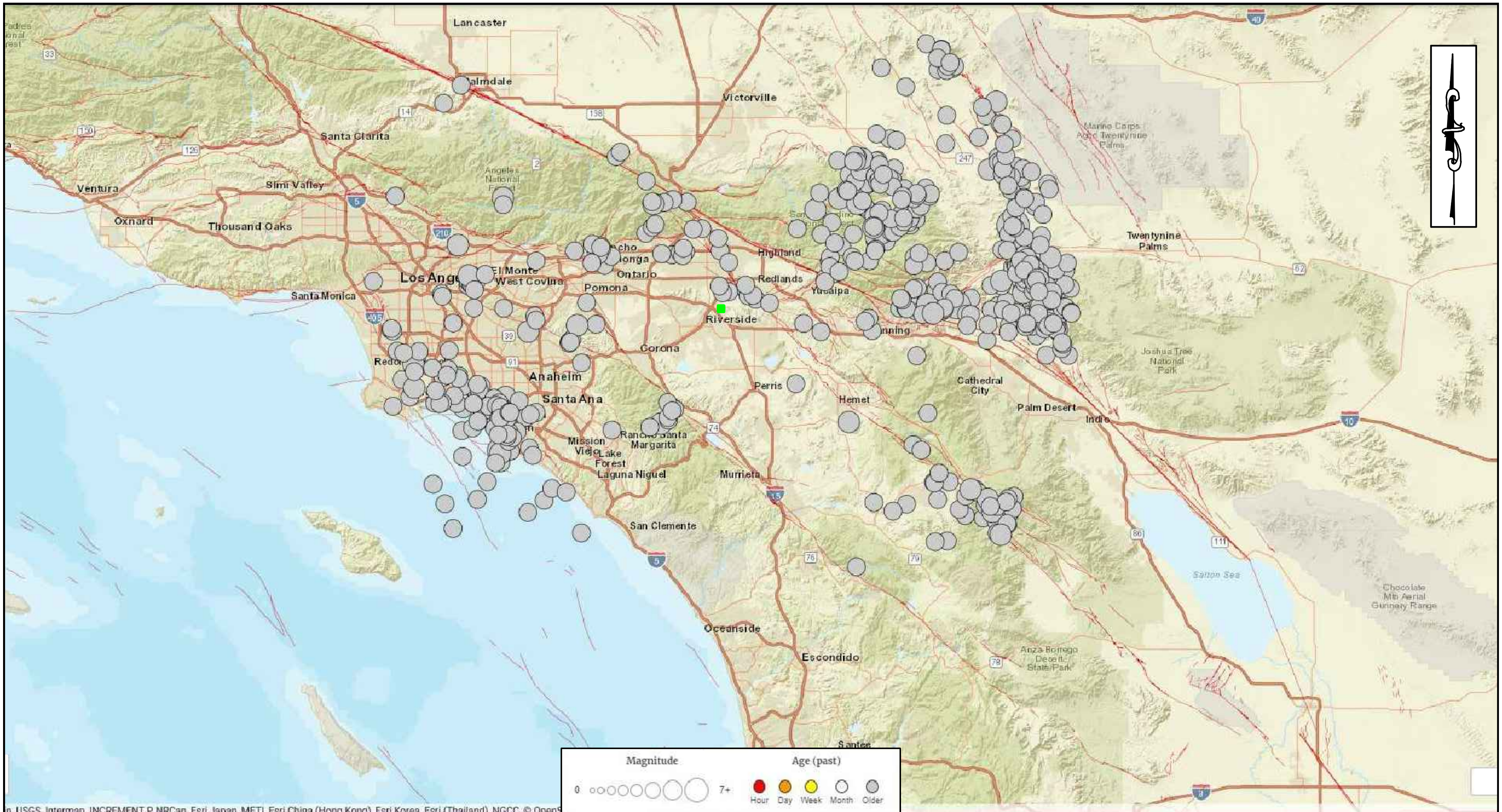
LOR GEOTECHNICAL GROUP, INC.



REGIONAL GEOLOGIC MAP

(Morton and Cox, 2001)

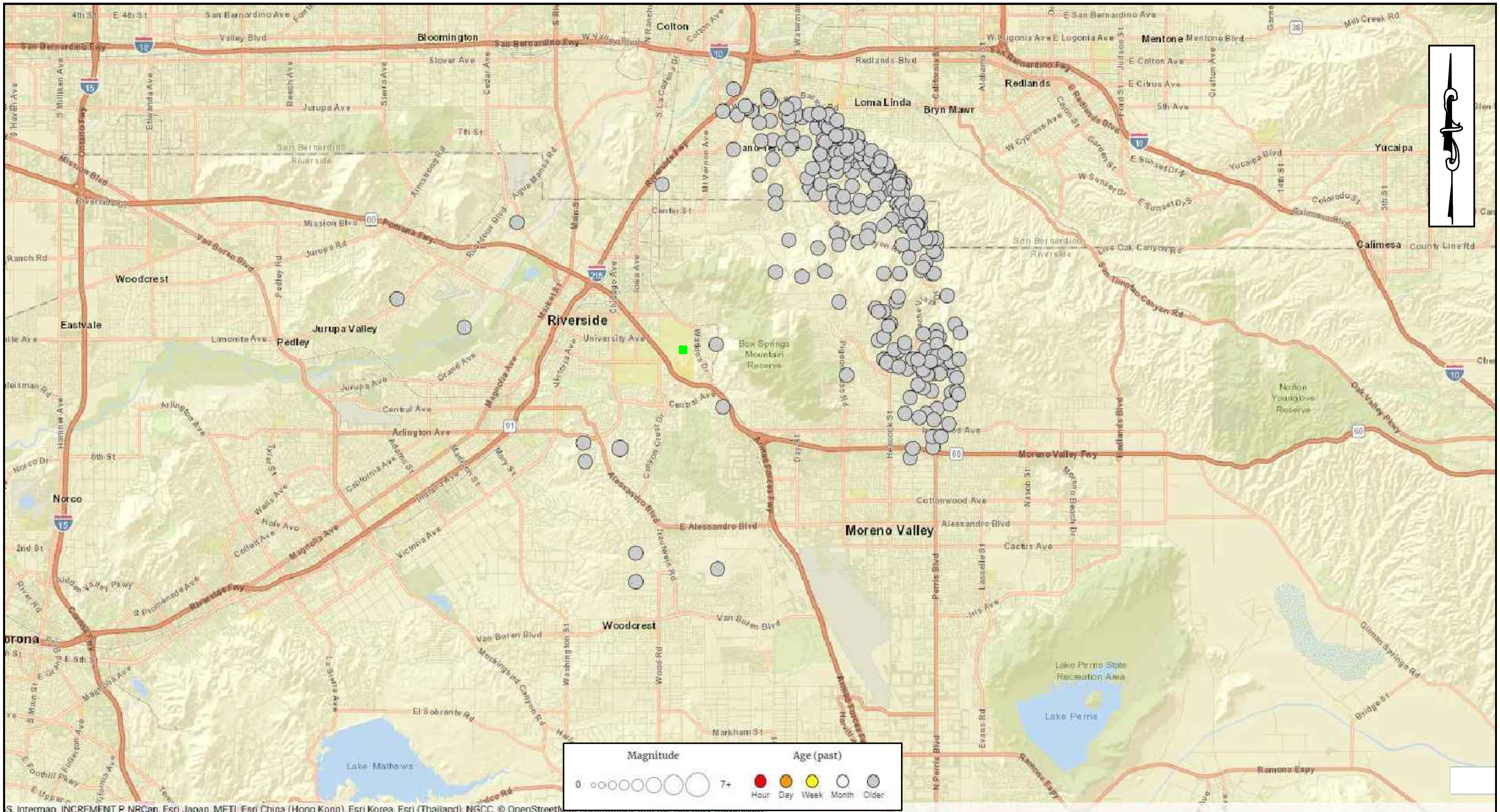
PROJECT:	Proposed Biocontrol Building and Geonomics Shed, UCR, Riverside, California	**PROJECT NO.:**	53805.1
CLIENT:	TKE Engineering, Inc.	**ENCLOSURE:**	A-3
LOR GEOTECHNICAL GROUP, INC.		**DATE:**	April 2022
		SCALE:	1" ≈ 2,000'



U.S. Geologic Survey (2022) real-time earthquake epicenter map. Plotted are 534 epicenters of instrument-recorded events from 01/01/32 to present (03/29/22) of local magnitude 4+ within a radius of ~62 miles (100 kilometers) of the site. Location accuracy varies. The site is indicated by the green square. The selected magnitude corresponds to a threshold intensity value where very light damage potential begins. These events are also generally widely felt by persons. Red lines mark the surface traces of known Quaternary-age faults.

HISTORICAL SEISMICITY MAP - 100km Radius

PROJECT:	Proposed Biocontrol Building and Geonomics Shed, UCR, Riverside, California	**PROJECT NO.:**	53805.1
CLIENT:	TKE Engineering, Inc.	**ENCLOSURE:**	A-4
LOR GEOTECHNICAL GROUP, INC.		**DATE:**	April 2022
		SCALE:	1" ≈ 40km



U.S. Geologic Survey (2022) real-time earthquake epicenter map. Plotted are 303 epicenters of instrument-recorded events from 01/01/78 to present (03/29/22) of local magnitude 2+ within a radius of ~6.2 miles (10 kilometers) of the site. Location accuracy varies. The site is indicated by the green square. The selected magnitude corresponds to a threshold intensity value where very light damage potential begins. These events are also generally widely felt by persons. Red lines mark the surface traces of known Quaternary-age faults.

HISTORICAL SEISMICITY MAP - 10km Radius

PROJECT:	Proposed Biocontrol Building and Geonomics Shed, UCR, Riverside, California	**PROJECT NO.:**	53805.1
CLIENT:	TKE Engineering, Inc.	**ENCLOSURE:**	A-5
LOR GEOTECHNICAL GROUP, INC.		**DATE:**	April 2022
		SCALE:	1" ≈ 10km

APPENDIX B

Field Investigation Program and Boring Logs

APPENDIX B
FIELD INVESTIGATION

Subsurface Exploration

Our subsurface exploration of the site consisted of drilling 4 exploratory borings to depths between approximately 15 to 25 feet below the existing ground surface using a Mobile B-61 drill rig on March 18, 2022. The approximate locations of the borings are shown on Enclosure A-2 within Appendix A.

The drilling exploration was conducted using a Mobile B-61 drill rig equipped with 8-inch diameter hollow stem augers. The soils were continuously logged by a geologist from this firm who inspected the site, created detailed logs of the borings, obtained undisturbed, as well as disturbed, soil samples for evaluation and testing, and classified the soils by visual examination in accordance with the Unified Soil Classification System.

Relatively undisturbed samples of the subsoils were obtained at a maximum interval of 5 feet. The samples were recovered by using a California split barrel sampler of 2.50 inch inside diameter and 3.25 inch outside diameter or a Standard Penetration Sampler (SPT) from the ground surface to the total depth explored. The samplers were driven by a 140 pound automatic trip hammer dropped from a height of 30 inches. The number of hammer blows required to drive the sampler into the ground the final 12 inches were recorded and further converted to an equivalent SPT N-value. Factors such as efficiency of the automatic trip hammer used during this investigation (80%), borehole diameter (8"), and rod length at the test depth were considered for further computing of equivalent SPT N-values corrected for field procedures (N60) which are included in the boring logs, Enclosures B-1 through B-4.

The undisturbed soil samples were retained in brass sample rings of 2.42 inches in diameter and 1.00 inch in height, and placed in sealed plastic containers. Disturbed soil samples were obtained at selected levels within the borings and placed in sealed containers for transport to our geotechnical laboratory.

All samples obtained were taken to our geotechnical laboratory for storage and testing. Detailed logs of the borings are presented on the enclosed Boring Logs, Enclosures B-1 through B-4. A Boring Log Legend is presented on Enclosure B-i. A Soil Classification Chart is presented as Enclosure B-ii.

CONSISTENCY OF SOIL

SANDS

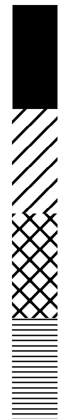
SPT BLOWS	CONSISTENCY
0-4	Very Loose
4-10	Loose
10-30	Medium Dense
30-50	Dense
Over 50	Very Dense

COHESIVE SOILS

SPT BLOWS	CONSISTENCY
0-2	Very Soft
2-4	Soft
4-8	Medium
8-15	Stiff
15-30	Very Stiff
30-60	Hard
Over 60	Very Hard

SAMPLE KEY

Symbol **Description**



INDICATES CALIFORNIA SPLIT SPOON SOIL SAMPLE

INDICATES BULK SAMPLE

INDICATES SAND CONE OR NUCLEAR DENSITY TEST

INDICATES STANDARD PENETRATION TEST (SPT) SOIL SAMPLE

TYPES OF LABORATORY TESTS

1	Atterberg Limits
2	Consolidation
3	Direct Shear (undisturbed or remolded)
4	Expansion Index
5	Hydrometer
6	Organic Content
7	Proctor (4", 6", or Cal216)
8	R-value
9	Sand Equivalent
10	Sieve Analysis
11	Soluble Sulfate Content
12	Swell
13	Wash 200 Sieve

BORING LOG LEGEND

PROJECT:	Biocontrol Bldg. and Genomics Shed, Riverside, California	**PROJECT NO.:**	53805.1
CLIENT:	TKE Engineering, Inc.	**ENCLOSURE:**	B-i
LOR GEOTECHNICAL GROUP, INC.		**DATE:**	April 2022

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

PARTICLE SIZE LIMITS

BOULDERS	COBBLES	GRAVEL		SAND			SILT OR CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE	

12" 3" 3/4" No . 4 No. 10 No. 40 200

(U.S. STANDARD SIEVE SIZE)

SOIL CLASSIFICATION CHART

PROJECT: Biocontrol Bldg. and Genomics Shed, Riverside, California

PROJECT NO.: 53805.1

CLIENT: TKE Engineering, Inc.

ENCLOSURE: B-ii

DATE: April 2022

LOR GEOTECHNICAL GROUP, INC.

LOG OF BORING B-1

DEPTH IN FEET	SPT BLOW COUNTS	LABORATORY TESTS	MOISTURE CONTENT (%)		DRY DENSITY (PCF)	SAMPLE TYPE	LITHOLOGY	U.S.C.S.	DESCRIPTION
0		3, 4 7, 11						SM	@ 0 feet, <u>FILL:</u> **SILTY SAND, approximately 20% coarse grained sand, 30% medium grained sand, 30% fine grained sand, 20% silty fines, brown, dry.**
	31		5.4		116.7				@ 0.5 feet, <u>COLLUVIUM:</u> **SILTY SAND, approximately 25% coarse grained sand, 30% medium grained sand, 30% fine grained sand, 15% silty fines, strong brown, dam, micaceous, trace pinhole porosity.**
5	39		4.0		126.2				
									@ 6.5 feet, <u>IGNEOUS BEDROCK:</u> **TONALITE, moderately weathered, coarse grained, gray-white, damp, friable.**
10	46 for 5"		2.5		111.7				**@ 10 feet, slightly less weathered, somewhat friable.**
15	65 for 6"		4.3						**@ 16 feet, difficult to drill, very hard, refusal, corestone ?**
20									

END OF BORING @ 16' due to refusal on possible corestone

Fill to 0.5'
No groundwater
Bedrock @ 6.5'

PROJECT:	Biocontrol Bldg. and Genomics Shed	**PROJECT NO.:**	53805.1
CLIENT:	TKE Engineering, Inc.	**ELEVATION:**	--
LOR GEOTECHNICAL GROUP, INC.		**DATE DRILLED:**	March 18, 2022
		EQUIPMENT:	Track CME
		HOLE DIA.: 8"	**ENCLOSURE:** B-1

LOG OF BORING B-2

DEPTH IN FEET	SPT BLOW COUNTS	LABORATORY TESTS	MOISTURE CONTENT (%)		DRY DENSITY (PCF)	SAMPLE TYPE	LITHOLOGY	U.S.C.S.	DESCRIPTION
0								SM	@ 0 feet, FILL: **SILTY SAND, approximately 20% coarse grained sand, 25% medium grained sand, 35% fine grained sand, 20% silty fines, brown, dry.**
	15		8.3		120.0				@ 0.5 feet, COLLUVIUM: **SILTY SAND, approximately 25% coarse grained sand, 25% medium grained sand, 25% fine grained sand, 25% silty fines, strong brown, damp to moist, micaceous, trace pinhole porosity.**
5	48		6.6		126.8				**@ 5 feet, becomes slightly finer grained, no visible porosity.**
10	55		8.9		108.8				
15	46 for 5"		7.7		118.2				@ 15 feet, IGNEOUS BEDROCK: **TONALITE, slightly weathered, coarse grained, gray-white, damp, slightly friable.**
20	51 for 2"		1.6		116.2				**@ 20 feet, very hard, somewhat difficult to drill.**
25	73 for 6"		4.1						**END OF BORING @ 25.5' due to very slow progress** **Fill to 0.5'** **No groundwater** **Bedrock @ 15'**
30									

PROJECT:	Biocontrol Bldg. and Genomics Shed	**PROJECT NO.:**	53805.1
CLIENT:	TKE Engineering, Inc.	**ELEVATION:**	--
		DATE DRILLED:	March 18, 2022
		EQUIPMENT:	Track CME
		HOLE DIA.: 8"	**ENCLOSURE:** B-2

LOR GEOTECHNICAL GROUP, INC.

LOG OF BORING B-3

DEPTH IN FEET	SPT BLOW COUNTS	LABORATORY TESTS	MOISTURE CONTENT (%)		DRY DENSITY (PCF)	SAMPLE TYPE	LITHOLOGY	U.S.C.S.	DESCRIPTION
0		3, 4, 7, 11						SM	@ 0 feet, FILL: **SILTY SAND, approximately 20% coarse grained sand, 25% medium grained sand, 25% fine grained sand, 30% silty fines, brown, damp, loose, roots.**
	35		5.7		119.6				**@ 1 foot, SILTY SAND, approximately 20% coarse grained sand, 30% medium grained sand, 30% fine grained sand, 20% silty fines, brown, dry.**
5	58		4.4		117.3				**@ 5 feet, trace gravel to 1/2".**
10	43		4.3		117.9				**@ 10 feet, contains some 1" diameter concrete debris.**
15	82 for 9"		4.6		120.3				**@ 15 feet,** COLLUVIUM: **SILTY SAND, approximately 10% coarse grained sand, 35% medium grained sand, 40% fine grained sand, 15% silty fines, strong brown, damp, trace thin calcite stringers, slightly micaceous.**
									@ 18 feet, IGNEOUS BEDROCK: **TONALITE, coarse grained, gray-white, dry, very hard, difficult to drill.**
20	51 for 3"		1.1						**@ 20 feet, rings disturbed.**
									END OF BORING @ 23' due to refusal **Fill to 15'** **No groundwater** **Bedrock @ 18'**
25									

PROJECT:	Biocontrol Bldg. and Genomics Shed	**PROJECT NO.:**	53805.1
CLIENT:	TKE Engineering, Inc.	**ELEVATION:**	--
		DATE DRILLED:	March 18, 2022
LOR	**GEOTECHNICAL GROUP, INC.**	**EQUIPMENT:**	Track CME
		HOLE DIA.: 8"	**ENCLOSURE:** B-3

LOG OF BORING B-4

DEPTH IN FEET	SPT BLOW COUNTS	LABORATORY TESTS	MOISTURE CONTENT (%)		DRY DENSITY (PCF)	U.S.C.S.	DESCRIPTION
0						SM	@ 0 feet, FILL: SILTY SAND, approximately 20% coarse grained sand, 25% medium grained sand, 25% fine grained sand, 30% silty fines, brown, damp, loose, roots.
	12		5.4		113.4		@ 2 feet, roots remain.
5	8		9.5		106.5		@ 5 feet, COLLUVIUM: SILTY SAND, approximately 25% coarse grained sand, 30% medium grained sand, 30% fine grained sand, 15% silty fines, strong brown, damp, trace pinhole porosity, trace thin calcite stringers.
	15		2.7		107.6		
10	45		2.0		121.4		@ 10 feet, no visible porosity, no effervescence to dilute HCl.
15	46 for 6"		4.4				@ 15 feet, appears to be completely weathered bedrock into soil, SILTY SAND, approximately 25% coarse grained sand, 30% medium grained sand, 30% fine grained sand, 15% silty fines, strong brown to red brown, micaceous, rings disturbed.
							@ 16 feet, IGNEOUS BEDROCK: TONALITE, moderately weathered, coarse grained, gray-white, dry, slightly friable.
20	51 for 2"						@ 20 feet, no recovery, difficult drilling.
25	73 for 5"		9.8				@ 25 feet, becomes less weathered, fine to medium grained.
							END OF BORING @ 25.42'
30							

Fill to 5'
No groundwater
Bedrock @ 16'

PROJECT:	Biocontrol Bldg. and Genomics Shed	**PROJECT NO.:**	53805.1
CLIENT:	TKE Engineering, Inc.	**ELEVATION:**	--
LOR GEOTECHNICAL GROUP, INC.		**DATE DRILLED:**	March 18, 2022
		EQUIPMENT:	Track CME
		HOLE DIA.: 8"	**ENCLOSURE:** B-4

APPENDIX C

Laboratory Testing Program and Test Results

APPENDIX C
LABORATORY TESTING

General

Selected soil samples obtained from the borings were tested in our geotechnical laboratory to evaluate the physical properties of the soils affecting foundation design and construction procedures. The laboratory testing program performed in conjunction with our investigation included moisture content, dry density, laboratory compaction characteristics, direct shear, expansion index, and corrosion. Descriptions of the laboratory tests are presented in the following paragraphs:

Moisture Density Tests

The moisture content and dry density information provides an indirect measure of soil consistency for each stratum, and can also provide a correlation between soils on this site. The dry unit weight and field moisture content were determined for selected undisturbed samples, in accordance with ASTM D 2921 and ASTM D 2216, respectively, and the results are shown on the boring logs, Enclosures B-1 through B-4 for convenient correlation with the soil profile.

Laboratory Compaction

Selected soil samples were tested in the laboratory to determine compaction characteristics using the ASTM D 1557 compaction test method. The results are presented in the following table:

LABORATORY COMPACTION				
Boring Number	**Sample Depth (feet)**	**Soil Description (U.S.C.S.)**	**Maximum Dry Density (pcf)**	**Optimum Moisture Content (percent)**
B-1	0-3	(SM) Silty Sand	135.5	7.5
B-3	0-3	(SM) Silty Sand	133.5	7.5

Direct Shear Test

Shear tests are performed in general accordance with ASTM D 3080 with a direct shear machine at a constant rate-of-strain (0.04 inches/minute). The machine is designed to test a sample partially extruded from a sample ring in single shear. Samples are tested at varying normal loads in order to evaluate the shear strength parameters, angle of internal friction and cohesion. Samples are tested in remolded condition (90 percent relative compaction per ASTM D 1557) and soaked, to represent the worse case conditions expected in the field.

The results of the shear tests on selected soil samples are presented in the following table:

DIRECT SHEAR TEST				
Boring Number	**Sample Depth (feet)**	**Soil Description (U.S.C.S.)**	**Apparent Cohesion (psf)**	**Angle of Internal Friction (degrees)**
B-1	0-3	(SM) Silty Sand	200	33
B-3	0-3	(SM) Silty Sand	200	29

Expansion Index Test

Remolded samples are tested to determine their expansion potential in accordance with the Expansion Index (EI) test. The test is performed in accordance with the ASTM D 4829. The test results for select soil samples are presented in the following table:

EXPANSION INDEX TEST				
Boring Number	**Sample Depth (feet)**	**Soil Description (U.S.C.S.)**	**Expansion Index (EI)**	**Expansion Potential**
B-1	0-3	(SM) Silty Sand	0	Very Low
B-3	0-3	(SM) Silty Sand	10	Very Low
Expansion Index:	0-20 Very low	21-50 Low	51-90 Medium	91-130 High

Results Only Soil Testing for Biocontrol Building and Genomics Shed

March 23, 2022

Prepared for:
Andrew Tardie
LOR Geotechnical
6121 Quail Valley Ct
Riverside, CA
atardie@lorgeo.com

Project X Job#: S220322B
Client Job or PO#: 53805.1

Respectfully Submitted,

Eduardo Hernandez, M.Sc., P.E.
Sr. Corrosion Consultant
NACE Corrosion Technologist #16592
Professional Engineer
California No. M37102
ehernandez@projectxcorrosion.com

Soil Analysis Lab Results

Client: LOR Geotechnical
Job Name: Biocontrol Building and Genomics Shed
Client Job Number: 53805.1
Project X Job Number: S220322B
March 23, 2022

	Method	ASTM D4327		ASTM D4327		ASTM G187		ASTM G51	ASTM G200	SM 4500-D	ASTM D4327	ASTM D6919	ASTM D6919	ASTM D6919	ASTM D6919	ASTM D6919	ASTM D6919	ASTM D4327	ASTM D4327
Bore# / Description	**Depth**	**Sulfates** SO_4^{2-}		**Chlorides** Cl^-		**Resistivity** As Rec'd	Minimum	**pH**	**Redox**	**Sulfide** S^{2-}	**Nitrate** NO_3^-	**Ammonium** NH_4^+	**Lithium** Li^+	**Sodium** Na^+	**Potassium** K^+	**Magnesium** Mg^{2+}	**Calcium** Ca^{2+}	**Fluoride** F_2^{--}	**Phosphate** PO_4^{3-}
	(ft)	(mg/kg)	(wt%)	(mg/kg)	(wt%)	(Ohm-cm)	(Ohm-cm)		(mV)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
RV-1 - B-1 (SM) Silty Sand	0-3	163.2	0.0163	106.2	0.0106	16,750	2,948	8.3	177	1.50	21.7	8.9	0.01	97.2	6.3	6.4	8.2	2.7	8.7
RV-2 - B-3 (SM) Silty Sand	0-3	185.8	0.0186	62.7	0.0063	19,430	2,412	8.7	175	2.40	1.2	5.3	ND	177.6	6.8	5.8	7.3	4.2	0.2

Cations and Anions, except Sulfide and Bicarbonate, tested with Ion Chromatography
mg/kg = milligrams per kilogram (parts per million) of dry soil weight
ND = 0 = Not Detected | NT = Not Tested | Unk = Unknown
Chemical Analysis performed on 1:3 Soil-To-Water extract
PPM = mg/kg (soil) = mg/L (Liquid)

Project X
Corrosion Engineering
Corrosion Control - Soil, Water, and Metallurgy Lab

Lab Request Sheet Chain of Custody
Phone: (213) 928-7213 · Fax (951) 226-1720 · www.projectxcorrosion.com

Ship Samples To: 29990 Technology Dr, Suite 13, Murrieta, CA 92563

Project X Job Number
S220322B LORGEO 53805.1 BIOCONTROL 2FULL

IMPORTANT: Please complete Project and Sample Identification Data as you would like it to appear in report & include this form with samples.

Company Name:	LOR Geotechnical Group, Inc.	**Contact Name:**	Andrew Tardie	**Phone No:**	951-653-1760
Mailing Address:	6121 Quail Valley Court	**Contact Email:**	atardie@lorgeo.com		
Accounting Contact:	John Leuer	**Invoice Email:**	atardie@lorgeo.com		
Client Project No:	53805.1	**Project Name:**	Biocontrol Building and Genomics Shed		

P.O. #:	--	3-5 Day Standard	3 Day Guarantee 50% mark-up	24 Hr RUSH 100% mark-up
	(Business Days) Turn Around Time:	✓		

Results By: ☐ Phone ☐ Fax ☐ Email

Date & Received by :

Default Method

Special Instructions:

ANALYSIS REQUESTED (Please circle)

Full Corrosion Series: Geo Quad (Soil Resistivity, pH, Sulfate, Chloride), Redox Potential, Sulfide, Ammonia, Nitrate, Flouride, Phosphate, Lithium, Sodium, Potassium, Magnesium, Calcium, BiCarbonate

Reports: *Req: Min. 3 Samples, site map, and groundwater info

		SAMPLE ID - BORE #	DESCRIPTION	DEPTH (ft)	DATE COLLECTED	Soil Resistivity (Caltrans CTM643 / AASHTO T2888 / ASTM G187)	pH (Caltrans CTM643 / AASHTO T 289 / ASTM G 51)	Sulfate (Caltrans CTM417 / AASHTO T 290 / ASTM D4327)	Chloride (Caltrans CTM422 / AASHTO T 291 / ASTM D4327)	Redox Potential (SM 2580B / ASTM G200)	Sulfide (SM 4500-S2)	Ammonia (SM 4500-NH3 / ASTM D6919)	Nitrate (SM 4500-NO3 / ASTM D4327)	Flouride (ASTM D4327)	Phosphate (ASTM D4327)	Lithium (ASTM D6919)	Sodium (ASTM D6919)	Potassium (ASTM D6919)	Magnesium (ASTM D6919)	Calcium (ASTM D6919)	BiCarbonate (SM 2320B)	Full Corrosion Series	Soil Corrosivity Evaluation Report	Water Corrosivity Mini Report	Moisture Content (ASTM D2216)	Total Alkalinity (SM 2520B)	Thermal Resistivity	Metallurgical Analysis	Langelier Index	Puckorius Index	XRF Elemental Analysis	Water Hardness
379	1	RV-1 - B-1	(SM) Silty Sand	0-3	03/18/22																	X										
380	2	RV-2 - B-3	(SM) Silty Sand	0-3	03/18/22																	X										
	3																															
	4																															
	5																															
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Appendix H

Soil Sampling and Analysis

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REPORT ON

SOIL SAMPLING AND ANALYSIS
UC RIVERSIDE SOUTH CAMPUS SCHOOL OF BUSINESS
SOUTH CAMPUS DRIVE AND CAMPUS PLACE
RIVERSIDE, CALIFORNIA

by Haley & Aldrich, Inc.
Costa Mesa, California

for University of California Riverside
Riverside, California

File No. 0204609-000
March 2022

HALEY & ALDRICH, INC.
3187 Red Hill Avenue
Suite 155
Costa Mesa, CA 92626
714.371.1800

March 31, 2022
File No. 0204609-000

University of California Riverside
Riverside, California

Attention: Evan Janson
CFO/Director of Project Controls

Subject: Soil Sampling and Analysis
University of California Riverside
School of Business

Mr. Janson:

Enclosed are the results of soil sampling and analysis to support the proposed construction of the University of California Riverside (UCR) School of Business Building (Site), located southeast of the intersection of South Campus Drive and Campus Place in Riverside, California. The purpose of the soil sampling and analysis presented in this report is to assess potential impacts to soil from leaching that may have occurred from the samples of soil-like material in containers located within a building at the Site and to assess potential impacts from potential chemical usage associated with the nozzles/tubing on a slope located at the Site prior to Site construction activities. Based on the results of the soil sample analytical results we do not recommend any further investigations or evaluations at this time.

We appreciate the opportunity to provide our services to you on this project. If you have any questions, please call.

Sincerely yours,
HALEY & ALDRICH, INC.

PROFESSIONAL GEOLOGIST
COLLEEN CANFIELD
No. 8627
Exp. 1/2024
STATE OF CALIFORNIA

Mathew T. Raithel
Senior Technical Specialist

Colleen Canfield, P.G. 8627 (CA)
Associate Geologist | Senior Project Manager

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1. Introduction

This report presents the results of soil sampling and analysis for the proposed construction of the University of California Riverside (UCR) School of Business Building (Site), located southeast of the intersection of South Campus Drive and Campus Place in Riverside, California. The Site is bounded by South Campus Drive to the north, Headhouse Green Houses and College Place to the east, a grass covered hill with water tank to the south, and College Place to the west. The site locus is presented in Figure 1.

1.1 BACKGROUND AND EXISTING SITE CONDITIONS

Three buildings are currently located on the Site and their locations, identified as Buildings 1 through 3, are presented on Figure 2. The three buildings will be demolished as part of the construction activities for the UC Riverside School of Business. Building 1 contained numerous samples of soil-like material in containers of unknown origin. In addition, a slope on the southern portion of the Site, located south of Building 2 and Building 3, which were reportedly used for genomics and entomology studies, contains metal nozzles and rubber tubing for unknown purposes.

1.2 PROJECT DESCRIPTION

We understand that the proposed Site construction activity is expected to include demolition of existing parking lots, driveways, and structures, and redevelopment of the Site with a new School of Business Building, landscaping and hardscaping improvements. The Biocontrol and Genomics shed will be relocated to accommodate the new School of Business Building.

1.3 PURPOSE

The purpose of the soil sampling and analysis presented in this report is to assess potential impacts to soil from leaching that may have occurred from the samples of soil-like material in containers within Building 1 and to assess potential impacts from potential chemical usage associated with the nozzles/tubing on the slope south of Building 2 and Building 3, prior to Site construction activities.

2. Field Investigation Activities

Field investigation activities were conducted on 21 February 2021 and included collection of 45 soil samples at 15 locations. The following sections provide additional details regarding the pre-field activities and investigation procedures.

2.1 PRE-FIELD ACTIVITIES

2.1.1 Health and Safety Plan

A Site-specific health and safety plan (HASP) was developed and implemented during the field activities. The HASP describes the procedures for maintaining a safe workplace and the precautions employed by Site workers to protect against potential exposure to chemical, biological, and physical hazards. Field personnel were required to review and sign the HASP prior to working at the Site and abide to the requirements while on-Site.

2.1.2 Underground Utility Clearance

Nine direct-push soil borings (SB-1 through SB-9) were located around and within Building 1, six hand auger soil sample locations (HA-1 through HA-6) were located on the slope containing the metal nozzles and rubber tubing, and sub-surface utility clearance was performed at each boring location. Proposed boring locations were reviewed in the field by Haley & Aldrich personnel to identify potential access issues, underground utility conflicts, overhead obstructions, work area restrictions, and to physically mark out the proposed boring locations. Underground Service Alert was notified at least 48 hours in advance of drilling. A private underground utility survey was conducted on 21 February 2021 prior to initiating the field investigation to identify the potential presence of underground utility lines near proposed borings. Utility locating was conducted by ULS Services Corp. of San Diego, California.

2.2 SOIL SAMPLING ACTIVITIES

Soil sampling activities were conducted on 21 February 2022 by Interphase Environmental, Inc. (Interphase), a C-57-licensed drilling company located in Los Angeles, California. Figure 2 shows the soil sample locations. Forty-five (45) soil samples were collected from 15 soil borings. Nine soil borings (SB-1 through SB-9) were advanced using direct push drilling equipment to a depth of approximately 5-feet below ground surface (bgs), and 27 soil samples were collected at depths of 0.5, 2- and 5-feet bgs. Six soil borings (HA-1 through HA-6) were advanced using a hand auger, and 18 soil samples were collected at depths of 0.5, 2- and 5-feet bgs.

2.2.1 Direct-Push Soil Borings (SB-1 through SB-9)

Soil borings SB-1 through SB-9 were advanced using a standard, percussively advanced direct-push sampling device (Geoprobe™) equipped with a dual-tube tool string. Interphase provided the drilling services on 21 February 2021. The borings were continuously cored with a 2.25-inch diameter outer rod and 2.0-inch inner rod. A 1.75-inch acetate sample liner was attached to the lead inner rod and advanced to the depth of the boring. Soil samples from the soil borings were collected in laboratory provided 8-ounce glass jars. Once the soil sampling was completed, each boring was backfilled with granular bentonite that was hydrated during placement and then capped to match the existing grade.

2.2.2 Hand Auger Borings (HA-1 through HA-6)

Hand auger soil samples were collected using hand auger sampling methods, and soil samples from each hand auger sampling location were collected in laboratory provided 8-ounce jars.

Once the soil sampling was completed, each boring was backfilled with granular bentonite that was hydrated during placement and then capped to match the existing grade.

2.2.3 Laboratory Analysis

Soil samples were sealed, labeled, and stored in insulated coolers with ice and maintained at 3.6˚C during transport under standard chain-of-custody procedures to Eurofins Calscience, Inc. (Eurofins), a state-certified laboratory located in Garden Grove, California.

Each of the 0.5 and 2 foot soil samples were analyzed for the following:

- Organochlorine pesticides (OCPs) by United States Environmental Protection Agency (EPA) Method 8081;
- Chlorinated herbicides by EPA Method 8151; and
- Arsenic by EPA Method 6010.

The five foot soil samples were placed on hold pending the results of the shallower soil samples.

2.2.4 Decontamination and Waste Management

Non-disposable drilling and sampling equipment was decontaminated prior to use and between sampling intervals by washing with a non-phosphate detergent solution, followed by rinsing twice with distilled water. Decontamination water and soil cuttings were transferred into a 55-gallon Department of Transportation (DOT)-approved drum and stored on-Site pending off-Site disposal.

3. Summary of Analytical Results

Soil analytical results are summarized in Table 1. The laboratory report and chain of custody form is provided in Appendix A.

3.1 SCREENING CRITERIA

The soil laboratory analytical results were compared to California Department of Toxic Substances Control Recommended Screening Levels (DTSC-SLs) for commercial/industrial property use selected from the "Human and Ecological Risk Office (HERO) HHRA Note Number: 3, DTSC-modified Screening Levels (DTSC-SLs)" prepared by the DTSC dated June 2020 (DTSC, 2020a) as shown on Table 1.

3.2 SOIL SAMPLE RESULTS

3.2.1 OCPs

There were no detectable concentrations of OCPs with the following exceptions in four soil samples from borings HA-3, HA-5, and SB-4:

- 4,4-Dichlorodiphenyldichloroethylene was detected in two of the 0.5 foot samples at concentrations of 0.005 milligrams per kilograms (mg/kg) at HA-5 and 0.0078 mg/kg at SB-4. The samples are less than the DTSC-SL of 9.3 mg/kg.
- Alpha-Chlordane was detected in two of the 0.5 foot samples at concentrations of 0.0052 mg/kg at HA-5 and 0.0053 mg/kg at HA-3. The samples are less than the DTSC-SL of 50 mg/kg.

These detected concentrations were orders of magnitude less than the commercial/industrial DTSC-SLs for each of the compounds detected. Based on these results, the deeper 5-foot soil samples were not analyzed.

3.2.2 Chlorinated Herbicides

There were no detectable concentrations of chlorinated herbicides with the following exceptions in two soil samples from borings HA-4, and SB-9:

- 2,4-Dichlorophenoxyacetic acid was detected in the 2 foot sample at a concentration of 0.12 mg/kg at HA-4, less than the DTSC-SL of 7300 mg/kg.
- 2-Methyl-4-chlorophenoxyacetic acid was detected in the 2 foot sample at a concentration of 39 mg/kg at SB-9, less than the DTSC-SL of 260 mg/kg.

These reported concentrations were at least an order of magnitude less than the commercial/industrial DTSC-SLs for each of the compounds detected. Based on these results, the deeper 5-foot soil samples were not analyzed.

3.2.3 Arsenic

There were no detected concentrations of arsenic except for five soil samples from borings SB-1, SB-4, SB-6, SB-9, and HA-4. Detected arsenic concentrations in the soil samples ranged between 2.57 mg/kg and 5.03 mg/kg.

These reported concentrations are less than the DTSC approved Southern California naturally occurring background level of 12 mg/kg (DTSC, 2020b), and are therefore considered to be within naturally occurring background concentrations. Based on these results, the deeper 5-foot soil samples were not analyzed.

4. Conclusions

4.1 SUMMARY

Based on the results of the soil sample analytical results, we present the following conclusions:

- Detected OCP and chlorinated herbicide concentrations were at least an order of magnitude less than commercial/industrial DTSC-SLs; and
- Detected arsenic concentrations were within naturally occurring background levels for Southern California soil.

We do not recommend further investigation or evaluation at this time.

References

1. California Department of Toxic Substances Control, 2020a. Human and Ecological Risk Office (HERO) HHRA Note Number 3: DTSC-modified Screening Levels (DTSC-SLs). June.

2. California Department of Toxic Substances Control, 2020b. Human and Ecological Risk Office (HERO) Human Health Risk Assessment (HHRA) Note Number 11, Southern California Ambient Arsenic Screening Level. 28 December.

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TABLE

TABLE 1
SUMMARY OF SOIL ANALYTICAL RESULTS
UC RIVERSIDE SCHOOL OF BUSINESS
RIVERSIDE, CALIFORNIA

Location	California DTSC Commercial/	HA-1	HA-1	HA-2	HA-2	HA-3	HA-3	HA-4	HA-4	HA-5	HA-5	HA-6	HA-6	SB-1	SB-1
Sample Date	Industrial Screening Level	02/21/2022	02/21/2022	02/21/2022	02/21/2022	02/21/2022	02/21/2022	02/21/2022	02/21/2022	02/21/2022	02/21/2022	02/21/2022	02/21/2022	02/21/2022	02/21/2022
Sample Depth (bgs)	or Background Concentration	0.5 (ft)	2 (ft)	0.5 (ft)	2 (ft)	0.5 (ft)	2 (ft)	0.5 (ft)	2 (ft)	0.5 (ft)	2 (ft)	0.5 (ft)	2 (ft)	0.5 (ft)	2 (ft)
Sample Name		HA-1-0.5	HA-1-2.0	HA-2-0.5	HA-2-2.0	HA-3-0.5	HA-3-2.0	HA-4-0.5	HA-4-2.0	HA-5-0.5	HA-5-2.0	HA-6-0.5	HA-6-2.0	SB-1-0.5	SB-1-2.0
Herbicides (mg/kg)															
2-(2-Methyl-4-chlorophenoxy)-propionic acid (MCPP)	530	< 10 F1	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 9.9
2,4,5-T	5300	< 0.01 F2	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.0099
2,4,5-TP (Silvex)	4200	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.0099
2,4-DB	16000	< 0.1 F1F2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.099
2,4-Dichlorophenoxyacetic acid (2,4-D)	7300	< 0.1 F1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	**0.12 p**	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.099
2-Methyl-4-chlorophenoxyacetic acid (MCPA)	260	< 10 F1*+	< 10 *+	< 10 *+	< 10 *+	< 10 *+	< 10 *+	< 10 *+	< 10 *+	< 10 *+	< 10 *+	< 10 *+	< 10 *+	< 10	< 9.9
2-sec-butyl-4,6-dinitrophenol (Dinoseb)	530	< 0.1 F1*1	< 0.1 *1	< 0.1 *1	< 0.1 *1	< 0.1 *1	< 0.1 *1	< 0.1 *1	< 0.1 *1	< 0.1 *1	< 0.1 *1	< 0.1 *1	< 0.1 *1	< 0.1	< 0.099
Dalapon	16000	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Dicamba	16000	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.0099
Dichloroprop	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.099
Inorganic Compounds (mg/kg)															
Arsenic	12	< 2.63	< 2.44	< 2.58	< 2.59	< 2.42	< 2.51	**2.57**	< 2.59	< 2.39	< 2.4	< 2.39	< 2.49	**3.55**	< 2.49
Pesticides (mg/kg)															
4,4'-DDD	6.2	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
4,4'-DDE	9.3	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	**0.005**	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
4,4'-DDT	7.1	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Aldrin	0.18	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
alpha-BHC	0.24	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
alpha-Chlordane	50	< 0.005	< 0.005	< 0.005	< 0.005	**0.0053**	< 0.005	< 0.005	< 0.005	**0.0052**	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
beta-BHC	0.82	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Chlordane	6.1	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
delta-BHC	-	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Dieldrin	0.093	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Endosulfan I	-	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Endosulfan II	-	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Endosulfan sulfate	3200	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Endrin	160	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Endrin aldehyde	-	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Endrin ketone	-	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
gamma-BHC (Lindane)	2	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
gamma-Chlordane	50	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Heptachlor	0.63	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Heptachlor epoxide	0.33	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Methoxychlor	2600	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Toxaphene	1.2	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025

Notes:
1. Results in **bold** are detected.
2. <: Result is not detected above the reporting limit.
3. Detected results were screened against the following criteria. Results detected above criteria are shaded gray and flagged in [ ].
   [A]: California DTSC Commercial/Industrial (June 2020)
   [B]: Arsenic Background concentration of 12 mg/kg
4. Lab qualifiers:
   *+: LCS and/or LCSD is outside acceptance limits, high biased.
   *1: LCS/LCSD RPD exceeds control limits.
   F1: MS and/or MSD recovery exceeds control limits.
   F2: MS/MSD RPD exceeds control limits.
   p: The %RPD between the primary and confirmation column/detector is >40%. The lower value has been reported.

TABLE 1
SUMMARY OF SOIL ANALYTICAL RESULTS
UC RIVERSIDE SCHOOL OF BUSINESS
RIVERSIDE, CALIFORNIA

Location Sample Date Sample Depth (bgs) Sample Name	California DTSC Commercial/ Industrial Screening Level or Background Concentration	SB-2 02/21/2022 0.5 (ft) SB-2-0.5	SB-2 02/21/2022 2 (ft) SB-2-2.0	SB-3 02/21/2022 0.5 (ft) SB-3-0.5	SB-3 02/21/2022 2 (ft) SB-3-2.0	SB-4 02/21/2022 0.5 (ft) SB-4-0.5	SB-4 02/21/2022 2 (ft) SB-4-2.0	SB-5 02/21/2022 0.5 (ft) SB-5-0.5	SB-5 02/21/2022 2 (ft) SB-5-2.0	SB-6 02/21/2022 0.5 (ft) SB-6-0.5	SB-6 02/21/2022 2 (ft) SB-6-2.0	SB-7 02/21/2022 0.5 (ft) SB-7-0.5	SB-7 02/21/2022 2 (ft) SB-7-2.0	SB-8 02/21/2022 0.5 (ft) SB-8-0.5	SB-8 02/21/2022 2 (ft) SB-8-2.0
Herbicides (mg/kg)															
2-(2-Methyl-4-chlorophenoxy)-propionic acid (MCPP)	530	< 10	< 10	< 10	< 10	< 10	< 10	< 9.6	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2,4,5-T	5300	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.0096 F2	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,4,5-TP (Silvex)	4200	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.0096	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,4-DB	16000	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.096 F1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4-Dichlorophenoxyacetic acid (2,4-D)	7300	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.096 F2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Methyl-4-chlorophenoxyacetic acid (MCPA)	260	< 10	< 10	< 10	< 10	< 10	< 10	< 9.6	< 10	< 10	< 10	< 10	< 10	< 10	< 10
2-sec-butyl-4,6-dinitrophenol (Dinoseb)	530	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.096	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dalapon	16000	< 0.25	< 0.26	< 0.26	< 0.25	< 0.26	< 0.26	< 0.24	< 0.25	< 0.26	< 0.25	< 0.26	< 0.25	< 0.25	< 0.25
Dicamba	16000	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.0096	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dichloroprop	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.096	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Inorganic Compounds (mg/kg)															
Arsenic	12	< 2.48	< 2.46	< 2.49	< 2.46	**5.03**	< 2.48	< 2.49	< 2.49	**3.44**	< 2.44	< 2.5	< 2.49	< 2.46	< 2.5
Pesticides (mg/kg)															
4,4'-DDD	6.2	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
4,4'-DDE	9.3	< 0.005	< 0.005	< 0.005	< 0.005	**0.0078**	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
4,4'-DDT	7.1	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Aldrin	0.18	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
alpha-BHC	0.24	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
alpha-Chlordane	50	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
beta-BHC	0.82	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Chlordane	6.1	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
delta-BHC	-	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Dieldrin	0.093	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Endosulfan I	-	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Endosulfan II	-	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Endosulfan sulfate	3200	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Endrin	160	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Endrin aldehyde	-	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Endrin ketone	-	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
gamma-BHC (Lindane)	2	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
gamma-Chlordane	50	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Heptachlor	0.63	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Heptachlor epoxide	0.33	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Methoxychlor	2600	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Toxaphene	1.2	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025

Notes:
1. Results in **bold** are detected.
2. <: Result is not detected above the reporting limit.
3. Detected results were screened against the following criteria. Results detected above criteria are shaded gray and flagged in [ ].
   [A]: California DTSC Commercial/Industrial (June 2020)
   [B]: Arsenic Background concentration of 12 mg/kg
4. Lab qualifiers:
   *+: LCS and/or LCSD is outside acceptance limits, high biased.
   *1: LCS/LCSD RPD exceeds control limits.
   F1: MS and/or MSD recovery exceeds control limits.
   F2: MS/MSD RPD exceeds control limits.
   p: The %RPD between the primary and confirmation column/detector is >40%. The lower value has been reported.

TABLE 1
SUMMARY OF SOIL ANALYTICAL RESULTS
UC RIVERSIDE SCHOOL OF BUSINESS
RIVERSIDE, CALIFORNIA

Location Sample Date Sample Depth (bgs) Sample Name	California DTSC Commercial/ Industrial Screening Level or Background Concentration	SB-9 02/21/2022 0.5 (ft) SB-9-0.5	SB-9 02/21/2022 2 (ft) SB-9-2.0
Herbicides (mg/kg)			
2-(2-Methyl-4-chlorophenoxy)-propionic acid (MCPP)	530	< 10	< 10
2,4,5-T	5300	< 0.01	< 0.01
2,4,5-TP (Silvex)	4200	< 0.01	< 0.01
2,4-DB	16000	< 0.1	< 0.1
2,4-Dichlorophenoxyacetic acid (2,4-D)	7300	< 0.1	< 0.1
2-Methyl-4-chlorophenoxyacetic acid (MCPA)	260	< 10	**39**
2-sec-butyl-4,6-dinitrophenol (Dinoseb)	530	< 0.1	< 0.1
Dalapon	16000	< 0.25	< 0.25
Dicamba	16000	< 0.01	< 0.01
Dichloroprop	-	< 0.1	< 0.1
Inorganic Compounds (mg/kg)			
Arsenic	12	**3.17**	< 2.49
Pesticides (mg/kg)			
4,4'-DDD	6.2	< 0.005	< 0.005
4,4'-DDE	9.3	< 0.005	< 0.005
4,4'-DDT	7.1	< 0.005	< 0.005
Aldrin	0.18	< 0.005 F1	< 0.005
alpha-BHC	0.24	< 0.005 F1	< 0.005
alpha-Chlordane	50	< 0.005	< 0.005
beta-BHC	0.82	< 0.005 F1	< 0.005
Chlordane	6.1	< 0.025	< 0.025
delta-BHC	-	< 0.005 F1	< 0.005
Dieldrin	0.093	< 0.005	< 0.005
Endosulfan I	-	< 0.005 F1	< 0.005
Endosulfan II	-	< 0.005	< 0.005
Endosulfan sulfate	3200	< 0.005	< 0.005
Endrin	160	< 0.005	< 0.005
Endrin aldehyde	-	< 0.005 F1	< 0.005
Endrin ketone	-	< 0.005	< 0.005
gamma-BHC (Lindane)	2	< 0.005 F1	< 0.005
gamma-Chlordane	50	< 0.005	< 0.005
Heptachlor	0.63	< 0.005 F1	< 0.005
Heptachlor epoxide	0.33	< 0.005 F1	< 0.005
Methoxychlor	2600	< 0.005	< 0.005
Toxaphene	1.2	< 0.025	< 0.025

Notes:
1. Results in **bold** are detected.
2. <: Result is not detected above the reporting limit.
3. Detected results were screened against the following criteria. Results detected above criteria are shaded gray and flagged in [ ].
   [A]: California DTSC Commercial/Industrial (June 2020)
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4. Lab qualifiers:
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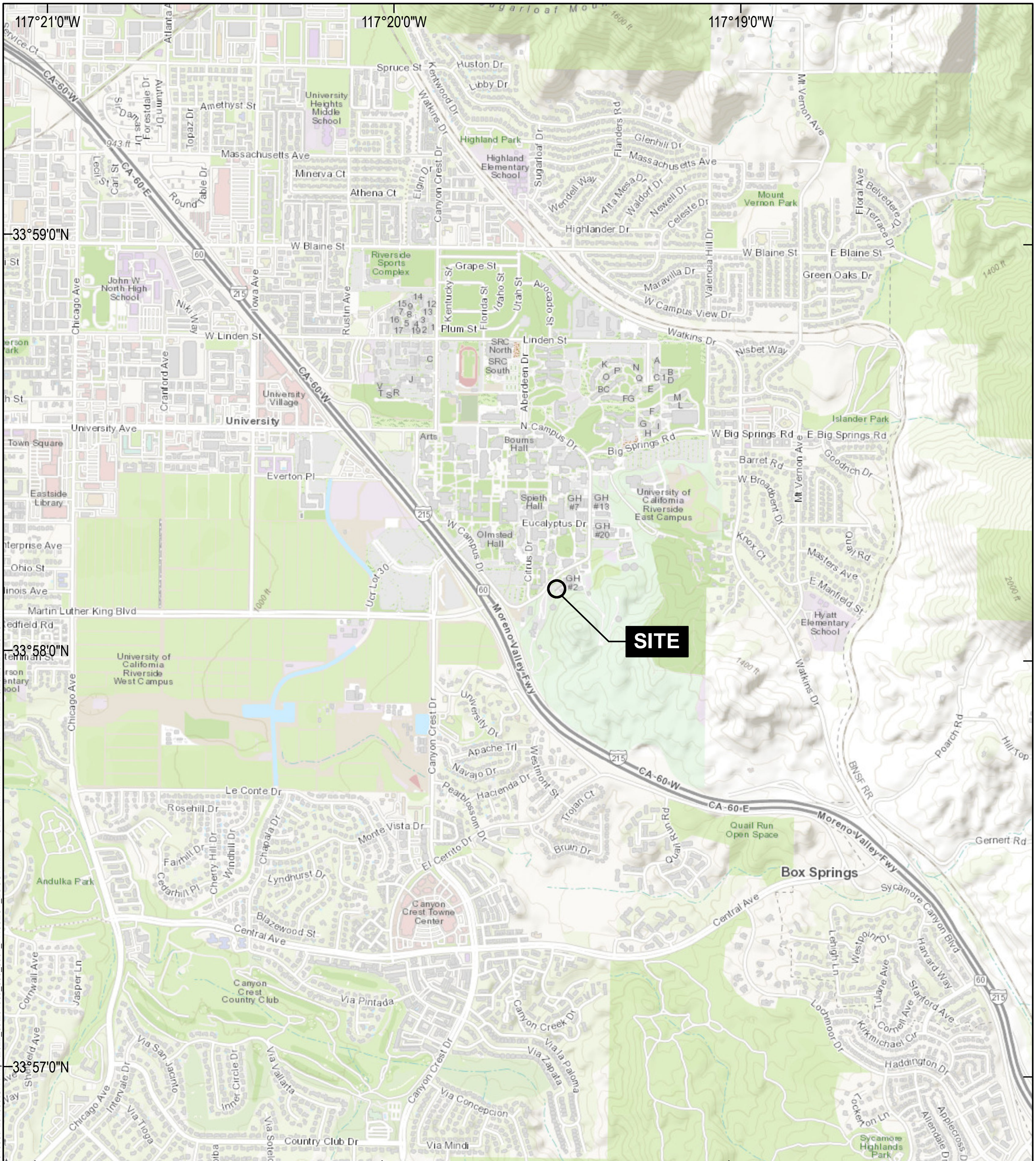
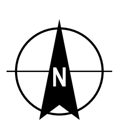
   F1: MS and/or MSD recovery exceeds control limits.
   F2: MS/MSD RPD exceeds control limits.
   p: The %RPD between the primary and confirmation column/detector is >40%. The lower value has been reported.

FIGURES





MAP SOURCE: ESRI
SITE COORDINATES: 33°58'9"N, 117°19'30"W

HALEY ALDRICH

UNIVERSITY OF CALIFORNIA RIVERSIDE CAMPUS
SOUTH CAMPUS DRIVE AND COLLEGE PLACE
RIVERSIDE, CALIFORNIA

PROJECT LOCUS

APPROXIMATE SCALE: 1 IN = 2000 FT
MARCH 2022

FIGURE 1

GIS FILE PATH: \\haleyaldrich.com\share\CF\Projects\0204609\P204609\GIS\Maps\2022_03\204609_000_0001_PROJECT_LOCUS.mxd — USER: hwachholz — LAST SAVED: 3/25/2022 2:28:48 PM

LEGEND

DIRECT PUSH SOIL BORING

HAND AUGER SOIL BORING

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. AERIAL IMAGERY SOURCE: NEARMAP, SEPTEMBER 2021

N

0 30 60

SCALE IN FEET

HALEY ALDRICH

UNIVERSITY OF CALIFORNIA RIVERSIDE CAMPUS
SOUTH CAMPUS DRIVE AND COLLEGE PLACE
RIVERSIDE, CALIFORNIA

SITE PLAN WITH SAMPLE LOCATIONS

MARCH 2022

FIGURE 2

GIS FILE PATH: \\haleyaldrich.com\share\CF\Projects\0204609\P204609\GIS\Maps\2022_03\204609_000_0002_SITE_PLAN_WITH_SAMPLE_LOCATIONS.mxd - USER: hwachholz - LAST SAVED: 3/25/2022 3:56:07 PM

APPENDIX A

Laboratory Analytical Report

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins Calscience
2841 Dow Avenue, Suite 100
Tustin, CA 92780
Tel: (714)895-5494

Laboratory Job ID: 570-85264-1
Client Project/Site: UC Riverside / 204609

For:
Haley & Aldrich, Inc.
3187 Red HIll Avenue
Suite 155
Costa Mesa, California 92626

Attn: Colleen Canfield

Virendra R Patel

Authorized for release by:
3/16/2022 5:17:52 PM

Virendra Patel, Project Manager I
(714)895-5494
Virendra.Patel@eurofinset.com

The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Qualifiers

GC Semi VOA

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.
*1	LCS/LCSD RPD exceeds control limits.
F1	MS and/or MSD recovery exceeds control limits.
F2	MS/MSD RPD exceeds control limits
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
p	The %RPD between the primary and confirmation column/detector is >40%. The lower value has been reported.

Metals

Qualifier	Qualifier Description
F1	MS and/or MSD recovery exceeds control limits.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 570-85264-1

Laboratory: Eurofins Calscience

Narrative

Job Narrative
570-85264-1

Comments
No additional comments.

Receipt
The samples were received on 2/21/2022 3:30 PM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 3.6º C.

GC Semi VOA
Method 8081A: The continuing calibration verification (CCV) associated with batch 570-215782 recovered above the upper control limit for 4,4'-DDE, 4,4'-DDT and Endrin ketone. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The associated samples are impacted: HA-1-0.5 (570-85264-1), HA-1-2.0 (570-85264-2), HA-4-0.5 (570-85264-4), HA-4-2.0 (570-85264-5), HA-2-0.5 (570-85264-7), HA-2-2.0 (570-85264-8), HA-5-0.5 (570-85264-10), HA-5-2.0 (570-85264-11), HA-3-0.5 (570-85264-13), HA-3-2.0 (570-85264-14), HA-6-0.5 (570-85264-16), HA-6-2.0 (570-85264-17), SB-5-0.5 (570-85264-19), SB-5-2.0 (570-85264-20), SB-6-0.5 (570-85264-22), SB-6-2.0 (570-85264-23), SB-7-0.5 (570-85264-25), SB-7-2.0 (570-85264-26), SB-8-0.5 (570-85264-28) and SB-8-2.0 (570-85264-29).

Method 8081A: The closing continuing calibration verification (CCV) associated with batch 570-216044 recovered above the upper control limit for 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Aldrin, alpha-BHC, alpha-Chlordane, beta-BHC, Chlordane, delta-BHC, Dieldrin, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin aldehyde, Endrin ketone, gamma-Chlordane, gamma-BHC, Heptachlor, Heptachlor epoxide, Methoxychlor, Tetrachloro-m-xylene (Surr) and DCB Decachlorobiphenyl (Surr). The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The associated samples are impacted: SB-9-2.0 (570-85264-32), SB-1-0.5 (570-85264-34), SB-1-2.0 (570-85264-35), SB-2-0.5 (570-85264-37), SB-2-2.0 (570-85264-38), SB-3-0.5 (570-85264-40), SB-3-2.0 (570-85264-41), SB-4-0.5 (570-85264-43), SB-4-2.0 (570-85264-44) and (MB 570-215033/1-A).

Method 8081A: The continuing calibration verification (CCV) associated with batch 570-216308 recovered above the upper control limit for Aldrin and Endrin aldehyde. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The associated samples are impacted: SB-9-0.5 (570-85264-31) and SB-4-0.5 (570-85264-43).

Method 8151A: The laboratory control sample (LCS) and / or laboratory control sample duplicate (LCSD) for preparation batch 570-216737 and analytical batch 570-218921 recovered outside control limits for the following analytes: MCPA. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.

Method 8151A: The matrix spike / matrix spike duplicate (MS/MSD) recoveries and precision for preparation batch 570-216737 and analytical batch 570-218921 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample / laboratory sample control duplicate (LCS/LCSD) precision was within acceptance limits.

Method 8151A: The matrix spike / matrix spike duplicate (MS/MSD) recoveries and precision for preparation batch 570-217285 and analytical batch 570-219765 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample / laboratory sample control duplicate (LCS/LCSD) precision was within acceptance limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Metals
Method 6010B: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 570-217347 and analytical batch 570-217894 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method 6010B: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 570-217810 and analytical batch 570-218233 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Job ID: 570-85264-1 (Continued)

Laboratory: Eurofins Calscience (Continued)

Organic Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: Haley & Aldrich, Inc.
Project/Site: UC Riverside / 204609

Job ID: 570-85264-1

Client Sample ID: HA-1-0.5 — Lab Sample ID: 570-85264-1

No Detections.

Client Sample ID: HA-1-2.0 — Lab Sample ID: 570-85264-2

No Detections.

Client Sample ID: HA-4-0.5 — Lab Sample ID: 570-85264-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	2.57		2.55		mg/Kg	1		6010B	Total/NA

Client Sample ID: HA-4-2.0 — Lab Sample ID: 570-85264-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
2,4-D	120	p	100		ug/Kg	1		8151A	Total/NA

Client Sample ID: HA-2-0.5 — Lab Sample ID: 570-85264-7

No Detections.

Client Sample ID: HA-2-2.0 — Lab Sample ID: 570-85264-8

No Detections.

Client Sample ID: HA-5-0.5 — Lab Sample ID: 570-85264-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
4,4'-DDE	5.0		5.0		ug/Kg	1		8081A	Total/NA
alpha-Chlordane	5.2		5.0		ug/Kg	1		8081A	Total/NA

Client Sample ID: HA-5-2.0 — Lab Sample ID: 570-85264-11

No Detections.

Client Sample ID: HA-3-0.5 — Lab Sample ID: 570-85264-13

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
alpha-Chlordane	5.3		5.0		ug/Kg	1		8081A	Total/NA

Client Sample ID: HA-3-2.0 — Lab Sample ID: 570-85264-14

No Detections.

Client Sample ID: HA-6-0.5 — Lab Sample ID: 570-85264-16

No Detections.

Client Sample ID: HA-6-2.0 — Lab Sample ID: 570-85264-17

No Detections.

Client Sample ID: SB-5-0.5 — Lab Sample ID: 570-85264-19

No Detections.

Client Sample ID: SB-5-2.0 — Lab Sample ID: 570-85264-20

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample ID: SB-6-0.5 — Lab Sample ID: 570-85264-22

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	3.44		2.48		mg/Kg	1		6010B	Total/NA

Client Sample ID: SB-6-2.0 — Lab Sample ID: 570-85264-23

No Detections.

Client Sample ID: SB-7-0.5 — Lab Sample ID: 570-85264-25

No Detections.

Client Sample ID: SB-7-2.0 — Lab Sample ID: 570-85264-26

No Detections.

Client Sample ID: SB-8-0.5 — Lab Sample ID: 570-85264-28

No Detections.

Client Sample ID: SB-8-2.0 — Lab Sample ID: 570-85264-29

No Detections.

Client Sample ID: SB-9-0.5 — Lab Sample ID: 570-85264-31

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	3.17		2.49		mg/Kg	1		6010B	Total/NA

Client Sample ID: SB-9-2.0 — Lab Sample ID: 570-85264-32

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
MCPA	39000		10000		ug/Kg	1		8151A	Total/NA

Client Sample ID: SB-1-0.5 — Lab Sample ID: 570-85264-34

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	3.55		2.46		mg/Kg	1		6010B	Total/NA

Client Sample ID: SB-1-2.0 — Lab Sample ID: 570-85264-35

No Detections.

Client Sample ID: SB-2-0.5 — Lab Sample ID: 570-85264-37

No Detections.

Client Sample ID: SB-2-2.0 — Lab Sample ID: 570-85264-38

No Detections.

Client Sample ID: SB-3-0.5 — Lab Sample ID: 570-85264-40

No Detections.

Client Sample ID: SB-3-2.0 — Lab Sample ID: 570-85264-41

No Detections.

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Haley & Aldrich, Inc. Job ID: 570-85264-1
Project/Site: UC Riverside / 204609

Client Sample ID: SB-4-0.5 Lab Sample ID: 570-85264-43

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
4,4'-DDE	7.8		5.0		ug/Kg	1		8081A	Total/NA
Arsenic	5.03		2.48		mg/Kg	1		6010B	Total/NA

Client Sample ID: SB-4-2.0 Lab Sample ID: 570-85264-44

No Detections.

This Detection Summary does not include radiochemical test results.

Method: 8081A - Organochlorine Pesticides (GC)

Client Sample ID: HA-1-0.5
Date Collected: 02/21/22 07:50
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-1
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 22:47	1
4,4'-DDE	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 22:47	1
4,4'-DDT	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 22:47	1
Aldrin	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 22:47	1
alpha-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 22:47	1
alpha-Chlordane	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 22:47	1
beta-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 22:47	1
Chlordane	ND		25		ug/Kg		02/23/22 13:08	02/26/22 22:47	1
delta-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 22:47	1
Dieldrin	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 22:47	1
Endosulfan I	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 22:47	1
Endosulfan II	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 22:47	1
Endosulfan sulfate	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 22:47	1
Endrin	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 22:47	1
Endrin aldehyde	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 22:47	1
Endrin ketone	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 22:47	1
gamma-Chlordane	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 22:47	1
gamma-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 22:47	1
Heptachlor	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 22:47	1
Heptachlor epoxide	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 22:47	1
Methoxychlor	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 22:47	1
Toxaphene	ND		25		ug/Kg		02/23/22 13:08	02/26/22 22:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene (Surr)	*70*		*38 - 148*	*02/23/22 13:08*	*02/26/22 22:47*	*1*
DCB Decachlorobiphenyl (Surr)	*72*		*37 - 151*	*02/23/22 13:08*	*02/26/22 22:47*	*1*

Client Sample ID: HA-1-2.0
Date Collected: 02/21/22 07:55
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-2
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:02	1
4,4'-DDE	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:02	1
4,4'-DDT	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:02	1
Aldrin	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:02	1
alpha-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:02	1
alpha-Chlordane	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:02	1
beta-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:02	1
Chlordane	ND		25		ug/Kg		02/23/22 13:08	02/26/22 23:02	1
delta-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:02	1
Dieldrin	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:02	1
Endosulfan I	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:02	1
Endosulfan II	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:02	1
Endosulfan sulfate	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:02	1
Endrin	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:02	1
Endrin aldehyde	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:02	1
Endrin ketone	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:02	1
gamma-Chlordane	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:02	1
gamma-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:02	1
Heptachlor	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:02	1

Method: 8081A - Organochlorine Pesticides (GC) (Continued)

Client Sample ID: HA-1-2.0 **Lab Sample ID: 570-85264-2**
Date Collected: 02/21/22 07:55 **Matrix: Solid**
Date Received: 02/21/22 15:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Heptachlor epoxide	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:02	1
Methoxychlor	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:02	1
Toxaphene	ND		25		ug/Kg		02/23/22 13:08	02/26/22 23:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene (Surr)	*87*		*38 - 148*	*02/23/22 13:08*	*02/26/22 23:02*	*1*
DCB Decachlorobiphenyl (Surr)	*86*		*37 - 151*	*02/23/22 13:08*	*02/26/22 23:02*	*1*

Client Sample ID: HA-4-0.5 **Lab Sample ID: 570-85264-4**
Date Collected: 02/21/22 08:15 **Matrix: Solid**
Date Received: 02/21/22 15:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:17	1
4,4'-DDE	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:17	1
4,4'-DDT	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:17	1
Aldrin	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:17	1
alpha-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:17	1
alpha-Chlordane	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:17	1
beta-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:17	1
Chlordane	ND		25		ug/Kg		02/23/22 13:08	02/26/22 23:17	1
delta-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:17	1
Dieldrin	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:17	1
Endosulfan I	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:17	1
Endosulfan II	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:17	1
Endosulfan sulfate	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:17	1
Endrin	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:17	1
Endrin aldehyde	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:17	1
Endrin ketone	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:17	1
gamma-Chlordane	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:17	1
gamma-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:17	1
Heptachlor	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:17	1
Heptachlor epoxide	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:17	1
Methoxychlor	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:17	1
Toxaphene	ND		25		ug/Kg		02/23/22 13:08	02/26/22 23:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene (Surr)	*68*		*38 - 148*	*02/23/22 13:08*	*02/26/22 23:17*	*1*
DCB Decachlorobiphenyl (Surr)	*72*		*37 - 151*	*02/23/22 13:08*	*02/26/22 23:17*	*1*

Client Sample ID: HA-4-2.0 **Lab Sample ID: 570-85264-5**
Date Collected: 02/21/22 08:20 **Matrix: Solid**
Date Received: 02/21/22 15:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:33	1
4,4'-DDE	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:33	1
4,4'-DDT	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:33	1
Aldrin	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:33	1
alpha-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:33	1
alpha-Chlordane	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:33	1
beta-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:33	1

Client: Haley & Aldrich, Inc. Job ID: 570-85264-1
Project/Site: UC Riverside / 204609

Method: 8081A - Organochlorine Pesticides (GC) (Continued)

Client Sample ID: HA-4-2.0 **Lab Sample ID: 570-85264-5**
Date Collected: 02/21/22 08:20 **Matrix: Solid**
Date Received: 02/21/22 15:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlordane	ND		25		ug/Kg		02/23/22 13:08	02/26/22 23:33	1
delta-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:33	1
Dieldrin	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:33	1
Endosulfan I	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:33	1
Endosulfan II	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:33	1
Endosulfan sulfate	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:33	1
Endrin	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:33	1
Endrin aldehyde	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:33	1
Endrin ketone	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:33	1
gamma-Chlordane	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:33	1
gamma-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:33	1
Heptachlor	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:33	1
Heptachlor epoxide	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:33	1
Methoxychlor	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:33	1
Toxaphene	ND		25		ug/Kg		02/23/22 13:08	02/26/22 23:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene (Surr)	*70*		*38 - 148*	*02/23/22 13:08*	*02/26/22 23:33*	*1*
DCB Decachlorobiphenyl (Surr)	*71*		*37 - 151*	*02/23/22 13:08*	*02/26/22 23:33*	*1*

Client Sample ID: HA-2-0.5 **Lab Sample ID: 570-85264-7**
Date Collected: 02/21/22 08:30 **Matrix: Solid**
Date Received: 02/21/22 15:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:48	1
4,4'-DDE	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:48	1
4,4'-DDT	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:48	1
Aldrin	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:48	1
alpha-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:48	1
alpha-Chlordane	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:48	1
beta-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:48	1
Chlordane	ND		25		ug/Kg		02/23/22 13:08	02/26/22 23:48	1
delta-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:48	1
Dieldrin	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:48	1
Endosulfan I	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:48	1
Endosulfan II	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:48	1
Endosulfan sulfate	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:48	1
Endrin	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:48	1
Endrin aldehyde	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:48	1
Endrin ketone	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:48	1
gamma-Chlordane	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:48	1
gamma-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:48	1
Heptachlor	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:48	1
Heptachlor epoxide	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:48	1
Methoxychlor	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 23:48	1
Toxaphene	ND		25		ug/Kg		02/23/22 13:08	02/26/22 23:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene (Surr)	*72*		*38 - 148*	*02/23/22 13:08*	*02/26/22 23:48*	*1*
DCB Decachlorobiphenyl (Surr)	*74*		*37 - 151*	*02/23/22 13:08*	*02/26/22 23:48*	*1*

Client Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: UC Riverside / 204609

Job ID: 570-85264-1

Method: 8081A - Organochlorine Pesticides (GC)

Client Sample ID: HA-2-2.0
Date Collected: 02/21/22 08:34
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-8
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:03	1
4,4'-DDE	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:03	1
4,4'-DDT	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:03	1
Aldrin	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:03	1
alpha-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:03	1
alpha-Chlordane	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:03	1
beta-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:03	1
Chlordane	ND		25		ug/Kg		02/23/22 13:08	02/27/22 00:03	1
delta-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:03	1
Dieldrin	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:03	1
Endosulfan I	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:03	1
Endosulfan II	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:03	1
Endosulfan sulfate	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:03	1
Endrin	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:03	1
Endrin aldehyde	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:03	1
Endrin ketone	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:03	1
gamma-Chlordane	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:03	1
gamma-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:03	1
Heptachlor	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:03	1
Heptachlor epoxide	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:03	1
Methoxychlor	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:03	1
Toxaphene	ND		25		ug/Kg		02/23/22 13:08	02/27/22 00:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene (Surr)	*79*		*38 - 148*	*02/23/22 13:08*	*02/27/22 00:03*	*1*
DCB Decachlorobiphenyl (Surr)	*77*		*37 - 151*	*02/23/22 13:08*	*02/27/22 00:03*	*1*

Client Sample ID: HA-5-0.5
Date Collected: 02/21/22 08:42
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-10
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:18	1
4,4'-DDE	**5.0**		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:18	1
4,4'-DDT	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:18	1
Aldrin	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:18	1
alpha-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:18	1
alpha-Chlordane	**5.2**		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:18	1
beta-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:18	1
Chlordane	ND		25		ug/Kg		02/23/22 13:08	02/27/22 00:18	1
delta-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:18	1
Dieldrin	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:18	1
Endosulfan I	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:18	1
Endosulfan II	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:18	1
Endosulfan sulfate	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:18	1
Endrin	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:18	1
Endrin aldehyde	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:18	1
Endrin ketone	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:18	1
gamma-Chlordane	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:18	1
gamma-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:18	1
Heptachlor	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:18	1

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Method: 8081A - Organochlorine Pesticides (GC) (Continued)

Client Sample ID: HA-5-0.5 — **Lab Sample ID: 570-85264-10**
Date Collected: 02/21/22 08:42 — **Matrix: Solid**
Date Received: 02/21/22 15:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Heptachlor epoxide	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:18	1
Methoxychlor	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:18	1
Toxaphene	ND		25		ug/Kg		02/23/22 13:08	02/27/22 00:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene (Surr)	*78*		*38 - 148*	*02/23/22 13:08*	*02/27/22 00:18*	*1*
DCB Decachlorobiphenyl (Surr)	*85*		*37 - 151*	*02/23/22 13:08*	*02/27/22 00:18*	*1*

Client Sample ID: HA-5-2.0 — **Lab Sample ID: 570-85264-11**
Date Collected: 02/21/22 08:45 — **Matrix: Solid**
Date Received: 02/21/22 15:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:33	1
4,4'-DDE	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:33	1
4,4'-DDT	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:33	1
Aldrin	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:33	1
alpha-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:33	1
alpha-Chlordane	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:33	1
beta-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:33	1
Chlordane	ND		25		ug/Kg		02/23/22 13:08	02/27/22 00:33	1
delta-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:33	1
Dieldrin	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:33	1
Endosulfan I	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:33	1
Endosulfan II	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:33	1
Endosulfan sulfate	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:33	1
Endrin	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:33	1
Endrin aldehyde	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:33	1
Endrin ketone	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:33	1
gamma-Chlordane	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:33	1
gamma-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:33	1
Heptachlor	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:33	1
Heptachlor epoxide	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:33	1
Methoxychlor	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:33	1
Toxaphene	ND		25		ug/Kg		02/23/22 13:08	02/27/22 00:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene (Surr)	*75*		*38 - 148*	*02/23/22 13:08*	*02/27/22 00:33*	*1*
DCB Decachlorobiphenyl (Surr)	*81*		*37 - 151*	*02/23/22 13:08*	*02/27/22 00:33*	*1*

Client Sample ID: HA-3-0.5 — **Lab Sample ID: 570-85264-13**
Date Collected: 02/21/22 08:52 — **Matrix: Solid**
Date Received: 02/21/22 15:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:48	1
4,4'-DDE	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:48	1
4,4'-DDT	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:48	1
Aldrin	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:48	1
alpha-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:48	1
alpha-Chlordane	**5.3**		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:48	1
beta-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:48	1

Method: 8081A - Organochlorine Pesticides (GC) (Continued)

Client Sample ID: HA-3-0.5 **Lab Sample ID: 570-85264-13**
Date Collected: 02/21/22 08:52 **Matrix: Solid**
Date Received: 02/21/22 15:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlordane	ND		25		ug/Kg		02/23/22 13:08	02/27/22 00:48	1
delta-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:48	1
Dieldrin	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:48	1
Endosulfan I	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:48	1
Endosulfan II	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:48	1
Endosulfan sulfate	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:48	1
Endrin	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:48	1
Endrin aldehyde	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:48	1
Endrin ketone	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:48	1
gamma-Chlordane	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:48	1
gamma-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:48	1
Heptachlor	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:48	1
Heptachlor epoxide	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:48	1
Methoxychlor	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 00:48	1
Toxaphene	ND		25		ug/Kg		02/23/22 13:08	02/27/22 00:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene (Surr)	*72*		*38 - 148*	*02/23/22 13:08*	*02/27/22 00:48*	*1*
DCB Decachlorobiphenyl (Surr)	*76*		*37 - 151*	*02/23/22 13:08*	*02/27/22 00:48*	*1*

Client Sample ID: HA-3-2.0 **Lab Sample ID: 570-85264-14**
Date Collected: 02/21/22 08:55 **Matrix: Solid**
Date Received: 02/21/22 15:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:03	1
4,4'-DDE	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:03	1
4,4'-DDT	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:03	1
Aldrin	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:03	1
alpha-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:03	1
alpha-Chlordane	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:03	1
beta-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:03	1
Chlordane	ND		25		ug/Kg		02/23/22 13:08	02/27/22 01:03	1
delta-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:03	1
Dieldrin	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:03	1
Endosulfan I	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:03	1
Endosulfan II	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:03	1
Endosulfan sulfate	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:03	1
Endrin	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:03	1
Endrin aldehyde	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:03	1
Endrin ketone	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:03	1
gamma-Chlordane	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:03	1
gamma-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:03	1
Heptachlor	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:03	1
Heptachlor epoxide	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:03	1
Methoxychlor	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:03	1
Toxaphene	ND		25		ug/Kg		02/23/22 13:08	02/27/22 01:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene (Surr)	*77*		*38 - 148*	*02/23/22 13:08*	*02/27/22 01:03*	*1*
DCB Decachlorobiphenyl (Surr)	*79*		*37 - 151*	*02/23/22 13:08*	*02/27/22 01:03*	*1*

Method: 8081A - Organochlorine Pesticides (GC)

Client Sample ID: HA-6-0.5
Lab Sample ID: 570-85264-16
Date Collected: 02/21/22 09:05
Matrix: Solid
Date Received: 02/21/22 15:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:18	1
4,4'-DDE	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:18	1
4,4'-DDT	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:18	1
Aldrin	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:18	1
alpha-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:18	1
alpha-Chlordane	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:18	1
beta-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:18	1
Chlordane	ND		25		ug/Kg		02/23/22 13:08	02/27/22 01:18	1
delta-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:18	1
Dieldrin	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:18	1
Endosulfan I	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:18	1
Endosulfan II	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:18	1
Endosulfan sulfate	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:18	1
Endrin	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:18	1
Endrin aldehyde	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:18	1
Endrin ketone	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:18	1
gamma-Chlordane	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:18	1
gamma-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:18	1
Heptachlor	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:18	1
Heptachlor epoxide	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:18	1
Methoxychlor	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:18	1
Toxaphene	ND		25		ug/Kg		02/23/22 13:08	02/27/22 01:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene (Surr)	*76*		*38 - 148*	*02/23/22 13:08*	*02/27/22 01:18*	*1*
DCB Decachlorobiphenyl (Surr)	*79*		*37 - 151*	*02/23/22 13:08*	*02/27/22 01:18*	*1*

Client Sample ID: HA-6-2.0
Lab Sample ID: 570-85264-17
Date Collected: 02/21/22 09:08
Matrix: Solid
Date Received: 02/21/22 15:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:33	1
4,4'-DDE	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:33	1
4,4'-DDT	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:33	1
Aldrin	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:33	1
alpha-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:33	1
alpha-Chlordane	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:33	1
beta-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:33	1
Chlordane	ND		25		ug/Kg		02/23/22 13:08	02/27/22 01:33	1
delta-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:33	1
Dieldrin	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:33	1
Endosulfan I	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:33	1
Endosulfan II	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:33	1
Endosulfan sulfate	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:33	1
Endrin	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:33	1
Endrin aldehyde	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:33	1
Endrin ketone	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:33	1
gamma-Chlordane	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:33	1
gamma-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:33	1
Heptachlor	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:33	1

Method: 8081A - Organochlorine Pesticides (GC) (Continued)

Client Sample ID: HA-6-2.0 **Lab Sample ID: 570-85264-17**
Date Collected: 02/21/22 09:08 **Matrix: Solid**
Date Received: 02/21/22 15:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Heptachlor epoxide	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:33	1
Methoxychlor	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:33	1
Toxaphene	ND		25		ug/Kg		02/23/22 13:08	02/27/22 01:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene (Surr)	*77*		*38 - 148*	*02/23/22 13:08*	*02/27/22 01:33*	*1*
DCB Decachlorobiphenyl (Surr)	*80*		*37 - 151*	*02/23/22 13:08*	*02/27/22 01:33*	*1*

Client Sample ID: SB-5-0.5 **Lab Sample ID: 570-85264-19**
Date Collected: 02/21/22 09:30 **Matrix: Solid**
Date Received: 02/21/22 15:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:48	1
4,4'-DDE	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:48	1
4,4'-DDT	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:48	1
Aldrin	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:48	1
alpha-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:48	1
alpha-Chlordane	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:48	1
beta-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:48	1
Chlordane	ND		25		ug/Kg		02/23/22 13:08	02/27/22 01:48	1
delta-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:48	1
Dieldrin	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:48	1
Endosulfan I	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:48	1
Endosulfan II	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:48	1
Endosulfan sulfate	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:48	1
Endrin	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:48	1
Endrin aldehyde	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:48	1
Endrin ketone	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:48	1
gamma-Chlordane	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:48	1
gamma-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:48	1
Heptachlor	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:48	1
Heptachlor epoxide	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:48	1
Methoxychlor	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 01:48	1
Toxaphene	ND		25		ug/Kg		02/23/22 13:08	02/27/22 01:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene (Surr)	*75*	*p*	*38 - 148*	*02/23/22 13:08*	*02/27/22 01:48*	*1*
DCB Decachlorobiphenyl (Surr)	*84*		*37 - 151*	*02/23/22 13:08*	*02/27/22 01:48*	*1*

Client Sample ID: SB-5-2.0 **Lab Sample ID: 570-85264-20**
Date Collected: 02/21/22 09:32 **Matrix: Solid**
Date Received: 02/21/22 15:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:03	1
4,4'-DDE	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:03	1
4,4'-DDT	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:03	1
Aldrin	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:03	1
alpha-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:03	1
alpha-Chlordane	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:03	1
beta-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:03	1

Method: 8081A - Organochlorine Pesticides (GC) (Continued)

Client Sample ID: SB-5-2.0
Lab Sample ID: 570-85264-20
Date Collected: 02/21/22 09:32
Matrix: Solid
Date Received: 02/21/22 15:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlordane	ND		25		ug/Kg		02/23/22 13:08	02/27/22 02:03	1
delta-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:03	1
Dieldrin	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:03	1
Endosulfan I	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:03	1
Endosulfan II	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:03	1
Endosulfan sulfate	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:03	1
Endrin	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:03	1
Endrin aldehyde	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:03	1
Endrin ketone	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:03	1
gamma-Chlordane	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:03	1
gamma-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:03	1
Heptachlor	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:03	1
Heptachlor epoxide	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:03	1
Methoxychlor	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:03	1
Toxaphene	ND		25		ug/Kg		02/23/22 13:08	02/27/22 02:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene (Surr)	*70*		*38 - 148*	*02/23/22 13:08*	*02/27/22 02:03*	*1*
DCB Decachlorobiphenyl (Surr)	*82*		*37 - 151*	*02/23/22 13:08*	*02/27/22 02:03*	*1*

Client Sample ID: SB-6-0.5
Lab Sample ID: 570-85264-22
Date Collected: 02/21/22 09:40
Matrix: Solid
Date Received: 02/21/22 15:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:18	1
4,4'-DDE	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:18	1
4,4'-DDT	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:18	1
Aldrin	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:18	1
alpha-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:18	1
alpha-Chlordane	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:18	1
beta-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:18	1
Chlordane	ND		25		ug/Kg		02/23/22 13:08	02/27/22 02:18	1
delta-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:18	1
Dieldrin	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:18	1
Endosulfan I	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:18	1
Endosulfan II	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:18	1
Endosulfan sulfate	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:18	1
Endrin	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:18	1
Endrin aldehyde	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:18	1
Endrin ketone	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:18	1
gamma-Chlordane	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:18	1
gamma-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:18	1
Heptachlor	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:18	1
Heptachlor epoxide	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:18	1
Methoxychlor	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:18	1
Toxaphene	ND		25		ug/Kg		02/23/22 13:08	02/27/22 02:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene (Surr)	*54*		*38 - 148*	*02/23/22 13:08*	*02/27/22 02:18*	*1*
DCB Decachlorobiphenyl (Surr)	*58*		*37 - 151*	*02/23/22 13:08*	*02/27/22 02:18*	*1*

Method: 8081A - Organochlorine Pesticides (GC)

Client Sample ID: SB-6-2.0
Date Collected: 02/21/22 09:42
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-23
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:33	1
4,4'-DDE	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:33	1
4,4'-DDT	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:33	1
Aldrin	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:33	1
alpha-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:33	1
alpha-Chlordane	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:33	1
beta-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:33	1
Chlordane	ND		25		ug/Kg		02/23/22 13:08	02/27/22 02:33	1
delta-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:33	1
Dieldrin	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:33	1
Endosulfan I	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:33	1
Endosulfan II	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:33	1
Endosulfan sulfate	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:33	1
Endrin	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:33	1
Endrin aldehyde	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:33	1
Endrin ketone	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:33	1
gamma-Chlordane	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:33	1
gamma-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:33	1
Heptachlor	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:33	1
Heptachlor epoxide	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:33	1
Methoxychlor	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:33	1
Toxaphene	ND		25		ug/Kg		02/23/22 13:08	02/27/22 02:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene (Surr)	*71*		*38 - 148*	*02/23/22 13:08*	*02/27/22 02:33*	*1*
DCB Decachlorobiphenyl (Surr)	*76*		*37 - 151*	*02/23/22 13:08*	*02/27/22 02:33*	*1*

Client Sample ID: SB-7-0.5
Date Collected: 02/21/22 09:50
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-25
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:48	1
4,4'-DDE	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:48	1
4,4'-DDT	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:48	1
Aldrin	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:48	1
alpha-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:48	1
alpha-Chlordane	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:48	1
beta-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:48	1
Chlordane	ND		25		ug/Kg		02/23/22 13:08	02/27/22 02:48	1
delta-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:48	1
Dieldrin	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:48	1
Endosulfan I	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:48	1
Endosulfan II	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:48	1
Endosulfan sulfate	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:48	1
Endrin	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:48	1
Endrin aldehyde	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:48	1
Endrin ketone	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:48	1
gamma-Chlordane	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:48	1
gamma-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:48	1
Heptachlor	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:48	1

Method: 8081A - Organochlorine Pesticides (GC) (Continued)

Client Sample ID: SB-7-0.5 **Lab Sample ID: 570-85264-25**
Date Collected: 02/21/22 09:50 **Matrix: Solid**
Date Received: 02/21/22 15:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Heptachlor epoxide	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:48	1
Methoxychlor	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 02:48	1
Toxaphene	ND		25		ug/Kg		02/23/22 13:08	02/27/22 02:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene (Surr)	*70*		*38 - 148*	*02/23/22 13:08*	*02/27/22 02:48*	*1*
DCB Decachlorobiphenyl (Surr)	*78*		*37 - 151*	*02/23/22 13:08*	*02/27/22 02:48*	*1*

Client Sample ID: SB-7-2.0 **Lab Sample ID: 570-85264-26**
Date Collected: 02/21/22 09:52 **Matrix: Solid**
Date Received: 02/21/22 15:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:04	1
4,4'-DDE	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:04	1
4,4'-DDT	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:04	1
Aldrin	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:04	1
alpha-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:04	1
alpha-Chlordane	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:04	1
beta-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:04	1
Chlordane	ND		25		ug/Kg		02/23/22 13:08	02/27/22 03:04	1
delta-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:04	1
Dieldrin	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:04	1
Endosulfan I	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:04	1
Endosulfan II	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:04	1
Endosulfan sulfate	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:04	1
Endrin	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:04	1
Endrin aldehyde	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:04	1
Endrin ketone	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:04	1
gamma-Chlordane	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:04	1
gamma-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:04	1
Heptachlor	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:04	1
Heptachlor epoxide	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:04	1
Methoxychlor	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:04	1
Toxaphene	ND		25		ug/Kg		02/23/22 13:08	02/27/22 03:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene (Surr)	*65*		*38 - 148*	*02/23/22 13:08*	*02/27/22 03:04*	*1*
DCB Decachlorobiphenyl (Surr)	*69*		*37 - 151*	*02/23/22 13:08*	*02/27/22 03:04*	*1*

Client Sample ID: SB-8-0.5 **Lab Sample ID: 570-85264-28**
Date Collected: 02/21/22 10:00 **Matrix: Solid**
Date Received: 02/21/22 15:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:19	1
4,4'-DDE	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:19	1
4,4'-DDT	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:19	1
Aldrin	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:19	1
alpha-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:19	1
alpha-Chlordane	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:19	1
beta-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:19	1

Method: 8081A - Organochlorine Pesticides (GC) (Continued)

Client Sample ID: SB-8-0.5 **Lab Sample ID: 570-85264-28**
Date Collected: 02/21/22 10:00 **Matrix: Solid**
Date Received: 02/21/22 15:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlordane	ND		25		ug/Kg		02/23/22 13:08	02/27/22 03:19	1
delta-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:19	1
Dieldrin	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:19	1
Endosulfan I	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:19	1
Endosulfan II	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:19	1
Endosulfan sulfate	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:19	1
Endrin	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:19	1
Endrin aldehyde	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:19	1
Endrin ketone	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:19	1
gamma-Chlordane	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:19	1
gamma-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:19	1
Heptachlor	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:19	1
Heptachlor epoxide	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:19	1
Methoxychlor	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:19	1
Toxaphene	ND		25		ug/Kg		02/23/22 13:08	02/27/22 03:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene (Surr)	*72*		*38 - 148*	*02/23/22 13:08*	*02/27/22 03:19*	*1*
DCB Decachlorobiphenyl (Surr)	*78*		*37 - 151*	*02/23/22 13:08*	*02/27/22 03:19*	*1*

Client Sample ID: SB-8-2.0 **Lab Sample ID: 570-85264-29**
Date Collected: 02/21/22 10:03 **Matrix: Solid**
Date Received: 02/21/22 15:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:34	1
4,4'-DDE	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:34	1
4,4'-DDT	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:34	1
Aldrin	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:34	1
alpha-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:34	1
alpha-Chlordane	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:34	1
beta-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:34	1
Chlordane	ND		25		ug/Kg		02/23/22 13:08	02/27/22 03:34	1
delta-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:34	1
Dieldrin	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:34	1
Endosulfan I	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:34	1
Endosulfan II	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:34	1
Endosulfan sulfate	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:34	1
Endrin	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:34	1
Endrin aldehyde	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:34	1
Endrin ketone	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:34	1
gamma-Chlordane	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:34	1
gamma-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:34	1
Heptachlor	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:34	1
Heptachlor epoxide	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:34	1
Methoxychlor	ND		5.0		ug/Kg		02/23/22 13:08	02/27/22 03:34	1
Toxaphene	ND		25		ug/Kg		02/23/22 13:08	02/27/22 03:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene (Surr)	*75*		*38 - 148*	*02/23/22 13:08*	*02/27/22 03:34*	*1*
DCB Decachlorobiphenyl (Surr)	*81*		*37 - 151*	*02/23/22 13:08*	*02/27/22 03:34*	*1*

Method: 8081A - Organochlorine Pesticides (GC)

Client Sample ID: SB-9-0.5
Date Collected: 02/21/22 10:50
Date Received: 02/21/22 15:30
Lab Sample ID: 570-85264-31
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		5.0		ug/Kg		02/23/22 13:11	03/01/22 21:41	1
4,4'-DDE	ND		5.0		ug/Kg		02/23/22 13:11	03/01/22 21:41	1
4,4'-DDT	ND		5.0		ug/Kg		02/23/22 13:11	03/01/22 21:41	1
Aldrin	ND	F1	5.0		ug/Kg		02/23/22 13:11	03/01/22 21:41	1
alpha-BHC	ND	F1	5.0		ug/Kg		02/23/22 13:11	03/01/22 21:41	1
alpha-Chlordane	ND		5.0		ug/Kg		02/23/22 13:11	03/01/22 21:41	1
beta-BHC	ND	F1	5.0		ug/Kg		02/23/22 13:11	03/01/22 21:41	1
Chlordane	ND		25		ug/Kg		02/23/22 13:11	03/01/22 21:41	1
delta-BHC	ND	F1	5.0		ug/Kg		02/23/22 13:11	03/01/22 21:41	1
Dieldrin	ND		5.0		ug/Kg		02/23/22 13:11	03/01/22 21:41	1
Endosulfan I	ND	F1	5.0		ug/Kg		02/23/22 13:11	03/01/22 21:41	1
Endosulfan II	ND		5.0		ug/Kg		02/23/22 13:11	03/01/22 21:41	1
Endosulfan sulfate	ND		5.0		ug/Kg		02/23/22 13:11	03/01/22 21:41	1
Endrin	ND		5.0		ug/Kg		02/23/22 13:11	03/01/22 21:41	1
Endrin aldehyde	ND	F1	5.0		ug/Kg		02/23/22 13:11	03/01/22 21:41	1
Endrin ketone	ND		5.0		ug/Kg		02/23/22 13:11	03/01/22 21:41	1
gamma-Chlordane	ND		5.0		ug/Kg		02/23/22 13:11	03/01/22 21:41	1
gamma-BHC	ND	F1	5.0		ug/Kg		02/23/22 13:11	03/01/22 21:41	1
Heptachlor	ND	F1	5.0		ug/Kg		02/23/22 13:11	03/01/22 21:41	1
Heptachlor epoxide	ND	F1	5.0		ug/Kg		02/23/22 13:11	03/01/22 21:41	1
Methoxychlor	ND		5.0		ug/Kg		02/23/22 13:11	03/01/22 21:41	1
Toxaphene	ND		25		ug/Kg		02/23/22 13:11	03/01/22 21:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene (Surr)	*104*		*38 - 148*	*02/23/22 13:11*	*03/01/22 21:41*	*1*
DCB Decachlorobiphenyl (Surr)	*100*		*37 - 151*	*02/23/22 13:11*	*03/01/22 21:41*	*1*

Client Sample ID: SB-9-2.0
Date Collected: 02/21/22 10:55
Date Received: 02/21/22 15:30
Lab Sample ID: 570-85264-32
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 19:57	1
4,4'-DDE	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 19:57	1
4,4'-DDT	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 19:57	1
Aldrin	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 19:57	1
alpha-BHC	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 19:57	1
alpha-Chlordane	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 19:57	1
beta-BHC	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 19:57	1
Chlordane	ND		25		ug/Kg		02/23/22 13:11	02/28/22 19:57	1
delta-BHC	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 19:57	1
Dieldrin	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 19:57	1
Endosulfan I	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 19:57	1
Endosulfan II	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 19:57	1
Endosulfan sulfate	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 19:57	1
Endrin	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 19:57	1
Endrin aldehyde	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 19:57	1
Endrin ketone	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 19:57	1
gamma-Chlordane	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 19:57	1
gamma-BHC	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 19:57	1
Heptachlor	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 19:57	1

Method: 8081A - Organochlorine Pesticides (GC) (Continued)

Client Sample ID: SB-9-2.0
Date Collected: 02/21/22 10:55
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-32
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Heptachlor epoxide	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 19:57	1
Methoxychlor	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 19:57	1
Toxaphene	ND		25		ug/Kg		02/23/22 13:11	02/28/22 19:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene (Surr)	*77*		*38 - 148*	*02/23/22 13:11*	*02/28/22 19:57*	*1*
DCB Decachlorobiphenyl (Surr)	*87*		*37 - 151*	*02/23/22 13:11*	*02/28/22 19:57*	*1*

Client Sample ID: SB-1-0.5
Date Collected: 02/21/22 11:05
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-34
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 18:22	1
4,4'-DDE	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 18:22	1
4,4'-DDT	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 18:22	1
Aldrin	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 18:22	1
alpha-BHC	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 18:22	1
alpha-Chlordane	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 18:22	1
beta-BHC	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 18:22	1
Chlordane	ND		25		ug/Kg		02/23/22 13:11	02/28/22 18:22	1
delta-BHC	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 18:22	1
Dieldrin	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 18:22	1
Endosulfan I	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 18:22	1
Endosulfan II	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 18:22	1
Endosulfan sulfate	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 18:22	1
Endrin	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 18:22	1
Endrin aldehyde	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 18:22	1
Endrin ketone	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 18:22	1
gamma-Chlordane	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 18:22	1
gamma-BHC	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 18:22	1
Heptachlor	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 18:22	1
Heptachlor epoxide	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 18:22	1
Methoxychlor	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 18:22	1
Toxaphene	ND		25		ug/Kg		02/23/22 13:11	02/28/22 18:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene (Surr)	*92*	*p*	*38 - 148*	*02/23/22 13:11*	*02/28/22 18:22*	*1*
DCB Decachlorobiphenyl (Surr)	*95*		*37 - 151*	*02/23/22 13:11*	*02/28/22 18:22*	*1*

Client Sample ID: SB-1-2.0
Date Collected: 02/21/22 11:07
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-35
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:12	1
4,4'-DDE	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:12	1
4,4'-DDT	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:12	1
Aldrin	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:12	1
alpha-BHC	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:12	1
alpha-Chlordane	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:12	1
beta-BHC	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:12	1

Method: 8081A - Organochlorine Pesticides (GC) (Continued)

Client Sample ID: SB-1-2.0
Date Collected: 02/21/22 11:07
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-35
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlordane	ND		25		ug/Kg		02/23/22 13:11	02/28/22 20:12	1
delta-BHC	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:12	1
Dieldrin	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:12	1
Endosulfan I	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:12	1
Endosulfan II	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:12	1
Endosulfan sulfate	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:12	1
Endrin	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:12	1
Endrin aldehyde	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:12	1
Endrin ketone	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:12	1
gamma-Chlordane	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:12	1
gamma-BHC	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:12	1
Heptachlor	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:12	1
Heptachlor epoxide	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:12	1
Methoxychlor	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:12	1
Toxaphene	ND		25		ug/Kg		02/23/22 13:11	02/28/22 20:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene (Surr)	*83*		*38 - 148*	*02/23/22 13:11*	*02/28/22 20:12*	*1*
DCB Decachlorobiphenyl (Surr)	*97*		*37 - 151*	*02/23/22 13:11*	*02/28/22 20:12*	*1*

Client Sample ID: SB-2-0.5
Date Collected: 02/21/22 11:15
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-37
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 18:07	1
4,4'-DDE	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 18:07	1
4,4'-DDT	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 18:07	1
Aldrin	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 18:07	1
alpha-BHC	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 18:07	1
alpha-Chlordane	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 18:07	1
beta-BHC	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 18:07	1
Chlordane	ND		25		ug/Kg		02/23/22 13:11	02/28/22 18:07	1
delta-BHC	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 18:07	1
Dieldrin	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 18:07	1
Endosulfan I	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 18:07	1
Endosulfan II	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 18:07	1
Endosulfan sulfate	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 18:07	1
Endrin	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 18:07	1
Endrin aldehyde	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 18:07	1
Endrin ketone	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 18:07	1
gamma-Chlordane	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 18:07	1
gamma-BHC	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 18:07	1
Heptachlor	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 18:07	1
Heptachlor epoxide	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 18:07	1
Methoxychlor	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 18:07	1
Toxaphene	ND		25		ug/Kg		02/23/22 13:11	02/28/22 18:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene (Surr)	*76*	*p*	*38 - 148*	*02/23/22 13:11*	*02/28/22 18:07*	*1*
DCB Decachlorobiphenyl (Surr)	*86*		*37 - 151*	*02/23/22 13:11*	*02/28/22 18:07*	*1*

Method: 8081A - Organochlorine Pesticides (GC)

Client Sample ID: SB-2-2.0
Lab Sample ID: 570-85264-38
Date Collected: 02/21/22 11:17
Matrix: Solid
Date Received: 02/21/22 15:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:27	1
4,4'-DDE	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:27	1
4,4'-DDT	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:27	1
Aldrin	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:27	1
alpha-BHC	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:27	1
alpha-Chlordane	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:27	1
beta-BHC	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:27	1
Chlordane	ND		25		ug/Kg		02/23/22 13:11	02/28/22 20:27	1
delta-BHC	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:27	1
Dieldrin	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:27	1
Endosulfan I	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:27	1
Endosulfan II	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:27	1
Endosulfan sulfate	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:27	1
Endrin	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:27	1
Endrin aldehyde	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:27	1
Endrin ketone	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:27	1
gamma-Chlordane	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:27	1
gamma-BHC	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:27	1
Heptachlor	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:27	1
Heptachlor epoxide	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:27	1
Methoxychlor	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:27	1
Toxaphene	ND		25		ug/Kg		02/23/22 13:11	02/28/22 20:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene (Surr)	*86*		*38 - 148*	*02/23/22 13:11*	*02/28/22 20:27*	*1*
DCB Decachlorobiphenyl (Surr)	*100*		*37 - 151*	*02/23/22 13:11*	*02/28/22 20:27*	*1*

Client Sample ID: SB-3-0.5
Lab Sample ID: 570-85264-40
Date Collected: 02/21/22 11:25
Matrix: Solid
Date Received: 02/21/22 15:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:42	1
4,4'-DDE	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:42	1
4,4'-DDT	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:42	1
Aldrin	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:42	1
alpha-BHC	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:42	1
alpha-Chlordane	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:42	1
beta-BHC	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:42	1
Chlordane	ND		25		ug/Kg		02/23/22 13:11	02/28/22 20:42	1
delta-BHC	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:42	1
Dieldrin	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:42	1
Endosulfan I	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:42	1
Endosulfan II	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:42	1
Endosulfan sulfate	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:42	1
Endrin	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:42	1
Endrin aldehyde	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:42	1
Endrin ketone	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:42	1
gamma-Chlordane	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:42	1
gamma-BHC	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:42	1
Heptachlor	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:42	1

Method: 8081A - Organochlorine Pesticides (GC) (Continued)

Client Sample ID: SB-3-0.5 **Lab Sample ID: 570-85264-40**
Date Collected: 02/21/22 11:25 **Matrix: Solid**
Date Received: 02/21/22 15:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Heptachlor epoxide	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:42	1
Methoxychlor	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:42	1
Toxaphene	ND		25		ug/Kg		02/23/22 13:11	02/28/22 20:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene (Surr)	*86*		*38 - 148*	*02/23/22 13:11*	*02/28/22 20:42*	*1*
DCB Decachlorobiphenyl (Surr)	*97*		*37 - 151*	*02/23/22 13:11*	*02/28/22 20:42*	*1*

Client Sample ID: SB-3-2.0 **Lab Sample ID: 570-85264-41**
Date Collected: 02/21/22 11:27 **Matrix: Solid**
Date Received: 02/21/22 15:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:58	1
4,4'-DDE	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:58	1
4,4'-DDT	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:58	1
Aldrin	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:58	1
alpha-BHC	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:58	1
alpha-Chlordane	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:58	1
beta-BHC	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:58	1
Chlordane	ND		25		ug/Kg		02/23/22 13:11	02/28/22 20:58	1
delta-BHC	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:58	1
Dieldrin	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:58	1
Endosulfan I	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:58	1
Endosulfan II	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:58	1
Endosulfan sulfate	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:58	1
Endrin	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:58	1
Endrin aldehyde	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:58	1
Endrin ketone	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:58	1
gamma-Chlordane	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:58	1
gamma-BHC	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:58	1
Heptachlor	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:58	1
Heptachlor epoxide	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:58	1
Methoxychlor	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 20:58	1
Toxaphene	ND		25		ug/Kg		02/23/22 13:11	02/28/22 20:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene (Surr)	*77*		*38 - 148*	*02/23/22 13:11*	*02/28/22 20:58*	*1*
DCB Decachlorobiphenyl (Surr)	*88*		*37 - 151*	*02/23/22 13:11*	*02/28/22 20:58*	*1*

Client Sample ID: SB-4-0.5 **Lab Sample ID: 570-85264-43**
Date Collected: 02/21/22 11:36 **Matrix: Solid**
Date Received: 02/21/22 15:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		5.0		ug/Kg		02/23/22 13:11	03/01/22 21:56	1
4,4'-DDE	**7.8**		5.0		ug/Kg		02/23/22 13:11	03/01/22 21:56	1
4,4'-DDT	ND		5.0		ug/Kg		02/23/22 13:11	03/01/22 21:56	1
Aldrin	ND		5.0		ug/Kg		02/23/22 13:11	03/01/22 21:56	1
alpha-BHC	ND		5.0		ug/Kg		02/23/22 13:11	03/01/22 21:56	1
alpha-Chlordane	ND		5.0		ug/Kg		02/23/22 13:11	03/01/22 21:56	1
beta-BHC	ND		5.0		ug/Kg		02/23/22 13:11	03/01/22 21:56	1

Method: 8081A - Organochlorine Pesticides (GC) (Continued)

Client Sample ID: SB-4-0.5
Date Collected: 02/21/22 11:36
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-43
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlordane	ND		25		ug/Kg		02/23/22 13:11	03/01/22 21:56	1
delta-BHC	ND		5.0		ug/Kg		02/23/22 13:11	03/01/22 21:56	1
Dieldrin	ND		5.0		ug/Kg		02/23/22 13:11	03/01/22 21:56	1
Endosulfan I	ND		5.0		ug/Kg		02/23/22 13:11	03/01/22 21:56	1
Endosulfan II	ND		5.0		ug/Kg		02/23/22 13:11	03/01/22 21:56	1
Endosulfan sulfate	ND		5.0		ug/Kg		02/23/22 13:11	03/01/22 21:56	1
Endrin	ND		5.0		ug/Kg		02/23/22 13:11	03/01/22 21:56	1
Endrin aldehyde	ND		5.0		ug/Kg		02/23/22 13:11	03/01/22 21:56	1
Endrin ketone	ND		5.0		ug/Kg		02/23/22 13:11	03/01/22 21:56	1
gamma-Chlordane	ND		5.0		ug/Kg		02/23/22 13:11	03/01/22 21:56	1
gamma-BHC	ND		5.0		ug/Kg		02/23/22 13:11	03/01/22 21:56	1
Heptachlor	ND		5.0		ug/Kg		02/23/22 13:11	03/01/22 21:56	1
Heptachlor epoxide	ND		5.0		ug/Kg		02/23/22 13:11	03/01/22 21:56	1
Methoxychlor	ND		5.0		ug/Kg		02/23/22 13:11	03/01/22 21:56	1
Toxaphene	ND		25		ug/Kg		02/23/22 13:11	03/01/22 21:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene (Surr)	*103*		*38 - 148*	*02/23/22 13:11*	*03/01/22 21:56*	*1*
DCB Decachlorobiphenyl (Surr)	*94*		*37 - 151*	*02/23/22 13:11*	*03/01/22 21:56*	*1*

Client Sample ID: SB-4-2.0
Date Collected: 02/21/22 11:38
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-44
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 21:12	1
4,4'-DDE	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 21:12	1
4,4'-DDT	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 21:12	1
Aldrin	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 21:12	1
alpha-BHC	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 21:12	1
alpha-Chlordane	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 21:12	1
beta-BHC	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 21:12	1
Chlordane	ND		25		ug/Kg		02/23/22 13:11	02/28/22 21:12	1
delta-BHC	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 21:12	1
Dieldrin	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 21:12	1
Endosulfan I	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 21:12	1
Endosulfan II	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 21:12	1
Endosulfan sulfate	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 21:12	1
Endrin	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 21:12	1
Endrin aldehyde	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 21:12	1
Endrin ketone	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 21:12	1
gamma-Chlordane	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 21:12	1
gamma-BHC	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 21:12	1
Heptachlor	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 21:12	1
Heptachlor epoxide	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 21:12	1
Methoxychlor	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 21:12	1
Toxaphene	ND		25		ug/Kg		02/23/22 13:11	02/28/22 21:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene (Surr)	*75*		*38 - 148*	*02/23/22 13:11*	*02/28/22 21:12*	*1*
DCB Decachlorobiphenyl (Surr)	*90*		*37 - 151*	*02/23/22 13:11*	*02/28/22 21:12*	*1*

Method: 8151A - Herbicides (GC)

Client Sample ID: HA-1-0.5
Date Collected: 02/21/22 07:50
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-1
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND	F2	10		ug/Kg		03/02/22 20:57	03/11/22 17:15	1
2,4,5-TP (Silvex)	ND		10		ug/Kg		03/02/22 20:57	03/11/22 17:15	1
2,4-D	ND	F1	100		ug/Kg		03/02/22 20:57	03/11/22 17:15	1
2,4-DB	ND	F1 F2	100		ug/Kg		03/02/22 20:57	03/11/22 17:15	1
Dalapon	ND		250		ug/Kg		03/02/22 20:57	03/11/22 17:15	1
Dicamba	ND		10		ug/Kg		03/02/22 20:57	03/11/22 17:15	1
Dichlorprop	ND		100		ug/Kg		03/02/22 20:57	03/11/22 17:15	1
Dinoseb	ND	F1 *1	100		ug/Kg		03/02/22 20:57	03/11/22 17:15	1
MCPA	ND	F1 *+	10000		ug/Kg		03/02/22 20:57	03/11/22 17:15	1
MCPP	ND	F1	10000		ug/Kg		03/02/22 20:57	03/11/22 17:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*129*	*p*	*20 - 163*	*03/02/22 20:57*	*03/11/22 17:15*	*1*

Client Sample ID: HA-1-2.0
Date Collected: 02/21/22 07:55
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-2
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND		10		ug/Kg		03/02/22 20:57	03/11/22 17:39	1
2,4,5-TP (Silvex)	ND		10		ug/Kg		03/02/22 20:57	03/11/22 17:39	1
2,4-D	ND		100		ug/Kg		03/02/22 20:57	03/11/22 17:39	1
2,4-DB	ND		100		ug/Kg		03/02/22 20:57	03/11/22 17:39	1
Dalapon	ND		250		ug/Kg		03/02/22 20:57	03/11/22 17:39	1
Dicamba	ND		10		ug/Kg		03/02/22 20:57	03/11/22 17:39	1
Dichlorprop	ND		100		ug/Kg		03/02/22 20:57	03/11/22 17:39	1
Dinoseb	ND	*1	100		ug/Kg		03/02/22 20:57	03/11/22 17:39	1
MCPA	ND	*+	10000		ug/Kg		03/02/22 20:57	03/11/22 17:39	1
MCPP	ND		10000		ug/Kg		03/02/22 20:57	03/11/22 17:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*96*		*20 - 163*	*03/02/22 20:57*	*03/11/22 17:39*	*1*

Client Sample ID: HA-4-0.5
Date Collected: 02/21/22 08:15
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-4
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND		10		ug/Kg		03/02/22 20:57	03/11/22 18:02	1
2,4,5-TP (Silvex)	ND		10		ug/Kg		03/02/22 20:57	03/11/22 18:02	1
2,4-D	ND		100		ug/Kg		03/02/22 20:57	03/11/22 18:02	1
2,4-DB	ND		100		ug/Kg		03/02/22 20:57	03/11/22 18:02	1
Dalapon	ND		250		ug/Kg		03/02/22 20:57	03/11/22 18:02	1
Dicamba	ND		10		ug/Kg		03/02/22 20:57	03/11/22 18:02	1
Dichlorprop	ND		100		ug/Kg		03/02/22 20:57	03/11/22 18:02	1
Dinoseb	ND	*1	100		ug/Kg		03/02/22 20:57	03/11/22 18:02	1
MCPA	ND	*+	10000		ug/Kg		03/02/22 20:57	03/11/22 18:02	1
MCPP	ND		10000		ug/Kg		03/02/22 20:57	03/11/22 18:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*123*		*20 - 163*	*03/02/22 20:57*	*03/11/22 18:02*	*1*

Client: Haley & Aldrich, Inc.
Project/Site: UC Riverside / 204609

Job ID: 570-85264-1

Method: 8151A - Herbicides (GC)

Client Sample ID: HA-4-2.0
Date Collected: 02/21/22 08:20
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-5
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND		10		ug/Kg		03/02/22 20:57	03/11/22 18:25	1
2,4,5-TP (Silvex)	ND		10		ug/Kg		03/02/22 20:57	03/11/22 18:25	1
2,4-D	**120**	**p**	100		ug/Kg		03/02/22 20:57	03/11/22 18:25	1
2,4-DB	ND		100		ug/Kg		03/02/22 20:57	03/11/22 18:25	1
Dalapon	ND		250		ug/Kg		03/02/22 20:57	03/11/22 18:25	1
Dicamba	ND		10		ug/Kg		03/02/22 20:57	03/11/22 18:25	1
Dichlorprop	ND		100		ug/Kg		03/02/22 20:57	03/11/22 18:25	1
Dinoseb	ND	*1	100		ug/Kg		03/02/22 20:57	03/11/22 18:25	1
MCPA	ND	*+	10000		ug/Kg		03/02/22 20:57	03/11/22 18:25	1
MCPP	ND		10000		ug/Kg		03/02/22 20:57	03/11/22 18:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*150*	*p*	*20 - 163*	*03/02/22 20:57*	*03/11/22 18:25*	*1*

Client Sample ID: HA-2-0.5
Date Collected: 02/21/22 08:30
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-7
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND		10		ug/Kg		03/02/22 20:57	03/11/22 18:49	1
2,4,5-TP (Silvex)	ND		10		ug/Kg		03/02/22 20:57	03/11/22 18:49	1
2,4-D	ND		100		ug/Kg		03/02/22 20:57	03/11/22 18:49	1
2,4-DB	ND		100		ug/Kg		03/02/22 20:57	03/11/22 18:49	1
Dalapon	ND		250		ug/Kg		03/02/22 20:57	03/11/22 18:49	1
Dicamba	ND		10		ug/Kg		03/02/22 20:57	03/11/22 18:49	1
Dichlorprop	ND		100		ug/Kg		03/02/22 20:57	03/11/22 18:49	1
Dinoseb	ND	*1	100		ug/Kg		03/02/22 20:57	03/11/22 18:49	1
MCPA	ND	*+	10000		ug/Kg		03/02/22 20:57	03/11/22 18:49	1
MCPP	ND		10000		ug/Kg		03/02/22 20:57	03/11/22 18:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*131*		*20 - 163*	*03/02/22 20:57*	*03/11/22 18:49*	*1*

Client Sample ID: HA-2-2.0
Date Collected: 02/21/22 08:34
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-8
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND		10		ug/Kg		03/02/22 20:57	03/11/22 19:12	1
2,4,5-TP (Silvex)	ND		10		ug/Kg		03/02/22 20:57	03/11/22 19:12	1
2,4-D	ND		100		ug/Kg		03/02/22 20:57	03/11/22 19:12	1
2,4-DB	ND		100		ug/Kg		03/02/22 20:57	03/11/22 19:12	1
Dalapon	ND		250		ug/Kg		03/02/22 20:57	03/11/22 19:12	1
Dicamba	ND		10		ug/Kg		03/02/22 20:57	03/11/22 19:12	1
Dichlorprop	ND		100		ug/Kg		03/02/22 20:57	03/11/22 19:12	1
Dinoseb	ND	*1	100		ug/Kg		03/02/22 20:57	03/11/22 19:12	1
MCPA	ND	*+	10000		ug/Kg		03/02/22 20:57	03/11/22 19:12	1
MCPP	ND		10000		ug/Kg		03/02/22 20:57	03/11/22 19:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*117*	*p*	*20 - 163*	*03/02/22 20:57*	*03/11/22 19:12*	*1*

Method: 8151A - Herbicides (GC)

Client Sample ID: HA-5-0.5
Date Collected: 02/21/22 08:42
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-10
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND		10		ug/Kg		03/02/22 20:57	03/11/22 19:35	1
2,4,5-TP (Silvex)	ND		10		ug/Kg		03/02/22 20:57	03/11/22 19:35	1
2,4-D	ND		100		ug/Kg		03/02/22 20:57	03/11/22 19:35	1
2,4-DB	ND		100		ug/Kg		03/02/22 20:57	03/11/22 19:35	1
Dalapon	ND		250		ug/Kg		03/02/22 20:57	03/11/22 19:35	1
Dicamba	ND		10		ug/Kg		03/02/22 20:57	03/11/22 19:35	1
Dichlorprop	ND		100		ug/Kg		03/02/22 20:57	03/11/22 19:35	1
Dinoseb	ND	*1	100		ug/Kg		03/02/22 20:57	03/11/22 19:35	1
MCPA	ND	*+	10000		ug/Kg		03/02/22 20:57	03/11/22 19:35	1
MCPP	ND		10000		ug/Kg		03/02/22 20:57	03/11/22 19:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*112*	*p*	*20 - 163*	*03/02/22 20:57*	*03/11/22 19:35*	*1*

Client Sample ID: HA-5-2.0
Date Collected: 02/21/22 08:45
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-11
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND		10		ug/Kg		03/02/22 20:57	03/11/22 19:58	1
2,4,5-TP (Silvex)	ND		10		ug/Kg		03/02/22 20:57	03/11/22 19:58	1
2,4-D	ND		100		ug/Kg		03/02/22 20:57	03/11/22 19:58	1
2,4-DB	ND		100		ug/Kg		03/02/22 20:57	03/11/22 19:58	1
Dalapon	ND		250		ug/Kg		03/02/22 20:57	03/11/22 19:58	1
Dicamba	ND		10		ug/Kg		03/02/22 20:57	03/11/22 19:58	1
Dichlorprop	ND		100		ug/Kg		03/02/22 20:57	03/11/22 19:58	1
Dinoseb	ND	*1	100		ug/Kg		03/02/22 20:57	03/11/22 19:58	1
MCPA	ND	*+	10000		ug/Kg		03/02/22 20:57	03/11/22 19:58	1
MCPP	ND		10000		ug/Kg		03/02/22 20:57	03/11/22 19:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*106*	*p*	*20 - 163*	*03/02/22 20:57*	*03/11/22 19:58*	*1*

Client Sample ID: HA-3-0.5
Date Collected: 02/21/22 08:52
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-13
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND		10		ug/Kg		03/02/22 20:57	03/11/22 20:22	1
2,4,5-TP (Silvex)	ND		10		ug/Kg		03/02/22 20:57	03/11/22 20:22	1
2,4-D	ND		100		ug/Kg		03/02/22 20:57	03/11/22 20:22	1
2,4-DB	ND		100		ug/Kg		03/02/22 20:57	03/11/22 20:22	1
Dalapon	ND		250		ug/Kg		03/02/22 20:57	03/11/22 20:22	1
Dicamba	ND		10		ug/Kg		03/02/22 20:57	03/11/22 20:22	1
Dichlorprop	ND		100		ug/Kg		03/02/22 20:57	03/11/22 20:22	1
Dinoseb	ND	*1	100		ug/Kg		03/02/22 20:57	03/11/22 20:22	1
MCPA	ND	*+	10000		ug/Kg		03/02/22 20:57	03/11/22 20:22	1
MCPP	ND		10000		ug/Kg		03/02/22 20:57	03/11/22 20:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*119*	*p*	*20 - 163*	*03/02/22 20:57*	*03/11/22 20:22*	*1*

Method: 8151A - Herbicides (GC)

Client Sample ID: HA-3-2.0
Date Collected: 02/21/22 08:55
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-14
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND		10		ug/Kg		03/02/22 20:57	03/11/22 20:45	1
2,4,5-TP (Silvex)	ND		10		ug/Kg		03/02/22 20:57	03/11/22 20:45	1
2,4-D	ND		100		ug/Kg		03/02/22 20:57	03/11/22 20:45	1
2,4-DB	ND		100		ug/Kg		03/02/22 20:57	03/11/22 20:45	1
Dalapon	ND		250		ug/Kg		03/02/22 20:57	03/11/22 20:45	1
Dicamba	ND		10		ug/Kg		03/02/22 20:57	03/11/22 20:45	1
Dichlorprop	ND		100		ug/Kg		03/02/22 20:57	03/11/22 20:45	1
Dinoseb	ND	*1	100		ug/Kg		03/02/22 20:57	03/11/22 20:45	1
MCPA	ND	*+	10000		ug/Kg		03/02/22 20:57	03/11/22 20:45	1
MCPP	ND		10000		ug/Kg		03/02/22 20:57	03/11/22 20:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*120*		*20 - 163*	*03/02/22 20:57*	*03/11/22 20:45*	*1*

Client Sample ID: HA-6-0.5
Date Collected: 02/21/22 09:05
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-16
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND		10		ug/Kg		03/02/22 20:57	03/11/22 21:08	1
2,4,5-TP (Silvex)	ND		10		ug/Kg		03/02/22 20:57	03/11/22 21:08	1
2,4-D	ND		100		ug/Kg		03/02/22 20:57	03/11/22 21:08	1
2,4-DB	ND		100		ug/Kg		03/02/22 20:57	03/11/22 21:08	1
Dalapon	ND		250		ug/Kg		03/02/22 20:57	03/11/22 21:08	1
Dicamba	ND		10		ug/Kg		03/02/22 20:57	03/11/22 21:08	1
Dichlorprop	ND		100		ug/Kg		03/02/22 20:57	03/11/22 21:08	1
Dinoseb	ND	*1	100		ug/Kg		03/02/22 20:57	03/11/22 21:08	1
MCPA	ND	*+	10000		ug/Kg		03/02/22 20:57	03/11/22 21:08	1
MCPP	ND		10000		ug/Kg		03/02/22 20:57	03/11/22 21:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*110*	*p*	*20 - 163*	*03/02/22 20:57*	*03/11/22 21:08*	*1*

Client Sample ID: HA-6-2.0
Date Collected: 02/21/22 09:08
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-17
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND		10		ug/Kg		03/02/22 20:57	03/11/22 21:32	1
2,4,5-TP (Silvex)	ND		10		ug/Kg		03/02/22 20:57	03/11/22 21:32	1
2,4-D	ND		100		ug/Kg		03/02/22 20:57	03/11/22 21:32	1
2,4-DB	ND		100		ug/Kg		03/02/22 20:57	03/11/22 21:32	1
Dalapon	ND		250		ug/Kg		03/02/22 20:57	03/11/22 21:32	1
Dicamba	ND		10		ug/Kg		03/02/22 20:57	03/11/22 21:32	1
Dichlorprop	ND		100		ug/Kg		03/02/22 20:57	03/11/22 21:32	1
Dinoseb	ND	*1	100		ug/Kg		03/02/22 20:57	03/11/22 21:32	1
MCPA	ND	*+	10000		ug/Kg		03/02/22 20:57	03/11/22 21:32	1
MCPP	ND		10000		ug/Kg		03/02/22 20:57	03/11/22 21:32	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*117*		*20 - 163*	*03/02/22 20:57*	*03/11/22 21:32*	*1*

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Method: 8151A - Herbicides (GC)

Client Sample ID: SB-5-0.5
Date Collected: 02/21/22 09:30
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-19
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND	F2	9.6		ug/Kg		03/04/22 15:25	03/15/22 23:04	1
2,4,5-TP (Silvex)	ND		9.6		ug/Kg		03/04/22 15:25	03/15/22 23:04	1
2,4-D	ND	F2	96		ug/Kg		03/04/22 15:25	03/15/22 23:04	1
2,4-DB	ND	F1	96		ug/Kg		03/04/22 15:25	03/15/22 23:04	1
Dalapon	ND		240		ug/Kg		03/04/22 15:25	03/15/22 23:04	1
Dicamba	ND		9.6		ug/Kg		03/04/22 15:25	03/15/22 23:04	1
Dichlorprop	ND		96		ug/Kg		03/04/22 15:25	03/15/22 23:04	1
Dinoseb	ND		96		ug/Kg		03/04/22 15:25	03/15/22 23:04	1
MCPA	ND		9600		ug/Kg		03/04/22 15:25	03/15/22 23:04	1
MCPP	ND		9600		ug/Kg		03/04/22 15:25	03/15/22 23:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*107*	*p*	*20 - 163*	*03/04/22 15:25*	*03/15/22 23:04*	*1*

Client Sample ID: SB-5-2.0
Date Collected: 02/21/22 09:32
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-20
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND		10		ug/Kg		03/04/22 15:25	03/15/22 23:27	1
2,4,5-TP (Silvex)	ND		10		ug/Kg		03/04/22 15:25	03/15/22 23:27	1
2,4-D	ND		100		ug/Kg		03/04/22 15:25	03/15/22 23:27	1
2,4-DB	ND		100		ug/Kg		03/04/22 15:25	03/15/22 23:27	1
Dalapon	ND		250		ug/Kg		03/04/22 15:25	03/15/22 23:27	1
Dicamba	ND		10		ug/Kg		03/04/22 15:25	03/15/22 23:27	1
Dichlorprop	ND		100		ug/Kg		03/04/22 15:25	03/15/22 23:27	1
Dinoseb	ND		100		ug/Kg		03/04/22 15:25	03/15/22 23:27	1
MCPA	ND		10000		ug/Kg		03/04/22 15:25	03/15/22 23:27	1
MCPP	ND		10000		ug/Kg		03/04/22 15:25	03/15/22 23:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*111*	*p*	*20 - 163*	*03/04/22 15:25*	*03/15/22 23:27*	*1*

Client Sample ID: SB-6-0.5
Date Collected: 02/21/22 09:40
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-22
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND		10		ug/Kg		03/04/22 15:25	03/15/22 23:50	1
2,4,5-TP (Silvex)	ND		10		ug/Kg		03/04/22 15:25	03/15/22 23:50	1
2,4-D	ND		100		ug/Kg		03/04/22 15:25	03/15/22 23:50	1
2,4-DB	ND		100		ug/Kg		03/04/22 15:25	03/15/22 23:50	1
Dalapon	ND		260		ug/Kg		03/04/22 15:25	03/15/22 23:50	1
Dicamba	ND		10		ug/Kg		03/04/22 15:25	03/15/22 23:50	1
Dichlorprop	ND		100		ug/Kg		03/04/22 15:25	03/15/22 23:50	1
Dinoseb	ND		100		ug/Kg		03/04/22 15:25	03/15/22 23:50	1
MCPA	ND		10000		ug/Kg		03/04/22 15:25	03/15/22 23:50	1
MCPP	ND		10000		ug/Kg		03/04/22 15:25	03/15/22 23:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*89*		*20 - 163*	*03/04/22 15:25*	*03/15/22 23:50*	*1*

Method: 8151A - Herbicides (GC)

Client Sample ID: SB-6-2.0
Date Collected: 02/21/22 09:42
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-23
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND		10		ug/Kg		03/04/22 15:25	03/16/22 00:14	1
2,4,5-TP (Silvex)	ND		10		ug/Kg		03/04/22 15:25	03/16/22 00:14	1
2,4-D	ND		100		ug/Kg		03/04/22 15:25	03/16/22 00:14	1
2,4-DB	ND		100		ug/Kg		03/04/22 15:25	03/16/22 00:14	1
Dalapon	ND		250		ug/Kg		03/04/22 15:25	03/16/22 00:14	1
Dicamba	ND		10		ug/Kg		03/04/22 15:25	03/16/22 00:14	1
Dichlorprop	ND		100		ug/Kg		03/04/22 15:25	03/16/22 00:14	1
Dinoseb	ND		100		ug/Kg		03/04/22 15:25	03/16/22 00:14	1
MCPA	ND		10000		ug/Kg		03/04/22 15:25	03/16/22 00:14	1
MCPP	ND		10000		ug/Kg		03/04/22 15:25	03/16/22 00:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*112*		*20 - 163*	*03/04/22 15:25*	*03/16/22 00:14*	*1*

Client Sample ID: SB-7-0.5
Date Collected: 02/21/22 09:50
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-25
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND		10		ug/Kg		03/04/22 15:25	03/16/22 00:37	1
2,4,5-TP (Silvex)	ND		10		ug/Kg		03/04/22 15:25	03/16/22 00:37	1
2,4-D	ND		100		ug/Kg		03/04/22 15:25	03/16/22 00:37	1
2,4-DB	ND		100		ug/Kg		03/04/22 15:25	03/16/22 00:37	1
Dalapon	ND		260		ug/Kg		03/04/22 15:25	03/16/22 00:37	1
Dicamba	ND		10		ug/Kg		03/04/22 15:25	03/16/22 00:37	1
Dichlorprop	ND		100		ug/Kg		03/04/22 15:25	03/16/22 00:37	1
Dinoseb	ND		100		ug/Kg		03/04/22 15:25	03/16/22 00:37	1
MCPA	ND		10000		ug/Kg		03/04/22 15:25	03/16/22 00:37	1
MCPP	ND		10000		ug/Kg		03/04/22 15:25	03/16/22 00:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*162*	*p*	*20 - 163*	*03/04/22 15:25*	*03/16/22 00:37*	*1*

Client Sample ID: SB-7-2.0
Date Collected: 02/21/22 09:52
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-26
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND		10		ug/Kg		03/04/22 15:25	03/16/22 01:00	1
2,4,5-TP (Silvex)	ND		10		ug/Kg		03/04/22 15:25	03/16/22 01:00	1
2,4-D	ND		100		ug/Kg		03/04/22 15:25	03/16/22 01:00	1
2,4-DB	ND		100		ug/Kg		03/04/22 15:25	03/16/22 01:00	1
Dalapon	ND		250		ug/Kg		03/04/22 15:25	03/16/22 01:00	1
Dicamba	ND		10		ug/Kg		03/04/22 15:25	03/16/22 01:00	1
Dichlorprop	ND		100		ug/Kg		03/04/22 15:25	03/16/22 01:00	1
Dinoseb	ND		100		ug/Kg		03/04/22 15:25	03/16/22 01:00	1
MCPA	ND		10000		ug/Kg		03/04/22 15:25	03/16/22 01:00	1
MCPP	ND		10000		ug/Kg		03/04/22 15:25	03/16/22 01:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*134*		*20 - 163*	*03/04/22 15:25*	*03/16/22 01:00*	*1*

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Client: Haley & Aldrich, Inc.
Project/Site: UC Riverside / 204609

Job ID: 570-85264-1

Method: 8151A - Herbicides (GC)

Client Sample ID: SB-8-0.5
Date Collected: 02/21/22 10:00
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-28
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND		10		ug/Kg		03/04/22 15:25	03/16/22 01:23	1
2,4,5-TP (Silvex)	ND		10		ug/Kg		03/04/22 15:25	03/16/22 01:23	1
2,4-D	ND		100		ug/Kg		03/04/22 15:25	03/16/22 01:23	1
2,4-DB	ND		100		ug/Kg		03/04/22 15:25	03/16/22 01:23	1
Dalapon	ND		250		ug/Kg		03/04/22 15:25	03/16/22 01:23	1
Dicamba	ND		10		ug/Kg		03/04/22 15:25	03/16/22 01:23	1
Dichlorprop	ND		100		ug/Kg		03/04/22 15:25	03/16/22 01:23	1
Dinoseb	ND		100		ug/Kg		03/04/22 15:25	03/16/22 01:23	1
MCPA	ND		10000		ug/Kg		03/04/22 15:25	03/16/22 01:23	1
MCPP	ND		10000		ug/Kg		03/04/22 15:25	03/16/22 01:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*85*		*20 - 163*	*03/04/22 15:25*	*03/16/22 01:23*	*1*

Client Sample ID: SB-8-2.0
Date Collected: 02/21/22 10:03
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-29
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND		10		ug/Kg		03/04/22 15:25	03/16/22 01:47	1
2,4,5-TP (Silvex)	ND		10		ug/Kg		03/04/22 15:25	03/16/22 01:47	1
2,4-D	ND		100		ug/Kg		03/04/22 15:25	03/16/22 01:47	1
2,4-DB	ND		100		ug/Kg		03/04/22 15:25	03/16/22 01:47	1
Dalapon	ND		250		ug/Kg		03/04/22 15:25	03/16/22 01:47	1
Dicamba	ND		10		ug/Kg		03/04/22 15:25	03/16/22 01:47	1
Dichlorprop	ND		100		ug/Kg		03/04/22 15:25	03/16/22 01:47	1
Dinoseb	ND		100		ug/Kg		03/04/22 15:25	03/16/22 01:47	1
MCPA	ND		10000		ug/Kg		03/04/22 15:25	03/16/22 01:47	1
MCPP	ND		10000		ug/Kg		03/04/22 15:25	03/16/22 01:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*91*	*p*	*20 - 163*	*03/04/22 15:25*	*03/16/22 01:47*	*1*

Client Sample ID: SB-9-0.5
Date Collected: 02/21/22 10:50
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-31
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND		10		ug/Kg		03/04/22 15:25	03/16/22 02:10	1
2,4,5-TP (Silvex)	ND		10		ug/Kg		03/04/22 15:25	03/16/22 02:10	1
2,4-D	ND		100		ug/Kg		03/04/22 15:25	03/16/22 02:10	1
2,4-DB	ND		100		ug/Kg		03/04/22 15:25	03/16/22 02:10	1
Dalapon	ND		250		ug/Kg		03/04/22 15:25	03/16/22 02:10	1
Dicamba	ND		10		ug/Kg		03/04/22 15:25	03/16/22 02:10	1
Dichlorprop	ND		100		ug/Kg		03/04/22 15:25	03/16/22 02:10	1
Dinoseb	ND		100		ug/Kg		03/04/22 15:25	03/16/22 02:10	1
MCPA	ND		10000		ug/Kg		03/04/22 15:25	03/16/22 02:10	1
MCPP	ND		10000		ug/Kg		03/04/22 15:25	03/16/22 02:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*115*		*20 - 163*	*03/04/22 15:25*	*03/16/22 02:10*	*1*

Method: 8151A - Herbicides (GC)

Client Sample ID: SB-9-2.0
Date Collected: 02/21/22 10:55
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-32
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND		10		ug/Kg		03/04/22 15:25	03/16/22 02:33	1
2,4,5-TP (Silvex)	ND		10		ug/Kg		03/04/22 15:25	03/16/22 02:33	1
2,4-D	ND		100		ug/Kg		03/04/22 15:25	03/16/22 02:33	1
2,4-DB	ND		100		ug/Kg		03/04/22 15:25	03/16/22 02:33	1
Dalapon	ND		250		ug/Kg		03/04/22 15:25	03/16/22 02:33	1
Dicamba	ND		10		ug/Kg		03/04/22 15:25	03/16/22 02:33	1
Dichlorprop	ND		100		ug/Kg		03/04/22 15:25	03/16/22 02:33	1
Dinoseb	ND		100		ug/Kg		03/04/22 15:25	03/16/22 02:33	1
MCPA	**39000**		10000		ug/Kg		03/04/22 15:25	03/16/22 02:33	1
MCPP	ND		10000		ug/Kg		03/04/22 15:25	03/16/22 02:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*80*		*20 - 163*	*03/04/22 15:25*	*03/16/22 02:33*	*1*

Client Sample ID: SB-1-0.5
Date Collected: 02/21/22 11:05
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-34
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND		10		ug/Kg		03/04/22 15:25	03/16/22 02:56	1
2,4,5-TP (Silvex)	ND		10		ug/Kg		03/04/22 15:25	03/16/22 02:56	1
2,4-D	ND		100		ug/Kg		03/04/22 15:25	03/16/22 02:56	1
2,4-DB	ND		100		ug/Kg		03/04/22 15:25	03/16/22 02:56	1
Dalapon	ND		250		ug/Kg		03/04/22 15:25	03/16/22 02:56	1
Dicamba	ND		10		ug/Kg		03/04/22 15:25	03/16/22 02:56	1
Dichlorprop	ND		100		ug/Kg		03/04/22 15:25	03/16/22 02:56	1
Dinoseb	ND		100		ug/Kg		03/04/22 15:25	03/16/22 02:56	1
MCPA	ND		10000		ug/Kg		03/04/22 15:25	03/16/22 02:56	1
MCPP	ND		10000		ug/Kg		03/04/22 15:25	03/16/22 02:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*100*		*20 - 163*	*03/04/22 15:25*	*03/16/22 02:56*	*1*

Client Sample ID: SB-1-2.0
Date Collected: 02/21/22 11:07
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-35
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND		9.9		ug/Kg		03/04/22 15:25	03/16/22 03:20	1
2,4,5-TP (Silvex)	ND		9.9		ug/Kg		03/04/22 15:25	03/16/22 03:20	1
2,4-D	ND		99		ug/Kg		03/04/22 15:25	03/16/22 03:20	1
2,4-DB	ND		99		ug/Kg		03/04/22 15:25	03/16/22 03:20	1
Dalapon	ND		250		ug/Kg		03/04/22 15:25	03/16/22 03:20	1
Dicamba	ND		9.9		ug/Kg		03/04/22 15:25	03/16/22 03:20	1
Dichlorprop	ND		99		ug/Kg		03/04/22 15:25	03/16/22 03:20	1
Dinoseb	ND		99		ug/Kg		03/04/22 15:25	03/16/22 03:20	1
MCPA	ND		9900		ug/Kg		03/04/22 15:25	03/16/22 03:20	1
MCPP	ND		9900		ug/Kg		03/04/22 15:25	03/16/22 03:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*112*	*p*	*20 - 163*	*03/04/22 15:25*	*03/16/22 03:20*	*1*

Client Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: UC Riverside / 204609

Job ID: 570-85264-1

Method: 8151A - Herbicides (GC)

Client Sample ID: SB-2-0.5
Date Collected: 02/21/22 11:15
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-37
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND		10		ug/Kg		03/04/22 15:25	03/16/22 03:43	1
2,4,5-TP (Silvex)	ND		10		ug/Kg		03/04/22 15:25	03/16/22 03:43	1
2,4-D	ND		100		ug/Kg		03/04/22 15:25	03/16/22 03:43	1
2,4-DB	ND		100		ug/Kg		03/04/22 15:25	03/16/22 03:43	1
Dalapon	ND		250		ug/Kg		03/04/22 15:25	03/16/22 03:43	1
Dicamba	ND		10		ug/Kg		03/04/22 15:25	03/16/22 03:43	1
Dichlorprop	ND		100		ug/Kg		03/04/22 15:25	03/16/22 03:43	1
Dinoseb	ND		100		ug/Kg		03/04/22 15:25	03/16/22 03:43	1
MCPA	ND		10000		ug/Kg		03/04/22 15:25	03/16/22 03:43	1
MCPP	ND		10000		ug/Kg		03/04/22 15:25	03/16/22 03:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*100*		*20 - 163*	*03/04/22 15:25*	*03/16/22 03:43*	*1*

Client Sample ID: SB-2-2.0
Date Collected: 02/21/22 11:17
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-38
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND		10		ug/Kg		03/04/22 15:25	03/16/22 04:06	1
2,4,5-TP (Silvex)	ND		10		ug/Kg		03/04/22 15:25	03/16/22 04:06	1
2,4-D	ND		100		ug/Kg		03/04/22 15:25	03/16/22 04:06	1
2,4-DB	ND		100		ug/Kg		03/04/22 15:25	03/16/22 04:06	1
Dalapon	ND		260		ug/Kg		03/04/22 15:25	03/16/22 04:06	1
Dicamba	ND		10		ug/Kg		03/04/22 15:25	03/16/22 04:06	1
Dichlorprop	ND		100		ug/Kg		03/04/22 15:25	03/16/22 04:06	1
Dinoseb	ND		100		ug/Kg		03/04/22 15:25	03/16/22 04:06	1
MCPA	ND		10000		ug/Kg		03/04/22 15:25	03/16/22 04:06	1
MCPP	ND		10000		ug/Kg		03/04/22 15:25	03/16/22 04:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*116*	*p*	*20 - 163*	*03/04/22 15:25*	*03/16/22 04:06*	*1*

Client Sample ID: SB-3-0.5
Date Collected: 02/21/22 11:25
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-40
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND		10		ug/Kg		03/04/22 15:25	03/16/22 04:53	1
2,4,5-TP (Silvex)	ND		10		ug/Kg		03/04/22 15:25	03/16/22 04:53	1
2,4-D	ND		100		ug/Kg		03/04/22 15:25	03/16/22 04:53	1
2,4-DB	ND		100		ug/Kg		03/04/22 15:25	03/16/22 04:53	1
Dalapon	ND		260		ug/Kg		03/04/22 15:25	03/16/22 04:53	1
Dicamba	ND		10		ug/Kg		03/04/22 15:25	03/16/22 04:53	1
Dichlorprop	ND		100		ug/Kg		03/04/22 15:25	03/16/22 04:53	1
Dinoseb	ND		100		ug/Kg		03/04/22 15:25	03/16/22 04:53	1
MCPA	ND		10000		ug/Kg		03/04/22 15:25	03/16/22 04:53	1
MCPP	ND		10000		ug/Kg		03/04/22 15:25	03/16/22 04:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*115*	*p*	*20 - 163*	*03/04/22 15:25*	*03/16/22 04:53*	*1*

Method: 8151A - Herbicides (GC)

Client Sample ID: SB-3-2.0
Date Collected: 02/21/22 11:27
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-41
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND		10		ug/Kg		03/04/22 15:25	03/16/22 05:16	1
2,4,5-TP (Silvex)	ND		10		ug/Kg		03/04/22 15:25	03/16/22 05:16	1
2,4-D	ND		100		ug/Kg		03/04/22 15:25	03/16/22 05:16	1
2,4-DB	ND		100		ug/Kg		03/04/22 15:25	03/16/22 05:16	1
Dalapon	ND		250		ug/Kg		03/04/22 15:25	03/16/22 05:16	1
Dicamba	ND		10		ug/Kg		03/04/22 15:25	03/16/22 05:16	1
Dichlorprop	ND		100		ug/Kg		03/04/22 15:25	03/16/22 05:16	1
Dinoseb	ND		100		ug/Kg		03/04/22 15:25	03/16/22 05:16	1
MCPA	ND		10000		ug/Kg		03/04/22 15:25	03/16/22 05:16	1
MCPP	ND		10000		ug/Kg		03/04/22 15:25	03/16/22 05:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*112*	*p*	*20 - 163*	*03/04/22 15:25*	*03/16/22 05:16*	*1*

Client Sample ID: SB-4-0.5
Date Collected: 02/21/22 11:36
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-43
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND		10		ug/Kg		03/04/22 15:25	03/16/22 05:39	1
2,4,5-TP (Silvex)	ND		10		ug/Kg		03/04/22 15:25	03/16/22 05:39	1
2,4-D	ND		100		ug/Kg		03/04/22 15:25	03/16/22 05:39	1
2,4-DB	ND		100		ug/Kg		03/04/22 15:25	03/16/22 05:39	1
Dalapon	ND		260		ug/Kg		03/04/22 15:25	03/16/22 05:39	1
Dicamba	ND		10		ug/Kg		03/04/22 15:25	03/16/22 05:39	1
Dichlorprop	ND		100		ug/Kg		03/04/22 15:25	03/16/22 05:39	1
Dinoseb	ND		100		ug/Kg		03/04/22 15:25	03/16/22 05:39	1
MCPA	ND		10000		ug/Kg		03/04/22 15:25	03/16/22 05:39	1
MCPP	ND		10000		ug/Kg		03/04/22 15:25	03/16/22 05:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*96*	*p*	*20 - 163*	*03/04/22 15:25*	*03/16/22 05:39*	*1*

Client Sample ID: SB-4-2.0
Date Collected: 02/21/22 11:38
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-44
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND		10		ug/Kg		03/04/22 15:25	03/16/22 06:03	1
2,4,5-TP (Silvex)	ND		10		ug/Kg		03/04/22 15:25	03/16/22 06:03	1
2,4-D	ND		100		ug/Kg		03/04/22 15:25	03/16/22 06:03	1
2,4-DB	ND		100		ug/Kg		03/04/22 15:25	03/16/22 06:03	1
Dalapon	ND		260		ug/Kg		03/04/22 15:25	03/16/22 06:03	1
Dicamba	ND		10		ug/Kg		03/04/22 15:25	03/16/22 06:03	1
Dichlorprop	ND		100		ug/Kg		03/04/22 15:25	03/16/22 06:03	1
Dinoseb	ND		100		ug/Kg		03/04/22 15:25	03/16/22 06:03	1
MCPA	ND		10000		ug/Kg		03/04/22 15:25	03/16/22 06:03	1
MCPP	ND		10000		ug/Kg		03/04/22 15:25	03/16/22 06:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*97*	*p*	*20 - 163*	*03/04/22 15:25*	*03/16/22 06:03*	*1*

Method: 6010B - Metals (ICP)

Client Sample ID: HA-1-0.5
Date Collected: 02/21/22 07:50
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-1
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		2.63		mg/Kg		03/04/22 19:29	03/07/22 21:23	1

Client Sample ID: HA-1-2.0
Date Collected: 02/21/22 07:55
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-2
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		2.44		mg/Kg		03/04/22 19:29	03/07/22 21:25	1

Client Sample ID: HA-4-0.5
Date Collected: 02/21/22 08:15
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-4
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**2.57**		2.55		mg/Kg		03/04/22 19:29	03/07/22 21:33	1

Client Sample ID: HA-4-2.0
Date Collected: 02/21/22 08:20
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-5
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		2.59		mg/Kg		03/04/22 19:29	03/07/22 21:36	1

Client Sample ID: HA-2-0.5
Date Collected: 02/21/22 08:30
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-7
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		2.58		mg/Kg		03/04/22 19:29	03/07/22 21:39	1

Client Sample ID: HA-2-2.0
Date Collected: 02/21/22 08:34
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-8
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		2.59		mg/Kg		03/04/22 19:29	03/07/22 21:42	1

Client Sample ID: HA-5-0.5
Date Collected: 02/21/22 08:42
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-10
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		2.39		mg/Kg		03/04/22 19:29	03/07/22 21:44	1

Client Sample ID: HA-5-2.0
Date Collected: 02/21/22 08:45
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-11
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		2.40		mg/Kg		03/04/22 19:29	03/07/22 21:47	1

Client Sample ID: HA-3-0.5
Date Collected: 02/21/22 08:52
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-13
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		2.42		mg/Kg		03/04/22 19:29	03/07/22 21:50	1

Method: 6010B - Metals (ICP)

Client Sample ID: HA-3-2.0 **Lab Sample ID: 570-85264-14**
Date Collected: 02/21/22 08:55 **Matrix: Solid**
Date Received: 02/21/22 15:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		2.51		mg/Kg		03/04/22 19:29	03/07/22 21:52	1

Client Sample ID: HA-6-0.5 **Lab Sample ID: 570-85264-16**
Date Collected: 02/21/22 09:05 **Matrix: Solid**
Date Received: 02/21/22 15:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		2.39		mg/Kg		03/04/22 19:29	03/07/22 21:55	1

Client Sample ID: HA-6-2.0 **Lab Sample ID: 570-85264-17**
Date Collected: 02/21/22 09:08 **Matrix: Solid**
Date Received: 02/21/22 15:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		2.49		mg/Kg		03/04/22 19:29	03/07/22 21:58	1

Client Sample ID: SB-5-0.5 **Lab Sample ID: 570-85264-19**
Date Collected: 02/21/22 09:30 **Matrix: Solid**
Date Received: 02/21/22 15:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		2.49		mg/Kg		03/04/22 05:22	03/04/22 18:41	1

Client Sample ID: SB-5-2.0 **Lab Sample ID: 570-85264-20**
Date Collected: 02/21/22 09:32 **Matrix: Solid**
Date Received: 02/21/22 15:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		2.49		mg/Kg		03/04/22 05:22	03/04/22 18:44	1

Client Sample ID: SB-6-0.5 **Lab Sample ID: 570-85264-22**
Date Collected: 02/21/22 09:40 **Matrix: Solid**
Date Received: 02/21/22 15:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**3.44**		2.48		mg/Kg		03/04/22 05:22	03/04/22 18:46	1

Client Sample ID: SB-6-2.0 **Lab Sample ID: 570-85264-23**
Date Collected: 02/21/22 09:42 **Matrix: Solid**
Date Received: 02/21/22 15:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		2.44		mg/Kg		03/04/22 19:29	03/07/22 22:06	1

Client Sample ID: SB-7-0.5 **Lab Sample ID: 570-85264-25**
Date Collected: 02/21/22 09:50 **Matrix: Solid**
Date Received: 02/21/22 15:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		2.50		mg/Kg		03/04/22 05:22	03/04/22 18:49	1

Client Sample ID: SB-7-2.0 **Lab Sample ID: 570-85264-26**
Date Collected: 02/21/22 09:52 **Matrix: Solid**
Date Received: 02/21/22 15:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		2.49		mg/Kg		03/04/22 05:22	03/04/22 19:02	1

Method: 6010B - Metals (ICP)

Client Sample ID: SB-8-0.5
Date Collected: 02/21/22 10:00
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-28
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		2.46		mg/Kg		03/04/22 05:22	03/04/22 19:04	1

Client Sample ID: SB-8-2.0
Date Collected: 02/21/22 10:03
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-29
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		2.50		mg/Kg		03/04/22 05:22	03/04/22 19:07	1

Client Sample ID: SB-9-0.5
Date Collected: 02/21/22 10:50
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-31
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**3.17**		2.49		mg/Kg		03/07/22 19:27	03/10/22 12:24	1

Client Sample ID: SB-9-2.0
Date Collected: 02/21/22 10:55
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-32
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		2.49		mg/Kg		03/04/22 05:22	03/04/22 19:10	1

Client Sample ID: SB-1-0.5
Date Collected: 02/21/22 11:05
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-34
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**3.55**		2.46		mg/Kg		03/04/22 05:22	03/04/22 19:12	1

Client Sample ID: SB-1-2.0
Date Collected: 02/21/22 11:07
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-35
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		2.49		mg/Kg		03/04/22 05:22	03/04/22 19:15	1

Client Sample ID: SB-2-0.5
Date Collected: 02/21/22 11:15
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-37
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		2.48		mg/Kg		03/04/22 05:22	03/04/22 19:17	1

Client Sample ID: SB-2-2.0
Date Collected: 02/21/22 11:17
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-38
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		2.46		mg/Kg		03/04/22 05:22	03/04/22 19:20	1

Client Sample ID: SB-3-0.5
Date Collected: 02/21/22 11:25
Date Received: 02/21/22 15:30

Lab Sample ID: 570-85264-40
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		2.49		mg/Kg		03/04/22 05:22	03/04/22 19:38	1

Method: 6010B - Metals (ICP)

Client Sample ID: SB-3-2.0
Date Collected: 02/21/22 11:27
Date Received: 02/21/22 15:30
Lab Sample ID: 570-85264-41
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		2.46		mg/Kg		03/04/22 05:22	03/04/22 19:40	1

Client Sample ID: SB-4-0.5
Date Collected: 02/21/22 11:36
Date Received: 02/21/22 15:30
Lab Sample ID: 570-85264-43
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**5.03**		2.48		mg/Kg		03/04/22 05:22	03/04/22 19:43	1

Client Sample ID: SB-4-2.0
Date Collected: 02/21/22 11:38
Date Received: 02/21/22 15:30
Lab Sample ID: 570-85264-44
Matrix: Solid

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		2.48		mg/Kg		03/04/22 05:22	03/04/22 19:45	1

Surrogate Summary

Client: Haley & Aldrich, Inc.
Project/Site: UC Riverside / 204609

Job ID: 570-85264-1

Method: 8081A - Organochlorine Pesticides (GC)

Matrix: Solid

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)	
		TCX2	DCB2
Lab Sample ID	Client Sample ID	(38-148)	(37-151)
570-85264-1	HA-1-0.5	70	72
570-85264-1 MS	HA-1-0.5	68	63
570-85264-1 MSD	HA-1-0.5	67	62
570-85264-2	HA-1-2.0	87	86
570-85264-4	HA-4-0.5	68	72
570-85264-5	HA-4-2.0	70	71
570-85264-7	HA-2-0.5	72	74
570-85264-8	HA-2-2.0	79	77
570-85264-10	HA-5-0.5	78	85
570-85264-11	HA-5-2.0	75	81
570-85264-13	HA-3-0.5	72	76
570-85264-14	HA-3-2.0	77	79
570-85264-16	HA-6-0.5	76	79
570-85264-17	HA-6-2.0	77	80
570-85264-19	SB-5-0.5	75 p	84
570-85264-20	SB-5-2.0	70	82
570-85264-22	SB-6-0.5	54	58
570-85264-23	SB-6-2.0	71	76
570-85264-25	SB-7-0.5	70	78
570-85264-26	SB-7-2.0	65	69
570-85264-28	SB-8-0.5	72	78
570-85264-29	SB-8-2.0	75	81
570-85264-32	SB-9-2.0	77	87
570-85264-34	SB-1-0.5	92 p	95
570-85264-35	SB-1-2.0	83	97
570-85264-37	SB-2-0.5	76 p	86
570-85264-38	SB-2-2.0	86	100
570-85264-40	SB-3-0.5	86	97
570-85264-41	SB-3-2.0	77	88
570-85264-44	SB-4-2.0	75	90
LCS 570-215030/2-A	Lab Control Sample	97	96
LCSD 570-215030/3-A	Lab Control Sample Dup	95	94
MB 570-215030/1-A	Method Blank	89	72
MB 570-215033/1-A	Method Blank	105	106

Surrogate Legend

TCX = Tetrachloro-m-xylene (Surr)
DCB = DCB Decachlorobiphenyl (Surr)

Method: 8081A - Organochlorine Pesticides (GC)

Matrix: Solid

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)	
		TCX1	DCB1
Lab Sample ID	Client Sample ID	(38-148)	(37-151)
570-85264-31	SB-9-0.5	104	100
570-85264-31 MS	SB-9-0.5	121	105
570-85264-31 MSD	SB-9-0.5	121	102
570-85264-43	SB-4-0.5	103	94
LCS 570-215033/2-A	Lab Control Sample	107	92

Method: 8081A - Organochlorine Pesticides (GC) (Continued)

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)	
		TCX1	DCB1
Lab Sample ID	Client Sample ID	(38-148)	(37-151)
LCSD 570-215033/3-A	Lab Control Sample Dup	98	83

Surrogate Legend

TCX = Tetrachloro-m-xylene (Surr)
DCB = DCB Decachlorobiphenyl (Surr)

Method: 8151A - Herbicides (GC)

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCPAA2
Lab Sample ID	Client Sample ID	(20-163)
570-85264-1	HA-1-0.5	129 p
570-85264-1 MS	HA-1-0.5	155
570-85264-1 MSD	HA-1-0.5	143
570-85264-2	HA-1-2.0	96
570-85264-4	HA-4-0.5	123
570-85264-5	HA-4-2.0	150 p
570-85264-7	HA-2-0.5	131
570-85264-8	HA-2-2.0	117 p
570-85264-10	HA-5-0.5	112 p
570-85264-11	HA-5-2.0	106 p
570-85264-13	HA-3-0.5	119 p
570-85264-14	HA-3-2.0	120
570-85264-16	HA-6-0.5	110 p
570-85264-17	HA-6-2.0	117
570-85264-19	SB-5-0.5	107 p
570-85264-19 MS	SB-5-0.5	146
570-85264-19 MSD	SB-5-0.5	126
570-85264-20	SB-5-2.0	111 p
570-85264-22	SB-6-0.5	89
570-85264-23	SB-6-2.0	112
570-85264-25	SB-7-0.5	162 p
570-85264-26	SB-7-2.0	134
570-85264-28	SB-8-0.5	85
570-85264-29	SB-8-2.0	91 p
570-85264-31	SB-9-0.5	115
570-85264-32	SB-9-2.0	80
570-85264-34	SB-1-0.5	100
570-85264-35	SB-1-2.0	112 p
570-85264-37	SB-2-0.5	100
570-85264-38	SB-2-2.0	116 p
570-85264-40	SB-3-0.5	115 p
570-85264-41	SB-3-2.0	112 p
570-85264-43	SB-4-0.5	96 p
570-85264-44	SB-4-2.0	97 p
LCS 570-216737/2-A	Lab Control Sample	85
LCS 570-217285/2-A	Lab Control Sample	90 p
LCSD 570-216737/3-A	Lab Control Sample Dup	76
LCSD 570-217285/3-A	Lab Control Sample Dup	98 p
MB 570-216737/1-A	Method Blank	99

Method: 8151A - Herbicides (GC) (Continued)

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
Lab Sample ID	Client Sample ID	DCPAA2 (20-163)
MB 570-217285/1-A	Method Blank	143

Surrogate Legend

DCPAA = 2,4-Dichlorophenylacetic acid

Method: 8081A - Organochlorine Pesticides (GC)

Lab Sample ID: MB 570-215030/1-A **Client Sample ID: Method Blank**
Matrix: Solid **Prep Type: Total/NA**
Analysis Batch: 215782 **Prep Batch: 215030**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 19:02	1
4,4'-DDE	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 19:02	1
4,4'-DDT	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 19:02	1
Aldrin	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 19:02	1
alpha-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 19:02	1
alpha-Chlordane	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 19:02	1
beta-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 19:02	1
Chlordane	ND		25		ug/Kg		02/23/22 13:08	02/26/22 19:02	1
delta-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 19:02	1
Dieldrin	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 19:02	1
Endosulfan I	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 19:02	1
Endosulfan II	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 19:02	1
Endosulfan sulfate	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 19:02	1
Endrin	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 19:02	1
Endrin aldehyde	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 19:02	1
Endrin ketone	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 19:02	1
gamma-Chlordane	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 19:02	1
gamma-BHC	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 19:02	1
Heptachlor	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 19:02	1
Heptachlor epoxide	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 19:02	1
Methoxychlor	ND		5.0		ug/Kg		02/23/22 13:08	02/26/22 19:02	1
Toxaphene	ND		25		ug/Kg		02/23/22 13:08	02/26/22 19:02	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene (Surr)	*89*		*38 - 148*	*02/23/22 13:08*	*02/26/22 19:02*	*1*
DCB Decachlorobiphenyl (Surr)	*72*		*37 - 151*	*02/23/22 13:08*	*02/26/22 19:02*	*1*

Lab Sample ID: LCS 570-215030/2-A **Client Sample ID: Lab Control Sample**
Matrix: Solid **Prep Type: Total/NA**
Analysis Batch: 215782 **Prep Batch: 215030**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
4,4'-DDD	25.0	26.62		ug/Kg		106	54 - 154
4,4'-DDE	25.0	28.85		ug/Kg		115	51 - 149
4,4'-DDT	25.0	26.98		ug/Kg		108	39 - 152
Aldrin	25.0	22.93		ug/Kg		92	52 - 138
alpha-BHC	25.0	24.48		ug/Kg		98	51 - 140
alpha-Chlordane	25.0	23.59		ug/Kg		94	53 - 141
beta-BHC	25.0	23.26		ug/Kg		93	53 - 141
delta-BHC	25.0	26.08		ug/Kg		104	20 - 132
Dieldrin	25.0	24.22		ug/Kg		97	52 - 144
Endosulfan I	25.0	23.51		ug/Kg		94	49 - 139
Endosulfan II	25.0	24.55		ug/Kg		98	51 - 150
Endosulfan sulfate	25.0	26.04		ug/Kg		104	45 - 139
Endrin	25.0	24.34		ug/Kg		97	53 - 151
Endrin aldehyde	25.0	23.26		ug/Kg		93	31 - 146
gamma-Chlordane	25.0	23.63		ug/Kg		95	46 - 156
gamma-BHC	25.0	24.39		ug/Kg		98	53 - 141

Method: 8081A - Organochlorine Pesticides (GC) (Continued)

Lab Sample ID: LCS 570-215030/2-A **Client Sample ID: Lab Control Sample**
Matrix: Solid **Prep Type: Total/NA**
Analysis Batch: 215782 **Prep Batch: 215030**

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Heptachlor			25.0	23.43		ug/Kg		94	52 - 144		
Heptachlor epoxide			25.0	23.44		ug/Kg		94	54 - 141		
Methoxychlor			25.0	27.03		ug/Kg		108	47 - 148		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Tetrachloro-m-xylene (Surr)	*97*		*38 - 148*
DCB Decachlorobiphenyl (Surr)	*96*		*37 - 151*

Lab Sample ID: LCSD 570-215030/3-A **Client Sample ID: Lab Control Sample Dup**
Matrix: Solid **Prep Type: Total/NA**
Analysis Batch: 215782 **Prep Batch: 215030**

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
4,4'-DDD			25.0	25.90		ug/Kg		104	54 - 154	3	30
4,4'-DDE			25.0	28.14		ug/Kg		113	51 - 149	2	28
4,4'-DDT			25.0	26.12		ug/Kg		104	39 - 152	3	31
Aldrin			25.0	22.57		ug/Kg		90	52 - 138	2	30
alpha-BHC			25.0	24.21		ug/Kg		97	51 - 140	1	29
alpha-Chlordane			25.0	23.18		ug/Kg		93	53 - 141	2	28
beta-BHC			25.0	22.59		ug/Kg		90	53 - 141	3	29
delta-BHC			25.0	25.30		ug/Kg		101	20 - 132	3	40
Dieldrin			25.0	23.67		ug/Kg		95	52 - 144	2	28
Endosulfan I			25.0	23.06		ug/Kg		92	49 - 139	2	28
Endosulfan II			25.0	24.03		ug/Kg		96	51 - 150	2	29
Endosulfan sulfate			25.0	25.40		ug/Kg		102	45 - 139	2	30
Endrin			25.0	23.91		ug/Kg		96	53 - 151	2	29
Endrin aldehyde			25.0	22.73		ug/Kg		91	31 - 146	2	40
gamma-Chlordane			25.0	23.27		ug/Kg		93	46 - 156	2	39
gamma-BHC			25.0	23.93		ug/Kg		96	53 - 141	2	29
Heptachlor			25.0	23.13		ug/Kg		93	52 - 144	1	29
Heptachlor epoxide			25.0	23.02		ug/Kg		92	54 - 141	2	29
Methoxychlor			25.0	26.45		ug/Kg		106	47 - 148	2	29

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Tetrachloro-m-xylene (Surr)	*95*		*38 - 148*
DCB Decachlorobiphenyl (Surr)	*94*		*37 - 151*

Lab Sample ID: 570-85264-1 MS **Client Sample ID: HA-1-0.5**
Matrix: Solid **Prep Type: Total/NA**
Analysis Batch: 215782 **Prep Batch: 215030**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
4,4'-DDD	ND		24.8	16.42		ug/Kg		66	27 - 144		
4,4'-DDE	ND		24.8	19.52		ug/Kg		70	28 - 141		
4,4'-DDT	ND		24.8	18.24		ug/Kg		67	10 - 154		
Aldrin	ND		24.8	13.81		ug/Kg		56	26 - 125		
alpha-BHC	ND		24.8	14.43		ug/Kg		58	24 - 125		
alpha-Chlordane	ND		24.8	16.00		ug/Kg		64	17 - 144		

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Method: 8081A - Organochlorine Pesticides (GC) (Continued)

Lab Sample ID: 570-85264-1 MS — **Client Sample ID: HA-1-0.5**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 215782 — **Prep Batch: 215030**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
beta-BHC	ND		24.8	14.57		ug/Kg		59	28 - 125
delta-BHC	ND		24.8	16.73		ug/Kg		67	10 - 125
Dieldrin	ND		24.8	16.13		ug/Kg		65	19 - 145
Endosulfan I	ND		24.8	14.52		ug/Kg		58	25 - 125
Endosulfan II	ND		24.8	14.34		ug/Kg		58	13 - 142
Endosulfan sulfate	ND		24.8	16.99		ug/Kg		68	14 - 126
Endrin	ND		24.8	16.01		ug/Kg		64	28 - 139
Endrin aldehyde	ND		24.8	13.93		ug/Kg		56	12 - 125
gamma-Chlordane	ND		24.8	16.99		ug/Kg		68	10 - 160
gamma-BHC	ND		24.8	14.58		ug/Kg		59	24 - 125
Heptachlor	ND		24.8	14.23		ug/Kg		57	19 - 127
Heptachlor epoxide	ND		24.8	14.41		ug/Kg		58	33 - 123
Methoxychlor	ND		24.8	16.94		ug/Kg		68	19 - 128

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Tetrachloro-m-xylene (Surr)	*68*		*38 - 148*
DCB Decachlorobiphenyl (Surr)	*63*		*37 - 151*

Lab Sample ID: 570-85264-1 MSD — **Client Sample ID: HA-1-0.5**
Matrix: Solid — **Prep Type: Total/NA**
Analysis Batch: 215782 — **Prep Batch: 215030**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
4,4'-DDD	ND		24.8	16.57		ug/Kg		67	27 - 144	1	40
4,4'-DDE	ND		24.8	19.66		ug/Kg		70	28 - 141	1	32
4,4'-DDT	ND		24.8	17.04		ug/Kg		63	10 - 154	7	40
Aldrin	ND		24.8	13.76		ug/Kg		56	26 - 125	0	40
alpha-BHC	ND		24.8	14.15		ug/Kg		57	24 - 125	2	40
alpha-Chlordane	ND		24.8	16.22		ug/Kg		65	17 - 144	1	40
beta-BHC	ND		24.8	14.42		ug/Kg		58	28 - 125	1	39
delta-BHC	ND		24.8	16.57		ug/Kg		67	10 - 125	1	40
Dieldrin	ND		24.8	16.02		ug/Kg		65	19 - 145	1	39
Endosulfan I	ND		24.8	14.28		ug/Kg		58	25 - 125	2	39
Endosulfan II	ND		24.8	13.94		ug/Kg		56	13 - 142	3	40
Endosulfan sulfate	ND		24.8	15.16		ug/Kg		61	14 - 126	11	38
Endrin	ND		24.8	15.80		ug/Kg		64	28 - 139	1	40
Endrin aldehyde	ND		24.8	13.49		ug/Kg		54	12 - 125	3	40
gamma-Chlordane	ND		24.8	16.99		ug/Kg		69	10 - 160	0	40
gamma-BHC	ND		24.8	14.30		ug/Kg		58	24 - 125	2	40
Heptachlor	ND		24.8	13.78		ug/Kg		56	19 - 127	3	40
Heptachlor epoxide	ND		24.8	14.01		ug/Kg		57	33 - 123	3	34
Methoxychlor	ND		24.8	16.13		ug/Kg		65	19 - 128	5	40

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
Tetrachloro-m-xylene (Surr)	*67*		*38 - 148*
DCB Decachlorobiphenyl (Surr)	*62*		*37 - 151*

Method: 8081A - Organochlorine Pesticides (GC) (Continued)

Lab Sample ID: MB 570-215033/1-A **Client Sample ID: Method Blank**
Matrix: Solid **Prep Type: Total/NA**
Analysis Batch: 216044 **Prep Batch: 215033**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 17:37	1
4,4'-DDE	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 17:37	1
4,4'-DDT	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 17:37	1
Aldrin	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 17:37	1
alpha-BHC	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 17:37	1
alpha-Chlordane	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 17:37	1
beta-BHC	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 17:37	1
Chlordane	ND		25		ug/Kg		02/23/22 13:11	02/28/22 17:37	1
delta-BHC	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 17:37	1
Dieldrin	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 17:37	1
Endosulfan I	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 17:37	1
Endosulfan II	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 17:37	1
Endosulfan sulfate	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 17:37	1
Endrin	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 17:37	1
Endrin aldehyde	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 17:37	1
Endrin ketone	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 17:37	1
gamma-Chlordane	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 17:37	1
gamma-BHC	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 17:37	1
Heptachlor	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 17:37	1
Heptachlor epoxide	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 17:37	1
Methoxychlor	ND		5.0		ug/Kg		02/23/22 13:11	02/28/22 17:37	1
Toxaphene	ND		25		ug/Kg		02/23/22 13:11	02/28/22 17:37	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene (Surr)	*105*		*38 - 148*	*02/23/22 13:11*	*02/28/22 17:37*	*1*
DCB Decachlorobiphenyl (Surr)	*106*		*37 - 151*	*02/23/22 13:11*	*02/28/22 17:37*	*1*

Lab Sample ID: LCS 570-215033/2-A **Client Sample ID: Lab Control Sample**
Matrix: Solid **Prep Type: Total/NA**
Analysis Batch: 216308 **Prep Batch: 215033**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
4,4'-DDD	25.0	29.30		ug/Kg		117	54 - 154
4,4'-DDE	25.0	30.25		ug/Kg		121	51 - 149
4,4'-DDT	25.0	26.97		ug/Kg		108	39 - 152
Aldrin	25.0	28.95		ug/Kg		116	52 - 138
alpha-BHC	25.0	29.56		ug/Kg		118	51 - 140
alpha-Chlordane	25.0	29.01		ug/Kg		116	53 - 141
beta-BHC	25.0	28.68		ug/Kg		115	53 - 141
delta-BHC	25.0	28.61		ug/Kg		114	20 - 132
Dieldrin	25.0	29.21		ug/Kg		117	52 - 144
Endosulfan I	25.0	27.46		ug/Kg		110	49 - 139
Endosulfan II	25.0	27.00		ug/Kg		108	51 - 150
Endosulfan sulfate	25.0	27.86		ug/Kg		111	45 - 139
Endrin	25.0	29.00		ug/Kg		116	53 - 151
Endrin aldehyde	25.0	22.34		ug/Kg		89	31 - 146
gamma-Chlordane	25.0	29.23		ug/Kg		117	46 - 156
gamma-BHC	25.0	29.59		ug/Kg		118	53 - 141

Method: 8081A - Organochlorine Pesticides (GC) (Continued)

Lab Sample ID: LCS 570-215033/2-A
Matrix: Solid
Analysis Batch: 216308

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 215033

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Heptachlor	25.0	29.08		ug/Kg		116	52 - 144
Heptachlor epoxide	25.0	28.42		ug/Kg		114	54 - 141
Methoxychlor	25.0	23.85		ug/Kg		95	47 - 148

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Tetrachloro-m-xylene (Surr)	*107*		*38 - 148*
DCB Decachlorobiphenyl (Surr)	*92*		*37 - 151*

Lab Sample ID: LCSD 570-215033/3-A
Matrix: Solid
Analysis Batch: 216308

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 215033

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
4,4'-DDD	25.0	27.29		ug/Kg		109	54 - 154	7	30
4,4'-DDE	25.0	29.12		ug/Kg		116	51 - 149	4	28
4,4'-DDT	25.0	25.80		ug/Kg		103	39 - 152	4	31
Aldrin	25.0	26.98		ug/Kg		108	52 - 138	7	30
alpha-BHC	25.0	27.93		ug/Kg		112	51 - 140	6	29
alpha-Chlordane	25.0	27.11		ug/Kg		108	53 - 141	7	28
beta-BHC	25.0	26.60		ug/Kg		106	53 - 141	8	29
delta-BHC	25.0	27.48		ug/Kg		110	20 - 132	4	40
Dieldrin	25.0	28.25		ug/Kg		113	52 - 144	3	28
Endosulfan I	25.0	26.14		ug/Kg		105	49 - 139	5	28
Endosulfan II	25.0	25.90		ug/Kg		104	51 - 150	4	29
Endosulfan sulfate	25.0	26.41		ug/Kg		106	45 - 139	5	30
Endrin	25.0	27.25		ug/Kg		109	53 - 151	6	29
Endrin aldehyde	25.0	23.09		ug/Kg		92	31 - 146	3	40
gamma-Chlordane	25.0	27.29		ug/Kg		109	46 - 156	7	39
gamma-BHC	25.0	27.60		ug/Kg		110	53 - 141	7	29
Heptachlor	25.0	27.42		ug/Kg		110	52 - 144	6	29
Heptachlor epoxide	25.0	26.70		ug/Kg		107	54 - 141	6	29
Methoxychlor	25.0	22.94		ug/Kg		92	47 - 148	4	29

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Tetrachloro-m-xylene (Surr)	*98*		*38 - 148*
DCB Decachlorobiphenyl (Surr)	*83*		*37 - 151*

Lab Sample ID: 570-85264-31 MS
Matrix: Solid
Analysis Batch: 216308

Client Sample ID: SB-9-0.5
Prep Type: Total/NA
Prep Batch: 215033

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
4,4'-DDD	ND		24.9	33.33		ug/Kg		134	27 - 144
4,4'-DDE	ND		24.9	33.67		ug/Kg		135	28 - 141
4,4'-DDT	ND		24.9	29.48		ug/Kg		119	10 - 154
Aldrin	ND	F1	24.9	33.97	F1	ug/Kg		137	26 - 125
alpha-BHC	ND	F1	24.9	35.12	F1	ug/Kg		141	24 - 125
alpha-Chlordane	ND		24.9	33.62		ug/Kg		135	17 - 144

Method: 8081A - Organochlorine Pesticides (GC) (Continued)

Lab Sample ID: 570-85264-31 MS **Client Sample ID: SB-9-0.5**
Matrix: Solid **Prep Type: Total/NA**
Analysis Batch: 216308 **Prep Batch: 215033**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
beta-BHC	ND	F1	24.9	32.97	F1	ug/Kg		133	28 - 125
delta-BHC	ND	F1	24.9	35.37	F1	ug/Kg		142	10 - 125
Dieldrin	ND		24.9	34.16		ug/Kg		137	19 - 145
Endosulfan I	ND	F1	24.9	35.08	F1	ug/Kg		141	25 - 125
Endosulfan II	ND		24.9	34.25		ug/Kg		138	13 - 142
Endosulfan sulfate	ND		24.9	32.62	F1	ug/Kg		131	14 - 126
Endrin	ND		24.9	33.20		ug/Kg		134	28 - 139
Endrin aldehyde	ND	F1	24.9	34.64	F1	ug/Kg		139	12 - 125
gamma-Chlordane	ND		24.9	33.84		ug/Kg		136	10 - 160
gamma-BHC	ND	F1	24.9	35.22	F1	ug/Kg		142	24 - 125
Heptachlor	ND	F1	24.9	34.45	F1	ug/Kg		139	19 - 127
Heptachlor epoxide	ND	F1	24.9	33.38	F1	ug/Kg		134	33 - 123
Methoxychlor	ND		24.9	25.58		ug/Kg		103	19 - 128

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Tetrachloro-m-xylene (Surr)	*121*		*38 - 148*
DCB Decachlorobiphenyl (Surr)	*105*		*37 - 151*

Lab Sample ID: 570-85264-31 MSD **Client Sample ID: SB-9-0.5**
Matrix: Solid **Prep Type: Total/NA**
Analysis Batch: 216308 **Prep Batch: 215033**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
4,4'-DDD	ND		24.8	32.65		ug/Kg		132	27 - 144	2	40
4,4'-DDE	ND		24.8	32.98		ug/Kg		133	28 - 141	2	32
4,4'-DDT	ND		24.8	29.08		ug/Kg		117	10 - 154	1	40
Aldrin	ND	F1	24.8	33.22	F1	ug/Kg		134	26 - 125	2	40
alpha-BHC	ND	F1	24.8	34.49	F1	ug/Kg		139	24 - 125	2	40
alpha-Chlordane	ND		24.8	32.88		ug/Kg		132	17 - 144	2	40
beta-BHC	ND	F1	24.8	32.36	F1	ug/Kg		130	28 - 125	2	39
delta-BHC	ND	F1	24.8	34.75	F1	ug/Kg		140	10 - 125	2	40
Dieldrin	ND		24.8	33.81		ug/Kg		136	19 - 145	1	39
Endosulfan I	ND	F1	24.8	34.72	F1	ug/Kg		140	25 - 125	1	39
Endosulfan II	ND		24.8	33.74		ug/Kg		136	13 - 142	1	40
Endosulfan sulfate	ND		24.8	31.88	F1	ug/Kg		128	14 - 126	2	38
Endrin	ND		24.8	32.56		ug/Kg		131	28 - 139	2	40
Endrin aldehyde	ND	F1	24.8	34.10	F1	ug/Kg		137	12 - 125	2	40
gamma-Chlordane	ND		24.8	33.15		ug/Kg		134	10 - 160	2	40
gamma-BHC	ND	F1	24.8	34.36	F1	ug/Kg		138	24 - 125	2	40
Heptachlor	ND	F1	24.8	33.72	F1	ug/Kg		136	19 - 127	2	40
Heptachlor epoxide	ND	F1	24.8	32.66	F1	ug/Kg		132	33 - 123	2	34
Methoxychlor	ND		24.8	24.56		ug/Kg		99	19 - 128	4	40

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
Tetrachloro-m-xylene (Surr)	*121*		*38 - 148*
DCB Decachlorobiphenyl (Surr)	*102*		*37 - 151*

Client: Haley & Aldrich, Inc.
Job ID: 570-85264-1
Project/Site: UC Riverside / 204609

Method: 8151A - Herbicides (GC)

Lab Sample ID: MB 570-216737/1-A
Client Sample ID: Method Blank
Matrix: Solid
Prep Type: Total/NA
Analysis Batch: 218921
Prep Batch: 216737

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND		10		ug/Kg		03/02/22 20:57	03/11/22 15:19	1
2,4,5-TP (Silvex)	ND		10		ug/Kg		03/02/22 20:57	03/11/22 15:19	1
2,4-D	ND		100		ug/Kg		03/02/22 20:57	03/11/22 15:19	1
2,4-DB	ND		100		ug/Kg		03/02/22 20:57	03/11/22 15:19	1
Dalapon	ND		250		ug/Kg		03/02/22 20:57	03/11/22 15:19	1
Dicamba	ND		10		ug/Kg		03/02/22 20:57	03/11/22 15:19	1
Dichlorprop	ND		100		ug/Kg		03/02/22 20:57	03/11/22 15:19	1
Dinoseb	ND		100		ug/Kg		03/02/22 20:57	03/11/22 15:19	1
MCPA	ND		10000		ug/Kg		03/02/22 20:57	03/11/22 15:19	1
MCPP	ND		10000		ug/Kg		03/02/22 20:57	03/11/22 15:19	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*99*		*20 - 163*	*03/02/22 20:57*	*03/11/22 15:19*	*1*

Lab Sample ID: LCS 570-216737/2-A
Client Sample ID: Lab Control Sample
Matrix: Solid
Prep Type: Total/NA
Analysis Batch: 218921
Prep Batch: 216737

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
2,4,5-T	20.0	21.66		ug/Kg		108	44 - 139
2,4,5-TP (Silvex)	20.0	25.56		ug/Kg		128	32 - 171
2,4-D	200	298.3		ug/Kg		149	27 - 160
2,4-DB	200	148.9		ug/Kg		74	55 - 190
Dalapon	500	569.9		ug/Kg		114	18 - 118
Dicamba	20.0	19.31		ug/Kg		97	43 - 163
Dichlorprop	200	218.4		ug/Kg		109	54 - 130
Dinoseb	100	ND		ug/Kg		14	10 - 140
MCPA	20000	28230	*+	ug/Kg		141	46 - 128
MCPP	20000	22570		ug/Kg		113	41 - 169

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4-Dichlorophenylacetic acid	*85*		*20 - 163*

Lab Sample ID: LCSD 570-216737/3-A
Client Sample ID: Lab Control Sample Dup
Matrix: Solid
Prep Type: Total/NA
Analysis Batch: 218921
Prep Batch: 216737

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
2,4,5-T	20.0	18.03		ug/Kg		90	44 - 139	18	30
2,4,5-TP (Silvex)	20.0	21.92		ug/Kg		110	32 - 171	15	26
2,4-D	200	266.8		ug/Kg		133	27 - 160	11	30
2,4-DB	200	137.5		ug/Kg		69	55 - 190	8	30
Dalapon	500	516.6		ug/Kg		103	18 - 118	10	30
Dicamba	20.0	16.81		ug/Kg		84	43 - 163	14	30
Dichlorprop	200	194.7		ug/Kg		97	54 - 130	11	25
Dinoseb	100	ND	*1	ug/Kg		24	10 - 140	48	30
MCPA	20000	25110		ug/Kg		126	46 - 128	12	30
MCPP	20000	20730		ug/Kg		104	41 - 169	9	30

Method: 8151A - Herbicides (GC) (Continued)

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
2,4-Dichlorophenylacetic acid	*76*		*20 - 163*

Lab Sample ID: 570-85264-1 MS | **Client Sample ID: HA-1-0.5**
Matrix: Solid | **Prep Type: Total/NA**
Analysis Batch: 218921 | **Prep Batch: 216737**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
2,4,5-T	ND	F2	20.0	17.91	p	ug/Kg		90	10 - 190
2,4,5-TP (Silvex)	ND		20.0	32.34		ug/Kg		162	11 - 184
2,4-D	ND	F1	200	487.6	F1	ug/Kg		244	10 - 178
2,4-DB	ND	F1 F2	200	264.2	p	ug/Kg		132	10 - 190
Dalapon	ND		500	571.6		ug/Kg		114	10 - 143
Dicamba	ND		20.0	27.97		ug/Kg		140	10 - 190
Dichlorprop	ND		200	228.1	p	ug/Kg		114	10 - 188
Dinoseb	ND	F1 *1	100	ND	F1	ug/Kg		0	10 - 190
MCPA	ND	F1 *+	20000	39230	F1 p	ug/Kg		196	10 - 172
MCPP	ND	F1	20000	28300	p	ug/Kg		141	10 - 190

Surrogate	MS %Recovery	MS Qualifier	Limits
2,4-Dichlorophenylacetic acid	*155*		*20 - 163*

Lab Sample ID: 570-85264-1 MSD | **Client Sample ID: HA-1-0.5**
Matrix: Solid | **Prep Type: Total/NA**
Analysis Batch: 218921 | **Prep Batch: 216737**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
2,4,5-T	ND	F2	20.0	10.85	p F2	ug/Kg		54	10 - 190	49	40
2,4,5-TP (Silvex)	ND		20.0	26.20		ug/Kg		131	11 - 184	21	40
2,4-D	ND	F1	200	434.2	F1	ug/Kg		217	10 - 178	12	40
2,4-DB	ND	F1 F2	200	261.6		ug/Kg		131	10 - 190	1	40
Dalapon	ND		500	584.9		ug/Kg		117	10 - 143	2	40
Dicamba	ND		20.0	23.92		ug/Kg		120	10 - 190	16	40
Dichlorprop	ND		200	214.5	p	ug/Kg		107	10 - 188	6	40
Dinoseb	ND	F1 *1	100	ND	F1	ug/Kg		0	10 - 190	NC	40
MCPA	ND	F1 *+	20000	36850	F1 p	ug/Kg		184	10 - 172	6	40
MCPP	ND	F1	20000	23850	p	ug/Kg		119	10 - 190	17	40

Surrogate	MSD %Recovery	MSD Qualifier	Limits
2,4-Dichlorophenylacetic acid	*143*		*20 - 163*

Lab Sample ID: MB 570-217285/1-A | **Client Sample ID: Method Blank**
Matrix: Solid | **Prep Type: Total/NA**
Analysis Batch: 219765 | **Prep Batch: 217285**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	ND		10		ug/Kg		03/04/22 15:25	03/15/22 20:26	1
2,4,5-TP (Silvex)	ND		10		ug/Kg		03/04/22 15:25	03/15/22 20:26	1
2,4-D	ND		100		ug/Kg		03/04/22 15:25	03/15/22 20:26	1
2,4-DB	ND		100		ug/Kg		03/04/22 15:25	03/15/22 20:26	1
Dalapon	ND		250		ug/Kg		03/04/22 15:25	03/15/22 20:26	1
Dicamba	ND		10		ug/Kg		03/04/22 15:25	03/15/22 20:26	1

Method: 8151A - Herbicides (GC) (Continued)

Lab Sample ID: MB 570-217285/1-A **Client Sample ID: Method Blank**
Matrix: Solid **Prep Type: Total/NA**
Analysis Batch: 219765 **Prep Batch: 217285**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dichlorprop	ND		100		ug/Kg		03/04/22 15:25	03/15/22 20:26	1
Dinoseb	ND		100		ug/Kg		03/04/22 15:25	03/15/22 20:26	1
MCPA	ND		10000		ug/Kg		03/04/22 15:25	03/15/22 20:26	1
MCPP	ND		10000		ug/Kg		03/04/22 15:25	03/15/22 20:26	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*143*		*20 - 163*	*03/04/22 15:25*	*03/15/22 20:26*	*1*

Lab Sample ID: LCS 570-217285/2-A **Client Sample ID: Lab Control Sample**
Matrix: Solid **Prep Type: Total/NA**
Analysis Batch: 219765 **Prep Batch: 217285**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
2,4,5-T	20.0	19.66	p	ug/Kg		98	44 - 139
2,4,5-TP (Silvex)	20.0	22.79		ug/Kg		114	32 - 171
2,4-D	200	244.4	p	ug/Kg		122	27 - 160
2,4-DB	200	256.0		ug/Kg		128	55 - 190
Dalapon	500	517.7		ug/Kg		104	18 - 118
Dicamba	20.0	28.59		ug/Kg		143	43 - 163
Dichlorprop	200	240.7		ug/Kg		120	54 - 130
Dinoseb	100	71.58	J	ug/Kg		72	10 - 140
MCPA	20000	23940	p	ug/Kg		120	46 - 128
MCPP	20000	22250	p	ug/Kg		111	41 - 169

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4-Dichlorophenylacetic acid	*90*	*p*	*20 - 163*

Lab Sample ID: LCSD 570-217285/3-A **Client Sample ID: Lab Control Sample Dup**
Matrix: Solid **Prep Type: Total/NA**
Analysis Batch: 220011 **Prep Batch: 217285**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
2,4,5-T	20.0	18.86	p	ug/Kg		94	44 - 139	4	30
2,4,5-TP (Silvex)	20.0	25.34		ug/Kg		127	32 - 171	11	26
2,4-D	200	213.3	p	ug/Kg		107	27 - 160	14	30
2,4-DB	200	278.5		ug/Kg		139	55 - 190	8	30
Dalapon	500	511.9		ug/Kg		102	18 - 118	1	30
Dicamba	20.0	30.82		ug/Kg		154	43 - 163	7	30
Dichlorprop	200	227.0		ug/Kg		113	54 - 130	6	25
Dinoseb	100	78.62	J	ug/Kg		79	10 - 140	9	30
MCPA	20000	23320	p	ug/Kg		117	46 - 128	3	30
MCPP	20000	21290	p	ug/Kg		106	41 - 169	4	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2,4-Dichlorophenylacetic acid	*98*	*p*	*20 - 163*

Method: 8151A - Herbicides (GC) (Continued)

Lab Sample ID: 570-85264-19 MS
Matrix: Solid
Analysis Batch: 219765

Client Sample ID: SB-5-0.5
Prep Type: Total/NA
Prep Batch: 217285

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
2,4,5-T	ND	F2	20.0	33.92		ug/Kg		170	10 - 190
2,4,5-TP (Silvex)	ND		20.0	27.33		ug/Kg		137	11 - 184
2,4-D	ND	F2	200	153.1	p	ug/Kg		77	10 - 178
2,4-DB	ND	F1	200	467.6	F1	ug/Kg		234	10 - 190
Dalapon	ND		500	463.9		ug/Kg		93	10 - 143
Dicamba	ND		20.0	33.86		ug/Kg		169	10 - 190
Dichlorprop	ND		200	249.8	p	ug/Kg		125	10 - 188
Dinoseb	ND		100	136.6		ug/Kg		137	10 - 190
MCPA	ND		20000	27300		ug/Kg		136	10 - 172
MCPP	ND	*+ F1	20000	37940		ug/Kg		190	10 - 190

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
2,4-Dichlorophenylacetic acid	*146*		*20 - 163*

Lab Sample ID: 570-85264-19 MSD
Matrix: Solid
Analysis Batch: 219765

Client Sample ID: SB-5-0.5
Prep Type: Total/NA
Prep Batch: 217285

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
2,4,5-T	ND	F2	20.0	18.58	F2	ug/Kg		93	10 - 190	58	40
2,4,5-TP (Silvex)	ND		20.0	21.08		ug/Kg		105	11 - 184	26	40
2,4-D	ND	F2	200	249.9	F2	ug/Kg		125	10 - 178	48	40
2,4-DB	ND	F1	200	376.4		ug/Kg		188	10 - 190	22	40
Dalapon	ND		500	440.6		ug/Kg		88	10 - 143	5	40
Dicamba	ND		20.0	27.11		ug/Kg		136	10 - 190	22	40
Dichlorprop	ND		200	189.3	p	ug/Kg		95	10 - 188	28	40
Dinoseb	ND		100	112.2	p	ug/Kg		112	10 - 190	20	40
MCPA	ND		20000	20920		ug/Kg		105	10 - 172	26	40
MCPP	ND	*+ F1	20000	31450		ug/Kg		157	10 - 190	19	40

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
2,4-Dichlorophenylacetic acid	*126*		*20 - 163*

Method: 6010B - Metals (ICP)

Lab Sample ID: MB 570-217014/1-A
Matrix: Solid
Analysis Batch: 217592

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 217014

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		2.60		mg/Kg		03/04/22 05:22	03/04/22 18:26	1

Lab Sample ID: LCS 570-217014/2-A
Matrix: Solid
Analysis Batch: 217592

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 217014

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	25.1	26.38		mg/Kg		105	80 - 120

Method: 6010B - Metals (ICP) (Continued)

Lab Sample ID: LCSD 570-217014/3-A
Matrix: Solid
Analysis Batch: 217592

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 217014

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic			24.6	24.26		mg/Kg		98	80 - 120	8	20

Lab Sample ID: 570-86421-A-41-F MS
Matrix: Solid
Analysis Batch: 217592

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 217014

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	ND		24.9	21.40		mg/Kg		76	75 - 125

Lab Sample ID: 570-86421-A-41-G MSD
Matrix: Solid
Analysis Batch: 217592

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 217014

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	ND		24.6	22.16		mg/Kg		80	75 - 125	3	20

Lab Sample ID: MB 570-217347/1-A
Matrix: Solid
Analysis Batch: 217894

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 217347

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		2.58		mg/Kg		03/04/22 19:29	03/07/22 17:41	1

Lab Sample ID: LCS 570-217347/2-A
Matrix: Solid
Analysis Batch: 217894

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 217347

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic			24.5	21.93		mg/Kg		89	80 - 120

Lab Sample ID: LCSD 570-217347/3-A
Matrix: Solid
Analysis Batch: 217894

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 217347

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic			25.9	25.51		mg/Kg		98	80 - 120	15	20

Lab Sample ID: 570-86518-A-1-B MS ^5
Matrix: Solid
Analysis Batch: 217894

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 217347

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	ND	F1	26.0	33.29	F1	mg/Kg		128	75 - 125

Lab Sample ID: 570-86518-A-1-C MSD ^5
Matrix: Solid
Analysis Batch: 217894

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 217347

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	ND	F1	25.4	30.05		mg/Kg		118	75 - 125	10	20

Method: 6010B - Metals (ICP)

Lab Sample ID: MB 570-217810/1-A
Matrix: Solid
Analysis Batch: 218233
Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 217810

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		2.43		mg/Kg		03/07/22 19:27	03/09/22 00:37	1

Lab Sample ID: LCS 570-217810/2-A
Matrix: Solid
Analysis Batch: 218233
Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 217810

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	24.4	22.11		mg/Kg		91	80 - 120

Lab Sample ID: LCSD 570-217810/3-A
Matrix: Solid
Analysis Batch: 218233
Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 217810

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	25.9	23.54		mg/Kg		91	80 - 120	6	20

Lab Sample ID: 570-86251-E-1-I MS
Matrix: Solid
Analysis Batch: 218233
Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 217810

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	9.09		24.9	39.79		mg/Kg		123	75 - 125

Lab Sample ID: 570-86251-E-1-J MSD
Matrix: Solid
Analysis Batch: 218233
Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 217810

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	9.09		24.8	39.72		mg/Kg		124	75 - 125	0	20

GC Semi VOA

Prep Batch: 215030

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-85264-1	HA-1-0.5	Total/NA	Solid	3546	
570-85264-2	HA-1-2.0	Total/NA	Solid	3546	
570-85264-4	HA-4-0.5	Total/NA	Solid	3546	
570-85264-5	HA-4-2.0	Total/NA	Solid	3546	
570-85264-7	HA-2-0.5	Total/NA	Solid	3546	
570-85264-8	HA-2-2.0	Total/NA	Solid	3546	
570-85264-10	HA-5-0.5	Total/NA	Solid	3546	
570-85264-11	HA-5-2.0	Total/NA	Solid	3546	
570-85264-13	HA-3-0.5	Total/NA	Solid	3546	
570-85264-14	HA-3-2.0	Total/NA	Solid	3546	
570-85264-16	HA-6-0.5	Total/NA	Solid	3546	
570-85264-17	HA-6-2.0	Total/NA	Solid	3546	
570-85264-19	SB-5-0.5	Total/NA	Solid	3546	
570-85264-20	SB-5-2.0	Total/NA	Solid	3546	
570-85264-22	SB-6-0.5	Total/NA	Solid	3546	
570-85264-23	SB-6-2.0	Total/NA	Solid	3546	
570-85264-25	SB-7-0.5	Total/NA	Solid	3546	
570-85264-26	SB-7-2.0	Total/NA	Solid	3546	
570-85264-28	SB-8-0.5	Total/NA	Solid	3546	
570-85264-29	SB-8-2.0	Total/NA	Solid	3546	
MB 570-215030/1-A	Method Blank	Total/NA	Solid	3546	
LCS 570-215030/2-A	Lab Control Sample	Total/NA	Solid	3546	
LCSD 570-215030/3-A	Lab Control Sample Dup	Total/NA	Solid	3546	
570-85264-1 MS	HA-1-0.5	Total/NA	Solid	3546	
570-85264-1 MSD	HA-1-0.5	Total/NA	Solid	3546	

Prep Batch: 215033

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-85264-31	SB-9-0.5	Total/NA	Solid	3546	
570-85264-32	SB-9-2.0	Total/NA	Solid	3546	
570-85264-34	SB-1-0.5	Total/NA	Solid	3546	
570-85264-35	SB-1-2.0	Total/NA	Solid	3546	
570-85264-37	SB-2-0.5	Total/NA	Solid	3546	
570-85264-38	SB-2-2.0	Total/NA	Solid	3546	
570-85264-40	SB-3-0.5	Total/NA	Solid	3546	
570-85264-41	SB-3-2.0	Total/NA	Solid	3546	
570-85264-43	SB-4-0.5	Total/NA	Solid	3546	
570-85264-44	SB-4-2.0	Total/NA	Solid	3546	
MB 570-215033/1-A	Method Blank	Total/NA	Solid	3546	
LCS 570-215033/2-A	Lab Control Sample	Total/NA	Solid	3546	
LCSD 570-215033/3-A	Lab Control Sample Dup	Total/NA	Solid	3546	
570-85264-31 MS	SB-9-0.5	Total/NA	Solid	3546	
570-85264-31 MSD	SB-9-0.5	Total/NA	Solid	3546	

Analysis Batch: 215782

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-85264-1	HA-1-0.5	Total/NA	Solid	8081A	215030
570-85264-2	HA-1-2.0	Total/NA	Solid	8081A	215030
570-85264-4	HA-4-0.5	Total/NA	Solid	8081A	215030
570-85264-5	HA-4-2.0	Total/NA	Solid	8081A	215030
570-85264-7	HA-2-0.5	Total/NA	Solid	8081A	215030

GC Semi VOA (Continued)

Analysis Batch: 215782 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-85264-8	HA-2-2.0	Total/NA	Solid	8081A	215030
570-85264-10	HA-5-0.5	Total/NA	Solid	8081A	215030
570-85264-11	HA-5-2.0	Total/NA	Solid	8081A	215030
570-85264-13	HA-3-0.5	Total/NA	Solid	8081A	215030
570-85264-14	HA-3-2.0	Total/NA	Solid	8081A	215030
570-85264-16	HA-6-0.5	Total/NA	Solid	8081A	215030
570-85264-17	HA-6-2.0	Total/NA	Solid	8081A	215030
570-85264-19	SB-5-0.5	Total/NA	Solid	8081A	215030
570-85264-20	SB-5-2.0	Total/NA	Solid	8081A	215030
570-85264-22	SB-6-0.5	Total/NA	Solid	8081A	215030
570-85264-23	SB-6-2.0	Total/NA	Solid	8081A	215030
570-85264-25	SB-7-0.5	Total/NA	Solid	8081A	215030
570-85264-26	SB-7-2.0	Total/NA	Solid	8081A	215030
570-85264-28	SB-8-0.5	Total/NA	Solid	8081A	215030
570-85264-29	SB-8-2.0	Total/NA	Solid	8081A	215030
MB 570-215030/1-A	Method Blank	Total/NA	Solid	8081A	215030
LCS 570-215030/2-A	Lab Control Sample	Total/NA	Solid	8081A	215030
LCSD 570-215030/3-A	Lab Control Sample Dup	Total/NA	Solid	8081A	215030
570-85264-1 MS	HA-1-0.5	Total/NA	Solid	8081A	215030
570-85264-1 MSD	HA-1-0.5	Total/NA	Solid	8081A	215030

Analysis Batch: 216044

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-85264-32	SB-9-2.0	Total/NA	Solid	8081A	215033
570-85264-34	SB-1-0.5	Total/NA	Solid	8081A	215033
570-85264-35	SB-1-2.0	Total/NA	Solid	8081A	215033
570-85264-37	SB-2-0.5	Total/NA	Solid	8081A	215033
570-85264-38	SB-2-2.0	Total/NA	Solid	8081A	215033
570-85264-40	SB-3-0.5	Total/NA	Solid	8081A	215033
570-85264-41	SB-3-2.0	Total/NA	Solid	8081A	215033
570-85264-44	SB-4-2.0	Total/NA	Solid	8081A	215033
MB 570-215033/1-A	Method Blank	Total/NA	Solid	8081A	215033

Analysis Batch: 216308

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-85264-31	SB-9-0.5	Total/NA	Solid	8081A	215033
570-85264-43	SB-4-0.5	Total/NA	Solid	8081A	215033
LCS 570-215033/2-A	Lab Control Sample	Total/NA	Solid	8081A	215033
LCSD 570-215033/3-A	Lab Control Sample Dup	Total/NA	Solid	8081A	215033
570-85264-31 MS	SB-9-0.5	Total/NA	Solid	8081A	215033
570-85264-31 MSD	SB-9-0.5	Total/NA	Solid	8081A	215033

Prep Batch: 216737

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-85264-1	HA-1-0.5	Total/NA	Solid	8151A	
570-85264-2	HA-1-2.0	Total/NA	Solid	8151A	
570-85264-4	HA-4-0.5	Total/NA	Solid	8151A	
570-85264-5	HA-4-2.0	Total/NA	Solid	8151A	
570-85264-7	HA-2-0.5	Total/NA	Solid	8151A	
570-85264-8	HA-2-2.0	Total/NA	Solid	8151A	
570-85264-10	HA-5-0.5	Total/NA	Solid	8151A	

GC Semi VOA (Continued)

Prep Batch: 216737 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-85264-11	HA-5-2.0	Total/NA	Solid	8151A	
570-85264-13	HA-3-0.5	Total/NA	Solid	8151A	
570-85264-14	HA-3-2.0	Total/NA	Solid	8151A	
570-85264-16	HA-6-0.5	Total/NA	Solid	8151A	
570-85264-17	HA-6-2.0	Total/NA	Solid	8151A	
MB 570-216737/1-A	Method Blank	Total/NA	Solid	8151A	
LCS 570-216737/2-A	Lab Control Sample	Total/NA	Solid	8151A	
LCSD 570-216737/3-A	Lab Control Sample Dup	Total/NA	Solid	8151A	
570-85264-1 MS	HA-1-0.5	Total/NA	Solid	8151A	
570-85264-1 MSD	HA-1-0.5	Total/NA	Solid	8151A	

Prep Batch: 217285

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-85264-19	SB-5-0.5	Total/NA	Solid	8151A	
570-85264-20	SB-5-2.0	Total/NA	Solid	8151A	
570-85264-22	SB-6-0.5	Total/NA	Solid	8151A	
570-85264-23	SB-6-2.0	Total/NA	Solid	8151A	
570-85264-25	SB-7-0.5	Total/NA	Solid	8151A	
570-85264-26	SB-7-2.0	Total/NA	Solid	8151A	
570-85264-28	SB-8-0.5	Total/NA	Solid	8151A	
570-85264-29	SB-8-2.0	Total/NA	Solid	8151A	
570-85264-31	SB-9-0.5	Total/NA	Solid	8151A	
570-85264-32	SB-9-2.0	Total/NA	Solid	8151A	
570-85264-34	SB-1-0.5	Total/NA	Solid	8151A	
570-85264-35	SB-1-2.0	Total/NA	Solid	8151A	
570-85264-37	SB-2-0.5	Total/NA	Solid	8151A	
570-85264-38	SB-2-2.0	Total/NA	Solid	8151A	
570-85264-40	SB-3-0.5	Total/NA	Solid	8151A	
570-85264-41	SB-3-2.0	Total/NA	Solid	8151A	
570-85264-43	SB-4-0.5	Total/NA	Solid	8151A	
570-85264-44	SB-4-2.0	Total/NA	Solid	8151A	
MB 570-217285/1-A	Method Blank	Total/NA	Solid	8151A	
LCS 570-217285/2-A	Lab Control Sample	Total/NA	Solid	8151A	
LCSD 570-217285/3-A	Lab Control Sample Dup	Total/NA	Solid	8151A	
570-85264-19 MS	SB-5-0.5	Total/NA	Solid	8151A	
570-85264-19 MSD	SB-5-0.5	Total/NA	Solid	8151A	

Analysis Batch: 218921

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-85264-1	HA-1-0.5	Total/NA	Solid	8151A	216737
570-85264-2	HA-1-2.0	Total/NA	Solid	8151A	216737
570-85264-4	HA-4-0.5	Total/NA	Solid	8151A	216737
570-85264-5	HA-4-2.0	Total/NA	Solid	8151A	216737
570-85264-7	HA-2-0.5	Total/NA	Solid	8151A	216737
570-85264-8	HA-2-2.0	Total/NA	Solid	8151A	216737
570-85264-10	HA-5-0.5	Total/NA	Solid	8151A	216737
570-85264-11	HA-5-2.0	Total/NA	Solid	8151A	216737
570-85264-13	HA-3-0.5	Total/NA	Solid	8151A	216737
570-85264-14	HA-3-2.0	Total/NA	Solid	8151A	216737
570-85264-16	HA-6-0.5	Total/NA	Solid	8151A	216737
570-85264-17	HA-6-2.0	Total/NA	Solid	8151A	216737

GC Semi VOA (Continued)

Analysis Batch: 218921 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 570-216737/1-A	Method Blank	Total/NA	Solid	8151A	216737
LCS 570-216737/2-A	Lab Control Sample	Total/NA	Solid	8151A	216737
LCSD 570-216737/3-A	Lab Control Sample Dup	Total/NA	Solid	8151A	216737
570-85264-1 MS	HA-1-0.5	Total/NA	Solid	8151A	216737
570-85264-1 MSD	HA-1-0.5	Total/NA	Solid	8151A	216737

Analysis Batch: 219765

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-85264-19	SB-5-0.5	Total/NA	Solid	8151A	217285
570-85264-20	SB-5-2.0	Total/NA	Solid	8151A	217285
570-85264-22	SB-6-0.5	Total/NA	Solid	8151A	217285
570-85264-23	SB-6-2.0	Total/NA	Solid	8151A	217285
570-85264-25	SB-7-0.5	Total/NA	Solid	8151A	217285
570-85264-26	SB-7-2.0	Total/NA	Solid	8151A	217285
570-85264-28	SB-8-0.5	Total/NA	Solid	8151A	217285
570-85264-29	SB-8-2.0	Total/NA	Solid	8151A	217285
570-85264-31	SB-9-0.5	Total/NA	Solid	8151A	217285
570-85264-32	SB-9-2.0	Total/NA	Solid	8151A	217285
570-85264-34	SB-1-0.5	Total/NA	Solid	8151A	217285
570-85264-35	SB-1-2.0	Total/NA	Solid	8151A	217285
570-85264-37	SB-2-0.5	Total/NA	Solid	8151A	217285
570-85264-38	SB-2-2.0	Total/NA	Solid	8151A	217285
570-85264-40	SB-3-0.5	Total/NA	Solid	8151A	217285
570-85264-41	SB-3-2.0	Total/NA	Solid	8151A	217285
570-85264-43	SB-4-0.5	Total/NA	Solid	8151A	217285
570-85264-44	SB-4-2.0	Total/NA	Solid	8151A	217285
MB 570-217285/1-A	Method Blank	Total/NA	Solid	8151A	217285
LCS 570-217285/2-A	Lab Control Sample	Total/NA	Solid	8151A	217285
570-85264-19 MS	SB-5-0.5	Total/NA	Solid	8151A	217285
570-85264-19 MSD	SB-5-0.5	Total/NA	Solid	8151A	217285

Analysis Batch: 220011

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCSD 570-217285/3-A	Lab Control Sample Dup	Total/NA	Solid	8151A	217285

Metals

Prep Batch: 217014

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-85264-19	SB-5-0.5	Total/NA	Solid	3050B	
570-85264-20	SB-5-2.0	Total/NA	Solid	3050B	
570-85264-22	SB-6-0.5	Total/NA	Solid	3050B	
570-85264-25	SB-7-0.5	Total/NA	Solid	3050B	
570-85264-26	SB-7-2.0	Total/NA	Solid	3050B	
570-85264-28	SB-8-0.5	Total/NA	Solid	3050B	
570-85264-29	SB-8-2.0	Total/NA	Solid	3050B	
570-85264-32	SB-9-2.0	Total/NA	Solid	3050B	
570-85264-34	SB-1-0.5	Total/NA	Solid	3050B	
570-85264-35	SB-1-2.0	Total/NA	Solid	3050B	
570-85264-37	SB-2-0.5	Total/NA	Solid	3050B	
570-85264-38	SB-2-2.0	Total/NA	Solid	3050B	

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Metals (Continued)

Prep Batch: 217014 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-85264-40	SB-3-0.5	Total/NA	Solid	3050B	
570-85264-41	SB-3-2.0	Total/NA	Solid	3050B	
570-85264-43	SB-4-0.5	Total/NA	Solid	3050B	
570-85264-44	SB-4-2.0	Total/NA	Solid	3050B	
MB 570-217014/1-A	Method Blank	Total/NA	Solid	3050B	
LCS 570-217014/2-A	Lab Control Sample	Total/NA	Solid	3050B	
LCSD 570-217014/3-A	Lab Control Sample Dup	Total/NA	Solid	3050B	
570-86421-A-41-F MS	Matrix Spike	Total/NA	Solid	3050B	
570-86421-A-41-G MSD	Matrix Spike Duplicate	Total/NA	Solid	3050B	

Prep Batch: 217347

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-85264-1	HA-1-0.5	Total/NA	Solid	3050B	
570-85264-2	HA-1-2.0	Total/NA	Solid	3050B	
570-85264-4	HA-4-0.5	Total/NA	Solid	3050B	
570-85264-5	HA-4-2.0	Total/NA	Solid	3050B	
570-85264-7	HA-2-0.5	Total/NA	Solid	3050B	
570-85264-8	HA-2-2.0	Total/NA	Solid	3050B	
570-85264-10	HA-5-0.5	Total/NA	Solid	3050B	
570-85264-11	HA-5-2.0	Total/NA	Solid	3050B	
570-85264-13	HA-3-0.5	Total/NA	Solid	3050B	
570-85264-14	HA-3-2.0	Total/NA	Solid	3050B	
570-85264-16	HA-6-0.5	Total/NA	Solid	3050B	
570-85264-17	HA-6-2.0	Total/NA	Solid	3050B	
570-85264-23	SB-6-2.0	Total/NA	Solid	3050B	
MB 570-217347/1-A	Method Blank	Total/NA	Solid	3050B	
LCS 570-217347/2-A	Lab Control Sample	Total/NA	Solid	3050B	
LCSD 570-217347/3-A	Lab Control Sample Dup	Total/NA	Solid	3050B	
570-86518-A-1-B MS ^5	Matrix Spike	Total/NA	Solid	3050B	
570-86518-A-1-C MSD ^5	Matrix Spike Duplicate	Total/NA	Solid	3050B	

Analysis Batch: 217592

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-85264-19	SB-5-0.5	Total/NA	Solid	6010B	217014
570-85264-20	SB-5-2.0	Total/NA	Solid	6010B	217014
570-85264-22	SB-6-0.5	Total/NA	Solid	6010B	217014
570-85264-25	SB-7-0.5	Total/NA	Solid	6010B	217014
570-85264-26	SB-7-2.0	Total/NA	Solid	6010B	217014
570-85264-28	SB-8-0.5	Total/NA	Solid	6010B	217014
570-85264-29	SB-8-2.0	Total/NA	Solid	6010B	217014
570-85264-32	SB-9-2.0	Total/NA	Solid	6010B	217014
570-85264-34	SB-1-0.5	Total/NA	Solid	6010B	217014
570-85264-35	SB-1-2.0	Total/NA	Solid	6010B	217014
570-85264-37	SB-2-0.5	Total/NA	Solid	6010B	217014
570-85264-38	SB-2-2.0	Total/NA	Solid	6010B	217014
570-85264-40	SB-3-0.5	Total/NA	Solid	6010B	217014
570-85264-41	SB-3-2.0	Total/NA	Solid	6010B	217014
570-85264-43	SB-4-0.5	Total/NA	Solid	6010B	217014
570-85264-44	SB-4-2.0	Total/NA	Solid	6010B	217014
MB 570-217014/1-A	Method Blank	Total/NA	Solid	6010B	217014
LCS 570-217014/2-A	Lab Control Sample	Total/NA	Solid	6010B	217014

Metals (Continued)

Analysis Batch: 217592 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCSD 570-217014/3-A	Lab Control Sample Dup	Total/NA	Solid	6010B	217014
570-86421-A-41-F MS	Matrix Spike	Total/NA	Solid	6010B	217014
570-86421-A-41-G MSD	Matrix Spike Duplicate	Total/NA	Solid	6010B	217014

Prep Batch: 217810

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-85264-31	SB-9-0.5	Total/NA	Solid	3050B	
MB 570-217810/1-A	Method Blank	Total/NA	Solid	3050B	
LCS 570-217810/2-A	Lab Control Sample	Total/NA	Solid	3050B	
LCSD 570-217810/3-A	Lab Control Sample Dup	Total/NA	Solid	3050B	
570-86251-E-1-I MS	Matrix Spike	Total/NA	Solid	3050B	
570-86251-E-1-J MSD	Matrix Spike Duplicate	Total/NA	Solid	3050B	

Analysis Batch: 217894

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-85264-1	HA-1-0.5	Total/NA	Solid	6010B	217347
570-85264-2	HA-1-2.0	Total/NA	Solid	6010B	217347
570-85264-4	HA-4-0.5	Total/NA	Solid	6010B	217347
570-85264-5	HA-4-2.0	Total/NA	Solid	6010B	217347
570-85264-7	HA-2-0.5	Total/NA	Solid	6010B	217347
570-85264-8	HA-2-2.0	Total/NA	Solid	6010B	217347
570-85264-10	HA-5-0.5	Total/NA	Solid	6010B	217347
570-85264-11	HA-5-2.0	Total/NA	Solid	6010B	217347
570-85264-13	HA-3-0.5	Total/NA	Solid	6010B	217347
570-85264-14	HA-3-2.0	Total/NA	Solid	6010B	217347
570-85264-16	HA-6-0.5	Total/NA	Solid	6010B	217347
570-85264-17	HA-6-2.0	Total/NA	Solid	6010B	217347
570-85264-23	SB-6-2.0	Total/NA	Solid	6010B	217347
MB 570-217347/1-A	Method Blank	Total/NA	Solid	6010B	217347
LCS 570-217347/2-A	Lab Control Sample	Total/NA	Solid	6010B	217347
LCSD 570-217347/3-A	Lab Control Sample Dup	Total/NA	Solid	6010B	217347
570-86518-A-1-B MS ^5	Matrix Spike	Total/NA	Solid	6010B	217347
570-86518-A-1-C MSD ^5	Matrix Spike Duplicate	Total/NA	Solid	6010B	217347

Analysis Batch: 218233

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 570-217810/1-A	Method Blank	Total/NA	Solid	6010B	217810
LCS 570-217810/2-A	Lab Control Sample	Total/NA	Solid	6010B	217810
LCSD 570-217810/3-A	Lab Control Sample Dup	Total/NA	Solid	6010B	217810
570-86251-E-1-I MS	Matrix Spike	Total/NA	Solid	6010B	217810
570-86251-E-1-J MSD	Matrix Spike Duplicate	Total/NA	Solid	6010B	217810

Analysis Batch: 218703

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
570-85264-31	SB-9-0.5	Total/NA	Solid	6010B	217810

Lab Chronicle

Client: Haley & Aldrich, Inc. Job ID: 570-85264-1
Project/Site: UC Riverside / 204609

Client Sample ID: HA-1-0.5 Lab Sample ID: 570-85264-1
Date Collected: 02/21/22 07:50 **Matrix: Solid**
Date Received: 02/21/22 15:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			20.11 g	10 mL	215030	02/23/22 13:08	USUL	ECL 1
Total/NA	Analysis	8081A		1			215782	02/26/22 22:47	UHHN	ECL 4
	Instrument ID: GC52A									
Total/NA	Prep	8151A			50.05 g	5 mL	216737	03/02/22 20:57	J7WE	ECL 4
Total/NA	Analysis	8151A		1			218921	03/11/22 17:15	J7WE	ECL 1
	Instrument ID: GC41									
Total/NA	Prep	3050B			1.90 g	100 mL	217347	03/04/22 19:29	SR3N	ECL 4
Total/NA	Analysis	6010B		1			217894	03/07/22 21:23	C0YH	ECL 4
	Instrument ID: ICP9									

Client Sample ID: HA-1-2.0 Lab Sample ID: 570-85264-2
Date Collected: 02/21/22 07:55 **Matrix: Solid**
Date Received: 02/21/22 15:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			20.15 g	10 mL	215030	02/23/22 13:08	USUL	ECL 1
Total/NA	Analysis	8081A		1			215782	02/26/22 23:02	UHHN	ECL 4
	Instrument ID: GC52A									
Total/NA	Prep	8151A			50.01 g	5 mL	216737	03/02/22 20:57	J7WE	ECL 4
Total/NA	Analysis	8151A		1			218921	03/11/22 17:39	J7WE	ECL 1
	Instrument ID: GC41									
Total/NA	Prep	3050B			2.05 g	100 mL	217347	03/04/22 19:29	SR3N	ECL 4
Total/NA	Analysis	6010B		1			217894	03/07/22 21:25	C0YH	ECL 4
	Instrument ID: ICP9									

Client Sample ID: HA-4-0.5 Lab Sample ID: 570-85264-4
Date Collected: 02/21/22 08:15 **Matrix: Solid**
Date Received: 02/21/22 15:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			20.17 g	10 mL	215030	02/23/22 13:08	USUL	ECL 1
Total/NA	Analysis	8081A		1			215782	02/26/22 23:17	UHHN	ECL 4
	Instrument ID: GC52A									
Total/NA	Prep	8151A			50.08 g	5 mL	216737	03/02/22 20:57	J7WE	ECL 4
Total/NA	Analysis	8151A		1			218921	03/11/22 18:02	J7WE	ECL 1
	Instrument ID: GC41									
Total/NA	Prep	3050B			1.96 g	100 mL	217347	03/04/22 19:29	SR3N	ECL 4
Total/NA	Analysis	6010B		1			217894	03/07/22 21:33	C0YH	ECL 4
	Instrument ID: ICP9									

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Client Sample ID: HA-4-2.0

Lab Sample ID: 570-85264-5

Date Collected: 02/21/22 08:20

Matrix: Solid

Date Received: 02/21/22 15:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			20.13 g	10 mL	215030	02/23/22 13:08	USUL	ECL 1
Total/NA	Analysis	8081A		1			215782	02/26/22 23:33	UHHN	ECL 4
	Instrument ID: GC52A									
Total/NA	Prep	8151A			50.01 g	5 mL	216737	03/02/22 20:57	J7WE	ECL 4
Total/NA	Analysis	8151A		1			218921	03/11/22 18:25	J7WE	ECL 1
	Instrument ID: GC41									
Total/NA	Prep	3050B			1.93 g	100 mL	217347	03/04/22 19:29	SR3N	ECL 4
Total/NA	Analysis	6010B		1			217894	03/07/22 21:36	C0YH	ECL 4
	Instrument ID: ICP9									

Client Sample ID: HA-2-0.5

Lab Sample ID: 570-85264-7

Date Collected: 02/21/22 08:30

Matrix: Solid

Date Received: 02/21/22 15:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			20.16 g	10 mL	215030	02/23/22 13:08	USUL	ECL 1
Total/NA	Analysis	8081A		1			215782	02/26/22 23:48	UHHN	ECL 4
	Instrument ID: GC52A									
Total/NA	Prep	8151A			50.05 g	5 mL	216737	03/02/22 20:57	J7WE	ECL 4
Total/NA	Analysis	8151A		1			218921	03/11/22 18:49	J7WE	ECL 1
	Instrument ID: GC41									
Total/NA	Prep	3050B			1.94 g	100 mL	217347	03/04/22 19:29	SR3N	ECL 4
Total/NA	Analysis	6010B		1			217894	03/07/22 21:39	C0YH	ECL 4
	Instrument ID: ICP9									

Client Sample ID: HA-2-2.0

Lab Sample ID: 570-85264-8

Date Collected: 02/21/22 08:34

Matrix: Solid

Date Received: 02/21/22 15:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			20.11 g	10 mL	215030	02/23/22 13:08	USUL	ECL 1
Total/NA	Analysis	8081A		1			215782	02/27/22 00:03	UHHN	ECL 4
	Instrument ID: GC52A									
Total/NA	Prep	8151A			50.01 g	5 mL	216737	03/02/22 20:57	J7WE	ECL 4
Total/NA	Analysis	8151A		1			218921	03/11/22 19:12	J7WE	ECL 1
	Instrument ID: GC41									
Total/NA	Prep	3050B			1.93 g	100 mL	217347	03/04/22 19:29	SR3N	ECL 4
Total/NA	Analysis	6010B		1			217894	03/07/22 21:42	C0YH	ECL 4
	Instrument ID: ICP9									

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Client Sample ID: HA-5-0.5

Lab Sample ID: 570-85264-10

Date Collected: 02/21/22 08:42
Matrix: Solid
Date Received: 02/21/22 15:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			20.14 g	10 mL	215030	02/23/22 13:08	USUL	ECL 1
Total/NA	Analysis	8081A		1			215782	02/27/22 00:18	UHHN	ECL 4
	Instrument ID:	GC52A								
Total/NA	Prep	8151A			50.01 g	5 mL	216737	03/02/22 20:57	J7WE	ECL 4
Total/NA	Analysis	8151A		1			218921	03/11/22 19:35	J7WE	ECL 1
	Instrument ID:	GC41								
Total/NA	Prep	3050B			2.09 g	100 mL	217347	03/04/22 19:29	SR3N	ECL 4
Total/NA	Analysis	6010B		1			217894	03/07/22 21:44	C0YH	ECL 4
	Instrument ID:	ICP9								

Client Sample ID: HA-5-2.0

Lab Sample ID: 570-85264-11

Date Collected: 02/21/22 08:45
Matrix: Solid
Date Received: 02/21/22 15:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			20.19 g	10 mL	215030	02/23/22 13:08	USUL	ECL 1
Total/NA	Analysis	8081A		1			215782	02/27/22 00:33	UHHN	ECL 4
	Instrument ID:	GC52A								
Total/NA	Prep	8151A			50.04 g	5 mL	216737	03/02/22 20:57	J7WE	ECL 4
Total/NA	Analysis	8151A		1			218921	03/11/22 19:58	J7WE	ECL 1
	Instrument ID:	GC41								
Total/NA	Prep	3050B			2.08 g	100 mL	217347	03/04/22 19:29	SR3N	ECL 4
Total/NA	Analysis	6010B		1			217894	03/07/22 21:47	C0YH	ECL 4
	Instrument ID:	ICP9								

Client Sample ID: HA-3-0.5

Lab Sample ID: 570-85264-13

Date Collected: 02/21/22 08:52
Matrix: Solid
Date Received: 02/21/22 15:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			20.15 g	10 mL	215030	02/23/22 13:08	USUL	ECL 1
Total/NA	Analysis	8081A		1			215782	02/27/22 00:48	UHHN	ECL 4
	Instrument ID:	GC52A								
Total/NA	Prep	8151A			50.10 g	5 mL	216737	03/02/22 20:57	J7WE	ECL 4
Total/NA	Analysis	8151A		1			218921	03/11/22 20:22	J7WE	ECL 1
	Instrument ID:	GC41								
Total/NA	Prep	3050B			2.07 g	100 mL	217347	03/04/22 19:29	SR3N	ECL 4
Total/NA	Analysis	6010B		1			217894	03/07/22 21:50	C0YH	ECL 4
	Instrument ID:	ICP9								

Client Sample ID: HA-3-2.0

Lab Sample ID: 570-85264-14

Date Collected: 02/21/22 08:55

Matrix: Solid

Date Received: 02/21/22 15:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			20.12 g	10 mL	215030	02/23/22 13:08	USUL	ECL 1
Total/NA	Analysis	8081A		1			215782	02/27/22 01:03	UHHN	ECL 4
	Instrument ID: GC52A									
Total/NA	Prep	8151A			50.19 g	5 mL	216737	03/02/22 20:57	J7WE	ECL 4
Total/NA	Analysis	8151A		1			218921	03/11/22 20:45	J7WE	ECL 1
	Instrument ID: GC41									
Total/NA	Prep	3050B			1.99 g	100 mL	217347	03/04/22 19:29	SR3N	ECL 4
Total/NA	Analysis	6010B		1			217894	03/07/22 21:52	C0YH	ECL 4
	Instrument ID: ICP9									

Client Sample ID: HA-6-0.5

Lab Sample ID: 570-85264-16

Date Collected: 02/21/22 09:05

Matrix: Solid

Date Received: 02/21/22 15:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			20.18 g	10 mL	215030	02/23/22 13:08	USUL	ECL 1
Total/NA	Analysis	8081A		1			215782	02/27/22 01:18	UHHN	ECL 4
	Instrument ID: GC52A									
Total/NA	Prep	8151A			50.00 g	5 mL	216737	03/02/22 20:57	J7WE	ECL 4
Total/NA	Analysis	8151A		1			218921	03/11/22 21:08	J7WE	ECL 1
	Instrument ID: GC41									
Total/NA	Prep	3050B			2.09 g	100 mL	217347	03/04/22 19:29	SR3N	ECL 4
Total/NA	Analysis	6010B		1			217894	03/07/22 21:55	C0YH	ECL 4
	Instrument ID: ICP9									

Client Sample ID: HA-6-2.0

Lab Sample ID: 570-85264-17

Date Collected: 02/21/22 09:08

Matrix: Solid

Date Received: 02/21/22 15:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			20.11 g	10 mL	215030	02/23/22 13:08	USUL	ECL 1
Total/NA	Analysis	8081A		1			215782	02/27/22 01:33	UHHN	ECL 4
	Instrument ID: GC52A									
Total/NA	Prep	8151A			50.20 g	5 mL	216737	03/02/22 20:57	J7WE	ECL 4
Total/NA	Analysis	8151A		1			218921	03/11/22 21:32	J7WE	ECL 1
	Instrument ID: GC41									
Total/NA	Prep	3050B			2.01 g	100 mL	217347	03/04/22 19:29	SR3N	ECL 4
Total/NA	Analysis	6010B		1			217894	03/07/22 21:58	C0YH	ECL 4
	Instrument ID: ICP9									

Client Sample ID: SB-5-0.5
Lab Sample ID: 570-85264-19
Date Collected: 02/21/22 09:30
Matrix: Solid
Date Received: 02/21/22 15:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			20.15 g	10 mL	215030	02/23/22 13:08	USUL	ECL 1
Total/NA	Analysis	8081A		1			215782	02/27/22 01:48	UHHN	ECL 4
	Instrument ID: GC52A									
Total/NA	Prep	8151A			51.90 g	5 mL	217285	03/04/22 15:25	J7WE	ECL 4
Total/NA	Analysis	8151A		1			219765	03/15/22 23:04	J7WE	ECL 4
	Instrument ID: GC41									
Total/NA	Prep	3050B			2.01 g	100 mL	217014	03/04/22 05:22	WL8G	ECL 4
Total/NA	Analysis	6010B		1			217592	03/04/22 18:41	C0YH	ECL 4
	Instrument ID: ICP9									

Client Sample ID: SB-5-2.0
Lab Sample ID: 570-85264-20
Date Collected: 02/21/22 09:32
Matrix: Solid
Date Received: 02/21/22 15:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			20.13 g	10 mL	215030	02/23/22 13:08	USUL	ECL 1
Total/NA	Analysis	8081A		1			215782	02/27/22 02:03	UHHN	ECL 4
	Instrument ID: GC52A									
Total/NA	Prep	8151A			49.50 g	5 mL	217285	03/04/22 15:25	J7WE	ECL 4
Total/NA	Analysis	8151A		1			219765	03/15/22 23:27	J7WE	ECL 4
	Instrument ID: GC41									
Total/NA	Prep	3050B			2.01 g	100 mL	217014	03/04/22 05:22	WL8G	ECL 4
Total/NA	Analysis	6010B		1			217592	03/04/22 18:44	C0YH	ECL 4
	Instrument ID: ICP9									

Client Sample ID: SB-6-0.5
Lab Sample ID: 570-85264-22
Date Collected: 02/21/22 09:40
Matrix: Solid
Date Received: 02/21/22 15:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			20.19 g	10 mL	215030	02/23/22 13:08	USUL	ECL 1
Total/NA	Analysis	8081A		1			215782	02/27/22 02:18	UHHN	ECL 4
	Instrument ID: GC52A									
Total/NA	Prep	8151A			48.84 g	5 mL	217285	03/04/22 15:25	J7WE	ECL 4
Total/NA	Analysis	8151A		1			219765	03/15/22 23:50	J7WE	ECL 4
	Instrument ID: GC41									
Total/NA	Prep	3050B			2.02 g	100 mL	217014	03/04/22 05:22	WL8G	ECL 4
Total/NA	Analysis	6010B		1			217592	03/04/22 18:46	C0YH	ECL 4
	Instrument ID: ICP9									

Client Sample ID: SB-6-2.0
Lab Sample ID: 570-85264-23
Date Collected: 02/21/22 09:42
Matrix: Solid
Date Received: 02/21/22 15:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			20.11 g	10 mL	215030	02/23/22 13:08	USUL	ECL 1
Total/NA	Analysis	8081A		1			215782	02/27/22 02:33	UHHN	ECL 4
	Instrument ID: GC52A									
Total/NA	Prep	8151A			49.38 g	5 mL	217285	03/04/22 15:25	J7WE	ECL 4
Total/NA	Analysis	8151A		1			219765	03/16/22 00:14	J7WE	ECL 4
	Instrument ID: GC41									
Total/NA	Prep	3050B			2.05 g	100 mL	217347	03/04/22 19:29	SR3N	ECL 4
Total/NA	Analysis	6010B		1			217894	03/07/22 22:06	C0YH	ECL 4
	Instrument ID: ICP9									

Client Sample ID: SB-7-0.5
Lab Sample ID: 570-85264-25
Date Collected: 02/21/22 09:50
Matrix: Solid
Date Received: 02/21/22 15:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			20.16 g	10 mL	215030	02/23/22 13:08	USUL	ECL 1
Total/NA	Analysis	8081A		1			215782	02/27/22 02:48	UHHN	ECL 4
	Instrument ID: GC52A									
Total/NA	Prep	8151A			48.50 g	5 mL	217285	03/04/22 15:25	J7WE	ECL 4
Total/NA	Analysis	8151A		1			219765	03/16/22 00:37	J7WE	ECL 4
	Instrument ID: GC41									
Total/NA	Prep	3050B			2.00 g	100 mL	217014	03/04/22 05:22	WL8G	ECL 4
Total/NA	Analysis	6010B		1			217592	03/04/22 18:49	C0YH	ECL 4
	Instrument ID: ICP9									

Client Sample ID: SB-7-2.0
Lab Sample ID: 570-85264-26
Date Collected: 02/21/22 09:52
Matrix: Solid
Date Received: 02/21/22 15:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			20.12 g	10 mL	215030	02/23/22 13:08	USUL	ECL 1
Total/NA	Analysis	8081A		1			215782	02/27/22 03:04	UHHN	ECL 4
	Instrument ID: GC52A									
Total/NA	Prep	8151A			49.89 g	5 mL	217285	03/04/22 15:25	J7WE	ECL 4
Total/NA	Analysis	8151A		1			219765	03/16/22 01:00	J7WE	ECL 4
	Instrument ID: GC41									
Total/NA	Prep	3050B			2.01 g	100 mL	217014	03/04/22 05:22	WL8G	ECL 4
Total/NA	Analysis	6010B		1			217592	03/04/22 19:02	C0YH	ECL 4
	Instrument ID: ICP9									

Lab Chronicle

Client: Haley & Aldrich, Inc.
Project/Site: UC Riverside / 204609

Job ID: 570-85264-1

Client Sample ID: SB-8-0.5

Lab Sample ID: 570-85264-28
Date Collected: 02/21/22 10:00
Matrix: Solid
Date Received: 02/21/22 15:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			20.17 g	10 mL	215030	02/23/22 13:08	USUL	ECL 1
Total/NA	Analysis	8081A		1			215782	02/27/22 03:19	UHHN	ECL 4
	Instrument ID: GC52A									
Total/NA	Prep	8151A			49.10 g	5 mL	217285	03/04/22 15:25	J7WE	ECL 4
Total/NA	Analysis	8151A		1			219765	03/16/22 01:23	J7WE	ECL 4
	Instrument ID: GC41									
Total/NA	Prep	3050B			2.03 g	100 mL	217014	03/04/22 05:22	WL8G	ECL 4
Total/NA	Analysis	6010B		1			217592	03/04/22 19:04	C0YH	ECL 4
	Instrument ID: ICP9									

Client Sample ID: SB-8-2.0

Lab Sample ID: 570-85264-29
Date Collected: 02/21/22 10:03
Matrix: Solid
Date Received: 02/21/22 15:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			20.14 g	10 mL	215030	02/23/22 13:08	USUL	ECL 1
Total/NA	Analysis	8081A		1			215782	02/27/22 03:34	UHHN	ECL 4
	Instrument ID: GC52A									
Total/NA	Prep	8151A			49.04 g	5 mL	217285	03/04/22 15:25	J7WE	ECL 4
Total/NA	Analysis	8151A		1			219765	03/16/22 01:47	J7WE	ECL 4
	Instrument ID: GC41									
Total/NA	Prep	3050B			2.00 g	100 mL	217014	03/04/22 05:22	WL8G	ECL 4
Total/NA	Analysis	6010B		1			217592	03/04/22 19:07	C0YH	ECL 4
	Instrument ID: ICP9									

Client Sample ID: SB-9-0.5

Lab Sample ID: 570-85264-31
Date Collected: 02/21/22 10:50
Matrix: Solid
Date Received: 02/21/22 15:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			20.13 g	10 mL	215033	02/23/22 13:11	USUL	ECL 1
Total/NA	Analysis	8081A		1			216308	03/01/22 21:41	UHHN	ECL 4
	Instrument ID: GC52A									
Total/NA	Prep	8151A			49.11 g	5 mL	217285	03/04/22 15:25	J7WE	ECL 4
Total/NA	Analysis	8151A		1			219765	03/16/22 02:10	J7WE	ECL 4
	Instrument ID: GC41									
Total/NA	Prep	3050B			2.01 g	100 mL	217810	03/07/22 19:27	WL8G	ECL 4
Total/NA	Analysis	6010B		1			218703	03/10/22 12:24	C0YH	ECL 4
	Instrument ID: ICP9									

Client Sample ID: SB-9-2.0
Lab Sample ID: 570-85264-32
Date Collected: 02/21/22 10:55
Matrix: Solid
Date Received: 02/21/22 15:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			20.17 g	10 mL	215033	02/23/22 13:11	USUL	ECL 1
Total/NA	Analysis	8081A		1			216044	02/28/22 19:57	UHHN	ECL 4
	Instrument ID: GC52A									
Total/NA	Prep	8151A			49.20 g	5 mL	217285	03/04/22 15:25	J7WE	ECL 4
Total/NA	Analysis	8151A		1			219765	03/16/22 02:33	J7WE	ECL 4
	Instrument ID: GC41									
Total/NA	Prep	3050B			2.01 g	100 mL	217014	03/04/22 05:22	WL8G	ECL 4
Total/NA	Analysis	6010B		1			217592	03/04/22 19:10	C0YH	ECL 4
	Instrument ID: ICP9									

Client Sample ID: SB-1-0.5
Lab Sample ID: 570-85264-34
Date Collected: 02/21/22 11:05
Matrix: Solid
Date Received: 02/21/22 15:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			20.11 g	10 mL	215033	02/23/22 13:11	USUL	ECL 1
Total/NA	Analysis	8081A		1			216044	02/28/22 18:22	UHHN	ECL 4
	Instrument ID: GC52A									
Total/NA	Prep	8151A			49.83 g	5 mL	217285	03/04/22 15:25	J7WE	ECL 4
Total/NA	Analysis	8151A		1			219765	03/16/22 02:56	J7WE	ECL 4
	Instrument ID: GC41									
Total/NA	Prep	3050B			2.03 g	100 mL	217014	03/04/22 05:22	WL8G	ECL 4
Total/NA	Analysis	6010B		1			217592	03/04/22 19:12	C0YH	ECL 4
	Instrument ID: ICP9									

Client Sample ID: SB-1-2.0
Lab Sample ID: 570-85264-35
Date Collected: 02/21/22 11:07
Matrix: Solid
Date Received: 02/21/22 15:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			20.16 g	10 mL	215033	02/23/22 13:11	USUL	ECL 1
Total/NA	Analysis	8081A		1			216044	02/28/22 20:12	UHHN	ECL 4
	Instrument ID: GC52A									
Total/NA	Prep	8151A			50.44 g	5 mL	217285	03/04/22 15:25	J7WE	ECL 4
Total/NA	Analysis	8151A		1			219765	03/16/22 03:20	J7WE	ECL 4
	Instrument ID: GC41									
Total/NA	Prep	3050B			2.01 g	100 mL	217014	03/04/22 05:22	WL8G	ECL 4
Total/NA	Analysis	6010B		1			217592	03/04/22 19:15	C0YH	ECL 4
	Instrument ID: ICP9									

Client Sample ID: SB-2-0.5 Lab Sample ID: 570-85264-37
Date Collected: 02/21/22 11:15 Matrix: Solid
Date Received: 02/21/22 15:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			20.19 g	10 mL	215033	02/23/22 13:11	USUL	ECL 1
Total/NA	Analysis	8081A		1			216044	02/28/22 18:07	UHHN	ECL 4
	Instrument ID: GC52A									
Total/NA	Prep	8151A			49.02 g	5 mL	217285	03/04/22 15:25	J7WE	ECL 4
Total/NA	Analysis	8151A		1			219765	03/16/22 03:43	J7WE	ECL 4
	Instrument ID: GC41									
Total/NA	Prep	3050B			2.02 g	100 mL	217014	03/04/22 05:22	WL8G	ECL 4
Total/NA	Analysis	6010B		1			217592	03/04/22 19:17	C0YH	ECL 4
	Instrument ID: ICP9									

Client Sample ID: SB-2-2.0 Lab Sample ID: 570-85264-38
Date Collected: 02/21/22 11:17 Matrix: Solid
Date Received: 02/21/22 15:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			20.15 g	10 mL	215033	02/23/22 13:11	USUL	ECL 1
Total/NA	Analysis	8081A		1			216044	02/28/22 20:27	UHHN	ECL 4
	Instrument ID: GC52A									
Total/NA	Prep	8151A			48.56 g	5 mL	217285	03/04/22 15:25	J7WE	ECL 4
Total/NA	Analysis	8151A		1			219765	03/16/22 04:06	J7WE	ECL 4
	Instrument ID: GC41									
Total/NA	Prep	3050B			2.03 g	100 mL	217014	03/04/22 05:22	WL8G	ECL 4
Total/NA	Analysis	6010B		1			217592	03/04/22 19:20	C0YH	ECL 4
	Instrument ID: ICP9									

Client Sample ID: SB-3-0.5 Lab Sample ID: 570-85264-40
Date Collected: 02/21/22 11:25 Matrix: Solid
Date Received: 02/21/22 15:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			20.11 g	10 mL	215033	02/23/22 13:11	USUL	ECL 1
Total/NA	Analysis	8081A		1			216044	02/28/22 20:42	UHHN	ECL 4
	Instrument ID: GC52A									
Total/NA	Prep	8151A			48.58 g	5 mL	217285	03/04/22 15:25	J7WE	ECL 4
Total/NA	Analysis	8151A		1			219765	03/16/22 04:53	J7WE	ECL 4
	Instrument ID: GC41									
Total/NA	Prep	3050B			2.01 g	100 mL	217014	03/04/22 05:22	WL8G	ECL 4
Total/NA	Analysis	6010B		1			217592	03/04/22 19:38	C0YH	ECL 4
	Instrument ID: ICP9									

Lab Chronicle

Client: Haley & Aldrich, Inc.
Project/Site: UC Riverside / 204609

Job ID: 570-85264-1

Client Sample ID: SB-3-2.0

Lab Sample ID: 570-85264-41

Date Collected: 02/21/22 11:27
Date Received: 02/21/22 15:30

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			20.13 g	10 mL	215033	02/23/22 13:11	USUL	ECL 1
Total/NA	Analysis	8081A		1			216044	02/28/22 20:58	UHHN	ECL 4
	Instrument ID: GC52A									
Total/NA	Prep	8151A			49.09 g	5 mL	217285	03/04/22 15:25	J7WE	ECL 4
Total/NA	Analysis	8151A		1			219765	03/16/22 05:16	J7WE	ECL 4
	Instrument ID: GC41									
Total/NA	Prep	3050B			2.03 g	100 mL	217014	03/04/22 05:22	WL8G	ECL 4
Total/NA	Analysis	6010B		1			217592	03/04/22 19:40	C0YH	ECL 4
	Instrument ID: ICP9									

Client Sample ID: SB-4-0.5

Lab Sample ID: 570-85264-43

Date Collected: 02/21/22 11:36
Date Received: 02/21/22 15:30

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			20.18 g	10 mL	215033	02/23/22 13:11	USUL	ECL 1
Total/NA	Analysis	8081A		1			216308	03/01/22 21:56	UHHN	ECL 4
	Instrument ID: GC52A									
Total/NA	Prep	8151A			48.41 g	5 mL	217285	03/04/22 15:25	J7WE	ECL 4
Total/NA	Analysis	8151A		1			219765	03/16/22 05:39	J7WE	ECL 4
	Instrument ID: GC41									
Total/NA	Prep	3050B			2.02 g	100 mL	217014	03/04/22 05:22	WL8G	ECL 4
Total/NA	Analysis	6010B		1			217592	03/04/22 19:43	C0YH	ECL 4
	Instrument ID: ICP9									

Client Sample ID: SB-4-2.0

Lab Sample ID: 570-85264-44

Date Collected: 02/21/22 11:38
Date Received: 02/21/22 15:30

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			20.12 g	10 mL	215033	02/23/22 13:11	USUL	ECL 1
Total/NA	Analysis	8081A		1			216044	02/28/22 21:12	UHHN	ECL 4
	Instrument ID: GC52A									
Total/NA	Prep	8151A			48.82 g	5 mL	217285	03/04/22 15:25	J7WE	ECL 4
Total/NA	Analysis	8151A		1			219765	03/16/22 06:03	J7WE	ECL 4
	Instrument ID: GC41									
Total/NA	Prep	3050B			2.02 g	100 mL	217014	03/04/22 05:22	WL8G	ECL 4
Total/NA	Analysis	6010B		1			217592	03/04/22 19:45	C0YH	ECL 4
	Instrument ID: ICP9									

Laboratory References:

ECL 1 = Eurofins Calscience Lincoln, 7440 Lincoln Way, Garden Grove, CA 92841, TEL (714)895-5494

ECL 4 = Eurofins Calscience Tustin, 2841 Dow Avenue, Tustin, CA 92780, TEL (714)895-5494

Accreditation/Certification Summary

Client: Haley & Aldrich, Inc. Job ID: 570-85264-1
Project/Site: UC Riverside / 204609

Laboratory: Eurofins Calscience

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2944	09-30-22

Method Summary

Method	Method Description	Protocol	Laboratory
8081A	Organochlorine Pesticides (GC)	SW846	ECL 4
8151A	Herbicides (GC)	SW846	ECL 1
6010B	Metals (ICP)	SW846	ECL 4
3050B	Preparation, Metals	SW846	ECL 4
3546	Microwave Extraction	SW846	ECL 1
8151A	Extraction (Herbicides)	SW846	ECL 4

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

ECL 1 = Eurofins Calscience Lincoln, 7440 Lincoln Way, Garden Grove, CA 92841, TEL (714)895-5494

ECL 4 = Eurofins Calscience Tustin, 2841 Dow Avenue, Tustin, CA 92780, TEL (714)895-5494

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
570-85264-1	HA-1-0.5	Solid	02/21/22 07:50	02/21/22 15:30
570-85264-2	HA-1-2.0	Solid	02/21/22 07:55	02/21/22 15:30
570-85264-4	HA-4-0.5	Solid	02/21/22 08:15	02/21/22 15:30
570-85264-5	HA-4-2.0	Solid	02/21/22 08:20	02/21/22 15:30
570-85264-7	HA-2-0.5	Solid	02/21/22 08:30	02/21/22 15:30
570-85264-8	HA-2-2.0	Solid	02/21/22 08:34	02/21/22 15:30
570-85264-10	HA-5-0.5	Solid	02/21/22 08:42	02/21/22 15:30
570-85264-11	HA-5-2.0	Solid	02/21/22 08:45	02/21/22 15:30
570-85264-13	HA-3-0.5	Solid	02/21/22 08:52	02/21/22 15:30
570-85264-14	HA-3-2.0	Solid	02/21/22 08:55	02/21/22 15:30
570-85264-16	HA-6-0.5	Solid	02/21/22 09:05	02/21/22 15:30
570-85264-17	HA-6-2.0	Solid	02/21/22 09:08	02/21/22 15:30
570-85264-19	SB-5-0.5	Solid	02/21/22 09:30	02/21/22 15:30
570-85264-20	SB-5-2.0	Solid	02/21/22 09:32	02/21/22 15:30
570-85264-22	SB-6-0.5	Solid	02/21/22 09:40	02/21/22 15:30
570-85264-23	SB-6-2.0	Solid	02/21/22 09:42	02/21/22 15:30
570-85264-25	SB-7-0.5	Solid	02/21/22 09:50	02/21/22 15:30
570-85264-26	SB-7-2.0	Solid	02/21/22 09:52	02/21/22 15:30
570-85264-28	SB-8-0.5	Solid	02/21/22 10:00	02/21/22 15:30
570-85264-29	SB-8-2.0	Solid	02/21/22 10:03	02/21/22 15:30
570-85264-31	SB-9-0.5	Solid	02/21/22 10:50	02/21/22 15:30
570-85264-32	SB-9-2.0	Solid	02/21/22 10:55	02/21/22 15:30
570-85264-34	SB-1-0.5	Solid	02/21/22 11:05	02/21/22 15:30
570-85264-35	SB-1-2.0	Solid	02/21/22 11:07	02/21/22 15:30
570-85264-37	SB-2-0.5	Solid	02/21/22 11:15	02/21/22 15:30
570-85264-38	SB-2-2.0	Solid	02/21/22 11:17	02/21/22 15:30
570-85264-40	SB-3-0.5	Solid	02/21/22 11:25	02/21/22 15:30
570-85264-41	SB-3-2.0	Solid	02/21/22 11:27	02/21/22 15:30
570-85264-43	SB-4-0.5	Solid	02/21/22 11:36	02/21/22 15:30
570-85264-44	SB-4-2.0	Solid	02/21/22 11:38	02/21/22 15:30

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HALEY & ALDRICH CHAIN OF CUSTODY RECORD

WO # / LAB USE ONLY

DATE: 02/21/22

PAGE: 1 OF 5

LABORATORY CLIENT: Haley & Aldrich, Inc.	HALEY & ALDRICH CLIENT NAME / PROJECT NO: UC Riverside
	P O No: 204609
ADDRESS: 3187 Red Hill Avenue, Suite 155	PROJECT CONTACT: Mathew Raithel/ Karl Neill
CITY: Costa Mesa STATE: CA ZIP: 92626	SAMPLER(S) (PRINT): JV
TEL: 714.371.1800	E-MAIL: JVANDERWAL@HALEYALDRICH.COM

TURNAROUND TIME (Rush surcharges may apply to any TAT not "STANDARD")

☐ SAME DAY ☐ 24 HR ☐ 48 HR ☐ 72 HR ☐ 5 DAYS ☑ STANDARD

GLOBAL ID

LOG CODE

☑ H&A Standard EDD

Sample Archiving requirements (if required to be held greater than 30 days):

Special Instructions:

Email Distribution: mraithel , kneill, jvanderwal @haleyaldrich.com

REQUESTED ANALYSES

LAB USE ONLY	SAMPLE ID	FIELD POINT NAME (For COELT EDF)	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. OF CONT.	Unpreserved	Preserved	Field Filtered	6010B (As)	8081	8151			HOLD
	HA-1-0.5		2/21/22	0750	Soil	1	X			X	X	X			
	HA-1-2.0		2/21/22	0755	Soil	1	X			X	X	X			
	HA-1-5.0		2/21/22	0800	Soil	1	X								X
	HA-4-0.5		2/21/22	0815	Soil	1	X			X	X	X			
	HA-4-2.0		2/21/22	0820	Soil	1	X			X	X	X			
	HA-4-5.0		2/21/22	0825	Soil	1	X								X
	HA-2-0.5		2/21/22	0830	Soil	1	X			X	X	X			
	HA-2-2.0		2/21/22	0834	Soil	1	X			X	X	X			
	HA-2-5.0		2/21/22	0838	Soil	1	X								X
	HA-5-0.5		2/21/22	0842	Soil	1	X			X	X	X			

570-85264 Chain of Custody

Relinquished by (Signature)	Received by: (Signature/Affiliation)	Date	Time
[signature]	[signature] ECI	2/21/22	1530
Relinquished by (Signature)	Received by: (Signature/Affiliation)	Date:	Time:
Relinquished by (Signature)	Received by: (Signature/Affiliation)	Date	Time:

Eurofins Calscience Inc 's services under this Chain of Custody shall be performed in accordance with terms and conditions within Blanket Service Agreement # 2015-18-Eurofins Calscience by and between Haley & Aldrich, Inc , its subsidiaries and affiliates and Eurofins Calscience Inc.

3.6/3.6 IR-89

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HALEY & ALDRICH CHAIN OF CUSTODY RECORD

WO # / LAB USE ONLY

DATE: 02/21/22

PAGE: 2 OF 5

LABORATORY CLIENT: Haley & Aldrich, Inc.	HALEY & ALDRICH CLIENT NAME / PROJECT NO: UC Riverside
ADDRESS: 3187 Red Hill Avenue, Suite 155	P O No: 204609
CITY: Costa Mesa STATE: CA ZIP: 92626	PROJECT CONTACT: Mathew Raithel/ Karl Neill
TEL: 714.371.1800 E-MAIL:	SAMPLER(S) (PRINT): JV

TURNAROUND TIME (Rush surcharges may apply to any TAT not "STANDARD")

☐ SAME DAY ☐ 24 HR ☐ 48 HR ☐ 72 HR ☐ 5 DAYS ☑ STANDARD

GLOBAL ID

LOG CODE

☑ H&A Standard EDD

Sample Archiving requirements (if required to be held greater than 30 days):

Special Instructions:

Email Distribution: mraithel , kneill, jvanderwal @haleyaldrich.com

REQUESTED ANALYSES

LAB USE ONLY	SAMPLE ID	FIELD POINT NAME (For COELT EDF)	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. OF CONT.	Unpreserved	Preserved	Field Filtered	6010B (As)	8081	8151	HOLD
	HA-5-2.0		2/21/22	0845	Soil	1	X			X	X	X	
	HA-5-5.0			0848	Soil	1	X						X
	HA-3-0.5			0852	Soil	1	X			X	X	X	
	HA-3-2.0			0855	Soil	1	X			X	X	X	
	HA-3-5.0			0900	Soil	1	X						X
	HA-6-0.5			0905	Soil	1	X			X	X	X	
	HA-6-2.0			0908	Soil	1	X			X	X	X	
	HA-6-5.0			0915	Soil	1	X						X
	SB-5-0.5			0930	Soil	1	X			X	X	X	
	SB-5-2.0			0932	Soil	1	X			X	X	X	

Relinquished by (Signature)	Received by: (Signature/Affiliation)	Date	Time
[signature]	[signature]	2/21/22	1530
Relinquished by (Signature)	Received by: (Signature/Affiliation)	Date	Time
Relinquished by (Signature)	Received by: (Signature/Affiliation)	Date	Time

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HALEY & ALDRICH CHAIN OF CUSTODY RECORD

WO # / LAB USE ONLY

DATE: 02/21/22

PAGE: 3 OF 5

LABORATORY CLIENT: Haley & Aldrich, Inc.

ADDRESS: 3187 Red Hill Avenue, Suite 155

CITY: Costa Mesa STATE: CA ZIP: 92626

TEL: 714.371.1800 E-MAIL:

HALEY & ALDRICH CLIENT NAME / PROJECT NO: UC Riverside

P O No: 204609

PROJECT CONTACT: Mathew Raithel/ Karl Neill

SAMPLER(S) (PRINT): JV

TURNAROUND TIME (Rush surcharges may apply to any TAT not "STANDARD")

☐ SAME DAY ☐ 24 HR ☐ 48 HR ☐ 72 HR ☐ 5 DAYS ☑ STANDARD

GLOBAL ID

LOG CODE

☑ H&A Standard EDD

Sample Archiving requirements (if required to be held greater than 30 days):

Special Instructions:

Email Distribution: mraithel , kneill, jvanderwal @haleyaldrich.com

REQUESTED ANALYSES

LAB USE ONLY	SAMPLE ID	FIELD POINT NAME (For COELT EDF)	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. OF CONT.	Unpreserved	Preserved	Field Filtered	6010B (As)	8081	8151		HOLD									
	SB-5-5.0		2/21/22	0934	Soil	1	X							X									
	SB-6-0.5		↓	0940	Soil	1	X			X	X	X											
	SB-6-2.0		↓	0942	Soil	1	X			X	X	X											
	SB-6-5.0		↓	0944	Soil	1	X							X									
	SB-7-0.5		↓	0950	Soil	1	X			X	X	X											
	SB-7-2.0		↓	0952	Soil	1	X			X	X	X											
	SB-7-5.0		↓	0954	Soil	1	X							X									
	SB-8-0.5		↓	1000	Soil	1	X			X	X	X											
	SB-8-2.0		↓	1003	Soil	1	X			X	X	X											
	SB-8-5.0		↓	1005	Soil	1	X							X									

Relinquished by: (Signature)	Received by: (Signature/Affiliation)	Date	Time
JV	[signature]	2/21/22	1530

Eurofins Calscience Inc.'s services under this Chain of Custody shall be performed in accordance with terms and conditions within Blanket Service Agreement # 2015-18-Eurofins Calscience by and between Haley & Aldrich, Inc , its subsidiaries and affiliates and Eurofins Calscience Inc

3/16/2022

15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

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HALEY & ALDRICH CHAIN OF CUSTODY RECORD

WO # / LAB USE ONLY

DATE: 02/21/22

PAGE: 4 OF 5

LABORATORY CLIENT: Haley & Aldrich, Inc.	HALEY & ALDRICH CLIENT NAME / PROJECT NO: UC Riverside
	P O No: 204609
ADDRESS: 3187 Red Hill Avenue, Suite 155	PROJECT CONTACT: Mathew Raithel/ Karl Neill
CITY: Costa Mesa STATE: CA ZIP: 92626	SAMPLER(S) (PRINT): JV
TEL: 714.371.1800	E-MAIL:

TURNAROUND TIME (Rush surcharges may apply to any TAT not "STANDARD")

☐ SAME DAY ☐ 24 HR ☐ 48 HR ☐ 72 HR ☐ 5 DAYS ☑ STANDARD

GLOBAL ID: LOG CODE:

☑ H&A Standard EDD

Sample Archiving requirements (if required to be held greater than 30 days):

Special Instructions:

Email Distribution: mraithel , kneill, jvanderwal @haleyaldrich.com

REQUESTED ANALYSES

LAB USE ONLY	SAMPLE ID	FIELD POINT NAME (For COELT EDF)	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. OF CONT.	Unpreserved	Preserved	Field Filtered	6010B (As)	8081	8151			Hold									
	SB-9-0.5		2/21/22	1050	Soil	1	X			X	X	X												
	SB-9-2.0			1055	Soil	1	X			X	X	X												
	SB-9-5.0			1057	Soil	1	X								X									
	SB-1-0.5			1105	Soil	1	X			X	X	X												
	SB-1-2.0			1107	Soil	1	X			X	X	X												
	SB-1-5.0			1109	Soil	1	X								X									
	SB-2-0.5			1115	Soil	1	X			X	X	X												
	SB-2-2.0			1117	Soil	1	X			X	X	X												
	SB-2-5.0			1119	Soil	1	X								X									
	SB-3-0.5			1125	Soil	1	X			X	X	X												

Relinquished by (Signature)	Received by: (Signature/Affiliation)	Date 2/21/22	Time 1530
Relinquished by (Signature)	Received by: (Signature/Affiliation)	Date	Time
Relinquished by (Signature)	Received by: (Signature/Affiliation)	Date	Time

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HALEY & ALDRICH CHAIN OF CUSTODY RECORD

WO # / LAB USE ONLY

DATE: 02/21/22

PAGE: 5 OF 5

LABORATORY CLIENT	Haley & Aldrich, Inc.
ADDRESS	3187 Red Hill Avenue, Suite 155
CITY	Costa Mesa
STATE	CA
ZIP	92626
TEL	714.371.1800
E-MAIL	
HALEY & ALDRICH CLIENT NAME / PROJECT NO	UC Riverside
P O No	204609
PROJECT CONTACT	Mathew Raithel/ Karl Neill
SAMPLER(S) (PRINT)	JV

TURNAROUND TIME (Rush surcharges may apply to any TAT not "STANDARD")

☐ SAME DAY ☐ 24 HR ☐ 48 HR ☐ 72 HR ☐ 5 DAYS ☑ STANDARD

GLOBAL ID

LOG CODE

☑ H&A Standard EDD

Sample Archiving requirements (if required to be held greater than 30 days):

Special Instructions:

Email Distribution: mraithel , kneill, jvanderwal @haleyaldrich.com

REQUESTED ANALYSES

LAB USE ONLY	SAMPLE ID	FIELD POINT NAME (For COELT EDF)	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. OF CONT.	Unpreserved	Preserved	Field Filtered	6010B (As)	8081	8151			HOLD
	SB-3-2.0		2/21/22	1127	Soil	1	X			X	X	X			
	SB-3-5.0			1129	Soil	1	X								X
	SB-4-0.5			1136	Soil	1	X			X	X	X			
	SB-4-2.0			1138	Soil	1	X			X	X	X			
	SB-4-5.0			1140	Soil	1	X								X

Relinquished by (Signature)	Received by: (Signature/Affiliation)	Date: 2/21/22	Time: 1530
Relinquished by (Signature)	Received by: (Signature/Affiliation)	Date:	Time
Relinquished by (Signature)	Received by: (Signature/Affiliation)	Date:	Time

Login Sample Receipt Checklist

Client: Haley & Aldrich, Inc.

Job Number: 570-85264-1

Login Number: 85264
List Number: 1
Creator: Lagunas, Jorge L

List Source: Eurofins Calscience

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	N/A	Not present
Sample custody seals, if present, are intact.	N/A	Not Present
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Appendix I

Noise Measurements

- Freq Weight : A
- Time Weight : SLOW
- Level Range : 40-100
- Max dB : 57.7 - 2021/11/30 11:11:35
- Level Range : 40-100
- SEL : 85.2
- Leq : 55.7
-

No.s	Date Time	(dB)				
1	2021/11/30 11:05:30	55.8	55.9	55.6	55.9	56.4
6	2021/11/30 11:05:45	55.5	55.7	55.6	55.9	55.7
11	2021/11/30 11:06:00	55.6	56.0	56.7	55.6	55.8
16	2021/11/30 11:06:15	55.7	55.5	56.0	55.3	55.6
21	2021/11/30 11:06:30	55.6	55.6	55.6	56.0	55.6
26	2021/11/30 11:06:45	56.0	55.6	55.5	56.8	55.8
31	2021/11/30 11:07:00	55.6	56.2	55.7	55.7	55.9
36	2021/11/30 11:07:15	55.8	55.7	56.2	55.8	55.9
41	2021/11/30 11:07:30	55.6	55.9	55.7	56.0	55.5
46	2021/11/30 11:07:45	55.8	55.7	55.3	55.7	55.7
51	2021/11/30 11:08:00	55.9	55.8	55.5	55.9	55.4
56	2021/11/30 11:08:15	55.5	55.6	55.7	55.5	55.7
61	2021/11/30 11:08:30	55.5	55.4	55.5	55.7	55.6
66	2021/11/30 11:08:45	55.5	55.5	55.8	55.8	56.0
71	2021/11/30 11:09:00	56.3	55.9	55.5	55.8	55.6
76	2021/11/30 11:09:15	56.0	55.7	55.5	55.8	55.6
81	2021/11/30 11:09:30	55.7	55.8	55.8	55.9	56.0
86	2021/11/30 11:09:45	55.2	55.8	55.6	55.5	55.7
91	2021/11/30 11:10:00	55.6	55.7	55.6	56.0	55.6
96	2021/11/30 11:10:15	55.7	55.5	55.8	55.7	55.9
101	2021/11/30 11:10:30	55.9	55.9	55.5	55.7	55.9
106	2021/11/30 11:10:45	55.9	55.6	55.7	55.8	55.7
111	2021/11/30 11:11:00	55.3	55.6	55.7	55.6	55.4
116	2021/11/30 11:11:15	56.0	55.7	55.9	55.9	56.2
121	2021/11/30 11:11:30	56.2	56.9	56.4	56.5	55.8
126	2021/11/30 11:11:45	56.8	56.6	56.8	56.0	56.3
131	2021/11/30 11:12:00	55.9	55.9	56.1	55.7	55.8
136	2021/11/30 11:12:15	55.8	55.7	55.8	56.0	55.8
141	2021/11/30 11:12:30	55.5	55.5	55.9	55.5	55.4
146	2021/11/30 11:12:45	55.4	55.7	55.7	55.7	55.6
151	2021/11/30 11:13:00	55.7	55.8	55.7	56.0	55.7
156	2021/11/30 11:13:15	55.7	55.6	55.9	56.1	56.0
161	2021/11/30 11:13:30	56.1	56.2	56.3	55.9	55.7
166	2021/11/30 11:13:45	55.7	55.7	55.7	55.4	56.0
171	2021/11/30 11:14:00	56.0	55.8	55.8	55.8	55.8
176	2021/11/30 11:14:15	56.1	55.8	56.1	56.0	55.8
181	2021/11/30 11:14:30	55.8	55.8	55.8	55.9	56.0
186	2021/11/30 11:14:45	55.7	55.7	55.9	55.9	56.0
191	2021/11/30 11:15:00	56.0	56.1	55.7	55.6	55.7
196	2021/11/30 11:15:15	55.7	55.6	55.5	55.5	55.6
201	2021/11/30 11:15:30	55.5	55.8	55.4	55.6	55.8
206	2021/11/30 11:15:45	55.8	55.9	56.0	55.6	55.4
211	2021/11/30 11:16:00	55.5	55.7	55.6	55.8	56.0
216	2021/11/30 11:16:15	56.3	56.0	55.7	55.7	56.0
221	2021/11/30 11:16:30	55.8	56.0	56.0	55.7	55.6
226	2021/11/30 11:16:45	55.5	55.9	55.8	55.7	55.5
231	2021/11/30 11:17:00	55.5	55.6	55.7	55.6	55.8
236	2021/11/30 11:17:15	56.0	56.0	55.6	55.6	55.8
241	2021/11/30 11:17:30	55.8	56.0	55.9	55.6	55.6
246	2021/11/30 11:17:45	55.5	55.9	56.1	56.3	56.0
251	2021/11/30 11:18:00	56.3	55.9	55.6	55.6	55.8
256	2021/11/30 11:18:15	55.4	55.6	55.6	55.8	55.9
261	2021/11/30 11:18:30	56.0	55.6	55.4	55.7	55.6
266	2021/11/30 11:18:45	55.7	55.6	55.7	55.6	55.6
271	2021/11/30 11:19:00	55.7	55.5	55.7	55.6	55.5
276	2021/11/30 11:19:15	55.8	55.7	55.7	55.9	55.5
281	2021/11/30 11:19:30	55.9	56.1	55.8	55.7	55.7
286	2021/11/30 11:19:45	55.7	56.0	55.7	55.6	56.0
291	2021/11/30 11:20:00	55.4	55.6	55.5	55.6	55.8
296	2021/11/30 11:20:15	55.8	55.8	55.6	55.9	55.8

- Freq Weight : A
- Time Weight : SLOW
- Level Range : 40-100
- Max dB : 62.5 - 2021/11/30 11:41:10
- Level Range : 40-100
- SEL : 82.6
- Leq : 53.1
-

No.s	Date Time	(dB)				
1	2021/11/30 11:30:12	53.5	55.3	54.2	55.1	53.7
6	2021/11/30 11:30:27	53.5	54.3	54.6	54.3	52.9
11	2021/11/30 11:30:42	52.4	52.1	52.3	52.1	52.7
16	2021/11/30 11:30:57	51.9	52.2	52.4	52.0	52.3
21	2021/11/30 11:31:12	51.8	52.0	52.1	52.0	52.3
26	2021/11/30 11:31:27	52.2	53.1	54.7	54.7	53.9
31	2021/11/30 11:31:42	52.6	52.6	55.1	55.1	54.2
36	2021/11/30 11:31:57	54.3	54.9	53.3	52.6	52.3
41	2021/11/30 11:32:12	52.8	53.4	53.0	52.2	52.0
46	2021/11/30 11:32:27	52.0	51.4	51.5	51.8	53.3
51	2021/11/30 11:32:42	55.1	54.3	53.2	52.5	52.4
56	2021/11/30 11:32:57	51.9	52.3	53.0	55.2	54.2
61	2021/11/30 11:33:12	53.7	53.1	54.4	54.7	54.9
66	2021/11/30 11:33:27	53.1	52.1	51.5	51.6	51.5
71	2021/11/30 11:33:42	52.1	51.7	51.8	51.9	52.8
76	2021/11/30 11:33:57	53.0	53.3	53.5	54.1	53.3
81	2021/11/30 11:34:12	53.8	53.4	53.1	52.2	52.3
86	2021/11/30 11:34:27	52.1	51.8	51.8	52.2	52.1
91	2021/11/30 11:34:42	52.0	51.8	52.0	52.2	53.2
96	2021/11/30 11:34:57	54.2	54.8	52.5	51.9	51.8
101	2021/11/30 11:35:12	52.6	51.6	52.5	53.3	52.3
106	2021/11/30 11:35:27	51.8	51.8	52.0	52.4	52.1
111	2021/11/30 11:35:42	52.5	52.4	53.1	53.1	54.6
116	2021/11/30 11:35:57	53.4	52.2	52.4	52.0	51.7
121	2021/11/30 11:36:12	51.4	51.5	51.5	51.8	52.1
126	2021/11/30 11:36:27	52.1	52.0	52.1	52.2	52.1
131	2021/11/30 11:36:42	51.7	51.8	51.5	51.4	52.0
136	2021/11/30 11:36:57	52.4	52.1	52.2	52.2	51.9
141	2021/11/30 11:37:12	51.9	51.5	51.8	53.3	54.4
146	2021/11/30 11:37:27	53.8	54.6	54.4	52.9	52.9
151	2021/11/30 11:37:42	52.5	52.0	52.0	51.9	52.3
156	2021/11/30 11:37:57	52.5	52.7	52.9	54.0	54.5
161	2021/11/30 11:38:12	56.6	56.4	54.3	56.3	57.4
166	2021/11/30 11:38:27	54.0	53.1	52.7	53.3	54.3
171	2021/11/30 11:38:42	53.3	54.4	56.3	55.0	53.4
176	2021/11/30 11:38:57	52.2	53.2	54.3	55.1	56.2
181	2021/11/30 11:39:12	55.1	54.0	52.9	52.0	51.8
186	2021/11/30 11:39:27	51.9	52.3	54.0	52.7	52.8
191	2021/11/30 11:39:42	51.9	51.3	51.3	51.7	51.5
196	2021/11/30 11:39:57	51.9	52.5	54.9	55.0	52.6
201	2021/11/30 11:40:12	51.8	51.5	51.8	52.2	51.8
206	2021/11/30 11:40:27	52.2	52.0	52.6	55.2	57.7
211	2021/11/30 11:40:42	54.1	52.0	51.6	51.7	51.8
216	2021/11/30 11:40:57	52.0	51.9	52.0	52.2	57.7
221	2021/11/30 11:41:12	53.2	53.3	53.7	53.0	52.6
226	2021/11/30 11:41:27	52.4	52.3	52.9	53.9	57.5
231	2021/11/30 11:41:42	56.5	52.8	52.5	52.1	51.7
236	2021/11/30 11:41:57	51.5	52.3	52.2	52.0	52.1
241	2021/11/30 11:42:12	52.2	51.7	51.7	52.0	52.1
246	2021/11/30 11:42:27	51.9	52.3	52.4	52.2	52.1
251	2021/11/30 11:42:42	51.6	52.1	51.9	52.0	51.6
256	2021/11/30 11:42:57	51.8	56.2	60.8	55.2	52.6
261	2021/11/30 11:43:12	52.4	51.9	52.8	54.8	53.6
266	2021/11/30 11:43:27	52.6	52.2	52.3	52.3	51.9
271	2021/11/30 11:43:42	52.0	51.3	51.8	52.2	53.7
276	2021/11/30 11:43:57	52.8	52.2	52.4	52.2	51.7
281	2021/11/30 11:44:12	51.6	52.2	52.1	52.0	52.9
286	2021/11/30 11:44:27	53.8	53.1	52.7	52.7	52.7
291	2021/11/30 11:44:42	52.5	52.0	52.4	53.9	54.0
296	2021/11/30 11:44:57	54.9	53.0	52.8	52.3	52.2

-
- Freq Weight : A
- Time Weight : SLOW
- Level Range : 40-100
- Max dB : 69.4 - 2021/11/30 09:32:02
- Level Range : 40-100
- SEL : 87.1
- Leq : 57.6
-

No.s	Date Time	(dB)				
1	2021/11/30 09:25:30	57.5	57.0	57.4	58.1	56.7
6	2021/11/30 09:25:45	58.8	58.7	58.7	58.3	57.7
11	2021/11/30 09:26:00	59.0	58.7	57.6	57.1	58.3
16	2021/11/30 09:26:15	58.4	57.5	58.7	59.2	58.2
21	2021/11/30 09:26:30	58.1	58.4	59.4	59.1	59.1
26	2021/11/30 09:26:45	59.3	58.8	57.7	56.8	56.9
31	2021/11/30 09:27:00	57.5	58.5	57.9	60.1	59.3
36	2021/11/30 09:27:15	57.9	57.6	57.6	58.2	58.7
41	2021/11/30 09:27:30	58.1	58.7	57.8	58.9	58.7
46	2021/11/30 09:27:45	58.1	57.7	56.8	58.1	58.5
51	2021/11/30 09:28:00	58.2	58.6	58.2	59.4	59.4
56	2021/11/30 09:28:15	59.1	59.0	60.4	64.9	59.9
61	2021/11/30 09:28:30	57.7	59.2	59.1	64.4	59.5
66	2021/11/30 09:28:45	58.1	58.5	58.8	58.1	57.2
71	2021/11/30 09:29:00	57.2	57.2	58.6	58.2	58.5
76	2021/11/30 09:29:15	57.5	58.5	58.0	57.2	58.0
81	2021/11/30 09:29:30	59.0	58.4	58.2	59.1	58.9
86	2021/11/30 09:29:45	58.7	58.0	58.4	58.2	60.4
91	2021/11/30 09:30:00	60.4	62.8	58.8	57.9	58.7
96	2021/11/30 09:30:15	59.0	58.1	56.8	56.8	57.1
101	2021/11/30 09:30:30	57.3	56.6	56.8	55.6	54.9
106	2021/11/30 09:30:45	55.8	56.3	56.6	56.9	56.4
111	2021/11/30 09:31:00	56.7	57.1	56.9	57.1	57.4
116	2021/11/30 09:31:15	56.7	56.0	55.0	55.7	55.4
121	2021/11/30 09:31:30	55.4	55.7	54.6	54.5	54.9
126	2021/11/30 09:31:45	56.0	58.5	58.5	56.5	65.0
131	2021/11/30 09:32:00	67.6	58.4	56.2	55.5	55.6
136	2021/11/30 09:32:15	56.7	56.5	55.5	57.0	59.3
141	2021/11/30 09:32:30	56.7	56.8	57.0	55.9	55.8
146	2021/11/30 09:32:45	56.4	56.6	55.1	56.8	55.9
151	2021/11/30 09:33:00	56.0	55.6	55.2	55.4	55.0
156	2021/11/30 09:33:15	55.3	55.5	55.7	56.0	56.3
161	2021/11/30 09:33:30	56.2	56.6	55.6	55.5	56.3
166	2021/11/30 09:33:45	56.0	55.8	56.1	56.6	56.7
171	2021/11/30 09:34:00	56.0	55.6	55.9	56.6	56.7
176	2021/11/30 09:34:15	55.8	55.3	54.3	54.9	54.6
181	2021/11/30 09:34:30	55.4	55.6	56.1	55.6	56.4
186	2021/11/30 09:34:45	56.3	55.8	55.5	57.3	54.4
191	2021/11/30 09:35:00	54.9	54.2	54.8	56.0	56.1
196	2021/11/30 09:35:15	56.1	55.4	54.9	55.0	55.2
201	2021/11/30 09:35:30	55.7	56.3	56.6	57.0	56.3
206	2021/11/30 09:35:45	55.9	56.0	56.3	55.8	55.9
211	2021/11/30 09:36:00	56.8	56.3	56.4	56.3	57.0
216	2021/11/30 09:36:15	56.5	56.6	56.9	57.1	57.6
221	2021/11/30 09:36:30	56.7	55.8	55.3	57.5	57.1
226	2021/11/30 09:36:45	57.3	56.4	55.6	55.7	55.9
231	2021/11/30 09:37:00	56.9	57.1	57.2	57.2	57.6
236	2021/11/30 09:37:15	58.6	58.2	57.4	56.2	57.3
241	2021/11/30 09:37:30	57.1	57.1	56.7	55.9	55.4
246	2021/11/30 09:37:45	56.3	56.4	56.1	57.6	58.8
251	2021/11/30 09:38:00	56.5	55.7	54.8	56.4	56.2
256	2021/11/30 09:38:15	56.4	56.7	56.5	57.3	56.4
261	2021/11/30 09:38:30	56.1	56.1	55.6	57.5	56.7
266	2021/11/30 09:38:45	57.0	56.2	56.8	56.3	56.9
271	2021/11/30 09:39:00	58.2	56.5	56.7	56.8	58.1
276	2021/11/30 09:39:15	58.5	58.6	60.7	57.8	57.1
281	2021/11/30 09:39:30	59.0	59.4	57.4	58.6	58.1
286	2021/11/30 09:39:45	58.9	58.6	58.2	57.6	56.6
291	2021/11/30 09:40:00	56.1	55.8	59.0	58.2	56.3
296	2021/11/30 09:40:15	56.2	56.6	56.3	57.3	57.9

- Freq Weight : A
- Time Weight : SLOW
- Level Range : 40-100
- Max dB : 70.8 - 2021/11/30 10:20:26
- Level Range : 40-100
- SEL : 87.0
- Leq : 57.5
-

No.s	Date Time	(dB)				
1	2021/11/30 10:17:23	57.5	57.7	57.8	57.7	57.8
6	2021/11/30 10:17:38	58.0	57.7	57.8	57.6	58.0
11	2021/11/30 10:17:53	57.8	57.8	57.9	57.4	57.4
16	2021/11/30 10:18:08	57.5	57.4	57.5	57.5	57.6
21	2021/11/30 10:18:23	57.4	57.5	57.4	57.5	57.3
26	2021/11/30 10:18:38	57.3	56.9	54.9	54.6	54.5
31	2021/11/30 10:18:53	54.5	54.6	54.6	54.8	54.8
36	2021/11/30 10:19:08	54.8	54.7	54.7	54.5	54.3
41	2021/11/30 10:19:23	54.4	54.4	60.0	58.4	57.5
46	2021/11/30 10:19:38	57.5	57.5	57.6	57.3	57.3
51	2021/11/30 10:19:53	57.1	57.2	57.4	57.3	57.5
56	2021/11/30 10:20:08	57.7	57.4	57.9	57.9	58.1
61	2021/11/30 10:20:23	67.7	64.6	59.0	58.0	58.0
66	2021/11/30 10:20:38	58.0	58.0	57.7	57.6	57.5
71	2021/11/30 10:20:53	57.4	57.4	57.5	57.5	57.6
76	2021/11/30 10:21:08	57.9	57.6	57.6	57.5	57.3
81	2021/11/30 10:21:23	57.4	57.2	57.5	57.2	57.2
86	2021/11/30 10:21:38	57.4	57.4	57.4	57.5	57.6
91	2021/11/30 10:21:53	57.5	57.6	57.5	57.5	57.5
96	2021/11/30 10:22:08	57.3	57.5	57.8	57.6	58.2
101	2021/11/30 10:22:23	57.8	57.9	58.0	57.6	57.8
106	2021/11/30 10:22:38	57.6	57.4	57.4	57.3	57.4
111	2021/11/30 10:22:53	57.3	57.4	57.4	57.2	57.3
116	2021/11/30 10:23:08	57.3	57.2	57.2	57.3	57.1
121	2021/11/30 10:23:23	57.1	57.3	57.4	57.4	57.3
126	2021/11/30 10:23:38	57.6	57.6	57.7	57.9	57.9
131	2021/11/30 10:23:53	57.6	57.5	58.1	57.7	57.4
136	2021/11/30 10:24:08	57.4	57.5	57.7	57.4	57.2
141	2021/11/30 10:24:23	57.5	57.4	57.3	57.3	57.1
146	2021/11/30 10:24:38	57.0	56.9	57.1	57.1	56.9
151	2021/11/30 10:24:53	56.8	57.0	56.8	56.7	56.8
156	2021/11/30 10:25:08	56.7	57.0	56.9	57.2	57.0
161	2021/11/30 10:25:23	56.9	56.9	56.9	56.9	56.8
166	2021/11/30 10:25:38	56.8	57.0	56.9	57.1	57.2
171	2021/11/30 10:25:53	57.4	57.5	57.4	58.0	58.5
176	2021/11/30 10:26:08	59.2	58.6	57.9	57.4	57.3
181	2021/11/30 10:26:23	57.3	57.1	57.1	57.1	57.2
186	2021/11/30 10:26:38	57.0	57.0	57.6	57.4	57.5
191	2021/11/30 10:26:53	57.5	57.3	57.3	57.5	57.4
196	2021/11/30 10:27:08	57.6	57.5	57.6	58.1	58.0
201	2021/11/30 10:27:23	58.0	57.5	57.5	57.8	59.5
206	2021/11/30 10:27:38	57.9	57.9	57.7	57.7	57.5
211	2021/11/30 10:27:53	57.9	57.8	57.6	57.5	57.9
216	2021/11/30 10:28:08	57.7	57.6	57.7	57.8	57.6
221	2021/11/30 10:28:23	57.6	57.6	57.7	57.5	57.7
226	2021/11/30 10:28:38	57.6	57.4	57.5	57.3	57.2
231	2021/11/30 10:28:53	57.4	57.4	57.5	57.6	57.6
236	2021/11/30 10:29:08	57.7	57.6	57.8	57.7	57.6
241	2021/11/30 10:29:23	57.5	57.4	57.3	57.0	57.1
246	2021/11/30 10:29:38	57.0	56.8	56.8	56.9	57.1
251	2021/11/30 10:29:53	57.1	57.0	57.1	57.0	57.0
256	2021/11/30 10:30:08	57.1	57.0	57.1	57.4	57.3
261	2021/11/30 10:30:23	57.5	57.5	57.4	57.0	56.8
266	2021/11/30 10:30:38	56.8	56.8	56.9	56.8	56.7
271	2021/11/30 10:30:53	56.8	56.9	57.0	56.7	57.3
276	2021/11/30 10:31:08	57.3	56.8	56.8	57.1	56.9
281	2021/11/30 10:31:23	56.7	57.1	57.0	57.1	57.2
286	2021/11/30 10:31:38	56.8	56.8	56.8	57.0	57.1
291	2021/11/30 10:31:53	57.0	57.2	57.0	57.1	57.1
296	2021/11/30 10:32:08	57.0	57.2	57.1	57.0	56.9

Freq Weight : A
Time Weight : SLOW
Level Range : 40-100
Max dB : 56.5 - 2021/11/30 10:04:54
Level Range : 40-100
SEL : 81.4
Leq : 52.0

No.s	Date Time	(dB)				
1	2021/11/30 09:52:38	51.8	51.8	51.9	51.7	51.5
6	2021/11/30 09:52:53	51.2	51.3	51.3	51.7	51.6
11	2021/11/30 09:53:08	51.4	51.5	51.6	51.7	51.7
16	2021/11/30 09:53:23	51.4	51.3	51.1	51.2	51.0
21	2021/11/30 09:53:38	51.3	50.7	50.6	51.0	50.8
26	2021/11/30 09:53:53	50.8	50.7	50.8	50.9	50.9
31	2021/11/30 09:54:08	50.9	50.7	51.0	50.9	50.9
36	2021/11/30 09:54:23	51.0	51.4	51.4	51.6	51.6
41	2021/11/30 09:54:38	51.4	51.4	51.2	51.6	51.4
46	2021/11/30 09:54:53	51.7	51.9	51.5	51.5	51.7
51	2021/11/30 09:55:08	52.0	53.0	52.4	51.8	52.4
56	2021/11/30 09:55:23	52.3	52.3	52.8	51.7	51.8
61	2021/11/30 09:55:38	52.1	52.0	51.7	51.3	51.2
66	2021/11/30 09:55:53	51.1	51.5	51.4	51.2	51.0
71	2021/11/30 09:56:08	51.1	51.1	50.9	51.3	51.0
76	2021/11/30 09:56:23	50.5	50.6	51.0	51.0	51.0
81	2021/11/30 09:56:38	51.1	51.2	51.1	51.0	51.2
86	2021/11/30 09:56:53	51.8	51.1	51.2	51.0	51.2
91	2021/11/30 09:57:08	51.6	51.1	52.5	52.4	51.8
96	2021/11/30 09:57:23	51.6	51.6	51.4	51.3	51.5
101	2021/11/30 09:57:38	51.8	51.6	51.3	51.5	51.6
106	2021/11/30 09:57:53	51.5	51.5	51.6	51.5	51.5
111	2021/11/30 09:58:08	51.2	51.2	51.2	51.0	51.3
116	2021/11/30 09:58:23	51.4	51.5	51.3	51.5	51.4
121	2021/11/30 09:58:38	51.7	51.4	51.1	51.3	51.5
126	2021/11/30 09:58:53	51.5	51.7	51.4	51.6	52.3
131	2021/11/30 09:59:08	51.8	51.8	51.7	51.9	52.0
136	2021/11/30 09:59:23	52.0	51.8	51.9	52.0	51.9
141	2021/11/30 09:59:38	51.8	52.3	51.7	51.7	51.8
146	2021/11/30 09:59:53	52.8	52.1	52.6	52.2	52.8
151	2021/11/30 10:00:08	52.1	51.8	51.8	52.0	51.5
156	2021/11/30 10:00:23	51.9	51.8	51.9	51.7	51.8
161	2021/11/30 10:00:38	51.8	51.7	51.6	52.3	53.0
166	2021/11/30 10:00:53	52.4	52.4	52.2	52.8	54.0
171	2021/11/30 10:01:08	51.8	51.3	51.4	52.4	52.0
176	2021/11/30 10:01:23	52.2	51.7	51.5	51.5	51.6
181	2021/11/30 10:01:38	51.7	51.5	51.6	51.3	51.5
186	2021/11/30 10:01:53	51.8	52.2	51.6	51.6	51.8
191	2021/11/30 10:02:08	51.7	51.7	52.0	51.8	51.9
196	2021/11/30 10:02:23	51.4	51.6	51.6	51.6	51.6
201	2021/11/30 10:02:38	51.8	51.6	51.7	52.0	51.8
206	2021/11/30 10:02:53	51.7	51.5	51.7	51.5	51.4
211	2021/11/30 10:03:08	51.2	51.6	51.4	51.6	51.3
216	2021/11/30 10:03:23	51.2	51.5	51.7	51.5	51.4
221	2021/11/30 10:03:38	51.5	51.9	51.6	52.1	52.0
226	2021/11/30 10:03:53	52.1	52.2	51.8	52.6	52.7
231	2021/11/30 10:04:08	51.7	52.7	52.0	52.3	52.7
236	2021/11/30 10:04:23	52.8	54.5	53.6	52.7	52.4
241	2021/11/30 10:04:38	52.7	52.4	52.5	52.7	53.0
246	2021/11/30 10:04:53	54.7	53.6	53.2	53.8	54.0
251	2021/11/30 10:05:08	55.4	52.7	52.4	53.0	53.2
256	2021/11/30 10:05:23	52.9	52.5	52.6	52.4	52.5
261	2021/11/30 10:05:38	52.5	52.8	52.8	52.7	52.5
266	2021/11/30 10:05:53	52.5	55.2	52.2	52.3	52.0
271	2021/11/30 10:06:08	52.7	52.4	52.6	52.6	52.5
276	2021/11/30 10:06:23	52.7	54.4	53.0	52.6	53.0
281	2021/11/30 10:06:38	53.2	52.9	52.7	53.6	53.4
286	2021/11/30 10:06:53	54.0	53.2	53.7	53.6	52.8
291	2021/11/30 10:07:08	52.7	52.9	53.2	53.2	53.4
296	2021/11/30 10:07:23	53.2	53.0	52.8	52.5	52.5

5:00 of / bug

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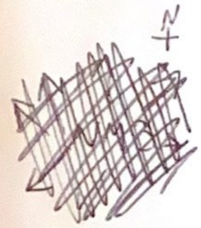
Ambient Noise Survey Data Sheet

Instructions: Document noise measurement locations with a photo of the site, including the noise meter. Additionally, take notes on general and secondary noise sources, including the instantaneous noise level if possible. As a reminder, A/C weighting should be set to "A", and response time should typically be set to "slow." For additional information, please review the *Noise Measurement Protocols* in the case or on Jive.

Project Name: ______ **Job Number:** ______
Date: ______ **Operator Name:** ______

N



Measurement #1

Location: NM3 **Begin time:** 9:25 **Finish time:** 9:40
Measurement No.: 001 **Wind (mph):** 0 **Direction:** E
Cloud Cover Class: Overcast (>80%) Light (20-80%) Sunny (<20%)
Calibration (dB): Start: 94.0 End: 94.0
Primary Noise Sources: S Campus Dr **Distance:** 50 ft from center line
Secondary Noise Sources: 215
Notes: on hill slopes down W of NM3, pretty step - alot of noise from I215, passing cars playing music

vending mashine "cooler" @ 10 min

Traffic Count: Passenger Cars: 57
Medium Trucks (2 axles, 6 tires): ______ Heavy Trucks (3+ axles): ______
Instantaneous Noise Sources/Levels (e.g., airplane, bus airbrake, etc.): ______

L_{eq}:	57.6	SEL:	87.1	L_{max}:	69.4	L_{min}:	53.9	PK:	84.4
L(05):	59.4	L(10):	59.0	L(50):	56.9	L(90):	55.4	L(95):	55.0

Response: Slow Fast Peak Impulse

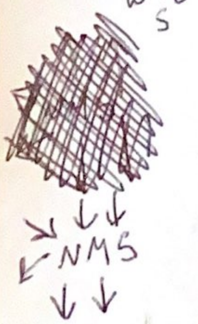
NM3 a little lower elevation than campus dr.

Measurement #2

Location: NM5 **Begin time:** 9:51 **Finish time:** 10:06
Measurement No.: 002 **Wind (mph):** 1 **Direction:** ENE
Cloud Cover Class: Overcast (>80%) Light (20-80%) Sunny (<20%)
Calibration (dB): Start: 94.0 End: 94.2
Primary Noise Sources: ______ **Distance:** 300 ft from center of campus dr
Secondary Noise Sources: ~~[illegible]~~ building to the W of NM5 emitting
Notes: odd constant fan sound. step slop twords campus road - lower elevations to the W, N, E → higer to the S

odd green house build noises

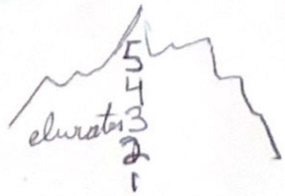
N W E S



Traffic Count: Passenger Cars: ______
Medium Trucks (2 axles, 6 tires): ______ Heavy Trucks (3+ axles): ______
Instantaneous Noise Sources/Levels (e.g., airplane, bus airbrake, etc.): plane @ 1 min, train horn @ 10 min

L_{eq}:	52.0	SEL:	81.4	L_{max}:	56.5	L_{min}:	50.4	PK:	76.1
L(05):	53.2	L(10):	52.9	L(50):	51.7	L(90):	51.1	L(95):	50.9

Response: Slow Fast Peak Impulse



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Ambient Noise Survey Data Sheet

Instructions: Document noise measurement locations with a photo of the site, including the noise meter. Additionally, take notes on general and secondary noise sources, including the instantaneous noise level if possible. As a reminder, A/C weighting should be set to "A", and response time should typically be set to "slow." For additional information, please review the *Noise Measurement Protocols* in the case or on Jive.

Project Name: ______ **Job Number:** ______

Date: ______ **Operator Name:** ______

Measurement #1

Location: NM4 **Begin time:** 10:17 **Finish time:** 10:32

Measurement No.: 003 **Wind (mph):** 2 **Direction:** NW

Cloud Cover Class: Overcast (>80%) Light (20-80%) Sunny (<20%)

Calibration (dB): Start: 94.2 End: 94.3

Primary Noise Sources: green houes **Distance:** 30 Ft

Secondary Noise Sources: Campus dr

Notes: NM4 overlooks parking lot 8 w/ green house to the E green houses making constant noise - NM4 higher elevation than NM3

Traffic Count: Passenger Cars: ______

Medium Trucks (2 axles, 6 tires): ______ Heavy Trucks (3+ axles): ______

Instantaneous Noise Sources/Levels (e.g., airplane, bus airbrake, etc.): motercycel @ 2 min

L_{eq}: 57.5 SEL: 87.0 L_{max}: 70.8 L_{min}: 54.3 PK: 85.4

L(05): 58.0 L(10): 57.8 L(50): 57.4 L(90): 56.8 L(95): 54.8

Response: Slow Fast Peak Impulse

Measurement #2

Location: NM1 **Begin time:** 11:05 **Finish time:** 11:20

Measurement No.: 004 **Wind (mph):** 3 **Direction:** W

Cloud Cover Class: Overcast (>80%) Light (20-80%) Sunny (<20%)

Calibration (dB): Start: 94.3 End: 94.4

hard to tell - there is a constant dull raw

Primary Noise Sources: **Distance:**

Secondary Noise Sources: Construction noise(?) or maybe I215

Notes: surronded by walls - low elevation court yard - people talking (whol recording), Citric drive is about 15 ft above NM1

Traffic Count: Passenger Cars: ______

Medium Trucks (2 axles, 6 tires): ______ Heavy Trucks (3+ axles): ______

Instantaneous Noise Sources/Levels (e.g., airplane, bus airbrake, etc.): ______

L_{eq}: 55.7 SEL: 85.2 L_{max}: 57.7 L_{min}: 55.2 PK: 87.6

L(05): 56.1 L(10): 56.0 L(50): 55.7 L(90): 55.5 L(95): 55.4

Response: Slow Fast Peak Impulse

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Ambient Noise Survey Data Sheet

Instructions: Document noise measurement locations with a photo of the site, including the noise meter. Additionally, take notes on general and secondary noise sources, including the instantaneous noise level if possible. As a reminder, A/C weighting should be set to "A", and response time should typically be set to "slow." For additional information, please review the *Noise Measurement Protocols* in the case or on Jive.

Project Name: ______ **Job Number:** ______
Date: ______ **Operator Name:** ______

Measurement #1

Location: NM2 **Begin time:** 11:29 **Finish time:** 11:44
Measurement No.: 005 **Wind (mph):** 4 **Direction:** WNW
Cloud Cover Class: Overcast (>80%) Light (20-80%) Sunny (<20%)
Calibration (dB): Start: 94.4 End: 94.5
Primary Noise Sources: S Campus dr **Distance:** 50 ft from center
Secondary Noise Sources: possibly generator noise Building to W is
Notes: lower, building to N is about same elevation building to the SE (near NM4 are higher elevation

...eight ...y speed bump ...n Campus ...dr.

Traffic Count: Passenger Cars: 50
Medium Trucks (2 axles, 6 tires): ______ Heavy Trucks (3+ axles): ______
Instantaneous Noise Sources/Levels (e.g., airplane, bus airbrake, etc.): ______

L_{eq}:	53.1	SEL:	82.6	L_{max}:	62.5	L_{min}:	51.1	PK:	93.3
L(05):	55.2	L(10):	54.7	L(50):	52.4	L(90):	51.7	L(95):	51.5

Response: Slow Fast Peak Impulse

Measurement #2

Location: Begin time: Finish time:

Appendix J

VMT Assessment Memorandum

FEHR & PEERS

Memorandum

Date: March 4, 2022

To: Anna Choudhuri, Rincon

From: Sarah Brandenberg

Subject: UC Riverside School of Business Building - VMT Assessment

OC22-0727

Introduction

The purpose of this vehicle miles traveled (VMT) assessment is to evaluate the University of California Riverside (UCR) School of Business project (project) for consistency with the UCR 2021 Long Range Development Plan (2021 LRDP) and its associated Program Environmental Impact Report (EIR). UCR's 2021 LRDP identified the land use framework and facility development required to achieve UCR's academic goals and projected growth of 35,000 students and 7,545 faculty and staff by 2035. Impacts to transportation were analyzed in the 2021 LRDP EIR in section 4.15. This memorandum describes the project and its potential for transportation impacts as relates to the 2021 LRDP and the LRDP EIR.

Proposed Project

The proposed project is the expansion of UCR's existing School of Business in the East Campus. The project is located within a developed area on the UCR East Campus, between Citrus Drive and College Place, with South Campus Circle Drive bisecting part of the site. The project would displace a surface parking lot, Parking Lot 8. Vehicles utilizing these parking spaces would be reallocated to other surface parking areas and parking structures on campus.

The proposed project would accommodate approximately 570 additional new students and 125 new faculty and staff. This growth in students, faculty, and staff was included in the 2021 LRDP EIR which assumed a 46 percent increase in UCR student population (approximately 11,078 new students) and a 60 percent increase in additional faculty and staff (approximately 1,806 new faculty and staff) by 2035.

VMT Thresholds

As a result of Senate Bill 743 (SB 743) and the new CEQA guidelines for determining transportation impacts, the 2021 LRDP EIR considered VMT as the metric for evaluating the Project's environmental impacts on the transportation system. On September 27, 2013, Governor Jerry Brown signed SB 743 into law and started a process to fundamentally change transportation impact analysis conducted as part of CEQA compliance. The Governor's Office of Planning and Research (OPR) was charged with developing new guidelines for evaluating transportation impacts under CEQA using methods that no longer focus on measuring automobile delay and level of service (LOS). SB 743 directed OPR to develop new guidelines that use a transportation performance metric which will help promote: the reduction of greenhouse gas emissions, the development of multimodal networks, and a more sustainable diversity of land uses.

OPR issued proposed updates to the CEQA guidelines in support of these goals in November 2017[1] and a supporting *Technical Advisory* in December 2018[2]. The updates establish vehicle miles traveled (VMT) as the primary metric for evaluating a project's environmental impacts on the transportation system. The changes to CEQA guidelines Section 15064.3 to implement SB 743 were certified by the State in December of 2018.

The following thresholds of significance were used to determine VMT impacts associated with the project and 2021 LRDP.

- A project would result in a significant project generated VMT impact if either of the following conditions are satisfied:
  - The Baseline Plus Project generated VMT per Service Population exceeds 15% below the WRCOG baseline VMT per Service Population
  - The Cumulative Plus Project generated VMT per Service Population exceeds 15% below the WRCOG baseline VMT per Service Population
- The project's effect on VMT would be considered significant if it resulted in the following condition being satisfied:
  - The cumulative link-level boundary WRCOG region VMT per Service Population increases under the Cumulative Plus Project condition compared to Cumulative (2035) conditions

[1] State of California, Governor's Office of Planning and Research, *Proposed Updates to the CEQA Guidelines, Final,* November 2017.

[2] State of California, Governor's Office of Planning and Research, *Technical Advisory on Evaluating Transportation Impacts in CEQA,* December 2018.

VMT Evaluation

The VMT analysis completed for the 2021 EIR reflects the number of vehicle-trips generated by the campus and the expected distance that drivers will travel to/from UC Riverside for their work/school trips as well as other trips generated by campus visitors and on-campus housing. The Riverside Traffic Analysis Model (RivTAM)[3] was used to develop VMT forecasts. UC Riverside campus wide VMT was calculated for the following four scenarios:

- Baseline (2018) – A Fall 2018 baseline was selected for the transportation analysis. Campus population (student enrollment, on-campus residents, and faculty/staff employment) was incorporated in the Base Year Riverside Traffic Analysis Model (RivTAM) to establish the Baseline conditions for the transportation assessment.
- Baseline Plus Project – The net new increases in campus population associated with the 2021 LRDP were added to the Baseline conditions to develop Baseline Plus Project conditions.
- Cumulative (2035) Without Project – The Cumulative (2035) Without Project conditions were developed by including the 2018 Baseline campus conditions in combination with future cumulative growth outside of UCR using the Future Year RivTAM model.
- Cumulative Plus Project– The net new increases in campus development and population associated with the LRDP were added to the Future Year RivTAM to develop Cumulative Plus Project conditions.

The metric identified for the transportation analysis in the 2021 LRDP EIR is Total VMT per Service Population. This represents the daily VMT generated by UC Riverside divided by the number of employees, residential students, and commuter (nonresidential) students on the campus. The Baseline Plus Project and Cumulative Plus Project VMT per Service Population calculations were determined by measuring the UC Riverside campus wide VMT with the inclusion of the LRDP population growth. These VMT measurements and associated calculations of VMT per Service Population were used to evaluate the VMT impact of the UC Riverside campus with the addition of the LRDP. This calculation methodology is reflective of the VMT generation characteristics of the UC Riverside campus with the inclusion of more students, faculty, and staff as is being proposed with the School of Business project.

Since the new students, faculty, and staff generated by the project were also included in the growth projections for the 2021 LRDP, the VMT results are expected to be consistent with those reported in the 2021 EIR as follows:

- The baseline 2021 LRDP generated VMT per Service Population of 17.65 does not exceed the threshold of 15% below Western Riverside Council of Governments (WRCOG) VMT per Service Population of 24.35 resulting in a less than significant in the 2021 LRDP EIR; therefore, the proposed project impact is also considered less than significant.

[3] The RivTAM is consistent with the 2016 SCAG Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) as described in the 2021 EIR.

- The cumulative 2021 LRDP generated VMT per Service Population of 19.93 does not exceed the threshold of 15% below WRCOG VMT per Service Population of 24.35 resulting in a less than significant in the 2021 LRDP EIR; therefore, the cumulative proposed project impact is also considered less than significant.
- The 2021 LRDP effect on VMT per Service Population of 18.05 does not cause total VMT for the WRCOG region to exceed the future forecast from the Southern California Association of Governments Regional Transportation Plan/Sustainable Communities Strategy (SCAG RTP/SCS) of 18.10 VMT per Service Population resulting in a less than significant in the 2021 LRDP EIR; therefore, the proposed project impact is also considered less than significant.

Similar to the 2021 LRDP, the proposed project would result in additional vehicular travel associated with increased population on the campus, but VMT would continue to be below regional thresholds. Therefore, transportation impacts related to VMT would remain less than significant under the proposed project as it would under the 2021 EIR and no mitigation measures are required.

Construction

Construction access would be provided by the I-215 freeway, Martin Luther King Boulevard, Canyon Crest Drive, and Campus Drive. Similar to the 2021 LRDP, in situations where road closures are necessary, there are ample detour routes that are a short distance away and are not anticipated to substantially increase the miles traveled on the roadway network. Therefore, construction impacts related to VMT would remain less than significant under the proposed project as it would under the 2021 EIR and no mitigation measures are required.

Other CEQA Check-List

In addition to VMT, the following transportation impacts were examined in the 2021 LRDP EIR:

a) Conflict with an applicable plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

Similar to the 2021 LRDP, the proposed project would increase bicycle and pedestrian travel, but it would not physically disrupt an existing pedestrian or bicycle facility or interfere with the implementation of a planned pedestrian or bicycle facility. Pedestrian circulation and accessibility to and from the project would be provided by existing sidewalks and pathways along South Campus Drive with improvements to meet Americans with Disabilities Act (ADA) requirements. Accessible pathway improvements are anticipated from the Citrus Drive parking lot and from Parking Lot 43 and other pathway improvements are anticipated from Anderson Hall to the project site. Bicycle lanes that currently exist on both sides of South Campus Drive will be maintained and improved with the addition of bicycle racks. Existing transit service on Canyon Crest Drive and West Campus Drive would continue to serve the campus and project site. In addition, the project would not conflict with any existing programs, plans, ordinances, or policies that address the circulation system. Therefore, transportation impacts related to plans, ordinances, or policies that address the circulation system would remain less than significant under the proposed project as it would under the 2021 EIR and no mitigation measures are required.

b) Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?

Please refer to the detailed discussion of VMT impacts above.

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

Similar to the 2021 LRDP, the proposed project would be constructed in such a way that changes would remain consistent to the surrounding geometric design features and would be designed and constructed to meet the Campus Construction and Design Standards. The 2021 LRDP EIR also considered transportation impacts resulting from freeway off-ramp queueing. Under Baseline conditions, the freeway off-ramp queueing with the 2021 LRDP was not found to exceed 85% of the storage length for any of the freeway off-ramps. Since new students, faculty, and staff generated by the project were also included in the 2021 LRDP analysis, the project would also not exceed 85% of the storage length for any of the freeway off-ramps under Baseline conditions. Under Cumulative conditions with the 2021 LRDP, freeway off-ramp queueing was found to exceed 85% of the storage length at the I-215/SR-60 Southbound Ramps at Martin Luther King Boulevard. Since the project would contribute to the increase in campus population under Cumulative conditions, it would also contribute to the impact related to AM peak hour queueing at the I-215/SR-60 Freeway Southbound Ramps at Martin Luther King Boulevard. The mitigation measure identified in the 2021 EIR would continue to reduce the severity of the impact; however, the implementation of the mitigation measure continues to remain uncertain as reported in the 2021 EIR. Therefore, transportation impacts related to geometric design features would remain significant and unavoidable as identified in the 2021 EIR.

d) Result in inadequate emergency access?

Similar to the 2021 LRDP, the proposed project would not include major changes to existing access points or on-campus circulation paths that would result in inadequate emergency access and would adhere to Campus Construction and Design Standards. Emergency access to the project site would be provided via ingress/egress routes along South Campus Drive, College Place, Science Walk, or Citrus Drive. Emergency vehicles could travel down Eucalyptus to Science Walk if the South Campus Drive access was impeded during an emergency. Another emergency access option would be to add two separate roads to the site that are less than 150 feet as well as the widening of a portion of College Place to meet fire access road code requirements. With each of these roads, a 150-foot hose pull would be achieved on both the east and west sides of the proposed building. This option could function for service access as well as trash pickup and deliveries to the project site. Emergency vehicular access would also be provided to the project site via two existing driveways off South Campus Drive; however, the road width is not up to current fire code and would require widening as well as surface improvements. During project construction, one lane would remain open along South Campus Drive in accordance with the construction traffic control plan. Therefore, transportation impacts related to emergency access would remain less than significant under the proposed project as it would under the 2021 EIR and no mitigation measures are required.