Final Initial Study/ Mitigated Negative Declaration

University of California, Riverside
Multidisciplinary Research Building 1
UCR Project No. 950528

SCH No. 2016041021

Prepared for

University of California, Riverside
Capital Planning – Capital Asset Strategies
1223 University Avenue, Suite 240
Riverside, California 92521

Prepared by

Psomas
1500 Iowa Avenue, Suite 210
Riverside, CA 92507

June 2016

UNIVERSITY OF CALIFORNIA, RIVERSIDE
MULTIDISCIPLINARY RESEARCH BUILDING 1
PROJECT NO. 950528

Final Initial Study/Mitigated Negative Declaration
State Clearinghouse No. 2016041021

Prepared for:
University of California, Riverside
Capital Planning – Capital Asset Strategies
1223 University Avenue, Suite 240
Riverside, California 92521

Contact: Ms. Tricia D. Thrasher, ASLA, LEED AP

Prepared by:
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1500 Iowa Avenue, Suite 210
Riverside, California 92507

June 2016

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SECTION 1.0 INTRODUCTION

Pursuant to State law and University procedures for the implementation of the California Environmental Quality Act (CEQA), the potential environmental effects of the proposed University of California, Riverside (UCR) Multidisciplinary Research Building 1 (MRB1) (Project) have been analyzed in a Draft Initial Study (SCH No. 2016041021) dated April 2016. The environmental analysis for the proposed Project is tiered from the 2005 Long Range Development Plan (LRDP) EIR (State Clearinghouse [SCH] No. 2005041164), certified by the University of California Board of Regents (The Regents) in November 2005, as augmented, revised and supplemented by the 2005 LRDP Amendment 2 EIR (SCH No. 2010111034) certified by The Regents on November 28, 2011.

Based on the project-specific analysis presented in the Initial Study, it was determined that for each topical issue, with the exception of construction-related noise, the Project would have no impact or a less than significant impact with the adoption of identified project-level mitigation measures (MMs) and incorporation of all relevant MMs and continuing adherence to adopted Programs, Practices and Procedures (PPs) identified in the UCR 2005 LRDP EIR as supplemented and updated by the UCR 2005 LRDP Amendment 2 EIR. The Project description includes and incorporates all relevant MMs and campus PPs identified in the Final EIRs to minimize the impacts of projects implementing the LRDP, and the Draft Initial Study identified project-specific mitigation measures to reduce potential project-specific environmental impacts to a less than significant level. Specifically, MM MRB1 AQ-1 requires that volatile organic compound (VOC) emission limits be met, and MM MRB1 Cult-1 documents UCR’s contractor specifications that address measures to be taken should human remains be encountered. However, even with incorporation of identified MMs and campus PPs, the proposed Project would result in significant short-term vibration impacts to on-campus uses during construction, for which no project-specific mitigation measures are feasible. This impact would be significant and unavoidable, consistent with the findings of the 2005 LRDP EIR for development on the East Campus. Therefore, a Mitigated Negative Declaration (MND) in accordance with CEQA is the appropriate environmental document for the proposed Project.

The Draft Initial Study/Mitigated Negative Declaration was released for a 30-day public review period that concluded on May 4, 2016. The Draft Initial Study was provided to approximately 36 interested agencies and individuals; it was also made available on the UCR Architects & Engineers website and at the UCR Capital Asset Strategies offices. Two letters were received during the public review period, one letter from the State Clearinghouse acknowledging compliance with CEQA review requirements, and one comment letter from the California Department of Transportation [Caltrans] stating that they have no comments, but want to be notified of any changes to the proposed Project.

This document is the Final Initial Study/Mitigated Negative Declaration for the UCR MRB1 Project. The document includes:

- The letter from State Clearinghouse;
- The comment letter received from Caltrans and the University’s response;
- Mitigation Monitoring and Reporting Program
- Draft Initial Study/Mitigated Negative Declaration, April 2016 (included in Attachment A).

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SECTION 2.0 PUBLIC COMMENT LETTERS AND UNIVERSITY RESPONSES

The University received the attached letter from the Governor's Office of Planning and Research, State Clearinghouse and Planning Unit documenting compliance with CEQA review requirements. As to the acknowledgement of CEQA compliance, no response is required.

Caltrans sent its letter directly to the University. The comment letter followed by the University responses is attached. The number provided in the right margin of the letter corresponds to the response to comments.

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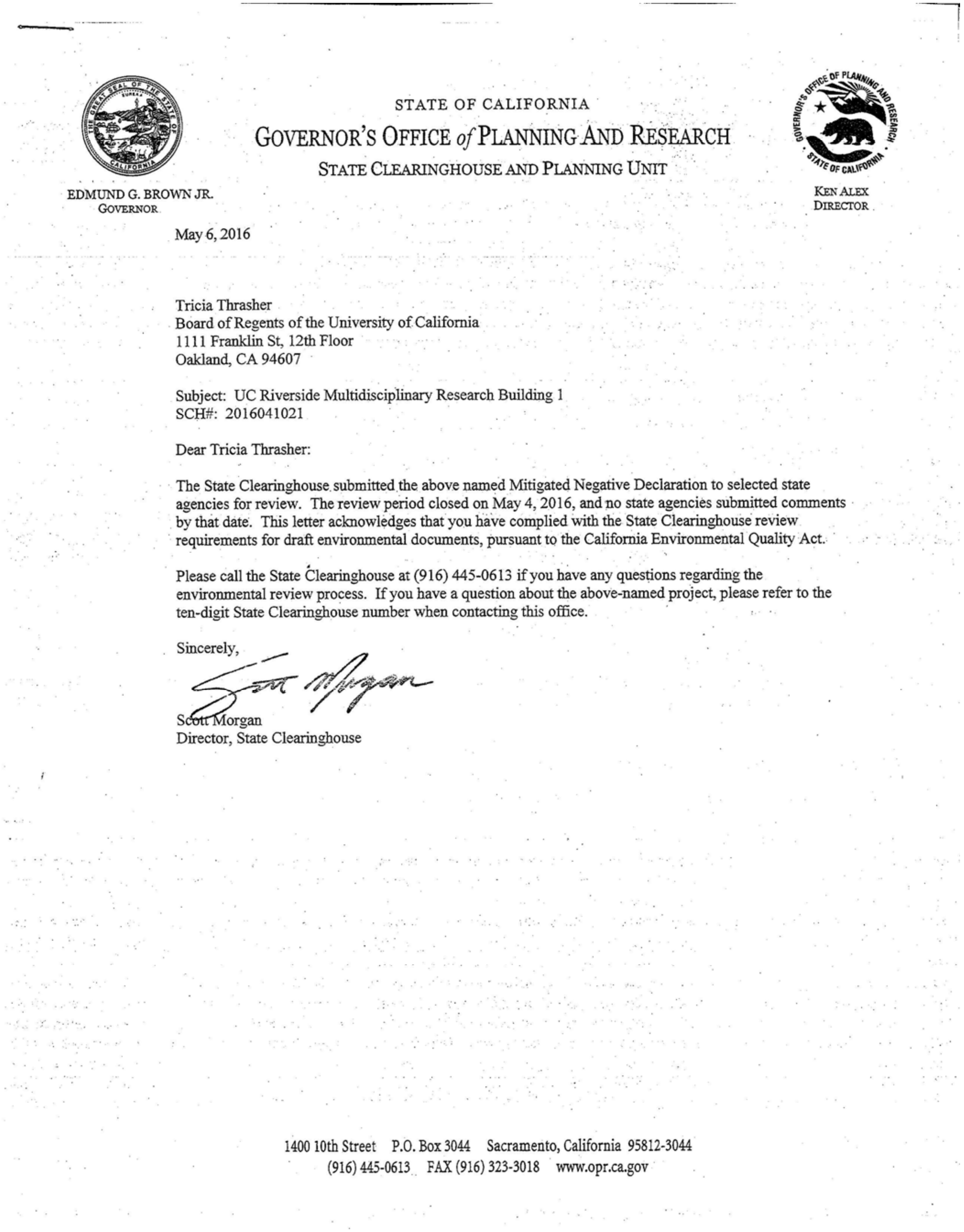


STATE OF CALIFORNIA
GOVERNOR'S OFFICE *of* PLANNING AND RESEARCH
STATE CLEARINGHOUSE AND PLANNING UNIT

EDMUND G. BROWN JR.
GOVERNOR

KEN ALEX
DIRECTOR

May 6, 2016

Tricia Thrasher
Board of Regents of the University of California
1111 Franklin St, 12th Floor
Oakland, CA 94607

Subject: UC Riverside Multidisciplinary Research Building 1
SCH#: 2016041021

Dear Tricia Thrasher:

The State Clearinghouse submitted the above named Mitigated Negative Declaration to selected state agencies for review. The review period closed on May 4, 2016, and no state agencies submitted comments by that date. This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act.

Please call the State Clearinghouse at (916) 445-0613 if you have any questions regarding the environmental review process. If you have a question about the above-named project, please refer to the ten-digit State Clearinghouse number when contacting this office.

Sincerely,

Scott Morgan

Scott Morgan
Director, State Clearinghouse

1400 10th Street P.O. Box 3044 Sacramento, California 95812-3044
(916) 445-0613 FAX (916) 323-3018 www.opr.ca.gov

Document Details Report
State Clearinghouse Data Base

SCH# **2016041021**
Project Title UC Riverside Multidisciplinary Research Building 1
Lead Agency University of California, Riverside

Type **MND** Mitigated Negative Declaration

Description UCR proposes the construction of a new up to 190,000 gsf Multidisciplinary Research Building 1 (MRB1). The proposed MRB1 project would provide a wet and dry research laboratories and related laboratory support spaces, along with research cores that include a vivarium; offices; scholarly activity and interactive spaces; and program support facilities. MRB1 would also involve the implementation of open space, landscape, and hardscape areas and installation of lighting and utility infrastructure. No new parking facilities/spaces would be added with implementation of the proposed project, with the exception of parking for service vehicles and Americans with Disabilities Act accessible parking.

Lead Agency Contact

Name Tricia Thrasher
Agency Board of Regents of the University of California
Phone 951-827-1484 ***Fax***
email
Address 1111 Franklin St, 12th Floor
City Oakland ***State*** CA ***Zip*** 94607

Project Location

County Riverside
City Riverside
Region
Lat / Long 33° 58' 36.6" N / -117° 19' 39.3" W
Cross Streets Aberdeen Dr and North Campus Dr
Parcel No.
Township ***Range*** ***Section*** ***Base***

Proximity to:

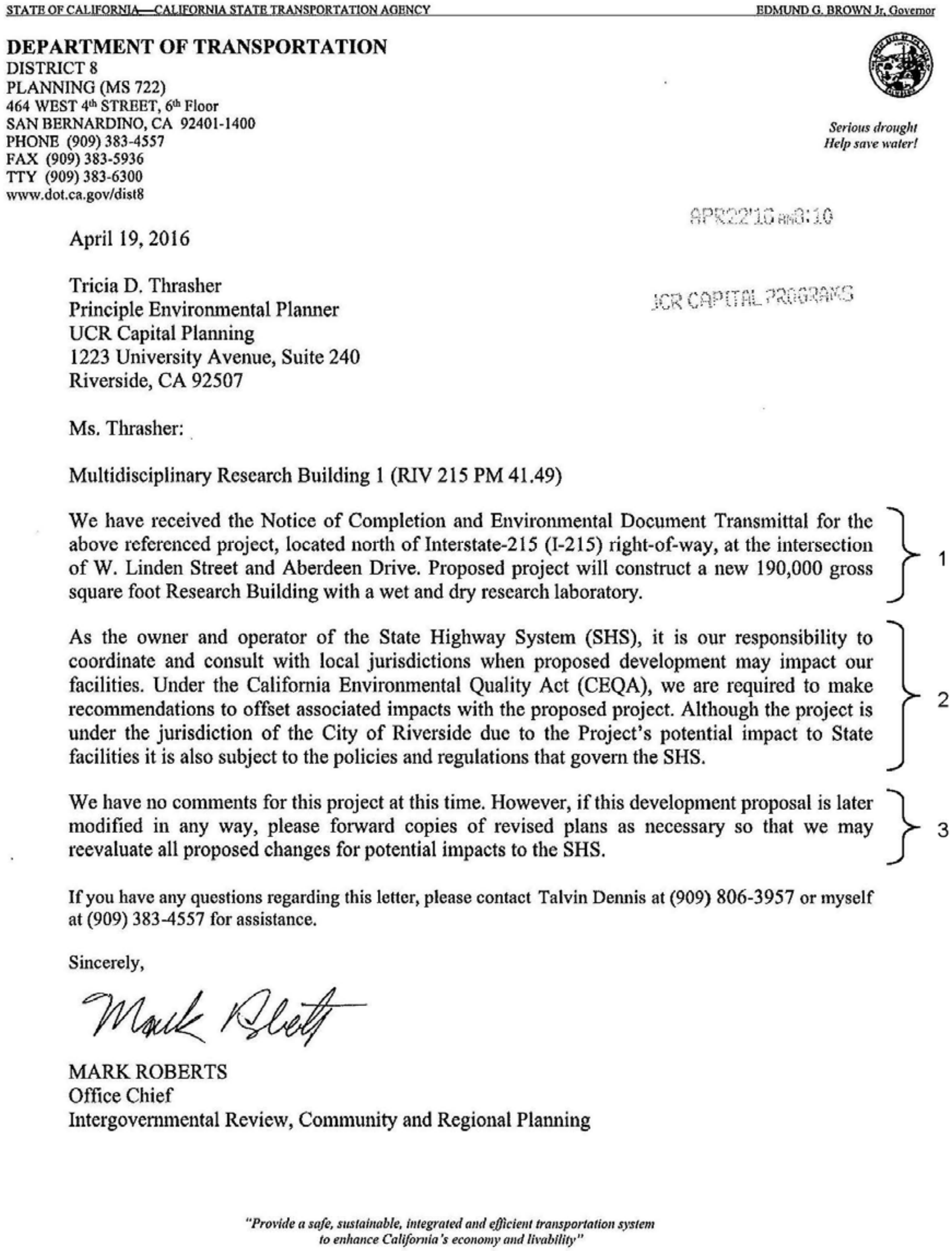
Highways 215, 60, 91
Airports
Railways BNSF
Waterways
Schools Highland, Hyatt, North
Land Use Long Range Development Plan Designation: Academic

Project Issues Aesthetic/Visual; Air Quality; Archaeologic-Historic; Biological Resources; Drainage/Absorption; Geologic/Seismic; Noise; Public Services; Sewer Capacity; Soil Erosion/Compaction/Grading; Solid Waste; Toxic/Hazardous; Traffic/Circulation; Vegetation; Water Quality; Landuse; Other Issues

Reviewing Agencies Resources Agency; Department of Fish and Wildlife, Region 6; Department of Parks and Recreation; Department of Water Resources; California Highway Patrol; Caltrans, District 8; Air Resources Board; Regional Water Quality Control Board, Region 2; Department of Toxic Substances Control; Native American Heritage Commission

Date Received 04/05/2016 ***Start of Review*** 04/05/2016 ***End of Review*** 05/04/2016

Note: Blanks in data fields result from insufficient information provided by lead agency.



STATE OF CALIFORNIA—CALIFORNIA STATE TRANSPORTATION AGENCY EDMUND G. BROWN Jr, Governor

DEPARTMENT OF TRANSPORTATION
DISTRICT 8
PLANNING (MS 722)
464 WEST 4th STREET, 6th Floor
SAN BERNARDINO, CA 92401-1400
PHONE (909) 383-4557
FAX (909) 383-5936
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UCR CAPITAL PROGRAMS

April 19, 2016

Tricia D. Thrasher
Principle Environmental Planner
UCR Capital Planning
1223 University Avenue, Suite 240
Riverside, CA 92507

Ms. Thrasher:

Multidisciplinary Research Building 1 (RIV 215 PM 41.49)

We have received the Notice of Completion and Environmental Document Transmittal for the above referenced project, located north of Interstate-215 (I-215) right-of-way, at the intersection of W. Linden Street and Aberdeen Drive. Proposed project will construct a new 190,000 gross square foot Research Building with a wet and dry research laboratory. 1

As the owner and operator of the State Highway System (SHS), it is our responsibility to coordinate and consult with local jurisdictions when proposed development may impact our facilities. Under the California Environmental Quality Act (CEQA), we are required to make recommendations to offset associated impacts with the proposed project. Although the project is under the jurisdiction of the City of Riverside due to the Project's potential impact to State facilities it is also subject to the policies and regulations that govern the SHS. 2

We have no comments for this project at this time. However, if this development proposal is later modified in any way, please forward copies of revised plans as necessary so that we may reevaluate all proposed changes for potential impacts to the SHS. 3

If you have any questions regarding this letter, please contact Talvin Dennis at (909) 806-3957 or myself at (909) 383-4557 for assistance.

Sincerely,

Mark Roberts

MARK ROBERTS
Office Chief
Intergovernmental Review, Community and Regional Planning

"Provide a safe, sustainable, integrated and efficient transportation system to enhance California's economy and livability"

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Response to Comment Letter 2

California Department of Transportation (Caltrans)
April 19, 2016

1. The commenter accurately identifies the proposed Project as presented in the Draft Initial Study/Mitigated Negative Declaration (IS/MND). No response is required.

2. The commenter describes its responsibility with respect to coordination with local agencies. Although the Project is under the jurisdiction of the University of California, not the City of Riverside, as noted by the commenter, the Project would not have a significant impact on the State Highway System and no further action on the part of Caltrans is required.

3. The commenter notes that they have no comments on the report, but want to be notified of any Project changes. No response is required.

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SECTION 3.0 MITIGATION MONITORING AND REPORTING PROGRAM

3.1 INTRODUCTION

The California Environmental Quality Act (CEQA) requires the adoption of feasible mitigation measures to reduce the severity and magnitude of potentially significant environmental impacts associated with project development. The Final Initial Study/Mitigated Negative Declaration (IS/MND) for the proposed UCR Multidisciplinary Research Building 1 (MRB1) project (proposed Project) (State Clearinghouse No. 2016041021) analyzes the impacts of the proposed Project, which includes all relevant mitigation measures (MMs) and campus programs and practices (PPs) carried forward from the LRDP EIR. This Mitigation Monitoring and Reporting Program (MMRP), which identifies the LRDP EIR PPs and MMs included as part of the Project description and two new project-specific mitigation measures related to air quality and cultural resources, obligates the University to implement the identified PPs and MMs. The MMRP will be reviewed by the University of California Board of Regents (The Regents), in conjunction with consideration for approval of the proposed Project and adoption of the Final IS/MND.

Monitoring of the PPs and MMs identified in the MMRP is required by Public Resources Code Section 21081.6. Following adoption of the Final IS/MND and approval of this MMRP by The Regents, the PPs and MMs from the LRDP EIR included as part of the Project description would be monitored in conjunction with UCR's annual LRDP EIR Mitigation Monitoring Program and reporting process.

Purpose

The purpose of the MMRP is to ensure compliance with all PPs and MMs to avoid or reduce adverse environmental impacts resulting from construction and operation of the proposed Project, which were identified in the IS/MND. The implementation of the applicable PPs and MMs shall be performed by the University, consulting architects, contractors, and appropriate agencies during the following:

- Development of the design
- Preparation of the construction contracts
- Construction phase
- Project operation

Project Description

The proposed MRB1 project is located on North Campus Drive, east of the soccer field, west of Aberdeen Drive, south of the Student Recreation Center, and north of the existing Materials Science and Engineering (MS&E) Building on UCR's East Campus. The proposed MRB1 Project involves construction and operation of a new 4- to 5-level (including 1 subterranean lower level) and up to 190,000-gsf building, at the northern end of the campus academic core, on the approximately 0.8-acre building site. The proposed Project would provide wet and dry research laboratories and related laboratory support spaces, along with research cores that include a vivarium; offices; scholarly activity and interactive spaces; and program support facilities. Programmatically, the building would host multiple scientific disciplines, including the some of the campus' most popular programs such as biology and chemistry. The proposed MRB1 would be designed and constructed to achieve a minimum LEED™ (Leadership in Energy and Environmental Design) "Silver" rating.

The proposed Project would also involve the implementation of open space, landscape, and hardscape areas and installation of lighting and utility infrastructure. No new parking facilities/spaces would be added with implementation of the proposed Project, with the exception of parking for service vehicles and Americans with Disabilities Act (ADA) accessible parking.

It is expected that the proposed MRB1 would accommodate a population of approximately 400 individuals; the analysis in the IS/MND assumes that all 400 positions would be new to the campus. This increase would fall within the population projections assumed in the 2005 LRDP Amendment 2 approved in November 2011.

Construction of the proposed Project is anticipated to begin in August 2016 with substantial completion by October 2018. Potential construction traffic routes have been identified to efficiently move construction vehicles. There are two options being considered for local construction access. The proposed/preferred access would involve construction of a new all-weather roadway extending from University Avenue between Canyon Crest Drive and Parking Lot 19, and the alternative access would involves construction of an access road from the south end of Parking Lot 25.

Monitoring Procedures

The Environmental Planning staff from Capital Planning, Capital Asset Strategies would be responsible for coordinating the reporting of compliance with the measures listed in this MMRP, including

- Coordination with the project manager (PM) and project inspector from the UCR Architects and Engineers office, who would be responsible for ensuring that design and construction contracts contain the relevant mitigation measures adopted in the Final IS/MND, and that mitigation measures are implemented during the design and construction phases of the Project.
- Coordination and assistance to other Campus units and/or Departments with monitoring and reporting responsibilities to ensure that they understand their charge and complete their reporting procedures accurately and on schedule, during construction and on-going project operations.

In general, monitoring will consist of demonstrating that mitigation measures were implemented and that the responsible units monitored the implementation of the measures. Monitoring will consist of determining whether the following occurred:

- Specific issues were considered in the design development phase
- Construction contracts included the specified provisions
- Certain actions occurred prior to construction
- The required measures were acknowledged and implemented during construction of the project

Reporting Procedures

Monitoring of applicable LRDP PPs and MMs included as part of the Project will be reported through the established LRDP EIR Mitigation Monitoring and Reporting Program process.

Monitoring and reporting of project-specific mitigation measures will consist of responsible entities verifying that the relevant mitigation measures were implemented and documentation confirming compliance. UCR Capital Planning, Capital Asset Strategies office will coordinate and maintain the reporting records.

3.2 LIST OF CAMPUS PROGRAMS, PRACTICES AND PROCEDURES AND MITIGATION MEASURES

Table 1 lists the MMs and PPs from the certified LRDP EIR applicable to and included as part of the MRB1 Project description, the timing for these measures, and project specific mitigation as identified in the Final IS/MND. Detailed information regarding the Category, Responsible UCR Unit, and Compliance Action for LRDP EIR MMs and PPs is presented in the MMRP included in the LRDP EIR. Note that there are two project-specific mitigation measures (MM MRB1 AQ-1 and MM MRB1 CULT-1) and they are presented in **bold** text.

TABLE 1
PROJECT-LEVEL MITIGATION MEASURES AND LRDP EIR CAMPUS PROGRAMS, PRACTICES AND PROCEDURES AND MITIGATION MEASURES INCLUDED AS PART OF THE MULTIDISCIPLINARY RESEARCH BUILDING 1 PROJECT

MM and PP Number	Mitigation Timing	Project- and LRDP-level Mitigation Measure(s) (MMs) and LRDP Campus Programs, Practices, and Procedures (PPs)
		Aesthetics
PP 4.1-1	Programming and Design	The Campus shall provide design professionals with the 2007 Campus Design Guidelines and instructions to implement the guidelines, including those sections related to use of consistent scale and massing, compatible architectural style, complementary color palette, preservation of existing site features, and appropriate site and exterior lighting design. *(This is identical to Land Use PP 4.9-1[a])*.
PP 4.1-2(a)	Programming and Design	The Campus shall continue to provide design professionals with the 2007 Campus Design Guidelines and instructions to develop project-specific landscape plans that are consistent with the Guidelines with respect to the selection of plants, retention of existing trees, and use of water conserving plants, where feasible. *(This is identical to Land Use PP 4.9-1[b]).*
PP 4.1-2(b)	Design and Construction	The Campus shall continue to relocate, where feasible, mature "specimen" trees that would be removed as a result of construction activities on the campus. *(This is identical to Land Use PP 4.9-1[c]).*
PP 4.1-2(d)	Design, Construction	To reduce disturbance of Natural and Naturalistic Open Space areas: (i) Unnecessary driving in sensitive or otherwise undisturbed areas shall be avoided. New roads or construction access roads would not be created where adequate access already exists. (ii) Removal of native shrub or brush shall be avoided, except where necessary. (iii) Drainages shall be avoided, except where required for construction. Limit activity to crossing drainages rather than using the lengths of drainage courses for access. (iv) Excess fill or construction waste shall not be dumped in washes. (v) Vehicles or other equipment shall not be parked in washes or other drainages. (vi) Overwatering shall be avoided in washes and other drainages. (vii) Wildlife including species such as fox, coyote, snakes, etc. shall not be harassed. Harassment includes shooting, throwing rocks, etc. *(This is identical to Biological Resources PP 4.4-1(b) and Hydrology PP 4.8-3[b])*
MM 4.1-3(a)	Design	Building materials shall be reviewed and approved as part of project-specific design and through approval of construction documents. Mirrored, reflective glass is prohibited on campus.
MM 4.1-3(b)	Design	All outdoor lighting on campus resulting from new development shall be directed to the specific location intended for illumination (e.g., roads, walkways, or recreation fields) to prevent stray light spillover onto adjacent residential areas. In addition, all fixtures on elevated light standards in parking lots, parking structures, and athletic fields shall be shielded to reduce glare. Lighting plans shall be reviewed and approved prior to project-specific design and construction document approval.

TABLE 1 (Continued)
PROJECT-LEVEL MITIGATION MEASURES AND LRDP EIR CAMPUS PROGRAMS, PRACTICES AND PROCEDURES AND MITIGATION MEASURES INCLUDED AS PART OF THE MULTIDISCIPLINARY RESEARCH BUILDING 1 PROJECT

MM and PP Number	Mitigation Timing	Project- and LRDP-level Mitigation Measure(s) (MMs) and LRDP Campus Programs, Practices, and Procedures (PPs)
		Air Quality
PP 4.3-1	Operation	The Campus shall continue to implement a Transportation Demand Management program that meets or exceeds all trip reduction and AVR requirements of the SCAQMD. The TDM program may be subject to modification as new technologies are developed or alternate program elements are found to be more effective. *(This is identical to Transportation and Traffic PP 4.14-1)*.
PP 4.3-2(a)	Construction	Construction contract specifications shall include the following: (i) Compliance with all SCAQMD rules and regulations (ii) Maintenance programs to assure vehicles remain in good operating condition (iii) Avoid unnecessary idling of construction vehicles and equipment (iv) Use of alternative fuel construction vehicles (v) Provision of electrical power to the site, to eliminate the need for on-site generators
PP 4.3-2(b)	Construction	The Campus shall continue to implement dust control measures consistent with SCAQMD Rule 403—Fugitive Dust during the construction phases of new project development. The following actions are currently recommended to implement Rule 403 and have been quantified by the SCAQMD as being able to reduce dust generation between 30 and 85 percent depending on the source of the dust generation. The Campus shall implement these measures as necessary to reduce fugitive dust. Individual measures shall be specified in construction documents and require implementation by construction contractor: (i) Apply water and/or approved non-toxic chemical soil stabilizers according to manufacturer's specification to all inactive construction areas (previously graded areas that have been inactive for 10 or more days) (ii) Replace ground cover in disturbed areas as quickly as possible (iii) Enclose, cover, water twice daily, or apply approved chemical soil binders to exposed piles with 5 percent or greater silt content (iv) Water active grading sites at least twice daily (v) Suspend all excavating and grading operations when wind speeds (as instantaneous gusts) exceed 25 miles per hour over a 30-minute period (vi) All trucks hauling dirt, sand, soil, or other loose materials shall be covered or maintain at least two feet of freeboard (i.e., minimum vertical distance between top of the load and the top of the trailer), in accordance with Section 23114 of the California Vehicle Code (vii) Sweep streets at the end of the day if visible soil material is carried over to adjacent roads (viii) Install wheel washers where vehicles enter and exit unpaved roads onto paved roads, or wash off trucks and any equipment leaving the site each trip (ix) Apply water three times daily or chemical soil stabilizers according to manufacturers' specifications to all unpaved parking or staging areas or unpaved road surfaces (x) Post and enforce traffic speed limits of 15 miles per hour or less on all unpaved roads *(This is identical to Geology PP 4.6-2(a) and Hydrology PP 4.8-3[c])*.
MM 4.3-1(a)	Construction	For each construction project on the campus, the project contractor will implement Programs and Practices 4.3-2(a) and 4.3-2(b). In addition, the following PM10 and PM2.5 control measure shall be implemented for each construction project: • Post a publicly visible sign with the telephone number and person to contact at the lead agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The phone number of the District shall also be visible to ensure compliance.

TABLE 1 (Continued)
PROJECT-LEVEL MITIGATION MEASURES AND LRDP EIR CAMPUS PROGRAMS, PRACTICES AND PROCEDURES AND MITIGATION MEASURES INCLUDED AS PART OF THE MULTIDISCIPLINARY RESEARCH BUILDING 1 PROJECT

MM and PP Number	Mitigation Timing	Project- and LRDP-level Mitigation Measure(s) (MMs) and LRDP Campus Programs, Practices, and Procedures (PPs)
MM 4.3-1(b)	Construction	For each construction project on the campus, the University shall require that the project include a construction emissions control plan that includes a comprehensive inventory of all off-road construction equipment, equal to or greater than 50 horsepower, that will be used for an aggregate of 40 or more hours during any portion of the construction project. During construction activity, the contractor shall utilize CARB certified equipment or better for all on-site construction equipment according to the following schedule: • January 1, 2011 to December 31, 2011: All off-road diesel-powered construction equipment greater than 50 hp shall meet Tier 2 off-road emissions standards. In addition, all construction equipment shall be outfitted with the BACT devices certified by CARB. Any emissions control device used by the contractor shall achieve emissions reductions that are no less than what could be achieved by a Level 2 or Level 3 diesel emissions control strategy for a similarly sized engine as defined by CARB regulations.[1] • January 1, 2012 to December 31, 2014: All off-road diesel-powered construction equipment greater than 50 hp shall meet Tier 3 off-road emissions standards. In addition, all construction equipment shall be outfitted with BACT devices certified by CARB. Any emissions control device used by the contractor shall achieve emissions reductions that are no less than what could be achieved by a Level 3 diesel emissions control strategy for a similarly sized engine as defined by CARB regulations.[2] • Post January 1, 2015: All off-road diesel-powered construction equipment greater than 50 hp shall meet the Tier 4 emission standards, where available. In addition, all construction equipment shall be outfitted with BACT devices certified by CARB. Any emissions control device used by the contractor shall achieve emissions reductions that are no less than what could be achieved by a Level 3 diesel emissions control strategy for a similarly sized engine as defined by CARB regulations. • A copy of each unit's certified specification, BACT documentation and CARB or SCAQMD operating permit shall be provided at the time of mobilization of each applicable unit or equipment. • Encourage construction contractors to apply for AQMD 'SOON" funds. Incentives could be provided for those construction contractors who apply for AQMD "SOON" funds. The "SOON" program provides funds to accelerate clean-up of off-road diesel vehicles, such as heavy duty construction equipment. More information on this program can be found at the following website: http://www.aqmd.gov/tao/implementation/soonprogram.htm The contractor shall also implement the following measures during construction: • Prohibit vehicle and engine idling in excess of 5 minutes and ensure that all off-road equipment is compliant with the California Air Resources Board's (CARB) in-use off-road diesel vehicle regulation and SCAQMD Rule 2449. • Configure construction parking to minimize traffic interference. • Provide temporary traffic controls such as a flag person, during all phases of construction to maintain smooth traffic flow.

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[1] The time frame for this component of MM 4.3-1(b) has passed and the more restrictive requirements defined are applicable.

[2] Although the time frame for this component has passed, the use of Tier 3 equipment is required where Tier 4 equipment is not available.

TABLE 1 (Continued) PROJECT-LEVEL MITIGATION MEASURES AND LRDP EIR CAMPUS PROGRAMS, PRACTICES AND PROCEDURES AND MITIGATION MEASURES INCLUDED AS PART OF THE MULTIDISCIPLINARY RESEARCH BUILDING 1 PROJECT

MM and PP Number	Mitigation Timing	Project- and LRDP-level Mitigation Measure(s) (MMs) and LRDP Campus Programs, Practices, and Procedures (PPs)
		• Provide dedicated turn lanes for movement of construction trucks and equipment on- and off site. • Schedule construction activities that affect traffic flow on the arterial system to off-peak hour to the extent practicable. • Improve traffic flow by signal synchronization, and ensure that all vehicles and equipment will be properly tuned and maintained according to manufacturers' specifications. • Use diesel-powered construction vehicles and equipment that operate on low-NOx fuel where possible. • Reroute construction trucks away from congested streets or sensitive receptor areas. • Maintain and tune all vehicles and equipment according to manufacturers' specifications.
MM 4.3-1(c)	Construction	To minimize VOC emissions from the painting/finishing phase, for each construction project on the campus, the project contractor will implement the following VOC control measures: • Construct or build with materials that do not require painting, or use pre-painted construction materials. • If appropriate materials are not available or are cost-prohibitive, use low VOC-content materials more stringent than required under SCAQMD Rule 1113.
MM 4.3-2(b)	Operation	UCR shall continue to participate in greenhouse gas (GHG) reduction programs such as the American College and University Presidents' Climate Commitment (ACUPCC) and shall adhere to the UC Policy on Sustainable Practices. The measures adopted by UCR are presented in Tables 4.16-9 and 4.16-10 in Section 4.16 Greenhouse Gas Emissions of the 2005 LRDP Amendment 2 EIR. While these measures are typically targeted at GHG emissions, many act to reduce energy consumption and vehicle use on campus and would consequently also reduce air pollutant emissions from both area and mobile sources. In accordance with the ACUPCC and the UC Policy on Sustainable Practices and through implementation of its Climate Action Plan, UCR shall commit to reducing GHG emissions to 1990 levels by 2020, which would require significant reductions (on the order of 70 percent) from these sources in terms of GHG and therefore reductions in other air pollutants as well.
MM MRB1 AQ-1	**Construction**	**The Campus shall ensure that the contractor specifications require that the average VOC content of interior architectural coatings does not exceed 100 grams per liter (g/l) and the average VOC content of exterior architectural coatings does not exceed 150 g/l. This measure does not relieve the requirement that individual coatings must comply with the current requirements of SCAQMD Rule 1113, Architectural Coatings.**

TABLE 1 (Continued)
PROJECT-LEVEL MITIGATION MEASURES AND LRDP EIR CAMPUS PROGRAMS, PRACTICES AND PROCEDURES AND MITIGATION MEASURES INCLUDED AS PART OF THE MULTIDISCIPLINARY RESEARCH BUILDING 1 PROJECT

MM and PP Number	Mitigation Timing	Project- and LRDP-level Mitigation Measure(s) (MMs) and LRDP Campus Programs, Practices, and Procedures (PPs)
		Biological Resources
MM 4.4-4(a)	Pre-Construction	Prior to the onset of construction activities that would result in the removal of mature trees that would occur between March and mid-August, surveys for nesting special status avian species and raptors shall be conducted on the affected portion of the campus following USFWS and/or CDFG guidelines. If no active avian nests are identified on or within 250 feet of the construction site, no further mitigation is necessary.
MM 4.4-4(b)	Pre-construction and Construction	If active nests for avian species of concern or raptor nests are found within the construction footprint or a 250-foot buffer zone, exterior construction activities shall be delayed within the construction footprint and buffer zone until the young have fledged or appropriate mitigation measures responding to the specific situation have been developed and implemented in consultation with USFWS and CDFG.
		Cultural Resources
PP 4.5-4	Construction	Construction specifications shall require that if a paleontological resource is uncovered during construction activities: (i) A qualified paleontologist shall determine the significance of the find. (ii) The Campus shall make an effort to preserve the find intact through feasible project design measures. (iii) If it cannot be preserved intact, then the University shall retain a qualified non-University paleontologist to design and implement a treatment plan to document and evaluate the data and/or preserve appropriate scientific samples. (iv) The paleontologist shall prepare a report of the results of the study, following accepted professional practice. (v) Copies of the report shall be submitted to the University and the Riverside County Museum.
PP 4.5-5	Construction	In the event of the discovery of a burial, human bone, or suspected human bone, all excavation or grading in the vicinity of the find shall halt immediately and the area of the find shall be protected and the University immediately shall notify the Riverside County Coroner of the find and comply with the provisions of P.R.C. Section 5097 with respect to Native American involvement, burial treatment, and re-burial, if necessary.
MM MRB1 CULT-1	**Construction**	**If a paleontological or archaeological resource is discovered during construction, all soil-disturbing work within 100 feet of the find shall cease and the University Representative shall contact a qualified archaeologist meeting the Secretary of Interior standards within 24 hours of discovery to inspect the site. If a resource within the project area of potential effect is determined to qualify as a unique archaeological resources (as defined by CEQA), the University shall devote adequate time and funding to determine if it is feasible, through project design measures to preserve the find intact. If it cannot be preserved the University shall retain a qualified non-University paleontologist/archaeologist to 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 finding that meets professional standards.** **a. If significant Native American cultural resources are discovered, as determined by the consulting archaeologist for which a Treatment Plan must be prepared, the Design- builder or his archaeologist shall immediately contact the University Representative. The University Representative shall contact the appropriate Tribal representatives.**

TABLE 1 (Continued)
PROJECT-LEVEL MITIGATION MEASURES AND LRDP EIR CAMPUS PROGRAMS, PRACTICES AND PROCEDURES AND MITIGATION MEASURES INCLUDED AS PART OF THE MULTIDISCIPLINARY RESEARCH BUILDING 1 PROJECT

MM and PP Number	Mitigation Timing	Project- and LRDP-level Mitigation Measure(s) (MMs) and LRDP Campus Programs, Practices, and Procedures (PPs)
		b. If requested by Tribal representatives, the University, the Design-builder or his project archaeologist shall in good faith, consult on the discovery and its disposition (e.g. avoidance, preservation, return of artifacts to tribe, etc.). **c. In the event of the discovery of a burial, human bone, or suspected human bone, all excavation or grading in the vicinity of the find shall halt immediately and the area of the find shall be protected and the University immediately shall notify the Riverside County Coroner of the find and comply with the provisions of State Health & Safety Cod § 7050.5.**
Geology and Soils		
PP 4.6-1(a)	Design	During project-specific building design, a site-specific geotechnical study shall be conducted under the direct supervision of a California Registered Engineering Geologist or licensed geotechnical engineer to assess seismic, geological, soil, and groundwater conditions at each construction site and develop recommendations to prevent or abate any identified hazards. The study shall follow applicable recommendations of CDMG Special Publication 117 and shall include, but not necessarily be limited to – Determination of the locations of any suspected fault traces and anticipated ground acceleration at the building site – Potential for displacement caused by seismically induced shaking, fault/ground surface rupture, liquefaction, differential soil settlement, expansive and compressible soils, landsliding, or other earth movements or soil constraints – Evaluation of depth to groundwater The structural engineer shall incorporate the recommendations made by the geotechnical report when designing building foundations.
PP 4.6-1(c)	Design	The Campus will continue to fully comply with the University of California's Policy for Seismic Safety, as amended. The intent of this policy is to ensure that the design and construction of new buildings and other facilities shall, as a minimum, comply with seismic provisions of California Code of Regulations, Title 24, California Administrative Code, the California State Building Code, or local seismic requirements, whichever requirements are most stringent.
Greenhouse Gas Emissions		
MM 4.16-1	Design and Operation	All projects developed under the amended 2005 LRDP shall be evaluated for consistency with the GHG reduction policies of the UCR CAP and the UC Policy on Sustainable Practices, as may be updated from time to time by the University. GHG reduction measures, including, but not limited to, those found within the UCR CAP and UC Policy identified in Tables 4.16-9 and 4.16-10 shall be incorporated in all campus projects so that at a minimum an 8 percent reduction in emissions from BAU is achieved. It is expected that the GHG reduction measures in the UCR CAP will be refined from time to time, especially in light of the evolving regulations and as more information becomes available regarding the effectiveness of specific GHG reduction measures. As part of the implementation of the UCR CAP, the Campus will also monitor its progress in reducing GHG emissions to ensure it will attain the established targets.

TABLE 1 (Continued)
PROJECT-LEVEL MITIGATION MEASURES AND LRDP EIR CAMPUS PROGRAMS, PRACTICES AND PROCEDURES AND MITIGATION MEASURES INCLUDED AS PART OF THE MULTIDISCIPLINARY RESEARCH BUILDING 1 PROJECT

MM and PP Number	Mitigation Timing	Project- and LRDP-level Mitigation Measure(s) (MMs) and LRDP Campus Programs, Practices, and Procedures (PPs)
Hazards and Hazardous Materials		
PP 4.7-1	Operation	The Campus shall continue to implement the current (or equivalent) health and safety plans, programs, and practices related to the use, storage, disposal, or transportation of hazardous materials, including, but not necessarily limited to, the Business Plan, the Broadscope Radioactive Materials License, and the following programs: Biosafety, Emergency Management, Environmental Health, Hazardous Materials, Industrial Hygiene and Safety, Laboratory/Research Safety, Radiation Safety, and Integrated Waste Management. These programs may be subject to modification as more stringent standards are developed or if the programs are replaced by other programs that incorporate similar health and safety protection measures.
PP 4.7-3	Operation	The campus will inform employees and students of hazardous materials minimization strategies applicable to research, maintenance, and instructional activities, and require the implementation of these strategies where feasible. Strategies include but are not limited to the following: (i) Maintenance of online database by EH&S of available surplus chemicals retrieved from laboratories to minimize ordering or new chemicals. (ii) Shifting from chemical usage to micro techniques as standard practice for instruction and research, as better technology becomes available.
PP 4.7-7(a)	Construction	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 appropriate signage indicating alternative routes. *(This is identical to Transportation and Traffic PP 4.14-5)*.
PP 4.7-7(b)	Construction	To maintain adequate access for emergency vehicles when construction projects would result in roadway closures, Architects & Engineers (formerly the Office of Design and Construction) shall consult with the UCPD, EH&S, and the RFD to disclose roadway closures and identify alternative travel routes. *(This is identical to Transportation and Traffic PP 4.14-8)*.
MM 4.7-7(b)	Operation	The campus Emergency Operations Plan shall be reviewed on an annual basis and updated as appropriate to account for new on-campus development, which may require changes to the plan, such as revised locations for Campus Evacuation Zones.
Hydrology and Water Quality		
PP 4.8-1	Design, Construction and Operation	The Campus will continue to comply with all applicable water quality requirements established by the SARWQCB. *(This is identical to Utilities PP 4.15-5).*
PP 4.8-2(a)	Design and Operation	To further reduce the campus' impact on domestic water resources, to the extent feasible, UCR will (i) Install hot water recirculation devices (to reduce water waste) (ii) Continue to require all new construction to comply with applicable State laws requiring water-efficient plumbing fixtures, including but not limited to the Health and Safety Code and Title 24, California Code of Regulations, Part 5 (California Plumbing Code) (iii) Retrofit existing plumbing fixtures that do not meet current standards on a phased basis over time (iv) Install recovery systems for losses attributable to existing and proposed steam and chilled-water systems (v) Prohibit using water as a means of cleaning impervious surfaces

TABLE 1 (Continued) PROJECT-LEVEL MITIGATION MEASURES AND LRDP EIR CAMPUS PROGRAMS, PRACTICES AND PROCEDURES AND MITIGATION MEASURES INCLUDED AS PART OF THE MULTIDISCIPLINARY RESEARCH BUILDING 1 PROJECT

MM and PP Number	Mitigation Timing	Project- and LRDP-level Mitigation Measure(s) (MMs) and LRDP Campus Programs, Practices, and Procedures (PPs)
		(vi) Install water-efficient irrigation equipment to maximize water savings for landscaping and retrofit existing systems over time *(This is identical to Utilities PP 4.15-1[b]).*
PP 4.8-2(b)	Operation	The Campus shall promptly detect and repair leaks in water and irrigation pipes. *(This is identical to Utilities PP 4.15-1[c]).*
PP 4.8-3(e)	Design	Prior to the time of design approval, the Campus will evaluate each specific project to determine if the project runoff would exceed the capacity of the existing storm drain system. If it is found that the capacity would be exceeded, one or more of the following components of the storm drain system would be implemented to minimize the occurrence of local flooding: (i) Multi-project stormwater detention basins (ii) Single-project detention basins (iii) Surface detention design (iv) Expansion or modification of the existing storm drain system (v) Installation of necessary outlet control facilities
Land Use and Planning		
See reference to Land Use and Planning PPs in other sections.		
Noise		
PP 4.10-1(a)	Design	UCR will incorporate the following siting design measures to reduce long-term noise impacts: (i) Truck access, parking area design, and air conditioning/refrigeration units will be designed and evaluated when planning specific individual new facilities to minimize the potential for noise impacts to adjacent developments. (ii) Building setbacks, building design and orientation will be used to reduce intrusive noise at sensitive student residential and educational building locations near main campus access routes, such as Blaine Street, Canyon Crest Drive, University Avenue, and Martin Luther King Jr. Boulevard. Noise walls may be advisable to screen existing and proposed facilities located near the I-215/SR-60 freeway. (iii) Adequate acoustic insulation would be added to residence halls to ensure that the interior Ldn would not exceed 45 dBA during the daytime and 40 dBA during the nighttime (10 PM to 7 AM) in rooms facing major streets. (iv) Potential noise impacts would be evaluated as part of the design review for all projects. If determined to be significant, mitigation measures would be identified and alternatives suggested. At a minimum, campus residence halls and student housing design would comply with Title 24, Part 2 of the California Administrative Code.
PP 4.10-2	Construction	The UCR campus shall limit the hours of exterior construction activities from 7:00 AM to 9:00 PM Monday through Friday and 8:00 AM to 6:00 PM on Saturday when necessary. Construction traffic shall follow transportation routes prescribed for all construction traffic to minimize the impact of this traffic (including noise impacts) on the surrounding community.
PP 4.10-6	Design, Construction and Operation	The Campus shall continue to shield all new stationary sources of noise that would be located in close proximity to noise-sensitive buildings and uses.
PP 4.10-7(a)	Construction	To the extent feasible, construction activities shall be limited to 7:00 AM to 9:00 PM Monday through Friday, 8:00 AM to 6:00 PM on Saturday, and no construction on Sunday and national holidays, as appropriate, in order to minimize disruption to area residences surrounding the campus and to on campus uses that are sensitive to noise.

TABLE 1 (Continued)
PROJECT-LEVEL MITIGATION MEASURES AND LRDP EIR CAMPUS PROGRAMS, PRACTICES AND PROCEDURES AND MITIGATION MEASURES INCLUDED AS PART OF THE MULTIDISCIPLINARY RESEARCH BUILDING 1 PROJECT

MM and PP Number	Mitigation Timing	Project- and LRDP-level Mitigation Measure(s) (MMs) and LRDP Campus Programs, Practices, and Procedures (PPs)
PP 4.10-7(b)	Pre-construction and Construction	The Campus shall continue to require by contract specifications that construction equipment be required to be muffled or otherwise shielded. Contracts shall specify that engine-driven equipment be fitted with appropriate noise mufflers.
PP 4.10-7(c)	Construction	The Campus shall continue to require that stationary construction equipment material and vehicle staging be placed to direct noise away from sensitive receptors.
PP 4.10-7(d)	Pre-construction and Construction	The Campus shall continue to conduct regular meetings, as needed, with on campus constituents to provide advance notice of construction activities in order to coordinate these activities with the academic calendar, scheduled events, and other situations, as needed.
PP 4.10-8	Pre-construction and Construction	The Campus shall continue to conduct meetings, as needed, with off-campus 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.
MM 4.10-2	Pre-construction and Construction	The campus shall notify all academic and residential facilities within 300 feet of approved construction sites of the planned schedule of vibration causing activities so that the occupants and/or researchers can take necessary precautionary measures to avoid negative effects to their activities and/or research.
		Public Services
PP 4.12-1(a)	Design and Operation	As development occurs, the following measures will be incorporated: (i) New structures would be designed with adequate fire protection features in compliance with State law and the requirements of the State Fire Marshal. Building designs would be reviewed by appropriate campus staff and government agencies. (ii) Prior to implementation of individual projects, the adequacy of water supply and water pressure will be determined in order to ensure sufficient fire protection services. (iii) Adequate access will be provided to within 50 feet of the main entrance of occupied buildings to accommodate emergency ambulance service. (iv) Adequate access for fire apparatus will be provided within 50 feet of stand pipes and sprinkler outlets. (v) Service roads, plazas, and pedestrian walks that may be used for fire or emergency vehicles will be constructed to withstand loads of up to 45,000 pounds. (vi) As implementation of the LRDP occurs, campus fire prevention staffing needs would be assessed; increases in staffing would be determined through such needs assessments.
PP 4.12-1(b)	Design and Operation	(i) Accident prevention features shall be reviewed and incorporated into new structures to minimize the need for emergency response from the City of Riverside. (ii) Increased staffing levels for local fire agencies shall be encouraged to meet needs generated by LRDP project related on-campus population increases.
PP 4.12-2(a)	Operation	As development under the LRDP occurs, the Campus will hire additional police officers and support staff as necessary to maintain an adequate level of service, staff, and equipment, and will expand the existing police facility when additional space is required.
PP 4.12-2(b)	Operation	The Campus will continue to participate in the “UNET” program (for coordinated police response and staffing of a community service center), which provides law enforcement services in the vicinity of the campus, with equal participation of UCR and City police staffs.

TABLE 1 (Continued) PROJECT-LEVEL MITIGATION MEASURES AND LRDP EIR CAMPUS PROGRAMS, PRACTICES AND PROCEDURES AND MITIGATION MEASURES INCLUDED AS PART OF THE MULTIDISCIPLINARY RESEARCH BUILDING 1 PROJECT

MM and PP Number	Mitigation Timing	Project- and LRDP-level Mitigation Measure(s) (MMs) and LRDP Campus Programs, Practices, and Procedures (PPs)
Transportation/Traffic		
PP 4.14-2	Design and Construction	The Campus will periodically assess construction schedules of major projects to determine the potential for overlapping construction activities to result in periods of heavy construction vehicle traffic on individual roadway segments, and adjust construction schedules, work hours, or access routes to the extent feasible to reduce construction-related traffic congestion.
PP 4.14-6	Construction	For any construction-related closure of pedestrian routes, the Campus shall provide alternate routes and appropriate signage and provide curb cuts and street crossings to assure alternate routes are accessible.
MM 4.14-1(b)	Operation	To reduce on- and off-campus vehicle trips and resulting impacts, the University will enhance its Transportation Demand Management (TDM) program. TDM strategies will include measures to increase transit and Shuttle use, encourage alternative transportation modes including bicycle transportation, implement parking policies that reduce demand, and other mechanisms that reduce vehicle trips to and from the campus. The University shall monitor the performance of campus TDM strategies through annual surveys.
MM 4.14-1(d)	Design and Operation	The University shall review individual projects proposed under the amended 2005 LRDP for consistency with UC sustainable transportation policy and UCR TDM strategies to ensure that bicycle and pedestrian improvements, alternative fuel infrastructure, transit stops, and other project features that promote alternative transportation are incorporated into each project to the extent feasible.
Utilities and Service Systems		
PP 4.15-1(a)	Design	Improvements to the campus water distribution system, including necessary pump capacity, will be made as required to serve new projects. Project-specific CEQA analysis of environmental effects that would occur prior to project-specific approval will consider the continued adequacy of the domestic/fire water systems, and no new development would occur without a demonstration that appropriate domestic/fire water supplies continue to be available.
PP 4.15-1(c)	Operation	The Campus shall promptly detect and repair leaks in water and irrigation pipes.
MM 4.15-6(a)	Operation	UCR will work with the City of Riverside to evaluate the capacity of existing sewer trunk lines serving the campus and estimate the future impact of LRDP implementation on available capacity.
MM 4.15-6(b)	Operation	If the study of sewer trunk line capacity determines that available capacity would be exceeded, UCR and the City will negotiate payment of fair share of improvements to provide sufficient discharge capacity to meet campus needs. UCR shall contribute its fair share payments and additional required trunk line capacity shall be provided by the City prior to exceedance of sewer trunk line capacity.

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ATTACHMENT A

UCR MULTIDISCIPLINARY RESEARCH BUILDING 1 PROJECT
DRAFT INITIAL STUDY/MITIGATED NEGATIVE DECLARATION

Draft Initial Study/ Mitigated Negative Declaration

University of California, Riverside
Multidisciplinary Research Building 1
UCR Project No. 950528

Prepared for

University of California, Riverside
Capital Planning – Capital Asset Strategies
1223 University Avenue, Suite 240
Riverside, California 92521

Prepared by

Psomas
1500 Iowa Avenue, Suite 210
Riverside, CA 92507

April 2016

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TABLES

FIGURES

APPENDICES

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MULTIDISCIPLINARY RESEARCH BUILDING 1 PROJECT
UNIVERSITY OF CALIFORNIA, RIVERSIDE

Project No. 950528

Initial Study and Environmental Checklist Form

I. PROJECT INFORMATION

1. PROJECT TITLE

Multidisciplinary Research Building 1 Project

2. LEAD AGENCY NAME AND ADDRESS

The Regents of the University of California
1111 Franklin Street, 12th Floor
Oakland, California 94607

3. CONTACT PERSON AND PHONE NUMBER

Tricia D. Thrasher, ASLA, LEED AP
Principal Environmental Planner
Capital Planning – Capital Asset Strategies
University of California, Riverside
1223 University Avenue, Suite 240
Riverside, California 92521
(951) 827-1484

4. PROJECT LOCATION

University of California, Riverside
Riverside, California 92521
(Refer to Figures 1 and 2)

5. PROJECT SPONSOR'S NAME AND ADDRESS

University of California, Riverside
Capital Asset Strategies
1223 University Avenue, Suite 240
Riverside, California 92521

6. CUSTODIAN OF THE ADMINISTRATIVE RECORD FOR THIS PROJECT

Same as listed under No. 3 above

7. IDENTIFICATION AND LOCATION OF ENVIRONMENTAL IMPACT REPORT(S) BEING RELIED ON FOR TIERING

UCR 2005 Long Range Development Plan Environmental Impact Report (referred to herein as the 2005 LRDP EIR) and the *UCR 2005 Long Range Development Plan Amendment 2 Environmental Impact Report* (referred to herein as the 2005 LRDP Amendment 2 EIR) (collectively referred to as the "LRDP EIR"). The documents are available for review at the

UCR Capital Resource Management office, at the address listed above in Section 3 and online at http://lrdp.ucr.edu/.

Introduction

The environmental analysis for the proposed University of California, Riverside (UCR) Multidisciplinary Research Building 1 (MRB1) Project (proposed Project) is tiered from the 2005 LRDP EIR (State Clearinghouse [SCH] No. 2005041164), certified by the University of California (UC) Board of Regents (The Regents) in November 2005, as augmented, revised, and supplemented by the 2005 LRDP Amendment 2 EIR (SCH No. 2010111034) certified by The Regents on November 28, 2011. The 2005 LRDP Amendment 2 EIR is a supplement to the 2005 LRDP EIR and provides an analysis of only those environmental effects identified in the 2005 LRDP EIR that changed as a result of the 2005 LRDP Amendment 2, which includes a revision to the land use map to allow for the location of a new School of Medicine (SOM) as well other land use map changes, additional building space to accommodate the increased square footage requirements for the SOM, and the extension of the LRDP horizon year (described further below). The 2005 LRDP Amendment 2 EIR also includes an analysis of greenhouse gas (GHG) emissions resulting from development under the 2005 LRDP, as amended. The 2005 LRDP EIR and 2005 LRDP Amendment 2 EIR are Program EIRs and were prepared in accordance with the California Environmental Quality Act (CEQA) (*Public Resources Code* [PRC], §21000, et seq., specifically, §21094), the State CEQA Guidelines (14, *California Code of Regulations* [CCR], 15000 et seq.), and the *University of California Procedures for the Implementation of CEQA*.

Section 15152 of the State CEQA Guidelines states, "'Tiering' refers to using the analysis of general matters contained in a broader EIR (such as one prepared for a general plan or policy statement) with later EIRs and negative declarations (NDs) on narrower projects; incorporating by reference the general discussions from the broader EIR; and concentrating the later EIR or ND solely on issues specific to the later project." CEQA and the State CEQA Guidelines encourage the use of tiered environmental documents to eliminate repetitive discussions of the same issues. As stated in the 2005 LRDP Amendment 2 EIR, "As authorized by Section 15168(c) of the State CEQA Guidelines, projects implementing the 2005 LRDP as revised by Amendment 2 will be examined in light of the 2005 LRDP EIR and this supplemental EIR [the 2005 LRDP Amendment 2 EIR] to determine whether the potential environmental effects of the individual project were adequately addressed in these EIRs, and whether any additional mitigation measures are required." Therefore, this Initial Study/Mitigated Negative Declaration (IS/MND) is hereby tiered from the UCR 2005 LRDP EIR as supplemented and updated by the UCR 2005 LRDP Amendment 2 EIR, which was certified November 28, 2011. The documents are available for review at the UCR Capital Programs – Capital Resource Management office, at the address listed above in Section I, and online at http://lrdp.ucr.edu/.

The 2005 LRDP EIR analyzes the direct, indirect, and cumulative impacts resulting from the projected need for development of approximately 7.1 million gross square feet (gsf) of new academic, housing, and support space to accommodate a total enrollment of 25,000 students[1] by the academic year 2015/16, for a total of 11.8 million gsf on the UCR campus with 2005 LRDP buildout. The 2005 LRDP Amendment 2 EIR analyzes the direct, indirect, and cumulative impacts resulting from revisions to the 2005 LRDP land use map and an increase in the maximum building space that could be built on the campus from 11.8 million gsf to 14.9 million gsf to accommodate the SOM. The 2005 LRDP Amendment 2 does not change the projected enrollment level of 25,000 students but projects that this enrollment level will be attained in 2020/21, five years later

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[1] Derived from 1 Full-Time Equivalent (FTE) = 1 Headcount. UCR uses a conversion rate of 1 FTE (0.95 rounded up) = 1 Headcount, and for the purposes of the 2005 LRDP and for the proposed Amendment 2, 1 FTE = 1 Headcount with the "student" taking full course loads every quarter with graduation in four years.

than projected in the 2005 LRDP. The 2005 LRDP Amendment 2 EIR addresses an increase in the projected on-campus population associated with faculty, staff, and visitors to 16,393 persons (an increase of 5,852 persons associated with the SOM). Measures to mitigate the significant direct, indirect, and/or cumulative impacts identified for UCR's projected development are identified in both the 2005 LRDP EIR and 2005 LRDP Amendment 2 EIR.

Section 15152(f) of the State CEQA Guidelines instructs that when tiering, a later EIR or ND shall be prepared only when, on the basis of an IS, the later project may cause significant effects on the environment that were not adequately addressed in the prior EIR(s) or ND(s). Significant environmental effects are considered to have been "adequately addressed" if the lead agency determines that:

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

Following review of the proposed Project and the analysis presented in the UCR 2005 LRDP EIR as supplemented and updated by the UCR 2005 LRDP Amendment 2 EIR, it has been determined that the proposed Project is a "project" under CEQA that was not fully addressed in the Program EIRs; therefore, additional environmental review is required. Accordingly, this tiered IS has been prepared on the basis that UCR has proposed to adopt an MND.

In conjunction with certification of the 2005 LRDP Amendment 2 EIR and approval of the 2005 LRDP Amendment 2, The Regents also adopted a Mitigation Monitoring and Reporting Program (MMRP). The MMRP ensures that 2005 LRDP Planning Strategies (PSs), Campus Programs and Practices (PPs), and Mitigation Measures (MMs), as revised by the 2005 LRDP Amendment 2 EIR, that are the responsibility of the UC are implemented in a timely manner. The MMs are monitored by the appropriate campus entity and reported on an annual basis. As individual projects, such as the proposed Project, are designed and constructed, the projects include features necessary to implement relevant PSs, PPs, and MMs. Therefore, in accordance with The Regents' November 2011 approval of the 2005 LRDP Amendment 2 and certification of the associated Final EIR, all relevant PSs, PPs, and MMs have been incorporated into the proposed Project description and would be implemented as a part of the proposed Project and monitored through the approved MMRP. Relevant UCR PSs, PPs, and/or MMs are listed in the introduction to the analysis for each topical issue in Section V, Evaluation of Environmental Impacts. In addition to PSs, PPs and MMs from the MMRP relevant to the proposed Project, this IS/MND includes new, project-specific mitigation measures identified to reduce project-specific environmental impacts to a less than significant level (specifically related to air quality impacts [VOC emissions] during construction, and impacts to cultural resources).

In summary, this IS/MND provides a project-specific environmental analysis to determine if the proposed MRB1 Project would result in any significant impacts not adequately addressed in the UCR 2005 LRDP EIR as supplemented and updated by the UCR 2005 LRDP Amendment 2 EIR and/or if additional MMs beyond those adopted in the MMRP for the 2005 LRDP Amendment 2 would be required to reduce identified impacts. In accordance with the State CEQA Guidelines, an MND is the appropriate environmental document because, after incorporation of the identified MMRP and proposed Project-specific mitigation measures, the proposed Project would not result in any new significant impacts that are not examined in the UCR 2005 LRDP EIR as supplemented and updated by the UCR 2005 LRDP Amendment 2 EIR or in a significant increase in the previously identified impacts. This project would result in significant and unavoidable short-term vibration impacts during construction, consistent with the findings of the 2005 LRDP EIR and 2005 LRDP Amendment 2 EIR.

This IS, along with a Notice of Intent to Adopt an ND, has been circulated by the State Office of Planning and Research (SCH) for review by State agencies and to any responsible agencies, trustee agencies, and interested parties, as required by CEQA, for a 30-day public review. Following receipt and evaluation of comments from agencies, organizations, and/or individuals, the UC will determine whether any substantial new environmental issues have been raised. It is anticipated that the proposed Project will subsequently be submitted to The Regents for consideration in July 2016.

II. PROJECT DESCRIPTION

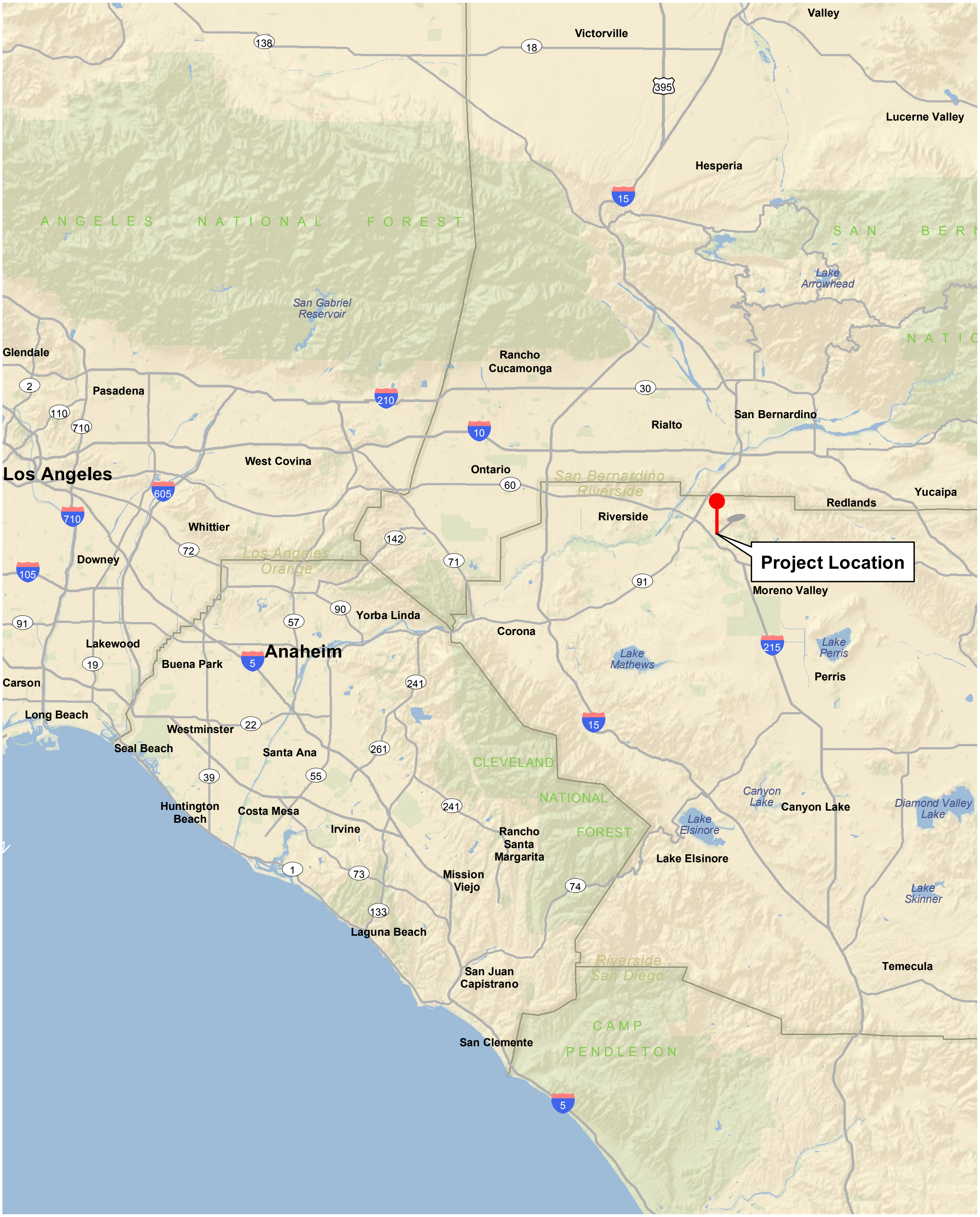
The proposed MRB1 Project involves construction and operation of a new 4- to 5-level (including 1 subterranean lower level) and up to 190,000-gsf building, at the northern end of the campus academic core. The proposed MRB1 Project would provide wet and dry research laboratories and related laboratory support spaces, along with research cores that include a vivarium; offices; scholarly activity and interactive spaces; and program support facilities. Programmatically, the building would host multiple scientific disciplines, including the some of the campus' most popular programs such as biology and chemistry.

The proposed Project would also involve the implementation of open space, landscape, and hardscape areas and installation of lighting and utility infrastructure. No new parking facilities/spaces would be added with implementation of the proposed Project, with the exception of parking for service vehicles and Americans with Disabilities Act (ADA) accessible parking. There are no off-campus modifications associated with the proposed Project. More detailed information regarding the project description is provided below under "Proposed Project Components".

The proposed MRB1 would be a flexible and adaptable building that would accommodate emerging research demands over the next several decades. It should be noted that as part of a master planning effort for the area and subject to future funding availability and environmental review, the proposed MRB1 has been sited to allow for the possible construction of a future research building immediately adjacent to and west of the project site. The site for the potential future research building is shown on various graphics in this IS for context; however, the campus does not have plans defined at this time for another building next to MRB1, and analysis of such a building would be speculative. If the campus ultimately has the funds and need to construct a future building adjacent to the proposed MRB1, that proposed project would be subject to separate environmental review pursuant to CEQA and is not evaluated in this IS.

1. PROJECT LOCATION

The proposed MRB1 would be located north of the existing Materials Sciences and Engineering (MS&E) Building on UCR's East Campus. The UCR campus is located within the City of Riverside, approximately 1.5 miles east of downtown Riverside and just west of the Box Springs Mountains (refer to Figure 1). Specifically, the project site is located on North Campus Drive, east of the soccer field, west of Aberdeen Drive, and south of the Student Recreation Center. Figure 2 depicts the local vicinity and Figure 3 provides a map of the UCR campus, including the location of the proposed Project.



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Regional Location

Figure 1

UCR Multidisciplinary Research Building 1 Project

N
W E
S

10 5 0 10
Miles

BonTerra
PSOMAS

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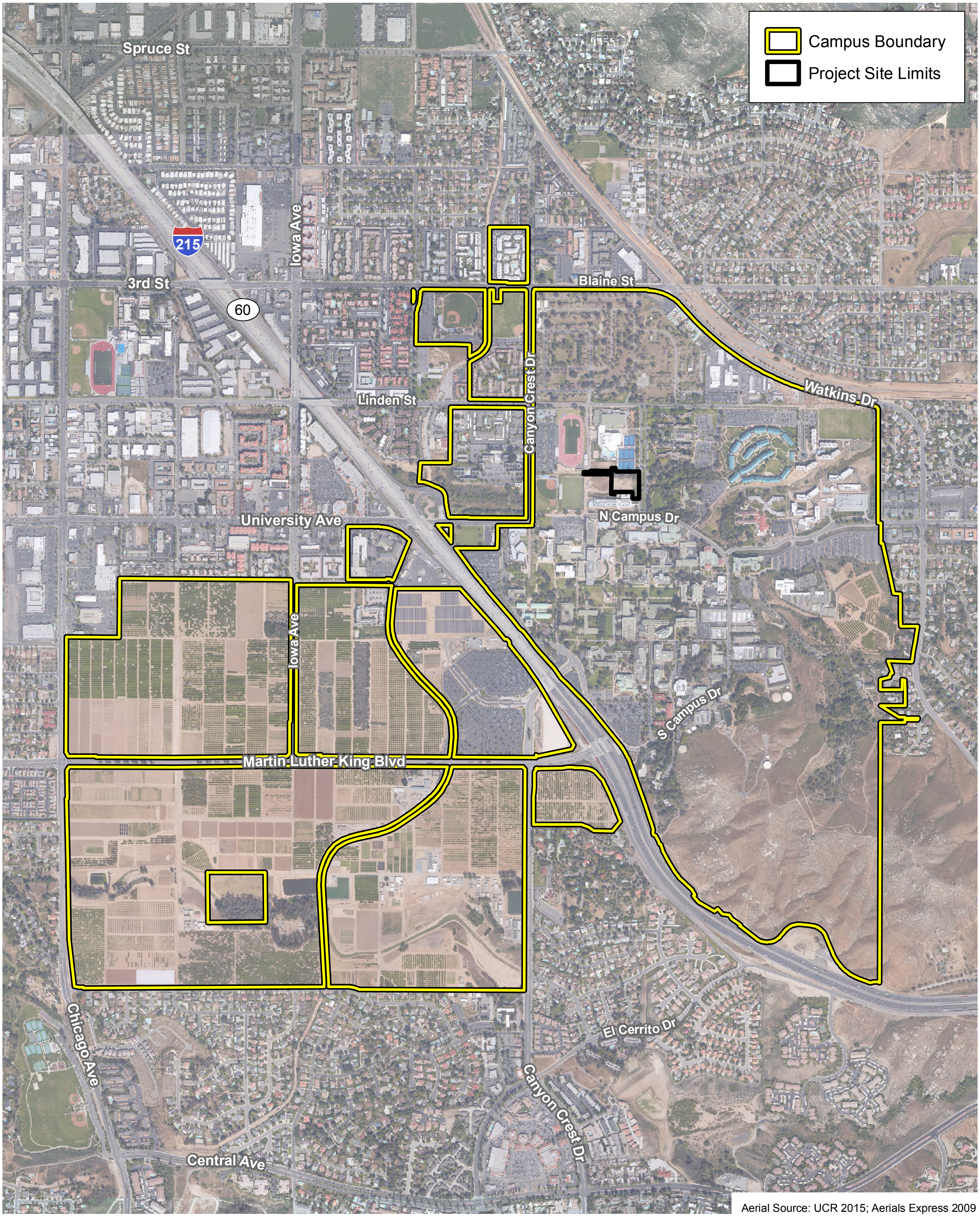

Aerial Source: UCR 2015; Aerials Express 2009

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Local Vicinity

Figure 2

UCR Multidisciplinary Research Building 1 Project

N W E S

1,500 750 0 1,500 Feet

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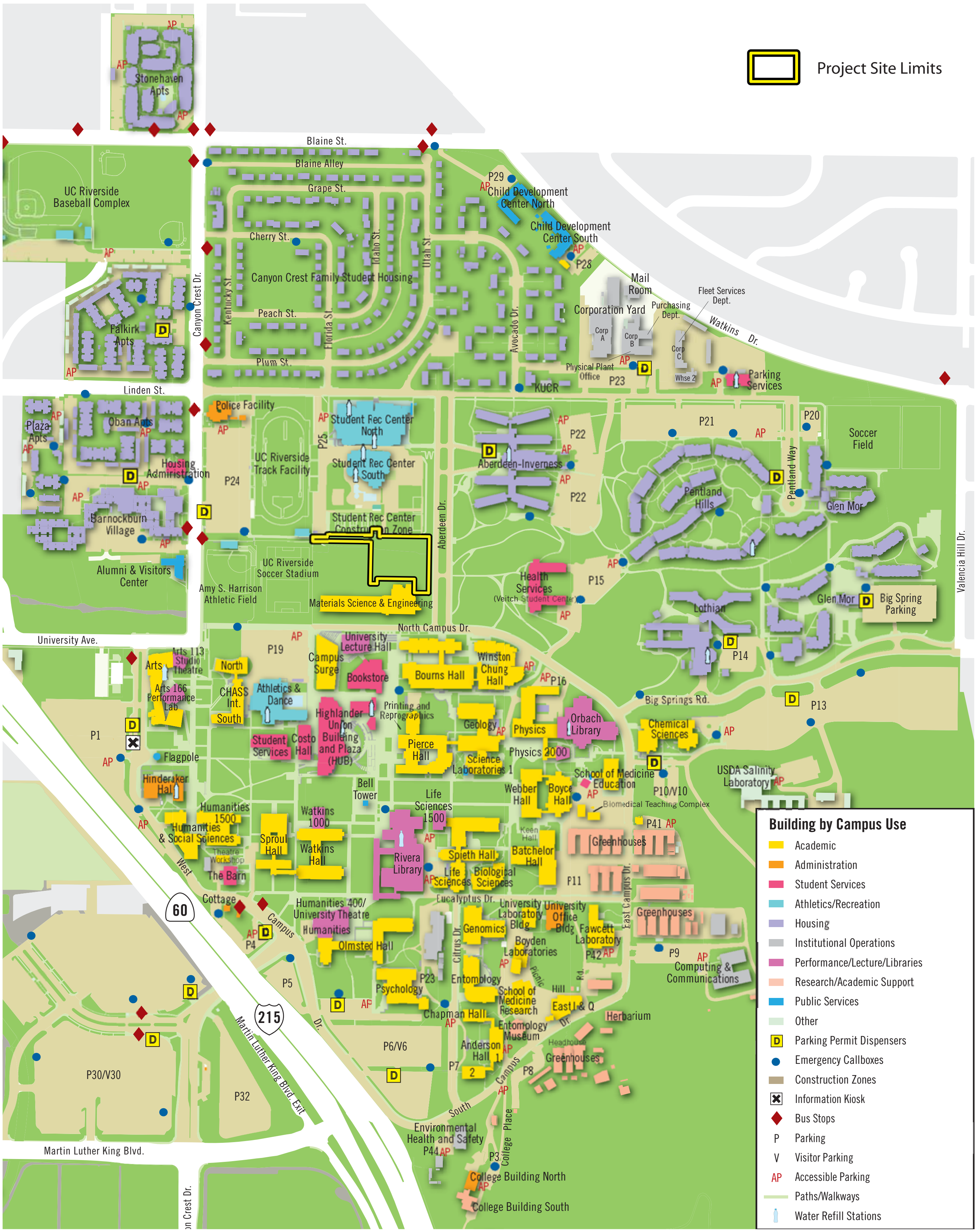

Source: UCR 2016

UCR Campus Map

Figure 3

UCR Multidisciplinary Research Building 1 Project

BonTerra PSOMAS

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For the purposes of this IS/MND, the “project site” includes the approximately 33,000-square-foot (sf) (0.8-acre) MRB1 site and the surrounding area that would be subject to modifications for operations at the MRB1, including, but not limited to, emergency and service access; non-vehicular circulation; and hardscape, landscape, and open space (Arroyo Plaza), as described in this section. The project site encompasses approximately 90,950 sf (2.1 acres) and is shown on the conceptual site plan provided on Figure 4.

2. ENVIRONMENTAL SETTING

The 2005 LRDP EIR and 2005 LRDP Amendment 2 EIR include descriptions of the regulatory and environmental setting for the region, the County and City, and the UCR campus, though the 2005 LRDP Amendment 2 EIR largely focuses on the West Campus. The regulatory and environmental settings for the topics addressed in this IS/MND have not substantively changed since preparation of the 2005 LRDP EIR or the 2005 LRDP Amendment 2 EIR, as appropriate. Therefore, they are not wholly repeated in this document. Particularly relevant and site-specific details of the regulatory and environmental settings are summarized in this IS/MND. Following is a description of the environmental setting for the proposed Project and surrounding areas.

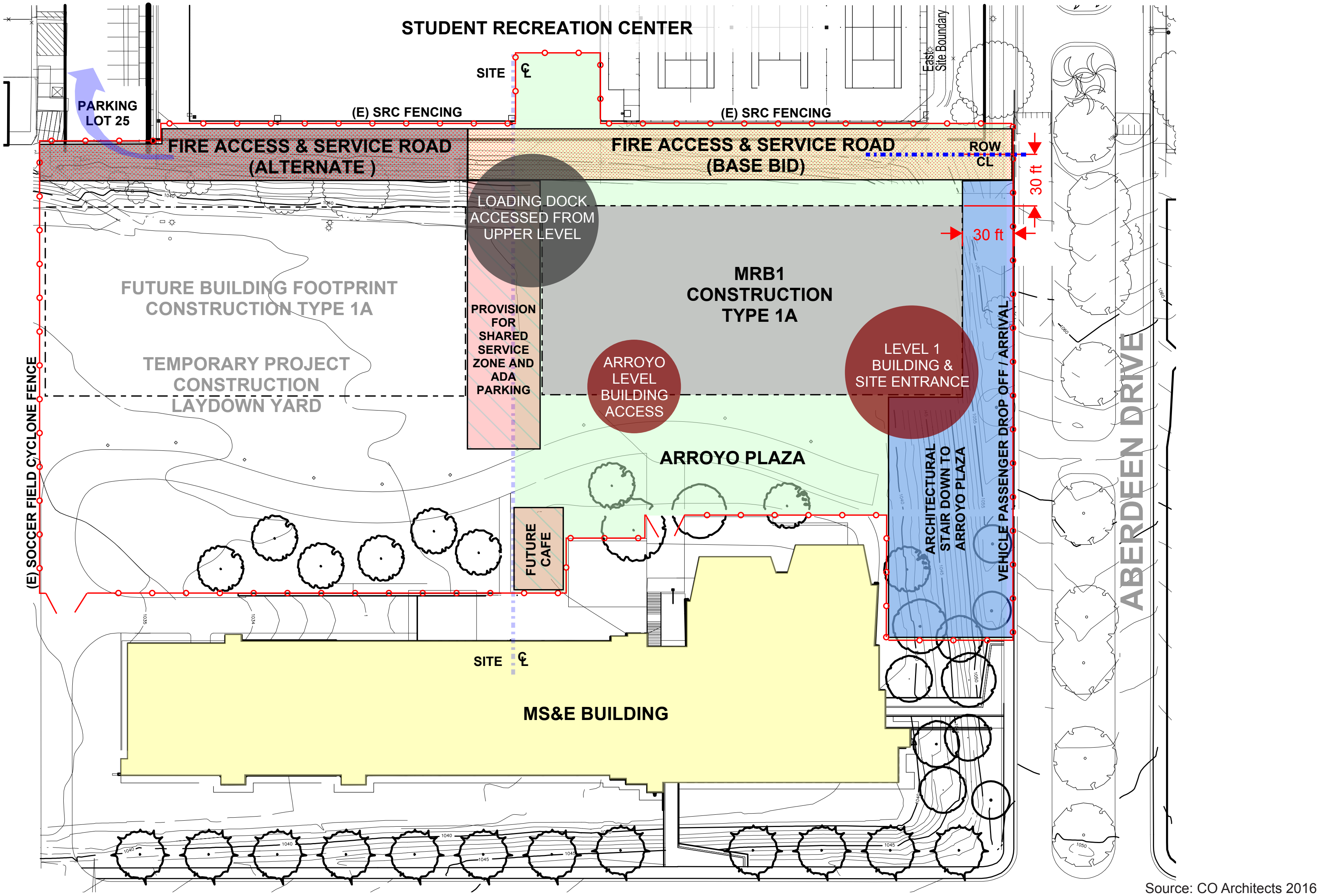
As shown in Figure 4, the proposed MRB1 would be constructed on an approximate 2.1-acre site on the eastern portion of campus. The project site is currently a graded, undeveloped area, with remnant concrete slabs from previous athletic uses. To the north, the project site is bordered by a landscaped slope with trees and ornamental vegetation and outdoor uses associated with the Student Recreation Center and, to the south, by an access road and the MS&E Building. The undeveloped area which may be developed with a future research building and the UCR soccer field are located west of the project site. Aberdeen Drive and undeveloped open space areas are located to the east. The Aberdeen-Inverness Residence Hall is located northeast of the project site, across Aberdeen Drive. Figure 5, Site Survey, depicts the existing condition of the project area.

Vehicular access to the project site is currently limited to North Campus Drive, and pedestrian access is limited to the pathways that currently serve the MS&E and adjacent uses.

The topography of the project site is relatively flat with elevations from approximately 1,040 feet above mean sea level (msl) in the western portion of the project site to approximately 1,044 feet above msl in the eastern portion. However, the northern and eastern perimeters of the project site are defined by approximate 15-foot-high slopes that ascend from within the project site north to the Student Recreation Center and east to Aberdeen Drive.

Due to the minimal change in topography across the site and surrounding areas and the presence of mature trees and adjacent development, views of the project area are limited to vantage points from adjacent structures, roadways, and areas that are internal to the campus (refer to additional discussion of viewsheds provided in Section V.1, Aesthetics). The MS&E Building and trees/landscaping, including along the northern perimeter of the site, are a prominent visual feature in the project area. The visual character of this area is also represented by recreational facilities surrounding the project site and other one- and two-level buildings with a mix of architectural styles and building materials (wood, concrete, and brick).

Vegetation within the project area consists of tree species and ornamental vegetation. Tree species identified within the project area include three species that are native to California: palo verde (*Parkinsonia* sp.), western sycamore (*Platanus racemosa*), and California fan palm (*Washingtonia filifera*). Though these species are all native to California, they are not necessarily native to the Riverside area and only western sycamore is typically regulated. An additional nine non-native tree species were identified, including camphor (*Cinnamomum camphora*), blue



Source: CO Architects 2016

Conceptual Site Plan

Figure 4

UCR Multidisciplinary Research Building 1 Project

Bonterra PSOMAS

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Existing Site Survey

UCR Multidisciplinary Research Building 1 Project

Figure 5

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D:\Projects\UCR\0005\MXDs\InitialStudy\ex_ExistingSiteSurvey.mxd gum (*Eucalyptus globulus*), ash (*Fraxinus* sp.), pine (*Pinus* sp.), locust (*Robinia* sp.), Peruvian pepper tree (*Schinus molle*), acacia (*Acacia* sp.), Mexican fan palm (*Washingtonia robusta*), and Chinese flame tree (*Koelreuteria bipinnata*). Tree species are further discussed in Section V.4, Biological Resources, of this IS/MND. There are no sensitive hydrologic or biological resources within the project area. Based on review of Figure 3.0-8 of the 2005 LRDP Amendment 2 EIR, there is no designated "natural open space" in the vicinity of the project site; however, a proposed "naturalistic open space" area is located between the project site and the MS&E Building to the south.

The project site is underlain by artificial fill materials up to 21.5 feet deep; these deeper fills occur primarily in the slope area along the east side of the site. The fill materials consist of silty sand and are underlain by native sediments mapped as young alluvial channel deposits that are composed primarily of silty sand and sand with gravel encountered in sand layers. Groundwater was not encountered at the project site within the maximum exploratory drilling depth of 76 feet below ground surface (bgs). Currently, storm water drains across the project area via sheet flow to existing storm drain infrastructure located along the north side of MS&E Building, which outlets into North Campus Drive.

Regionally, as with all of Southern California, the UCR campus lies within a seismically active area. There are no known active or potentially active faults within the project site or the immediate vicinity. The nearest active fault is the San Jacinto Fault Zone located approximately 4.9 miles to the northeast.

3. BACKGROUND AND NEED FOR THE PROPOSED PROJECT

Between 2000 and 2014, UCR's undergraduate population increased 64 percent, while its faculty increased 28 percent. The disproportionate levels of growth between students and faculty have contributed to a student-to-faculty ratio of 29:1 based on ladder-rank[2] faculty, which is among the highest in the UC system and diminishes the undergraduate and graduate student experience. With both undergraduate and graduate enrollment on the UCR campus expected to increase, particularly related to the physical and natural sciences, the student-faculty ratio will increase dramatically if the campus does not hire additional faculty. In response, UCR plans to hire 300 new faculty by 2020 to reduce the student-to-faculty ratio and to increase student-faculty interaction. However, the lack of available contemporary and flexible research space on campus hinders the ability to promote and encourage collaborative research efforts, which, in turn, challenges the ability to recruit and retain faculty for instruction.

In 2010, the campus completed a robust faculty-led process that identified areas for strategic investment. This process led to the adoption of research cluster hiring proposals focused on priority areas for interdisciplinary research identified in the strategic plan, *UCR 2020: The Path to Preeminence*. Areas of study span all colleges and departments and involve investigators across campus from colleges and schools such as Bourns College of Engineering; College of Natural and Agricultural Sciences; School of Medicine; School of Public Policy; and College of Humanities, Arts and Social Sciences. Examples of research clusters include biomedical informatics, neurosciences, systems biology, pathophysiology, and aging and life span. While the campus has developed a strategy for renovation of existing research facilities, leased space, and increased efficiency of existing space, accommodation of these research initiatives requires additional, flexible research space suited to multidisciplinary research.

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[2] Ladder-rank faculty are faculty holding tenured titles or non-tenured titles in a series in which tenure may be conferred.

UC Riverside has 24 research buildings, of which nearly $^1/_3$ range in age from 41 to 84 years. Approximately 80 percent of this space consists of enclosed laboratories, as opposed to a more contemporary open bay configuration. The enclosed laboratories limit the size of research teams; each laboratory typically accommodates a single research team and so inherently limits opportunities for cross-disciplinary collaboration. Enclosed laboratories are typically more costly to adapt to the evolving technical demands of contemporary multidisciplinary research than are the open bays proposed in the MRB1. A contemporary open laboratory configuration enables the integration of multidisciplinary research teams of varying sizes to colocate, thus fostering collaboration within commonly focused scientific "neighborhoods". Additionally, this type of flexible research space allows several disciplines to examine research questions from their subject areas. For example, scholarly collaborations between colleges can be leveraged to expand present strengths in human and animal behavioral and neuroscience research as well as opening new areas of study. Parallel investigative efforts allow the exchange of information and the comparison of findings, enabling the creation and advancement of scientific knowledge and technological processes.

The proposed MRB1 would support UCR's strategic goals related to research in three ways: (1) provide a portion of the research space necessary to hire new faculty who would help reduce student-to-faculty ratios; (2) facilitate new strategic science initiatives; and (3) increase flexible research space by incorporating contemporary open bay configurations that can subsequently be modified in order to meet the changing needs of scientific research.

4. PROJECT GOALS/OBJECTIVES

The goals and objectives of the proposed Project are:

1. Create the ability to recruit faculty to improve student-faculty ratios and enhance instructional capabilities.
2. Expand the campus research capabilities with new space for approximately 300 additional faculty over the next five years.
3. Address current and short-term laboratory-based research space needs in terms of quantity and quality to meet existing requirements, which has resulted in overcrowded conditions and handicaps the research enterprises.
4. Create a well-organized, welcoming environment that promotes scientific collaboration and cross-discipline research in an atmosphere that stimulates and encourages academic scholarship and provides opportunities for intellectual discourse to attract and retain the best faculty members, graduate students, and technical and support personnel.
5. Provide adaptable and flexible laboratory support and core facilities to meet evolving research needs.
6. Establish a sense of place in the unique UCR campus setting that strengthens the academic community.
7. Plan, design, and implement the proposed Project in a manner consistent with the University of California Policy on Sustainable Practices 2015.

5. PROPOSED PROJECT COMPONENTS

The following physical project components are described below:

- Multidisciplinary Research Building 1
- Vehicular and Pedestrian Circulation

- Open Space, Landscape, and Hardscape
- Interior and Exterior Lighting
- Utilities/Infrastructure
- Sustainable Building Features
- Construction Activities

Multidisciplinary Research Building 1

Building Design

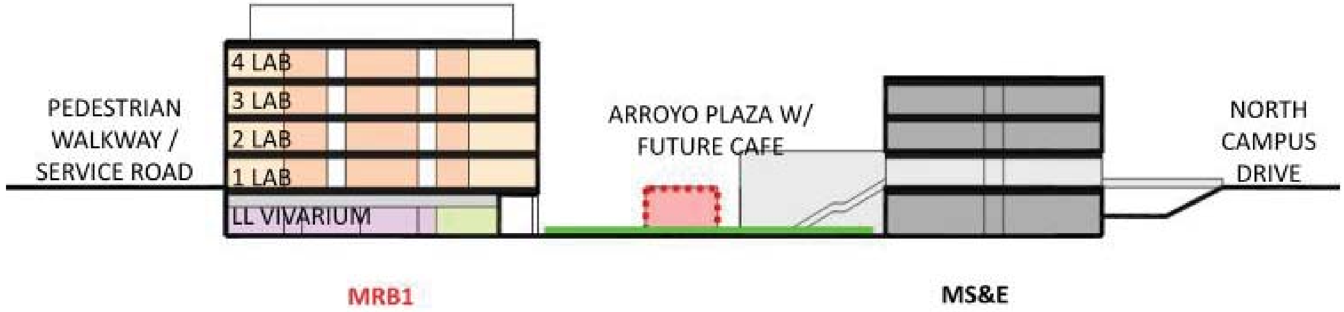
The proposed Project involves construction of a new 4- to 5-level (including 1 lower level) and up to 190,000-gsf multidisciplinary research building. As identified above, Figure 4 provides the conceptual site plan for the proposed Project and depicts the location of the MRB1 site in relation to proposed access, public spaces, and adjacent uses.

The proposed MRB1 would be sited so that the finish floor elevation of the lower level would be close to existing grades across the majority of the site, and the elevation of Level 1 would have an at-grade connection to the service road/pedestrian path to the north and Aberdeen Drive to the east. Figure 6 provides conceptual cross-sections of the proposed MRB1, assuming a building with five levels, one lower level, and a rooftop parapet/equipment screen. The proposed MRB1 would be up to approximately 90 feet above ground at the roof level and approximately 94 feet above ground level at the top of building (parapet). Rooftop mechanical equipment would not extend above the equipment screen, with the exception of exhaust stacks that would be of uniform height, aligned, evenly spaced, and clad in metal with a high-performance coating.

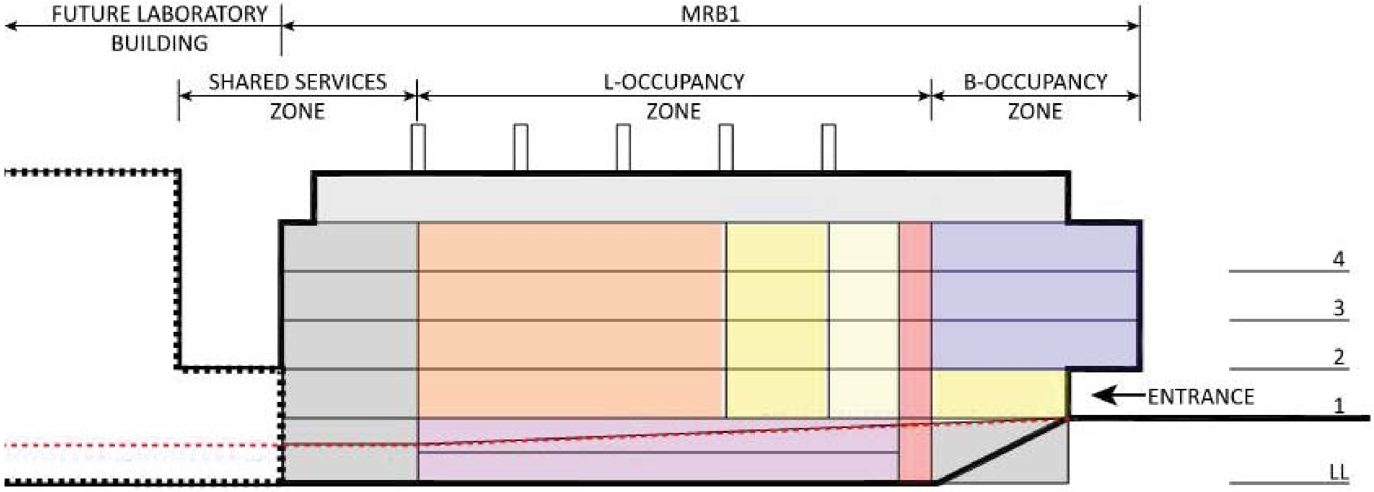
Figure 7 depicts conceptual building massing studies of the proposed MRB1 from various viewpoints. These illustrations depict one possible outcome of the massing, fenestration, and detail possible for the building exterior and are provided for reference but not intended to be prescriptive of the eventual design of the proposed Project. The University is using a design-build delivery methodology for this project, which provides the design-build teams with detailed performance criteria and studies as the basis for competitive design and cost proposals. The selected team will be contractually obligated to implement mitigation measures identified in this IS/MND. The Campus will monitor compliance through a Mitigation Monitoring and Reporting Program to be adopted with the project approval.

The proposed MRB1 has been conceptually designed to include building massing and facade composition that acknowledges “base, middle, and top” (exclusive of any mechanical screen); to provide expression of a base, inset from the body of the building to create a south-facing covered arcade facing onto the “arroyo”; to introduce horizontal bands that approximately correspond to the floor levels or window sill lines; and to provide flat roofs and parapets set back from the main building edge visually to reduce the overall height of the building. Building fenestration may include, but not be limited to, solar orientation and shading devices to maximize daylight while controlling heat gain and glare; sun shading; recessed (“punched”) windows in brick walls to give the appearance of weight; and indentations of the building mass for covered terraces.

The final selection of building materials and color palette would adhere to the UCR Campus Design Guidelines to be visually harmonious with the UCR campus as well as the immediately surrounding buildings. Building materials may include exposed architectural concrete; brick (using the “UCR blend”); clear anodized or pre-finished aluminum (curtain wall and infill panels); pre-finished aluminum or unfinished zinc (rain-screen cladding systems, equipment screens);



Site Section and Program Stacking



Section Looking North

COLOR KEY

- ■ OPEN LABORATORY
- ■ LABORATORY SUPPORT
- ■ DISTRIBUTED CORE
- ■ CENTRALIZED CORE
- ■ VIVARIUM
- ■ OFFICE
- ■ OPEN OFFICE
- ■ PUBLIC AND MEETING
- ■ BUILDING SUPPORT
- ■ VERTICAL CIRCULATION

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Source: CO Architects 2016

Conceptual Building Sections

Figure 6

UCR Multidisciplinary Research Building 1 Project

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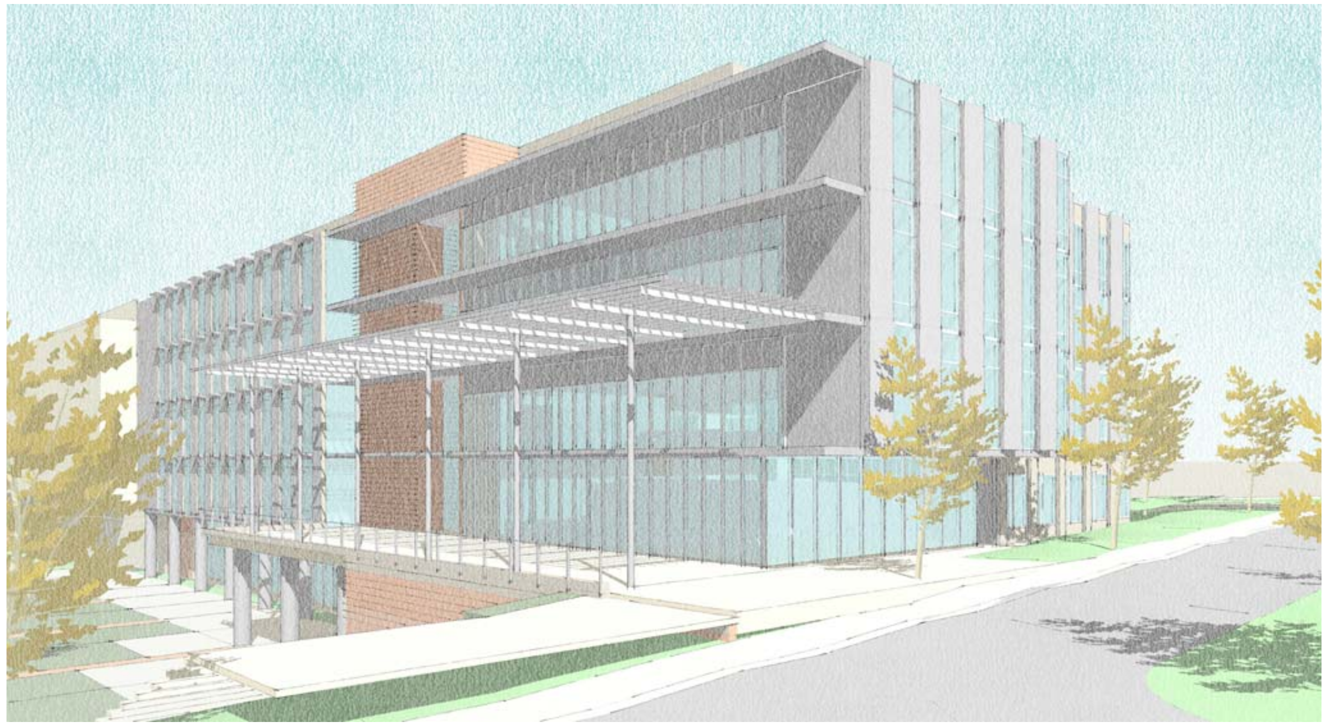
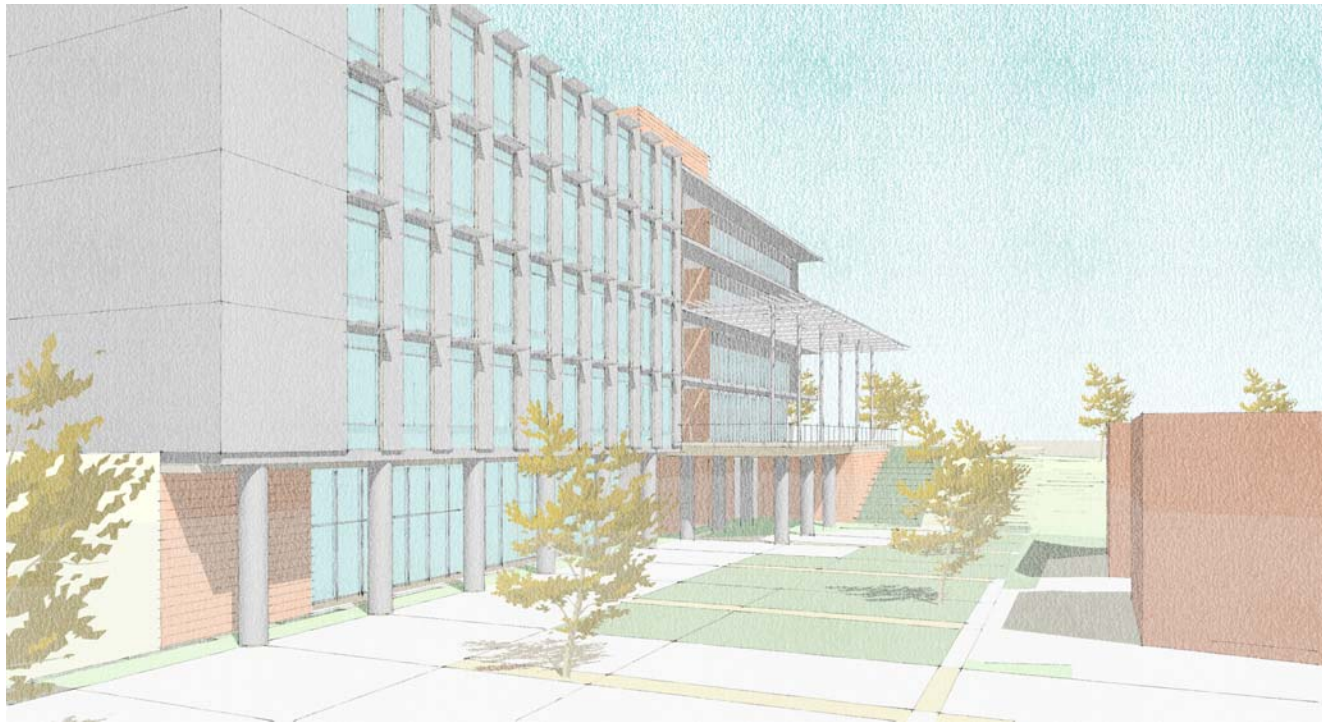


Looking Northwest from Aberdeen Drive



Looking Northeast from the Arroyo Plaza

Looking North from Aberdeen Drive (MS&E in Foreground)

Looking Southeast from the Pedestrian Walkway

Source: CO Architects 2016

Conceptual Building Massing

Figure 7

UCR Multidisciplinary Research Building 1 Project

BonTerra PSOMAS

exposed architectural steel (sunshades, railings, projections, canopies); and insulated, low-e glass selected for high transparency and low reflectivity.

The proposed MBR1 would be designed and constructed in compliance with applicable requirements of the *California Building Code* (CBC) and *California Fire Code*. Specifically, fire sprinklers, fire alarm systems, emergency lighting, emergency response notification systems, and illuminated signage would be installed.

Internal Operations

The proposed MRB1 would be comprised of wet and dry research laboratories and related support space, core laboratories, a vivarium, offices and meeting spaces, and program support facilities designed to support collaborative research at the intersection of life/chemical sciences, medicine, and engineering. A modular planning principle would be utilized to create a flexible and adaptable building to accommodate emerging research demands in the future. The MRB1 would operate 24 hours per day, 7 days per week, and all building entrances would be fully secured and monitored. The anticipated key internal program elements of the proposed MRB1 are described below.

- **Research Laboratories and Laboratory Support Space.** Wet, dry (computation intensive), and flex (instrument and procedure intensive) laboratory types would be provided on multiple levels. The wet research laboratories would be designed as Biosafety Level 2[3] (BSL2) to allow for a more diverse and sophisticated scope of research. The laboratories would have various fume hood densities. Flexible, multipurpose laboratory support spaces would be provided that support a broad range of activities. A Draft Hazardous Materials Technical Report, estimating anticipated chemical quantities that can be stored and used in the proposed MRB1, would be prepared and submitted to the State Fire Marshal's Office as per Section 414.1.3 of the CBC, upon submission for plan check. A Final Hazardous Materials Technical Report is required prior to occupancy to reflect the requirements of known occupants. Hazardous materials anticipated to be used to support research activities at the proposed MRB1 are discussed in the Section V.8, Hazards and Hazardous Materials, of this IS.
- **Core Laboratories**. Centralized core laboratories would be purpose-built for specific instruments or processes that have unique environmental or spatial characteristics and are not conducive to placement on typical research floors. Distributed core laboratories would be highly flexible "garages" that can be quickly reconfigured around specific instruments or procedures with minimal effort or expense.
- **Vivarium.** A vivarium is an area, usually enclosed, for keeping animals or plants under semi-natural conditions for observation or study. The proposed vivarium would be a self-contained portion of the building, with its own internal circulation, mechanical system, and secure entry/exit points. It would have a dedicated, secured loading dock and receiving, processing, and waste storage area on Level 1. Animal types anticipated for use include mice, rats, rabbits, and other small rodents, as well as small fish aquatics. Other animal types that are not presently anticipated but may occasionally be housed in the facility include frogs and birds. The vivarium would have both a BSL2 barrier side and a conventional side and shared-use facilities accessible from both sides, such as a cage and rack wash autoclave, support facilities, and holding room. Instruments that are

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[3] Biological safety levels are ranked from one to four and are selected based on the agents or organisms on which the research or work is being conducted. Each level up builds on the previous level, adding constraints and barriers. Biosafety Level 2 would cover work with agents associated with human disease, in other words, pathogenic or infectious organisms posing a moderate hazard.

extremely sensitive to vibration would be located in the lower level and would be limited to the vivarium imaging suite.

- **Offices and Meeting Spaces.** A variety of non-lab spaces would be provided to support independent and collaborative scholarly activity of faculty, graduate students, postdoctoral scholars, and administrative support. These include faculty offices, student workstations, meeting rooms, teaming areas, a seminar room, kitchenettes and break areas, and a lobby and exhibit area.
- **Program Support.** Facilities provided in support of research activities include shared-use cold room, glasswash and autoclave, and chemical storage. A loading dock (separate from the vivarium loading dock) would be located in the northwest corner of the building on Level 1 to enable access of service vehicles from Aberdeen Drive via the new service road/fire lane along the northern boundary of the site and to centralize service functionality for the potential future research building to the west.
- **Public Spaces.** Public spaces would be situated and designed to reinforce collaboration between groups and disciplines, both horizontally and vertically (on different levels) within the building.
- **Mechanical Equipment.** The lower level would provide space for mechanical, electrical, and telecommunications equipment. The following utilities would be provided as centralized systems to each type of laboratory from a common infrastructure backbone: domestic hot and cold water, industrial hot and cold water, process chilled water loop, reverse osmosis water, compressed air, natural gas, laboratory vacuum, and laboratory exhaust. The following types of utilities would be provided at point of use: deionized water, nitrogen gas, liquid nitrogen, carbon dioxide, medical air, oxygen, and other process gases.

Population

It is expected that the proposed MRB1 would accommodate a population of approximately 400 individuals. This may include, but not be limited to, approximately 50 to 56 Principal Investigators with 6 team members each (consisting of a combination of graduate students, post-doctoral researchers, and research assistants) and approximately 50 administrative staff.

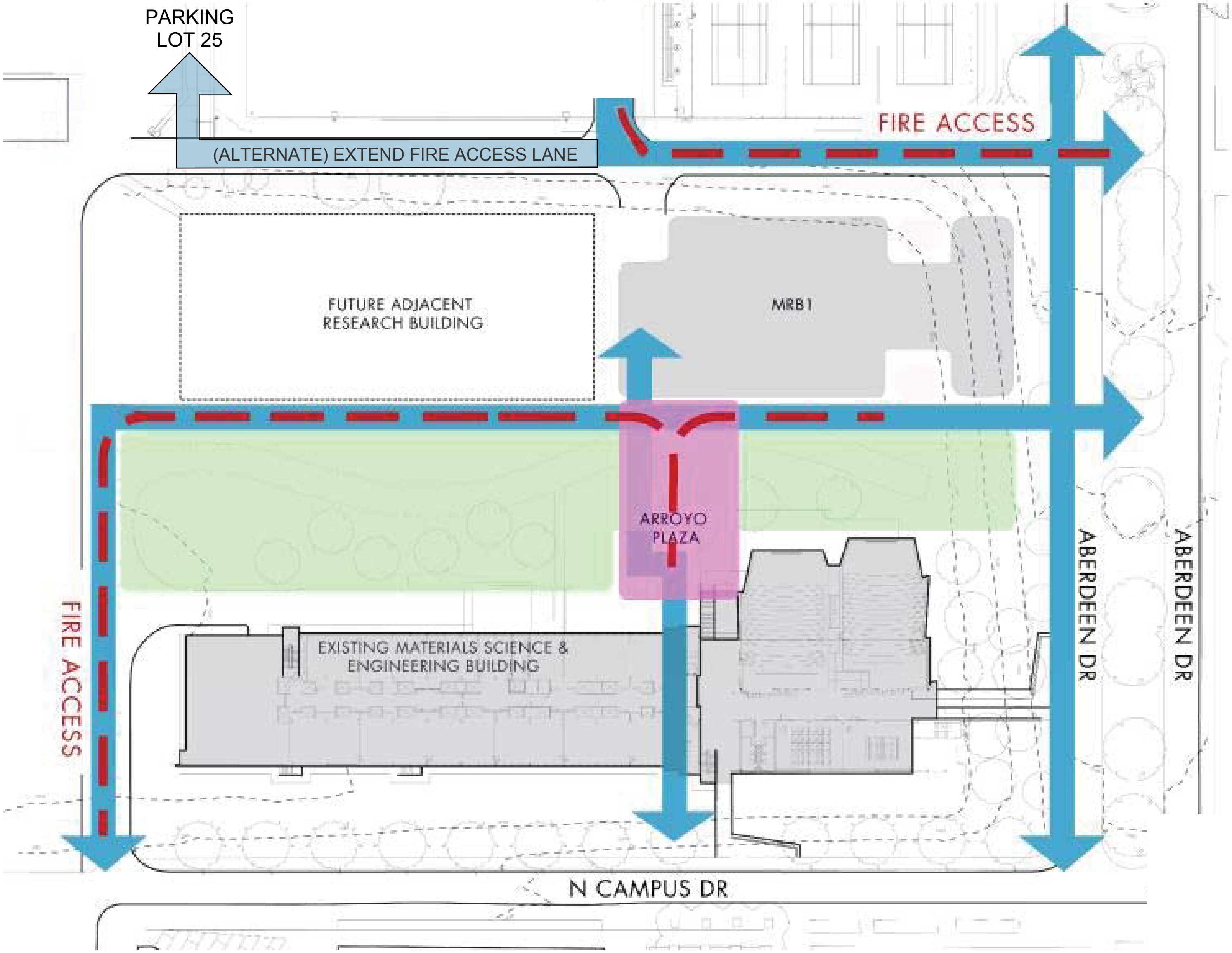
While the proposed MRB1 would provide new research space on campus to accommodate approximately 400 individuals. For purposes of analysis in this IS, it is assumed that all 400 positions would be new to the campus, which allows for a conservative analysis of potential impacts. As described in Section V.10, Land Use and Planning, of this IS, this increase would fall within the population projections assumed in the 2005 LRDP Amendment 2 approved in November 2011.

Vehicular and Pedestrian Circulation

The proposed circulation system for the MRB1 is described below and has been designed to take into consideration existing and planned circulation movement surrounding the project site. Figure 4, Conceptual Site Plan; Figure 8, Conceptual Circulation Plan; and Figure 9, Conceptual Open Space and Landscape Plan, depict the proposed vehicular and non-vehicular circulation in and surrounding the project site.

Vehicular Circulation and Parking

As shown on Figure 4, the loading dock for the MRB1 is proposed at the northwest corner of the building site to enable access of service vehicles from Aberdeen Drive and to centralize service



Source: CO Architects 2016

Conceptual Circulation Plan

Figure 8

UCR Multidisciplinary Research Building 1 Project

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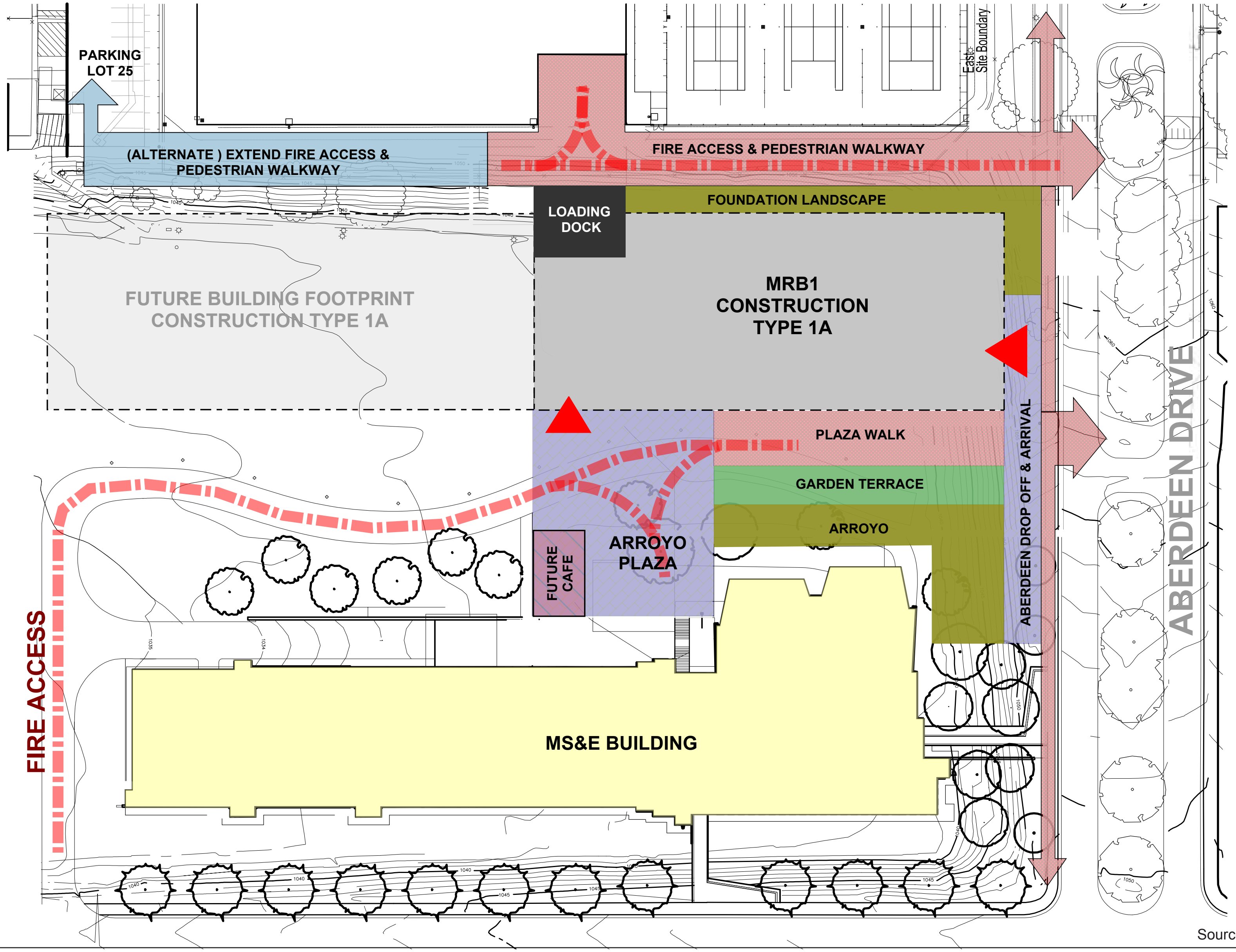

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Conceptual Open Space and Landscape Plan

Figure 9

UCR Multidisciplinary Research Building 1 Project

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(03/21/2016 CO Architects) R:\Projects\UCR\3UCR000500\Graphics\InitialStudy\Fig9_ConceptOpenSpaceAndLandscapePlan.pdf functionality for the potential future research building to the west. The service road would also serve as a fire access lane and would have a minimum width able to accommodate two-way access of service vehicles and code-compliant fire truck access, turnaround dimensions, and hose pull lengths. The portion of the service road north of and adjacent to the proposed MRB1 site would be sufficient to serve the proposed MRB1; however, the extension of the service road to the west, to Parking Lot 25, is also being addressed in this IS and may be constructed as part of the proposed Project. While the purpose of this road is intended for service and fire truck access, it would include enhanced paving appropriate for a significant pedestrian campus walkway, as discussed below.

The lower half of the project site would rely on the existing fire lane to the west of the project site. The fire access lane would "hammerhead" at the western end of the building footprint and would meet all current *California Fire Code* requirements.

The Aberdeen Drive drop-off/arrival area would be located on the west side of Aberdeen Drive, generally between the existing MS&E Building and the proposed MRB1. The drop-off area would be designed to allow cars to pull off of Aberdeen Drive, keeping Aberdeen Drive clear of traffic.

With the exception of service vehicle and dedicated ADA-compliant parking, there would be no vehicular parking provided at the project site. It is expected that building occupants and visitors would park at existing parking lots in the vicinity, as further discussed in Section V.16, Transportation and Traffic, of this IS.

Pedestrian and Bicycle Circulation

The 2005 LRDP identified the need to enhance physical connections across campus, including adding and widening walkways and bike paths and limiting vehicular circulation. As shown on Figure 8, the proposed Project has been organized to facilitate campus pedestrian circulation. The proposed pedestrian walkway, Arroyo Plaza, and Aberdeen Drive drop-off zone and stairway intersect and provide new east-west connectivity within the northernmost portion of the academic core, consistent with the goals of the 2005 LRDP.

To accommodate pedestrian and bicycle circulation within the site and to the surrounding campus, the proposed MRB1 (and the potential future research building to the west) is situated to define a new east-west pedestrian walkway along the north edge of the site, connecting Aberdeen Drive to Canyon Crest Drive, both of which are vital north-south campus connectors. This walkway is envisioned to be an important east-west pedestrian circulation route providing access to the existing residence halls to the northeast and nearby parking lots.

The pedestrian walkway is envisioned to be a 30-feet wide promenade, comprised of integral color concrete paving. This would include an approximately 20-foot-wide pedestrian walkway and fire lane clear zone and a 10-foot-wide pedestrian zone walkway.

A second east-west connector is formed through the area created between the MRB1 and the existing MS&E Building to the south. The pedestrian walkway traversing this space is anticipated to have a minimum clear width of 20 feet and would also accommodate emergency vehicles.

Bike storage would be provided for at least five percent of building users, and a single-stall, ADA-accessible shower would be provided on both the Lower Level and Level 1 for use by bicyclists.

Open Space, Landscape, and Hardscape

Consistent with the provisions of the UCR Campus Design Guidelines, the area between the proposed MRB1 and existing MS&E Building would be designed to provide an important open space area that facilitates pedestrian movement and provides gathering spaces. The proposed Project's outdoor components consist of a series of programmed spaces or zones that make up the internal system of the site. Figure 9, Conceptual Open Space and Landscape Plan, illustrates these components, which include the service road/pedestrian walkway, foundation landscape, plaza walk, garden terrace, and "arroyo"[4]; Arroyo Plaza; Aberdeen drop-off/arrival area; and architecturally significant stair and ramp. Figure 10 provides cross-sections of the conceptual landscape and hardscape elements proposed to the north and south of the proposed MRB1.

The area between the proposed MRB1 and existing MS&E Building is an expansion of the existing arroyo landscape that was created as part of the MS&E Building and is divided into three parallel areas: plaza walk, garden terrace, and arroyo. The transitional space between the plaza walk (fully paved) and the arroyo (fully landscaped) is the garden terrace area that provides structured social spaces and seating. The garden terrace is intended to be a series of smaller gathering spaces combined with larger planting areas and a mixture of fixed-seat walls and moveable furniture. These spaces shall act as extensions of the plaza walk where students, staff, and faculty of the MS&E, proposed MRB1, and the potential future research building may gather. The arroyo garden is planned to be a more naturalized extension of the garden terrace and visually reflect the historic arroyo. At the same time, the arroyo garden would function as a bioretention area.

The Arroyo Plaza is conceptually designed to be the center of outdoor activity between the proposed MRB1, the existing MS&E Building, and the potential future research building. It would have a strong indoor-outdoor connection to the lower level of the proposed MRB1. The Arroyo Plaza would be largely open, as it would also function as the main turnaround for emergency vehicles.

The architecturally significant stair and ramp located west of the Aberdeen Drive drop-off/arrival would provide a formal connection between the upper level of the site adjacent to Aberdeen Drive and the active lower level and Arroyo Plaza. The stair and ramp would be a minimum of 30 feet wide and have a higher level of finish such as an architectural colored concrete. The stair and ramp would help anchor the east side of the site and transition the upper and lower levels so the landscape feels continuous and uninterrupted, extending the plaza walk connection in both the east and west directions.

There are three main planting typologies proposed for the MRB1 landscape design, each of which provides a specific function that not only helps reinforce the overall design of the site but helps with the ecology and sustainability. These typologies include foundation landscape, garden terrace, and arroyo. An existing "native" arroyo exists to the east of Aberdeen Drive and resumes south of Canyon Crest Drive and is an important landscape feature on the UCR campus. The open space linkage proposed as part of the proposed Project is a direct response to the historic arroyo.

The proposed MRB1 and potential future research building would be aligned along the north and east edges of the site, wrapped by a linear foundation planting zone. The foundation landscape is envisioned as a consistent landscape edge along the pedestrian walk that wraps north and east ends of the proposed buildings.

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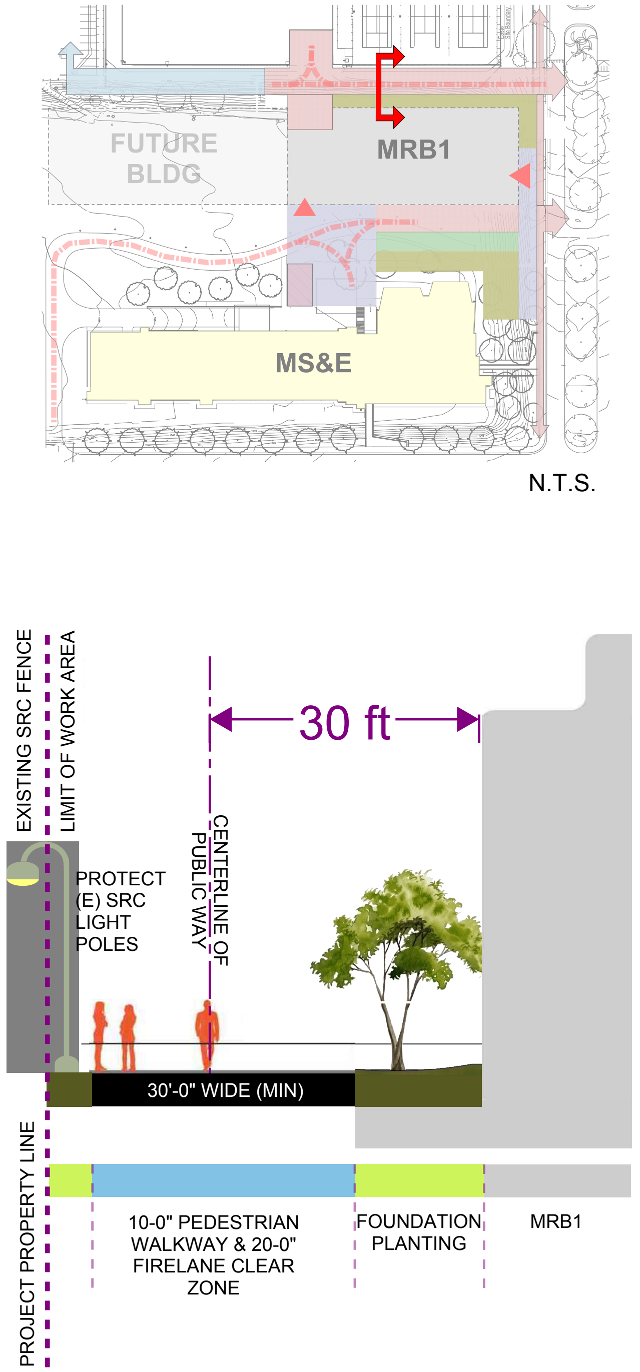
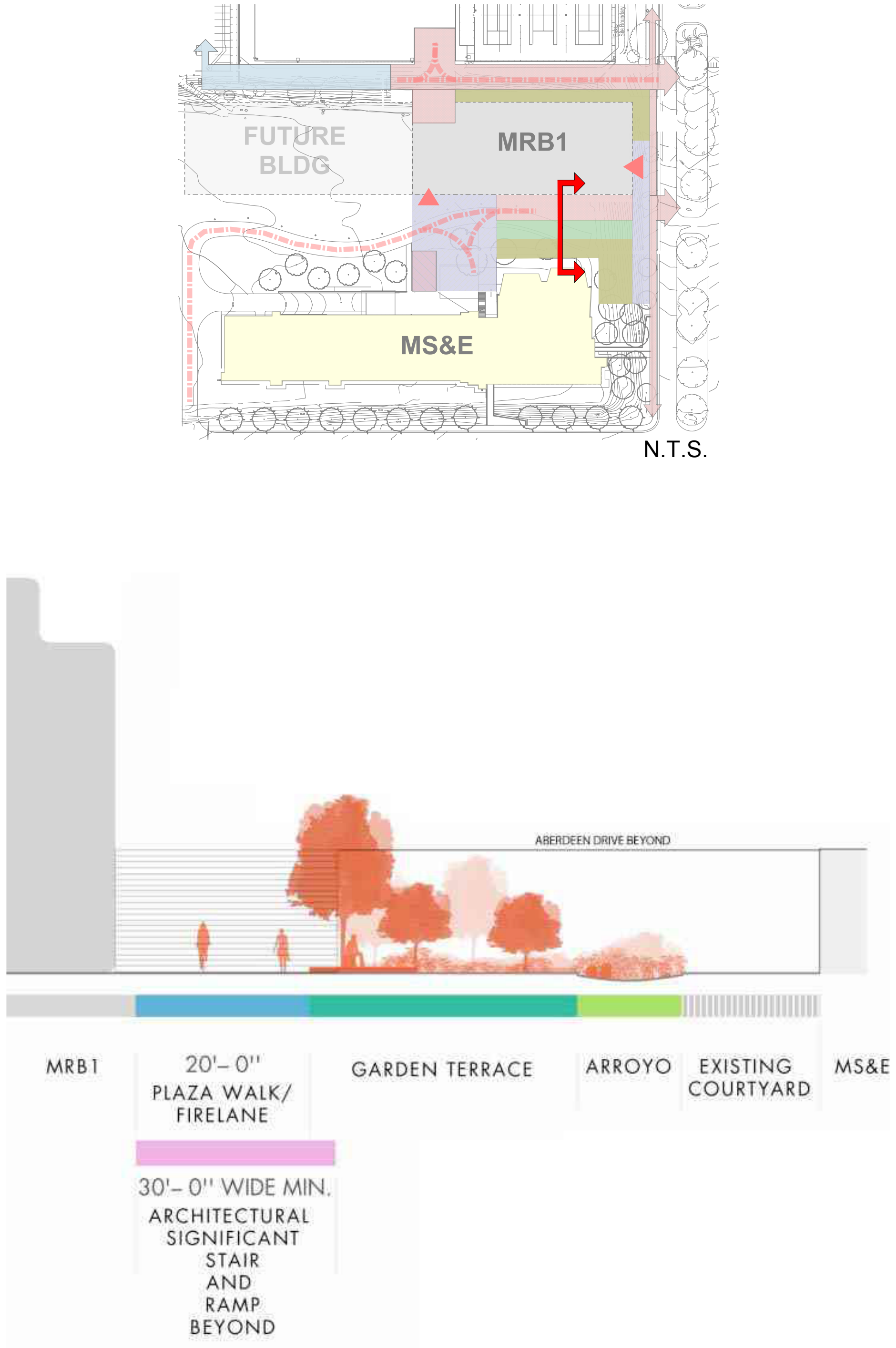
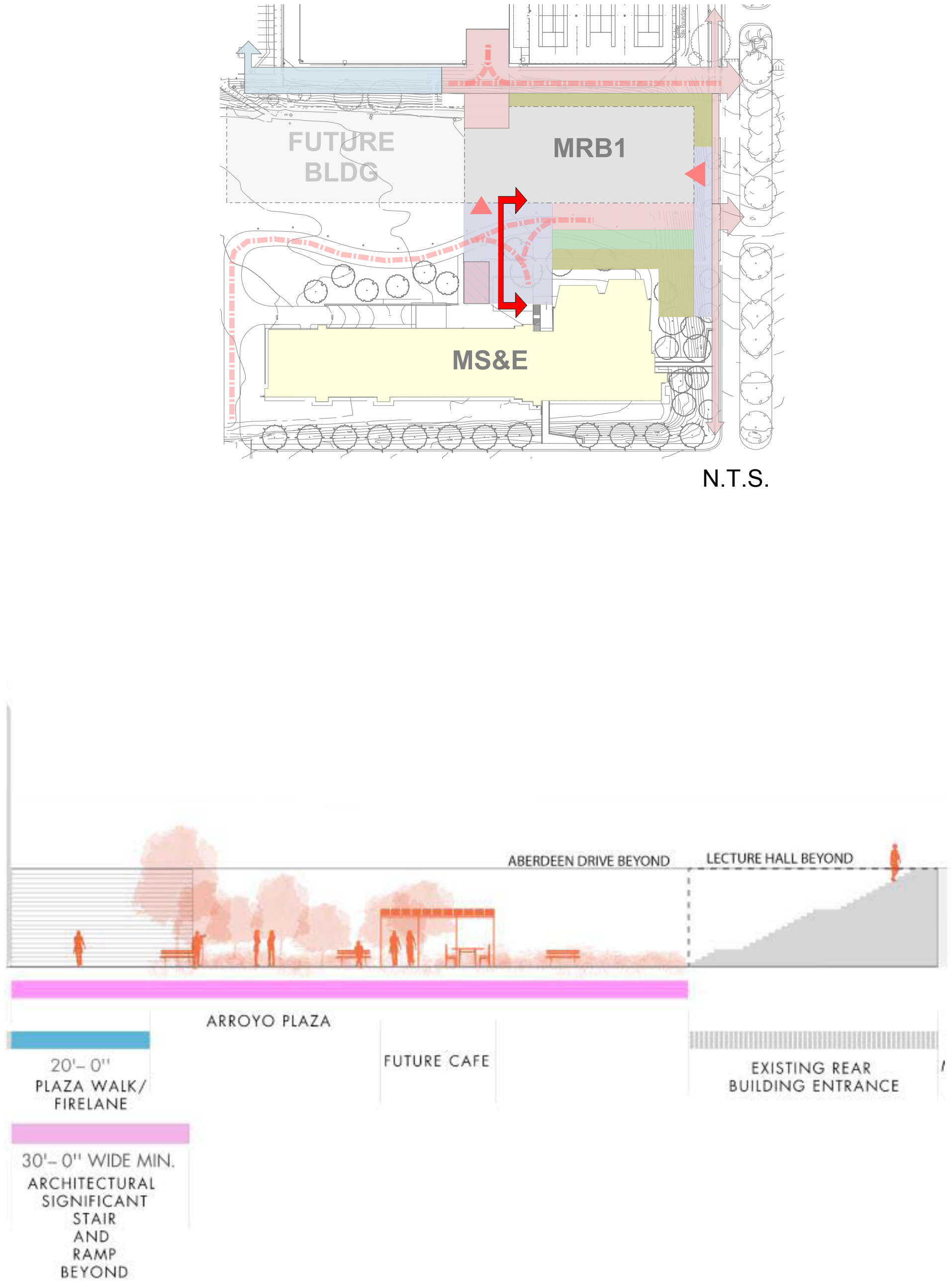
[4] The landscaped area between the buildings is intended as a gesture to, or representative of an historic connection between the two remaining sections of the existing arroyo, but in itself is not an arroyo.



Section A: Site Section Looking East Cutting Through Proposed Pedestrian Walk (N.T.S.)



Section B: Site Section Looking East Cutting Through MS&E Hall (N.T.S.)



Section C: Site Section Looking East Cutting Through Arroyo Plaza (N.T.S.)

Source: CO Architects 2016

Conceptual Landscape Sections

Figure 10

UCR Multidisciplinary Research Building 1 Project

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Paving types would include asphalt (only for common vehicular routes); cast-in-place concrete with a broom finish and a "UCR Tan" integral color; unit paving; and aggregate paving.

As further discussed in Section V.4, Biological Resources, of this IS, there are approximately 40 trees that would be removed during construction; tree replacement would be required in accordance with the mitigation established in the LRDP EIR. It should be noted that the existing trees in the project site along Aberdeen Drive and along the north side of the MS&E Building would be protected in place, if possible, and replaced with new trees of same species and similar size if they cannot.

Interior and Exterior Lighting

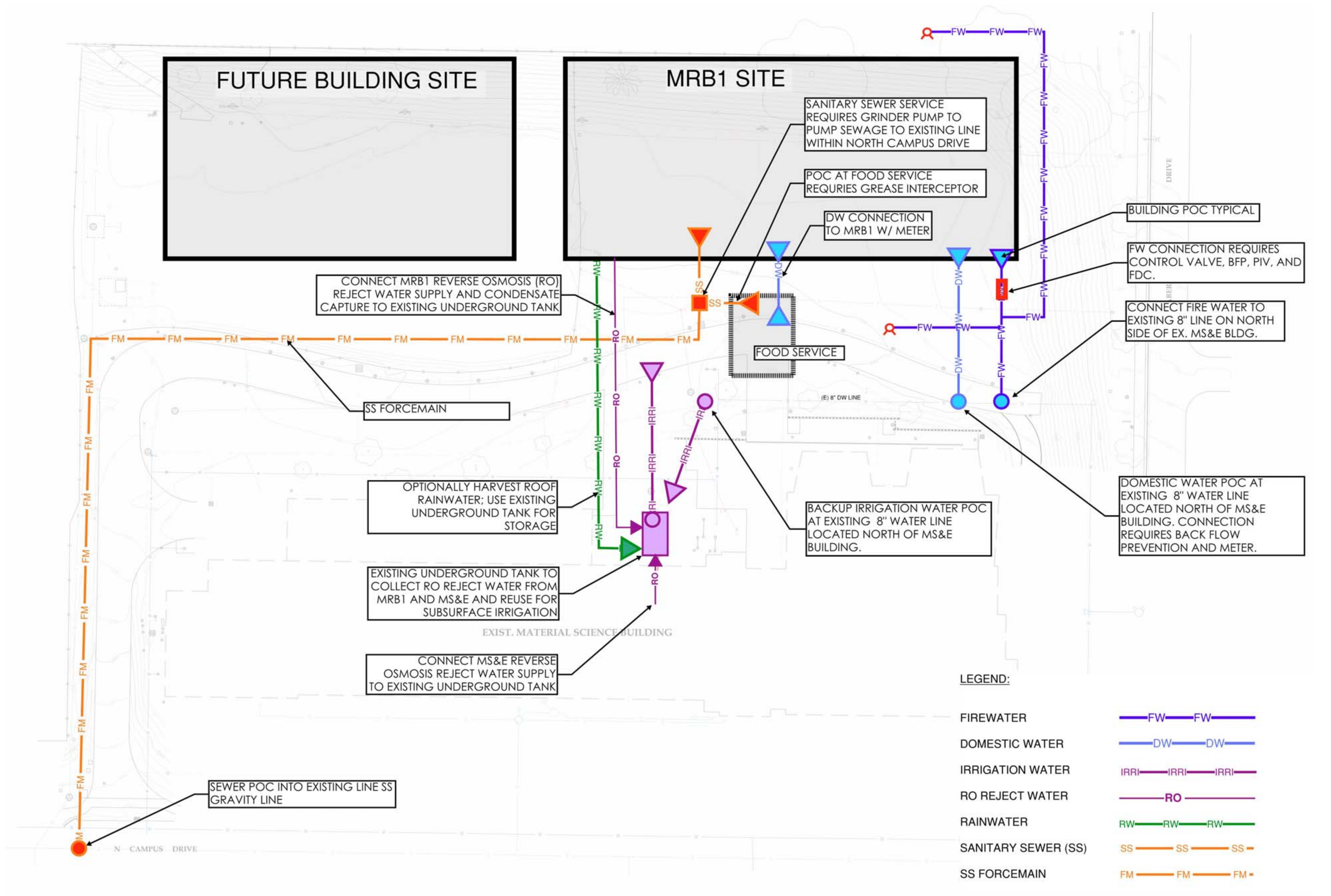
The proposed Project lighting design would provide sufficient lighting to ensure visual performance and safety. The quantity of lighting would be determined by adherence to recommended illuminance levels derived from the latest industry standards and Campus Design Guidelines and any applicable code requirements. Indoor and outdoor lighting control systems would conform to *California Administrative Code* Title 24 (Title 24) energy efficiency requirements.

The interior lighting design would optimize the use of natural daylight to reduce overall power consumption. Lighting control strategies would be designed to respond to the environment through the use of sensors to monitor the building's perimeter of natural lighting as well as internal occupancy levels. Outdoor lighting would include the lighting of vehicular access and parking, and sidewalks.

Utilities/Infrastructure

The proposed Project would require connections to existing campus utilities, including domestic water, chilled water, steam, sewer, storm drains, natural gas, and electric systems that are currently located within the project area, as described below (refer to Figure 5, Site Survey, which shows existing utilities). Figure 11, Conceptual Wet Utility Connections, and Figure 12, Conceptual Dry Utility Connections, depict the anticipated location of utility connections to serve the proposed MRB1. The final sizing and design of on-site facilities would occur during final building design. Following is a description of proposed utility systems, including water quality Best Management Practices (BMPs).

- **Domestic, Fire and Irrigation Water.** Domestic water service is provided to the project site from the UCR Physical Plant. Domestic water would be provided to the proposed MRB1 from a 2.5-inch line connected to the existing 8-inch campus water main that runs east-west north of the MS&E Building. Separate fire water connections would be made to the eight-inch main to feed the hydrants, sprinkler systems for the building, and the Fire Department Connection (FDC) assemblies. It is anticipated that irrigation water demand would be primarily met by non-potable water sources (reverse osmosis reject water, condensate return, treated graywater, and/or rainwater). A new irrigation water service would be installed for backup. If required, it would connect to the existing eight-inch main.
- **Steam and Chilled Water.** Steam and chilled water, available from UCR's Central Plant, would be supplied from the existing vault located near the western end of the potential future research building site. Steam and chilled water lines would be extended from the existing vault to a new vault that would be constructed as part of the proposed Project.
- **Sewer.** Sanitary sewer service would be provided from an existing 15-inch sewer line in North Campus Drive. Due to existing grades in the site vicinity, sewage would require pumping to the sewer line. As shown on Figure 11, a sewer lateral would extend from the south side of the MRB1 to a force main that would extend to the point of connection. A

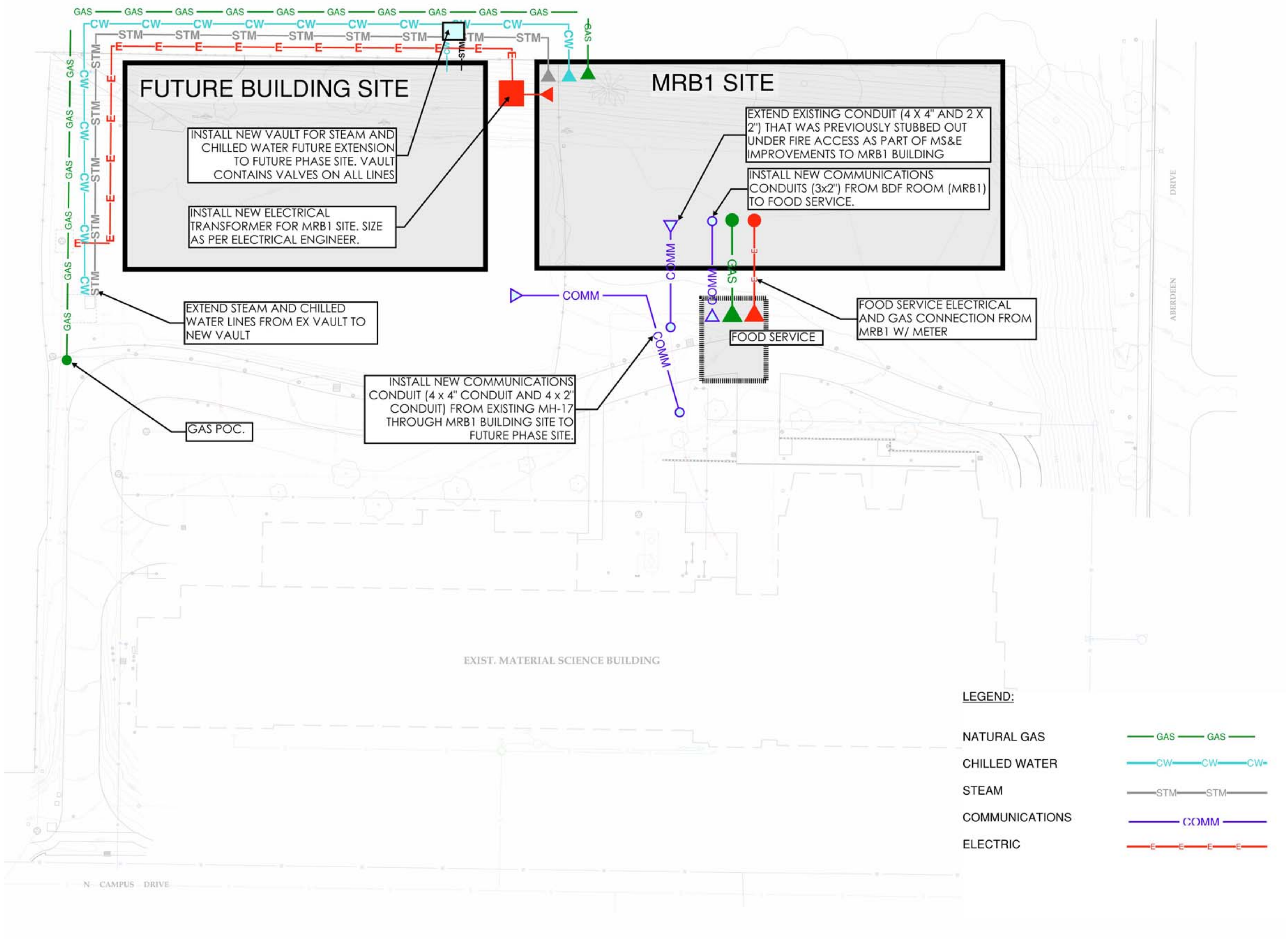


Source: CO Architects 2016

Conceptual Wet Utility Connections

Figure 11

UCR Multidisciplinary Research Building 1 Project



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Source: CO Architects 2016

Conceptual Dry Utility Connections

Figure 12

UCR Multidisciplinary Research Building 1 Project

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(01/28/2016 JAZ) R:\Projects\UCR\3UCR000500\Graphics\InitialStudy\Fig12_ConceptDryUtilityConnections.pdf grinder pump would be installed to serve the MRB1 and a grease interceptor would be installed to accommodate a potential future café or related use.

Storm Water and Water Quality. All storm water runoff would be managed for both quality and quantity as required by current regulations (as further discussed in Section V.9, Hydrology and Water Quality, of this IS). Conveyance facilities would be designed in compliance with Riverside County Flood Control and Water Conservation District requirements in effect at the time of permit issuance. Conveyance facilities, including pipes and swales, would be sized for the 10-year, 24-hour storm event.

Storm water quality would be managed using treatment-based low impact development (LID) BMPs. The project will follow the Riverside County Flood Control and Water Conservation District BMPs. Potential storm water management BMPs that may be implemented at the project site are presented in Figure 13 and include rain gardens, flow-through planters, green roof, pervious paving, rainwater harvesting, and self-retaining landscapes. The proposed arroyo garden would provide storm water treatment and infiltration functions. Flow-through planters within the garden terrace can include seating areas, and suspended pavement can be used in the Arroyo Plaza. Roof runoff from the new building may be captured and stored in the existing cistern just north of the existing MS&E Building.

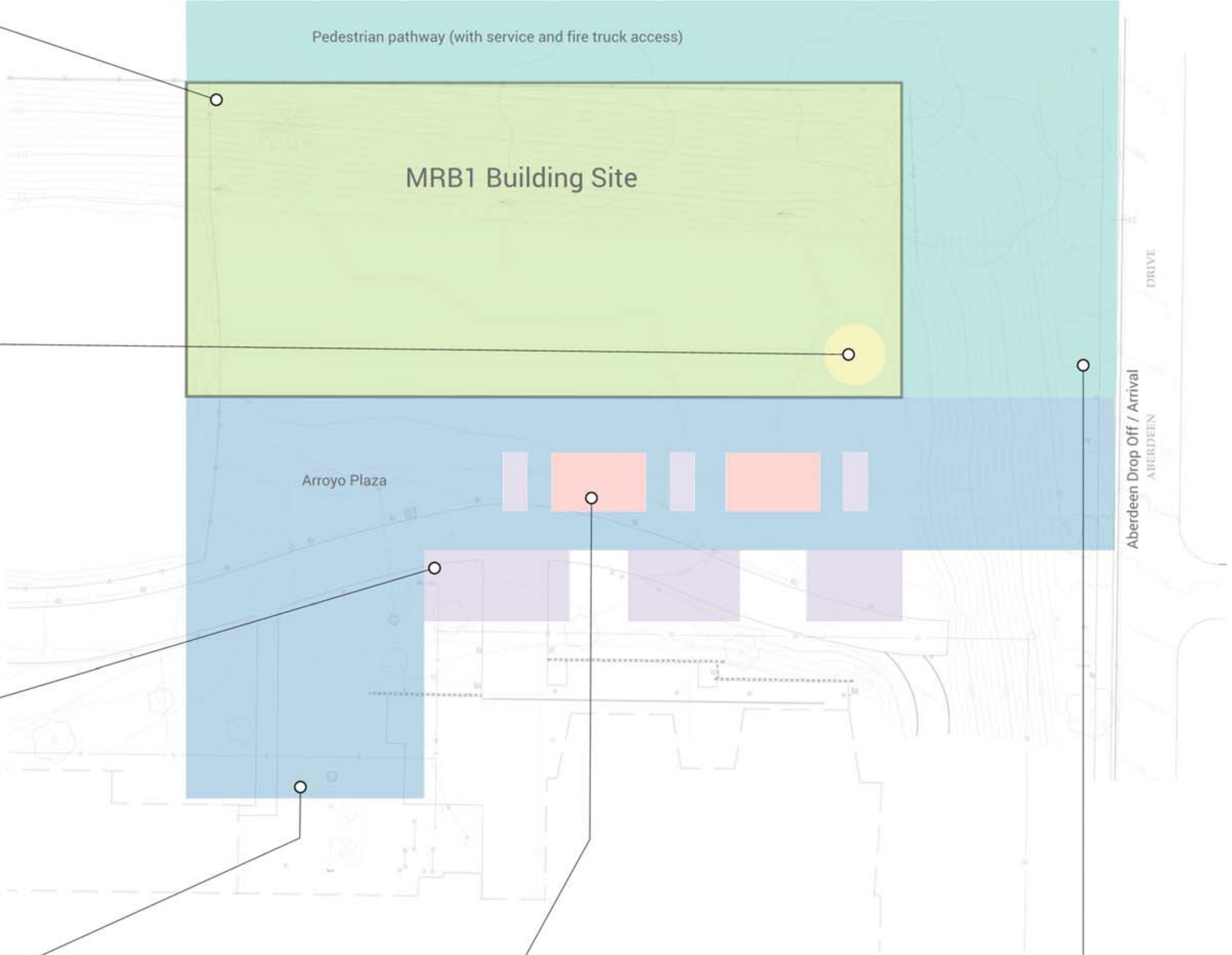
Overflow from the storm water management areas would enter a piped network that would connect to the existing storm drain system, where available. The existing storm drain system would be rebuilt within the project site. Grading of the site would be designed to allow for overland flow of storm events greater than a 10-year storm without flooding of existing and new structures.

- **Electricity and Natural Gas.** Electricity would be supplied via a connection to the existing electric service manhole located near the western end of the potential future research building site. A new transformer would be installed, and electric lines would be extended to the northwest corner of the proposed MRB1. Standby/emergency power would be supplied by a diesel generator; the capacity of the generator would be determined during final design. Natural gas would be supplied via a connection to an existing two-inch, five pounds per square inch (psi) line within the western and northern portions of the potential future research building site. Electricity and natural gas would also be extended from the south side of the proposed MRB1 to accommodate a potential future café or related use.
- **Telecommunications.** Telecommunications infrastructure would be supplied to the proposed MRB1 by connecting to the conduit that was stubbed out beneath the fire lane as part of the MS&E Building construction.

Sustainable Building Features

The proposed Project would comply with the University of California Policy on Sustainable Practices 2015 (Policy on Sustainable Practices) and adopt the principles of energy efficiency and sustainability to the fullest extent possible, consistent with budgetary constraints and regulatory and programmatic requirements. Leadership in Energy and Environmental Design (LEED™) is a green building rating system that contains prerequisites and credits in five areas: (1) environmentally sensitive site planning; (2) water conservation; (3) energy efficiency; (4) conservation of materials and resources; and (5) indoor air quality. A minimum LEED Silver rating standard has been established for all UC projects. To achieve this rating, the design, construction, and operation of the proposed Project incorporates a series of green building strategies, including, but not limited to, the following:

- Protect undeveloped land by developing in an urban area with existing infrastructure.



Green Roof + PV

Research shows that green roofs can cool pv panels, allowing pv panels to work more efficiently. Green roofs also provide insulation, reducing cooling and heating loads of the building. Additinally, they provide habitat for pollinators such as bees and butterflies.

Rainwater Harvesting

Rainwater can be captured from rooftops and stored in tanks that blend in with the site, either placed on the roof, on the ground, or underground. Rainwater can be reused for irrigation. The existing tank adjacent to the MS&E building may be used for rainwater collection.

Rain Gardens and Flow Through Planters

Rain gardens are shallow depressions that capture and treat stormwater, allowing it to infiltrate into the ground. Flow through planters use the same treatment technique as rain gardens but can be more easily incoporated into seat walls and the active pedestrian areas within the Garden Terrace.

Pervious Paving

Pervious paving allows stormwater to move through the paving surface where it infiltrates into the ground, which helps decrease stormwater runoff. Pervious paving can be integrated into the Arroyo Plaza paving design.

Suspended Pavement

Pavement suspended over Silva Cells or Structural Soils is a great way to promote healthy tree growth and improve stormwater treatment. Several trees can be connected beneath the paving surface, improving soil and plant health.

Self Retaining Landscape

Landscape areas with highly porous, uncompacted soils are utilized to absorb all water that lands on it, treating water through adsorbtion and minimizing runoff by emulating the natural unaltered condition. The building's foundation landscape zones can be designed as self retaining areas.

Source: CO Architects 2016

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Conceptual Storm Water Management Program

Figure 13

UCR Multidisciplinary Research Building 1 Project

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- Implement an infill project promoting higher development density and community connectivity.
- Develop a project near public transportation alternatives and limit on-site parking to encourage non-vehicular transportation.
- Provide secure bicycle storage as well as changing rooms and showers to encourage reliance on modes of travel other than single occupancy vehicles.
- Utilize roofing material with high solar reflectance to reduce the heat island effect, which contributes to higher temperatures.
- Manage both the quantity and quality of storm water runoff through diversion of water for flow control and/or treatment to features such planter boxes, swales, and underground basins.
- Reduce water use for irrigation through efficient irrigation systems and selection of climate-appropriate plant species.
- Reduce potable water use by 40 percent or more through water-efficiency fixtures, such as ultra-low flow and flush plumbing fixtures, and potential use of non-potable water sources such as reverse-osmosis reject water, condensate capture, graywater, wastewater, and/or roof rainwater for irrigation and toilet flushing.
- Reduce building energy consumption by at least 20 percent below Title 24 and strive to achieve 30 percent or more. Additionally, implement enhanced commissioning and enhanced refrigerant management as well as measurement and verification of energy systems to ensure planned features are properly installed and maintained.
- Design the roof structural system to accommodate future photovoltaic (PV) panels and leave at least 15 percent of the roof area left open for installation of PV panels.
- Divert 95 percent of construction and demolition waste from landfill streams toward recycling, salvage, and charitable organization streams.
- Utilize recycled building materials and regionally-sourced materials (within 500 miles of the project site).
- Utilize products certified by the Forest Stewardship Council (FSC) for 100 percent of wood-based materials.
- Maintain responsible construction practices to protect indoor air quality (IAQ) through implementation of a Construction IAQ Management Plan during construction and prior to occupancy.
- Utilize low volatile organic compound (VOC)-emitting flooring, paints, coatings, adhesives, sealants, and composite wood within the building interior.
- Provide individually controlled temperature and lighting systems and provide daylight and/or outside views within the majority of spaces.
- Implement a green cleaning program and policy that uses environmentally benign equipment and products certified by Green Seal and the U.S. Environmental Protection Agency (USEPA) as low impact and low-emitting.
- Conduct and document an education and outreach program involving guided tours, signage, and case studies to provide awareness of LEED and the green components of the building.

In addition to the minimum LEED rating standard, the UC Policy on Sustainable Practices directs that UC campuses design, construct, and commission new laboratory buildings (defined as having 10 percent or more assignable square feet [ASF] assigned to web lab use) to meet, at least, the prerequisites of the Laboratories for the 21st Century (Labs21) Environmental Performance Criteria (EPC). Labs21 is a voluntary partnership program that offers training and resources to support the design and operation of high-performance laboratories, co-sponsored by the U.S. Department of Energy and the USEPA. The Labs21 EPC is a rating system that consists of prerequisites and credits in several laboratory-specific areas and is designed as a complement to LEED. Labs21 EPC prerequisites that may be implemented in the proposed MRB1, include, but are not limited to:

- WE (Water Efficiency) EPC Prerequisite 1: Laboratory Equipment Water Use
- EA (Energy and Atmosphere) EPC Prerequisite 1: Assess Minimum Ventilation Requirements
- MR (Materials and Resources) EPC Prerequisite 1: Hazardous Material Handling
- EQ (Indoor Environmental Quality) EPC Prerequisite 1: Laboratory Ventilation
- EQ EPC Prerequisite 2: Protection and Notification Systems

Construction Activities

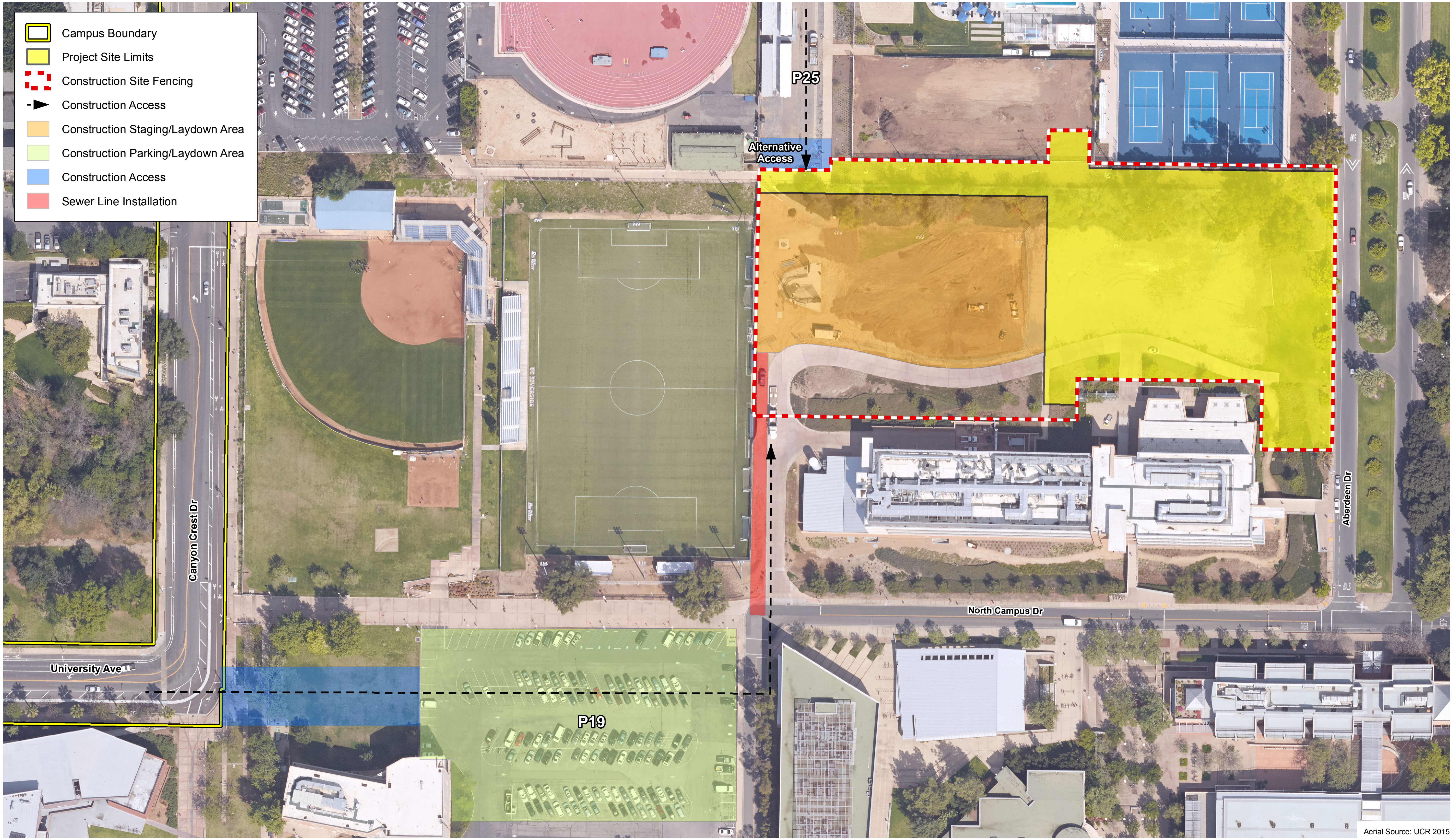
Construction of the proposed Project is anticipated to begin in August 2016 with substantial completion by October 2018 (construction duration of approximately 26 months). The generalized construction phasing is as follows, with some overlap between phases:

- Demolition; Rough and Precise Grading (2 months, including 2 weeks of demolition);
- Utility and Foundation Trenching (2 months);
- Building Construction (15 months);
- Interior Improvements/Buildout (9 months); and
- Commissioning (3 months).

Figure 14, Construction Impact Limits, illustrates the boundaries of the areas that would be impacted by construction activities for the proposed MRB1, as analyzed in this IS/MND. It is assumed that the entire approximately 2.1-acre project site would be disturbed (on-site impacts). Off-site impacts would occur for the implementation of construction access roads, construction staging, and trenching for utility connections.

Construction of the proposed Project would require common equipment such as truck loaders, compressors, backhoes, concrete breakers, bulldozers, finish graders, paving machine, and concrete pumps. The proposed Project would require minimal demolition and would primarily include the concrete sidewalk along the north side of the MS&E Building within the construction footprint and the remnant concrete slabs.

Earth-moving activities (grading/excavation) would be required to accommodate the new building pad and Level 1 connections to the north and east. The proposed Project would require some cut (i.e., excavation) within the entire building footprint for foundations and additional cut under the eastern portion of the building footprint where it pushes up against Aberdeen Drive and into the existing slope. Fill is anticipated to the north and east outside the building footprint to bring adjacent grades up to the elevation of the upper level (Level 1) entrances and to provide an at-grade connection to the pedestrian walkway/service road to the north and Aberdeen Drive to the



Aerial Source: UCR 2015

Construction Areas

UCR Multidisciplinary Research Building 1 Project

N W E S 100 50 0 100 Feet

Figure 14

BonTerra PSOMAS

(Rev: 03-22-2016 JAZ) R:\Projects\UCR\3UCR000500\Graphics\InitialStudy\Fig14_ConstructionAreas.pdf

D:\Projects\UCR\0005\MXDs\InitialStudy\ex_ConstructionAreas.mxd east. A retaining wall would be constructed as part of the stairway from the Arroyo Plaza up to Aberdeen Drive. On-site soils would be reused wherever possible as fill, where conformance to the proposed Project's geotechnical requirements can be achieved.

Earth moving would generally be shallow (up to 5 feet bgs) to accommodate the required removal and preparation of the underlying soils for foundation design and associated building construction and benching into the slopes in the northern and eastern portions of the site. Construction of the proposed Project would require an estimated 5,000 cy of cut and 1,000 cy of fill, necessitating the off-site disposal of approximately 4,000 cy of soil. This would require approximately 250 truck trips (500 one-way trips), using 16 cy trucks, over approximately 2 months (43 workdays). Therefore, there would be approximately 6 round truck trips (12 one-way trips) per weekday during each week of the grading period.

As shown in Figure 14, the area immediately west of the project site would be used for construction staging to receive, lay down, and prepare materials for use during construction. An all-weather surfacing agent would be applied to the loading area. Construction trailers would be located between the staging area and MS&E Building.

Vehicular and Pedestrian Circulation During Construction

During construction, existing vehicular, emergency, and pedestrian access, including access to the MS&E Building, would be maintained. However, it is possible that certain pedestrian movements would be re-routed during construction.

Potential construction traffic routes have been identified to efficiently move construction vehicles. There are two options being considered for local construction access. The proposed/preferred access would involve construction of a new all-weather roadway extending from University Avenue between Canyon Crest Drive and Parking Lot 19 (refer to Figure 14, Construction Areas). Construction vehicles would use this roadway, pass through Parking Lot 19, to the vehicle access road off of North Campus Drive that leads to the project site. The alternative access would involves construction of an access road from the south end of Parking Lot 25. Under the first option, construction vehicles, including haul trucks, would take University Avenue to Interstate (I) 215. Under the alternative access option, construction vehicles would turn left on Linden Street, right on Iowa Avenue, and left on West Blaine Street to I-215. Pursuant to PP 4.14-2 from the 2005 LRDP Amendment 2 EIR, the construction schedules of major projects would be coordinated to adjust construction schedules, work hours, and access routes to the extent feasible in order to reduce construction-related traffic congestion.

As shown on Figure 14, Parking Lot 19 would be designated for construction worker vehicles and construction laydown. This area is expected to meet peak demand for worker parking needs. Should additional parking be needed during peak worker demand periods, assignment of small clusters distributed across all campus parking areas would be made.

6. RELATIONSHIP TO THE 2005 LONG RANGE DEVELOPMENT PLAN AMENDMENT 2

The 2005 LRDP Amendment 2 approved in November 2011 projected total building space on campus to be approximately 14.9 million gsf by 2020/2021, including approximately 3.1 million gsf allocated to the SOM. As identified in Table 3.0-5 of the 2005 LRDP Amendment 2 EIR, of this amount, there is a total of 5.5 million gsf allocated to Academic Programs. The existing on campus development is approximately 7.0 million gsf; therefore, there is approximately 7.9 million gsf of development allocation remaining on campus. The proposed Project involves up to 190,000 gsf of development, which is well within the remaining building allocation.

Additionally, the 2005 LRDP, as amended, projected a total enrollment of 25,000 students and 16,393 associated faculty, staff, and visitors, for a total campus population of 41,393 by the academic year 2020–2021. The projected population for the campus (less SOM) is 35,540 individuals. Excluding the category of "other individuals"[5], there are projected to be 32,916 students, faculty and academic staff, and non-academic staff. For comparison, the current student population on campus based on the Fall 2015 enrollment is 21,539 students (including 18,608 undergraduate students and 2,931 graduate students) (UCR 2016). Additionally, there are approximately 8,306 faculty, staff and staff personnel, for a total population of 29,845 individuals (not including other individuals). Therefore, the remaining projected growth on campus (not including SOM and other individuals) is 3,071 individuals. It is expected that the proposed MRB1 would provide new research space on campus to accommodate a population of approximately 400 individuals. It is assumed that all 400 positions would be new to the campus. This potential increase in population is within the remaining projected growth on campus, as identified in the 2005 LRDP, as amended.

As further discussed in Section V.10, Land Use and Planning, of this Initial Study, the 2005 LRDP Amendment 2 includes Planning Strategies for the following issues to guide expansion and development of the UCR Campus: land use, circulation and parking, open space and landscape, and campus and community. These planning strategies are required to be implemented with each development project on Campus, and have been specifically identified in the UCR 2005 LRDP EIR as supplemented and updated by the UCR 2005 LRDP Amendment 2 EIR, along with general development strategies. The Planning Strategies that are applicable to the proposed Project have been incorporated into the project as identified for each topical issue in this Initial Study.

7. ANTICIPATED DISCRETIONARY APPROVALS

The Regents will consider the proposed MRB1 Project, the tiered IS/MND, and UCR's request for Project approval. UCR and the responsible agencies identified below are expected to use the information contained in this tiered IS/MND for consideration of approvals related to and involved in the implementation of the proposed Project. This tiered IS/MND has been prepared to inform all State, regional, and local government approvals needed for construction and/or operation of the proposed Project, whether or not such actions are known or are explicitly listed. Anticipated approvals required from UCR and the responsible agencies to implement the proposed Project include, but are not limited to, those listed below.

University of California Board of Regents

- Adoption of the Final Tiered Initial Study/Mitigated Negative Declaration
- Budget Approval
- Design approval of the MRB1 Project.

Responsible Agencies

- **City of Riverside.** The proposed project may require street improvement and/or construction easements for the construction of an access road from University Avenue.

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[5] Includes campus visitors, patients, childcare students, student family members (living on campus), daytime extension students, ASUCR, KUCR & Highlander nonstudent staff, vendors, and construction workers.

III. ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

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

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

IV. DETERMINATION (TO BE COMPLETED BY THE LEAD AGENCY)

On the basis of this initial evaluation:

☐ I find that the proposed project WOULD NOT have a significant effect on the environment, and recommend that a NEGATIVE DECLARATION be adopted.

☒ I find that although the proposed project could have a significant effect on the environment, the project impacts were adequately addressed in an earlier document or there will not be a significant effect in this case because revisions in the project have been made or project-specific mitigation measures have been proposed that will avoid or reduce any potential significant effects to a less than significant level and recommend that a MITIGATED NEGATIVE DECLARATION be adopted.

☐ I find that the proposed project MAY have a significant effect on the environment and recommend that an ENVIRONMENTAL IMPACT REPORT be certified.

Tricia D. Thrasher, ASLA, LEED AP
University of California, Riverside
Principal Environmental Planner

April 1, 2016
Date

V. EVALUATION OF ENVIRONMENTAL IMPACTS

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

A) "**Potentially Significant Impact**" is appropriate if there is substantial evidence that the project's effect may be significant even with the incorporation of Planning Strategies (PSs), Programs and Practices (PPs), and Mitigation Measures (MMs) identified in the UCR 2005 LRDP EIR as supplemented and updated by the UCR 2005 LRDP Amendment 2 EIR. If there are one or more "Potentially Significant Impacts" a Project EIR will be prepared.

B) "**Project Impact Adequately Addressed in LRDP EIR**" applies where the potential impacts of the proposed Project were adequately addressed in the UCR 2005 LRDP EIR as supplemented and updated by the UCR 2005 LRDP Amendment 2 EIR, and the PSs, PPs, and MMs identified in the UCR 2005 LRDP EIR as supplemented and updated by the UCR 2005 LRDP Amendment 2 EIR will mitigate any impacts of the proposed Project to the extent feasible. All applicable MMs identified in the UCR 2005 LRDP EIR as supplemented and updated by the UCR 2005 LRDP Amendment 2 EIR are incorporated into the Project as proposed. The impact analysis in this document summarizes and cross references the relevant analysis in the UCR 2005 LRDP EIR as supplemented and updated by the UCR 2005 LRDP Amendment 2 EIR.

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

D) "**Less Than Significant Impact**" applies where the proposed Project will not result in any significant effects. The effects may or may not have been discussed in the UCR 2005 LRDP EIR as supplemented and updated by the UCR 2005 LRDP Amendment 2 EIR. The Project impact is less than significant without the incorporation of UCR 2005 LRDP EIR as supplemented and updated by the UCR 2005 LRDP Amendment 2 EIR or Project-level mitigation.

E) "**No Impact**" applies where the proposed Project would not result in any impact in the category or the category does not apply. "No Impact" answers need to be adequately supported by the information sources cited, which show that the impact does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on Project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).

IMPACT QUESTIONS AND RESPONSES

1. Aesthetics

The analysis of Aesthetics is tiered from the 2005 LRDP EIR, and was addressed in Section 4.1, Aesthetics, of that document. As described previously in Section II, Project Description, of this IS, relevant elements of the proposed Project related to aesthetics/visual change include construction of the up to 190,000-gsf, 4- to 5-level MRB1 and installation of new or updated landscaping (including tree replacement), hardscape, and exterior lighting fixtures.

The following applicable PSs, PPs, and MMs were adopted as part of the UCR 2005 LRDP EIR as supplemented and updated by the UCR 2005 LRDP Amendment 2 EIR and are incorporated as part of the proposed Project and assumed in the analysis presented in this section.

PS Open Space 3	In Naturalistic Open Space areas, where arroyos and other natural features exist, preserve wherever possible, existing landforms, native plant materials, and trees. Where appropriate, restore habitat value.
PS Land Use 2	In order to achieve these densities of 1.0 FAR, infill sites in the partially developed East Campus academic core, and expand to the West Campus academic zone immediately adjacent to the I-215/SR-60 freeway, maintaining a compact and contiguous academic core.
PS Development Strategy 1	Establish a design review process to provide regular review of building and landscape development on campus.
PP 4.1-1	The Campus shall provide design professionals with the 2007 Campus Design Guidelines and instructions to implement the guidelines, including those sections related to use of consistent scale and massing, compatible architectural style, complementary color palette, preservation of existing site features, and appropriate site and exterior lighting design. *(This is identical to Land Use PP 4.9-1[a])*.
PP 4.1-2(a)	The Campus shall continue to provide design professionals with the 2007 Campus Design Guidelines and instructions to develop project-specific landscape plans that are consistent with the Guidelines with respect to the selection of plants, retention of existing trees, and use of water conserving plants, where feasible. *(This is identical to Land Use PP 4.9-1[b]).*
PP 4.1-2(b)	The Campus shall continue to relocate, where feasible, mature “specimen” trees that would be removed as a result of construction activities on the campus. *(This is identical to Land Use PP 4.9-1[c]).*
PP 4.1-2(d)	To reduce disturbance of Natural and Naturalistic Open Space areas:

(i) Unnecessary driving in sensitive or otherwise undisturbed areas shall be avoided. New roads or construction access roads would not be created where adequate access already exists.

(ii) Removal of native shrub or brush shall be avoided, except where necessary.

(iii) Drainages shall be avoided, except where required for construction. Limit activity to crossing drainages rather than using the lengths of drainage courses for access.

(iv) Excess fill or construction waste shall not be dumped in washes.

(v) Vehicles or other equipment shall not be parked in washes or other drainages.

(vi) Overwatering shall be avoided in washes and other drainages.

(vii) Wildlife including species such as fox, coyote, snakes, etc. shall not be harassed. Harassment includes shooting, throwing rocks, etc.

(This is identical to Biological Resources PP 4.4-1(b) and Hydrology PP 4.8-3[b])

MM 4.1-3(a) Building materials shall be reviewed and approved as part of project-specific design and through approval of construction documents. Mirrored, reflective glass is prohibited on campus.

MM 4.1-3(b) All outdoor lighting on campus resulting from new development shall be directed to the specific location intended for illumination (e.g., roads, walkways, or recreation fields) to prevent stray light spillover onto adjacent residential areas. In addition, all fixtures on elevated light standards in parking lots, parking structures, and athletic fields shall be shielded to reduce glare. Lighting plans shall be reviewed and approved prior to project-specific design and construction document approval.

Project Impact Analysis

	Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
a)	Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒	☐

Discussion

As discussed on page 4.1-13 of the 2005 LRDP EIR, scenic vistas may generally be described in two ways: panoramic views (visual access to a large geographic area, for which the field of view can be wide and extend into the distance) and focal views (visual access to a particular object, scene, setting, or feature of interest). The 2005 LRDP EIR concluded that scenic vistas for the campus are limited to panoramic views of the Box Springs Mountains from publicly accessible viewpoints. Views of these mountains from many vantage points on the East Campus are partially blocked by buildings, mature trees, and landscaping. Notably, there are panoramic views of the Box Springs Mountains from Carillon Mall and the Athletic Fields (east of Canyon Crest Drive) within the East Campus; however, views in some portions of the Carillon Mall are obstructed by a large number of mature trees. While views of the adjacent mountains are generally available from locations on the West Campus, these locations are not publically accessible with the exception of Parking Lot 30. There are no identified focal views for the UCR campus.

The analysis of Impact 4.1-1 in Section 4.1, Aesthetics, of the 2005 LRDP EIR concluded that with implementation of PS Open Space 5 (retaining Carillon Mall as a major campus Landmark Open Space) and PP 4.1-1 (developed in compliance with the Campus Design Guidelines), development under the 2005 LRDP would result in a less than significant impact to scenic vistas.

The Athletic Fields (formerly known as the Lower Intramural Fields), a portion of which includes the project site, are one of the identified vantage points for views of the Box Springs Mountains. Implementation of the proposed Project would partially block public views of the Box Springs Mountains from vantage points in the eastern half of the Athletic Fields; however, as shown in the site photographs discussed in Threshold 4b below, the views are obstructed by intervening development and mature vegetation. The 2005 LRDP EIR addressed the expansion of the academic core to the area occupied by the Athletic Fields and its effect on mountain views. Specifically, as the 2005 LRDP included the plan to extend the system of landscaped courtyards and pedestrian malls into this area of the campus, including the Naturalist Open Space area located between the project site and the MS&E Building to the south. With these open space areas, panoramic views would continue to be available from certain vantage points. The areas to be maintained as a Campus Mall/Open Space are further defined in the Regulating Plan included in the 2007 Campus Design Guidelines. The open space between the project site and the MS&E Building to the south is required to be a minimum of 100 feet.

Consistent with this plan and as shown on Figure 9, Conceptual Open Space and Landscape Plan, the proposed Project has been designed to maintain the required open space. This area would facilitate pedestrian circulation, in particular by providing new east-west connectivity on the south side of the proposed MRB1. Additionally, a prominent east-west pedestrian path is provided along the north site of proposed building. Therefore, views of the Box Springs Mountains would be available from these east-west pedestrian and open space corridors. The proposed Project would be implemented in compliance with the Campus Design Guidelines, and the project site is not within the line of sight from the Carillon Mall.

Implementation of PP 4.1-1 (design in compliance with the Campus Design Guidelines) would ensure that impacts are less than significant. Therefore, the proposed Project would have a less than significant impact on a scenic vista, consistent with the findings of the 2005 LRDP EIR.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

There would be a less than significant impact on scenic vistas.

	Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
b)	Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☐	☒

Discussion

As identified in the IS for the 2005 LRDP EIR, the UCR campus is bisected by the I-215/SR-60 freeway and generally bound by University Avenue, Canyon Crest Drive, Blaine Street, Watkins Drive, Valencia Hill Drive, Le Conte Drive, and Chicago Avenue, none of which are officially designated or identified as eligible for designation as a State scenic highway. Therefore, development under the 2005 LRDP was determined to have no impact related to State scenic highways. While there are no scenic highways in the campus vicinity, the 2005 LRDP includes the provision to retain the southeast hills and associated rock outcroppings, considered a scenic resource, as an Open Space Reserve. The proposed Project is not located in proximity to the southeast hills. Therefore, there would be no impact from implementation of the proposed Project on scenic resources, including within a State scenic highway, consistent with the findings of the 2005 LRDP EIR.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

There would be no impact to scenic resources within a scenic highway.

	Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
c)	Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☐	☒	☐

Discussion

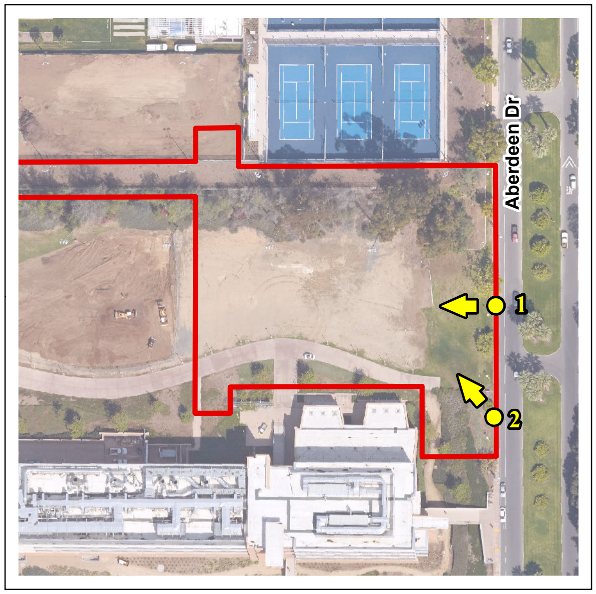
The analysis of Impact 4.1-2 in the 2005 LRDP EIR concluded that, with implementation of PS Land Use 1 through 3, PS Open Space 1 through 7, PS Conservation 1 through 4, PS Campus & Community 1, PS Development Strategy 1 through 3, and PP 4.1-2(a) through PP 4.1-2(d), development under the 2005 LRDP would result in a less than significant impact to the visual character or quality of the campus and the immediately surrounding area. As discussed above, relevant PSs and PPs have been incorporated into the proposed Project.

The project area is surrounded by existing development and the primary views of the project area are from immediately adjacent vantage points; views from more distant vantage points are obstructed by intervening buildings and landscaping. The existing visual character of the project site and immediate surrounding areas is depicted in the site photographs provided in Figures 15a through 15e and are described below.

- **Views 1 and 2 – Views to the west and northwest of the project site.** These photographs depict the existing condition of the project site as viewed from vantage points along Aberdeen Drive. The topographic (i.e., elevation) difference between the central portion of the site and the northern and eastern portions and the vegetation along the northern slope are evident in this view. Existing uses adjacent to the project site (athletic facilities, the Student Recreation Center, and the MS&E Building) are visible from these vantage points. Mature trees and other landscaping are a prominent visual feature. Distant mountain ranges are visible from the vantage point looking northwest. The existing athletic field lights along the northern portion of the project site are shown in these photographs.
- **Views 3 and 4 – Views to the south and north along Aberdeen Drive.** These photographs depict the current streetscape along Aberdeen Drive adjacent to the project site. As shown, the existing street trees on each side of the street and the landscaped medians are a prominent visual feature from these vantage points. The trees largely obstruct views to land uses further to the north and south.
- **Views 5 and 6 – View to the east from the vehicle access road and south from Parking Lot 25.** View 5 represents the view looking east from the existing service vehicle access road along the northern and western perimeters of the MS&E Building; this is representative of the view from the planned open space corridor between the project site and the MS&E Building. The project site is visible in the middle ground and is framed by existing vegetated slopes to the north and east. From this vantage point, there are obstructed views of the Box Springs Mountain in the distance.

  The project site is not visible from View 6; however, this photograph depicts Parking Lot 25 and the proposed alternate construction access route to the project site.
- **Views 7 and 8 – Views to the south from the Student Recreation Center.** These photographs depict the views toward the project looking south from the Student Recreation Center, which is north of and adjacent to the project site. As shown in View 7, the trees and landscaping along the northern slope of the project site; however, the MS&E Building is a prominent visual feature in the background. The MS&E Building obstructs views farther to the south. View 8 depicts how the existing windscreen around the tennis courts largely obstructs views. Taller trees along the northern slope of the project site are visible, as well as the roof of the MS&E Building.
- **Views 9 and 10 – Views to the east from University Avenue and the North Mall.** These photographs depict the views looking east from University Avenue and North Mall, which is a designated “Mall and Linear Open Space” in the 2005 LRDP Amendment 2 Open Space Framework (refer to Figure 3.0-8 of the UCR 2005 LRDP Amendment 2 EIR).

View 1: View to the west of the proposed Project site.



View 2: View to the northwest of the proposed Project site.

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Aerial Source: UCR 2015

Existing Site Views

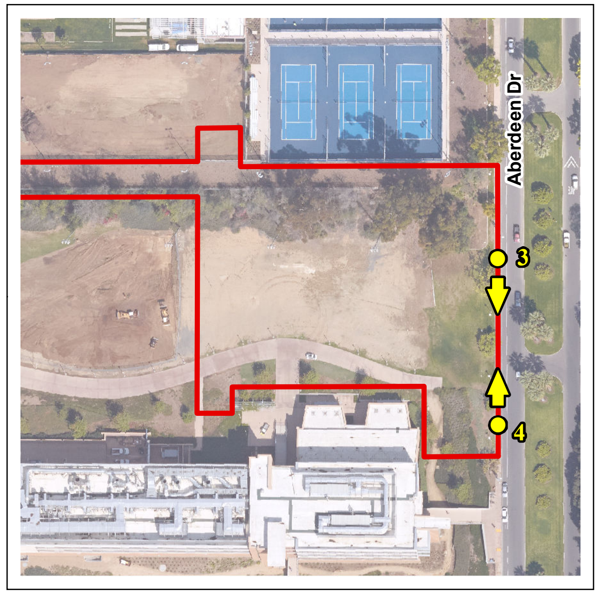
Figure 15a

UCR Multidisciplinary Research Building 1 Project

BonTerra PSOMAS

(Rev: 3-22-2016 JAZ) R:\Projects\UCR\3UCR000500\Graphics\InitialStudy\Fig15a_SP.pdf

View 3: View to the south from Aberdeen Drive.



View 4: View to the north from Aberdeen Drive.

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Aerial Source: UCR 2015

Existing Site Views

Figure 15b

UCR Multidisciplinary Research Building 1 Project

BonTerra PSOMAS

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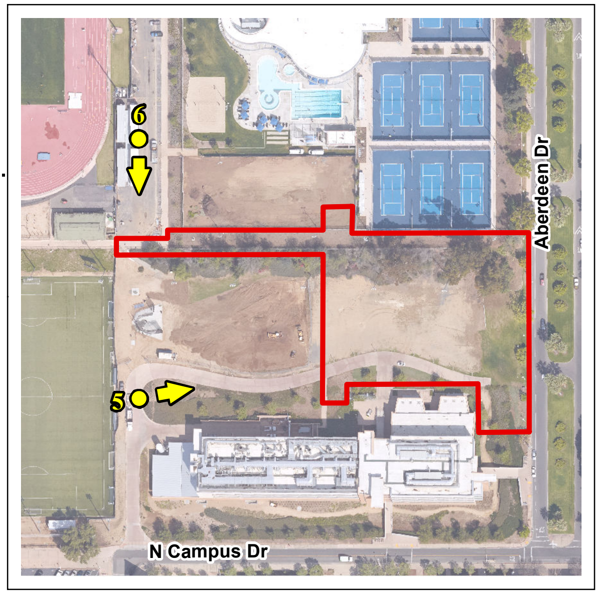

View 5: View to the east from vehicle access road.

View 6: View to the south from Parking Lot 25.

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Aerial Source: UCR 2015

Existing Site Views

Figure 15c

UCR Multidisciplinary Research Building 1 Project

BonTerra PSOMAS

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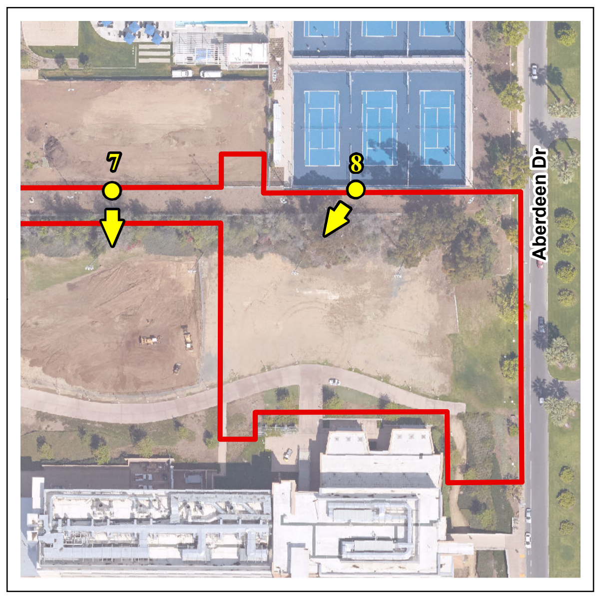
View 7: View to the south from the SRC field.



View 8: View to the southwest from the SRC tennis court.

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Aerial Source: UCR 2015

Existing Site Views

Figure 15d

UCR Multidisciplinary Research Building 1 Project

BonTerra PSOMAS

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View 9: View to the east from University Avenue.

View 10: View to the east from the pedestrian walkway.

Aerial Source: UCR 2015

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Existing Site Views

Figure 15e

UCR Multidisciplinary Research Building 1 Project

(Rev: 3-22-2016 JAZ) R:\Projects\UCR\3UCR000500\Graphics\InitialStudy\Fig15e_SP.pdf

> These photographs depict the distant views that are intended to be maintained, to the extent feasible, by maintaining the designated open space areas. The Box Springs Mountains are visible in the background of the photographs; however, they are partially obstructed by mature trees and intervening development, including the MS&E Building.

As shown in these photographs, views in and around the project area are limited due to topography, landscaping/mature trees, and/or intervening development. To address visual changes associated with implementation of the proposed Project and to address the relationship between the proposed Project and the existing land uses surrounding the project site, conceptual massing studies and building elevations are provided in Figures 6 and 7 in Section II, Project Description, of this IS. The conceptual Open Space and Landscape Plan and conceptual landscape sections are provided in Exhibits 9 and 10, respectively.

As discussed above, PSs and PPs relevant to project design and visual character have been incorporated into the proposed Project. Notably, the proposed MRB1 is located on an infill site in the northern portion of the East Campus academic core, consistent with PS Land Use 2. The building design and orientation respects the site topography; the proposed MRB1 would be sited so that the finish floor elevation of the lower level would be close to existing grades across the majority of the site and the elevation of Level 1 would have an at-grade connection to the service road/pedestrian path to the north and Aberdeen Drive to the east (refer to the building sections provided in Figure 6). As shown in the conceptual massing studies (Figure 7), the proposed building height (up to five levels) and massing would be consistent with the adjacent MS&E Building.

The building materials and color palette to be used would adhere to the Campus Design Guidelines to be visually harmonious with the UCR campus as well as the immediately surrounding buildings (as required by PP 4.1-1) and would be reviewed as part of the project design-build process (refer to MM 4.1-3[a]). Building materials may include exposed architectural concrete; brick (using the “UCR blend”); clear anodized or pre-finished aluminum (curtain wall and infill panels); pre-finished aluminum or unfinished zinc (rain-screen cladding systems, equipment screens); exposed architectural steel (sunshades, railings, projections, canopies); and insulated, low-e glass selected for high transparency and low reflectivity.

Consistent with the Regulating Plan identified in the Campus Design Guidelines, the proposed building footprint has been established to define the required open space corridor between the buildings, allowing continued visual access to the east (refer to Figure 9). There are three main planting typologies proposed for the MRB1 landscape design, each of which provides a specific function that not only helps reinforce the overall design of the site but helps with its ecology and sustainability. These typologies include foundation landscape, garden terrace, and arroyo. An existing “native” arroyo exists to the east of Aberdeen Drive and resumes west of Canyon Crest Drive and is an important landscape feature on the UCR campus. As required by PP 4.1-2(d), the proposed Project would not disturb landforms, native plant materials, or trees in a Natural or Naturalistic Open Space area; rather, the open space linkage proposed as part of the proposed Project is a designated Naturalistic Open Space area and is a direct response to the historic arroyo, consistent with PS Open Space 3.

As a result of the proposed Project and construction of a construction access road extending east from University Avenue (refer to Figure 14, Construction Areas), existing landscaping, including primarily trees and shrubs, would be removed, changing the existing visual character. Potential impacts to trees are discussed in detail in Section V.4, Biological Resources, and shown on Figure 16, Tree Impacts. The proposed Project includes PP 4.1-2(a), which ensures that project-specific landscape plans are consistent with the Campus Design Guidelines with respect to, among other items, retention of existing trees. In addition, the proposed Project also includes

PP 4.1-2(b) by preserving mature trees in place or replacing mature trees removed within the project site. In summary, there are 71 trees located within the project site and adjacent construction areas; approximately 40 trees, including 22 mature trees, would be removed during construction of the proposed Project. The remaining trees would be protected in place.

As shown in Figure 9 in Section II, Project Description, the proposed Project involves installation of new landscaping. Replacement trees would be positioned to visually complement the proposed Project, gathering spaces, and hardscape areas. Groundcover and shrubs would be planted to complement the structures and transition areas to adjacent uses.

In summary, the proposed MRB1, outdoor gathering spaces, and landscaping, including the east-west open space corridor, have been designed in consideration of the Campus Design Guidelines (PPs 4.1-1 and 4.1-2[a]) and will be subject to design review by the campus Design Review Board (PS Development Strategy 1). The height, massing, site design, materials, and other aspects of the visual character of the proposed Project would be consistent with and complementary to the existing surrounding structures and uses and would not degrade the existing visual quality of the project site and surroundings consistent with the findings of the 2005 LRDP EIR. There would be a less than significant impact, and no mitigation is required.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

There would be a less than significant impact to existing visual character or quality of the site and its surroundings.

Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	☒	☐

Discussion

The analysis of Impact 4.1-3 in the 2005 LRDP EIR concluded that implementation of PS Land Use 3, PS Open Space 1 through 4, PS Conservation 1 and 2, PS Campus & Community 1, PS Development Strategy 1, PP 4.1-1, PP 4.1-2(a), PP 4.1-2(b), and MM 4.1-3(a) through MM 4.1-3(c) would ensure that light and glare impacts on adjacent land uses resulting from development under the 2005 LRDP would be reduced or avoided, resulting in a less than significant impact.

The 2005 LRDP EIR identifies that the primary sources of light and glare on the UCR campus include recreation facilities and surface parking lots. Specifically, the 2005 LRDP EIR identifies that the SRC, Track Stadium, and Athletic Fields, which are north, northwest, on-site, and west, respectively, of the proposed MRB1 site, provide lighting on these facilities to extend hours of use. There is also existing street lighting along adjacent roadways and lighting associated with the MS&E Building to the south (constructed subsequent to preparation of the LRDP EIR).

The proposed MRB1 is internal to the campus, and the lighting design would provide sufficient lighting to ensure visual performance and safety. The quantity of lighting would be determined by adherence to recommended illuminance levels derived from the latest industry standards (Illuminating Engineering Society lighting recommendations), guidelines, and code requirements. The proposed Project incorporates MM 4.1-3(b) to ensure that outdoor lighting is appropriately directed to prevent light spillover, even though there are no adjacent residential uses, and that all elevated light fixtures are shielded. Based on the level of lighting currently present on and near the project site and the existing level of ambient nighttime illumination at the UCR campus, the proposed Project would not noticeably increase the intensity of nighttime ambient light from the campus. Therefore, the lighting associated with the proposed Project would not adversely affect any existing land uses, including the student housing uses to the northeast across Aberdeen Drive.

The proposed Project also incorporates MM 4.1-3(a) to ensure there is no glare from the proposed structure. Building materials for the proposed MRB1 would comply with the UCR Design Guidelines and may include exposed architectural concrete; UCR blend brick; clear anodized or pre-finished aluminum (curtain wall and infill panels); pre-finished aluminum or unfinished zinc (rain-screen cladding systems, equipment screens); exposed architectural steel (sunshades, railings, projections, canopies); and insulated, low-e glass selected for high transparency and low reflectivity.

Implementation of PS Development Strategy 1 (design review), PP 4.1-1 (design in compliance with the Campus Design Guidelines), MM 4.1-3(a) (use of non-reflective building materials), and MM 4.1-3(b) (prevention of light and glare from outdoor lighting), as part of the proposed Project, would ensure that impacts are less than significant. The proposed Project would not result in a substantial new source of light or glare, and there would be less than significant impacts related to new sources of daytime or nighttime light and glare, consistent with the findings of the 2005 LRDP EIR.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

There would be a less than significant impact associated with the creation of a new source of substantial light or glare affecting day or nighttime views in the area.

2. Agricultural and Forest Resources

The analysis of agricultural and forest resources is tiered from the UCR 2005 LRDP Amendment 2 EIR, and was addressed in Section 4.2, Agriculture, of that document. There are no relevant elements of the proposed Project related to agricultural or forestry resources, and no PSs, PPs, or MMs are applicable. There are no agricultural or forestry resources on or near the project area.

Project Impact Analysis

Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Would the project 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 nonagricultural use?	☐	☐	☐	☐	☒
b) Would the project conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☐	☒
c) Would the project 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) Would the project result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☐	☒
e) Would the project involve other changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland, to nonagricultural use?	☐	☐	☐	☐	☒

Discussion

The analysis of Impact 4.2-1 in Section 4.2, Agriculture, of the 2005 LRDP Amendment 2 EIR concluded that, even with implementation of PS Land Use 1, PS Land Use 2, and PS Land Use 3, development under the 2005 LRDP, as amended, would result in a significant and unavoidable impact due to conversion of Prime Farmland to non-agricultural uses.

The 2005 LRDP Amendment 2 EIR identified the distribution of Farmland, as designated by the California Farmland Mapping and Monitoring Program (FMMP), on the UCR campus at that time. The UCR campus was mapped as having 481.7 acres of Prime Farmland and Farmland of Statewide Importance (collectively, "Farmland") primarily located on the West Campus with an isolated area of Farmland of Statewide Importance located along the eastern boundary of the East Campus. Review of the 2012 Important Farmland Map indicates a similar distribution of Farmland, primarily on the West Campus with an isolated area near the eastern boundary of the campus (FMMP 2015). The project area is designated as Urban Built-Up Land and, as such, implementation of the proposed Project would not convert Farmland to non-agricultural resources (FMMP 2015). Therefore, the proposed Project would have no impact on agricultural resources.

As identified in the IS prepared for, and summarized in, the 2005 LRDP Amendment 2 EIR, no portion of the UCR campus is zoned for forest land, timberland, or agricultural use; it does not contain any forest land or timberland, nor is it under Williamson Act Contract. Therefore, implementation of the proposed Project would result in no impacts related to conflict with existing zoning for forest land, timberland, or agriculture; it would not conflict with a Williamson Act Contract; and it would not result in the loss or conversion of forest lands, consistent with the findings of the 2005 LRDP Amendment 2 EIR.

Implementation of the proposed Project would not involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use. Therefore, the proposed Project would result in no impacts related to indirect conversion of Farmland to non-agricultural use, consistent with the findings of the 2005 LRDP Amendment 2 EIR.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

There would be no impacts to Farmland, forest land, timberland, or Williamson Act Contracts.

3. Air Quality

The analysis of air quality is tiered from the 2005 LRDP Amendment 2 EIR and was addressed in Section 4.3, Air Quality, of that document. As described previously in Section II, Project Description, of this IS, relevant elements of the proposed Project related to air quality include approximately 4,000 cy of exported soil from the project site during grading and the use of diesel-powered and other construction equipment that would contribute to local and regional emissions (refer to discussion of “Construction Activities” in Section II, Project Description, of this IS). The proposed Project would include construction of up to 190,000 gsf in the MRB1. It is estimated that the proposed Project could increase the UCR campus population by approximately 400 persons.

The following applicable PSs, PPs, and MMs were adopted as part of the 2005 LRDP EIR and 2005 LRDP Amendment 2 EIR; they are incorporated as part of the proposed Project and assumed in the analysis presented in this section.

PS Campus and Community 4	Provide strong connections within the campus and its edges to promote walking, bicycling, and transit use, rather than vehicular traffic.
PS Transportation 3	Provide a continuous network of bicycle lanes and paths throughout the campus, connecting to off-campus bicycle routes.
PS Transportation 5	Provide bicycle parking at convenient locations.
PP 4.3-1	The Campus shall continue to implement a Transportation Demand Management program that meets or exceeds all trip reduction and AVR requirements of the SCAQMD. The TDM program may be subject to modification as new technologies are developed or alternate program elements are found to be more effective. *(This is identical to Transportation and Traffic PP 4.14-1)*.
PP 4.3-2(a)	Construction contract specifications shall include the following: (i) Compliance with all SCAQMD rules and regulations

(ii) Maintenance programs to assure vehicles remain in good operating condition

(iii) Avoid unnecessary idling of construction vehicles and equipment

(iv) Use of alternative fuel construction vehicles

(v) Provision of electrical power to the site, to eliminate the need for on-site generators

PP 4.3-2(b)

The Campus shall continue to implement dust control measures consistent with SCAQMD Rule 403—Fugitive Dust during the construction phases of new project development. The following actions are currently recommended to implement Rule 403 and have been quantified by the SCAQMD as being able to reduce dust generation between 30 and 85 percent depending on the source of the dust generation. The Campus shall implement these measures as necessary to reduce fugitive dust. Individual measures shall be specified in construction documents and require implementation by construction contractor:

(i) Apply water and/or approved non-toxic chemical soil stabilizers according to manufacturer’s specification to all inactive construction areas (previously graded areas that have been inactive for 10 or more days)

(ii) Replace ground cover in disturbed areas as quickly as possible

(iii) Enclose, cover, water twice daily, or apply approved chemical soil binders to exposed piles with 5 percent or greater silt content

(iv) Water active grading sites at least twice daily

(v) Suspend all excavating and grading operations when wind speeds (as instantaneous gusts) exceed 25 miles per hour over a 30-minute period

(vi) All trucks hauling dirt, sand, soil, or other loose materials shall be covered or maintain at least two feet of freeboard (i.e., minimum vertical distance between top of the load and the top of the trailer), in accordance with Section 23114 of the *California Vehicle Code*

(vii) Sweep streets at the end of the day if visible soil material is carried over to adjacent roads

(viii) Install wheel washers where vehicles enter and exit unpaved roads onto paved roads, or wash off trucks and any equipment leaving the site each trip

(ix) Apply water three times daily or chemical soil stabilizers according to manufacturers’ specifications to all unpaved parking or staging areas or unpaved road surfaces

(x) Post and enforce traffic speed limits of 15 miles per hour or less on all unpaved roads

(This is identical to Geology PP 4.6-2(a) and Hydrology PP 4.8-3[c]).

MM 4.3-1(a)

For each construction project on the campus, the project contractor will implement Programs and Practices 4.3-2(a) and 4.3-2(b). In addition, the following PM10 and PM2.5 control measure shall be implemented for each construction project:

- Post a publicly visible sign with the telephone number and person to contact at the lead agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The phone number of the District shall also be visible to ensure compliance.

MM 4.3-1(b)

For each construction project on the campus, the University shall require that the project include a construction emissions control plan that includes a comprehensive inventory of all off-road construction equipment, equal to or greater than 50 horsepower, that will be used for an aggregate of 40 or more hours during any portion of the construction project. During construction activity, the contractor shall utilize CARB certified equipment or better for all on-site construction equipment according to the following schedule:

- January 1, 2011 to December 31, 2011: All off-road diesel-powered construction equipment greater than 50 hp shall meet Tier 2 off-road emissions standards. In addition, all construction equipment shall be outfitted with the BACT devices certified by CARB. Any emissions control device used by the contractor shall achieve emissions reductions that are no less than what could be achieved by a Level 2 or Level 3 diesel emissions control strategy for a similarly sized engine as defined by CARB regulations.[6]
- January 1, 2012 to December 31, 2014: All off-road diesel-powered construction equipment greater than 50 hp shall meet Tier 3 off-road emissions standards. In addition, all construction equipment shall be outfitted with BACT devices certified by CARB. Any emissions control device used by the contractor shall achieve emissions reductions that are no less than what could be achieved by a Level 3 diesel emissions control

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[6] The time frame for this component of MM 4.3-1(b) has passed and the more restrictive requirements defined are applicable.

strategy for a similarly sized engine as defined by CARB regulations~~.[7]~~

- Post January 1, 2015: All off-road diesel-powered construction equipment greater than 50 hp shall meet the Tier 4 emission standards, where available. In addition, all construction equipment shall be outfitted with BACT devices certified by CARB. Any emissions control device used by the contractor shall achieve emissions reductions that are no less than what could be achieved by a Level 3 diesel emissions control strategy for a similarly sized engine as defined by CARB regulations.
- A copy of each unit's certified specification, BACT documentation and CARB or SCAQMD operating permit shall be provided at the time of mobilization of each applicable unit or equipment.
- Encourage construction contractors to apply for AQMD 'SOON" funds. Incentives could be provided for those construction contractors who apply for AQMD "SOON" funds. The "SOON" program provides funds to accelerate clean-up of off-road diesel vehicles, such as heavy duty construction equipment. More information on this program can be found at the following website: http://www.aqmd.gov/tao/implementation/ soonprogram.htm

The contractor shall also implement the following measures during construction:

- Prohibit vehicle and engine idling in excess of 5 minutes and ensure that all off-road equipment is compliant with the California Air Resources Board's (CARB) in-use off-road diesel vehicle regulation and SCAQMD Rule 2449.
- Configure construction parking to minimize traffic interference.
- Provide temporary traffic controls such as a flag person, during all phases of construction to maintain smooth traffic flow.
- Provide dedicated turn lanes for movement of construction trucks and equipment on- and off site.
- Schedule construction activities that affect traffic flow on the arterial system to off-peak hour to the extent practicable.
- Improve traffic flow by signal synchronization, and ensure that all vehicles and equipment will be properly

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[7] Although the time frame for this component has passed, the use of Tier 3 equipment is required where Tier 4 equipment is not available.

tuned and maintained according to manufacturers' specifications.

- Use diesel-powered construction vehicles and equipment that operate on low-NOx fuel where possible.
- Reroute construction trucks away from congested streets or sensitive receptor areas.
- Maintain and tune all vehicles and equipment according to manufacturers' specifications.

MM 4.3-1(c) To minimize VOC emissions from the painting/finishing phase, for each construction project on the campus, the project contractor will implement the following VOC control measures:

- Construct or build with materials that do not require painting, or use pre-painted construction materials.
- If appropriate materials are not available or are cost-prohibitive, use low VOC-content materials more stringent than required under SCAQMD Rule 1113.

MM 4.3-2(b) UCR shall continue to participate in greenhouse gas (GHG) reduction programs such as the American College and University Presidents' Climate Commitment (ACUPCC) and shall adhere to the UC Policy on Sustainable Practices. The measures adopted by UCR are presented in Tables 4.16-9 and 4.16-10 in Section 4.16 Greenhouse Gas Emissions of the 2005 LRDP Amendment 2 EIR. While these measures are typically targeted at GHG emissions, many act to reduce energy consumption and vehicle use on campus and would consequently also reduce air pollutant emissions from both area and mobile sources. In accordance with the ACUPCC and the UC Policy on Sustainable Practices and through implementation of its Climate Action Plan, UCR shall commit to reducing GHG emissions to 1990 levels by 2020, which would require significant reductions (on the order of 70 percent) from these sources in terms of GHG and therefore reductions in other air pollutants as well.

Regulatory Framework

A detailed discussion of the regulatory framework for air quality is provided in Section 4.3 of the 2005 LRDP Amendment 2 EIR. In summary, both the federal and State governments have established ambient air quality standards for outdoor concentrations of specific pollutants, referred to as "criteria pollutants", in order to protect public health. The national and State ambient air quality standards have been set at concentration levels to protect the most sensitive persons from illness or discomfort; these levels are given with a margin of safety. The criteria pollutants for which federal standards have been promulgated and that are most relevant to this air quality impact analysis are ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), and particulate matter (PM10 and PM2.5). Respirable particulate matter with an aerodynamic diameter of 10 micrometers or less is referred to as PM10. Fine particulate matter (PM2.5) is a subgroup of particulate matter that consists of smaller particles that have an aerodynamic diameter of

2.5 micrometers or less. O_3 is a gas that is formed when volatile organic compounds (VOCs) and nitrogen oxides (NOx)—both byproducts of internal combustion engine exhaust—undergo slow photochemical reactions in the presence of sunlight. Thus, VOCs and NOx are O_3 precursors.

The campus is located within the South Coast Air Basin (SoCAB), which was named as such since its geographical formation is that of a basin with the surrounding mountains trapping the air and its pollutants in the valleys (or basins) below. This area includes all of Orange County and the non-desert portions of Los Angeles, San Bernardino, and Riverside Counties. The South Coast Air Quality Management District (SCAQMD) is responsible for ensuring that the SoCAB meets the national and State ambient air quality standards.

Subsequent to the preparation of the air quality study for the 2005 LRDP Amendment 2 EIR, there have been changes to the attainment status in the SoCAB. These changes include federal designation of the SoCAB as a PM10 attainment area and federal designation of Los Angeles County as a nonattainment area for lead. The current federal and State attainment designations are shown in Table 1.

TABLE 1
ATTAINMENT STATUS OF CRITERIA POLLUTANTS IN THE SOUTH COAST AIR BASIN

Pollutant	State	Federal
O_3 (1 hour)	Nonattainment	No Standard
O_3 (8 hour)		Extreme Nonattainment
PM10	Nonattainment	Attainment/Maintenance
PM2.5	Nonattainment	Moderate Nonattainment
CO	Attainment	Attainment/Maintenance
NO_2	Attainment	Attainment/Maintenance
SO_2	Attainment	Attainment
Lead	Attainment	Attainment/Nonattainment*
All others	Attainment/Unclassified	No Standards

O_3: ozone; PM10: respirable particulate matter 10 micrometers or less in diameter; PM2.5: fine particulate matter 2.5 micrometers or less in diameter; CO: carbon monoxide; NO_2: nitrogen dioxide; SO_2: sulfur dioxide.

* The Los Angeles County portion of the South Coast Air Basin (SoCAB) is designated nonattainment for lead; the remainder of the SoCAB is designated attainment.

Source: CARB 2016

On November 28, 2007, CARB submitted a State Implementation Plan (SIP) revision to the USEPA for O_3, PM2.5 (1997 Standard), CO, and NO_2 in the SoCAB. This revision is identified as the “2007 South Coast SIP”. The 2007 South Coast SIP demonstrates attainment of the federal PM2.5 standard in the SoCAB by 2014 and attainment of the federal 8-hour O_3 standard by 2023. This SIP also includes a request to reclassify the O_3 attainment designation from “severe” to “extreme”. The USEPA approved the redesignation effective June 4, 2010. The “extreme” designation requires the attainment of the 8-hour O_3 standard in the SoCAB by June 2024. CARB approved PM2.5 SIP revisions in April 2011 and the O_3 SIP revisions in July 2011. The USEPA approved the PM2.5 SIP on September 25, 2013, and has approved 47 of the 62 1997 eight-hour O_3 SIP requirements (USEPA 2015). On November 30, 2014, the USEPA proposed a finding that the SoCAB has attained the 1997 PM2.5 standards (USEPA 2014). The comment period closed on January 22, 2015; no subsequent action has been taken.

On December 7, 2012, the SCAQMD adopted the 2012 Air Quality Management Plan (AQMP), which is a regional and multiagency effort (SCAQMD, CARB, Southern California Association of Governments [SCAG], and USEPA). The 2012 AQMP incorporates the latest scientific and technical information and planning assumptions, including SCAG's 2012–2035 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS); updated emission inventory methods for various source categories; and SCAG's latest growth forecasts. The primary purposes of the 2012 AQMP are to demonstrate attainment of the federal 24-hour PM2.5 standard by 2014 and to update the USEPA-approved 8-hour Ozone Control Plan. On December 20, 2012, the 2012 AQMP was submitted to CARB and the USEPA for concurrent review and approval for inclusion in the SIP (SCAQMD 2013a). CARB approved the 2012 AQMP on January 25, 2013. The USEPA has not approved the 2012 AQMP portion of the SIP (CARB 2015).

The SCAQMD is currently developing the 2016 AQMP. Adoption by the SCAQMD Governing Board is scheduled for the Spring 2016 (SCAQMD 2016).

Air Quality Sensitive Receptors

The SCAQMD defines typical sensitive receptors as residences, schools, playgrounds, childcare centers, athletic facilities, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes. The sensitive receptors nearest the project area are the Student Recreation Center to the north, athletic facilities to the west and northwest, the residence halls east of Aberdeen Drive, and the MS&E Building to the south. Potential impacts to sensitive receptors from construction emissions are assessed under the analysis of Threshold d below.

Methods

The SCAQMD recommends that projects be evaluated in terms of their quantitative thresholds, which have been established to assess both the regional and localized impacts of project-related air pollutant emissions. The significance thresholds are updated, as needed, to appropriately represent current ambient air quality standards and attainment status. As identified in Section 4.3.4, Impacts and Mitigation Measures, of the 2005 LRDP Amendment 2 EIR, UCR utilizes the SCAQMD-recommended thresholds that are in place at the time development projects are proposed in order to assess the significance of quantifiable emissions. The current SCAQMD thresholds are identified in Table 2 and are applied to the proposed Project.

TABLE 2
SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT AIR QUALITY SIGNIFICANCE THRESHOLDS

Mass Daily Thresholds[a]		
Pollutant	**Construction**	**Operation**
NOx	100 lbs/day	55 lbs/day
VOC	75 lbs/day	55 lbs/day
PM10	150 lbs/day	150 lbs/day
PM2.5	55 lbs/day	55 lbs/day
SOx	150 lbs/day	150 lbs/day
CO	550 lbs/day	550 lbs/day
Lead	3 lbs/day	3 lbs/day
Toxic Air Contaminants, Odor, and Greenhouse Gas Thresholds		
TACs (including carcinogens and non-carcinogens)	Maximum Incremental Cancer Risk ≥ 10 in 1 million Cancer Burden > 0.5 excess cancer cases (in areas ≥ 1 in 1 million) Chronic & Acute Hazard Index ≥ 1.0 (project increment)	
Odor	Project creates an odor nuisance pursuant to SCAQMD Rule 402	
GHG	10,000 MT/yr CO_2eq for industrial facilities	
Ambient Air Quality Standards for Criteria Pollutants[b, c]		
NO_2 1-hour average annual arithmetic mean	The SCAQMD is in attainment; the Project is significant if it causes or contributes to an exceedance of the following attainment standards: 0.18 ppm (State) 0.03 ppm (State) and 0.0534 ppm (federal)	
PM10 24-hour average annual average	10.4 μg/m^3 (construction)[c] & 2.5 μg/m^3 (operation) 1.0 μg/m^3	
PM2.5 24-hour average	10.4 μg/m^3 (construction)[c] & 2.5 μg/m^3 (operation)	
SO_2 1-hour average 24-hour average	0.25 ppm (State) & 0.075 ppm (federal – 99th percentile) 0.04 ppm (State)	
Sulfate 24-hour average	25 μg/m^3 (State)	
CO 1-hour average 8-hour average	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 20.0 ppm (State) and 35 ppm (federal) 9.0 ppm (State/federal)	
Lead 30-day average Rolling 3-month average	1.5 μg/m^3 (State) 0.15 μg/m^3 (federal)	

NOx: nitrogen oxides; lbs/day: pounds per day; VOC: volatile organic compound; PM10: respirable particulate matter with a diameter of 10 micrometers or less; PM2.5: fine particulate matter with a diameter of 2.5 micrometers or less; SOx: sulfur oxides; CO: carbon monoxide; TACs: toxic air contaminants; GHG: greenhouse gases; MT/yr CO_2eq: metric tons per year of carbon dioxide equivalents; NO_2: nitrogen dioxide; SCAQMD: South Coast Air Quality Management District; ppm: parts per million; μg/m^3: micrograms per cubic meter.

[a] Source: SCAQMD California Environmental Quality Act Handbook (SCAQMD 1993).
[b] Ambient air quality thresholds for criteria pollutants based on SCAQMD Rule 1303, Table A-2 unless otherwise stated.
[c] Ambient air quality threshold is based on SCAQMD Rule 403.

Source: SCAQMD 2015

Existing Emissions

The project site is currently vacant and includes minimal asphalt and paved surfaces; there are no sources for emissions of criteria pollutants.

Project Impact Analysis

Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☐	☒

Discussion

The analysis of Impact 4.3-6 in the 2005 LRDP Amendment 2 EIR concluded that, even with implementation of PS Land Use 4 and 5, PS Transportation 1 through 6, and MM 4.3-6 (which implements MM 4.3-1 and MM 4.3-2[b]), development under the 2005 LRDP would likely conflict with SCAQMD AQMPs for O_3 and particulate matter, and there would be a significant and unavoidable impact. This conclusion was based on the forecasted construction emissions that exceed SCAQMD CEQA significance mass daily thresholds for VOC, NOx, and PM10 and operational emissions that exceed the mass daily thresholds for VOC, NOx, PM10, and PM2.5.

The two principal criteria for conformance to the AQMP are whether (1) the project would result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations or delay timely attainment of air quality standards and (2) whether the project would exceed the assumptions in the AQMP (SCAQMD 1993).

With respect to the first criterion, with incorporation of the identified PSs, PPs, and MMs the forecasted proposed Project construction and operational emissions, as detailed in Threshold b, would not exceed the SCAQMD CEQA significance mass daily thresholds, which demonstrates that the proposed Project would not result in a long-term increase in the frequency or severity of existing regional air quality violations; cause or contribute to new violations; or delay timely attainment of air quality standards. With respect to the second criterion, the increase in faculty and staff to accommodate a student population of 25,000 was anticipated in the 2005 LRDP. As stated in Section 4.9 of the 2005 LRDP Amendment 2 EIR, “The projected growth in campus population by 2020 is within the SCAG projections for the City of Riverside. Therefore, the 2005 LRDP population increase would be consistent with AQMP attainment forecasts”. The current 2012 AQMP would have included the projected growth associated with the 2005 LRDP, including the increase in population resulting from the proposed Project, and it may be assumed that these projections are included in the Draft 2016 AQMP. Therefore, the proposed Project would not exceed the assumptions in the AQMP. Based on these criteria, it is concluded that the proposed Project would not conflict with or obstruct the SCAQMD AQMP; there would be no impact.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would not conflict with or obstruct implementation of the applicable air quality plans; there would be no impact.

Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☒	☐	☐

Discussion

The analysis of Impacts 4.3-1 and 4.3-2 in the 2005 LRDP Amendment 2 EIR concluded that, even with implementation of PP 4.3-1, PP 4.3-2(a), PP 4.3-2(b), MM 4.3-1(a) through MM 4.3-1(c), MM 4.3-2(a), and MM 4.3-2(b), development under the 2005 LRDP could result in significant and unavoidable impacts related to

- construction emissions of VOC, NOx, and PM10 (Impact 4.3-1) and
- operational emissions of VOC, NOx, CO, PM10, and PM2.5 (Impact 4.3-2).

Following is an analysis of the short-term construction-related and long-term operational emissions that would result from implementation of the proposed Project.

Construction Emissions

Construction-related emissions are described as short-term (or temporary) in duration. Construction activities associated with the proposed Project would result in emissions of criteria air pollutants (i.e., PM10, PM2.5, CO, and the O_3 precursors VOC and NOx) from (1) construction equipment that performs excavation, grading, and erection of building materials; (2) material handling and transport; and (3) other miscellaneous activities, including worker commuting vehicles and application of architectural coatings.

As described further in Section II.5, Proposed Project Components, under "Construction Activities", the total construction period is anticipated to extend from August 2016 to October 2018, for a period of approximately 26 months. The generalized construction phasing used for the air quality analysis is as follows, with some overlap between phases: demolition (2 weeks); grading (2 months); utility installation/underground infrastructure (2 months); building construction (21 months); paving (1 week); and, architectural coating (6 weeks).

Demolition would include an estimated 12,000 sf of pavement on the project site. It is estimated that demolition would require approximately 18 round trips to a construction and demolition waste disposal site. Trenching for utilities installation would occur subsequent to the grading. Construction of the proposed MRB1 and surrounding hardscape would take approximately 21 months. Painting of interior and exterior spaces would occur for approximately six weeks after building construction.

Construction and operational emissions for the proposed Project were calculated by using the California Emissions Estimator Model (CalEEMod), Version 2013.2.2. CalEEMod is a computer program prepared under the direction of the SCAQMD and is used to estimate anticipated emissions associated with land development projects in California. CalEEMod calculates emission rates for criteria pollutants utilizing the EMission FACtor model (EMFAC2011) for on-road vehicles, OFFROAD 2011 for off-road vehicles, and USEPA formulas for non-vehicular emissions (SCAQMD 2013b).The CalEEMod model input was based on the proposed Project's construction assumptions (described above and in Section II.5, Proposed Project Components). Where specific information was not known, engineering judgment and default CalEEMod settings and parameters were used. Compliance with SCAQMD Rules is required and included as part of the proposed Project (PP 4.3-2[a]). Additionally, the proposed Project includes PPs and MMs that serve to reduce construction-related emissions and have been assumed in the analysis. Specifically, construction would be performed in accordance with Rule 403, Fugitive Dust (SCAQMD 2005) (PP 4.3-2[b]) and Rule 1113, Architectural Coatings (SCAQMD 2007) (MM 4.3-1[c]). Additionally, Tier 3 or better construction equipment would be used (MM 4.3-1[b]). The CalEEMod default values for VOC content of architectural coatings exceed the current requirements of SCAQMD Rule 1113. For the emissions calculation, VOC limits were set at 100 grams per liter (g/l) for interior coatings and 150 g/l for exterior coatings. These limits are reflected in additional MM MRB1 AQ-1.

Table 3 summarizes the modeled emissions for proposed Project construction. Construction-related regional air quality impacts were determined by comparing these modeling results with applicable SCAQMD significance thresholds, as shown.

TABLE 3
MAXIMUM DAILY REGIONAL CONSTRUCTION EMISSIONS FOR THE PROPOSED PROJECT

Year	Emissions in Pounds per Day				
	VOC	**NOx**	**CO**	**PM10**	**PM2.5**
2016	1	13	17	3	2
2017	1	11	15	1	1
2018	58	10	14	1	1
Maximum Daily Emissions	***460***	***134***	***146***	***36***	***23***
SCAQMD Significance Thresholds (Construction)	75	100	550	150	55
Significant Impact?	**NO**	**NO**	**NO**	**NO**	**NO**

VOC: volatile organic compound; NOx: nitrogen oxides; CO: carbon monoxide; PM10: respirable particulate matter less than 10 micrometers in diameter; PM2.5: fine particulate matter less than 2.5 micrometers in diameter; SCAQMD: South Coast Air Quality Management District.

Note: Calculations assume compliance with SCAQMD Rules 403 and 1113.

* Totals may not add due to rounding.

CalEEMod model data sheets are included in Appendix A.

The maximum daily regional emissions of NOx, CO, would occur for a period of two weeks during demolition. The maximum daily regional emissions of PM10, and PM2.5 would occur for a period of two months in 2016 as a result of grading activities. Maximum VOC emissions would occur for approximately six weeks during painting activities. Estimated regional construction emissions would be less than the SCAQMD CEQA significance thresholds; therefore, with the implementation of MM AQ-1, the proposed Project-specific construction emissions impact would be less than significant.

Operational Emissions

Operational emissions are comprised of area source, natural gas combustion, and mobile source emissions. Area source emissions would result from use of landscape maintenance equipment, periodic painting, and use of consumer products. Natural gas emissions are based on CalEEMod default consumption data modified assuming that 2013 CBC Energy Efficiency (Title 24, Part 6) requirements are exceeded by 20 percent. The proposed Project incorporates MM 4.3.2(b), which requires UCR to participate in GHG-reduction programs, which serve to reduce natural gas emissions.

Based on an estimated 400 individuals added to the campus population, the proposed Project would generate an estimated 1,217 weekday vehicular trips. This is a conservative estimate because the proposed Project incorporates PS Campus and Community 4 (promote campus-wide non-vehicular transportation), PS Transportation 3 (campus-wide bicycle network to connect to off-campus bicycle routes), PS Transportation 5 (provide bicycle parking), and PP 4.3-1 (campus-wide implementation of a transportation demand management program), which all serve to reduce vehicular trips. The peak daily operational emissions attributable to the proposed Project were calculated using CalEEMod and are shown in Table 4.

TABLE 4
PEAK DAILY OPERATIONAL EMISSIONS FOR THE PROPOSED PROJECT

	Emissions in Pounds per Day				
	VOC	**NOx**	**CO**	**PM10**	**PM2.5**
Area sources	5	<0.5	<0.5	<0.5	<0.5
Energy Sources*	<0.5	1	1	<0.5	<0.5
Mobile sources	4	13	45	9	3
Maximum daily operational emissions	***9***	***14***	***46***	***9***	***3***
SCAQMD Significance Thresholds (Operational)	55	55	550	150	55
Significant Impact?	**NO**	**NO**	**NO**	**NO**	**NO**

VOC: volatile organic compound; NOx: nitrogen oxides; CO: carbon monoxide; PM10: respirable particulate matter less than 10 micrometers in diameter; PM2.5: fine particulate matter less than 2.5 micrometers in diameter; SCAQMD: South Coast Air Quality Management District.

Totals may not add due to rounding.

Values are the higher of summer or winter.
*Energy sources for this Project are natural gas.

Note: CalEEMod model data sheets are included in Appendix A.

As shown in Table 4, the operational emissions for the proposed Project would be substantially less than the SCAQMD CEQA significance thresholds. The operational impact of the proposed Project on regional emissions would be less than significant, and no mitigation is required.

Additional Project-Level Mitigation Measures

MM MRB1 AQ-1 The Campus shall ensure that the contractor specifications require that the average VOC content of interior architectural coatings does not exceed 100 grams per liter (g/l) and the average VOC content of exterior architectural coatings does not exceed 150 g/l. This measure does not relieve the requirement that individual coatings must comply with the current requirements of SCAQMD Rule 1113, Architectural Coatings.

Level of Significance

With implementation of project-specific MM MRB1 AQ-1, the proposed Project has a less than significant potential to violate any air quality standard or contribute substantially to an existing or projected air quality violation.

	Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
c)	Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☐	☒	☐

Discussion

The analysis of Impact 4.3-7 in the 2005 LRDP Amendment 2 EIR concluded that, with implementation of MM 4.3-7 (implements MM 4.3-2[b], which will reduce traffic associated with campus operations), development under the 2005 LRDP would result in a less than significant impact related to a cumulatively considerable net increase of pollutants for which the Project region is in nonattainment.

The Riverside County portion of the SoCAB is a federal and State nonattainment area for O_3 and PM2.5 and a State nonattainment area for PM10. Therefore, cumulative regional emissions of VOCs and NOx (which are O_3 precursors) as well as PM10 and PM2.5 are addressed in the following analysis of cumulative criteria pollutant emissions (during construction and operation).

<u>Construction</u>

As identified in Table 4.3-8 of the 2005 LRDP Amendment 2 EIR, construction of the remaining development on campus would include individual projects that would have construction emissions that would exceed the SCAQMD VOC, NOx, and PM10 mass emissions thresholds in some years. Because of the short duration of peak emissions and the relatively low VOC, NOx, and PM10 emission rates compared to the SCAQMD CEQA significance thresholds (Table 3), the proposed Project's cumulative contributions to construction emissions on campus would not be considerable, and the impact would be less than significant.

<u>Operations</u>

The increase in long-term emissions of all nonattainment pollutants resulting from the proposed Project would be very small relative to SCAQMD CEQA significance thresholds (Table 4) and would not be cumulatively considerable. The impact would be less than significant.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

Construction and operation of the proposed Project would result in a less than significant cumulatively considerable net increase of criteria pollutants for which the proposed Project region is in nonattainment under an applicable federal or State ambient air quality standard (O_3, PM10, and PM2.5).

	Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
d)	Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☐	☒	☐

Discussion

The analysis of Impacts 4.3-3 and 4.3-4 in the 2005 LRDP Amendment 2 EIR concluded that development under the 2005 LRDP would result in a less than significant impact related to exposure of sensitive receptors to substantial concentrations of CO and toxic air contaminants (TACs). Exposure to substantial concentrations of construction emissions is a project-specific and site-specific analysis and was not evaluated in the 2005 LRDP Amendment 2 EIR.

Carbon Monoxide

Exposure of sensitive receptors to CO is of concern if the project contributes substantial traffic to severely congested, high-volume, signalized intersections with an associated potential increase in local CO concentrations (i.e., CO hotspots). As discussed in Section V.16, Transportation and Traffic, the proposed Project would not increase delay at any intersections that would operate at level of service (LOS) E or F. Therefore, there would be no potential to generate a CO hotspot.

Consistent with the conclusion of the 2005 LRDP Amendment 2 EIR, implementation of the proposed Project would not result in exposure of sensitive receptors to substantial concentrations of CO, and there would be no impact. No mitigation is required.

Toxic Air Contaminants

The proposed MRB1 would include laboratories that could generate TAC emissions. The emissions would be captured and emitted through fume hoods. TACs are airborne substances that are capable of causing chronic (i.e., of long duration) and acute (i.e., severe but of short duration) adverse effects on human health. A human health risk assessment (HHRA) was prepared as part of the 2005 LRDP Amendment 2 EIR to estimate the potential off-campus and on-campus health risks associated with TACs generated by current and projected campus-wide operations. The emissions sources analyzed in the HHRA included natural gas combustion sources, boilers and kitchen equipment, gasoline dispensing operations, emergency generators driven by internal combustion engines (ICEs), painting operations, and laboratory fume hoods (chemical usage). The HHRA concluded that full development of the campus under the 2005 LRDP Amendment 2 would not generate toxic air emissions that would result in excess human cancer risk from stationary sources or that would result in a cumulative acute or chronic non-cancer Hazard Index that exceeds the established standards. Therefore, sensitive receptors on and off campus would not be exposed to substantial pollutant concentrations due to TACs generated in the proposed MRB1.

Users of the new facilities would not be located closer to known generators of TACs than the maximally exposed individual (MEI) identified in the HHRA. Therefore, implementation of the proposed Project would not result in exposure of the additional campus population to substantial concentrations of TACs. The impact would be less than significant, which is consistent with the findings of the 2005 LRDP Amendment 2 EIR.

Construction Emissions

The SCAQMD has developed thresholds and methodologies for analyzing the localized air quality effects on a project-specific level. The localized significance thresholds (LST) methodology is a conservative, simple screening methodology for determining impacts to off-site receptors from on-site emissions (SCAQMD 2008a). The LST methodology provides “lookup” tables of emissions limits based on the location of the project site, the size of the project area, and the distance to the sensitive receptor. The lookup tables are prepared for sites up to five acres in area, but the five-acre thresholds may be used for sites somewhat larger than five acres since the thresholds for larger sites would be larger than those for a five-acre site.

The MS&E Building south of the building site and the SRC to the north are the closest sensitive receptors to the proposed Project. The distance to the sensitive receptors used for analysis is 25 meters,[8] which is the minimum distance prescribed for the LST methodology for all source-to-receptor distances of 25 meters or less. Thresholds were obtained for a two-acre site in Receptor Source Area 23, Metropolitan Riverside County. Based on these parameters, LST emissions and thresholds for the proposed Project are shown in Table 5. The emissions shown in Table 5 are less than those in Table 3 because Table 3 includes off-site emissions as well as on-site emissions.

TABLE 5
LOCAL CONSTRUCTION EMISSIONS TO NEAREST SENSITIVE RECEPTORS

Pollutant	Maximum Daily On-Site Emissions[a] (lbs/day)	LST[b] (lbs/day)	Exceed Threshold?
NOx	12	170	No
CO	16	883	No
PM10	3	7	No
PM2.5	1	4	No

lbs/day: pounds per day; LST: localized significance threshold; NOx: nitrogen oxides; CO: carbon monoxide; PM10: respirable particulate matter less than 10 micrometers in diameter; PM2.5: fine particulate matter less than 2.5 micrometers in diameter.

[a] CalEEMod model data sheets are included in Appendix A.
[b] LST thresholds from SCAQMD 2009

The peak on-site NOx and CO emissions would occur during the two weeks of demolition; peak PM10 and PM2.5 emissions would occur during the two-month grading activities. As shown, the proposed Project’s estimated construction emissions would not exceed the SCAQMD LST thresholds, and the impact from exposure to construction emissions at the adjacent SRC and MS&E Building, or elsewhere on or off campus would be less than significant.

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[8] The methodology for LST analysis uses the metric system for distance factors.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

Construction and operation of the proposed Project would have a less than significant impact related to exposure of sensitive receptors to substantial pollutant concentrations.

Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☐	☒	☐

Discussion

The analysis of Impact 4.3-5 in the 2005 LRDP Amendment 2 EIR concluded that development under the 2005 LRDP would result in a less than significant impact related to objectionable odors.

Construction activities may generate some odors during construction, such as diesel exhaust associated with operations of diesel-fueled construction vehicles/equipment, architectural coatings, and asphalt paving. These odors are typical of urbanized environments and would be subject to construction and air quality regulations, including proper maintenance of machinery to minimize engine emissions. These emissions would occur during daytime hours and would be isolated to the immediate vicinity of construction activities. The odors would be of a relatively small magnitude and short duration and would quickly disperse into the atmosphere. These odors are not pervasive enough to cause objectionable odors affecting a substantial number of people. There would be a less than significant impact.

As identified in the 2005 LRDP Amendment 2 EIR, the campus does not contain any facilities that are considered by the SCAQMD to be odor-emitting, and no such facilities would be added. As described in Section II, Project Description, the MRB1 would include research and core laboratories and a vivarium. The vivarium would have a separate internal circulation system. As stated in the 2005 LRDP Amendment 2 EIR, academic research using odorous materials would take place inside buildings with the appropriate laboratory hoods and ventilation equipment, as required by regulations. Compliance with these regulations would not result in substantial odorous emissions associated with research activities. Therefore, long-term operation of the proposed Project would not expose substantial numbers of persons to objectionable odors.

In summary, impacts from construction or operation of the proposed Project related to odors would be less than significant consistent with the findings of the 2005 LRDP Amendment 2 EIR.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would create a less than significant impact associated with objectionable odors affecting a substantial number of people.

4. Biological Resources

The analysis of biological resources is tiered from the 2005 LRDP EIR and was addressed in Section 4.4, Biological Resources, of that document. As described previously in Section II, Project Description, of this IS, relevant elements of the proposed Project related to biological resources include tree removal, replacement, and retention and removal of the limited amount of ornamental vegetation located within the project area.

The following applicable PSs, PPs, and MMs were adopted as part of the 2005 LRDP EIR and 2005 LRDP Amendment 2 EIR and are incorporated as part of the proposed Project and assumed in the analysis presented in this section.

PS Open Space 3	In Naturalistic Open Space areas, where arroyos and other natural features exist, preserve wherever possible, existing landforms, native plant materials, and trees. Where appropriate, restore habitat value.
PS Conservation 2	Site buildings and plan site development to minimize site disturbance, reduce erosion and sedimentation, reduce stormwater runoff, and maintain existing landscapes, including healthy mature trees whenever possible.
MM 4.4-4(a)	Prior to the onset of construction activities that would result in the removal of mature trees that would occur between March and mid-August, surveys for nesting special status avian species and raptors shall be conducted on the affected portion of the campus following USFWS and/or CDFG guidelines. If no active avian nests are identified on or within 250 feet of the construction site, no further mitigation is necessary.
MM 4.4-4(b)	If active nests for avian species of concern or raptor nests are found within the construction footprint or a 250-foot buffer zone, exterior construction activities shall be delayed within the construction footprint and buffer zone until the young have fledged or appropriate mitigation measures responding to the specific situation have been developed and implemented in consultation with USFWS and CDFG.

Additionally, PPs 4.1-2(a) and 4.1-2(b) (included under the Aesthetics analysis, which is Section V.1 of this IS) are included in the proposed Project. PP 4.1-2(a) requires development of landscape plans that are consistent with the Campus Design Guidelines (including tree retention). PP 4.1-2(b) requires that the campus continue to relocate, where feasible, mature “specimen” trees that would be removed as a result of construction activities on the campus.

Project Impact Analysis

Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☐	☐	☒

Discussion

The analysis of Impact 4.4-1 in the 2005 LRDP EIR concluded that, with implementation of PS Open Space 1 through 4, PS Conservation 1 through 3, PP 4.4-1(a), PP 4.4-1(b), MM 4.4-1(a), and MM 4.4-1(b), development under the 2005 LRDP would result in less than significant impacts on candidate, sensitive, and special status plant and wildlife species.

Based on the land use and open space designations defined in the 2005 LRDP, on-campus plant and wildlife resources can be generally described by four biological resource “associations” as follows:

- **Natural** areas are undeveloped open space and are comprised of native and naturally occurring plant species. This association refers to the southeast hills on the East Campus, where the primary plant community is coastal sage scrub.
- **Naturalistic** areas are mostly undeveloped but have been subject to modification and/or the introduction of ornamental trees and shrubs. This association is limited to drainage channels or arroyos, Picnic Hill, and the Botanic Garden.
- **Landscaped** areas are open spaces that have been developed with turf-covered lawn areas, mature trees, and shrubs or groundcover in planting beds, typically around the edges of these spaces. This association dominates the academic core and the residential areas of the East Campus.
- **Agricultural** areas are undeveloped land that is used for agricultural teaching and research and is dominated by row crops and orchards. This association is found on most of the West Campus.

As identified in the 2005 LRDP EIR, a literature search determined that special status plant and animal species have the potential to occur within Natural and Naturalistic areas of the campus; several sensitive wildlife species and one sensitive plant species were observed within the UCR Botanic Gardens (refer to Tables 4.4-1 and 4.4-2 of the 2005 LRDP EIR). Therefore, development within Natural and Naturalistic areas could result in substantial direct and indirect (e.g., removal of foraging habitat) adverse impacts on candidate, sensitive, and/or special status species. The distribution of the campus’ Natural and Naturalistic areas is shown on Figure 4.4-1, Existing Campus Biological Resources, of the 2005 LRDP EIR. As shown, an existing drainage exists to the east of Aberdeen Drive and resumes west of Canyon Crest Drive, and a designated Naturalistic east-west-trending corridor is located south of the project site. It should be noted that this segment of Naturalistic open space has been developed with the MS&E Building and associated hardscape and landscape areas and athletic fields.

Existing vegetation in the project area is primarily limited to various ornamental plants, shrubs, and trees. Additionally, there are native trees in the project area (western sycamores). Consistent with PS Open Space 3 (preservation of landforms, native plant materials, and trees within Naturalistic open space areas), trees would be protected in place, to the extent feasible. Additionally, consistent with PP 4.1-2(b), the campus would relocate “mature” trees disturbed during construction, where feasible.

Although no wildlife species were observed on the project site, there is potential for common animal species typically found in urban areas to be present, such as small mammals, birds, small reptiles, and insects. There are no natural or sensitive biological resources present on the project site. Therefore, the proposed Project would not 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 regulation by the California Department of Fish and Wildlife (CDFW) or by the U.S. Fish and Wildlife Service (USFWS). No impact would occur, and no mitigation is required.

A discussion of impacts to migratory birds is provided under Threshold 4d below.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would have no impact to candidate, sensitive, or special status plant or wildlife species.

Threshold(s)	**Potentially Significant Impact**	**Project Impact Adequately Addressed in LRDP EIR**	**Less Than Significant With Project-Level Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	☐	☐	☐	☐	☒

Discussion

The analysis of Impact 4.4-2 in the 2005 LRDP EIR concluded that there would be less than significant impacts to the on-campus portion of the USFWS-designated critical habitat area for coastal California gnatcatcher (*Polioptila californica californica*) and on the riparian habitat within the existing arroyos on campus with implementation of PS Open Space 1 through 3, PS Conservation 1, PP 4.4-1(a), PP 4.4-1(b), PP 4.4-2(a), PP 4.4.2-(b), MM 4.4-1(a), and MM 4.4-1(b).

Based on review of Figure 4.4-1, Existing Campus Biological Resources, of the 2005 LRDP EIR, the proposed Project does not involve any development within or near designated critical habitat for the coastal California gnatcatcher, and the project area is not traversed by an existing arroyo or other drainage feature. As discussed previously, an existing drainage in the area exists to the east of Aberdeen Drive and resumes west of Canyon Crest Drive. Therefore, the proposed Project does not have the potential to impact riparian or other sensitive natural communities that may occur in these areas. The proposed Project would have no impact.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would have no impact on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations by the CDFW or the USFWS.

Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☐	☒

Discussion

As identified in Section 4.4, Biological Resources, of the 2005 LRDP EIR, development under the 2005 LRDP could involve minor development, such as extension of utility lines or pedestrian or bicycle paths, within Naturalistic open space areas, which can include arroyos that may contain jurisdictional seasonal wetlands or “waters of the U.S.”. The analysis of Impact 4.4-3 in the 2005 LRDP EIR concluded that, with implementation of PS Open Space 3, PS Conservation 1 and 2, PP 4.4-1(a), PP 4.4-1(b), PP 4.4-2(a), PP 4.4.2-(b), MM 4.4-3(a), MM 4.4-3(b), and MM 4.4-3(c), there would be less than significant impacts to jurisdictional wetlands.

The project site has been previously disturbed by its development with the Athletic Fields and use as a construction staging area; it does not include wetlands, or other areas under the jurisdiction of the CDFW or U.S. Army Corps of Engineers (USACE). There would be no impact, and no mitigation is required.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would have no impact on federally protected wetlands (including, but not limited to, marsh, vernal pool, and coastal) as defined by Section 404 of the Clean Water Act through direct removal, filling, hydrological interruption, or other means.

Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
d) 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?	☐	☐	☐	☒	☐

Discussion

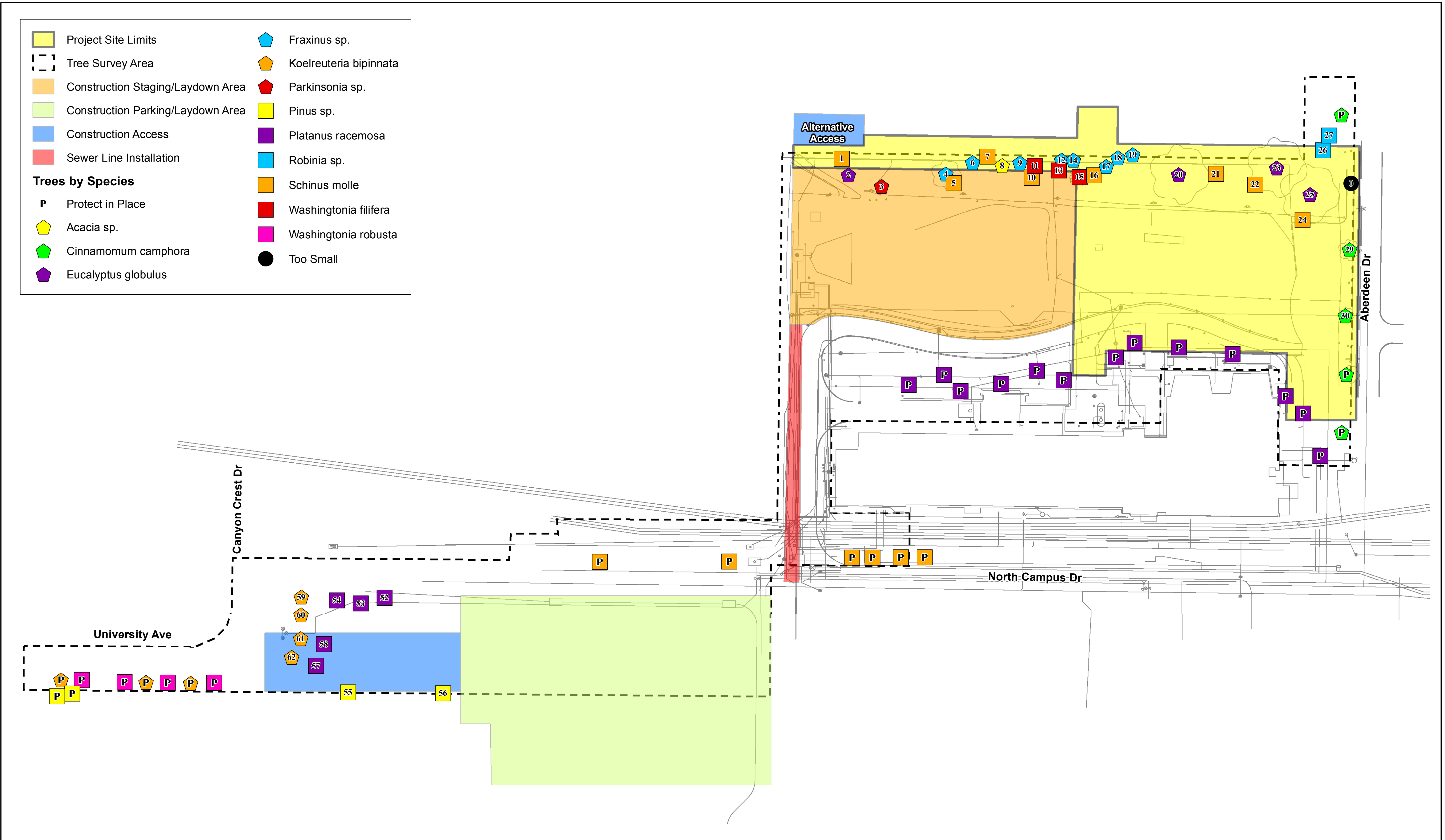
As identified in Section 4.4, Biological Resources, of the 2005 LRDP EIR, the large undeveloped areas of the southeast hills, including the Botanical Gardens and nearby arroyos, provide opportunities for wildlife connections between the Box Springs Mountains and Sycamore Canyon Park. These undeveloped areas function as potential wildlife corridors in that they connect two or more habitat patches that would otherwise be fragmented or isolated from one another. Also, the 2005 LRDP EIR identified that development on campus would result in the removal of mature trees, some of which could be used by migratory birds. Nesting birds and raptors are protected by the Migratory Bird Treaty Act (MBTA); raptors are also protected by the *California Fish and Game Code.* The loss of an occupied nest as a result of construction or demolition activities would constitute a substantial adverse effect (such as "take" or "destruction" under Section 3513 of the *California Fish and Game Code*) and, in the case of raptors, would constitute the "take" or "destruction" of the nest or egg (under Section 3503.5 of the *California Fish and Game Code*).

The analysis of Impact 4.4-4 in the 2005 LRDP EIR concluded there would be less than significant impacts related to wildlife movement with implementation of PS Open Space 1, 2, 3, and 5; PS Conservation 1 and 2; PP 4.4-1(a); PP 4.4-1(b); MM 4.4-4(a); and MM 4.4-4(b).

The proposed Project is located in the central portion of the UCR campus of the East Campus and would not involve development within or near the southeast hills; it would not, therefore, interfere with wildlife movement through identified corridors. Impacts to wildlife movement would be less than significant, which is consistent with the conclusions of the 2005 LRDP EIR.

As shown on Figure 16, Tree Impacts, there are 71 trees surveyed within the vicinity of the project site and potential construction-related areas; a summary of the relevant information is provided in Appendix B (e.g., type, height, dbh, canopy diameter, health, and aesthetics). Of these 71 trees, 40 are within or immediately adjacent to the project site limits, including the potential extension of the service/access to Parking Lot 25 and the area that would be impacted to install the construction access road from University Avenue (refer to Figure 16). Of these 40 trees, 5 western sycamores located at the north side of the MS&E Building would be protected in place, consistent with PS Open Space 3 and PS Conservation 2. The remaining 35 trees would be removed to accommodate construction of the project; 24 are considered mature trees, with a tree trunk dbh of 12 inches or greater. Consistent with PP 4.1-2(b), the campus would relocate mature trees removed during construction, where feasible.

In addition, there are 5 trees that are near the construction access and staging areas east of University Avenue, and in the construction staging area adjacent to and west of the project site. It is not expected that these trees would need to be removed during construction; however, there is a potential that they would be disturbed during construction, dependent on the logistics of construction staging and project access. Consistent with PS Open Space 3 and PS Conservation 2, the campus would protect mature trees in place, as feasible. Should any of



Tree Impacts

Figure 16

UCR Multidisciplinary Research Building 1 Project

N W E S

100 50 0 100 Feet

PSOMAS

(Rev: 03-22-2016 JAZ) R:\Projects\UCR\3UCR000500\Graphics\InitialStudy\ex16_TreeImpacts.pdf

D:\Projects\UCR\0005\MXDs\InitialStudy\ex_TreeImpacts.mxd these trees be removed, consistent with PP 4.1-2(b), the campus would relocate them, where feasible.

The proposed Project includes PP 4.1-2(a), which ensures that project-specific landscape plans are consistent with the Campus Design Guidelines with respect to, among other items, retention of existing trees. Additionally, the proposed Project would involve planting additional trees within the project site. As discussed previously, the proposed Project includes an arroyo landscape through the east-west corridor formed by the proposed MRB1 and the MS&E Building, and retains the trees planted around the MS&E Building.

As analyzed in the 2005 LRDP EIR, it is anticipated that any migratory birds or raptors using mature trees as perching sites would leave the site upon the initiation of construction activities. However, implementation of the 2005 LRDP, including the proposed Project, could still result in the removal of mature trees that may serve as perching or nesting sites of migratory birds or raptors. This would constitute substantial interference (take or destruction) with a raptor or migratory species of special concern. Therefore, the proposed Project incorporates MM 4.4-4(a), which requires a pre-construction survey for nesting special status avian species and raptors, and MM 4.4-4(b), which requires that exterior construction activities be delayed within the construction footprint or a 250-foot buffer zone until the young have fledged or appropriate MMs responding to the specific situation have been developed and implemented in consultation with USFWS and CDFW. Because the proposed Project incorporates all relevant PSs, PPs, and MMs, impacts on nesting birds and raptors would be less than significant, consistent with the findings of the 2005 LRDP EIR.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

There would be a less than significant impact to nesting birds and raptors.

	Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
e)	Conflict with any applicable policies protecting biological resources?	☐	☐	☐	☐	☒

Discussion

UCR is a part of UC, a constitutionally created unit of the State of California. As a State entity, UC is not subject to municipal plans, policies, or regulations such as the County and City General Plans or local ordinances. However, because UCR values its relationship with the local communities, it voluntarily reviewed the policies in the *City of Riverside General Plan* (General Plan) for consistency. Relevant General Plan policies include preservation of sage scrub habitat, retention of natural ridgeline areas, and preservation of Rare and Endangered Species habitat. The *County of Riverside General Plan* does not apply to the UCR campus as it includes only unincorporated areas of the County. The analysis of Impact 4.4-5 in the 2005 LRDP EIR concluded there would be less than significant impacts related to consistency with *City of*

Riverside General Plan goals related to preservation of biological resources with implementation of PS Conservation 1 and PS Open Space 1 through 3.

As discussed under Thresholds 4a through 4d and Threshold 4f, the proposed Project incorporates PS Open Space 3, PP 4.1-2(a), PP 4.1-2(b), MM 4.4-4(a), and MM 4.4-4(b) and would have no impacts to sensitive biological resources. Additionally, the proposed Project would have less than significant impacts related to removal of mature trees and associated potential for disturbance of protected birds and raptors with implementation of the above-listed measures. Accordingly, the proposed Project would also be consistent with the *City of Riverside General Plan* policies related to biological resources. No impact would occur.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would have no impact related to conflict with LRDP policies protecting biological resources.

	Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
f)	Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other applicable habitat conservation plan?	☐	☐	☐	☐	☒

Discussion

A Multiple Species Habitat Conservation Plan (MSHCP) was approved and adopted by Riverside County in 2003 as a comprehensive, multijurisdictional Habitat Conservation Plan (HCP) focusing on conservation of both species and associated habitats to address biological and ecological diversity conservation needs in Western Riverside County. In addition to being an HCP pursuant to Section 10(a)(1)(B) of the Federal Endangered Species Act of 1973, this MSHCP also serves as a Natural Communities Conservation Plan under the Natural Communities Conservation Planning (NCCP) Act of 1991. Although sections of Cells 634 and 719 of the MSHCP include portions of the campus, the plan does not identify any portion of UCR for conservation. Therefore, the 2005 LRDP EIR concluded that development under the 2005 LRDP, of which the proposed Project is a part, would not conflict with the MSHCP, and there would be no impact. Therefore, the proposed Project would have no impact related to conflict with the MSHCP, consistent with the findings of the 2005 LRDP EIR.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would have no impact related to conflict with the Western Riverside County MSHCP.

5. Cultural Resources

The analysis of cultural resources is tiered from the 2005 LRDP EIR and was addressed in Section 4.5, Cultural Resources, of that document. As described previously in Section II, Project Description, of this IS, relevant elements of the proposed Project related to cultural resources include earth-moving activities to accommodate the required removal and preparation of the underlying soils for foundation design that could encounter native soils. There are no identified historic resources within the project area.

The following applicable PPs are incorporated as part of the proposed Project and assumed in the analysis presented in this section.

PP 4.5-4 Construction specifications shall require that if a paleontological resource is uncovered during construction activities:

(i) A qualified paleontologist shall determine the significance of the find.

(ii) The Campus shall make an effort to preserve the find intact through feasible project design measures.

(iii) If it cannot be preserved intact, then the University shall retain a qualified non-University paleontologist to design and implement a treatment plan to document and evaluate the data and/or preserve appropriate scientific samples.

(iv) The paleontologist shall prepare a report of the results of the study, following accepted professional practice.

(v) Copies of the report shall be submitted to the University and the Riverside County Museum.

PP 4.5-5 In the event of the discovery of a burial, human bone, or suspected human bone, all excavation or grading in the vicinity of the find shall halt immediately and the area of the find shall be protected and the University immediately shall notify the Riverside County Coroner of the find and comply with the provisions of P.R.C. Section 5097 with respect to Native American involvement, burial treatment, and re-burial, if necessary.

Project Impact Analysis

Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?	☐	☐	☐	☐	☒

Discussion

The analysis of Impact 4.5-1 in the 2005 LRDP EIR concluded that there would be less than significant impacts associated with modification of historic or potentially historic resources during construction activities with implementation of PS Conservation 4, MM 4.5-1(a), and MM 4.5-1(b); the analysis of Impact 4.5-2 concluded there would be significant and unavoidable impacts with demolition of historic or potentially historic resources even with implementation of PS Conservation 4, PS Land Use 3, PS Open Space 5, PP 4.5-2, MM 4.5-1(a), and MM 4.5-1(b).

A detailed discussion of the regulatory setting and existing cultural resources is provided in Section 4.4, Cultural Resources, of the 2005 LRDP EIR. As identified, relevant regulatory programs include the National Historic Preservation Act of 1966, California Senate Bill 297, and the California Register of Historic Resources (CRHR). The 2005 LRDP EIR identified a total of eight campus structures located on both the East Campus and West Campus that are eligible or potentially eligible for listing in the National Register of Historic Places (NRHP) and/or the CRHR; it also identified structures exceeding 45 years of age that were evaluated and determined not to be eligible for listing as a historic resource. In addition, the 2005 LRDP EIR included a compilation of structures that will be of age for evaluation as potentially historic by the end of the 2005 LRDP planning horizon (in 2015–2016). The planning horizon was extended to 2020–2021 as part of the 2005 LRDP Amendment 2 and, as such, would result in additional campus buildings that are potentially historic.

The project area, which includes the project site and related construction areas, is currently undeveloped. As such, the proposed Project would not involve modification or demolition of a historic or potentially historic structure. Based on review of Figure 4.5-1, Potentially Historic Structures on the UCR Campus, in the 2005 LRDP EIR, the nearest potential historic resource to the project area is the Physical Education (Athletics & Dance) Building, which is located approximately 0.14 mile to the south. Based on the cultural resources records and literature search discussed below, the nearest off-campus historic resource is a historic district made up of the Canyon Crest Heights neighborhood, north of Linden Street. The proposed Project would have no direct or indirect impacts on historic resources.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would have no impact related to the potential to cause a substantial adverse change to a significant historical resource as defined in Section 15064.5 of the State CEQA Guidelines.

Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	☐	☐	☒	☐	☐

Discussion

The analysis of Impact 4.5-3 in the 2005 LRDP EIR concluded there would be less than significant impacts related to archaeological resources during construction activities with implementation of PS Land Use 2 and 3, PS Open Space 1 through 3 and 5, PS Conservation 1 through 3, and PP 4.5-3.

As discussed in the 2005 LRDP EIR, three archaeological sites have been recorded within the UCR campus: Site CA-RIV-495, a prehistoric site located on a slope in the southeast hills; the 2002 discovery of a previously undocumented prehistoric site located in the southeast hills in the vicinity of Site CA-RIV-495; and Site CA-RIV-4768H, which represents the historic Gage Canal that traverses the West Campus. Also, the cultural resources investigation in support of the 2005 LRDP EIR concluded that the following areas of the UCR campus exhibit moderate sensitivity for unknown archaeological resources: (1) the rolling hills in the southeastern portion of the campus and (2) the agricultural fields on West campus.

Regarding the East Campus, the majority of the area has been developed with academic and support uses and large areas of grading and fill placement underlie these developed areas. Substantial ground disturbance has, therefore, occurred in these areas, and surface evidence of archaeological resources is not likely to be encountered. Further, no archaeological materials have been uncovered during excavation or grading associated with development of the campus core on the East Campus, and this area is not considered sensitive for archaeological resources.

Records Search and Field Survey

Regardless, a cultural resources records search and literature review was completed at the Eastern Information Center (EIC) at UCR, one of nine regional clearinghouses for archaeological and historical records in California. This included a search of historic maps; consultation of the NRHP and the California Office of Historic Preservation’s Archaeological Determination of Eligibility (ADE) and Historic Property Directory (HPD). The review of records and topographical maps on file at the EIC and provided by UCR indicate there have been eight investigations within a ¼-mile radius, and of these, three included the Athletic Fields. The archaeological records search/literature review conducted for the proposed project is summarized in Appendix C and reveals that no cultural resources have been recorded on the project site.

On December 18, 2015, Psomas Senior Archaeologist David Smith visited the site and the adjacent site to the west to determine if any prehistoric or historic artifacts or features were present. Visibility was generally excellent overall, but the westernmost portion of the site was fenced and covered with grass. Low-lying foothills in this part of the campus have been graded extensively to create roads, buildings, parking lots, sports facilities, landscaping, and other campus features. The subject parcel was constructed by cutting and filling from areas to the north and east, resulting in the deposition of fill materials over the entire western half of the parcel. The eastern portion was likely the result of deep cutting into native sediments to create a level pad.

Recently deposited sediments from an unknown location were piled in the northeastern corner of the parcel. The unfenced eastern portion is almost entirely bare, gravely, sandy soils. Remnants of two concrete slabs associated with an unknown athletic activity are present on the project site. None of the athletic facilities observed in the western half of the property were present in 2006, while the concrete slabs in the eastern half likely supported seating for spectators of an athletic event. The remaining features are not of significant age to warrant consideration as cultural resources.

A functioning fenced athletic facility occupies the western half of the area surveyed. Most of this area was covered in sparse grass, but soils were visible over most of the area. No prehistoric artifacts or features were observed in the heavily disturbed and reworked sediments.

Native American Coordination

Regarding Native American resources, a Sacred Lands File Check was performed in 2003 by the Native American Heritage Commission (NAHC) for the 2005 LRDP EIR and did not indicate the presence of sites of Native American cultural or religious value on the campus. A Sacred Lands File Check was also conducted by the NAHC in November 2015 and also had negative results.

In September 2014, Governor Brown signed Assembly Bill (AB) 52 (Chapter 532, Statutes of 2014), which creates a new category of environmental resources that must be considered under CEQA: "tribal cultural resources". The legislation imposes new requirements for offering to consult with California Native American tribes regarding projects that may affect a tribal cultural resource, emphasizes a broad definition of what may be considered to be a tribal cultural resource, and includes a list of recommended MMs.

Recognizing that tribes may have expertise regarding their tribal history and practices, AB 52, which became effective on July 1, 2015, requires lead agencies to provide notice to tribes that are traditionally and culturally affiliated with the geographic area of a proposed project, if they have requested such notice in writing. The project notification is required prior to the lead agency's release of a Notice of Preparation (NOP) of an EIR or notice of an MND or ND on or after July 1, 2015. Once Native American tribes receive a project notification, they have 30 days to respond as to whether they wish to initiate consultation regarding the project, including subjects such as mitigation for any potential project impacts. If a tribe requests consultation and the lead agency and the tribe ultimately agree on mitigation to address any potentially significant impacts to tribal cultural resources, the MMs agreed upon during consultation must be recommended for inclusion in the environmental document.

AB52 directs the tribes to initiate this process, but the law's provisions do not require the NAHC to provide lead agency information to tribes until July 1, 2016, and CEQA Guidelines revisions are not required to be adopted until that date. Therefore, UCR has bridged the one-year delay by assisting tribes with initiating the consultation. On December 3, 2015, UCR sent letters to 22 tribes identified by NAHC to provide a formal notification of the proposed Project pursuant to AB 52. Only one tribe (the Agua Caliente Band of Cahuilla Indians) had previously provided a written request for project notifications under AB52.

To date, three tribes have responded to UCR's notification letter: the Pala Band of Mission Indians, the Agua Caliente Band of Cahuilla Indians, and the Morongo Band of Mission Indians. The Pala Band of Mission Indians declined consultation while the other two tribes requested consultation. Both of the tribes requested the results of a records search and an archaeological survey. The Morongo Band of Mission Indians also requested that a tribal monitor be present for the field survey and during ground disturbing activities; however, the field survey was conducted prior to receipt of this request.

On January 12, 2016, UCR provided the tribes with results of the cultural resources records search and field survey conducted for the project, and a copy of UCR's standard contractor specifications regarding the protection and recovery of buried artifacts (included as MM MRB1 Cult-1). UCR sent follow-up letters on January 29, 2015 to the Agua Caliente Band of Cahuilla Indians and the Morongo Band of Mission Indians, again requesting input on the information provided, and to confirm if further consultation is required. On February 4, 2016 a subsequent letter from the Agua Caliente Band of Cahuilla Indians was received requesting specific revisions to the contractor specifications to address measures to be taken should human remains be encountered; the requested measure is consistent with the requirements of PP 4.5-5, and has been incorporated in MM MRB1 Cult-1. UCR sent a follow-up letter on February 23, 2016 with additional information and offering to schedule a telephone call to discuss. To date, there has been no further input received from either tribe.

Impacts to Archaeological Resources

Regarding archaeological resources, the proposed Project is an infill development on a previously disturbed site. Also, the project area is not located within the southeast hills or within the West Campus agricultural fields, where on-campus archeological resources are most likely to be encountered. Based on review of the preliminary geotechnical investigation for the proposed Project (AFW 2015), the project site is underlain by artificial fill materials up to 21.5 feet deep, which is underlain by native alluvial sediments. The deeper fills occur primarily in the slope area along the east side of the site. Review of the geotechnical boring logs for the central portion of the site indicates the presence of no to very shallow fill materials. While the extent of excavation associated with the proposed Project has been minimized by siting the building such that the finish floor elevation of the lower level would be close to existing grades in the central (i.e., relatively flat) portion of the site, construction of the proposed Project may disturb native sediments during earth moving necessary to prepare the building foundation and install utility connections.

As discussed in the 2005 LRDP EIR, the academic core on the East Campus and areas immediately adjacent to the academic core (except for the southeast hills) present a low potential for encountering unknown, intact archaeological resources. Therefore, although there is a potential to encounter unknown archaeological resources during earth-moving activities that could disturb native sediments, the proposed Project's impact to archaeological resources is less than significant impact, consistent with the findings of the 2005 LRDP EIR. However, UCR's standard contractor specifications address protection and recovery or buried artifacts, including archaeological resources, and the standard requirements are incorporated into the project as MM MRB1 Cult-1, presented below. This MM identifies steps to be taken if archaeological resources, including Native American cultural resources, are discovered during construction.

Additional Project-Level Mitigation Measure

MM MRB1-CULT 1 If a paleontological or archaeological resource is discovered during construction, all soil- disturbing work within 100 feet of the find shall cease and the University Representative shall contact a qualified archaeologist meeting the Secretary of Interior standards within 24 hours of discovery to inspect the site. If a resource within the project area of potential effect is determined to qualify as a unique archaeological resources (as defined by CEQA), the University shall devote adequate time and funding to determine if it is feasible, through project design measures to preserve the find intact. If it cannot be preserved the University shall retain a qualified non-University paleontologist/archaeologist to 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 finding that meets professional standards.

a. If significant Native American cultural resources are discovered, as determined by the consulting archaeologist for which a Treatment Plan must be prepared, the Design- builder or his archaeologist shall immediately contact the University Representative. The University Representative shall contact the appropriate Tribal representatives.

b. If requested by Tribal representatives, the University, the Design-builder or his project archaeologist shall in good faith, consult on the discovery and its disposition (e.g. avoidance, preservation, return of artifacts to tribe, etc.).

c. In the event of the discovery of a burial, human bone, or suspected human bone, all excavation or grading in the vicinity of the find shall halt immediately and the area of the find shall be protected and the University immediately shall notify the Riverside County Coroner of the find and comply with the provisions of State Health & Safety Cod § 7050.5.

Level of Significance

The proposed Project would have a less than significant impact related to a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5 of the State CEQA Guidelines.

	Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
c)	Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☒	☐

Discussion

The analysis of Impact 4.5-4 in the 2005 LRDP EIR concluded that there would be less than significant impacts related to paleontological resources during construction activities with implementation of PS Land Use 3; PS Open Space 1, 2, and 5; and PP 4.5-4. As discussed in the 2005 LRDP EIR, the rock and sediment types that underlie the campus are unlikely to be fossil-bearing. However, while the likelihood of encountering paleontological resources is low, the potential for discovery of previously unknown paleontological resources cannot be eliminated.

As discussed under Threshold 4b, construction of the proposed Project may disturb native sediments during earth moving necessary to prepare the building foundation and install utility connections. Therefore, there is a potential to encounter unknown paleontological resources. The proposed Project incorporates PP 4.5-4, which requires the preparation of a site-specific analysis and provisional measures in the event that paleontological resources are uncovered during construction activities. Accordingly, the proposed Project would result in a less than significant impact to paleontological resources, consistent with the findings of the 2005 LRDP EIR.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would have a less than significant impact related to the potential to directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☐	☒	☐

Discussion

The analysis of Impact 4.5-5 in the 2005 LRDP EIR concluded that there would be less than significant impacts related to disturbance of human remains—including those interred outside of formal cemeteries—during construction activities with implementation of PS Land Use 3; PS Open Space 1, 2, and 5; PS Conservation 1 and 2; and PP 4.5-5. As discussed in the 2005 LRDP EIR, no formal cemeteries are known to have occupied the UCR campus, so any human remains encountered would likely come from archaeological or historical archaeological contexts. As such, given the presence of archeological resources on the campus, ground-disturbing activities associated with development could affect unknown human remains, particularly in those areas of the campus that are in a relatively undisturbed condition.

As discussed under Threshold 4b, construction of the proposed Project may disturb native sediments during earth moving necessary to prepare the building foundation and install utility connections. Therefore, there is a potential to encounter unknown human remains. The proposed Project minimizes the area of campus subject to disturbance by implementing infill development on a previously disturbed site. Also, human burials, in addition to being potential archaeological resources, have specific provisions for treatment in Section 5097 of the PRC. In accordance with these requirements, the proposed Project incorporates PP 4.5-5, which requires implementation of these provisions if human remains are discovered on campus. Accordingly, the proposed Project would result in a less than significant impact related to the disturbance of human remains, consistent with the findings of the 2005 LRDP EIR.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would have a less than significant potential to disturb any human remains, including those interred outside of formal cemeteries.

6. Geology and Soils

The analysis of geology and soils is tiered from the 2005 LRDP EIR and was addressed in Section 4.6, Geology and Soils, of that document. As described previously in Section II, Project Description, of this IS, relevant elements of the proposed Project related to geology and soils include earth-moving activities to accommodate the required removal and preparation of the underlying soils for foundation design that could encounter native soils and associated building construction.

The following applicable PPs are incorporated as part of the proposed Project and are assumed in the analysis presented in this section.

PP 4.6-1(a)

During project-specific building design, a site-specific geotechnical study shall be conducted under the direct supervision of a California Registered Engineering Geologist or licensed geotechnical engineer to assess seismic, geological, soil, and groundwater conditions at each construction site and develop recommendations to prevent or abate any identified hazards. The study shall follow applicable recommendations of CDMG Special Publication 117 and shall include, but not necessarily be limited to

- Determination of the locations of any suspected fault traces and anticipated ground acceleration at the building site
- Potential for displacement caused by seismically induced shaking, fault/ground surface rupture, liquefaction, differential soil settlement, expansive and compressible soils, landsliding, or other earth movements or soil constraints
- Evaluation of depth to groundwater

The structural engineer shall incorporate the recommendations made by the geotechnical report when designing building foundations.

PP 4.6-1(c)

The Campus will continue to fully comply with the University of California's Policy for Seismic Safety, as amended. The intent of this policy is to ensure that the design and construction of new buildings and other facilities shall, as a minimum, comply with seismic provisions of California Code of Regulations, Title 24, California Administrative Code, the California State Building Code, or local seismic requirements, whichever requirements are most stringent.

PP 4.6-2(a)

The Campus shall continue to implement dust control measures consistent with SCAQMD Rule 403—Fugitive Dust during the construction phases of new project development. The following actions are currently recommended to implement Rule 403 and have been quantified by the SCAQMD as being able to reduce dust generation between 30 and 85 percent depending on the source of the dust generation. The Campus shall implement these measures as necessary to reduce fugitive dust. Individual measures shall be specified in construction documents and require implementation by construction contractor:

(i) Apply water and/or approved nontoxic chemical soil stabilizers according to manufacturer's specification to all inactive construction areas (previously graded areas that have been inactive for 10 or more days)

(ii) Replace ground cover in disturbed areas as quickly as possible

(iii) Enclose, cover, water twice daily, or apply approved chemical soil binders to exposed piles with 5 percent or greater silt content

(iv) Water active grading sites at least twice daily

(v) Suspend all excavating and grading operations when wind speeds (as instantaneous gusts) exceed 25 miles per hour over a 30-minute period

(vi) All trucks hauling dirt, sand, soil, or other loose materials are to be covered or should maintain at least two feet of freeboard (i.e., minimum vertical distance between top of the load and the top of the trailer), in accordance with Section 23114 of the California Vehicle Code

(vii) Sweep streets at the end of the day if visible soil material is carried over to adjacent roads

(viii) Install wheel washers where vehicles enter and exit unpaved roads onto paved roads, or wash off trucks and any equipment leaving the site each trip

(ix) Apply water three times daily or chemical soil stabilizers according to manufacturers' specifications to all unpaved parking or staging areas or unpaved road surfaces

(x) Post and enforce traffic speed limits of 15 miles per hour or less on all unpaved roads

(This is identical to Air Quality PP 4.3-2(b) and Hydrology PP 4.8-3[c]).

Project Impact Analysis

Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:					
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☐	☐	☒

Threshold(s)		Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
ii)	Strong seismic ground shaking?	☐	☐	☐	☒	☐
iii)	Seismic-related ground failure, including liquefaction?	☐	☐	☐	☐	☒
iv)	Landslides?	☐	☐	☐	☐	☒

Discussion

The analysis of Impact 4.6-1 in the 2005 LRDP EIR determined that, with implementation of PS Open Space 1 and 2, PS Conservation 2, and PPs 4.6-1(a) through 4.6-1(c), there would be less than significant impacts related to fault rupture, strong seismic ground shaking, or seismic-related hazards.

A *Report of Limited Geotechnical Investigation, Proposed Multidisciplinary Research Building, University of California, Riverside, Near Intersection of North Campus Drive and Aberdeen Drive Riverside, California* (preliminary geotechnical study) was prepared for the proposed Project by Amec Foster Wheeler (AFW) and is provided in Appendix D (AFW 2015). In accordance with PP 4.6-1(a), a site-specific study with associated geotechnical recommendations would be prepared as part of the subsequent design-build process and incorporated into the building design. The preliminary geotechnical study involved advancing 20 exploratory soil borings within the project site and the potential future research building site the west to depths between 50 feet bgs and 76 feet bgs; laboratory testing of representative soil samples collected from the borings; and performing a limited geologic-seismic hazards evaluation.

The preliminary geotechnical study identifies that the project site is underlain by artificial fill materials up to 21.5 feet deep; these deeper fills occur primarily in the slope area along the east side of the site. The fill materials consist of silty sand, and deeper and/or poorer quality fill may be encountered between boring locations. The fill materials are underlain by native sediments mapped as Holocene- and late Pleistocene-age young alluvial channel deposits. The alluvium at the site consists predominantly of massive- to crudely stratified, interbedded, poorly graded sand and silty sand. Gravel was generally encountered in well-graded sand layers. The sands are generally medium dense to very dense; some loose sandy layers were encountered. Groundwater was not encountered within the maximum drilling depth of 76 feet bgs, and prior borings advanced by AFW on campus did not encounter groundwater to a maximum depth of 70 feet bgs. In addition, based on data from nearby wells, the historic high groundwater level is greater than 49 feet bgs (AFW 2015).

As identified in the 2005 LRDP EIR and the geotechnical study, the UCR campus is not located within an Alquist-Priolo Earthquake Fault Zone as established by the California Department of Conservation, California Geologic Survey, and no known active or potentially active faults traverse the campus. Because ground rupture occurrences are generally limited to the location of faults, the proposed MRB1 would not be subject to a substantial risk of fault (ground surface) ruptures, and there would be no impact. This is consistent with the findings of the preliminary geotechnical study for the proposed Project, provided in Appendix D (AFW 2015).

The preliminary geotechnical study provides a list of nearby active faults and the distance in miles between the nearest point on the fault and the project site, the maximum magnitude, and the slip rate for the fault; a similar list for potentially active faults; and a graphic representation of the faults in the vicinity. As identified in the preliminary geotechnical study, the active San Jacinto fault zone, considered one of the most seismically active faults in Southern California, is located approximately 4.9 miles northeast of the site. The active San Bernardino section of the San Andreas fault zone, Cucamonga fault zone, Elsinore fault zone and Chino fault zone are between 13 and 18 miles from the project site. Although buried thrust faults, commonly referred to as blind thrusts, are not known to underlie the Perris structural block, the Los Angeles Basin contains several at depth. These faults do not present a potential surface fault rupture hazard. However, the following described blind thrust faults are considered active and potential sources for future earthquakes. The Puente Hill Blind Thrust and San Joaquin Hills Blind Thrust are more than 30 miles from the project site.

Therefore, as concluded for the UCR campus in the 2005 LRDP EIR, the project area is located within a seismically active area and moderate to strong seismic shaking caused by an earthquake on any of the active or potentially active local and regional faults (refer to Figure 4.6-2, Regional Fault Map, of the 2005 LRDP EIR and Figure 5 of the preliminary geotechnical study) can be expected during the lifetime of the proposed Project. According to the 2013 CBC, the project area is classified as Site Class D, corresponding to a “Stiff Soil” Profile. This classification is used as the basis for seismic design parameters to be implemented for the proposed Project in accordance with 2013 CBC standards.

The preliminary geotechnical study concludes there are no geologic and seismic conditions on the project site that would preclude development of the proposed MRB1, provided appropriate engineering design and construction practices are implemented (AFW 2015). The proposed Project incorporates PP 4.6-1(c) and ensures that buildings and other facilities are designed and constructed in compliance with the University Policy on Seismic Safety, which requires compliance with the seismic provisions of the current CBC and other State codes as described in PP 4.6-1(c) or local seismic requirements, whichever is more stringent. Therefore, implementation of the proposed Project would not expose people and/or structures to potentially substantial adverse effects resulting from strong seismic ground shaking, and this impact would be less than significant.

Other seismic-related hazards investigated in the geotechnical study include liquefaction, seismically induced settlement, and landslide potential. The geotechnical study concludes that although the site is identified within a moderate liquefaction zone in the Riverside County General Plan, liquefaction is not considered a hazard at the project site due to the low potential for shallow groundwater. Based on laboratory testing, the geotechnical study concludes that seismically induced settlement has the potential to occur on the site but would not exceed one inch in the event of the Design Earthquake. The majority of the site is relatively level, although there are slopes along the north and east portions of the site, which would be removed to accommodate the proposed Project. Landslides are not anticipated because the project area is not identified as having a potential for slope instability by the County of Riverside, and because there are both no known landslides at the site nor is the site in the path of any known or potential landslides (AFW 2015). Therefore, there would be no impacts related to seismic-related ground failure or landslides, consistent with the findings of the 2005 LRDP EIR.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would have no impacts related to surface fault rupture or seismic-related ground failure, including liquefaction, settlement, or landslides. There would be less than significant impacts related to strong seismic ground shaking.

Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☐	☒	☐

Discussion

The analysis of Impact 4.6-2 in the 2005 LRDP EIR concluded that there would be less than significant impacts related to soil erosion and loss of topsoil with implementation of PS Land Use 2 and 3, PS Open Space 1 through 5, PS Conservation 1 through 3, PP 4.6-2(a), and PP 4.6-2(b).

Soil erosion from water or wind can occur to exposed soils during site clearance, excavation/grading activities, and other earth-disturbing activities associated with construction, including vegetation and hardscape removal. Erosion hazards in most of the East Campus, including the project area, range from slight to moderate. Construction activities associated with the proposed Project would comply with all provisions of the 2013 CBC related to excavation activities, grading activities, erosion control, and construction of foundations and retaining walls to minimize or eliminate soil erosion or loss of topsoil.

The proposed Project would also minimize or eliminate soil erosion during construction activities through implementation of dust-control measures consistent with SCAQMD Rule 403 (PP 4.6-2[a]) and implement BMPs, in compliance with the National Pollution Discharge Elimination System (NPDES) permit (refer to the discussion provided for Thresholds 9a and 9f in Section V.9, Hydrology and Water Quality, of this IS). When these dust-control measures and construction BMPs are applied, they significantly reduce the erosion potential of project construction to negligible amounts. Therefore, the proposed Project would result in less than significant impacts related to soil erosion or loss of topsoil, consistent with the findings of the 2005 LRDP EIR.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would have a less than significant impact related to soil erosion and the loss of topsoil.

	Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
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?	☐	☐	☐	☒	☐

Discussion

The analysis of Impacts 4.6-3 and 4.6-4 in the 2005 LRDP EIR determined that, with implementation of PS Open Space 1 and 2, PS Conservation 2, and PP 4.6-1(a), there would be less than significant impacts related to unstable geologic materials, including expansive soils.

Soil engineering constraints addressed in the project-specific geotechnical study that have the potential to occur on the project site include hydroconsolidation (water-induced collapse), subsidence, and corrosive soils. The geotechnical study concludes that the upper alluvial soils are subject to hydroconsolidation and may become weaker when wet. The geotechnical study states the site is not within an area documented to have experienced subsidence due to large scale groundwater withdrawal. Laboratory testing for corrosivity measured resistivity, hydrogen potential (pH), chlorides, soluble sulfates, ammonium, and carbonate/bicarbonate concentrations. Based on this testing, corrosion-control measures are recommended for buried iron and steel pipelines/structures, steel piling systems, hot water copper piping, and metallic fittings and valves. The chloride and sulfate concentrations in the soils tested did not indicate a concern as to corrosion of concrete strictures and piping in contact with soils. As discussed under Threshold 6a, the soils underlying the project site are not susceptible to liquefaction, excessive seismically induced settlement, or landslides.

The preliminary geotechnical study concludes there are no geologic and seismic conditions on the project site that would preclude development of the proposed MRB1, provided appropriate engineering design and construction practices are implemented (AFW 2015). As required by PP 4.6-1(a), a site-specific study with associated geotechnical recommendations for the proposed Project, including expansive soils, would be prepared as part of the subsequent design-build process and incorporated into the building design. Therefore, with the proposed Project’s incorporation of PP 4.6-1(a), there would be less than significant impacts related to unstable and expansive soils, consistent with the findings of the 2005 LRDP EIR.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would have less than significant impacts associated with unstable and expansive soils.

Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☐	☒

Discussion

Through the IS process for the 2005 LRDP EIR, implementation of the 2005 LRDP was determined to have no impact related to soils constraints for alternative wastewater disposal systems and was not carried forward for further discussion in the Draft EIR. There would be no impact related to the use of septic tanks or alternative waste water disposal systems resulting from implementation of the proposed Project because existing wastewater infrastructure would be used. This is consistent with the findings of the 2005 LRDP EIR.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would have no impact related to soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water.

7. Greenhouse Gas Emissions

The analysis of GHG emissions is tiered from the 2005 LRDP Amendment 2 EIR and was addressed in Section 4.16, Greenhouse Gas Emissions, of that document. As described previously in Section II, Project Description, of this IS, relevant elements of the proposed Project related to GHG emissions include (1) construction of the proposed MRB1 up to approximately 190,000 gsf and (2) an increase in population and associated traffic. Construction activities would involve demolition of existing hardscape and excavation. The proposed Project would have the potential to increase long-term GHG emissions from increased vehicular trips, an increase in demand for water and energy, and the generation of solid waste and wastewater within the project site. The proposed Project would be designed to achieve, at a minimum, LEED Silver rating. The proposed Project would add up to 400 individuals (employees, staff, and students) to the UCR campus population.

Section 4.16 of the 2005 LRDP Amendment 2 EIR discusses the background of GHG emissions and climate change; the types of GHGs; the State, U.S., and global GHG contributions; and the regulatory framework related to GHG emissions and their assessment under CEQA. This information remains current and applicable to the analysis of GHG emissions related to the proposed Project in this IS/MND.

It is noted that analysis of GHG emissions and the establishment of GHG reduction goals has been historically based on comparisons with a “business as usual” (BAU) scenario. The BAU scenario, typically for year 2020, assumes the implementation of no GHG reduction measures. The measures not considered in BAU analysis include many now adopted and/or required at the

State or local level, such as the GHG emissions standards for vehicles, renewable energy requirements for electrical utilities, and the Title 24 Green Building Code. The UCR Climate Action Plan (CAP), adopted in December 2010, uses the BAU analysis (UCR 2010a).

The following applicable PSs and MMs were adopted as part of the 2005 LRDP Amendment 2 EIR and are incorporated as part of the proposed Project and assumed in the analysis presented in this section.

PS Campus and Community 4	Provide strong connections within the campus and its edges to promote walking, bicycling and transit use, rather than vehicular traffic.
PS Transportation 3	Provide a continuous network of bicycle lanes and paths throughout the campus, connecting to off campus bicycle routes.
PS Transportation 5	Provide bicycle parking at convenient locations.
MM 4.16-1	All projects developed under the amended 2005 LRDP shall be evaluated for consistency with the GHG reduction policies of the UCR CAP and the UC Policy on Sustainable Practices, as may be updated from time to time by the University. GHG reduction measures, including, but not limited to, those found within the UCR CAP and UC Policy identified in Tables 4.16-9 and 4.16-10 shall be incorporated in all campus projects so that at a minimum an 8 percent reduction in emissions from BAU is achieved. It is expected that the GHG reduction measures in the UCR CAP will be refined from time to time, especially in light of the evolving regulations and as more information becomes available regarding the effectiveness of specific GHG reduction measures. As part of the implementation of the UCR CAP, the Campus will also monitor its progress in reducing GHG emissions to ensure it will attain the established targets.

In addition, the following MMs are incorporated into the proposed Project and would reduce GHG emissions: MM 4.3-2(b) included under the Air Quality analysis (Section V.3 of this IS) which requires UCR to continue to participate in GHG reduction programs; MM 4.14-1(b) included under the Transportation and Traffic analysis (Section V.16 of this IS), which requires UCR to enhance its Transportation Demand Management (TDM); and MM 4.14-1(d) included under the Transportation and Traffic analysis (Section V.16 of this IS) which requires UCR to review individual projects for consistency with UC sustainable transportation policy and UCR TDM strategies.

Project Impact Analysis

Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☐	☒	☐

Discussion

The analysis of Impact 4.16-1 in the 2005 LRDP Amendment 2 EIR concluded that, although development under the 2005 LRDP Amendment 2 would generate substantial direct and indirect GHG emissions, impacts would be less than significant with implementation of MM 4.16-1. UCR has committed to reduce GHG emissions by over 70 percent by 2020 from BAU projections.

Existing Campus Emissions

Total UCR campus operational GHG emissions for 2008 were estimated at 166,966 metric tons of CO_2 equivalent per year ($MTCO_2e$), as provided in UCR's CAP (UCR 2010a). Campus GHG emissions in 2008 were approximately double the 1990 emissions (82,167 $MTCO_2e$), commensurate with the steady growth experienced in both campus population and building space. During the 1990 to 2000 period, the total campus population increased approximately 46 percent and building space increased approximately 40 percent. From 2000 to 2008, the population increased approximately 35 percent and space increased approximately 43 percent. However, despite an increase in the rate of growth in building space between 2000 and 2008, the rate of growth in GHG emissions decreased in this time period due to the implementation of a number of energy efficient projects on the campus (UCR 2010a).

The project site is currently vacant with minimal asphalt and paved surfaces; there are no sources of emissions for GHGs.

Proposed Project Emissions

GHG emissions from the proposed Project were calculated using CalEEMod Version 2013.2.2. Construction GHG emissions are generated by vehicle engine exhaust from construction equipment, on-road hauling trucks, vendor trips, and worker commuting trips. Construction assumptions are described in Section V.3, Air Quality, and in Appendix A of this IS. The results are output in $MTCO_2e$ for each year of construction. The estimated construction GHG emissions for the proposed Project are shown in Table 6.

TABLE 6
ESTIMATED CONSTRUCTION GREENHOUSE GAS EMISSIONS

Year	**Emissions ($MTCO_2e$)**
2016	79
2017	310
2018	196
Total*	**585**
Annual emissions for 30-year amortization	***20***

$MTCO_2e$: metric tons carbon dioxide equivalent

* Totals may not add due to rounding.
Note: CalEEMod model data sheets are included in Appendix A.

Operational GHG emissions attributed to the proposed Project were estimated by including purchased electricity; natural gas use for space and water heating; the electricity embodied in water consumption; the energy associated with solid waste disposal; and vehicle travel by the estimated additional 400 individuals. CalEEMod incorporates local energy emission factors and MMs based on the California Air Pollution Control Officers Association (CAPCOA) publication *Quantifying Greenhouse Gas Mitigation* Measures (CAPCOA 2010) and the *California Climate Action Registry General Reporting Protocol* (CCAR 2009). The analysis of operational GHG emissions is applied to the total new construction.

A loss of vegetation, which sequesters CO_2, would occur concurrently with construction. As further discussed in Section 4, Biological Resources, trees would be removed from the project site to accommodate construction of the Project. As required, any mature trees removed during construction would be replaced. The net change in sequestered CO_2 would be negligible when compared to other Project GHG emissions.

UCR has committed to achieving, at a minimum, LEED Silver rating. The proposed Project also incorporates PS Campus and Community 4, PS Transportation 3 and 5, MM 4.3-2b, MM 4.14-1b, MM 4.14-1d, and MM 4.16-1, which relate primarily to UCR implementation of GHG reduction policies and measures, travel demand management, and promoting alternative transportation. Accordingly, the proposed Project would implement energy- and water-efficiency measures, which would lead to GHG emissions reductions. The calculation of GHG emissions assumes that building energy use would be 20 percent less than required by the 2013 Title 24 Energy Efficiency Standards, as described in Section II, Project Description.

Estimated operational and total GHG emissions for the proposed Project are shown in Table 7. For estimating annual GHG emissions, the SCAQMD has recommended amortizing construction emissions over the life of a project, and a common value for project life is 30 years (SCAQMD 2008b). As shown in Table 6, the 30-year amortized construction emissions would be 20 $MTCO_2e$ per year ($MTCO_2e$/yr).

TABLE 7
ESTIMATED ANNUAL GREENHOUSE GAS EMISSIONS

Source	Emissions $MTCO_2e$/yr
Area	<0.5
Energy	993
Mobile	1,267
Waste	5
Water	463
Total – Proposed Project	**2,728**
Plus: Amortized construction emissions (Table 6)	20
Total Increase – Proposed Project	**2,748**
$MTCO_2e$/yr: Metric tons of carbon dioxide per year Totals may not add due to rounding. Note: Detailed calculations can be found in Appendix A.	

As discussed in Section 4.16 of the 2005 LRDP Amendment 2 EIR, some air quality management and air pollution control districts in California, including CARB and the SCAQMD, have either proposed or adopted guidance documents for evaluating the significance of GHG emissions. Beginning in April 2008, the SCAQMD convened a Working Group to provide guidance to local lead agencies on determining significance for GHG emissions in their CEQA documents. In September 2010, the SCAQMD Working Group presented a revised tiered approach to determining GHG significance for residential and commercial projects (SCAQMD 2010). These proposals have not yet been considered by the SCAQMD Board. At Tier 1, GHG emissions impacts would be less than significant if the project qualifies under a categorical or statutory CEQA exemption. At Tier 2, for projects that do not meet the Tier 1 criteria, the GHG emissions impact would be less than significant if the project is consistent with a previously adopted GHG reduction plan that meets specific requirements.[9] At Tier 3, the Working Group proposes extending the 10,000 $MTCO_2e$/yr screening threshold currently applicable to industrial projects where the SCAQMD is the lead agency, described above, to other lead agency industrial projects. For residential and commercial projects, the Working Group proposes the following Tier 3 screening values: either (1) a single 3,000 $MTCO_2e$/yr threshold for all land use types or (2) separate thresholds of 3,500 $MTCO_2e$/yr for residential projects, 1,400 $MTCO_2e$/yr for commercial projects, and 3,000 $MTCO_2e$/yr for mixed-use projects. A project with emissions less than the applicable screening value would be considered to have less than significant GHG emissions.

As shown in Table 7, the estimated annual operational GHG emissions for the proposed Project with GHG reduction features, including amortized construction emissions, is 2,748 $MTCO_2e$/yr. This value may be compared with the proposed SCAQMD Tier 3 screening threshold of 3,000 $MTCO_2e$/yr for all land use types. Therefore, the proposed Project would generate a less than significant emission rate of GHG emissions based on SCAQMD threshold. It is therefore

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[9] The plan must (A) quantify greenhouse gas emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic area; (B) Establish a level, based on substantial evidence, below which the contribution to greenhouse gas emissions from activities covered by the plan would not be cumulatively considerable; (C) Identify and analyze the greenhouse gas emissions resulting from specific actions or categories of actions anticipated within the geographic area; (D) Specify measures or a group of measures, including performance standards, that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions level; (E) Establish a mechanism to monitor the plan's progress toward achieving the level and to require amendment if the plan is not achieving specified levels; and (F) Be adopted in a public process following environmental review (State CEQA Guidelines, §15183.5).

concluded that the direct and indirect GHG emissions of the proposed Project would not be cumulatively considerable and would result in a less than significant impact.

Additional Project-Level Mitigation Measures

None required.

Level of Significance after Mitigation

The proposed Project would have a less than significant impact related to GHG emissions.

Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
b) Would the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☐	☐	☒

Discussion

The analysis of Impact 4.16-2 in the 2005 LRDP Amendment 2 EIR concluded that development under the 2005 LRDP, as amended, would result in a less than significant impact related to conflict with applicable plans, policies, or regulations concerning reductions in GHG emissions. The applicable plans, policies, or regulations pertinent to the proposed Project include (1) the UC Policy on Sustainable Practices (last updated in June 2015) and (2) the UCR CAP (UCOP 2015 and UCR 2010a).

The Green Building Design section of the UC Policy on Sustainable Practices includes the following goals for new buildings that are applicable to the proposed Project:

- All new building projects, other than acute care facilities, shall be designed, constructed, and commissioned to outperform the CBC energy-efficiency standards by at least 20%. The University will strive to design, construct, and commission buildings that outperform CBC energy efficiency standards by 30% or more, whenever possible within the constraints of program needs and standard budget parameters.
- All new buildings will achieve a USGBC LEED “Silver” certification at a minimum. All new buildings will strive to achieve certification at a USGBC LEED “Gold” rating or higher, whenever possible within the constraints of program needs and standard budget parameters.
- The University of California will design, construct, and commission new laboratory buildings to achieve a minimum of LEED- “Silver” certification as well as meeting at least the prerequisites of the Laboratories for the 21st Century (Labs21) Environmental Performance Criteria (EPC)2. Laboratory spaces in new buildings also shall meet at least the prerequisites of Labs21 EPC. Design, construction, and commissioning processes shall strive to optimize the energy efficiency of systems not addressed by the CBC energy efficiency standards.
- All new building projects will achieve at least two points within the available credits in LEED-NC’s Water Efficiency category.

UCR's CAP, prepared in 2010, describes and addresses policy and regulatory requirements of the UC Policy on Sustainable Practices*;* AB 32; American College and University Presidents Climate Commitment (ACUPCC), to which UCR is a signatory; CEQA; and USEPA reporting requirements. Consistent with the UC Policy on Sustainable Practices*,* the UCR CAP establishes the goal and emission reductions methods for the campus to reduce GHG emissions to 1990 levels by 2020.

The proposed Project incorporates MM 4.3-2b, which requires UCR to implement the GHG reduction measures described in the 2005 LRDP Amendment 2 EIR (Tables 4.16-9 and 4.16-10 in Section 4.16); MM 4.14-1b, which requires UCR's continued implementation and enhancement of its TDM program; MM 4.14-1d, which requires UCR's review of individual projects for consistency with UC transportation policy and TDM strategies; and MM 4.16-1, which requires UCR's review of individual projects for consistency with the GHG reduction policies of the UC Policy on Sustainable Practices and the CAP.

Specifically, UCR has committed to achieving, at a minimum, LEED Silver rating. The proposed Project incorporates the following features, which demonstrate consistency with the UC Policy on Sustainable Practices and the UCR CAP:

- Utilize roofing material with high solar reflectance to reduce the heat island effect, which contributes to higher temperatures.
- Reduce water use for irrigation through efficient irrigation systems and selection of climate-appropriate plant species.
- Reduce potable water use by 40 percent or more through water-efficiency fixtures, such as ultra-low flow and flush plumbing fixtures, and potential use of non-potable water sources such as reverse-osmosis reject water, condensate capture, graywater, wastewater, and/or roof rainwater for irrigation and toilet flushing
- Reduce building energy consumption by at least 20 percent below Title 24 and strive to achieve 30 percent or more. Additionally, implement enhanced commissioning and enhanced refrigerant management as well as measurement and verification of energy systems to ensure planned features are properly installed and maintained.
- Design the roof structural system to accommodate future PV panels and leave at least 15 percent of the roof area left open for installation of PV panels.
- Utilize recycled building materials and regionally sourced materials (within 500 miles of the project site).

The proposed Project would provide bicycle paths and bicycle parking (to accommodate a minimum 5 percent of building occupancy) and storage following strategies PS Transportation 3 and PS Transportation 6 and supporting vehicle trip reduction goals in the University of California Office of the President (UCOP) and UCR policy documents. A detailed description of the sustainability features of the proposed Project is included in Section II, Project Description, of this IS.

Based on the above analysis, the proposed Project would not conflict with the UCR CAP or the UC Policy on Sustainable Practices. No impact would result and no mitigation is required.

Additional Project-Level Mitigation Measures

None required.

Level of Significance after Mitigation

The proposed Project would have no impact related to conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions.

8. Hazards and Hazardous Materials

The analysis of hazards and hazardous materials is tiered from the 2005 LRDP EIR and was addressed in Section 4.7, Hazards and Hazardous Materials, of that document. As described previously in Section II, Project Description, of this IS, relevant elements of the proposed Project related to hazards and hazardous materials include (1) construction of the up to 190,000-gsf, 4- to 5-level proposed MRB1 and (2) operation of new laboratories and related research facilities, including a vivarium, that may use hazardous materials and generate hazardous waste. The construction activities would involve demolition of existing hardscape and excavation, primarily within the slopes in the northern and eastern portions of the site. Landscape maintenance chemicals and cleaning products would continue to be used, consistent with existing campus operations. The design of the proposed Project ensures that emergency access to and around the project area is maintained.

Section 4.7 of the 2005 LRDP EIR provides a detailed description of the hazardous materials and wastes handled and/or generated at UCR and the policies, programs, and practices implemented to manage these materials in compliance with local, State, and federal regulations, as applicable. These include, but are not limited to, the following programs offered by UCR's Environmental Health and Safety (EH&S) Department: Biosafety; Emergency Management; Campus Emergency Response Plan; Environmental Health; Environmental Programs; Hazardous Materials Program; Spill Prevention, Control and Countermeasures Plan; Industrial Hygiene and Safety; Laboratory/Research Safety; and Radiation Safety.

The following applicable PPs and MMs were adopted as part of the UCR 2005 LRDP EIR as supplemented and updated by the 2005 LRDP Amendment 2 EIR; they are incorporated as part of the proposed Project and assumed in the analysis presented in this section.

PP 4.7-1	The Campus shall continue to implement the current (or equivalent) health and safety plans, programs, and practices related to the use, storage, disposal, or transportation of hazardous materials, including, but not necessarily limited to, the Business Plan, the Broadscope Radioactive Materials License, and the following programs: Biosafety, Emergency Management, Environmental Health, Hazardous Materials, Industrial Hygiene and Safety, Laboratory/Research Safety, Radiation Safety, and Integrated Waste Management. These programs may be subject to modification as more stringent standards are developed or if the programs are replaced by other programs that incorporate similar health and safety protection measures.
PP 4.7-3	The campus will inform employees and students of hazardous materials minimization strategies applicable to research, maintenance, and instructional activities, and require the implementation of these strategies where feasible. Strategies include but are not limited to the following:

(i) Maintenance of online database by EH&S of available surplus chemicals retrieved from laboratories to minimize ordering or new chemicals.

(ii) Shifting from chemical usage to micro techniques as standard practice for instruction and research, as better technology becomes available.

PP 4.7-7(a) 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 appropriate signage indicating alternative routes. (This is identical to Transportation and Traffic PP 4.14-5).

PP 4.7-7(b) To maintain adequate access for emergency vehicles when construction projects would result in roadway closures, Architects & Engineers (formerly the Office of Design and Construction) shall consult with the UCPD, EH&S, and the RFD to disclose roadway closures and identify alternative travel routes. (This is identical to Transportation and Traffic PP 4.14-8).

MM 4.7-7(b) The campus Emergency Operations Plan shall be reviewed on an annual basis and updated as appropriate to account for new on-campus development, which may require changes to the plan, such as revised locations for Campus Evacuation Zones.

<u>Project Impact Analysis</u>

	Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
a)	Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☐	☒	☐
b)	Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☐	☒	☐

Discussion

The analysis of Impacts 4.7-1 through 4.7-4 in the 2005 LRDP EIR concluded that, with implementation of PP 4.7-1 through PP 4.7-4 and MM 4.7-4, development under the 2005 LRDP would have a less than significant impact during construction (including demolition and utility line relocation activities) and long-term operations related to public exposure to hazards from (1) the routine transport, use, or disposal of hazardous materials and (2) a reasonably foreseeable upset and accident condition involving the release of hazardous materials.

As defined in the 2005 LRDP EIR, for purposes of this analysis, hazardous materials include inorganic and organic chemicals and products (chemical reagents and reactions) containing such substances as defined by California laws and regulations, radioactive materials, and biohazardous materials.

Construction-Related Hazards

As discussed in Section 4.7 of the 2005 LRDP EIR, maintenance, renovation, or demolition of existing buildings and extension and/or relocation of utility systems as part of 2005 LRDP implementation could expose construction workers and campus occupants to hazardous materials or wastes that may be present in buildings or in underground utilities (Impact 4.7-2).

Cutting, grinding, or drilling activities have the potential to release friable asbestos fibers and/or lead dust, dependent on the age of the building or utility, unless appropriate precautions are taken. There are no existing buildings or other structures on the project site. The only demolition activity necessary to implement the proposed Project is removal of existing concrete.

There have been localized areas of soil contamination on campus in connection with leaking underground storage tanks (USTs) in the past, all of the sites on campus have been remediated and properly closed. Additionally, although there is no known contamination associated with historic use of agricultural teaching and research fields in West Campus, due to the long-term use of common agricultural practices, including the application of pesticides, fertilizers, and other agricultural chemicals, the potential exists for residues of agricultural chemicals to be present in the soil in this area. Development of new facilities in the West Campus north of Martin Luther King Jr. Boulevard could result in exposure of these residues, if any, to construction workers during construction and campus occupants during operation of the buildings and other facilities. The proposed Project is located in the East Campus and would not expose construction workers or building occupants to these potential hazards.

Additionally, construction activities, including extension or relocation of utilities, could encounter abandoned pipes, discarded building materials, unknown USTs, or previously unidentified contaminated soil, which could result in the exposure of construction workers or campus occupants to hazardous materials. However, the preliminary geotechnical study included advancing 20 soil borings to a depth of approximately 40 feet bgs, with the exception of 3 borings that refused at depths of 16, 20.5, and 39 feet bgs, respectively, and laboratory testing of soil samples for total petroleum hydrocarbons (TPH), VOCs, and Title 22 metals. The testing determined that TPH and VOCs were not detected above the laboratory reporting detection limits in any of the samples analyzed. While some metals were detected above the laboratory reporting detection limits, including arsenic, barium, chromium, copper, lead, nickel, vanadium, and zinc, none of the concentrations are considered to be significant with regard to potential environmental impacts and are likely representative of typical background concentrations for soils in the vicinity of the boring locations. Based on the analytical results, the soils that may be excavated would not create a hazard for construction workers or future site occupants (AFW 2015).

The proposed Project incorporates PP 4.7-1, described above, which requires compliance with federal, State, and local regulations as well as current (or equivalent) campus plans, programs, and practices related to the use, storage, disposal, and transport of hazardous materials and wastes. Therefore, the proposed Project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials or through reasonably foreseeable upset and accident conditions involving the release of hazardous materials during construction; there would be a less than significant impact, consistent with the findings of the 2005 LRDP EIR.

Operational Hazards

Hazardous Materials Use and Transport

As discussed in Section 4.7 of the 2005 LRDP EIR, implementation of the 2005 LRDP would include development of facilities that use hazardous materials in teaching and research activities, such as the proposed Project. Also, with an increase in on-campus facilities, expansion of maintenance and cleaning services would be required, which would increase the use, handling, storage, and disposal of products routinely used in building maintenance, some of which may contain hazardous materials (Impact 4.7-1). This, in turn, would result in an increase in the amount of hazardous materials that are used, stored, transported, and disposed and could increase the potential for an accident or accidental release of hazardous materials or wastes (Impact 4.7-3).

As noted above and further described in Section II, Project Description, the proposed Project involves the development of new wet and dry laboratories and research facilities, including a vivarium. Notably, the wet research laboratories would be designed as Biosafety Level 2[10] to allow for a more diverse and sophisticated scope of research. The laboratories would have various fume hood densities. The proposed vivarium would be a self-contained portion of the building, with its own internal circulation, mechanical system, and secure entry/exit points. It would have a dedicated, secured loading dock and receiving, processing, and waste storage area on Level 1.

The proposed facilities are the same, or similar, to those already present on campus, specifically engineering, life/chemical sciences, and biomedical sciences. These facilities include wet and dry laboratories that use a variety of chemicals, compounds, and other materials that are considered hazardous. Hazardous material types that may be used as part of the proposed Project include, but are not limited to, oxidizers, oxidizing gas, flammable solid, flammable gas, insert gas, unstable reactive, water reactive, toxic/highly toxic, pyrophoric, organic peroxide, combustible liquid, cryogenics, chemicals, and corrosives, as well as commercial cleaning products and landscape maintenance chemicals. The type, form, and concentrations of potentially hazardous materials proposed for use during operation and maintenance at the proposed MRB1 and how these would be transported, used, and stored, would be consistent with existing practices at UCR, as required by PP 4.7-1. The 2005 LRDP EIR anticipated the increased use of these materials with the development of new research facilities. Additionally, a Draft Hazardous Materials Technical Report, estimating anticipated chemical quantities that can be stored and used in the proposed MRB1, would be prepared and submitted to the State Fire Marshal's Office as per Section 414.1.3 of the CBC, upon submission for plan check. A Final Hazardous Materials Technical Report is required prior to occupancy to reflect the requirements of known occupants.

As discussed in the 2005 LRDP EIR, transportation of hazardous materials and wastes along any City or State roadway or rail lines within or near the campus is subject to all relevant Department of Transportation (DOT), California Highway Patrol (CHP), and California Department of Health Services (DHS) hazardous materials and wastes transportation regulations, as applicable. Regular inspections of licensed waste transporters are conducted by a number of agencies to ensure

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[10] Biological safety levels are ranked from one to four and are selected based on the agents or organisms on which the research or work is being conducted. Each level up builds on the previous level, adding constraints and barriers. Biosafety Level 2 would cover work with agents associated with human disease, in other words, pathogenic or infectious organisms posing a moderate hazard.

compliance with requirements that range from the design of vehicles used to transport wastes to the procedures to be followed in case of spills or leaks during transit.

To minimize risks associated with routine hazardous material use on campus, the proposed Project incorporates PP 4.7-1, which requires compliance with federal, State, and local regulations as well as current (or equivalent) campus plans, programs, and practices related to the use, storage, disposal, and transport of hazardous materials and wastes. Also, PP 4.7-3 would be implemented, which requires the campus to inform employees and students of hazardous material minimization strategies applicable to research, maintenance, and instructional activities. Any added requirements associated with hazardous materials and waste resulting from implementation of the proposed Project would be met through modifications of these existing programs and services over time to make sure that they continue to keep the campus in compliance with the numerous hazardous materials laws and regulations at all levels of government.

Other hazardous materials that may be used as part of the proposed Project include commercial cleaning products and landscape maintenance chemicals. Cleaning products would be disposed of either through the wastewater system (i.e., sinks, laundry) or evaporation. Neither chlorine nor standard cleaning products (i.e., degreasers, window cleaning products) are used in quantities that would result in adverse health effects either through direct exposure to the skin or inhalation. Pesticides and herbicides are directly applied to affected areas using methods that follow State and County laws and/or guidelines.

The potential for accidents involving hazardous materials during operation would not increase with the proposed Project. Additionally, operation of the proposed Project would comply with applicable federal, State, and local laws and regulations and with the existing UCR programs, practices, and procedures required by PP 4.7-1 and PP 4.7-3, identified above. Therefore, the proposed Project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials or through reasonably foreseeable upset and accident conditions involving the release of hazardous materials during operation; there would be a less than significant impact, consistent with the findings of the 2005 LRDP EIR.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would have a less than significant impact related to the potential to create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials, or through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.

	Threshold(s)	**Potentially Significant Impact**	**Project Impact Adequately Addressed in LRDP EIR**	**Less Than Significant With Project-Level Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
c)	Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☐	☒

Discussion

The analysis of Impact 4.7-5 in the 2005 LRDP EIR concluded that, with implementation of PP 4.7-1, development under the 2005 LRDP would have a less than significant impact related to hazardous emissions or handling hazardous materials within a ¼ mile of a school. There are six existing schools within a ¼ mile of the UCR campus perimeter:

- Emerson Elementary School, 4660 Ottawa Avenue (Riverside Unified School District [RUSD]);
- Islamic Academy of Riverside Elementary School, 1038 West Linden Street (private);
- Riverside Garden Elementary School, 1085 West Linden Street (private);
- Highland Elementary School, 700 Highlander Drive (RUSD);
- University Heights Middle School, 1155 Massachusetts Avenue (RUSD); and
- Hyatt Elementary School, 4466 Mount Vernon Avenue (RUSD).

Specifically, the 2005 LRDP EIR stated that development under the 2005 LRDP would result in additional academic buildings, laboratories, and other research facilities that would involve the use, storage, transport, and disposal of hazardous materials, which may occur within a ¼ mile of an existing or proposed off-campus school. However, these materials would not exist in quantities significant enough to pose a risk to occupants of the schools or the campus community, as established through the analysis presented for Impacts 4.7-1 through 4.7-4 and Impact 4.7-6 of the 2005 LRDP EIR. Compliance with federal, State, and local regulations as well as current (or equivalent) campus plans, programs, and practices related to the use, storage, disposal, and transport of hazardous materials and wastes, as required by PP 4.7-1, would ensure that risks associated with hazardous emissions or materials to existing or proposed schools located within a ¼ mile of campus would be eliminated or reduced through proper handling techniques, disposal practices, and/or cleanup procedures.

There are no schools located within a ¼ mile of the project area. The nearest school is the Islamic Academy of Riverside Elementary School, which is approximately 0.35 mile west-northwest of the project area at its nearest point. Regardless, the proposed Project incorporates PP 4.7-1, which would ensure the appropriate use and transport of materials used in the laboratory and related research facilities and other common hazardous materials, including cleaning and landscape maintenance products, as discussed under Thresholds a and b, above. Therefore, there would be no impact related to handling hazardous materials within a ¼ mile of a school, consistent with the findings of the 2005 LRDP EIR.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would have no impact related to handling hazardous materials within a ¼ mile of a school.

Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☐	☒

Discussion

The analysis of Impact 4.7-6 in the 2005 LRDP EIR concluded that development under the 2005 LRDP would have a less than significant impact related to construction on a site included on the Cortese List, which is compiled pursuant to Section 65962.5 of the *California Government Code.*

The project site is not included in any database of sites compiled pursuant to Section 65962.5 of the *California Government Code*, referred to as the Cortese List, and collected by the California Environmental Protection Agency (CalEPA 2016a). Specifically, the project site is not identified on (1) the California Department of Toxic Substances Control's (DTSC's) Hazardous Waste and Substances Site List, also called Envirostor; (2) the DTSC's list of hazardous waste facilities where the DTSC has taken or contracted for corrective action because a facility owner/operator has failed to comply with a date for taking corrective action or because DTSC determined that immediate corrective action was necessary to abate an imminent or substantial endangerment; (3) the State Water Resources Control Board's (SWRCB) Leaking Underground Storage Tank (LUST) sites, also called GeoTracker; (4) the SWRCB's list of Cease and Desist Orders (CDO) and Cleanup and Abatement Orders (CAO); and (5) the SWRCB's list of solid waste disposal sites with waste constituents above hazardous waste levels outside the waste management unit (CalEPA 2016a, 2016b, 2016c, 2016d, 2016e, DTSC 2016).

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would not be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and would have no impact.

	Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
e)	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☐	☒
f)	For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☐	☒

Discussion

Based on the IS prepared for the 2005 LRDP EIR, development under the 2005 LRDP was determined to have no impact related to public use airports or private airstrips and was not carried forward for further discussion in the Draft EIR. Specifically, the UCR campus is not located within two miles of a public airport or public use airport; it has not been included in an airport land use plan; and it is not located within the vicinity of a private airstrip.

Therefore, the proposed Project would not result in any impacts from safety hazards associated with any airports or airstrips.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would have no impacts related to public use airports or private airstrips.

	Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
g)	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒	☐

Discussion

The analysis of Impact 4.7-7 in the 2005 LRDP EIR concluded that, with implementation of PS Land Use 3, PS Open Space 1, PS Open Space 4 through 7, PS Transportation 4, PP 4.7-7(a), PP 4.7-7(b), MM 4.7-7(a), and MM 4.7-7(b), development under the 2005 LRDP would have a less than significant impact related to impairing the implementation of or physically interfering with an adopted emergency response plan or emergency evacuation plan.

EH&S is responsible for the campus' Emergency Operations Plan (EOP), which is intended to safeguard people, property, research, and other resources from the consequences of natural and man-made hazards through mitigation, preparedness, response, and recovery. The EOP was last updated in December 2011. Although the City of Riverside does not have a Master Emergency Response Plan prepared specifically for the campus, the campus coordinates with the City during development and update of its EOP to ensure awareness and proper coordination when emergency situations occur on the campus.

Multiple emergency access or evacuation routes are provided on campus to ensure that, in the event one roadway or travel lane is temporarily blocked, another may be utilized. Construction of the proposed Project could result in temporary lane or roadway closures to an on-campus road, Aberdeen Drive, during construction of the drop-off/arrival zone. However, construction and operation of the proposed Project would be designed to ensure that the EOP is maintained and that emergency access on campus is not impeded, including existing fire lanes near the project area. Notably, as shown on Figure 9, Conceptual Circulation Plan, the existing fire access from North Campus Drive (west of the MS&E Building) would be maintained, and the proposed service road on the north side of the proposed MRB1, and the potential extension of this service road to the west to Parking Lot 25, would also serve as a fire access lane. It would have a minimum width able to accommodate two-way access of service vehicles and code-compliant fire truck access, turnaround dimensions, and hose pull lengths.

Also, the proposed Project incorporates PP 4.7-7(a), which requires the maintenance of at least one unobstructed lane in both directions on campus roadways, to the extent feasible; PP 4.7-7(b), which requires consultation between UCR and the UC Police Department (UCPD), Riverside Fire Department, and UCR EH&S to identify alternative travel routes for emergency vehicle access when construction projects result in roadway closures; and MM 4.7-7(b), which requires an annual review of the campus EOP to determine whether an update of the plan is needed to accommodate new on-campus development.

The campus emergency assembly area (EAA) nearest to the project site is north of the eastern portion of the MS&E Building. This area would be used for construction staging; therefore, during construction, the EAA would be relocated to south side of North Campus Drive between the Surge Building and University Lecture Hall. Once the proposed MRB1 is completed, the EAA for the building and the MS&E Building would remain in the same location until a reassessment of current conditions is made. Therefore, the proposed Project would result in a less than significant impact related to emergency response and evacuation on campus with incorporation of PPs 4.7-7(a) and 4.7-7(b) and MM 4.7-7(b), consistent with the findings of the 2005 LRDP EIR.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would have a less than significant impact related to implementation of or physical interference with an adopted emergency response plan or emergency evacuation plan.

Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☐	☒

Discussion

The analysis of Impact 4.7-8 in the 2005 LRDP EIR concluded that, with implementation of PS Open Space 1, MM 4.7-8(a), and MM 4.7-8(b), development under the 2005 LRDP would have a less than significant impact related to wildfires. The 2005 LRDP EIR identified the campus areas that may be subject to wildland fires, which include the following areas located adjacent to the southeast hills and the Botanic Gardens: the area south of South Campus Drive and areas currently occupied by Parking Lots 13 and V10, east of East Campus Drive.

The project area is not located within or near the areas in the southeast portions of campus that are susceptible to wildfires. Also, the project area is surrounded on all sides by development. There would be no impact related to wildland fires.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would have no impact related to wildland fires.

9. Hydrology and Water Quality

The analysis of hydrology and water quality is primarily tiered from the 2005 LRDP EIR; however, current regulatory information and selected portions of the impact analysis, as indicated, are tiered from the 2005 Amendment 2 EIR. Hydrology and water quality issues are addressed in Section 4.8 of both documents. As described previously in Section II, Project Description, of this IS, relevant elements of the proposed Project related to hydrology and water quality include the use of treatment-based low impact development (LID) BMPs. Roof runoff from the new building may be captured and stored in the existing cistern just north of the existing MS&E Building. Overflow from the storm water management areas would enter a piped network that would connect to the existing storm drain system, where available. The existing storm drain system would be rebuilt within the project site. Grading of the site would be designed to allow for overland flow of storm events greater than a 10-year storm without flooding of structures, existing and new.

The following applicable PPs were adopted as part of the 2005 LRDP Amendment and/or 2005 LRDP Amendment 2 EIR; they are incorporated as part of the proposed Project and have been assumed in the analysis presented in this section.

PP 4.8-1	The Campus will continue to comply with all applicable water quality requirements established by the SARWQCB. *(This is identical to Utilities PP 4.15-5).*

PP 4.8-2(a)

To further reduce the campus' impact on domestic water resources, to the extent feasible, UCR will

(i) Install hot water recirculation devices (to reduce water waste)

(ii) Continue to require all new construction to comply with applicable State laws requiring water-efficient plumbing fixtures, including but not limited to the Health and Safety Code and Title 24, California Code of Regulations, Part 5 (California Plumbing Code)

(iii) Retrofit existing plumbing fixtures that do not meet current standards on a phased basis over time

(iv) Install recovery systems for losses attributable to existing and proposed steam and chilled-water systems

(v) Prohibit using water as a means of cleaning impervious surfaces

(vi) Install water-efficient irrigation equipment to maximize water savings for landscaping and retrofit existing systems over time

(This is identical to Utilities PP 4.15-1[b]).

PP 4.8-2(b)

The Campus shall promptly detect and repair leaks in water and irrigation pipes. *(This is identical to Utilities PP 4.15-1[c]).*

PP 4.8-3(c)

The Campus shall continue to implement dust control measures consistent with SCAQMD Rule 403—Fugitive Dust during the construction phases of new project development. The following actions are currently recommended to implement Rule 403 and have been quantified by the SCAQMD as being able to reduce dust generation between 30 and 85 percent depending on the source of the dust generation. The Campus shall implement these measures as necessary to reduce fugitive dust. Individual measures shall be specified in construction documents and require implementation by construction contractor:

(i) Apply water and/or approved nontoxic chemical soil stabilizers according to manufacturer's specification to all inactive construction areas (previously graded areas that have been inactive for 10 or more days)

(ii) Replace ground cover in disturbed areas as quickly as possible

(iii) Enclose, cover, water twice daily, or apply approved chemical soil binders to exposed piles with 5 percent or greater silt content

(iv) Water active grading sites at least twice daily

(v) Suspend all excavating and grading operations when wind speeds (as instantaneous gusts) exceed 25 miles per hour over a 30-minute period

(vi) All trucks hauling dirt, sand, soil, or other loose materials are to be covered or should maintain at least two feet of freeboard (i.e., minimum vertical distance between top of the load and the top of the trailer), in accordance with Section 23114 of the California Vehicle Code

(vii) Sweep streets at the end of the day if visible soil material is carried over to adjacent roads

(viii) Install wheel washers where vehicles enter and exit unpaved roads onto paved roads, or wash off trucks and any equipment leaving the site each trip

(ix) Apply water three times daily or chemical soil stabilizers according to manufacturers' specifications to all unpaved parking or staging areas or unpaved road surfaces

(x) Post and enforce traffic speed limits of 15 miles per hour or less on all unpaved roads

(This is identical to Air Quality PP 4.3-2[b] and Geology PP 4.6-2[a]).

PP 4.8-3(e)

Prior to the time of design approval, the Campus will evaluate each specific project to determine if the project runoff would exceed the capacity of the existing storm drain system. If it is found that the capacity would be exceeded, one or more of the following components of the storm drain system would be implemented to minimize the occurrence of local flooding:

(i) Multi-project stormwater detention basins

(ii) Single-project detention basins

(iii) Surface detention design

(iv) Expansion or modification of the existing storm drain system

(v) Installation of necessary outlet control facilities

Project Impact Analysis

	Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
a)	Violate any water quality standards or waste discharge requirements?	☐	☐	☐	☒	☐
f)	Otherwise substantially degrade water quality?	☐	☐	☐	☒	☐

Discussion

The analysis of Impacts 4.8-1 and 4.8-7 in the 2005 LRDP EIR concluded that, with implementation of PS Conservation 2 and PP 4.8-1, there would be a less than significant impact related to violation of existing water quality standards or waste discharge requirements and degradation of water quality. A detailed discussion of the regulatory setting for water quality is provided in Section 4.8, Hydrology and Water Quality, of the 2005 LRDP Amendment 2 EIR. The Clean Water Act (CWA) establishes a framework for regulating potential water quality impacts through the NPDES program. Phase I of the NPDES Program requires NPDES permits for storm water discharge from a large number of priority sources, including Municipal Separate Storm Sewer System Permits (MS4s) serving populations of over 100,000; several categories of industrial activity; and construction activity that disturbs one acre or more, as discussed further below.

Phase II of the NPDES Program regulates storm water discharges from small MS4s (such as schools and universities). As part of Phase II, the SWRCB adopted a General Permit for the Discharge of Storm Water from Small MS4s (WQ Order No. 2003-0005-DWQ) to provide permit coverage for smaller municipalities, including non-traditional Small MS4s, which include public campuses. The Phase II Small MS4 General Permit covers Phase II Permittees statewide. On February 5, 2013, the Phase II Small MS4 General Permit was adopted and became effective on July 1, 2013 (WQ Order No. 2013-0001-DWQ). UCR was approved for coverage under the Phase II MS4 permit program, and is required to comply with the requirements of the MS4 permit including:

1. Education and outreach program;
2. Public Involvement and participation program;
3. Illicit discharge detection and elimination;
4. Construction site storm water runoff control program;
5. Pollution prevention/good housekeeping for facilities;
6. Post-construction stormwater management program; and
7. Program effectiveness assessment and improvement.

Construction

Implementation of the proposed Project could result in runoff exiting the project area during project construction. Storm water runoff during construction could contain pollutants such as soils and sediments released during grading and excavation activities as well as petroleum-related pollutants due to spills or leaks from heavy equipment and machinery. Other common pollutants that may result from construction activities include solid or liquid chemical spills; concrete and related cutting or curing residues; wastes from paints, stains, sealants, solvents, detergents, glues, acids, lime, plaster, and cleaning agents; and heavy metals from equipment.

The proposed Project would involve construction activities on more than one acre; therefore, the proposed Project incorporates PP 4.8-1, which requires compliance with requirements and water quality standards set forth within the current NPDES Permit regulations. The SWRCB is authorized by the USEPA to oversee the NPDES program through the RWQCBs. The proposed Project would be subject to the requirements of the Statewide General NPDES Permits, including the requirement to obtain coverage under the Statewide General NPDES Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (NPDES No. CAS000002, California Water Resources Control Board Resolution No. 2001-046; Modification of Water Quality Order 99-08-DWQ, SWRCB, NPDES, General Permit for Storm Water Discharges Associated with Construction Activity). This permit was revised on September 2, 2009 (Construction General Permit Order 2009-0009-DWQ) and was subsequently amended by Order No. 2010-0014-DWQ and Order No. 2012-0006-DWQ. Order No. 2012-0006-DWQ became effective on July 17, 2012. Specifically, the proposed Project would require completion and filing of a Permit Registration Document with the SWRCB, which consists of a Notice of Intent (NOI), Risk Assessment, Site Map, Storm Water Pollution Prevention Plan (SWPPP), annual fee, and a signed certification statement. The primary objective of the SWPPP is to identify, construct, implement, and maintain BMPs to reduce or eliminate pollutants in storm water discharges and authorized non-storm water discharges from the construction site during construction.

A SWPPP typically includes both source-control and treatment-control BMPs to reduce water quality impacts. The BMPs that are most often used during construction include watering exposed soils; covering stockpiles of soil; installing sand bags to minimize off-site runoff; creating temporary desilting basins; and timing grading to avoid the rainy season (November through April). In addition, coverage under the Construction Permit would also include implementation of post-construction standards to achieve the pre-project volume and rate of storm water runoff from the project area. The proposed Project would meet these standards through installation of active and passive treatment units, as described below under “Operation”. The proposed Project also incorporates PP 4.8-3(c), which requires implementation of SCAQMD Rule 403 for management of fugitive dust during construction. Finally, the proposed Project would be required to comply with applicable provisions of the California Building Code and 2013 California Green Building Standards (CalGreen) Code, which require the reduction of erosion and sedimentation and therefore further reduce construction-related water quality impacts.

Because the PPs discussed above are included in the proposed Project, short-term, construction-related water quality impacts would be less than significant, which is consistent with the findings of the 2005 LRDP EIR.

Operation

As discussed under the analysis of Impact 4.8-1 in the 2005 LRDP EIR, the UCR campus is not considered a point source for regulatory purposes and is not subject to waste discharge requirements (WDRs). In addition, no hazardous wastes generated on campus are discharged into the sewer or storm drainage systems. Therefore, the proposed Project would not violate waste discharge requirements.

Implementation of the proposed Project would introduce a total of approximately 62,100 sf of impervious surfaces, which would result in increased storm water runoff that would contain contaminants that are typical of urbanized areas. Despite the increase in development on the project site, the constituent pollutants entering the campus and City storm drain systems with proposed Project implementation would not substantively change in character, as the proposed facilities are essentially the same as existing facilities near the site (i.e., the MS&E Building) and research and teaching facilities across campus. In addition, as required by PP 4.8-1, the proposed Project would comply with all applicable water quality requirements, including NPDES Phase I requirements (General Construction Permit), as described above, and Phase II Small MS4 General Permit requirements.

The proposed Project would use treatment-based LID BMPs to meet applicable Phase II Small MS4 General Permit requirements, which may include rain gardens, flow-through planters, green roof, pervious paving, rainwater harvesting, and self-retaining landscapes (refer to Figure 13 in Section II, Project Description). The proposed arroyo garden would provide storm water treatment and infiltration functions. Flow-through planters within the garden terrace can include seating areas, and suspended pavement can be used in the Arroyo Plaza.

Therefore, operation of the proposed Project would not violate any water quality standards or otherwise substantially degrade water quality. There would be a less than significant impact related to surface water quality, consistent with the findings of the 2005 LRDP EIR.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would have a less than significant impact related to (1) violating water quality standards or waste discharge requirements and (2) otherwise substantially degrading water quality.

	Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
b)	Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☒	☐

Discussion

The analysis of Impact 4.8-2 in the 2005 LRDP EIR concluded that, with implementation of PS Conservation 5 and PP 4.8-2(a) through PP 4.8-2(c), there would be a less than significant impact related to substantial depletion of groundwater supplies or interference with groundwater recharge. The Riverside area is located within the Upper Santa Ana Valley Groundwater Basin, and the UCR campus is located near the southeastern edge of the Riverside-Arlington Subbasin (Subbasin). Groundwater in the Subbasin is replenished by infiltration from Santa Ana River flow; underflow past the Rialto-Colton Fault; intermittent underflow from the Chino Groundwater Subbasin; return irrigation flow; and deep percolation of precipitation.

As discussed in Section V.17, Utilities and Service Systems, of this IS, the proposed Project would generate a demand for an additional 0.016 mgd) of potable water. The increased demand for potable water resulting from the proposed Project could indirectly increase demand for groundwater, as the RPU supplies domestic water to the campus. The RPU utilizes groundwater wells for potable water. It should be noted that the proposed Project incorporates PP 4.8-2(a), which requires implementation of water conservation measures to reduce potable water consumption, and PP 4.8-2(b), which requires the campus to promptly detect and repair leaks in water and irrigation pipes. As stated in the 2005 LRDP Amendment 2 EIR, the RPU has indicated that it does not anticipate any problems in providing adequate water supply to remaining and new development on the UCR campus. Therefore, the provision of additional water to the UCR campus, which could include groundwater, would not require water supplies in excess of existing entitlements and resources or result in the need for new or expanded entitlements. As such, implementation of the proposed Project would not substantially deplete groundwater supplies, which is consistent with the findings of the 2005 LRDP EIR.

As identified in the 2005 LRDP EIR, the UCR campus is not a designated groundwater recharge area for the Subbasin, nor does the campus serve as a primary source of groundwater recharge within the Subbasin. The soils underlying the East Campus are designated as Class D, which is the least-permeable soil type. Therefore, the increase in the impervious surface area on the approximately 2.1-acre project site would not substantially interfere with groundwater recharge. Therefore, there would be a less than significant impact related to groundwater recharge, which is consistent with the findings of the 2005 LRDP EIR.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would have a less than significant impact related to substantial depletion of groundwater supplies; it would have a less than significant impact related to interference with groundwater recharge such that there would be a net deficit in aquifer volume or lowering of the local groundwater table.

Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☐	☐	☒	☐
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☐	☐	☐	☒	☐
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☐	☒	☐

Discussion

The analysis of Impacts 4.8-3 through 4.8-5 in the 2005 LRDP EIR concluded that, with implementation of PS Land Use 2 and 3, PS Open Space 1 through 5, PS Conservation 1 through 3, and PP 4.8-3(a) through 4.8-3(e), there would be a less than significant impact related to alteration of existing drainage patterns and storm drain system capacity.

As described in the 2005 LRDP EIR, the UCR campus is located within two sub-watersheds of the Upper Santa Ana River Watershed, generally divided by the I-215/SR-60 freeway. Most of the East Campus drains to the University Arroyo Watershed, while portions of the West Campus drain to the Box Springs Arroyo Watershed. Major storm drainages, including natural drainages, on campus are shown in Figure 4.8-3 of the 2005 LRDP EIR. As shown, there are no natural channels within the project site; the nearest major storm drain extends in an east-west direction through the area currently developed by the MS&E Building. Storm water runoff from the project site currently sheet flows toward the southwest until it intersects the existing fire lane which runs along the northern edge of the existing MS&E Building improvements. A swale directs the runoff along the northern edge of the fire land into two existing catch basins which are connected to a storm drain line which connects to the main campus line in North Campus Drive.

Consistent with existing conditions, storm water runoff from the project site would discharge into the East Campus' existing storm drain system, which consists of culverts, pipelines, engineered channels of the University Arroyo, and the Gage and Glade Detention Basins, and then into the City of Riverside's storm drain system. Storm water flows from the project site would not directly enter a natural channel or drainage, and the proposed Project would not alter the course of a stream or river.

In compliance with PP 4.8-3(d), UCR has evaluated the existing hydrologic conditions of the project site and future conditions with implementation of the proposed Project to determine if the proposed Project runoff would exceed the capacity of the existing storm drain system. The project site is currently undeveloped and assumed to be a completely permeable surface. With implementation of the proposed Project, approximately 70 percent of the project site would be impermeable, compared to 10 percent under existing conditions. As shown in Table 8 the estimated increase in storm water runoff due to a 10-year storm event (consistent with City of

Riverside requirements) from implementation of the proposed Project is 4,400 cubic feet (cf) based on preliminary project information.

TABLE 8
EXISTING AND PROPOSED HYDROLOGY

	Pre-Development	Post-Development
Site Characteristics and Hydrology		
Site Imperviousness	10%	70%
10-Year Storm Runoff Volume (cf)	3,300 cf	7,700 cf
10-Year Storm Runoff Rate (cfs)	1.8 cfs	2.5 cfs
85th Percentile Flow Rate	-	0.6 cfs

cf: cubic feet; cfs: cubic feet per second.
Source: Sherwood Design Engineers 2016.

As discussed above, the proposed Project would include the installation of a minimum of 1,200 cf of detention on site to capture the increase in storm water runoff. Overflow from the storm water management areas would enter a piped network that would connect to the existing 12-, 15- and 24-inch storm drain lines that extend from area north of the MS&E Building, to the fire access road to the west, and then to North Campus Drive. Roof runoff from the new building may be captured and stored in the existing cistern just north of the existing MS&E Building, then gradually released into the existing storm drain lines. Grading of the site would be designed to allow for overland flow of storm events greater than a 10-year storm without flooding of structures, existing and new.

The proposed storm drain system would be located within the project site; the installation of new or expanded storm drains off site would not be required. The proposed infrastructure has been designed to accommodate the estimated storm water flows from the project site and would not result in flooding on or off site.

Additionally, as discussed above, the proposed Project incorporates PP 4.8-1, which require compliance with applicable water quality regulations to manage storm water runoff during construction and operation with appropriate BMPs and to ensure that drainage from the project site does not result in erosion or contribute pollutants to runoff. Therefore, the proposed Project would result in less than significant impacts related to (1) substantial alteration of existing drainage patterns and the potential to cause substantial erosion or flooding on or off site; (2) increased volumes of runoff that could exceed the capacity of the existing UCR or City of Riverside storm drain systems; or (3) substantial additional sources of polluted runoff. This determination is consistent with the findings of the 2005 LRDP EIR.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would have a less than significant impact related to (1) altering the existing drainage pattern in a manner that would result in substantial erosion or siltation on or off site; (2) altering the existing drainage pattern or substantially increasing the rate or amount of surface runoff in a manner that would result in flooding on or off site; and (3) creating or contributing to runoff water that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff.

	Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
g)	Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☐	☒
h)	Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☐	☐	☒
i)	Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☐	☒
j)	Inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☐	☒

Discussion

The analysis of Impacts 4.8-8 through 4.8-11 in the 2005 LRDP EIR concluded that, with implementation of PS Open Space 1 and 2, PP 4.8-3(e), PP 4.8-10, and MMs 4.8-9(a) and 4.8-9(b), there would be no impact related to placing housing within a 100-year flood hazard area and less than significant impacts related to placing structures within a 100-year flood hazard area; flooding as a result of failure of a levee or dam; or inundation by seiche, tsunami, or mudflow.

The 100-year floodplain that traverses East Campus in generally an east-west direction, as shown on Figure 4.8-2, FEMA Map, of the 2005 LRDP EIR, was the subject of a map revision to reflect a Letter of Map Revision (LOMR) effective August 27, 2010. The project area is not within the Federal Emergency Management Agency’s (FEMA’s) 100-year flood hazard area and would not, therefore, result in the placement of housing or other structures in a flood hazard area. Therefore, the proposed Project would not result in any impacts related to the 100-year flood hazard area.

The nearest upstream dam to the campus is the Seven Oaks Dam, located on the Santa Ana River in the upper Santa Ana Canyon about 8 miles northeast of the City of Redlands and approximately 24 miles upstream of the City of Riverside. As discussed in the 2005 LRDP EIR, given the distance between the campus and the Santa Ana River (more than three miles), the potential for flooding to occur on the project area as the result of a catastrophic failure of the Seven Oaks Dam is remote. In addition, the potential for catastrophic failure of the Santa Ana Pipeline (which is operated by the California State Department of Water Resources and is located north and east of the campus along Watkins Drive at the base of the Box Springs Mountains) to affect campus lands is also considered remote. Therefore, implementation of the proposed Project would not expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam, and there would be no impact.

As discussed in the 2005 LRDP EIR, the potential for the campus to be affected by a seiche or tsunami is considered extremely remote given the inland location of the campus and the distance to any large water bodies. In addition, the potential for mudflows to affect campus development is limited to areas immediately adjacent to the southeast hills or within the existing on-campus arroyos. As the project area is not located in or near these areas, the proposed Project would not be susceptible to mudflows. Therefore, implementation of the proposed Project would not result in potential inundation by a seiche, tsunami, or mudflow, and there would be no impact.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would have no impacts related to (1) placement of housing or structures within a 100-year flood hazard area; (2) exposure of people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam; and (3) inundation by seiche, tsunami, or mudflow; and no impact related to placement of structures within a 100-year flood hazard area that would impede or redirect flood flows due to installation of a utility connection across an identified flood hazard area.

10. Land Use and Planning

The analysis of land use and planning is tiered from the 2005 LRDP EIR, and as applicable, the 2005 Amendment 2 EIR, and was addressed in Section 4.9, Land Use and Planning, of both documents. As described previously in Section II, Project Description, of this IS, relevant elements of the proposed Project related to land use and planning include (1) construction of the up to 190,000-gsf, 4- to 5-level proposed MRB1; (2) the introduction of new landscaping and hardscape; and (3) consistency with the 2005 LRDP, as amended. The proposed Project would increase the UCR campus population with the addition of approximately 400 individuals (faculty, graduate students, postdoctoral scholars, and administrative support).

The following applicable PSs and PPs were adopted as part of the 2005 LRDP Amendment and/or 2005 LRDP Amendment 2 EIR and are incorporated as part of the proposed Project and assumed in the analysis presented in this section.

PS Land Use 1	Achieve academic core densities of 1.0 FAR or higher on the East Campus and 1.6 to 1.9 FAR on the West Campus in order to achieve a balance of academic land area versus other required uses.
PS Land Use 2	In order to achieve densities of 1.0 FAR, infill sites in the partially developed East Campus academic core, and expand to the West Campus academic zone immediately adjacent to the I-215/SR-60 freeway, maintaining a compact and contiguous academic core.
PS Open Space 3	In Naturalistic Open Space areas, where arroyos and other natural features exist, preserve wherever possible, existing landforms, native plant materials, and trees. Where appropriate, restore habitat value.
PP 4.9-1(a)	The Campus shall provide design professionals with the 2007 Campus Design Guidelines and instructions to implement the guidelines, including those sections related to use of consistent scale and massing, compatible architectural style, complementary color palette, preservation of existing site features, and appropriate site

and exterior lighting design. *(This is identical to Aesthetics PP 4.1-1).*

PP 4.9-1(b) The Campus shall continue to provide design professionals with the 2007 Campus Design Guidelines and instructions to develop project-specific landscape plans that are consistent with the Guidelines with respect to the selection of plants, retention of existing trees, and use of water conserving plants, where feasible. *(This is identical to Aesthetics PP 4.1-2(a)).*

PP 4.9-1(c) The Campus shall continue to relocate, where feasible, mature “specimen” trees that would be removed as a result of construction activities on the campus. *(This is identical to Aesthetics PP 4.1-2(b)).*

Project Impact Analysis

	Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
a)	Physically divide an established community?	☐	☐	☐	☐	☒

Discussion

Based on the IS prepared for the 2005 LRDP Amendment 2 EIR, it was concluded that development of the campus under the 2005 LRDP, as amended, would have no impact related to division of an established community. This issue was not carried forward for further analysis in the EIR. The 2005 LRDP, as amended, guides development within the campus boundaries, such as the proposed Project, and does not therefore affect the established community outside the UCR campus. Consistent with the findings of the 2005 LRDP Amendment 2 EIR, no impact would occur.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would have no impact related to physically dividing an established community.

Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the LRDP, general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒	☐

Discussion

The analysis of Impact 4.9-2 in the 2005 LRDP Amendment 2 EIR concluded that development of the UCR campus under the 2005 LRDP, as amended, which incorporates relevant PSs, PPs, and MMs would not conflict with applicable local or regional land use plans, policies, or regulations.

Following is an evaluation of the proposed Project's consistency with the local and regional plans, policies, or regulations.

UCR 2005 LRDP, as Amended

The "Vision for UC Riverside" section of the 2005 LRDP, as amended, identifies various goals for the UCR campus, including to "accommodate planned growth for UCR to 25,000 students while retaining flexibility for unanticipated additional needs in the future"; "recognize teaching and research change, and encourage interdisciplinary endeavors by identifying a flexible academic zone rather than individual college precincts"; and "emphasize strong connections and ease of access within campus and with the surrounding community". The proposed MRB1 would support these goals by (1) providing a portion of the research space necessary to hire new faculty who would help reduce student-to-faculty ratios; (2) facilitating new strategic science initiatives; (3) increasing flexible research space by incorporating contemporary open bay configurations that can subsequently be modified in order to meet the changing needs of scientific research; and (4) designing the proposed Project to ensure convenient access through both the project site and among surrounding land uses.

Following is a discussion of the proposed Project's consistency with the land use designation, square footage and population assumptions, and Planning Strategies of the 2005 LRDP, as amended.

LRDP Land Use Designation. The Land Use Plan included in the 2005 LRDP, as amended, (shown in Figure 3.0-6 of the 2005 LRDP Amendment 2 EIR) identifies 12 general categories of land use for development within the UCR campus boundaries. The project site is designated for "Academic". The proposed Project, which includes construction of a new multidisciplinary research building, would be consistent with this land use designation.

LRDP Square Footage*.* The 2005 LRDP, as amended, projected total building space on campus to be approximately 14.9 million gsf by 2020/2021, including approximately 3.1 million gsf allocated to the SOM. As identified in Table 3.0-5 of the 2005 LRDP Amendment 2 EIR, of this amount, there is a total of 5.5 million gsf allocated to Academic Programs. The existing on campus development is approximately 7.0 million gsf; therefore, there is approximately 7.9 million gsf of development allocation remaining on campus. The proposed Project involves up to 190,000 gsf of development, which is well within the remaining building allocation.

LRDP Population. The 2005 LRDP, as amended, projected a total enrollment of 25,000 students and 16,393 associated faculty, staff, and visitors, for a total campus population of 41,393 by the academic year 2020–2021. Of this amount, 5,853 individuals (non-students) would be associated with the SOM; the projected population for the rest of the campus is 35,540 individuals. Excluding the category of "other individuals",[11] there are projected to be 32,916 students, faculty and academic staff, and non-academic staff. For comparison, the current student population on campus based on the Fall 2015 enrollment is 21,539 students (including 18,608 undergraduate students and 2,931 graduate students). Additionally, there are approximately 8,306 faculty, staff and staff personnel, for a total population of 29,845 individuals (not including other individuals). Therefore, the remaining projected growth on campus (not including SOM and other individuals) is 3,071 individuals.

It is expected that the proposed MRB1 would provide new research space on campus to accommodate a population of approximately 400 individuals. For purposes of analysis in this IS, it is conservatively assumed that all 400 positions would be new to the campus. This may include, but not be limited to, approximately 50 to 56 Principal Investigators (PI) with approximately 6 team members each (consisting of a combination of graduate students, post-doctoral researchers, and research assistants) and approximately 50 administrative staff. Therefore, the estimated new campus population resulting from the proposed Project would include approximately 150 non-academic staff (50 PIs and 100 post-doctoral researchers), approximately 200 graduate students, and approximately 50 administrative staff. This increase in population is within the remaining projected growth on campus, as identified in the 2005 LRDP, as amended.

LRDP Planning Strategies. The 2005 LRDP, as amended, includes Planning Strategies for the following issues to guide expansion and development of the UCR campus: land use, circulation and parking, open space and landscape, and campus and community. These planning strategies are required to be implemented with each development project on campus and have been specifically identified in the 2005 LRDP EIR and 2005 LRDP Amendment 2 EIR, along with general development strategies. Key Planning Strategies that have been incorporated into the project are identified for each topical issue in this IS. Notably, as identified in the "Land Use" section of the 2005 LRDP, as amended, in order to achieve campus goals and to accommodate the program anticipated to be associated with an enrollment of 25,000, expansion of the campus and its facilities will be guided by a number of Land Use Planning Strategies. Most relevant to the proposed Project are the following two strategies that are incorporated into the proposed Project:

- Achieve academic core densities of 1.0 Floor Area Ratio (FAR) or higher on the East Campus and 1.6 to 1.9 FAR on the West Campus in order to achieve a balance of academic land area versus other required uses within the existing land base; and
- In order to achieve a compact and contiguous academic core and desired development densities, strategies will include infill sites in the developed East Campus academic core as well as expansion to the West Campus academic zone immediately adjacent to the I-215/SR-60 freeway.

  The proposed Project involves construction of the proposed up to 190,000 gsf MRB1, which would be an infill development at the northern end of the academic core. The

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[11] Includes campus visitors, patients, childcare students, student family members (living on campus), daytime extension students, ASUCR, KUCR & Highlander nonstudent staff, vendors, and construction workers.

proposed building would contribute to a 1.0 FAR or higher density on the East Campus.

Circulation and Parking Planning Strategies relevant to the proposed Project include:

- Develop an integrated multi-modal transportation plan to encourage walking, biking, and transit use.
- Provide bicycle parking at convenient locations.

As shown on Figure 8, Conceptual Circulation Plan, in Section II, Project Description, of this IS, the proposed Project has been organized to facilitate campus pedestrian circulation. The proposed pedestrian walkway, Arroyo Plaza, and Aberdeen Drive drop-off zone and stairway intersect and provide new east-west connectivity within the northernmost portion of the academic core, consistent with the goals of the 2005 LRDP.

To accommodate pedestrian and bicycle circulation within the site and to the surrounding campus, the proposed MRB1 is situated to define a new east-west pedestrian walkway along the north edge of the site, connecting Aberdeen Drive to Canyon Crest Drive, both of which are vital north-south campus connectors. This walkway is envisioned to be an important east-west pedestrian circulation route providing access to the existing residence halls to the northeast and nearby parking lots.

A second east-west connector is formed through the area created between the proposed MRB1 and the existing MS&E Building to the south, which is designated as Natural Open Space in the 2005 LRDP, as amended. Additionally, bike storage would be provided for at least five percent of building users.

The Open Space and Landscape Planning Strategy relevant to the proposed Project is as follows:

- In Naturalistic Open Space areas, where arroyos and other natural features exist, preserve, wherever possible, existing landforms, native plant materials, and trees. Where appropriate, restore habitat value.

The area between the proposed MRB1 and existing MS&E Building is an expansion of the existing arroyo landscape that was created as part of the MS&E Building and includes the area identified as Naturalistic Open Space and in the 2005 LRDP, as amended, and the Campus Design Guidelines. This area of the project site is currently undeveloped and disturbed by previous uses at the site (e.g., Athletic Fields and construction staging). The proposed open space area is divided into three parallel areas: plaza walk, garden terrace, and “arroyo”. The “arroyo” would be fully landscaped and is planned to be a more naturalized extension of the garden terrace and reflect the historic arroyo. The arroyo garden would function as a bioretention area.

UCR Campus Design Guidelines

The UCR Campus Design Guidelines include Site and Architectural Guidelines to establish the basic premises and clear intent for creative design decisions that are made for projects on campus; the Campus Design Guidelines are not intended to be prescriptive. The Site Guidelines address planting, paving, site lighting, furnishings, grading and rainwater management, circulation systems, and campus-wide signage. The Architectural Guidelines address outdoor circulation; building orientation and entrances; relationship of interior to exterior at ground floor; building massing and articulation; building materials and color palette; and building response to climate.

A description of the proposed Project, which addresses each of these issues, is provided in Section II, Project Description, of this IS.

The proposed Project incorporates PP 4.9-1(a), which ensures that the Campus Design Guidelines and instructions to implement the Guidelines are taken into consideration, including those sections related to use of consistent scale and massing, compatible architectural style, complementary color palette, preservation of existing site features, and appropriate site and exterior lighting design. As described in Section II, Project Description, and further analyzed in Section V.1, Aesthetics, of this IS, the proposed MRB1 would be 4- to 5-levels and up to 190,000 gsf and would be located immediately north of the existing MS&E Building and immediately east of an undeveloped site that could accommodate a potential future new research building. The placement and orientation of the buildings accommodates east-west corridors, including the designated Naturalistic Open Space area between the buildings, which would facilitate pedestrian and bicycle movement and would assist in connecting existing open space areas to the east and west, as further discussed below.

The proposed MRB1 has been conceptually designed to include building massing and facade composition that acknowledges “base, middle, and top” (exclusive of any mechanical screen); to provide expression of a base, inset from the body of the building to create a south-facing covered arcade facing onto the arroyo; to introduce horizontal bands that approximately correspond to the floor levels or window sill lines; and to provide flat roofs and parapets set back from the main building edge visually to reduce the overall height of the building. Building fenestration may include, but not be limited to, solar orientation and shading devices to maximize daylight while controlling heat gain and glare; sun shading; recessed (“punched”) windows in brick walls to give the appearance of weight; and indentations of the building mass for covered terraces.

The final selection of building materials and color palette would adhere to the UCR Campus Design Guidelines to be visually harmonious with the UCR campus as well as the immediately surrounding buildings. Building materials may include exposed architectural concrete; brick (using the “UCR blend”); clear anodized or pre-finished aluminum (curtain wall and infill panels); pre-finished aluminum or unfinished zinc (rain-screen cladding systems, equipment screens); exposed architectural steel (sunshades, railings, projections, canopies); and insulated, low-e glass selected for high transparency and low reflectivity.

Additionally, the proposed Project incorporates PP 4.9-1(b), which ensures that the design team has developed a project-specific landscape plan consistent with the Campus Design Guidelines with respect to the selection of plants, retention of existing trees, and use of water conserving plants, where feasible. The conceptual open space and landscape plan is depicted on Figure 9. There are three main planting typologies proposed for the proposed MRB1 landscape design, each of which provides a specific function that not only helps reinforce the overall design of the site but helps with the ecology and sustainability. These typologies include foundation landscape, garden terrace, and arroyo. An existing “native” arroyo exists to the east of Aberdeen Drive and resumes south of Canyon Crest Drive and is an important landscape feature on the UCR campus. The open space linkage proposed as part of the proposed Project is a direct response to the historic arroyo.

The proposed MRB1 would be aligned along the north and east edges of the site, wrapped by a linear foundation planting zone. The foundation landscape is envisioned as a consistent landscape edge along the pedestrian walk that wraps the north and east ends of the proposed MRB1.

The types of trees, shrubs, and ground covers to be planted as part of the proposed Project would be selected from UCR’s approved plant materials list as presented in the Campus Design

Guidelines and supplemented by additional varieties suggested by the landscape architect and approved by UCR. Selected species would be appropriate for the region's soils, climate, and the criteria of the specific intended placement.

Incorporation of PPs 4.9-1(a) and 4.9-1(b) into the proposed Project ensures that the intent of the Campus Design Guidelines related to site and architectural guidelines have been met.

Regional and Local Plans

With respect to regional plans, the 2005 LRDP Amendment 2 EIR included an assessment of consistency with relevant Southern California Association of Governments' (SCAG's) programs, the Santa Ana RWQCB Santa Ana Basin Plan, the Western Riverside County MSHCP, and the SCAQMD Air Quality Management Plan. SCAG is the Metropolitan Planning Organization (MPO) for six counties: Riverside, Los Angeles, Orange, San Bernardino, Ventura, and Imperial. As the designated MPO, the federal government mandates that SCAG research and draw up plans for transportation, growth management, hazardous waste management, and air quality. Notably, SCAG reviews EIRs for projects of regional significance for consistency with regional plans (SCAG 2016a).

The proposed Project would not be considered regionally significant by SCAG based on the established criteria in Section 15206 of the State CEQA Guidelines, which is applied by SCAG to determine regional significance (SCAG 2016b). However, the 2005 LRDP Amendment 2 EIR was considered regionally significant and regional plans for which a consistency analysis is provided in the 2005 LRDP EIR include the following SCAG documents: the *2008 Regional Comprehensive Plan and Guide* (RCPG), the *Regional Transportation Plan* (RTP), and the *Compass Growth Vision Report* (CGV).

SCAG prepared the 2012 RTP/SCS to supersede the 2008 RTP; the 2012 RTP/SCS was adopted in April 2012. In addition to meeting federal and State transportation planning requirements, the 2012 RTP/SCS includes a chapter that complies with California's Senate Bill (SB) 375 mandate for a regional Sustainable Communities Strategy. Per SB 375, the RTP/SCS must coordinate transportation and land use planning in a manner that results in GHG emissions reductions sufficient to meet 2020 and 2035 targets set by the California Air Resources Board (CARB). The goals and policies of the 2012 RTP/SCS focus on transportation and land use planning that include building compact infill projects; locating residents closer to where they work and play; designing walkable environments; and designing communities so there is access to high-quality transit service (SCAG 2012). The SCAG 2016–2040 RTP/SCS, which updates the 2012 RTP/SCS, is being considered for approval on April 7, 2016. The 2016 RTP/SCS highlights regional changes that have affected the development of the Plan since the 2012 RTP/SCS, including the region's fluid and dynamic demographic and housing market; the passage of MAP-21; state legislation on transportation funding; the rapid advancement of new technologies such as real-time traveler information, on-demand shared mobility services enabled by smartphone applications, or ride-sourcing, car share, and bike share; and the state's continued emphasis on reducing GHG emissions. The 2016 RTP/SCS was also developed with recognition of the progress the region has made since preparation of the 2012 RTP/SCS. The goals of the 2016 RTP/SCS have remained unchanged since the 2012 RTP/SCS (SCAG 2016c).

Because the 2005 LRDP, as amended, was determined to be consistent with all applicable SCAG documents (the RCPG, the RTP, and the CGV) and the proposed Project would be consistent with the 2005 LRDP, as amended, the proposed Project would also be consistent with applicable SCAG land use planning documents.

As addressed in Section V.9, Hydrology and Water Quality, of this IS, the proposed Project is required to comply with all applicable water quality requirements established by the Santa Ana RWQCB and SWRCB. Therefore, consistent with the findings of the 2005 LRDP Amendment 2 EIR, the proposed Project would be consistent with the Basin Plan. As discussed in Section V.3, Air Quality, the proposed Project would also be consistent with the AQMP. Refer to the analysis for Threshold 10d below regarding the MSHCP.

UCR is part of the UC, a constitutionally created entity of the State of California. As a constitutional entity, the UC is not subject to municipal regulations, such as the County and City General Plans. Nevertheless, UCR has considered local plans and policies for the communities surrounding the campus. UCR participated in the development of the current City of Riverside General Plan and the University Neighborhood Plan in an effort to coordinate planning efforts between the City of Riverside and the campus. The City of Riverside General Plan, which includes the campus, has identified UCR as a public facility/institutional land use. The proposed Project is consistent with this land use designation, consistent with the findings of the 2005 LRDP Amendment 2 EIR.

In summary, consistent with the finding under Impact 4.9-2 of the 2005 LRDP Amendment 2 EIR, there would be a less than significant impact related to conflicts with an applicable land use plan, policy, or regulation of an agency with jurisdiction over the proposed Project adopted for the purpose of avoiding or mitigating an environmental effect.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would result in a less than significant impact related to conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the proposed Project.

	Threshold(s)	**Potentially Significant Impact**	**Project Impact Adequately Addressed in LRDP EIR**	**Less Than Significant With Project-Level Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
c)	Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☐	☒

Discussion

As addressed in Section V.4, Biological Resources, although sections of Cells 634 and 719 of the MSHCP include portions of the campus, the plan does not identify any portion of UCR for conservation. Therefore, the development under the 2005 LRDP, including the proposed Project, would not conflict with the MSHCP.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would have no impact to any applicable HCP or NCCP.

Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
d) Create other land use impacts?	☐	☐	☐	☒	☐

Discussion

The analysis of Impact 4.9-1 in the 2005 LRDP EIR concluded that, with implementation of PS Land Use 1 through 7, PS Open Space 1 through 7, PS Campus and Community 1 through 3, PS Transportation 1 through 6, PS Conservation 1 through 4, PS Development Strategy 1 through 3, and PP 4.9-1(a) through (c), there would be a less than significant impact related to land use incompatibilities.

The 2005 LRDP EIR addressed the development of new academic facilities on the East Campus between North Campus Drive and the south end of the SRC complex, with a segment of Naturalistic Open Space traversing the Academic land use areas, among the anticipated facilities to be developed within the 2005 LRDP planning horizon. The existing MS&E Building occupies one of the two Academic-designated areas separated by designated open space area.

While the proposed MRB1 was not specifically addressed, the analysis of the academic core's expansion on the East Campus to the area currently occupied by athletic fields did conclude that academic facilities on the project site would be consistent with adjacent land uses within the academic core with implementation of the identified PSs and PPs. The proposed Project would be part of the planned expansion of the academic core onto the existing athletic fields, consistent with the conclusion of the 2005 LRDP EIR. Additionally, the proposed Project is consistent with PSs Land Use 1 and Land Use 2, to achieve an East Campus academic core density of 1.0 FAR or more, in part through infill development.

The proposed location of the MRB1 minimizes site disturbance and would maintain existing landscaping, including mature trees, to the extent feasible. The final design of the building is required to be consistent with the Campus Design Guidelines (PPs 4.9-1[a] through [c]). As discussed above and further under the analysis of Aesthetics in Section V.1 of this IS, the proposed Project has been designed to complement the existing MS&E Building and fully integrate into the project area with regard to scale, massing, and other aspects of building design as well as enhancing pedestrian and bicycle circulation within and through the project site. The proposed Project would be compatible with existing on-campus development, including the Student Recreation Center and athletic uses to the north and west and the MS&E Building to the south.

Therefore, there would be a less than significant impact related to development of land uses that are incompatible with existing adjacent land uses or with planned uses with incorporation of the identified PSs and PPs into the proposed Project, consistent with the findings of the 2005 LRDP EIR.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would have a less than significant impact related to other land use impacts.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would have a less than significant impact related to other land use impacts.

11. Mineral Resources

Mineral resource issues were addressed in the Initial Study prepared for the 2005 LRDP EIR. There are no relevant elements of the proposed Project related to Mineral Resources. Additionally, there are no relevant PSs, PPs, or MMs adopted as part of the 2005 LRDP EIR.

Project Impact Analysis

	Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
a)	Would the project result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☐	☒
b)	Would the project result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	☐	☐	☐	☐	☒

Discussion

As identified in the Initial Study for the 2005 LRDP EIR, there are no mineral resources of regional or Statewide importance known to exist on the UC Riverside campus. Also, no mineral resource recovery activities occur on the UCR campus, and no mineral resource recovery sites are delineated in the General Plans for the County and City of Riverside, or the University Community Plan, which covers the area around the campus. Therefore, consistent with the findings of the 2005 LRDP EIR, implementation of the proposed Project would not result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state, and no impact would occur.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would have no impact related to (1) the availability of a known mineral resource that would be of value to the region and the residents of the State or (2) the availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan.

12. Noise

The analysis of noise is tiered from the UCR 2005 LRDP EIR (as it relates to development in the East Campus) as supplemented and updated by the UCR 2005 LRDP Amendment 2 EIR (as it relates to increased noise from traffic generated by the 2005 LRDP Amendment 2); it was addressed in Section 4.10, Noise, of those documents. As described previously in Section II, Project Description, of this IS, relevant elements of the proposed Project related to noise and vibration include the use of diesel-powered and other heavy equipment during construction. The proposed Project would include construction activities on the MRB1 site on the eastern portion of campus, which would involve demolition, grading, and construction, and other construction-related activities. With respect to long-term operations, relevant elements of the proposed Project include use of mechanical equipment (such as air conditioning units) and an increase in the UCR campus population with the addition of up to 400 individuals. There would be an associated increase in traffic.

The following applicable PS and PPs were adopted as part of the 2005 LRDP Amendment and/or 2005 LRDP Amendment 2 EIR and are incorporated as part of the proposed Project and assumed in the analysis presented in this section.

PP 4.10-1(a) UCR will incorporate the following siting design measures to reduce long-term noise impacts:

(i) Truck access, parking area design, and air conditioning/refrigeration units will be designed and evaluated when planning specific individual new facilities to minimize the potential for noise impacts to adjacent developments.

(ii) Building setbacks, building design and orientation will be used to reduce intrusive noise at sensitive student residential and educational building locations near main campus access routes, such as Blaine Street, Canyon Crest Drive, University Avenue, and Martin Luther King Jr. Boulevard. Noise walls may be advisable to screen existing and proposed facilities located near the I-215/SR-60 freeway.

(iii) Adequate acoustic insulation would be added to residence halls to ensure that the interior L_{dn} would not exceed 45 dBA during the daytime and 40 dBA during the nighttime (10 PM to 7 AM) in rooms facing major streets.

(iv) Potential noise impacts would be evaluated as part of the design review for all projects. If determined to be significant, mitigation measures would be identified and alternatives suggested. At a minimum, campus residence halls and student housing design would comply with Title 24, Part 2 of the California Administrative Code.

PP 4.10-2 The UCR campus shall limit the hours of exterior construction activities from 7:00 AM to 9:00 PM Monday through Friday and 8:00 AM to 6:00 PM on Saturday when necessary. Construction traffic shall follow transportation

	routes prescribed for all construction traffic to minimize the impact of this traffic (including noise impacts) on the surrounding community.
PP 4.10-6	The Campus shall continue to shield all new stationary sources of noise that would be located in close proximity to noise-sensitive buildings and uses.
PP 4.10-7(a)	To the extent feasible, construction activities shall be limited to 7:00 AM to 9:00 PM Monday through Friday, 8:00 AM to 6:00 PM on Saturday, and no construction on Sunday and national holidays, as appropriate, in order to minimize disruption to area residences surrounding the campus and to on campus uses that are sensitive to noise.
PP 4.10-7(b)	The Campus shall continue to require by contract specifications that construction equipment be required to be muffled or otherwise shielded. Contracts shall specify that engine-driven equipment be fitted with appropriate noise mufflers.
PP 4.10-7(c)	The Campus shall continue to require that stationary construction equipment material and vehicle staging be placed to direct noise away from sensitive receptors.
PP 4.10-7(d)	The Campus shall continue to conduct regular meetings, as needed, with on campus constituents to provide advance notice of construction activities in order to coordinate these activities with the academic calendar, scheduled events, and other situations, as needed.
PP 4.10-8	The Campus shall continue to conduct meetings, as needed, with off-campus 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.
MM 4.10-2	The campus shall notify all academic and residential facilities within 300 feet of approved construction sites of the planned schedule of vibration causing activities so that the occupants and/or researchers can take necessary precautionary measures to avoid negative effects to their activities and/or research.

As identified in Section V.3, Air Quality, of this IS, the proposed Project also incorporates PS Campus and Community 4 (promote campus-wide non-vehicular transportation), PS Transportation 3 (campus-wide bicycle network to connect to off campus bicycle routes), PS Transportation 4 (provide bicycle parking), and PP 4.3-1 (campus-wide implementation of a transportation demand management program), which all serve to reduce vehicular trips.

Noise-Sensitive Receptors

Noise-sensitive land uses include those uses where noise exposure could result in health-related risks to individuals and places where quiet is an essential element of the intended purpose. Residential dwellings are of primary concern; land uses such as parks, historic sites, cemeteries, and some recreation areas are considered sensitive to increases in exterior noise levels. Hospitals, schools, places of worship, hotels, libraries, and other places where low interior noise levels are essential are noise-sensitive land uses.

The nearest noise-sensitive land uses to the project area are the MS&E Building, which is adjacent to the south; and the Aberdeen-Inverness Residence Hall, which is across Aberdeen Drive approximately 350 feet to the northeast.

Ambient daytime noise levels measured for the Student Recreation Center (SRC) Expansion project are referenced in this analysis because the measurement locations are in proximity to the project site. The measurements were measured on July 26, 2011 at four locations in the study area in order to identify representative ambient noise levels. During the previous noise survey, average daytime noise levels within the Project study area ranged from 55 to 62 A-weighted decibels (dBA) on the Sound Energy Equivalent Noise Level (L_{eq}). The predominant source of noise in the study area was traffic on Linden Street; background traffic from SR-60 could be heard at the southeastern portions of the project area. The highest noise level was recorded adjacent to Linden Street, which resulted in 62 dBA L_{eq} at 35 feet from the street curb. A doubling of traffic volumes is required to increase noise levels by 3 dBA. Campus traffic volumes on Linden Street, and Aberdeen Drive adjacent to the SRC and the project site, have not substantially increased since 2011; therefore, the ambient traffic noise data from 2011 is considered representative of current conditions (Stewart 2016).

Project Impact Analysis

Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Exposure of persons to or generation of noise levels in excess of standards established in any applicable plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☐	☐	☒

Discussion

The University of California is not subject to municipal regulations, such as the County and City General Plans or noise ordinances. As identified in the UCR 2005 LRDP EIR, federal agencies that have developed noise standards include the Federal Highway Administration (FHWA), the Department of Housing and Urban Development (HUD), the Federal Interagency Committee on Urban Noise (FICUN), and the Federal Aviation Administration (FAA). None of these federal noise standards are applicable to the UCR campus. Title 24 of the California Code of Regulations codifies Sound Transmission Control requirements, which establishes uniform minimum noise insulation performance standards for new hotels, motels, dormitories, apartment houses, and dwellings other than detached single-family dwellings. The proposed MRB1 is an academic building (non-residential) and the State Title 24 regulations are not applicable to the proposed Project. In addition, there are no University noise standards applicable to the proposed Project.

Therefore, there would be no impact because there are no federal, State, or University noise regulations applicable to the proposed Project.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would have no impact related to exposure of persons to or generation of noise levels in excess of standards established in any applicable plan or noise ordinance, or applicable standards of other agencies.

	Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
b)	Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☒	☐	☐	☐

Discussion

The analysis of Impact 4.10-3 in the 2005 LRDP EIR and 2005 LRDP Amendment 2 EIR concluded that development on campus would result in less than significant short-term construction-related impacts related to off-campus vibration during construction including from heavy trucks.

The analysis of Impacts 4.10-2 concluded that development under the 2005 LRDP, as amended, would result in significant and unavoidable impacts related to on-campus excessive groundborne vibration or groundborne noise levels during construction.

Operational Vibration

As described in the 2005 LRDP EIR, the existing campus facilities are not a major source of vibration. The proposed MRB1 would accommodate activities similar to existing academic buildings on campus and operation of the building would not result in vibration levels that could expose persons on- or off-campus to excessive groundborne vibration or noise levels. This impact would be less than significant, which is consistent with findings of the 2005 LRDP EIR, as amended.

Short-Term (Construction) Vibration

Construction of the proposed Project is anticipated to begin in August 2016 with completion by the end of December 2018. Construction activities would include grading for a period of two months, utility and foundation trenching for 2 months, and building construction for 29 months. The construction phasing would have some overlap between phases and building construction would last approximately a total of 29 months.

On-Campus

Construction activities would include excavation and grading, concrete demolition, and asphalt removal. The proposed Project would not include pile driving or blasting, which are the construction activities that generate the highest vibration levels. Heavy trucks would transport materials to and from the project area. During the demolition and grading phases, the operation of heavy or large construction equipment such as bulldozers, excavators, and loaded trucks have the potential to generate perceptible vibration levels at nearby buildings.

As described under the analysis of Impact 4.10-2 in the 2005 LRDP EIR and 2005 LRDP Amendment 2 EIR, where construction occurs more than 50 feet from campus classroom buildings, office buildings, and student housing buildings, or where construction occurs more than 300 feet from research buildings with vibration-sensitive equipment, the impact would be less than significant. It was also identified that construction on campus could occur as close as 25 feet to existing buildings on campus, including buildings sensitive to vibration. Based on the information presented in Table 4.10-4, Vibration Levels for Construction Equipment, of the LRDP EIRs, vibration levels could reach up to 87 VdB at the buildings located within 25 feet of construction. This would exceed the thresholds for each building type.

Construction for the proposed MRB1 would occur more than 50 feet from the Aberdeen-Inverness residential buildings and all other campus buildings that do not contain vibration-sensitive equipment. However, construction would occur adjacent to the MS&E Building, which does contain vibration-sensitive equipment. Therefore, the vibration impact to the MS&E Building would be potentially significant, even with limits on hours of construction where necessary, as described in PP 4.10-2. MM 4.10-2 from the 2005 LRDP Amendment 2 EIR is incorporated into the project, and requires notification of affected persons about the planned construction in order to minimize the impact. MM 4.10-2 represents the best management practice to minimize the impact of groundborne vibration near on-campus facilities during construction. It would not, however, ensure that groundborne vibration does not exceed the identified thresholds of significance for sensitive buildings located in close proximity to the construction sites. Therefore, this impact would be significant and unavoidable, consistent with the conclusion of the 2005 LRDP EIR and 2005 LRDP Amendment 2 EIR.

Off-Campus

Potential vibration impacts from construction activities to off-campus uses are addressed under the analysis of Impact 4.10-3 in 2005 LRDP EIR. The nearest off-campus residential uses to the project area are the Canyon Court Condominiums approximately 0.3 mile to the northwest along Linden Street. Based on Table 4.10-8 of the 2005 LRDP EIR, vibration levels at the nearest off campus residences from construction activities at the project area would be less than 75 decibels from vibration (VdB), which is the highest vibration level at 100 feet. No significant construction-related vibration impact to off campus uses would result, which is consistent with the findings of the 2005 LRDP EIR.

Heavy trucks would transport materials to and from the campus when construction activities occur. The proposed Project would require minimal demolition. It is estimated 4,000 cubic yards of soil are anticipated to be exported during site grading. Assuming each truck would carry 16 cy of materials, grading activities would generate a total of approximately 250 round trips (500 one-way trips). Grading would occur over a two-month period; there would be an average of approximately 6 round trips per day. Potential construction traffic routes have been identified to efficiently move construction vehicles. The proposed/preferred access would involve construction of a new all-weather roadway extending from University Avenue between Canyon Crest Drive and Parking Lot 19 (refer to Figure 14, Construction Areas). Construction vehicles would traverse this roadway before reaching the vehicle access road off of North Campus Drive that leads to the project site. As an alternative option, a construction access road extending from the south end of Parking Lot 25 would be installed.

Assuming construction access from University Avenue, construction vehicles, including haul trucks would take University Avenue to I-215 from the project site. Under the alternative option with construction access from Parking Lot 25, construction vehicles would turn left on Linden Street, right on Iowa Avenue, left on West Blaine Street to I-215. No construction access via Aberdeen Drive or North Campus Drive would be permitted. These trucks typically generate groundborne vibration velocity levels of around 63 VdB at 50 feet, and could reach 72 VdB where trucks pass over bumps in the road; these vibration levels would be less than the Federal Railway Administration's 80 VdB vibration impact threshold for residences referenced in Table 4.10-8 of the 2005 LRDP Amendment 2 EIR. Therefore, construction of the proposed Project would not expose occupants of on- or off-campus buildings to excessive groundborne vibration levels, and this impact would be less than significant, which is consistent with the finding in the 2005 LRDP EIR and 2005 LRDP Amendment 2 EIR.

Additional Project-Level Mitigation Measures

No additional project-level mitigation is required for construction-related vibration to off-campus uses. There are no mitigation measures that would further reduce the construction-related vibration impact to on campus uses (the adjacent MS&E Building) beyond those adopted as part of the 2005 LRDP EIR and 2005 LRDP Amendment 2 EIR, and incorporated into the proposed Project.

Level of Significance after Mitigation

The proposed Project would have less than significant temporary construction vibration impacts to off-campus receptors.

Even with incorporation of PP 4.10-2 (limits on construction hours), and MM 4.10-2 (notification of affected persons about the planned construction and potential vibration), the proposed Project would have a significant and unavoidable impact for temporary construction vibration impacts to on-campus buildings with vibration-sensitive instruments or activities. This impact was adequately addressed in the 2005 LRDP EIR and 2005 LRDP Amendment 2 EIR and Statements of Overriding Considerations were adopted by the Board of Regents of the University of California as part of the approval of these EIRs, for the significant and unavoidable construction-related on-campus vibration impacts resulting from construction anticipated in the 2005 LRDP, as amended, within the East Campus, of which the proposed Project is a part.

Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
c) Would the project result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	☒	☐

Discussion

The analysis of Impacts 4.10-5 and 4.10-6 in the 2005 LRDP EIR and 2005 LRDP Amendment 2 EIR concluded that development under the 2005 LRDP, as amended, would result in less than significant long-term operational impacts related to:

- on- or off-campus ambient roadway (traffic) noise levels; and

- on- or off-campus ambient stationary source noise levels.

The 2005 LRDP Amendment 2 EIR addressed potential traffic-related noise impacts associated with the remaining development under the 2005 LRDP, as amended, which includes the proposed Project. For purposes of analysis in this Initial Study, it is expected that the proposed MRB1 could result in an increased campus population of approximately 400 persons. The proposed Project would generate approximately 75 AM peak hour trips, 58 Mid-day trips and 94 PM peak hour trips; the estimated ADT is 1,217 weekday trips.

As discussed in Section V.16, Transportation and Traffic, occupants and visitors of the proposed MRB1 are anticipated to use Parking Lot 13 to the southeast, or Parking Lot 24 to the northwest. To provide a conservative analysis, it was assumed that all of the traffic from the proposed Project would use each of the parking lots. Assuming use of Parking Lot 24, approximately 70 percent of the traffic would use University Avenue and Canyon Crest Drive to get to the parking lot and 30 percent would use Linden Street. Assuming use of Parking Lot 13, approximately 95 percent of the traffic would travel to/from the west on Big Springs Road, and 5 percent would travel to/from the east. It is anticipated that a small fraction of the trips would occur at night.

The existing ADT on Campus Drive is approximately 3,400 vehicles, the ADT on Big Springs Road is approximately 5,100 vehicles, the ADT on Canyon Crest Drive is approximately 7,300, and the ADT on University Avenue is approximately 12,600 vehicles. With the addition of project-generated traffic to the existing traffic volumes, and taking into consideration the anticipated traffic distribution, the traffic noise increases to receptors adjacent to campus roads would be less than 1 dBA CNEL, which would be imperceptible. Therefore, there would be less than significant long-term, traffic-related noise impacts resulting from implementation of the proposed Project, which is consistent within the findings of the 2005 LRDP Amendment 2 EIR. Additionally, the proposed Project incorporates PS Campus and Community 4 (promote campus-wide non-vehicular transportation), PS Transportation 3 (provide a campus-wide bicycle network to connect to off campus bicycle routes), PS Transportation 4 (provide bicycle parking), and PP 4.3-1 (implement a campus-wide transportation demand management program), which all serve to reduce vehicular trips below the levels used in this analysis.

Heating, ventilation, and air conditioning (HVAC) units would be installed on the roof of the proposed MRB1. The equipment would be shielded by parapets. As identified under the analysis of 4.10-6 in the 2005 LRDP Amendment 2 EIR, the type of equipment currently installed on new on-campus buildings generates noise levels up to 66 dBA L_{eq}, or 73 dBA on the Community Noise Equivalent Level (CNEL) if operating for 24 hours, when measured at 50 feet from the source. The nearest noise-sensitive receptors to the proposed MRB1's rooftop are the Aberdeen-Inverness Residence Hall; these receptors would be located at least 350 feet from the noise source. At that distance, noise from the operation of typical HVAC units could be 44 dBA L_{eq} and 51 dBA CNEL. This value is compared with previously measured noise levels of 55 dBA L_{eq}. The noise level increase would be approximately 1.5 dBA and would not be substantial. With an interior noise reduction of 15 dBA with windows open, the HVAC noise of less than 29 dBA L_{eq} would not be readily discernable. Further, the edge of the proposed MRB1 would break the line of sight from ground floor receptors east of the project area to the mechanical equipment on the top of the building, resulting in additional noise reduction of at least 5 dBA. The noise impacts from stationary sources would be less than significant, which is consistent with the findings of the 2005 LRDP Amendment 2 EIR.

In summary, the proposed Project would not result in a substantial permanent operational noise impacts. The impact would be less than significant, which is consistent with the findings of the 2005 LRDP Amendment 2 EIR.

Additional Project-Level Mitigation Measures

None required.

Level of Significance after Mitigation

The proposed Project would have less than significant impacts related excessive groundborne noise levels and resulting in a substantial permanent to increase in ambient noise levels in the project vicinity above existing noise levels.

	Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
d)	A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project (including construction)?	☐	☐	☐	☒	☐

Discussion

The analysis of Impacts 4.10-7 and 4.10-8 in the 2005 LRDP EIR and 2005 LRDP Amendment 2 EIR concluded that development under the 2005 LRDP, as amended, would result in significant and unavoidable impacts related to:

- on-campus ambient noise levels during construction; and
- off-campus ambient noise levels during construction.

The analysis of Impact 4.10-9 in the 2005 LRDP EIR and 2005 LRDP Amendment 2 EIR concluded that development on campus would result in less than significant short-term construction-related impacts related to:

- ambient noise levels due to special events.

On-Campus Receptors

During construction, nearby noise-sensitive receptors would be exposed to occasional increased noise levels associated with the operation of heavy equipment (e.g., loaders and bulldozers) during the demolition and grading phase. For the purpose of this analysis, and consistent with the 2005 LRDP EIR, noise impacts during construction would be considered significant if activities lasting more than 1 day would increase the ambient noise levels by 10 dBA L_{eq} or more over a 1-hour period at any on-campus or off-campus noise-sensitive location.

The closest noise-sensitive receptors during grading would be the on-campus residents of the Aberdeen-Inverness Residence Hall, located more than 350 feet northeast of the project site. Construction equipment noise would not be constant because of the variations of power, cycles, and equipment location. Worst-case one-hour noise levels were calculated assuming a bulldozer and loader would be operating near the northern site boundary during grading. Noise levels could reach 64 dBA L_{eq} at the western building façade of the Aberdeen-Inverness Residence Hall. After applying an assumed 20 dBA exterior-to-interior noise reduction with all windows closed, the interior average noise levels would be 44 dBA L_{eq} inside the building. The average ambient daytime noise level at the facade of an Aberdeen-Inverness Residence Hall building, was previously measured at 55 dBA L_{eq}. The construction noise increase in 1-hour average noise levels would not exceed 10 dBA; therefore, the impact would be less than significant.

The proposed Project incorporates PPs 4.10-2 and 4.10-7(a), which require hours of construction to be limited to 7:00 AM to 9:00 PM Monday through Friday and 8:00 AM to 6:00 PM on Saturday. Noise impacts would be minimized with PP 4.10-7(b), which requires the muffling or shielding of equipment; and PP 4.10-7(c), which requires that stationary construction equipment material and vehicle staging be placed to direct noise away from sensitive receptors.

Off-Campus Receptors

As previously noted, the nearest off-campus noise-sensitive receptors are the Canyon Court Condominiums, located approximately 0.3 mile northwest from the project area. At this distance, construction activity noise levels from the site would be reduced by at least 30 dBA due to distance; additional reduction would occur due to intervening buildings and terrain. It is therefore unlikely that construction noise from the site would be heard at off-campus residences. Therefore, no impact would occur.

With respect to construction vehicle noise impacts, heavy trucks exporting soil would use designated haul routes. As discussed above, there are two potential construction access/haul routes (University Drive to I-215 from Parking Lot 19, and Linden Avenue from Parking Lot 25). There are residences along the I-215 segment. Therefore, project-generated haul trucks (an average of approximately 6 round trips per day or 1 to 2 passbys per hour) may pass off-campus noise-sensitive receptors along I-215. The additional truck noise on off-campus roadway segments would be mixed with existing traffic noise from I-215. Individual truck passbys may be occasionally noticeable; however, because of the large volume of existing traffic on I-215, the change in the overall average noise level would not be perceptible. There are residences along Linden Street and Iowa Avenue which would be used by haul trucks, assuming the alternative construction access from Parking Lot 25 is used. The noise level increases from construction trucks (also estimated to be 1 or 2 passbys per hour) would not be substantial, resulting in a less than significant impact.

Construction activities for the proposed Project would result in a less than significant noise impact to off campus sensitive receptors.

Additional Project-Level Mitigation Measures

No mitigation is required.

Level of Significance after Mitigation

The proposed Project would have less than significant temporary construction noise impacts to on-campus and off-campus receptors.

	Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
e)	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☐	☒
f)	For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☐	☒

Discussion

As discussed in the Initial Study for the 2005 LRDP Amendment 2 EIR, development under the 2005 LRDP, as amended, was determined to have no impact related to noise from public or private airport/airstrip operations and was not carried forward for further discussion in the Draft EIR. The UCR campus is not located within the boundaries of any airport land use plan; is more than two miles from the nearest public airport; and is not located in the vicinity of a private airstrip. Consistent with the findings of the 2005 LRDP Amendment 2 EIR, implementation of the proposed Project would not expose people in the Project area to excessive noise levels related to public or private airport operations.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would have no impact related to public use airports or private airstrips.

13. Population and Housing

The analysis of population and housing is tiered from the 2005 LRDP Amendment 2 EIR and was addressed in Section 4.11, Population and Housing, of that document. Relevant elements of the proposed Project related to population and housing include the addition of approximately 400 individuals (faculty, graduate students, postdoctoral scholars, and administrative support) on campus as part of the proposed Project. There were no applicable PSs, PPs, or MMs adopted as part of the 2005 LRDP EIR and 2005 LRDP Amendment 2 EIR related to population and housing.

Project Impact Analysis

Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒	☐

Discussion

The analysis of Impacts 4.11-1 and 4.11-2 in the 2005 LRDP Amendment 2 EIR determined that, although development under the 2005 LRDP Amendment 2 EIR and cumulative development would directly induce substantial population growth, because the projected housing supply in the area would be adequate to serve the additional population, there would be a less than significant impact with implementation of PS Land Use 4 (related to provision of on-campus housing).

As discussed in Section II, Project Description, of this IS, it is expected that the proposed MRB1 would provide new research space on campus to accommodate a population of approximately 400 individuals. Therefore, for purposes of analysis in this IS, it is conservatively assumed that all 400 positions would be new to the campus. This may include, but not be limited to, 50 to 56 PIs with 6 team members each (consisting of a combination of graduate students, post-doctoral researchers, and research assistants) and approximately 50 administrative staff. Therefore, the estimated new campus population resulting from the proposed Project would include 150 non-academic staff (50 - 56 PIs and approximately 100 postdoctoral researchers), approximately 200 graduate students, and approximately 50 administrative staff. As discussed in Section V.10, Land Use and Planning, this increase in the on-campus population is within the remaining projected growth on campus, as identified in the 2005 LRDP, as amended.

Because the projected housing supply in both the City of Riverside and the region was determined adequate for the additional non-student population associated with implementation of the 2005 LRDP, as amended, it can be concluded that there would be adequate supply for an additional 400 persons. However, it is not likely that all of the proposed MRB1 occupants would be new to the City or region. Therefore, the proposed Project would not result in substantial population growth or growth beyond that anticipated with implementation of the 2005 LRDP, as amended. This impact is less than significant, consistent with the findings of the 2005 LRDP Amendment 2 EIR.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would have a less than significant impact related to inducing substantial population growth in the area either directly or indirectly.

Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☐	☒
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☐	☒

Discussion

The IS prepared for the 2005 LRDP Amendment 2 EIR concluded that there would be no impacts related to the displacement of existing housing or people since implementation of the 2005 LRDP, as amended, would not involve the demolition or removal of housing. There are no existing residential uses located within the project site. Therefore, the proposed Project would not require the construction of replacement housing consistent with the findings of the 2005 LRDP Amendment 2 EIR.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would have no impacts related to (1) displacement of a substantial number of existing housing that would necessitate the construction of replacement housing or (2) displacement of substantial numbers of people that would necessitate the construction of replacement housing.

14. Public Services

The analysis of the provision of public services on campus (i.e., fire, police, schools, and other public facilities) is tiered from the 2005 LRDP EIR and 2005 LRDP Amendment 2 EIR and is addressed in Section 4.12, Public Services, of those documents. As described previously in Section II, Project Description, of this IS, relevant elements of the proposed Project related to public services include the construction of the up to 190,000-gsf, 4- to 5-level MRB1 and the accommodation of emergency vehicles. Existing fire and emergency access would be maintained (existing access to the MS&E Building) and new access would be provided with construction of the proposed service road/walkway along the north side of the proposed MRB1.

The following applicable PPs were adopted as part of the 2005 LRDP EIR and 2005 LRDP Amendment 2 EIR; they have been incorporated as part of the proposed Project and are assumed in the analysis presented in this section.

PP 4.12-1(a) As development occurs, the following measures will be incorporated:

(i) New structures would be designed with adequate fire protection features in compliance with State law and the requirements of the State Fire Marshal. Building designs would be reviewed by appropriate campus staff and government agencies.

(ii) Prior to implementation of individual projects, the adequacy of water supply and water pressure will be determined in order to ensure sufficient fire protection services.

(iii) Adequate access will be provided to within 50 feet of the main entrance of occupied buildings to accommodate emergency ambulance service.

(iv) Adequate access for fire apparatus will be provided within 50 feet of stand pipes and sprinkler outlets.

(v) Service roads, plazas, and pedestrian walks that may be used for fire or emergency vehicles will be constructed to withstand loads of up to 45,000 pounds.

(vi) As implementation of the LRDP occurs, campus fire prevention staffing needs would be assessed; increases in staffing would be determined through such needs assessments.

PP 4.12-1(b)

(i) Accident prevention features shall be reviewed and incorporated into new structures to minimize the need for emergency response from the City of Riverside.

(ii) Increased staffing levels for local fire agencies shall be encouraged to meet needs generated by LRDP project related on-campus population increases.

PP 4.12-2(a)

As development under the LRDP occurs, the Campus will hire additional police officers and support staff as necessary to maintain an adequate level of service, staff, and equipment, and will expand the existing police facility when additional space is required.

PP 4.12-2(b)

The Campus will continue to participate in the “UNET” program (for coordinated police response and staffing of a community service center), which provides law enforcement services in the vicinity of the campus, with equal participation of UCR and City police staffs.

Project Impact Analysis

Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:					
a) Fire protection?	☐	☐	☐	☒	☐

Discussion

The analysis of Impacts 4.12-1 and 4.12-3 in the 2005 LRDP EIR and 2005 LRDP Amendment 2 EIR concluded that, with implementation of PP 4.12-1(a), PP 4.12-1(b), and MM 4.12-1, there would be less than significant direct and cumulative impacts related to the need for new or physically altered fire protection facilities to accommodate the increased demand resulting from implementation of the 2005 LRDP, as amended, and to maintain acceptable service levels. As identified in the 2005 LRDP Amendment 2 EIR, the City of Riverside Fire Department (RFD) indicated that it would be desirable to add a fire station near the campus in order to meet national standards for fire and life safety services with the addition of planned development under the 2005 LRDP, as amended. The 2005 LRDP Amendment 2 EIR concluded that the environmental impact resulting from the potential for the RFD to construct new or expanded fire protection facilities would be less than significant.

As discussed in Section V.13, Population and Housing, of this IS, the proposed Project would increase the campus population by approximately 400 individuals; however, this increase is within the growth projections for the campus as identified in the 2005 LRDP, as amended, and analyzed in the 2005 LRDP EIR and the 2005 LRDP Amendment 2 EIR. The RFD is responsible for fire suppression, and the UCR EH&S is responsible for inspection, fire protection engineering, and fire prevention. The campus has a Memorandum of Understanding (MOU) with the State Fire Marshal to provide additional support, and the Campus Fire Marshal is a designated Deputy State Fire Marshal. The proposed Project would comply with all regulations of Sections 13000 et seq. of the *California Health and Safety Code,* which pertain to fire protection systems, including provision of smoke alarms, fire extinguishers, appropriate building access, and emergency response notification systems. The proposed Project incorporates PP 4.12-1(a), which requires new structures to be designed with adequate fire protection features in compliance with State law. It also requires adequacy of water supply and water pressure to be determined prior to implementation of individual projects to ensure sufficient fire protection services for the campus. PP 4.12-1(b) requires accident prevention features to be included in new structures to minimize the demand for emergency response services from RFD.

The service road proposed along the northern site boundary connecting to Aberdeen Drive would also serve as a fire access lane and would have a minimum width able to accommodate two-way access of service vehicles and code-compliant fire truck access, turnaround dimensions, and hose pull lengths. The lower half of the project site would rely on the existing fire lane to the west of the MS&E Building. The fire access lane would “hammerhead” at the western end of the project site and would meet all current *California Fire Code* requirements.

The Aberdeen Drive drop-off/arrival area would be located on the west side of Aberdeen Drive along, generally between the existing MS&E Building and the proposed MRB1. The drop-off area would be designed to allow cars to pull off Aberdeen Drive, keeping Aberdeen Drive clear of traffic. As such, existing emergency access along the adjacent section of Aberdeen Drive would be maintained.

The Campus Fire Marshal has determined that the RFD can adequately provide fire protection and emergency medical response services, and the UCR EH&S can adequately provide the fire prevention and inspection services for the proposed Project without resulting in the need for additional staff or facilities from other departments (Corrin 2016). As such, no new, expanded, or altered fire protection services or facilities would be required to serve the proposed Project, and no physical environmental impacts related to the provision of fire protection services would result.

Because emergency access and fire flows would be adequate to serve the proposed Project and no new, expanded, or altered fire protection services or facilities would be required beyond those included as part of the proposed Project, impacts associated with the provision of fire protection services from implementation of the proposed Project, which incorporates PP 4.12-1(a) and PP 4.12-1(b), are considered less than significant; this is consistent with the findings of the 2005 LRDP EIR and 2005 LRDP Amendment 2 EIR.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would have a less than significant impact on fire protection services; no new or altered fire protection services would be required.

	Threshold(s)	**Potentially Significant Impact**	**Project Impact Adequately Addressed in LRDP EIR**	**Less Than Significant With Project-Level Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
b)	Police protection?	☐	☐	☐	☒	☐

Discussion

The analysis of Impacts 4.12-2 and 4.12-3 in the 2005 LRDP EIR and 2005 LRDP Amendment 2 EIR identified that the incremental increase in the campus population may result in increased response times by the UC Police Department, Riverside (UCPDR). The increased population on campus would require additional routine services to provide additional patrols of the campus and maintain police presence. Additional administrative staff may be necessary to support the additional patrol personnel. In order to maintain adequate levels of police protection to serve the anticipated increase in campus population, the UCPDR may need to purchase additional equipment and hire additional personnel. However, with implementation of PP 4.12-2(a) and PP 4.12-2(b), there would be less than significant direct and cumulative impacts related to the need for new or physically altered police facilities to accommodate the increased demand resulting from implementation of the 2005 LRDP, as amended, and to maintain acceptable service levels.

The increase in staffing and equipment of the UCPDR anticipated with the addition of planned development under the 2005 LRDP, as amended, could require provision of additional space, which could include renovation of the existing UCPDR facility, expansion of the existing facility, or the acquisition of a satellite facility (similar to the storefront facility at University Village). The potential environmental effects associated with expanding the existing facility or providing a satellite facility were evaluated in the 2005 LRDP Amendment 2 EIR at a program level, and it was concluded that there would be a less than significant impact.

The UCPDR is responsible for providing police services to the UCR campus. The UCPDR has an MOU with the City of Riverside, whereby the UCPDR and the Riverside Police Department (RPD) provide reciprocal assistance to each other. The two departments jointly operate a community policing enterprise known as the University Neighborhood Enhancement Team (UNET) in a 17.5-square-mile area of the City of Riverside. In addition to UNET, the UCR campus beat officers handle incidents within the City. In turn, RPD provides the UCPDR with emergency backup and, infrequently, assists in handling emergency calls.

As discussed above, the proposed Project would increase the campus population by up to approximately 400 individuals; however, this increase is within the growth projections for the campus as identified in the 2005 LRDP, as amended, and analyzed in the 2005 LRDP EIR and the 2005 LRDP Amendment 2 EIR. While there would be an increase in demand resulting from the proposed Project, the types and volume of service calls for police services at the proposed MRB1 would be similar to the existing MS&E Building to the south and other academic facilities on campus. Additionally the proposed building incorporates crime prevention related design features including, but not limited to security cameras, electronic access/controls and environmental design features to help prevent or deter criminal activity. PP 4.12-2(a), which ensures the hiring of additional officers as needed to maintain adequate service levels, and PP 4.12-2(b), which ensures continued UCR participation in the UNET program are also incorporated into the proposed Project. The UCPDR has determined that the proposed Project can be adequately served without the need for additional staff or expanded police facilities (Lane 2016).

Therefore, consistent with the findings of the 2005 LRDP EIR and the 2005 LRDP Amendment 2 EIR, no new or expanded police facilities would be required and no physical environmental impacts would result. There would be no impact.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would have a less than significant impact to police services; no new or altered police facilities would be required.

Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
c) Schools?	☐	☐	☐	☒	☐

Discussion

As identified in the 2005 LRDP EIR and the IS for the 2005 LRDP Amendment 2 EIR, implementation of the proposed 2005 LRDP Amendment 2 would result in new students in the City of Riverside and surrounding areas, and funds would be available from private residential and commercial development to pay for new facilities. In addition, the RUSD and neighboring school districts have a number of options available to accommodate new students. Therefore, it was concluded that implementation of the 2005 LRDP, as amended, would not result in substantial adverse physical impacts associated with the provision of new or physically altered school facilities.

The proposed Project involves the construction of the proposed MRB1. As such, the proposed Project would not include new student, faculty, or staff housing and would not result in a direct increase in new students within the RUSD service area. However, the proposed Project would increase the campus population by up to approximately 400 individuals. This increase in population could generate an indirect increase in new students within the RUSD through the provision of employment opportunities. However, the increase in population is consistent with the growth projections assumed in the 2005 LRDP, as amended, and analyzed in the 2005 LRDP EIR and the 2005 LRDP Amendment 2 EIR. As such, the proposed Project would not result in an increase in new students within the RUSD service area that was not anticipated in 2005 in the 2005 LRDP EIR or LRDP Amendment 2 EIR. Therefore, consistent with the previous findings, substantial adverse impacts associated with new or physically altered school facilities would not result from implementation of the proposed Project, and there would be a less than significant impact.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would have a less than significant impact to schools; no new or altered school facilities would be required.

	Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
d)	Parks?	☐	☐	☐	☒	☐

Discussion

The analysis of the proposed Project’s impacts on parks and other recreation facilities is provided in Section V.15, Recreation, of this IS.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would not involve the development of new and expanded recreational facilities, and no new or altered park/recreation facilities would be required as a result of the proposed Project.

	Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
e)	Other public facilities?	☐	☐	☐	☒	☐
f)	Create other public service impacts?	☐	☐	☐	☒	☐

Discussion

As identified in the 2005 LRDP EIR and IS for the 2005 LRDP Amendment 2 EIR, implementation of the proposed 2005 LRDP, as amended, would not result in substantial adverse physical impacts associated with the provision of new or physically altered library facilities, and this impact would be less than significant. In addition, UCR provides libraries that are open to the public and are used by its campus population, thus reducing demand on City resources. It was also identified that implementation of planned development under the 2005 LRDP, as amended, would increase the demand on each of the four existing libraries on campus and that satellite libraries may also be developed as part of professional school development. The potential environmental effects associated with the development of satellite libraries were evaluated in the 2005 LRDP EIR at a program level, and it was concluded that there would be a less than significant impact.

As discussed previously, the proposed Project would increase the campus population by approximately 400 individuals, and this increase would be within the growth projections for the campus. As such, the proposed Project would not result in an increased demand for on- or off-campus library services or other public services not anticipated in the 2005 LRDP EIR or 2005 LRDP Amendment 2 EIR. Therefore, consistent with the findings of these EIRs, substantial adverse impacts associated with new or physically altered libraries or other public services would not result from implementation of the proposed Project, and there would be a less than significant impact.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would have less than significant impacts to library services or other public services.

15. Recreation

The analysis of recreation is tiered from the 2005 LRDP EIR and was addressed in Section 4.13, Recreation, of that document. The proposed Project does not include the development of any recreational facilities. However, as shown on Figure 9, Conceptual Open Space and Landscape Plan, the proposed Project provides open space and landscape areas throughout the site, including an open space area between the proposed MRB1 and existing MS&E Building, which would facilitate east-west pedestrian movement through the north end of the academic core of the campus and provide gathering spaces for faculty, staff, students, and visitors. A pedestrian walkway is also provided north of the proposed MRB1. The proposed Project could increase the campus population by up to approximately 400 individuals (faculty, graduate students, postdoctoral scholars, and administrative support).

There were no applicable PSs, PPs, or MMs adopted as part of the 2005 LRDP EIR and 2005 LRDP Amendment 2 EIR related to recreation.

Project Impact Analysis

	Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
a)	Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒	☐

Discussion

The analysis of Impact 4.13-1 in the 2005 LRDP EIR concluded that the 2005 LRDP includes the implementation of recreational facilities that would be sufficient to serve the planned population growth on campus. Further, it was concluded that with implementation of PS Open Space 7, the increased demand for recreational facilities from additional persons in the City of Riverside would not increase the use of existing neighborhood and regional parks or other recreational facilities such that the substantial physical deterioration of the facility would occur or be accelerated. Therefore, the impact was determined to be less than significant.

As discussed previously, the proposed Project would increase the campus population by up to approximately 400 individuals, and this increase would be within the growth projections for the campus. As such, although there would be a potential increased demand for on- or off-campus recreational facilities associated with the increase in population, the proposed Project would not result in an increased demand for recreational facilities not anticipated in the 2005 LRDP EIR. The addition of needed on-campus recreational facilities is planned in order to meet the increased demand for recreational facilities generated by the planned growth in the campus population and would be expected to decrease the reliance on existing off-campus parks and recreational facilities by UCR students, faculty, and staff. Notably, the SRC is located immediately north of and adjacent to the project site and was recently expanded. The proposed Project also provides outdoor open space and gathering areas for occupants and visitors of the proposed MRB1.

Therefore, consistent with the findings of the 2005 LRDP EIR, the proposed Project would result in a less than significant impact related to substantial or accelerated physical deterioration of existing neighborhood or regional parks or other recreational facilities.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would have a less than significant impact related to an increase in 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.

Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?	☐	☐	☐	☐	☒

Discussion

The analysis of Impact 4.13-2 in the 2005 LRDP EIR identified that the implementation of the 2005 LRDP would include the development of new recreational facilities which could result in adverse physical impacts on the environment during the construction period. Development of new recreational facilities are one component of the overall LRDP program and, as such, are part of the whole of the action that is analyzed in this 2005 LRDP EIR. The 2005 LRDP EIR concluded that there would be less than significant impacts related to the construction of recreational facilities with implementation of relevant construction-related PSs, PPs, and MMs, including, but not limited to, those related to air quality, noise, traffic, and agriculture.

While there are no recreational facilities proposed, this IS provides project-specific environmental review of the installation of open space, landscape, and hardscape improvements within the project site. Local and regional air quality impacts are addressed under Section V.3, Air Quality; noise and vibration impacts are addressed under Section V.12, Noise; and traffic impacts are addressed under Section V.16, Transportation and Traffic. No additional impacts associated with these improvements would occur beyond those addressed for the proposed Project and evaluated in the 2005 LRDP EIR.

The proposed Project would not require the expansion of any existing recreational facilities on or off campus, nor would it require the construction or expansion of recreational facilities. Therefore, no additional physical impacts would occur with implementation of the proposed Project.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would have no impact related to the construction or expansion of recreational facilities.

16. Transportation and Traffic

The analysis of transportation and traffic is tiered from the 2005 LRDP Amendment 2 EIR and was addressed in Section 4.14, Transportation and Traffic, of that document. As described previously in Section II, Project Description, of this IS, relevant elements of the proposed Project related to transportation and traffic include (1) a potential increase in traffic associated with up to 400 new individuals on campus; (2) the provision of a new service road/pedestrian walkway along the north side of the proposed MRB1 and a reconfiguration of the existing fire lane serving the MS&E Building within the proposed Arroyo Plaza on the south side of the proposed MRB1; and (3) short-term construction activities that would involve heavy trucks on the identified construction routes (as described in Section II, Project Description, under "Construction Activities").

The following applicable PSs, PPs, and MMs were adopted as part of the 2005 LRDP Amendment and/or 2005 LRDP Amendment 2 EIR and are incorporated as part of the proposed Project and assumed in the analysis presented in this section.

PS Campus and Community 4	Provide strong connections within the campus and its edges to promote walking, bicycling and transit use, rather than vehicular traffic.
PS Transportation 3	Provide a continuous network of bicycle lanes and paths throughout the campus, connecting to off campus bicycle routes.
PS Transportation 4	Over time, limit general vehicular circulation in the central campus, but allow transit, service, and emergency vehicle access, and provide access for persons with mobility impairments.
PS Transportation 5	Provide bicycle parking at convenient locations.
PP 4.14-1	The campus shall continue to implement a Transportation Demand Management program that meets or exceeds all trip reduction and AVR requirements of the SCAQMD. The TDM program may be subject to modification as new technologies are developed or alternate program elements are found to be more effective. *(This is identical to Air Quality PP 4.3-1.)*
PP 4.14-2	The Campus will periodically assess construction schedules of major projects to determine the potential for overlapping construction activities to result in periods of heavy construction vehicle traffic on individual roadway segments, and adjust construction schedules, work hours, or access routes to the extent feasible to reduce construction-related traffic congestion.
PP 4.14-5	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. *(This is identical to Hazards and Hazardous Materials PP 4.7-7(a)).*

PP 4.14-6	For any construction-related closure of pedestrian routes, the Campus shall provide alternate routes and appropriate signage and provide curb cuts and street crossings to assure alternate routes are accessible.
PP 4.14-8	To maintain adequate access for emergency vehicles when construction projects would result in roadway closures, the Architects & Engineers (formerly Office of Design and Construction) shall consult with the UCPD, EH&S, and the RFD to disclose roadway closures and identify alternative travel routes. *(This is identical to Hazards and Hazardous Materials PP 4.7-7(b)).*
MM 4.14-1b	**Travel Demand Management.** To reduce on- and off-campus vehicle trips and resulting impacts, the University will enhance its Transportation Demand Management (TDM) program. TDM strategies will include measures to increase transit and Shuttle use, encourage alternative transportation modes including bicycle transportation, implement parking policies that reduce demand, and other mechanisms that reduce vehicle trips to and from the campus. The University shall monitor the performance of campus TDM strategies through annual surveys.
MM 4.14-1d	**Sustainability and Monitoring.** The University shall review individual projects proposed under the amended 2005 LRDP for consistency with UC sustainable transportation policy and UCR TDM strategies to ensure that bicycle and pedestrian improvements, alternative fuel infrastructure, transit stops, and other project features that promote alternative transportation are incorporated into each project to the extent feasible.

Project Impact Analysis

Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☐	☒	☐

Discussion

The analysis of Impacts 4.14-1 through 4.14-4 in the 2005 LRDP Amendment 2 EIR, which addresses intersection and roadway capacity, concluded that, with implementation of PS Land Use 4, PS Land Use 7, PS Transportation 1 through 6, PP 4.14-1, MM 4.14-1(a), and the Campus Traffic Mitigation Program (CTMP), comprised of MM 4.14-1(b) through MM 4.14-1(f), development under the 2005 LRDP, as amended, would result in:

- less than significant impacts to local roadways under existing plus project conditions and in 2020 and no mitigation is required (Impacts 4.14-3 and 4.14-4);
- significant and unavoidable impacts to 13 of the 32 study area intersections under the existing plus project condition and 17 intersections under the year 2020 condition; these intersections are under the jurisdiction of the City of Riverside or California Department of Transportation (Caltrans) (Impacts 4.14-1 and 4.14-2).

As discussed in the 2005 LRDP Amendment 2 EIR, all of the intersection improvements described in the CTMP would fall under the jurisdiction of the City and/or Caltrans. However, because the City and/or Caltrans have not programmed any improvements to these facilities at the time of preparation of the EIR, the construction of the improvements cannot be ensured, as it depends on actions by the City and/or Caltrans. Furthermore, improvements that would restore operations to acceptable levels are not feasible at some of the 17 total affected intersections under the jurisdiction of the City and/or Caltrans. For these reasons, the identified off-campus intersection impacts (Impacts 4.14-1 and 4.14-2) remain significant and unavoidable.

The analysis of Impact 4.14-5 concluded that, even with implementation of PP 4.14-2, development under the 2005 LRDP, as amended, would result in a significant and unavoidable impact to intersection and roadway capacity due to temporary construction traffic.

<u>Short-Term Construction Traffic</u>

Construction activities associated with the proposed Project could result in temporary closure of on-campus traffic lanes or roadway segments in the project vicinity to permit the delivery of construction materials; to transport exported soil; or to provide adequate site access or during construction of utility connections or other project-related features located adjacent to, or within, Aberdeen Drive, North Campus Drive, and University Avenue. Exporting approximately 4,000 cy of soil would require approximately 250 round-trips using 16 cy trucks over an approximate 2-month period (43 working days). Therefore, trucks would make approximately six round-trips per weekday during each week of the grading period when soil is exported, representing the period of highest heavy construction vehicle traffic.

Using the conservative assumption that these trips would be generated by a tractor-trailer combination (for which each truck trip is equivalent to 2.5 vehicle trips), peak construction traffic of approximately 15 car equivalent round trips per day could result. Because these trips would occur over a typical eight-hour construction day, approximately two trips would be generated during an average hour. With a typical construction day starting at 7:00 AM, approximately two equivalent trips would be generated during the AM peak hour during the period of heaviest construction activity. Construction would typically be completed each day prior to the PM peak hour; therefore, no PM peak hour impacts are anticipated. The addition of two equivalent trips during the AM peak hour, in itself, would not degrade intersection levels of service sufficiently to exceed the identified significance criteria. It should also be noted that there would be an increase in construction traffic associated with construction workers traveling to and from the campus. The average number of construction workers on a daily basis would vary depending on the stage of construction. It is estimated that the average number of construction workers would range from approximately 20 individuals in the later stages of construction to approximately 245 individuals during building construction. With the start of construction at 7:00 AM and ending before the PM peak hour, the construction workers would be traveling to and from the construction site during off-peak traffic hours. Additionally, the construction workers would be directed to the designated parking areas. Therefore, project-specific construction traffic impacts from the proposed Project would be less than significant.

There is a chance that construction of the proposed Project may overlap with construction of other on-campus projects that are either proposed or approved; however, it is not anticipated that they would have overlapping construction traffic routes. Additionally, the proposed Project would require lane closures or other access restrictions for extended periods of time. Proposed construction access to the project site would be from a new roadway extended from University Avenue through Parking Lot 19 to the existing service access road for the MS&E Building. Alternatively, access would be from the southern end of Parking Lot 25 into the construction staging area. No construction access would occur from Aberdeen Drive or North Campus Drive. Additionally, the proposed Project incorporates PP 4.14-2, which requires the campus to assess construction schedules of major projects periodically to determine the potential for overlapping construction activities and adjust construction schedules, work hours, or access routes to the extent feasible to reduce construction-related traffic congestion. Additionally, the proposed Project incorporates PP 4.14-5, which requires one travel lane in each direction, to minimize construction traffic impacts to the extent feasible. Therefore, potential Project-related traffic impacts associated with lane closures and access restrictions during construction would be less than significant. Although the 2005 LRDP Amendment 2 EIR concluded that construction traffic could be significant at some locations along the identified access routes, for the reasons discussed above, in the event there is an overlap of construction activities on campus, it is concluded that the proposed Project would result in a less than significant cumulative traffic construction impact.

Long-Term Operational Traffic

One of the key objectives of the proposed Project is to provide a portion of the research space necessary to hire new faculty, which would improve student-faculty ratios. It is expected that the proposed MRB1 would accommodate a population of up to approximately 400 individuals. While the MRB1 would provide new research space on campus to accommodate approximately 400 individuals, it is not known what percentage of the building occupants would be new to the campus or would be relocated from other existing facilities on campus. Therefore, this traffic analysis assumes that all 400 individuals and associated trip generation would be new to the campus. Because the estimated population growth for the proposed MRB1 is anticipated in the 2005 LRDP, as amended, traffic demand and its increase associated with this population growth have also been considered in the traffic impact analysis included in the 2005 LRDP Amendment 2 EIR.

Using the trip generation rates presented in Table 4.14-8, AM & PM Peak Hour Trip Rate, of the 2005 LRDP Amendment 2 EIR, AM and PM peak hour trips generated by the project were calculated and are presented in Table 9. Similarly, mid-day peak hour trips based on rates presented in Table 4.14-9 were calculated and are presented in Table 10. Based on the estimated increase in the on-campus population, the proposed Project would generate approximately 75 AM peak hour trips, 58 mid-day trips, and 94 PM peak hour trips. This is a conservative estimate, as it is expected that there would less than 400 people new to the campus. Also, conservatively, all new trips assumed generated by the "new" 400 individuals were assigned to come in and out of either Parking Lot 13 or 24 with direct impacts to Intersection No. 7; Linden Street at Canyon Crest Drive (City of Riverside) or Intersection No. 16; and Big Springs Road/Campus Drive (UCR).

Figure 17 depicts trip distribution percentages at the two said intersections based on review of logical origins and destinations given their locations.

Additionally, as discussed under Threshold f below, the proposed Project incorporates various PSs, PPs, and MMs related to non-vehicular modes of transportation that would serve to reduce vehicular trips. The proposed Project does not provide increased parking (only parking for service vehicles), which would encourage alternative transportation modes.

TABLE 9
AM & PM PEAK HOUR TRIP RATES AND TRIPS

Land Use Category	Population	AM In		AM Out		AM Total Trips	PM In		PM Out		PM Total Trips
		Trip Rate	Trips	Trip Rate	Trips		Trip Rate	Trips	Trip Rate	Trips	
Non-School of Medicine Students	300	0.065	20	0.015	5	25	0.014	5	0.054	17	22
Non-School of Medicine Faculty and Staff	100	0.384	39	0.106	11	50	0.287	29	0.43	43	72
Non-School of Medicine Other Individuals	50	Included in Trip Rate for Non-School of Medicine Faculty and Staff									

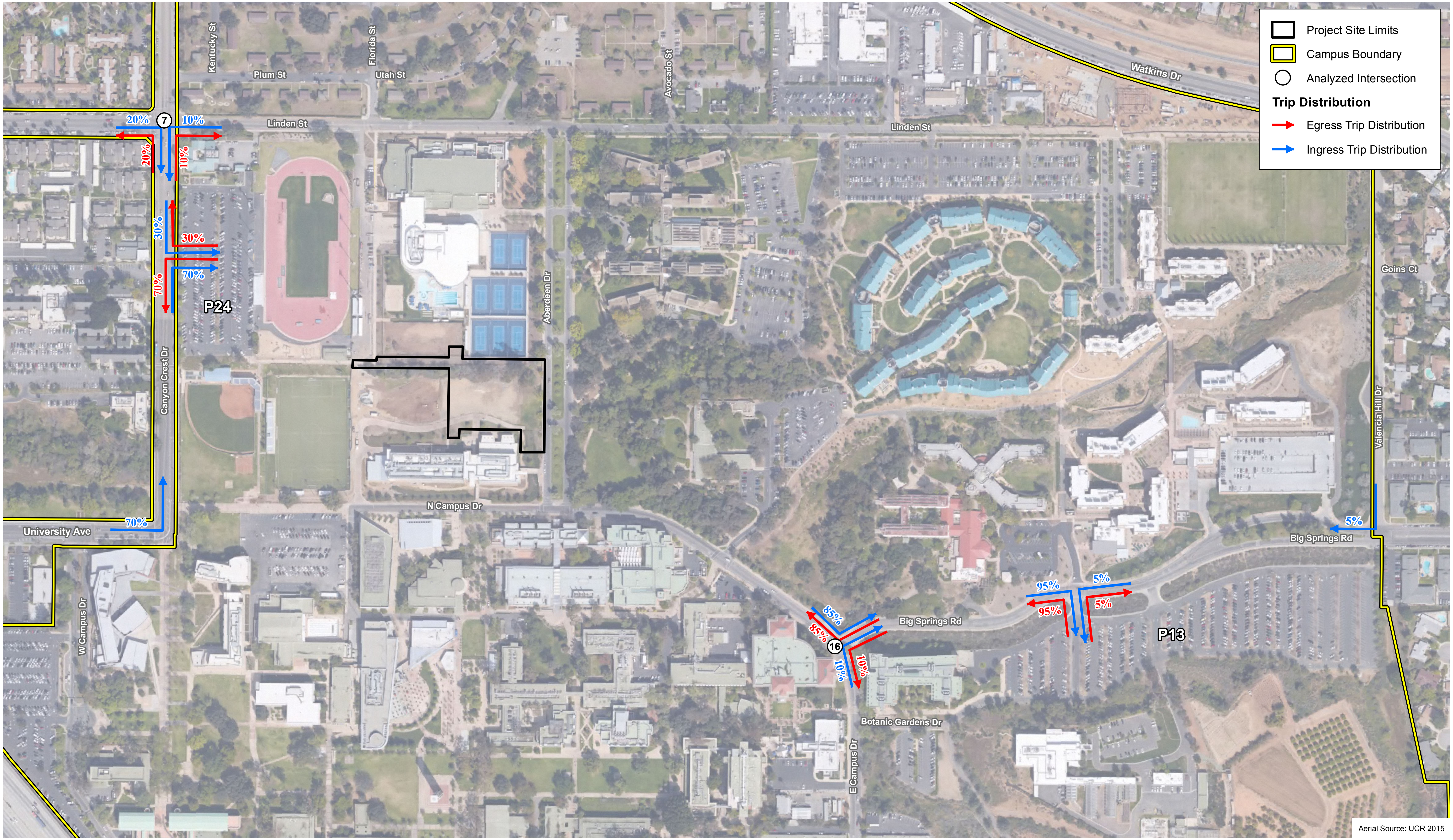
TABLE 10
MID-DAY PEAK HOUR TRIP RATES AND TRIPS

Land Use Category	Population	Mid-Day In Trip Rate	Mid-Day In Trips	Mid-Day Out Trip Rate	Mid-Day Out Trips	Mid-Day Total
Non-School of Medicine Students	300	0.026	8	0.026	8	16
Non-School of Medicine Faculty and Staff	100	0.209	21	0.209	21	42
Non-School of Medicine Other Individuals	50	Included in Trip Rate for Non-School of Medicine Faculty and Staff				

Table 11 presents the existing LOS at the two study area intersections adjoining Parking Lots 13 and 24; supporting traffic analysis is provided in Appendix E.

TABLE 11
INTERSECTION LEVELS OF SERVICE – EXISTING 2015
AM, MID-DAY, AND PM PEAK HOUR

Intersection	Control	AM Peak Hour		Mid-Day Peak Hour		PM Peak Hour	
		Delay(s)	LOS	Delay(s)	LOS	Delay(s)	LOS
Canyon Crest Dr and Linden St	Signalized	21.3	C	24.3	C	32.2	C
Campus Dr and Big Springs Rd	AWSC	8.3	A	8.6	A	9.7	A
LOS: Level of Service; AWSC: All-Way Stop Controlled.							



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Study Area Intersection and Trip Distribution

Figure 17

UCR Multidisciplinary Research Building 1 Project

N W E S

300 150 0 300
Feet

BonTerra
PSOMAS

(Rev: 03/22/2016 JAZ) R:\Projects\UCR\3UCR000500\Graphics\InitialStudy\Fig17_StudyAreaIntersectionAndTripDistribution.pdf

With the proposed MRB1 slated to be fully open and operational by 2019, an annual growth factor of 1.5 percent was applied. This yields "Without Project" LOS conditions as shown in Table 12 at the two intersections. Portions of expected trips to be generated to and from Parking Lots 13 and 24 were then appropriated to yield expected traffic demand in 2019, representing "With Project" LOS conditions as shown in Table 13.

TABLE 12
INTERSECTION LEVELS OF SERVICE – 2019 WITHOUT PROJECT
AM, MID-DAY, AND PM PEAK HOURS

		AM Peak Hour		Mid-Day Peak Hour		PM Peak Hour	
Intersection	**Control**	**Delay(s)**	**LOS**	**Delay(s)**	**LOS**	**Delay(s)**	**LOS**
Canyon Crest Dr and Linden St	Signalized	21.9	C	24.7	C	35.2	D
Campus Dr and Big Springs Rd	AWSC	8.5	A	8.8	A	10	A
LOS: Level of Service; AWSC = All-Way Stop Controlled.							

TABLE 13
INTERSECTION LEVELS OF SERVICE – 2019 WITH PROJECT
AM, MID-DAY, AND PM PEAK HOUR

		AM Peak Hour			Mid-Day Peak Hour			PM Peak Hour		
Intersection	**Control**	**Delay (s)**	**LOS**	**Δ Delay (s)**	**Delay (s)**	**LOS**	**Δ Delay (s)**	**Delay (s)**	**LOS**	**Δ Delay (s)**
Canyon Crest Dr and Linden St	Signalized	22.5	C	0.6	24.9	C	0.2	36.1	D	0.9
Campus Dr and Big Springs Rd	AWSC	9.0	A	0.5	9.2	A	0.4	11.2	B	1.2
LOS: Level of Service; Δ: change; AWSC = All-Way Stop Controlled.										

The City of Riverside's Traffic Impact Guideline defines a significant traffic impact when the peak hour LOS falls below "D" as a result of project trips for roadways of Collector or higher classification or when the addition of project trips causes either peak hour LOS to degrade from acceptable (LOS "A" through "D") to unacceptable levels ("E" or "F") or the peak-hour delay increases between ten to five seconds for existing LOS "A" to "D", respectively. Furthermore, in accordance with Table 4.14-7 of the 2005 LRDP Amendment 2 EIR, a significant impact on a University intersection, which is applicable to Big Springs Road at Campus Drive (Intersection No. 16) is caused when LOS falls below "D". As shown, increases in operational delay of the proposed project would result in a less than significant impact relative to the City's or University's criteria. This is consistent to any applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system.

A discussion of project impacts related to non-vehicular circulation is provided under Threshold f below.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would have a less than significant impact for construction-related and operational project-related traffic.

	Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
b)	Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☐	☐	☒

The analysis of Impacts 4.14-6 and 4.14-7 in the 2005 LRDP Amendment 2 EIR, which addressed the Riverside County Congestion Management Program (CMP) under existing plus project conditions and in 2020, determined that the operating conditions of all freeway segments operating unacceptably would continue to do so with the addition of 2005 LRDP-related traffic. In addition, the freeway segment LOS under existing plus project conditions for I-215 northbound, between SR-60 and Central Avenue, and I-215 northbound, between Martin Luther King Jr. Boulevard and University Avenue, would reduce from LOS E to LOS F in the AM peak hour with the addition of project traffic. There are no feasible mitigation measures available for these impacts, and the EIR concluded there would be a significant and unavoidable impact to the affected freeway segments.

As previously discussed, the increase in the on-campus population associated with the proposed Project would not result in a significant impact to Intersection No. 7 or No. 16 near the project site. University Avenue between Market Street and SR-91 is identified as the closest segment that is part of the County's Arterial CMP. The interchange of SR-91 at University Avenue acts as a buffer or collection point by which traffic volumes generated would not significantly impact the CMP facility. The proposed Project would not generate traffic volumes that would significantly impact this CMP facility. The proposed Project would not conflict with the Riverside County CMP. No impact would result, and no mitigation is required.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would have no impact related to a conflict with an applicable CMP, including, but not limited to, LOS standards and travel demand measures or other standards established by the Riverside County CMP for designated roads or highways.

Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☐	☒

Discussion

Based on the IS prepared for the 2005 LRDP Amendment 2 EIR, implementation of the 2005 LRDP, as amended, would have no impact related to air traffic patterns. The closest airports to the campus are Flabob Airport, located approximately four miles to the west, and March Joint Air Reserve Base, located approximately six miles to the southeast. The IS concluded development under the 2005 LRDP, as amended, would not increase air traffic levels or result in a change in the location of air traffic patterns resulting in substantial safety risks. Therefore, consistent with the findings of the 2005 LRDP Amendment 2 EIR, there would be no impact from implementation of the proposed Project related to air traffic patterns.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would have no impact related to a change in air traffic patterns.

Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒	☐

Discussion

The analysis of Impacts 4.14-8 through 4.14-10 in the 2005 LRDP Amendment 2 EIR, which addresses transportation hazards, concluded that, with implementation of PP 4.14-4, PP 4.14-5, and PP 4.14-6, development under the 2005 LRDP, as amended, would result in less than significant impacts related to (1) vehicular traffic hazards due to design or land use incompatibilities during long-term operation, (2) vehicular traffic hazards during construction due to closure of traffic lands or roadway segments, or (3) pedestrian hazards during construction due to closure of sidewalks or paths.

<u>Vehicular Hazards during Construction</u>

As discussed under Threshold a, construction activities associated with the proposed Project could result in temporary closure of traffic lanes or roadway segments in the project vicinity to permit the delivery of construction materials; to transport exported soil; to provide adequate site access; or during construction of other project-related features located adjacent to or within roadways adjacent to proposed construction activities (University Avenue, Aberdeen Drive, and North Campus Drive). However, disruption to adjacent roadways is expected to be minimal as the majority of construction activity would occur north of the existing MS&E Building, within the project site.

The temporary reduction of roadway capacity, the narrowing of traffic lanes, and the occasional interruption of traffic flow on streets associated with proposed Project-related construction activities could pose hazards to vehicular traffic due to localized traffic congestion, decreased turning radii, or the condition of roadway surfaces. To minimize traffic disruption and congestion, the proposed Project incorporates PP 4.14-2, which requires coordination of major construction projects on campus, and PP 4.14-5, which requires one travel lane in each direction, to minimize construction traffic impacts to the extent feasible. With implementation of these PPs, construction-related traffic disruptions would be less than significant.

Pedestrian and Bicycle Hazards during Construction

Existing key pedestrian routes near the project area, that can also be used by bicyclists, include the walkway on the north side of the existing MS&E Building; the sidewalk located on the east side of the project site, on Aberdeen Drive; and the pedestrian path located north of Parking Lot 19. Additionally, there are sidewalks and on-street striped bikeways on both sides of University Avenue and Canyon Crest Drive near the proposed construction access driveway at the intersection of these roadways. As discussed in Section II, Project Description, of this IS, during construction, the north side of the existing MS&E Building would remain accessible to pedestrians and bicyclists via an alternate route. Access on the sidewalk along Aberdeen Drive and the pedestrian/bicycle path north of Parking Lot 19 would be maintained throughout the construction period. The sidewalk and on-street bikeway along the east side of Canyon Crest Drive would be disrupted to allow for construction and use of the construction access driveway for the construction route that would extend Parking Lot 19. However, PP 4.14-6 is incorporated into the proposed Project; therefore, alternate pedestrian routes, which also accommodate bicyclists, would be identified to maintain the same travel movement and signage would be installed to facilitate wayfinding. The use of the on-street bikeway would not be precluded during construction and PP 4.14-5, which requires use of flag persons to ensure traffic control during construction, would also ensure that there is safe movement through the construction access area. Therefore, consistent with the findings of the 2005 LRDP Amendment 2 EIR, there would be less than significant impacts related to pedestrian and bicycle hazards during construction.

Vehicular Hazards during Operation

The proposed Project does not include permanent modifications to on-campus or City of Riverside roadways. Adequate vehicle and emergency access to the MS&E Building and the proposed MRB1 would be maintained with proposed Project implementation. As further described in Section II, Project Description, of this IS, the existing fire lane on the north side of the MS&E Building would be realigned, and a new fire lane would be available on the north side of the proposed MRB1. Therefore, implementation of the proposed Project would not increase hazards due to design features or incompatible uses. Consistent with the findings of the 2005 LRDP Amendment 2 EIR, operation of the proposed Project would result in a less than significant impact related to vehicular hazards.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would have a less than significant impact related to a substantial increase in traffic hazards due to a design feature or incompatible uses.

	Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
e)	Result in inadequate emergency access?	☐	☐	☐	☒	☐

Discussion

The analysis of Impacts 4.14-11 and 4.14-12 in the 2005 LRDP Amendment 2 EIR, which addressed emergency access, concluded that construction and operation of development under the 2005 LRDP, as amended, would result in less than significant impacts to emergency access with implementation of PS Transportation 4.

Emergency Access during Construction

Aberdeen Drive and North Campus Drive and the on-site fire lane provide the primary emergency vehicular access to the existing MS&E Building and the project site. Construction activities associated with the proposed Project could result in temporary closure of on-campus traffic lanes or roadway segments in the project vicinity. The reduction of roadway capacity, the narrowing of traffic lanes, and the occasional interruption of traffic flow could impair emergency access. Construction activities would be planned so that emergency access, including from Aberdeen Drive and North Campus Drive, is provided at all times. Fire access within the gated construction area and the north side of the MS&E Building would be maintained. Additionally, the proposed Project incorporates PP 4.14-8, and emergency service agencies would be consulted regarding street closures to ensure adequate access for emergency vehicles during construction. Therefore, consistent with the findings of the 2005 LRDP Amendment 2 EIR, construction of the proposed Project would result in less than significant impacts related to vehicular hazards during construction.

Emergency Access during Operation

Emergency vehicles access the campus via roadways such as the I-215/SR-60 freeways and University Avenue from each of the cardinal directions. Once emergency vehicles are on campus, the internal roadway network is adequate to allow these vehicles to reach their designated locations, including the project site. With implementation of the proposed Project, existing emergency access points would be maintained and a new emergency access would be provided with the proposed fire lane on the north side of the proposed MRB1. The proposed Project does not include permanent modifications to on-campus or City of Riverside roadways. Adequate vehicle and emergency access to the project site would be maintained with proposed Project implementation, including the realigned fire lane along the north side of the existing MS&E Building. Therefore, consistent with the findings of the 2005 LRDP Amendment 2 EIR, there would be less than significant impacts related to emergency access during operation of the proposed Project.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would have a less than significant impact related to emergency access.

	Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
f)	Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☐	☒	☐

Discussion

The analysis of Impact 4.14-13 in the 2005 LRDP Amendment 2 EIR concluded that development under the 2005 LRDP, as amended, would result in less than significant impacts related to demand for public transit with implementation of PS Transportation 1 and PP 4.14-1. As discussed previously, the proposed Project would result in the addition of up to approximately 400 individuals to the on-campus population, and this increase is within the growth projections assumed in the 2005 LRDP, as amended, and analyzed in the 2005 LRDP Amendment 2 EIR.

The increase in population is not expected to result in direct or indirect population growth that would create an additional demand for alternative transportation facilities not anticipated in the 2005 LRDP Amendment 2 EIR. Additionally, the proposed Project incorporates PS Campus and Community 4 (promote campus-wide non-vehicular transportation) and PS Transportation 3 (provide a campus-wide bicycle network to connect to off-campus bicycle routes) by maintaining pedestrian and bicycle access through and surrounding the project site; PS Transportation 5 by providing additional on-site bicycle and skateboard racks/parking; PPs 4.3-1 and 4.14-1 by continuing to implement a TDM program; and MMs 4.14-1(b) and (d) by providing bike racks and showers and maintaining pedestrian and vehicular access through and surrounding the project site. These PSs, PPs, and MMs serve to reduce vehicular trips and encourage public transit among other types of alternative transportation (i.e., walking, biking).

It should also be noted that UCR, partnered with the Riverside Transit Agency (RTA), is currently studying the feasibility of developing a mobility hub[12] at the existing Parking Lot 19, southwest of the project site. The UCR Mobility Hub currently under consideration would allow for multiple RTA buses to stop and layover concurrently, allowing for transit users to have access to multiple routes within a predictable timeframe and enable convenient transfers within a pedestrian-oriented environment. As identified in Section II.5, Proposed Project Components, of this IS, the proposed/preferred construction access for the MRB1 Project would involve construction of a new all-weather roadway extending from University Avenue between Canyon Crest Drive and Parking Lot 19 (refer to Figure 14, Construction Areas). Construction vehicles would use this roadway, pass through Parking Lot 19, to the vehicle access road off of North Campus Drive that leads to the project site. Additionally, Parking Lot 19 would be used for construction worker parking and

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[12] A mobility hub is a place of connectivity where different modes of transportation come together seamlessly and where there is an intensive concentration of activity, such as at a university campus or an urban center.

construction laydown. Should the Mobility Hub project proceed during the timeframe of construction activities for the proposed MRB1; the proposed MRB1 construction activities could be relocated and would not conflict with, or otherwise impede implementation of the Mobility Hub. Notably, a secondary construction access from Parking Lot 25 has been addressed in this Initial Study, and alternative parking solutions on campus are available. It should be noted that implementation of the Mobility Hub at Parking Lot 19 is not part of the proposed Project, is not evaluated in this Initial Study, and would be subject to separate environmental review pursuant to CEQA.

Thus, consistent with the findings of the 2005 LRDP Amendment 2 EIR, the proposed Project would not conflict with adopted policies, plans, or programs that support alternative transportation and would result in a less than significant impact.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would have a less than significant impact related to conflicts with applicable policies, plans, or programs supporting alternative transportation.

17. Utilities and Service Systems

The analysis of utilities and service systems (i.e., water supply, solid waste, wastewater, and energy) is tiered from the 2005 LRDP Amendment 2 EIR and was addressed in Section 4.15, Utilities, of that document. As described previously in Section II, Project Description, of this IS, relevant elements of the proposed Project related to utilities and service systems include construction of the up to 190,000-gsf MRB1, and installation of new landscaping that would increase the demand for water and energy and the generation of solid waste and wastewater within the project area. The proposed Project would be designed to achieve, at a minimum, a LEED Silver rating.

The following applicable PPs were adopted as part of the 2005 LRDP Amendment 2 EIR and are incorporated as part of the proposed Project and assumed in the analysis presented in this section.

PP 4.15-1(a)

Improvements to the campus water distribution system, including necessary pump capacity, will be made as required to serve new projects. Project-specific CEQA analysis of environmental effects that would occur prior to project-specific approval will consider the continued adequacy of the domestic/fire water systems, and no new development would occur without a demonstration that appropriate domestic/fire water supplies continue to be available.

PP 4.15-1(b)

To further reduce the campus' impact on domestic water resources, to the extent feasible, UCR will

(i) Install hot water recirculation devices (to reduce water waste)

(ii) Continue to require all new construction to comply with applicable State laws requiring water-efficient plumbing fixtures, including but not limited to the Health and Safety Code and Title 24, California Code of Regulations, Part 5 (California Plumbing Code)

(iii) Retrofit existing plumbing fixtures that do not meet current standards on a phased basis over time

(iv) Install recovery systems for losses attributable to existing and proposed steam and chilled-water systems

(v) Prohibit using water as a means of cleaning impervious surfaces

(vi) Install water-efficient irrigation equipment to local evaporation rates to maximize water savings for landscaping and retrofit existing systems over time.

(This is identical to Hydrology PP 4.8-2(a)).

PP 4.15-1(c) The Campus shall promptly detect and repair leaks in water and irrigation pipes.

PP 4.15-5 The Campus will continue to comply with all applicable water quality requirements established by the SARWQCB. *(This is identical to Hydrology PP 4.8-1)*.

MM 4.15-6(a) UCR will work with the City of Riverside to evaluate the capacity of existing sewer trunk lines serving the campus and estimate the future impact of LRDP implementation on available capacity.

MM 4.15-6(b) If the study of sewer trunk line capacity determines that available capacity would be exceeded, UCR and the City will negotiate payment of fair share of improvements to provide sufficient discharge capacity to meet campus needs. UCR shall contribute its fair share payments and additional required trunk line capacity shall be provided by the City prior to exceedance of sewer trunk line capacity.

Project Impact Analysis

	Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
a)	Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☐	☒

Discussion

As identified under the analysis of Impact 4.15-3 of the 2005 LRDP Amendment 2 EIR, the UCR Campus does not treat or discharge wastewater to any surface waters. Wastewater generated at the campus is collected and discharged into the City's sewer system from where it is conveyed to the City of Riverside Regional Water Quality Control Plant (RRWQCP) for treatment and disposal. Therefore, the campus is not considered a point-source of water pollution for regulatory purposes and is not subject currently to any Waste Discharge Requirements established by the Santa Ana Regional Water Quality Control Board (RWQCB. Therefore, the proposed Project would not exceed wastewater treatment requirements. No impact would occur, consistent with the findings of the 2005 LRDP Amendment 2 EIR.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed project would have no impact related to exceeding wastewater treatment requirements of the applicable Regional Water Quality Control Board (RWQCB).

	Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
b)	Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒	☐

Discussion

The analysis of Impact 4.15-2 in the 2005 LRDP Amendment 2 EIR concluded there would be a less than significant impact related to construction of new or expanded water treatment facilities with implementation of PP 4.15-1(a) and PP 4.15-1(d). The analysis of Impact 4.15-4 in the 2005 LRDP Amendment 2 EIR concluded there would be a less than significant impact related to construction of new or expanded wastewater conveyance systems with implementation of MM 4.15-4. In addition, the EIR identified that campus development under the amended 2005 LRDP would also be required to follow water conservation policies listed in the UC Sustainability Policy and adhere to goals listed in the water section of the Sustainability Action Plan (SAP).

Water

As identified in Table 4.15-4, Existing and Projected UCR Campus Water Demand, from the 2005 LRDP Amendment 2 EIR, the total water consumption on campus in 2009–2010 was 2.5 million gallons per day (mgd); the entire demand was generated on the East Campus. The projected campus-wide water demand in 2020 is estimated in the 2005 LRDP Amendment 2 EIR at 5.3 mgd, including 3.0 mgd on the East Campus. This represents an estimated increase in water demand associated with the East Campus of 0.5 mgd.

The total water consumption on campus from February 2015 through January 2016 averaged approximately 1.4 mgd (Deal 2016), this represents a reduction of approximately 1.1 mgd compared to conditions in 2009-2010. The proposed Project would result in an increase in the on-campus population by up to approximately 400 individuals, and involves the construction of a new up to 190,000 gsf building. Even with incorporation of PP 4.15-1(b) (implementation of water consumption reduction measures) and PP 4.15-1(c) (ensures that leaks in water and irrigation pipes are repaired), the proposed Project would result in an increase in water consumption of approximately (0.016 mgd), which would represent approximately 3.2 percent of the projected water demand associated with development on the East Campus assumed in the 2005 LRDP, as amended. Therefore, the proposed Project's water consumption would be well within the increase anticipated in the 2005 LRDP Amendment 2 EIR. The proposed Project would also use chilled water for air conditioning. It is estimated that the increased demand for chilled water would be 860 gpm.

The domestic water system at UCR consists of an underground distribution system, a pumping system, storage tanks, and connections to the City of Riverside's municipal water distribution system. The 2005 LRDP Amendment 2 EIR concluded that because the City would be able to provide the necessary water using existing or planned water facilities, implementation of the 2005 LRDP, as amended, would not require the construction of new or expanded water facilities. As required by PP 4.15-1(a), the campus has reviewed the adequacy of the domestic/fire water systems that would serve the proposed Project. As identified in Section II, Project Description, domestic cold water and fire supply would be supplied from the existing eight-inch campus water line located on the north side of the MS&E Building. Chilled water would be provided via a connection to the existing vault located near the western end of the potential future research building site. Existing flow rates are sufficient with existing main sizes and distribution pumps to allow for connection of the proposed Project to the campus water lines. No new or expanded water lines would be necessary beyond those within the project limits to connect the proposed Project to existing lines, including the chilled water line (CO Architects 2016). The impact area for installation of these water lines is within the construction impact limits identified on Figure 14 in Section II, Project Description, and the physical impacts have been addressed in the analysis throughout this IS. Therefore, consistent with the findings of the 2005 LRDP Amendment 2 EIR, this impact would be less than significant.

Wastewater Infrastructure

Wastewater on campus is collected in the sanitary sewer system on campus, which consists of a network of four- six-, and eight-inch-diameter lines owned and maintained by UCR. Wastewater flows from the proposed Project would discharge into a new sewer lateral to a new force main that would extend to the City's 15-inch sewer line in North Campus Drive (refer to Figure 14 in Section II, Project Description).

A Sanitary Sewer Analysis Study (Sewer Study) for the North Campus Drive sewer line was completed for the proposed Project to determine if the existing lines have sufficient capacity to accommodate the anticipated increase in wastewater generated by the proposed Project (DBA 2015). To determine existing sewer flows, flow monitoring was performed in the existing system. This data was then analyzed to determine the peak and average contribution of wastewater from the proposed Project that could be accommodated by the existing sewer system.

Based on the Sewer Study, there is a maximum system capacity of 1.44 million gallons per day (mgd) flowing ½ full and 2.61 mgd flowing ¾ full. Given the most conservative of values (½ full pipe flow) and a peaking factor of 2.55 it has been determined the proposed MRB1 can contribute a peak of 0.603 mgd, or an average of 0.236 mgd, of sewer effluent to the system without exceeding the current sanitary sewer systems capacity. The additional flow that is projected to be added to the line from the proposed Project is approximately 0.032 mgd (Ho 2016). The project flows are below the amount that can be contributed without exceeding the capacity of the sewer line, and no new or upgraded sewer lines would be required.

The proposed Project's increase in on-campus population was assumed in the 2005 LRDP, as amended. Therefore, the proposed Project's wastewater generation would be within the increase anticipated with buildout of the 2005 LRDP, as amended, and there is sufficient remaining capacity in the sewer lines serving the East Campus. No new or expanded sewer laterals or main lines would be necessary with proposed Project implementation beyond the sewer line/force main within the project area to connect the proposed Project to the existing sewer line. The impact area for installation of these sewer lines is within the construction impact limits identified on Figure 4 in Section II, Project Description, and the physical impacts have been addressed in the analysis throughout this IS. Therefore, consistent with the findings of the 2005 LRDP Amendment 2 EIR, this impact would be less than significant.

Consistent with the findings of the 2005 LRDP Amendment 2 EIR, there would be less than significant impacts related to wastewater infrastructure or wastewater treatment facility capacity. In addition, because wastewater generation is correlated with water usage, continued water conservation practices would reduce the volume of wastewater generated. Continued implementation of PPs 4.15-1(b) and 4.15-1(c), which emphasize a variety of water conservation practices, would further reduce wastewater generation and utilization of sewer line capacity.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would not require construction of new wastewater treatment facilities beyond the installation of new lines to connect to the proposed Project; the physical limits of utility construction are within the impact area addressed throughout this IS. The proposed Project would have a less than significant impact related to the capacity of existing wastewater systems.

Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒	☐

Discussion

Please refer to the analysis of drainage provided under Section V.9, Hydrology and Water Quality, of this IS. 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, consistent with the findings of the 2005 LRDP Amendment 2 EIR.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

There is a less than significant impact related to the need for new or expanded storm drainage facilities beyond the installation of new storm waste management facilities to serve the proposed Project. The physical limits of construction are within the impact area addressed throughout this IS.

Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☒	☐

Discussion

The analysis of Impact 4.15-1 in the 2005 LRDP Amendment 2 EIR concluded there would be a less than significant impact related to water supply with implementation of PP 4.15-1(a) through PP 4.15-1(d). In addition, the EIR identified that campus development under the amended 2005 LRDP would also be required to follow water conservation policies listed in the UC Sustainability Policy; adhere to goals listed in the water section of the SAP; and comply with any future conservation goals or programs enacted by the UC.

As described in the 2005 LRDP Amendment 2 EIR, the City of Riverside Public Utilities Department (RPU) supplies domestic water to UCR. RPU's water supply consists primarily of groundwater, with additional sources, including recycled water and imported water. UCR also has rights to potable water in the Gage Canal. All existing and planned water supply entitlements, water rights, and/or water service contracts that may be used to serve development associated with the 2005 LRDP, as amended, are set forth in the current City of Riverside Urban Water Management Plan (UWMP), prepared by the RPU in 2010 (2010 UWMP). As stated in the 2005 LRDP Amendment 2 EIR, the RPU has indicated that it does not anticipate any problems in providing adequate water supply to remaining and new development on the UCR campus, of which the project is a part. The 2010 UWMP identifies adequate potable water supplies to meet future demands (through 2035) within the RPU's water supply service area, which includes the UCR campus, under normal weather conditions. Specifically, the 2010 UWMP projects surplus water supplies under all scenarios, including multiple dry years, and the EIR prepared for the City of Riverside 2025 General Plan in 2007 confirms the supply surplus assessment (City of Riverside 2007). The RPU website indicates that the 2015 UWMP was scheduled for completion and adoption by December 31, 2015, consistent with State law. However, an updated UWMP is not yet publicly available (RPU 2016).

On April 1, 2015, in response to historically dry conditions, the Governor signed Executive Order B-29-15 (Governor's Executive Order) which required a 25 percent reduction in urban potable water use throughout the State of California through February 28, 2016. The RPU and UCR have implemented various water conservation measures to comply with these requirements. As discussed above, UCR's water consumption has decreased from approximately 2.5 mgd in 2009-2010, to approximately 1.4 mgd under existing conditions.

The 2005 LRDP Amendment 2 EIR concluded there would be adequate water supplies for implementation of the 2005 LRDP, as amended, with implementation of PP 4.15-1(a) through PP 4.15-1(d). Therefore, because the proposed Project is within the assumed remaining development for the East Campus under the 2005 LRDP, as amended, the estimated increase in water demand of 0.016 mgd would also be met with existing entitlements and resources and would not result in the need for new or expanded entitlements with continued implementation of the identified PPs. Consistent with the findings of the 2005 LRDP Amendment 2 EIR, there would be a less than significant impact related to water supply, and no mitigation is required.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

There are adequate water supplies to serve the proposed Project, resulting in a less than significant impact.

Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
e) Result in a determination by the wastewater treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒	☐

Discussion

The analysis of Impact 4.15-3 in the 2005 LRDP Amendment 2 EIR concluded there would be a less than significant impact related to construction of new or expanded wastewater treatment facilities with implementation of PP 4.15-5 and MM 4.15-3. As identified in the 2005 LRDP Amendment 2 EIR, the Sewerage Systems Services Program and its Treatment Services unit, administered by the RPU, collects, treats, and disposes of all wastewater generated within the City of Riverside and is responsible for compliance with State and federal requirements governing the treatment and discharge of all domestic and industrial wastewater generated in its service area, including the UCR campus. The RRWQCP provides treatment of all campus-generated wastewater, with UCR operating its own collection system that connects to the City's system. The RRWQCP currently treats 33 mgd and has a capacity of 40 mgd. The plant is currently being expanded and will have a capacity of 46 mgd (City of Riverside 2016). The City's Integrated Wastewater Master Plan (IWWMP) addresses facility needs for projected wastewater influent flow through the year 2025 and identifies improvements that would increase the capacity of the RRWQCP up to 52.2 mgd, although at this time the City is increasing the treatment capacity of the RRWQCP to 46 mgd (UCR 2011b).

The 2005 LRDP Amendment 2 EIR also determined that implementation of the 2005 LRDP, as amended, would not generate a volume of wastewater that would exceed the capacity of the RRWQCP wastewater treatment system in combination with the provider's existing service commitments. Because the proposed Project is within the remaining development allocation assumed for the campus in the 2005 LRDP Amendment 2 EIR, the wastewater generated would also be accommodated by the RRWQCP. The addition of approximately 0.032 mgd could be adequately treated at this facility. Consistent with the findings of the 2005 LRDP Amendment 2 EIR, this impact would be less than significant.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would not generate wastewater that exceeds the capacity of the wastewater treatment facilities resulting in a less than significant impact.

	Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
f)	Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☐	☒	☐
g)	Comply with applicable federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒	☐

Discussion

The analysis of Impact 4.15-6 in the 2005 LRDP Amendment 2 EIR concluded there would be a less than significant impact related to landfill capacity. The analysis of Impact 4.15-7 in the 2005 LRDP Amendment 2 EIR concluded there would be a less than significant impact related to compliance with applicable federal, State, and local solid waste-related statutes and regulations. It should also be noted that further reduction in solid waste generation would occur with implementation of the UC Policy on Sustainable Practices.

The City of Riverside Solid Waste Division is responsible for the collection and handling of residential refuse, recycling, and green waste (compostable organic waste) generated within the City of Riverside. The Robert A. Nelson Transfer Station, located at 1830 Agua Mansa Road, receives refuse from western Riverside County, including the UCR campus. The transfer station is owned by the Riverside County Waste Management Department and operated by Burrtec Waste Industries. The transfer station has a capacity to transfer up to 4,000 tons of solid waste per day and is currently processing approximately 2,000 tons of solid waste per day (Mitchell 2016). The operations division of the Riverside County Waste Management Department receives, compacts, and buries refuse received at the various landfill sites at several locations in the County (UCR 2011b).

On the UCR campus, trash is collected and placed in containers located throughout the campus. As further discussed below, approximately 95 percent of the general solid waste stream is diverted, recycled, or reused. The Riverside County Department of Waste Resources (RCDWR) is responsible for the landfilling of non-hazardous county waste. In this effort the Department operates six landfills, has a contract agreement for waste disposal with an additional private landfill, and administers several transfer station leases (RCDWR 2016). These facilities are regulated at the federal, State, and local levels and monitored for compliance.

The 2005 LRDP Amendment 2 EIR assumed an annual generation factor of 0.675 ton of solid waste per 1,000 square feet of building space on campus. This factor was developed by comparing the existing occupied building space to existing generation of solid waste at the time of preparation of the EIR. Based on the identified solid waste generation factor, the proposed up to 190,000-sf MRB1 would generate approximately 128.25 tons per year of solid waste, which is approximately 3.60 percent of the total projected solid waste generation for the development remaining on campus under the 2005 LRDP, as amended, not including the SOM (3,544 tons per year). However, as discussed above, approximately 95 percent of solid waste stream on campus is diverted, recycled, or reused, consistent with the requirements of the California Integrated Waste Management Act. Therefore, the proposed Project would generate approximately 6.4 tons per year of solid waste after implementation of solid waste diversion efforts.

As discussed in the 2005 LRDP Amendment 2 EIR, it is anticipated that solid waste from UCR would continue to be disposed at the Badlands Landfill, in the City of Moreno Valley, which has an estimated capacity of approximately 9 million tons. Based on the current permit, the landfill is expected to close in 2024. The Badlands Landfill receives approximately 1,667 tons per day (tpd) but is permitted for a maximum of 4,000 tpd. The approximately 45.6 tons of solid waste per year from the proposed Project (0.12 tpd) would equate to approximately 0.003 percent of the landfill's permitted daily capacity of 4,000.00 tpd and approximately 0.005 percent of the remaining daily capacity of 2,333.0 tons. Therefore, the anticipated solid waste generation from the proposed Project can be accommodated within the remaining permitted capacity of the Badlands landfill, and there would be a less than significant impact related to solid waste disposal, consistent with the findings of the 2005 LRDP Amendment 2 EIR.

In compliance with the UC Sustainable Practices Policy, the UCR campus is committed to achieving 100 percent waste diversion from landfills by 2020. As discussed above, to accomplish this, 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 Lot 30. UCR collects the recyclables and waste on campus and delivers these materials to the transfer station for hauling. Athens Services picks up the recyclable material for recycling. UCR delivers waste, in UCR haul trucks, to the Nelson Transfer Station from which Burrtec then transports 100 percent of the non-recyclable material to a waste-to-energy facility (Ishida 2016). The campus composts all green wastes on campus. In addition, the campus is carrying out a shift in its procurement practices toward recyclable, second generation, or reusable products to the extent feasible. Therefore, consistent with the findings of the 2005 LRDP Amendment 2 EIR, there would be a less than significant impact related to solid waste statutes and regulations.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would have a less than significant impact related to (1) landfill capacity and solid waste disposal and (2) compliance with applicable federal, State, and local statutes and regulations related to solid waste.

	Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
h)	Create other utility and service system impacts?	☐	☐	☐	☒	☐

Discussion

The analysis of Impacts 4.15-8 through 4.15-10 in the 2005 LRDP Amendment 2 EIR concluded there would be a less than significant impact related to the need to construct new or expanded energy (electricity and natural gas) production or transmission facilities or to the inefficient use of energy.

Electricity

As identified in the 2005 LRDP Amendment 2 EIR, the RPU provides electricity to the UCR campus. The campus uses approximately 109 million kilowatt hour (kWh) of electricity annually. The energy is received through a 69 kilovolt (kV) line at a substation west of the Interstate (I) 215/State Route (SR) 60 freeway. From this point, the power is reduced to a usable voltage and distributed to individual buildings and transformers. UCR is in the process of transitioning the East Campus to 12 kV distribution lines and transformers; portions of the East Campus are currently operating under a 5kV system.

The 2005 LRDP Amendment 2 EIR concluded that the peak power demands on campus are 25.5 MVA (megavolt amps), and the total campus development under the 2005 LRDP, as amended, would demand 49 MVA, which is an increase of 23.5 MVA over existing conditions at the time. The total capacity of the existing 12 kV substation is 54 MVA, so the 2005 LRDP Amendment 2 EIR concluded that the existing campus electrical distribution system would be able to accommodate the anticipated demand of development under the 2005 LRDP, as amended, of which the proposed Project is a part. Additionally, it was concluded that the RPU would have adequate infrastructure to serve the remaining and new development on campus.

The proposed Project is estimated to generate an electric demand of 2,150 kVa (kilovolt amps), or 2.15 MVA, which would be approximately 9.1 percent of the increased electric demand anticipated with the remaining development under the 2005 LRDP, as amended, and approximately 4.0 percent of the remaining capacity of the existing 12 kV substation serving the campus. It should also be noted that campus development under the 2005 LRDP, as amended, would be required to follow energy conservation policies listed in the UC Sustainability Policy, minimize energy use in order for the campus to attain the GHG reduction goals listed in the campus CAP and comply with any future conservation goals or programs enacted by the UC. Therefore, the electric demand of the proposed Project has been calculated taking these requirements into consideration.

As described in Section II, Project Description, electricity would be supplied to the proposed Project via a connection to the existing electric service manhole located near the western end of the potential future research building site. A new transformer would be installed, and electric lines would be extended to the northwest corner of the proposed MRB1. The installation of electric lines would be within the construction impact footprint for the proposed Project. Therefore, the potential environmental impacts from construction of the new and replacement electrical facilities are addressed as part of the proposed Project analysis provided throughout this IS.

Therefore, consistent with the findings of the 2005 LRDP Amendment 2 EIR, there would be a less than significant impact related to construction of new or expanded electrical infrastructure or the inefficient use of energy.

Natural Gas

As identified in the 2005 LRDP Amendment 2 EIR, UCR uses natural gas for heating and some cooling needs for research and instructional lab purposes. Natural gas is provided to the East Campus by SoCalGas. The 2005 LRDP Amendment 2 EIR concluded that the total campus development under the 2005 LRDP, as amended, would demand 45,458 therms per day, which is an increase of 31,700 therms per day over existing conditions at the time. SoCalGas has indicated that it could provide gas service to the campus to accommodate future development under the 2005 LRDP, as amended.

Demand for natural gas on campus is currently approximately 8,964 therms per day (Deal 2015). A high-pressure gas distribution system owned and maintained by SoCalGas provides natural gas to the Central Utility Plant, as well as many individual buildings on campus. Separate SoCalGas gas mains also enter the campus to serve the residence halls in addition to the Canyon Crest Family Student Housing area. Natural gas at the project site would be utilized to serve domestic water heating and in the laboratories at low pressure. The proposed Project is estimated to generate a natural gas demand of 14 therms per day, which would be approximately 0.04 percent of the increased natural gas demand anticipated with the remaining development under the 2005 LRDP, as amended. It should also be noted that campus development under the 2005 LRDP, as amended, would be required to follow energy conservation policies listed in the UC Sustainability Policy; minimize energy use in order for the campus to attain the GHG reduction goals listed in the campus CAP; and comply with any future conservation goals or programs enacted by the UC. Therefore, the natural demand of the proposed Project has been calculated taking these requirements into consideration.

Natural gas would be supplied to the proposed Project via a connection to an existing two-inch, five psi line within the western and northern portions of the potential future research building site. The installation of natural gas lines within the project site and connections to the existing line would be within the construction impact footprint for the proposed Project. Therefore, the potential environmental impacts from construction of the new and replacement natural gas facilities are addressed as part of the proposed Project analysis provided throughout this IS.

Therefore, consistent with the findings of the 2005 LRDP Amendment 2 EIR, there would be a less than significant impact related to construction of new or expanded natural gas infrastructure or the inefficient use of natural gas or energy.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would have a less than significant impact related to provision of electricity and natural gas to the project site or the inefficient use of energy.

18. Mandatory Findings of Significance

Project Impact Analysis

Threshold(s)	Potentially Significant Impact	Project Impact Adequately Addressed in LRDP EIR	Less Than Significant With Project-Level Mitigation Incorporated	Less Than Significant Impact	No Impact
MANDATORY FINDINGS OF SIGNIFICANCE – The lead agency shall find that a project may have a significant effect on the environment and thereby require an EIR to be prepared for the project where there is substantial evidence, in light of the whole record, that any of the following conditions may occur. Where prior to commencement of the environmental analysis a project proponent agrees to mitigation measures or project modifications that would avoid any significant effect on the environment or would mitigate the significant environmental effect, a lead agency need not prepare an EIR solely because without mitigation the environmental effects would have been significant (per Section 15065 of the State CEQA Guidelines):					
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☐	☒	☐

Discussion

As discussed in Section V.4, Biological Resources, the proposed Project would have no potential to impact special status plant and wildlife species or sensitive habitats and wildlife corridors. The proposed Project incorporates PS Open Space 3 (preserve natural resources, including trees, where feasible, in Naturalistic Open Space areas), MM 4.4-4(a) (surveys for nesting bird and raptor species prior to construction), and MM 4.3-1(b) (protection of active nests during construction) from the 2005 LRDP Amendment 2 EIR, and as a result would have a less than significant impact on nesting species. The proposed Project also includes tree retention and replacement to ensure a less than significant impact related to removal of trees. Therefore the potential for the proposed Project to degrade the quality of the environment related to biological resources would result in a less than significant impact.

As discussed under Section V.5, Cultural Resources, there are no historic resources within or adjacent to the project area. Therefore, the proposed Project would not have any impacts on historical resources. The proposed Project would require excavation in native soils and because it incorporates PP 4.5-4 (include instructions for addressing uncovered paleontological resources in the construction specifications) and PP 4.5-5 (instruction for discovery of a human remains) from the 2005 LRDP EIR, and project-specific MM MRB1 Cult-1 (protection of buried resources), there would be a less than significant impact related to the potential to eliminate important examples of the major periods of California history or prehistory.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project has a less than significant impact related to the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or Endangered plant or animal or eliminate important examples of the major periods of California history or prehistory.

Threshold(s)	**Potentially Significant Impact**	**Project Impact Adequately Addressed in LRDP EIR**	**Less Than Significant With Project-Level Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of past, present and probable future projects)?	☐	☐	☐	☒	☐

Discussion

The proposed Project involves construction of the up to 190,000-gsf MRB1

As identified through the analysis presented in this Initial Study, with the exception of construction-related vibration, the proposed Project would not result in significant environmental impacts during construction or operation with continued implementation of applicable PSs, PPs, and MMs (identified for each environmental topic analyzed above in Sections V.1 through V.17 of this IS). Potential cumulative construction impacts related to air quality and traffic have been addressed in Section V.3 and V.15 of this IS, respectively, and are determined to be less than significant. The potential for vibration impacts to the MS&E Building would be project-specific as vibration from individual construction sites would not affect the same receptors; therefore, no cumulative vibration impacts would result.

Additional Project-Level Mitigation Measures

None required.

Level of Significance

The proposed Project would have less than significant cumulatively considerable impacts.

Threshold(s)	**Potentially Significant Impact**	**Project Impact Adequately Addressed in LRDP EIR**	**Less Than Significant With Project-Level Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☒	☐	☐	☐

Discussion

As indicated in the analysis presented in this Initial Study, with the exception of short-term construction-related vibration impacts, implementation of the proposed Project would not result in significant impacts that could degrade the quality of the environment or cause substantial adverse effects on human beings, either directly or indirectly.

Even with the incorporation of identified PPs, the proposed Project construction activities would result in significant short-term construction-related vibration impacts due to construction activities adjacent the MS&E Building, which contains vibration sensitive equipment. This impact is significant and unavoidable, consistent with the findings of the 2005 LRDP EIR, as amended (Impact 4.10-2).

The proposed Project would not result in new or more significant impacts than addressed and disclosed in the 2005 LRDP EIR and 2005 Amendment 2 LRDP EIR with continued implementation of applicable PPs, and MMs (identified for each environmental topic analyzed above in Sections V.1 through V.17 of this IS) from the Mitigation Monitoring and Reporting Program (MMRP) adopted as part of the 2005 LRDP EIR and the 2005 Amendment 2 LRDP EIR.

Additional Project-Level Mitigation Measures

There are no mitigation measures that would further reduce the construction-related vibration impact to on campus uses (the adjacent MS&E Building) beyond those adopted as part of the 2005 LRDP EIR and 2005 LRDP Amendment 2 EIR, and incorporated into the proposed Project. For other topical issues, no project-specific mitigation is required.

Level of Significance

The proposed Project would result in significant and unavoidable construction-related vibration impacts (consistent with the analysis presented in the 2005 LRDP EIR and 2005 LRDP Amendment 2 EIR). These impacts were adequately addressed in the 2005 LRDP EIR and 2005 LRDP Amendment 2 EIR. A Statement of Overriding Considerations was adopted by the Board of Regents of the University of California as part of the approval of the 2005 LRDP, as amended, for the significant and unavoidable construction-related vibration impacts resulting from implementation of the remaining development on the East Campus under the 2005 LRDP, as amended, of which the proposed Project is a part.

Fish and Game Determination

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

___ Yes (No Effect)

_x_ No (Pay fee)

VI. SUPPORTING INFORMATION SOURCES

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Appendix A

Air Quality and Greenhouse Gas Emissions Calculations

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Research & Development	190.00	1000sqft	0.70	190,000.00	400
Other Non-Asphalt Surfaces	25.00	1000sqft	0.57	25,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.4	**Precipitation Freq (Days)**	28
Climate Zone	10			**Operational Year**	2018
Utility Company	Riverside Public Utilities				
CO2 Intensity (lb/MWhr)	850	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Riverside IF updated

Land Use - Per PD

Construction Phase - Based on Data Needs and assumptions:
demo: 8/1/16-8/14/16
grading: 8/15/16-10/14/16
Underground: 10/15/16-12/14/16
Off-road Equipment - defaults

Off-road Equipment - Per data needs- 1 crane, 2 forklifts, 1 loader, 1 welder, 1 air compressor.

Off-road Equipment - Defaults for Demo

Off-road Equipment - defaults

Off-road Equipment - 1 cement mixer, 1 paver, 1 roller.

Off-road Equipment - 1 trencher- per judgement.

Trips and VMT - Defaults

Demolition - based on manual calcs for 12,000 sf area of pavement with 7.5 in thickness

Grading - total acres graded- default

Architectural Coating - Manual calculations based on 190,000 sf building.

Vehicle Trips - ADT: 1217 weekday

Area Coating - Manual calcs based on 190,000 sf building.

Energy Use - .

Construction Off-road Equipment Mitigation - All Tier 3 off-road diesel

Mobile Land Use Mitigation -

Area Mitigation - x

Energy Mitigation - Exceed Title 24 2013 code by 20%

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Nonresidential_Exterior	84,750.00	95,000.00
tblArchitecturalCoating	ConstArea_Nonresidential_Interior	254,250.00	285,000.00
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	150.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	100.00
tblAreaCoating	Area_EF_Nonresidential_Exterior	250	150
tblAreaCoating	Area_EF_Nonresidential_Interior	250	100
tblAreaCoating	Area_Nonresidential_Exterior	84750	95000
tblAreaCoating	Area_Nonresidential_Interior	254250	285000
tblAreaMitigation	UseLowVOCPaintNonresidentialExteriorValue	150	250
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
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tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
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tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
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tblConstEquipMitigation	Tier	No Change	Tier 3
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tblConstEquipMitigation	Tier	No Change	Tier 3
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tblConstructionPhase	NumDays	200.00	429.00
tblConstructionPhase	NumDays	20.00	10.00
tblConstructionPhase	NumDays	4.00	45.00
tblConstructionPhase	NumDays	10.00	5.00
tblGrading	MaterialExported	0.00	4,000.00
tblLandUse	LotAcreage	4.36	0.70
tblLandUse	Population	0.00	400.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Building Construction
tblOffRoadEquipment	PhaseName		Underground Infrastructure
tblProjectCharacteristics	CO2IntensityFactor	1325.65	850
tblProjectCharacteristics	OperationalYear	2014	2018
tblVehicleTrips	ST_TR	1.90	1.50
tblVehicleTrips	SU_TR	1.11	0.87
tblVehicleTrips	WD_TR	8.11	6.40

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2016	3.0086	29.2833	22.7845	0.0286	5.2089	1.7625	6.4041	2.6041	1.6492	3.7038			2,869.6743	0.6366	0.0000	2,883.0435
2017	2.3760	17.8714	15.2325	0.0281	0.8021	1.0589	1.8610	0.2163	1.0029	1.2192			2,610.5868	0.3906	0.0000	2,618.7883
2018	58.6092	15.9095	14.4974	0.0280	0.8021	0.9017	1.7038	0.2163	0.8547	1.0710			2,565.0865	0.3795	0.0000	2,573.0553
Total	**63.9939**	**63.0643**	**52.5144**	**0.0847**	**6.8131**	**3.7230**	**9.9689**	**3.0368**	**3.5068**	**5.9940**			**8,045.3476**	**1.4067**	**0.0000**	**8,074.8872**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2016	0.8394	13.2597	16.8487	0.0286	2.4998	0.7411	2.8851	1.2141	0.7396	1.5951			2,869.6743	0.6366	0.0000	2,883.0435
2017	0.7947	10.5271	14.7858	0.0281	0.8021	0.5319	1.3340	0.2163	0.5283	0.7446			2,610.5868	0.3906	0.0000	2,618.7883
2018	58.3700	10.3164	14.4393	0.0280	0.8021	0.5295	1.3315	0.2163	0.5261	0.7424			2,565.0865	0.3795	0.0000	2,573.0553
Total	**60.0041**	**34.1032**	**46.0738**	**0.0847**	**4.1040**	**1.8024**	**5.5506**	**1.6467**	**1.7940**	**3.0820**			**8,045.3476**	**1.4067**	**0.0000**	**8,074.8871**

	ROG	**NOx**	**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	**6.23**	**45.92**	**12.26**	**0.00**	**39.76**	**51.59**	**44.32**	**45.77**	**48.84**	**48.58**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	4.8020	2.1000e-004	0.0223	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005			0.0471	1.3000e-004		0.0498
Energy	0.1869	1.6989	1.4271	0.0102		0.1291	0.1291		0.1291	0.1291			2,038.7107	0.0391	0.0374	2,051.1180
Mobile	3.9503	13.1447	41.9610	0.1199	8.7061	0.1978	8.9039	2.3234	0.1821	2.5056			9,902.7714	0.3141		9,909.3673
Total	**8.9391**	**14.8438**	**43.4104**	**0.1301**	**8.7061**	**0.3270**	**9.0331**	**2.3234**	**0.3113**	**2.6348**			**11,941.5291**	**0.3533**	**0.0374**	**11,960.5350**

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	4.8020	2.1000e-004	0.0223	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005			0.0471	1.3000e-004		0.0498
Energy	0.1470	1.3361	1.1223	8.0200e-003		0.1015	0.1015		0.1015	0.1015			1,603.2632	0.0307	0.0294	1,613.0204
Mobile	3.9503	13.1447	41.9610	0.1199	8.7061	0.1978	8.9039	2.3234	0.1821	2.5056			9,902.7714	0.3141		9,909.3673
Total	**8.8992**	**14.4809**	**43.1056**	**0.1279**	**8.7061**	**0.2994**	**9.0055**	**2.3234**	**0.2838**	**2.6072**			**11,506.0816**	**0.3450**	**0.0294**	**11,522.4374**

	ROG	**NOx**	**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	**0.45**	**2.44**	**0.70**	**1.67**	**0.00**	**8.44**	**0.31**	**0.00**	**8.86**	**1.05**	**0.00**	**0.00**	**3.65**	**2.36**	**21.38**	**3.66**

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	8/1/2016	8/12/2016	5	10	
2	Grading	Grading	8/13/2016	10/14/2016	5	45	
3	Underground Infrastructure	Trenching	10/15/2016	12/14/2016	5	43	
4	Paving	Paving	12/15/2016	12/21/2016	5	5	
5	Building Construction	Building Construction	12/22/2016	8/14/2018	5	429	
6	Architectural Coating	Architectural Coating	8/15/2018	10/1/2018	5	34	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 16.88

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 285,000; Non-Residential Outdoor: 95,000 (Architectural Coating –

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	8.00	255	0.40
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Grading	Graders	1	6.00	174	0.41
Grading	Rubber Tired Dozers	1	6.00	255	0.40
Grading	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Underground Infrastructure	Trenchers	1	8.00	80	0.50
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	6.00	125	0.42
Paving	Paving Equipment	0	8.00	130	0.36
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Building Construction	Air Compressors	1	8.00	78	0.48
Building Construction	Cranes	1	6.00	226	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Building Construction	Generator Sets	0	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	5	13.00	0.00	35.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	8.00	0.00	500.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Underground Infrastructure	1	3.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	3	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	6	56.00	28.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	11.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Clean Paved Roads

3.2 Demolition - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.7536	0.0000	0.7536	0.1141	0.0000	0.1141			0.0000			0.0000
Off-Road	2.9066	28.2579	21.4980	0.0245		1.7445	1.7445		1.6328	1.6328			2,487.1296	0.6288		2,500.3343
Total	**2.9066**	**28.2579**	**21.4980**	**0.0245**	**0.7536**	**1.7445**	**2.4981**	**0.1141**	**1.6328**	**1.7469**			**2,487.1296**	**0.6288**		**2,500.3343**

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	0.0546	0.9628	0.6513	2.4900e-003	0.0611	0.0170	0.0781	0.0167	0.0157	0.0324			250.7264	1.6100e-003		250.7603
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
Worker	0.0475	0.0627	0.6352	1.5900e-003	0.1453	9.1000e-004	0.1462	0.0385	8.4000e-004	0.0394			131.8183	6.2200e-003		131.9490
Total	**0.1021**	**1.0254**	**1.2865**	**4.0800e-003**	**0.2064**	**0.0179**	**0.2243**	**0.0553**	**0.0165**	**0.0717**			**382.5447**	**7.8300e-003**		**382.7092**

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					0.3391	0.0000	0.3391	0.0513	0.0000	0.0513			0.0000			0.0000
Off-Road	0.5689	12.2343	15.5622	0.0245		0.7231	0.7231		0.7231	0.7231			2,487.1296	0.6288		2,500.3343
Total	**0.5689**	**12.2343**	**15.5622**	**0.0245**	**0.3391**	**0.7231**	**1.0623**	**0.0513**	**0.7231**	**0.7745**			**2,487.1296**	**0.6288**		**2,500.3343**

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	0.0546	0.9628	0.6513	2.4900e-003	0.0611	0.0170	0.0781	0.0167	0.0157	0.0324			250.7264	1.6100e-003		250.7603
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
Worker	0.0475	0.0627	0.6352	1.5900e-003	0.1453	9.1000e-004	0.1462	0.0385	8.4000e-004	0.0394			131.8183	6.2200e-003		131.9490
Total	**0.1021**	**1.0254**	**1.2865**	**4.0800e-003**	**0.2064**	**0.0179**	**0.2243**	**0.0553**	**0.0165**	**0.0717**			**382.5447**	**7.8300e-003**		**382.7092**

3.3 Grading - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.9256	0.0000	4.9256	2.5273	0.0000	2.5273			0.0000			0.0000
Off-Road	1.9908	21.0361	13.6704	0.0141		1.1407	1.1407		1.0494	1.0494			1,462.8468	0.4413		1,472.1130
Total	**1.9908**	**21.0361**	**13.6704**	**0.0141**	**4.9256**	**1.1407**	**6.0663**	**2.5273**	**1.0494**	**3.5768**			**1,462.8468**	**0.4413**		**1,472.1130**

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	0.1732	3.0564	2.0675	7.8900e-003	0.1938	0.0540	0.2478	0.0531	0.0497	0.1028			795.9569	5.1200e-003		796.0644
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
Worker	0.0292	0.0386	0.3909	9.8000e-004	0.0894	5.6000e-004	0.0900	0.0237	5.1000e-004	0.0242			81.1190	3.8300e-003		81.1994
Total	**0.2024**	**3.0950**	**2.4584**	**8.8700e-003**	**0.2832**	**0.0546**	**0.3378**	**0.0768**	**0.0502**	**0.1270**			**877.0758**	**8.9500e-003**		**877.2637**

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					2.2165	0.0000	2.2165	1.1373	0.0000	1.1373			0.0000			0.0000
Off-Road	0.3416	6.8371	9.0489	0.0141		0.3308	0.3308		0.3308	0.3308			1,462.8468	0.4413		1,472.1130
Total	**0.3416**	**6.8371**	**9.0489**	**0.0141**	**2.2165**	**0.3308**	**2.5473**	**1.1373**	**0.3308**	**1.4681**			**1,462.8468**	**0.4413**		**1,472.1130**

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	0.1732	3.0564	2.0675	7.8900e-003	0.1938	0.0540	0.2478	0.0531	0.0497	0.1028			795.9569	5.1200e-003		796.0644
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
Worker	0.0292	0.0386	0.3909	9.8000e-004	0.0894	5.6000e-004	0.0900	0.0237	5.1000e-004	0.0242			81.1190	3.8300e-003		81.1994
Total	**0.2024**	**3.0950**	**2.4584**	**8.8700e-003**	**0.2832**	**0.0546**	**0.3378**	**0.0768**	**0.0502**	**0.1270**			**877.0758**	**8.9500e-003**		**877.2637**

3.4 Underground Infrastructure - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5559	4.8694	2.8136	3.4600e-003		0.3819	0.3819		0.3514	0.3514			359.7258	0.1085		362.0044
Total	**0.5559**	**4.8694**	**2.8136**	**3.4600e-003**		**0.3819**	**0.3819**		**0.3514**	**0.3514**			**359.7258**	**0.1085**		**362.0044**

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
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
Worker	0.0110	0.0145	0.1466	3.7000e-004	0.0335	2.1000e-004	0.0337	8.8900e-003	1.9000e-004	9.0900e-003			30.4196	1.4400e-003		30.4498
Total	**0.0110**	**0.0145**	**0.1466**	**3.7000e-004**	**0.0335**	**2.1000e-004**	**0.0337**	**8.8900e-003**	**1.9000e-004**	**9.0900e-003**			**30.4196**	**1.4400e-003**		**30.4498**

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	0.0847	1.9330	2.6103	3.4600e-003		0.1355	0.1355		0.1355	0.1355			359.7258	0.1085		362.0044
Total	**0.0847**	**1.9330**	**2.6103**	**3.4600e-003**		**0.1355**	**0.1355**		**0.1355**	**0.1355**			**359.7258**	**0.1085**		**362.0044**

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
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
Worker	0.0110	0.0145	0.1466	3.7000e-004	0.0335	2.1000e-004	0.0337	8.8900e-003	1.9000e-004	9.0900e-003			30.4196	1.4400e-003		30.4498
Total	**0.0110**	**0.0145**	**0.1466**	**3.7000e-004**	**0.0335**	**2.1000e-004**	**0.0337**	**8.8900e-003**	**1.9000e-004**	**9.0900e-003**			**30.4196**	**1.4400e-003**		**30.4498**

3.5 Paving - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6397	6.3853	4.1322	6.2100e-003		0.3799	0.3799		0.3504	0.3504			628.0754	0.1820		631.8964
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.6397**	**6.3853**	**4.1322**	**6.2100e-003**		**0.3799**	**0.3799**		**0.3504**	**0.3504**			**628.0754**	**0.1820**		**631.8964**

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
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
Worker	0.0292	0.0386	0.3909	9.8000e-004	0.0894	5.6000e-004	0.0900	0.0237	5.1000e-004	0.0242			81.1190	3.8300e-003		81.1994
Total	**0.0292**	**0.0386**	**0.3909**	**9.8000e-004**	**0.0894**	**5.6000e-004**	**0.0900**	**0.0237**	**5.1000e-004**	**0.0242**			**81.1190**	**3.8300e-003**		**81.1994**

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	0.1396	2.8966	4.3053	6.2100e-003		0.1679	0.1679		0.1679	0.1679			628.0754	0.1820		631.8964
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.1396**	**2.8966**	**4.3053**	**6.2100e-003**		**0.1679**	**0.1679**		**0.1679**	**0.1679**			**628.0754**	**0.1820**		**631.8964**

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
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
Worker	0.0292	0.0386	0.3909	9.8000e-004	0.0894	5.6000e-004	0.0900	0.0237	5.1000e-004	0.0242			81.1190	3.8300e-003		81.1994
Total	**0.0292**	**0.0386**	**0.3909**	**9.8000e-004**	**0.0894**	**5.6000e-004**	**0.0900**	**0.0237**	**5.1000e-004**	**0.0242**			**81.1190**	**3.8300e-003**		**81.1994**

3.6 Building Construction - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1894	16.7349	10.4241	0.0154		1.1275	1.1275		1.0696	1.0696			1,503.2587	0.3723		1,511.0767
Total	**2.1894**	**16.7349**	**10.4241**	**0.0154**		**1.1275**	**1.1275**		**1.0696**	**1.0696**			**1,503.2587**	**0.3723**		**1,511.0767**

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
Vendor	0.2321	2.4086	2.7975	5.8500e-003	0.1762	0.0460	0.2222	0.0503	0.0423	0.0926			586.4647	3.9800e-003		586.5483
Worker	0.2047	0.2699	2.7364	6.8600e-003	0.6260	3.9100e-003	0.6299	0.1660	3.6000e-003	0.1696			567.8327	0.0268		568.3955
Total	**0.4368**	**2.6786**	**5.5340**	**0.0127**	**0.8021**	**0.0499**	**0.8520**	**0.2163**	**0.0459**	**0.2622**			**1,154.2974**	**0.0308**		**1,154.9437**

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	0.4026	8.1020	9.6930	0.0154		0.4869	0.4869		0.4869	0.4869			1,503.2587	0.3723		1,511.0767
Total	**0.4026**	**8.1020**	**9.6930**	**0.0154**		**0.4869**	**0.4869**		**0.4869**	**0.4869**			**1,503.2587**	**0.3723**		**1,511.0767**

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
Vendor	0.2321	2.4086	2.7975	5.8500e-003	0.1762	0.0460	0.2222	0.0503	0.0423	0.0926			586.4647	3.9800e-003		586.5483
Worker	0.2047	0.2699	2.7364	6.8600e-003	0.6260	3.9100e-003	0.6299	0.1660	3.6000e-003	0.1696			567.8327	0.0268		568.3955
Total	**0.4368**	**2.6786**	**5.5340**	**0.0127**	**0.8021**	**0.0499**	**0.8520**	**0.2163**	**0.0459**	**0.2622**			**1,154.2974**	**0.0308**		**1,154.9437**

3.6 Building Construction - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9840	15.4464	10.1397	0.0154		1.0138	1.0138		0.9614	0.9614			1,488.7512	0.3621		1,496.3558
Total	**1.9840**	**15.4464**	**10.1397**	**0.0154**		**1.0138**	**1.0138**		**0.9614**	**0.9614**			**1,488.7512**	**0.3621**		**1,496.3558**

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
Vendor	0.2092	2.1831	2.6424	5.8300e-003	0.1762	0.0412	0.2174	0.0503	0.0379	0.0882			576.5463	3.8400e-003		576.6269
Worker	0.1829	0.2420	2.4503	6.8500e-003	0.6260	3.8000e-003	0.6298	0.1660	3.5100e-003	0.1695			545.2894	0.0246		545.8056
Total	**0.3920**	**2.4251**	**5.0928**	**0.0127**	**0.8021**	**0.0450**	**0.8471**	**0.2163**	**0.0414**	**0.2577**			**1,121.8357**	**0.0284**		**1,122.4326**

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	0.4026	8.1020	9.6930	0.0154		0.4869	0.4869		0.4869	0.4869			1,488.7512	0.3621		1,496.3558
Total	**0.4026**	**8.1020**	**9.6930**	**0.0154**		**0.4869**	**0.4869**		**0.4869**	**0.4869**			**1,488.7512**	**0.3621**		**1,496.3558**

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
Vendor	0.2092	2.1831	2.6424	5.8300e-003	0.1762	0.0412	0.2174	0.0503	0.0379	0.0882			576.5463	3.8400e-003		576.6269
Worker	0.1829	0.2420	2.4503	6.8500e-003	0.6260	3.8000e-003	0.6298	0.1660	3.5100e-003	0.1695			545.2894	0.0246		545.8056
Total	**0.3920**	**2.4251**	**5.0928**	**0.0127**	**0.8021**	**0.0450**	**0.8471**	**0.2163**	**0.0414**	**0.2577**			**1,121.8357**	**0.0284**		**1,122.4326**

3.6 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7255	13.6952	9.7511	0.0154		0.8591	0.8591		0.8155	0.8155			1,474.0290	0.3529		1,481.4403
Total	**1.7255**	**13.6952**	**9.7511**	**0.0154**		**0.8591**	**0.8591**		**0.8155**	**0.8155**			**1,474.0290**	**0.3529**		**1,481.4403**

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
Vendor	0.1934	1.9958	2.5365	5.8200e-003	0.1761	0.0389	0.2150	0.0503	0.0357	0.0860			566.5006	3.8200e-003		566.5808
Worker	0.1644	0.2185	2.2098	6.8500e-003	0.6260	3.7500e-003	0.6297	0.1660	3.4700e-003	0.1695			524.5569	0.0227		525.0343
Total	**0.3578**	**2.2144**	**4.7463**	**0.0127**	**0.8021**	**0.0426**	**0.8447**	**0.2163**	**0.0392**	**0.2555**			**1,091.0575**	**0.0266**		**1,091.6150**

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	0.4026	8.1020	9.6930	0.0154		0.4869	0.4869		0.4869	0.4869			1,474.0290	0.3529		1,481.4403
Total	**0.4026**	**8.1020**	**9.6930**	**0.0154**		**0.4869**	**0.4869**		**0.4869**	**0.4869**			**1,474.0290**	**0.3529**		**1,481.4403**

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
Vendor	0.1934	1.9958	2.5365	5.8200e-003	0.1761	0.0389	0.2150	0.0503	0.0357	0.0860			566.5006	3.8200e-003		566.5808
Worker	0.1644	0.2185	2.2098	6.8500e-003	0.6260	3.7500e-003	0.6297	0.1660	3.4700e-003	0.1695			524.5569	0.0227		525.0343
Total	**0.3578**	**2.2144**	**4.7463**	**0.0127**	**0.8021**	**0.0426**	**0.8447**	**0.2163**	**0.0392**	**0.2555**			**1,091.0575**	**0.0266**		**1,091.6150**

3.7 Architectural Coating - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	58.2783					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2986	2.0058	1.8542	2.9700e-003		0.1506	0.1506		0.1506	0.1506			281.4485	0.0267		282.0102
Total	**58.5769**	**2.0058**	**1.8542**	**2.9700e-003**		**0.1506**	**0.1506**		**0.1506**	**0.1506**			**281.4485**	**0.0267**		**282.0102**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
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
Worker	0.0323	0.0429	0.4341	1.3500e-003	0.1230	7.4000e-004	0.1237	0.0326	6.8000e-004	0.0333			103.0380	4.4700e-003		103.1317
Total	**0.0323**	**0.0429**	**0.4341**	**1.3500e-003**	**0.1230**	**7.4000e-004**	**0.1237**	**0.0326**	**6.8000e-004**	**0.0333**			**103.0380**	**4.4700e-003**		**103.1317**

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	58.2783					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0594	1.3570	1.8324	2.9700e-003		0.0951	0.0951		0.0951	0.0951			281.4485	0.0267		282.0102
Total	**58.3377**	**1.3570**	**1.8324**	**2.9700e-003**		**0.0951**	**0.0951**		**0.0951**	**0.0951**			**281.4485**	**0.0267**		**282.0102**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
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
Worker	0.0323	0.0429	0.4341	1.3500e-003	0.1230	7.4000e-004	0.1237	0.0326	6.8000e-004	0.0333			103.0380	4.4700e-003		103.1317
Total	**0.0323**	**0.0429**	**0.4341**	**1.3500e-003**	**0.1230**	**7.4000e-004**	**0.1237**	**0.0326**	**6.8000e-004**	**0.0333**			**103.0380**	**4.4700e-003**		**103.1317**

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	3.9503	13.1447	41.9610	0.1199	8.7061	0.1978	8.9039	2.3234	0.1821	2.5056			9,902.7714	0.3141		9,909.3673
Unmitigated	3.9503	13.1447	41.9610	0.1199	8.7061	0.1978	8.9039	2.3234	0.1821	2.5056			9,902.7714	0.3141		9,909.3673

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Research & Development	1,216.00	285.00	165.30	3,151,943	3,151,943
Total	1,216.00	285.00	165.30	3,151,943	3,151,943

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-	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Research & Development	16.60	8.40	6.90	33.00	48.00	19.00	82	15	3

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.459583	0.069267	0.177530	0.170944	0.045911	0.007406	0.012759	0.044006	0.000935	0.001057	0.006483	0.000867	0.003251

5.0 Energy Detail

4.4 Fleet Mix

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	0.1470	1.3361	1.1223	8.0200e-003		0.1015	0.1015		0.1015	0.1015			1,603.2632	0.0307	0.0294	1,613.0204
NaturalGas Unmitigated	0.1869	1.6989	1.4271	0.0102		0.1291	0.1291		0.1291	0.1291			2,038.7107	0.0391	0.0374	2,051.1180

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Research & Development	17329	0.1869	1.6989	1.4271	0.0102		0.1291	0.1291		0.1291	0.1291			2,038.7107	0.0391	0.0374	2,051.1180
Total		**0.1869**	**1.6989**	**1.4271**	**0.0102**		**0.1291**	**0.1291**		**0.1291**	**0.1291**			**2,038.7107**	**0.0391**	**0.0374**	**2,051.1180**

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					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Research & Development	13.6277	0.1470	1.3361	1.1223	8.0200e-003		0.1015	0.1015		0.1015	0.1015			1,603.2632	0.0307	0.0294	1,613.0204
Total		**0.1470**	**1.3361**	**1.1223**	**8.0200e-003**		**0.1015**	**0.1015**		**0.1015**	**0.1015**			**1,603.2632**	**0.0307**	**0.0294**	**1,613.0204**

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	4.8020	2.1000e-004	0.0223	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005			0.0471	1.3000e-004		0.0498
Unmitigated	4.8020	2.1000e-004	0.0223	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005			0.0471	1.3000e-004		0.0498

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	0.5429					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	4.2570					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.1300e-003	2.1000e-004	0.0223	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005			0.0471	1.3000e-004		0.0498
Total	**4.8020**	**2.1000e-004**	**0.0223**	**0.0000**		**8.0000e-005**	**8.0000e-005**		**8.0000e-005**	**8.0000e-005**			**0.0471**	**1.3000e-004**		**0.0498**

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	0.5429					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	4.2570					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.1300e-003	2.1000e-004	0.0223	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005			0.0471	1.3000e-004		0.0498
Total	**4.8020**	**2.1000e-004**	**0.0223**	**0.0000**		**8.0000e-005**	**8.0000e-005**		**8.0000e-005**	**8.0000e-005**			**0.0471**	**1.3000e-004**		**0.0498**

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Research & Development	190.00	1000sqft	0.70	190,000.00	400
Other Non-Asphalt Surfaces	25.00	1000sqft	0.57	25,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.4	**Precipitation Freq (Days)**	28
Climate Zone	10			**Operational Year**	2018
Utility Company	Riverside Public Utilities				
CO2 Intensity (lb/MWhr)	850	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Riverside IF updated

Land Use - Per PD

Construction Phase - Based on Data Needs and assumptions:
demo: 8/1/16-8/14/16
grading: 8/15/16-10/14/16
Underground: 10/15/16-12/14/16
Paving: 12/15/16-12/21/16
Off-road Equipment - defaults

Off-road Equipment - Per data needs- 1 crane, 2 forklifts, 1 loader, 1 welder, 1 air compressor.

Off-road Equipment - Defaults for Demo

Off-road Equipment - defaults

Off-road Equipment - 1 cement mixer, 1 paver, 1 roller.

Off-road Equipment - 1 trencher- per judgement.

Trips and VMT - Defaults

Demolition - based on manual calcs for 12,000 sf area of pavement with 7.5 in thickness

Grading - total acres graded- default

Architectural Coating - Manual calculations based on 190,000 sf building.

Vehicle Trips - ADT: 1217 weekday

Area Coating - Manual calcs based on 190,000 sf building.

Energy Use - .

Construction Off-road Equipment Mitigation - All Tier 3 off-road diesel

Mobile Land Use Mitigation -

Area Mitigation - x

Energy Mitigation - Exceed Title 24 2013 code by 20%

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Nonresidential_Exterior	107,500.00	95,000.00
tblArchitecturalCoating	ConstArea_Nonresidential_Interior	322,500.00	285,000.00
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	150.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	100.00
tblAreaCoating	Area_EF_Nonresidential_Exterior	250	150
tblAreaCoating	Area_Nonresidential_Interior	322500	285000
tblAreaMitigation	UseLowVOCPaintNonresidentialExteriorValue	150	250
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
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	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	10.00	34.00
tblConstructionPhase	NumDays	200.00	429.00
tblConstructionPhase	NumDays	20.00	10.00
tblConstructionPhase	NumDays	4.00	45.00
tblConstructionPhase	NumDays	10.00	5.00
tblGrading	MaterialExported	0.00	4,000.00
tblLandUse	LotAcreage	4.36	0.70
tblLandUse	Population	0.00	400.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00

tblProjectCharacteristics	CO2IntensityFactor	1325.65	850
tblProjectCharacteristics	OperationalYear	2014	2018
tblSolidWaste	SolidWasteGenerationRate	14.44	11.40
tblTripsAndVMT	VendorTripNumber	35.00	28.00
tblTripsAndVMT	WorkerTripNumber	71.00	56.00
tblTripsAndVMT	WorkerTripNumber	14.00	11.00
tblVehicleTrips	ST_TR	1.90	1.50
tblVehicleTrips	SU_TR	1.11	0.87
tblVehicleTrips	WD_TR	8.11	6.40
tblWater	IndoorWaterUseRate	93,421,849.97	73,754,092.08

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2016	3.0088	29.2442	22.8273	0.0288	5.2089	1.7624	6.4040	2.6041	1.6492	3.7036			2,882.7200	0.6366	0.0000	2,896.0888
2017	2.3727	17.8049	15.2884	0.0288	0.8021	1.0585	1.8606	0.2163	1.0025	1.2189			2,667.1141	0.3904	0.0000	2,675.3129
2018	58.6110	15.8503	14.5167	0.0288	0.8021	0.9014	1.7035	0.2163	0.8544	1.0707			2,619.6292	0.3793	0.0000	2,627.5952
Total	**63.9924**	**62.8993**	**52.6324**	**0.0863**	**6.8131**	**3.7223**	**9.9681**	**3.0368**	**3.5062**	**5.9932**			**8,169.4634**	**1.4064**	**0.0000**	**8,198.9968**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2016	0.8350	13.2205	16.8915	0.0288	2.4998	0.7410	2.8850	1.2141	0.7396	1.5950			2,882.7200	0.6366	0.0000	2,896.0887
2017	0.7913	10.4605	14.8417	0.0288	0.8021	0.5315	1.3337	0.2163	0.5280	0.7443			2,667.1141	0.3904	0.0000	2,675.3129
2018	58.3718	10.2572	14.4586	0.0288	0.8021	0.5292	1.3312	0.2163	0.5258	0.7421			2,619.6292	0.3793	0.0000	2,627.5952
Total	**59.9980**	**33.9383**	**46.1917**	**0.0863**	**4.1040**	**1.8017**	**5.5499**	**1.6467**	**1.7933**	**3.0813**			**8,169.4634**	**1.4064**	**0.0000**	**8,198.9968**

	ROG	**NOx**	**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	**6.24**	**46.04**	**12.24**	**0.00**	**39.76**	**51.60**	**44.32**	**45.77**	**48.85**	**48.59**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	5.3687	2.1000e-004	0.0223	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005			0.0471	1.3000e-004		0.0498
Energy	0.1869	1.6989	1.4271	0.0102		0.1291	0.1291		0.1291	0.1291			2,038.7107	0.0391	0.0374	2,051.1180
Mobile	4.0548	12.6170	44.8255	0.1285	8.7061	0.1971	8.9032	2.3234	0.1815	2.5050			10,573.0225	0.3137		10,579.6091
Total	**9.6104**	**14.3161**	**46.2748**	**0.1387**	**8.7061**	**0.3263**	**9.0324**	**2.3234**	**0.3107**	**2.6342**			**12,611.7803**	**0.3529**	**0.0374**	**12,630.7769**

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	5.3687	2.1000e-004	0.0223	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005			0.0471	1.3000e-004		0.0498
Energy	0.1470	1.3361	1.1223	8.0200e-003		0.1015	0.1015		0.1015	0.1015			1,603.2632	0.0307	0.0294	1,613.0204
Mobile	4.0548	12.6170	44.8255	0.1285	8.7061	0.1971	8.9032	2.3234	0.1815	2.5050			10,573.0225	0.3137		10,579.6091
Total	**9.5705**	**13.9532**	**45.9700**	**0.1366**	**8.7061**	**0.2987**	**9.0048**	**2.3234**	**0.2831**	**2.6066**			**12,176.3327**	**0.3445**	**0.0294**	**12,192.6793**

	ROG	NOx	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	**0.42**	**2.53**	**0.66**	**1.56**	**0.00**	**8.45**	**0.31**	**0.00**	**8.88**	**1.05**	**0.00**	**0.00**	**3.45**	**2.37**	**21.38**	**3.47**

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	8/1/2016	8/12/2016	5	10	
2	Grading	Grading	8/13/2016	10/14/2016	5	45	
3	Underground Infrastructure	Trenching	10/15/2016	12/14/2016	5	43	
4	Paving	Paving	12/15/2016	12/21/2016	5	5	
5	Building Construction	Building Construction	12/22/2016	8/14/2018	5	429	
6	Architectural Coating	Architectural Coating	8/15/2018	10/1/2018	5	34	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 16.88

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 285,000; Non-Residential Outdoor: 95,000 (Architectural Coating –

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	8.00	255	0.40
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Grading	Graders	1	6.00	174	0.41
Grading	Rubber Tired Dozers	1	6.00	255	0.40
Grading	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Underground Infrastructure	Trenchers	1	8.00	80	0.50
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	6.00	125	0.42
Paving	Paving Equipment	0	8.00	130	0.36
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Building Construction	Air Compressors	1	8.00	78	0.48
Building Construction	Cranes	1	6.00	226	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Building Construction	Generator Sets	0	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	5	13.00	0.00	35.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	8.00	0.00	500.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Underground Infrastructure	1	3.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	3	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	6	56.00	28.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	11.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Demolition - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.7536	0.0000	0.7536	0.1141	0.0000	0.1141			0.0000			0.0000
Off-Road	2.9066	28.2579	21.4980	0.0245		1.7445	1.7445		1.6328	1.6328			2,487.1296	0.6288		2,500.3343
Total	**2.9066**	**28.2579**	**21.4980**	**0.0245**	**0.7536**	**1.7445**	**2.4981**	**0.1141**	**1.6328**	**1.7469**			**2,487.1296**	**0.6288**		**2,500.3343**

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	0.0524	0.9274	0.5921	2.4900e-003	0.0611	0.0170	0.0780	0.0167	0.0156	0.0323			251.3449	1.5900e-003		251.3782
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
Worker	0.0498	0.0588	0.7372	1.7400e-003	0.1453	9.1000e-004	0.1462	0.0385	8.4000e-004	0.0394			144.2456	6.2200e-003		144.3763
Total	**0.1022**	**0.9863**	**1.3293**	**4.2300e-003**	**0.2064**	**0.0179**	**0.2243**	**0.0553**	**0.0165**	**0.0717**			**395.5905**	**7.8100e-003**		**395.7545**

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					0.3391	0.0000	0.3391	0.0513	0.0000	0.0513			0.0000			0.0000
Off-Road	0.5689	12.2343	15.5622	0.0245		0.7231	0.7231		0.7231	0.7231			2,487.1296	0.6288		2,500.3343
Total	**0.5689**	**12.2343**	**15.5622**	**0.0245**	**0.3391**	**0.7231**	**1.0623**	**0.0513**	**0.7231**	**0.7745**			**2,487.1296**	**0.6288**		**2,500.3343**

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	0.0524	0.9274	0.5921	2.4900e-003	0.0611	0.0170	0.0780	0.0167	0.0156	0.0323			251.3449	1.5900e-003		251.3782
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
Worker	0.0498	0.0588	0.7372	1.7400e-003	0.1453	9.1000e-004	0.1462	0.0385	8.4000e-004	0.0394			144.2456	6.2200e-003		144.3763
Total	**0.1022**	**0.9863**	**1.3293**	**4.2300e-003**	**0.2064**	**0.0179**	**0.2243**	**0.0553**	**0.0165**	**0.0717**			**395.5905**	**7.8100e-003**		**395.7545**

3.3 Grading - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.9256	0.0000	4.9256	2.5273	0.0000	2.5273			0.0000			0.0000
Off-Road	1.9908	21.0361	13.6704	0.0141		1.1407	1.1407		1.0494	1.0494			1,462.8468	0.4413		1,472.1130
Total	**1.9908**	**21.0361**	**13.6704**	**0.0141**	**4.9256**	**1.1407**	**6.0663**	**2.5273**	**1.0494**	**3.5768**			**1,462.8468**	**0.4413**		**1,472.1130**

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	0.1664	2.9443	1.8796	7.9100e-003	0.1938	0.0539	0.2477	0.0531	0.0496	0.1027			797.9202	5.0400e-003		798.0261
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
Worker	0.0307	0.0362	0.4537	1.0700e-003	0.0894	5.6000e-004	0.0900	0.0237	5.1000e-004	0.0242			88.7665	3.8300e-003		88.8469
Total	**0.1971**	**2.9805**	**2.3333**	**8.9800e-003**	**0.2832**	**0.0544**	**0.3377**	**0.0768**	**0.0501**	**0.1269**			**886.6867**	**8.8700e-003**		**886.8730**

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					2.2165	0.0000	2.2165	1.1373	0.0000	1.1373			0.0000			0.0000
Off-Road	0.3416	6.8371	9.0489	0.0141		0.3308	0.3308		0.3308	0.3308			1,462.8468	0.4413		1,472.1130
Total	**0.3416**	**6.8371**	**9.0489**	**0.0141**	**2.2165**	**0.3308**	**2.5473**	**1.1373**	**0.3308**	**1.4681**			**1,462.8468**	**0.4413**		**1,472.1130**

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	0.1664	2.9443	1.8796	7.9100e-003	0.1938	0.0539	0.2477	0.0531	0.0496	0.1027			797.9202	5.0400e-003		798.0261
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
Worker	0.0307	0.0362	0.4537	1.0700e-003	0.0894	5.6000e-004	0.0900	0.0237	5.1000e-004	0.0242			88.7665	3.8300e-003		88.8469
Total	**0.1971**	**2.9805**	**2.3333**	**8.9800e-003**	**0.2832**	**0.0544**	**0.3377**	**0.0768**	**0.0501**	**0.1269**			**886.6867**	**8.8700e-003**		**886.8730**

3.4 Underground Infrastructure - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5559	4.8694	2.8136	3.4600e-003		0.3819	0.3819		0.3514	0.3514			359.7258	0.1085		362.0044
Total	**0.5559**	**4.8694**	**2.8136**	**3.4600e-003**		**0.3819**	**0.3819**		**0.3514**	**0.3514**			**359.7258**	**0.1085**		**362.0044**

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
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
Worker	0.0115	0.0136	0.1701	4.0000e-004	0.0335	2.1000e-004	0.0337	8.8900e-003	1.9000e-004	9.0900e-003			33.2875	1.4400e-003		33.3176
Total	**0.0115**	**0.0136**	**0.1701**	**4.0000e-004**	**0.0335**	**2.1000e-004**	**0.0337**	**8.8900e-003**	**1.9000e-004**	**9.0900e-003**			**33.2875**	**1.4400e-003**		**33.3176**

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	0.0847	1.9330	2.6103	3.4600e-003		0.1355	0.1355		0.1355	0.1355			359.7258	0.1085		362.0044
Total	**0.0847**	**1.9330**	**2.6103**	**3.4600e-003**		**0.1355**	**0.1355**		**0.1355**	**0.1355**			**359.7258**	**0.1085**		**362.0044**

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
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
Worker	0.0115	0.0136	0.1701	4.0000e-004	0.0335	2.1000e-004	0.0337	8.8900e-003	1.9000e-004	9.0900e-003			33.2875	1.4400e-003		33.3176
Total	**0.0115**	**0.0136**	**0.1701**	**4.0000e-004**	**0.0335**	**2.1000e-004**	**0.0337**	**8.8900e-003**	**1.9000e-004**	**9.0900e-003**			**33.2875**	**1.4400e-003**		**33.3176**

3.5 Paving - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6397	6.3853	4.1322	6.2100e-003		0.3799	0.3799		0.3504	0.3504			628.0754	0.1820		631.8964
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.6397**	**6.3853**	**4.1322**	**6.2100e-003**		**0.3799**	**0.3799**		**0.3504**	**0.3504**			**628.0754**	**0.1820**		**631.8964**

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
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
Worker	0.0307	0.0362	0.4537	1.0700e-003	0.0894	5.6000e-004	0.0900	0.0237	5.1000e-004	0.0242			88.7665	3.8300e-003		88.8469
Total	**0.0307**	**0.0362**	**0.4537**	**1.0700e-003**	**0.0894**	**5.6000e-004**	**0.0900**	**0.0237**	**5.1000e-004**	**0.0242**			**88.7665**	**3.8300e-003**		**88.8469**

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	0.1396	2.8966	4.3053	6.2100e-003		0.1679	0.1679		0.1679	0.1679			628.0754	0.1820		631.8964
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.1396**	**2.8966**	**4.3053**	**6.2100e-003**		**0.1679**	**0.1679**		**0.1679**	**0.1679**			**628.0754**	**0.1820**		**631.8964**

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
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
Worker	0.0307	0.0362	0.4537	1.0700e-003	0.0894	5.6000e-004	0.0900	0.0237	5.1000e-004	0.0242			88.7665	3.8300e-003		88.8469
Total	**0.0307**	**0.0362**	**0.4537**	**1.0700e-003**	**0.0894**	**5.6000e-004**	**0.0900**	**0.0237**	**5.1000e-004**	**0.0242**			**88.7665**	**3.8300e-003**		**88.8469**

3.6 Building Construction - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1894	16.7349	10.4241	0.0154		1.1275	1.1275		1.0696	1.0696			1,503.2587	0.3723		1,511.0767
Total	**2.1894**	**16.7349**	**10.4241**	**0.0154**		**1.1275**	**1.1275**		**1.0696**	**1.0696**			**1,503.2587**	**0.3723**		**1,511.0767**

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
Vendor	0.2178	2.3496	2.4604	5.8900e-003	0.1762	0.0456	0.2218	0.0503	0.0419	0.0923			591.5845	3.8500e-003		591.6653
Worker	0.2146	0.2534	3.1758	7.5100e-003	0.6260	3.9100e-003	0.6299	0.1660	3.6000e-003	0.1696			621.3657	0.0268		621.9285
Total	**0.4323**	**2.6030**	**5.6362**	**0.0134**	**0.8021**	**0.0495**	**0.8516**	**0.2163**	**0.0455**	**0.2619**			**1,212.9502**	**0.0307**		**1,213.5939**

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	0.4026	8.1020	9.6930	0.0154		0.4869	0.4869		0.4869	0.4869			1,503.2587	0.3723		1,511.0767
Total	**0.4026**	**8.1020**	**9.6930**	**0.0154**		**0.4869**	**0.4869**		**0.4869**	**0.4869**			**1,503.2587**	**0.3723**		**1,511.0767**

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
Vendor	0.2178	2.3496	2.4604	5.8900e-003	0.1762	0.0456	0.2218	0.0503	0.0419	0.0923			591.5845	3.8500e-003		591.6653
Worker	0.2146	0.2534	3.1758	7.5100e-003	0.6260	3.9100e-003	0.6299	0.1660	3.6000e-003	0.1696			621.3657	0.0268		621.9285
Total	**0.4323**	**2.6030**	**5.6362**	**0.0134**	**0.8021**	**0.0495**	**0.8516**	**0.2163**	**0.0455**	**0.2619**			**1,212.9502**	**0.0307**		**1,213.5939**

3.6 Building Construction - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9840	15.4464	10.1397	0.0154		1.0138	1.0138		0.9614	0.9614			1,488.7512	0.3621		1,496.3558
Total	**1.9840**	**15.4464**	**10.1397**	**0.0154**		**1.0138**	**1.0138**		**0.9614**	**0.9614**			**1,488.7512**	**0.3621**		**1,496.3558**

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
Vendor	0.1965	2.1312	2.2965	5.8800e-003	0.1762	0.0409	0.2170	0.0503	0.0376	0.0879			581.5955	3.7100e-003		581.6734
Worker	0.1922	0.2273	2.8521	7.5100e-003	0.6260	3.8000e-003	0.6298	0.1660	3.5100e-003	0.1695			596.7675	0.0246		597.2837
Total	**0.3887**	**2.3585**	**5.1486**	**0.0134**	**0.8021**	**0.0447**	**0.8468**	**0.2163**	**0.0411**	**0.2574**			**1,178.3630**	**0.0283**		**1,178.9571**

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	0.4026	8.1020	9.6930	0.0154		0.4869	0.4869		0.4869	0.4869			1,488.7512	0.3621		1,496.3558
Total	**0.4026**	**8.1020**	**9.6930**	**0.0154**		**0.4869**	**0.4869**		**0.4869**	**0.4869**			**1,488.7512**	**0.3621**		**1,496.3558**

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
Vendor	0.1965	2.1312	2.2965	5.8800e-003	0.1762	0.0409	0.2170	0.0503	0.0376	0.0879			581.5955	3.7100e-003		581.6734
Worker	0.1922	0.2273	2.8521	7.5100e-003	0.6260	3.8000e-003	0.6298	0.1660	3.5100e-003	0.1695			596.7675	0.0246		597.2837
Total	**0.3887**	**2.3585**	**5.1486**	**0.0134**	**0.8021**	**0.0447**	**0.8468**	**0.2163**	**0.0411**	**0.2574**			**1,178.3630**	**0.0283**		**1,178.9571**

3.6 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7255	13.6952	9.7511	0.0154		0.8591	0.8591		0.8155	0.8155			1,474.0290	0.3529		1,481.4403
Total	**1.7255**	**13.6952**	**9.7511**	**0.0154**		**0.8591**	**0.8591**		**0.8155**	**0.8155**			**1,474.0290**	**0.3529**		**1,481.4403**

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
Vendor	0.1819	1.9496	2.1857	5.8700e-003	0.1761	0.0385	0.2147	0.0503	0.0355	0.0858			571.4757	3.6800e-003		571.5530
Worker	0.1733	0.2055	2.5799	7.5100e-003	0.6260	3.7500e-003	0.6297	0.1660	3.4700e-003	0.1695			574.1245	0.0227		574.6019
Total	**0.3551**	**2.1551**	**4.7656**	**0.0134**	**0.8021**	**0.0423**	**0.8444**	**0.2163**	**0.0389**	**0.2552**			**1,145.6002**	**0.0264**		**1,146.1549**

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	0.4026	8.1020	9.6930	0.0154		0.4869	0.4869		0.4869	0.4869			1,474.0290	0.3529		1,481.4403
Total	**0.4026**	**8.1020**	**9.6930**	**0.0154**		**0.4869**	**0.4869**		**0.4869**	**0.4869**			**1,474.0290**	**0.3529**		**1,481.4403**

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
Vendor	0.1819	1.9496	2.1857	5.8700e-003	0.1761	0.0385	0.2147	0.0503	0.0355	0.0858			571.4757	3.6800e-003		571.5530
Worker	0.1733	0.2055	2.5799	7.5100e-003	0.6260	3.7500e-003	0.6297	0.1660	3.4700e-003	0.1695			574.1245	0.0227		574.6019
Total	**0.3551**	**2.1551**	**4.7656**	**0.0134**	**0.8021**	**0.0423**	**0.8444**	**0.2163**	**0.0389**	**0.2552**			**1,145.6002**	**0.0264**		**1,146.1549**

3.7 Architectural Coating - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	58.2783					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2986	2.0058	1.8542	2.9700e-003		0.1506	0.1506		0.1506	0.1506			281.4485	0.0267		282.0102
Total	**58.5769**	**2.0058**	**1.8542**	**2.9700e-003**		**0.1506**	**0.1506**		**0.1506**	**0.1506**			**281.4485**	**0.0267**		**282.0102**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
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
Worker	0.0340	0.0404	0.5068	1.4800e-003	0.1230	7.4000e-004	0.1237	0.0326	6.8000e-004	0.0333			112.7745	4.4700e-003		112.8682
Total	**0.0340**	**0.0404**	**0.5068**	**1.4800e-003**	**0.1230**	**7.4000e-004**	**0.1237**	**0.0326**	**6.8000e-004**	**0.0333**			**112.7745**	**4.4700e-003**		**112.8682**

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	58.2783					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0594	1.3570	1.8324	2.9700e-003		0.0951	0.0951		0.0951	0.0951			281.4485	0.0267		282.0102
Total	**58.3377**	**1.3570**	**1.8324**	**2.9700e-003**		**0.0951**	**0.0951**		**0.0951**	**0.0951**			**281.4485**	**0.0267**		**282.0102**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
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
Worker	0.0340	0.0404	0.5068	1.4800e-003	0.1230	7.4000e-004	0.1237	0.0326	6.8000e-004	0.0333			112.7745	4.4700e-003		112.8682
Total	**0.0340**	**0.0404**	**0.5068**	**1.4800e-003**	**0.1230**	**7.4000e-004**	**0.1237**	**0.0326**	**6.8000e-004**	**0.0333**			**112.7745**	**4.4700e-003**		**112.8682**

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	4.0548	12.6170	44.8255	0.1285	8.7061	0.1971	8.9032	2.3234	0.1815	2.5050			10,573.0225	0.3137		10,579.6091
Unmitigated	4.0548	12.6170	44.8255	0.1285	8.7061	0.1971	8.9032	2.3234	0.1815	2.5050			10,573.0225	0.3137		10,579.6091

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Research & Development	1,216.00	285.00	165.30	3,151,943	3,151,943
Total	1,216.00	285.00	165.30	3,151,943	3,151,943

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-	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Research & Development	16.60	8.40	6.90	33.00	48.00	19.00	82	15	3

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.459583	0.069267	0.177530	0.170944	0.045911	0.007406	0.012759	0.044006	0.000935	0.001057	0.006483	0.000867	0.003251

5.0 Energy Detail

4.4 Fleet Mix

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	0.1470	1.3361	1.1223	8.0200e-003		0.1015	0.1015		0.1015	0.1015			1,603.2632	0.0307	0.0294	1,613.0204
NaturalGas Unmitigated	0.1869	1.6989	1.4271	0.0102		0.1291	0.1291		0.1291	0.1291			2,038.7107	0.0391	0.0374	2,051.1180

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Research & Development	17329	0.1869	1.6989	1.4271	0.0102		0.1291	0.1291		0.1291	0.1291			2,038.7107	0.0391	0.0374	2,051.1180
Total		**0.1869**	**1.6989**	**1.4271**	**0.0102**		**0.1291**	**0.1291**		**0.1291**	**0.1291**			**2,038.7107**	**0.0391**	**0.0374**	**2,051.1180**

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					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Research & Development	13.6277	0.1470	1.3361	1.1223	8.0200e-003		0.1015	0.1015		0.1015	0.1015			1,603.2632	0.0307	0.0294	1,613.0204
Total		**0.1470**	**1.3361**	**1.1223**	**8.0200e-003**		**0.1015**	**0.1015**		**0.1015**	**0.1015**			**1,603.2632**	**0.0307**	**0.0294**	**1,613.0204**

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	5.3687	2.1000e-004	0.0223	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005			0.0471	1.3000e-004		0.0498
Unmitigated	5.3687	2.1000e-004	0.0223	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005			0.0471	1.3000e-004		0.0498

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.1095					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	4.2570					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.1300e-003	2.1000e-004	0.0223	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005			0.0471	1.3000e-004		0.0498
Total	**5.3687**	**2.1000e-004**	**0.0223**	**0.0000**		**8.0000e-005**	**8.0000e-005**		**8.0000e-005**	**8.0000e-005**			**0.0471**	**1.3000e-004**		**0.0498**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.1095					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	4.2570					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.1300e-003	2.1000e-004	0.0223	0.0000		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005			0.0471	1.3000e-004		0.0498
Total	**5.3687**	**2.1000e-004**	**0.0223**	**0.0000**		**8.0000e-005**	**8.0000e-005**		**8.0000e-005**	**8.0000e-005**			**0.0471**	**1.3000e-004**		**0.0498**

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Research & Development	190.00	1000sqft	0.70	190,000.00	400
Other Non-Asphalt Surfaces	25.00	1000sqft	0.57	25,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.4	**Precipitation Freq (Days)**	28
Climate Zone	10			**Operational Year**	2018
Utility Company	Riverside Public Utilities				
CO2 Intensity (lb/MWhr)	850	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Riverside IF updated

Land Use - Per PD

Construction Phase - Based on Data Needs and assumptions:
demo: 8/1/16-8/14/16
grading: 8/15/16-10/14/16
Underground: 10/15/16-12/14/16
Paving: 12/15/16-12/21/16
Building: 12/22/16-8/14/18
Off-road Equipment - defaults

Off-road Equipment - Per data needs- 1 crane, 2 forklifts, 1 loader, 1 welder, 1 air compressor.

Off-road Equipment - Defaults for Demo

Off-road Equipment - defaults

Off-road Equipment - 1 cement mixer, 1 paver, 1 roller.

Off-road Equipment - 1 trencher- per judgement.

Trips and VMT - Defaults

Demolition - based on manual calcs for 12,000 sf area of pavement with 7.5 in thickness

Grading - total acres graded- default

Architectural Coating - Manual calculations based on 190,000 sf building.

Vehicle Trips - ADT: 1217 weekday

Area Coating - Manual calcs based on 190,000 sf building.

Energy Use - .

Construction Off-road Equipment Mitigation - All Tier 3 off-road diesel

Mobile Land Use Mitigation -

Area Mitigation - x

Energy Mitigation - Exceed Title 24 2013 code by 20%

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Nonresidential_Exterior	84,750.00	95,000.00
tblArchitecturalCoating	ConstArea_Nonresidential_Interior	254,250.00	285,000.00
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	150.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	100.00
tblAreaCoating	Area_EF_Nonresidential_Exterior	250	150
tblAreaCoating	Area_EF_Nonresidential_Interior	250	100
tblAreaCoating	Area_Nonresidential_Exterior	84750	95000
tblAreaCoating	Area_Nonresidential_Interior	254250	285000
tblAreaMitigation	UseLowVOCPaintNonresidentialExteriorValue	150	250
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
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	1.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	10.00	34.00
tblConstructionPhase	NumDays	200.00	429.00
tblConstructionPhase	NumDays	20.00	10.00
tblConstructionPhase	NumDays	4.00	45.00
tblConstructionPhase	NumDays	10.00	5.00
tblGrading	MaterialExported	0.00	4,000.00
tblLandUse	LotAcreage	4.36	0.70
tblLandUse	Population	0.00	400.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Building Construction
tblOffRoadEquipment	PhaseName		Underground Infrastructure
tblProjectCharacteristics	CO2IntensityFactor	1325.65	850
tblProjectCharacteristics	OperationalYear	2014	2018
tblVehicleTrips	ST_TR	1.90	1.50
tblVehicleTrips	SU_TR	1.11	0.87
tblVehicleTrips	WD_TR	8.11	6.40

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2016	0.0873	0.8798	0.6101	8.6000e-004	0.1256	0.0490	0.1746	0.0604	0.0453	0.1057			78.5347	0.0159	0.0000	78.8690
2017	0.3071	2.3302	2.0009	3.6600e-003	0.1026	0.1376	0.2402	0.0277	0.1304	0.1581			309.1004	0.0461	0.0000	310.0675
2018	1.1641	1.3275	1.2251	2.3600e-003	0.0660	0.0756	0.1416	0.0178	0.0718	0.0896			195.1777	0.0284	0.0000	195.7733
Total	**1.5585**	**4.5375**	**3.8361**	**6.8800e-003**	**0.2942**	**0.2622**	**0.5564**	**0.1059**	**0.2475**	**0.3534**			**582.8128**	**0.0903**	**0.0000**	**584.7097**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2016	0.0209	0.3781	0.4699	8.6000e-004	0.0626	0.0176	0.0801	0.0288	0.0175	0.0463			78.5346	0.0159	0.0000	78.8690
2017	0.1016	1.3755	1.9428	3.6600e-003	0.1026	0.0691	0.1717	0.0277	0.0687	0.0964			309.1002	0.0461	0.0000	310.0672
2018	1.0528	0.8634	1.2200	2.3600e-003	0.0660	0.0445	0.1105	0.0178	0.0442	0.0620			195.1776	0.0284	0.0000	195.7732
Total	**1.1753**	**2.6170**	**3.6328**	**6.8800e-003**	**0.2311**	**0.1312**	**0.3623**	**0.0743**	**0.1304**	**0.2047**			**582.8124**	**0.0903**	**0.0000**	**584.7093**

	ROG	**NOx**	**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	**24.59**	**42.32**	**5.30**	**0.00**	**21.43**	**49.96**	**34.87**	**29.81**	**47.33**	**42.08**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.8762	3.0000e-005	2.7800e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005			5.3400e-003	1.0000e-005	0.0000	5.6400e-003
Energy	0.0341	0.3101	0.2605	1.8600e-003		0.0236	0.0236		0.0236	0.0236			1,148.4661	0.0341	0.0119	1,152.8758
Mobile	0.5276	1.8753	6.0425	0.0169	1.1956	0.0275	1.2232	0.3195	0.0254	0.3449			1,265.8242	0.0397	0.0000	1,266.6580
Waste						0.0000	0.0000		0.0000	0.0000			2.3141	0.1368	0.0000	5.1860
Water						0.0000	0.0000		0.0000	0.0000			393.6659	2.4159	0.0594	462.8017
Total	**1.4379**	**2.1854**	**6.3057**	**0.0188**	**1.1956**	**0.0511**	**1.2467**	**0.3195**	**0.0489**	**0.3684**			**2,810.2757**	**2.6265**	**0.0713**	**2,887.5272**

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	0.8762	3.0000e-005	2.7800e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005			5.3400e-003	1.0000e-005	0.0000	5.6400e-003
Energy	0.0268	0.2438	0.2048	1.4600e-003		0.0185	0.0185		0.0185	0.0185			989.6681	0.0298	9.9800e-003	993.3872
Mobile	0.5276	1.8753	6.0425	0.0169	1.1956	0.0275	1.2232	0.3195	0.0254	0.3449			1,265.8242	0.0397	0.0000	1,266.6580
Waste						0.0000	0.0000		0.0000	0.0000			2.3141	0.1368	0.0000	5.1860
Water						0.0000	0.0000		0.0000	0.0000			393.6659	2.4155	0.0593	462.7644
Total	**1.4306**	**2.1192**	**6.2501**	**0.0184**	**1.1956**	**0.0461**	**1.2417**	**0.3195**	**0.0439**	**0.3634**			**2,651.4776**	**2.6218**	**0.0693**	**2,728.0012**

	ROG	**NOx**	**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	**0.51**	**3.03**	**0.88**	**2.13**	**0.00**	**9.85**	**0.40**	**0.00**	**10.28**	**1.37**	**0.00**	**0.00**	**5.65**	**0.18**	**2.83**	**5.52**

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	8/1/2016	8/12/2016	5	10	
2	Grading	Grading	8/13/2016	10/14/2016	5	45	
3	Underground Infrastructure	Trenching	10/15/2016	12/14/2016	5	43	
4	Paving	Paving	12/15/2016	12/21/2016	5	5	
5	Building Construction	Building Construction	12/22/2016	8/14/2018	5	429	
6	Architectural Coating	Architectural Coating	8/15/2018	10/1/2018	5	34	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 16.88

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 285,000; Non-Residential Outdoor: 95,000 (Architectural Coating –

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	8.00	255	0.40
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Grading	Graders	1	6.00	174	0.41
Grading	Rubber Tired Dozers	1	6.00	255	0.40
Grading	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Underground Infrastructure	Trenchers	1	8.00	80	0.50
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	6.00	125	0.42
Paving	Paving Equipment	0	8.00	130	0.36
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Building Construction	Air Compressors	1	8.00	78	0.48
Building Construction	Cranes	1	6.00	226	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Building Construction	Generator Sets	0	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	5	13.00	0.00	35.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	8.00	0.00	500.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Underground Infrastructure	1	3.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	3	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	6	56.00	28.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	11.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Clean Paved Roads

3.2 Demolition - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.7700e-003	0.0000	3.7700e-003	5.7000e-004	0.0000	5.7000e-004			0.0000	0.0000	0.0000	0.0000
Off-Road	0.0145	0.1413	0.1075	1.2000e-004		8.7200e-003	8.7200e-003		8.1600e-003	8.1600e-003			11.2814	2.8500e-003	0.0000	11.3413
Total	**0.0145**	**0.1413**	**0.1075**	**1.2000e-004**	**3.7700e-003**	**8.7200e-003**	**0.0125**	**5.7000e-004**	**8.1600e-003**	**8.7300e-003**			**11.2814**	**2.8500e-003**	**0.0000**	**11.3413**

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	2.7000e-004	4.8900e-003	3.3400e-003	1.0000e-005	3.0000e-004	8.0000e-005	3.9000e-004	8.0000e-005	8.0000e-005	1.6000e-004			1.1389	1.0000e-005	0.0000	1.1391
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Worker	2.2000e-004	3.3000e-004	3.2900e-003	1.0000e-005	7.1000e-004	0.0000	7.2000e-004	1.9000e-004	0.0000	1.9000e-004			0.6061	3.0000e-005	0.0000	0.6067
Total	**4.9000e-004**	**5.2200e-003**	**6.6300e-003**	**2.0000e-005**	**1.0100e-003**	**8.0000e-005**	**1.1100e-003**	**2.7000e-004**	**8.0000e-005**	**3.5000e-004**			**1.7450**	**4.0000e-005**	**0.0000**	**1.7457**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.7000e-003	0.0000	1.7000e-003	2.6000e-004	0.0000	2.6000e-004			0.0000	0.0000	0.0000	0.0000
Off-Road	2.8400e-003	0.0612	0.0778	1.2000e-004		3.6200e-003	3.6200e-003		3.6200e-003	3.6200e-003			11.2814	2.8500e-003	0.0000	11.3413
Total	**2.8400e-003**	**0.0612**	**0.0778**	**1.2000e-004**	**1.7000e-003**	**3.6200e-003**	**5.3200e-003**	**2.6000e-004**	**3.6200e-003**	**3.8800e-003**			**11.2814**	**2.8500e-003**	**0.0000**	**11.3413**

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	2.7000e-004	4.8900e-003	3.3400e-003	1.0000e-005	3.0000e-004	8.0000e-005	3.9000e-004	8.0000e-005	8.0000e-005	1.6000e-004			1.1389	1.0000e-005	0.0000	1.1391
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Worker	2.2000e-004	3.3000e-004	3.2900e-003	1.0000e-005	7.1000e-004	0.0000	7.2000e-004	1.9000e-004	0.0000	1.9000e-004			0.6061	3.0000e-005	0.0000	0.6067
Total	**4.9000e-004**	**5.2200e-003**	**6.6300e-003**	**2.0000e-005**	**1.0100e-003**	**8.0000e-005**	**1.1100e-003**	**2.7000e-004**	**8.0000e-005**	**3.5000e-004**			**1.7450**	**4.0000e-005**	**0.0000**	**1.7457**

3.3 Grading - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1108	0.0000	0.1108	0.0569	0.0000	0.0569			0.0000	0.0000	0.0000	0.0000
Off-Road	0.0448	0.4733	0.3076	3.2000e-004		0.0257	0.0257		0.0236	0.0236			29.8591	9.0100e-003	0.0000	30.0483
Total	**0.0448**	**0.4733**	**0.3076**	**3.2000e-004**	**0.1108**	**0.0257**	**0.1365**	**0.0569**	**0.0236**	**0.0805**			**29.8591**	**9.0100e-003**	**0.0000**	**30.0483**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.8900e-003	0.0699	0.0477	1.8000e-004	4.3000e-003	1.2100e-003	5.5100e-003	1.1800e-003	1.1200e-003	2.3000e-003			16.2700	1.0000e-004	0.0000	16.2722
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Worker	6.2000e-004	9.0000e-004	9.1200e-003	2.0000e-005	1.9800e-003	1.0000e-005	1.9900e-003	5.3000e-004	1.0000e-005	5.4000e-004			1.6784	8.0000e-005	0.0000	1.6800
Total	**4.5100e-003**	**0.0708**	**0.0568**	**2.0000e-004**	**6.2800e-003**	**1.2200e-003**	**7.5000e-003**	**1.7100e-003**	**1.1300e-003**	**2.8400e-003**			**17.9484**	**1.8000e-004**	**0.0000**	**17.9522**

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					0.0499	0.0000	0.0499	0.0256	0.0000	0.0256			0.0000	0.0000	0.0000	0.0000
Off-Road	7.6900e-003	0.1538	0.2036	3.2000e-004		7.4400e-003	7.4400e-003		7.4400e-003	7.4400e-003			29.8591	9.0100e-003	0.0000	30.0482
Total	**7.6900e-003**	**0.1538**	**0.2036**	**3.2000e-004**	**0.0499**	**7.4400e-003**	**0.0573**	**0.0256**	**7.4400e-003**	**0.0330**			**29.8591**	**9.0100e-003**	**0.0000**	**30.0482**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.8900e-003	0.0699	0.0477	1.8000e-004	4.3000e-003	1.2100e-003	5.5100e-003	1.1800e-003	1.1200e-003	2.3000e-003			16.2700	1.0000e-004	0.0000	16.2722
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Worker	6.2000e-004	9.0000e-004	9.1200e-003	2.0000e-005	1.9800e-003	1.0000e-005	1.9900e-003	5.3000e-004	1.0000e-005	5.4000e-004			1.6784	8.0000e-005	0.0000	1.6800
Total	**4.5100e-003**	**0.0708**	**0.0568**	**2.0000e-004**	**6.2800e-003**	**1.2200e-003**	**7.5000e-003**	**1.7100e-003**	**1.1300e-003**	**2.8400e-003**			**17.9484**	**1.8000e-004**	**0.0000**	**17.9522**

3.4 Underground Infrastructure - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0120	0.1047	0.0605	7.0000e-005		8.2100e-003	8.2100e-003		7.5500e-003	7.5500e-003			7.0163	2.1200e-003	0.0000	7.0607
Total	**0.0120**	**0.1047**	**0.0605**	**7.0000e-005**		**8.2100e-003**	**8.2100e-003**		**7.5500e-003**	**7.5500e-003**			**7.0163**	**2.1200e-003**	**0.0000**	**7.0607**

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
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Worker	2.2000e-004	3.2000e-004	3.2700e-003	1.0000e-005	7.1000e-004	0.0000	7.1000e-004	1.9000e-004	0.0000	1.9000e-004			0.6014	3.0000e-005	0.0000	0.6020
Total	**2.2000e-004**	**3.2000e-004**	**3.2700e-003**	**1.0000e-005**	**7.1000e-004**	**0.0000**	**7.1000e-004**	**1.9000e-004**	**0.0000**	**1.9000e-004**			**0.6014**	**3.0000e-005**	**0.0000**	**0.6020**

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	1.8200e-003	0.0416	0.0561	7.0000e-005		2.9100e-003	2.9100e-003		2.9100e-003	2.9100e-003			7.0163	2.1200e-003	0.0000	7.0607
Total	**1.8200e-003**	**0.0416**	**0.0561**	**7.0000e-005**		**2.9100e-003**	**2.9100e-003**		**2.9100e-003**	**2.9100e-003**			**7.0163**	**2.1200e-003**	**0.0000**	**7.0607**

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
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Worker	2.2000e-004	3.2000e-004	3.2700e-003	1.0000e-005	7.1000e-004	0.0000	7.1000e-004	1.9000e-004	0.0000	1.9000e-004			0.6014	3.0000e-005	0.0000	0.6020
Total	**2.2000e-004**	**3.2000e-004**	**3.2700e-003**	**1.0000e-005**	**7.1000e-004**	**0.0000**	**7.1000e-004**	**1.9000e-004**	**0.0000**	**1.9000e-004**			**0.6014**	**3.0000e-005**	**0.0000**	**0.6020**

3.5 Paving - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.6000e-003	0.0160	0.0103	2.0000e-005		9.5000e-004	9.5000e-004		8.8000e-004	8.8000e-004			1.4245	4.1000e-004	0.0000	1.4331
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Total	**1.6000e-003**	**0.0160**	**0.0103**	**2.0000e-005**		**9.5000e-004**	**9.5000e-004**		**8.8000e-004**	**8.8000e-004**			**1.4245**	**4.1000e-004**	**0.0000**	**1.4331**

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
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Worker	7.0000e-005	1.0000e-004	1.0100e-003	0.0000	2.2000e-004	0.0000	2.2000e-004	6.0000e-005	0.0000	6.0000e-005			0.1865	1.0000e-005	0.0000	0.1867
Total	**7.0000e-005**	**1.0000e-004**	**1.0100e-003**	**0.0000**	**2.2000e-004**	**0.0000**	**2.2000e-004**	**6.0000e-005**	**0.0000**	**6.0000e-005**			**0.1865**	**1.0000e-005**	**0.0000**	**0.1867**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.5000e-004	7.2400e-003	0.0108	2.0000e-005		4.2000e-004	4.2000e-004		4.2000e-004	4.2000e-004			1.4245	4.1000e-004	0.0000	1.4331
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Total	**3.5000e-004**	**7.2400e-003**	**0.0108**	**2.0000e-005**		**4.2000e-004**	**4.2000e-004**		**4.2000e-004**	**4.2000e-004**			**1.4245**	**4.1000e-004**	**0.0000**	**1.4331**

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
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Worker	7.0000e-005	1.0000e-004	1.0100e-003	0.0000	2.2000e-004	0.0000	2.2000e-004	6.0000e-005	0.0000	6.0000e-005			0.1865	1.0000e-005	0.0000	0.1867
Total	**7.0000e-005**	**1.0000e-004**	**1.0100e-003**	**0.0000**	**2.2000e-004**	**0.0000**	**2.2000e-004**	**6.0000e-005**	**0.0000**	**6.0000e-005**			**0.1865**	**1.0000e-005**	**0.0000**	**0.1867**

3.6 Building Construction - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	7.6600e-003	0.0586	0.0365	5.0000e-005		3.9500e-003	3.9500e-003		3.7400e-003	3.7400e-003			4.7731	1.1800e-003	0.0000	4.7979
Total	**7.6600e-003**	**0.0586**	**0.0365**	**5.0000e-005**		**3.9500e-003**	**3.9500e-003**		**3.7400e-003**	**3.7400e-003**			**4.7731**	**1.1800e-003**	**0.0000**	**4.7979**

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
Vendor	8.0000e-004	8.6000e-003	0.0101	2.0000e-005	6.1000e-004	1.6000e-004	7.7000e-004	1.7000e-004	1.5000e-004	3.2000e-004			1.8715	1.0000e-005	0.0000	1.8718
Worker	6.7000e-004	9.8000e-004	9.9300e-003	2.0000e-005	2.1500e-003	1.0000e-005	2.1700e-003	5.7000e-004	1.0000e-005	5.8000e-004			1.8275	9.0000e-005	0.0000	1.8293
Total	**1.4700e-003**	**9.5800e-003**	**0.0200**	**4.0000e-005**	**2.7600e-003**	**1.7000e-004**	**2.9400e-003**	**7.4000e-004**	**1.6000e-004**	**9.0000e-004**			**3.6991**	**1.0000e-004**	**0.0000**	**3.7011**

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	1.4100e-003	0.0284	0.0339	5.0000e-005		1.7000e-003	1.7000e-003		1.7000e-003	1.7000e-003			4.7731	1.1800e-003	0.0000	4.7979
Total	**1.4100e-003**	**0.0284**	**0.0339**	**5.0000e-005**		**1.7000e-003**	**1.7000e-003**		**1.7000e-003**	**1.7000e-003**			**4.7731**	**1.1800e-003**	**0.0000**	**4.7979**

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
Vendor	8.0000e-004	8.6000e-003	0.0101	2.0000e-005	6.1000e-004	1.6000e-004	7.7000e-004	1.7000e-004	1.5000e-004	3.2000e-004			1.8715	1.0000e-005	0.0000	1.8718
Worker	6.7000e-004	9.8000e-004	9.9300e-003	2.0000e-005	2.1500e-003	1.0000e-005	2.1700e-003	5.7000e-004	1.0000e-005	5.8000e-004			1.8275	9.0000e-005	0.0000	1.8293
Total	**1.4700e-003**	**9.5800e-003**	**0.0200**	**4.0000e-005**	**2.7600e-003**	**1.7000e-004**	**2.9400e-003**	**7.4000e-004**	**1.6000e-004**	**9.0000e-004**			**3.6991**	**1.0000e-004**	**0.0000**	**3.7011**

3.6 Building Construction - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2579	2.0080	1.3182	2.0000e-003		0.1318	0.1318		0.1250	0.1250			175.5744	0.0427	0.0000	176.4713
Total	**0.2579**	**2.0080**	**1.3182**	**2.0000e-003**		**0.1318**	**0.1318**		**0.1250**	**0.1250**			**175.5744**	**0.0427**	**0.0000**	**176.4713**

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
Vendor	0.0269	0.2894	0.3527	7.6000e-004	0.0226	5.3300e-003	0.0279	6.4600e-003	4.9000e-003	0.0114			68.3398	4.4000e-004	0.0000	68.3491
Worker	0.0223	0.0328	0.3300	9.0000e-004	0.0800	4.9000e-004	0.0805	0.0213	4.6000e-004	0.0217			65.1862	2.9000e-003	0.0000	65.2471
Total	**0.0492**	**0.3222**	**0.6827**	**1.6600e-003**	**0.1026**	**5.8200e-003**	**0.1084**	**0.0277**	**5.3600e-003**	**0.0331**			**133.5260**	**3.3400e-003**	**0.0000**	**133.5962**

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	0.0523	1.0533	1.2601	2.0000e-003		0.0633	0.0633		0.0633	0.0633			175.5742	0.0427	0.0000	176.4710
Total	**0.0523**	**1.0533**	**1.2601**	**2.0000e-003**		**0.0633**	**0.0633**		**0.0633**	**0.0633**			**175.5742**	**0.0427**	**0.0000**	**176.4710**

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
Vendor	0.0269	0.2894	0.3527	7.6000e-004	0.0226	5.3300e-003	0.0279	6.4600e-003	4.9000e-003	0.0114			68.3398	4.4000e-004	0.0000	68.3491
Worker	0.0223	0.0328	0.3300	9.0000e-004	0.0800	4.9000e-004	0.0805	0.0213	4.6000e-004	0.0217			65.1862	2.9000e-003	0.0000	65.2471
Total	**0.0492**	**0.3222**	**0.6827**	**1.6600e-003**	**0.1026**	**5.8200e-003**	**0.1084**	**0.0277**	**5.3600e-003**	**0.0331**			**133.5260**	**3.3400e-003**	**0.0000**	**133.5962**

3.6 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1398	1.1093	0.7898	1.2400e-003		0.0696	0.0696		0.0661	0.0661			108.3145	0.0259	0.0000	108.8591
Total	**0.1398**	**1.1093**	**0.7898**	**1.2400e-003**		**0.0696**	**0.0696**		**0.0661**	**0.0661**			**108.3145**	**0.0259**	**0.0000**	**108.8591**

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
Vendor	0.0155	0.1649	0.2107	4.7000e-004	0.0141	3.1300e-003	0.0172	4.0300e-003	2.8800e-003	6.9100e-003			41.8396	2.7000e-004	0.0000	41.8454
Worker	0.0125	0.0185	0.1854	5.6000e-004	0.0499	3.0000e-004	0.0502	0.0132	2.8000e-004	0.0135			39.0723	1.6700e-003	0.0000	39.1073
Total	**0.0280**	**0.1833**	**0.3961**	**1.0300e-003**	**0.0639**	**3.4300e-003**	**0.0674**	**0.0173**	**3.1600e-003**	**0.0204**			**80.9119**	**1.9400e-003**	**0.0000**	**80.9527**

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	0.0326	0.6563	0.7851	1.2400e-003		0.0394	0.0394		0.0394	0.0394			108.3144	0.0259	0.0000	108.8590
Total	**0.0326**	**0.6563**	**0.7851**	**1.2400e-003**		**0.0394**	**0.0394**		**0.0394**	**0.0394**			**108.3144**	**0.0259**	**0.0000**	**108.8590**

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
Vendor	0.0155	0.1649	0.2107	4.7000e-004	0.0141	3.1300e-003	0.0172	4.0300e-003	2.8800e-003	6.9100e-003			41.8396	2.7000e-004	0.0000	41.8454
Worker	0.0125	0.0185	0.1854	5.6000e-004	0.0499	3.0000e-004	0.0502	0.0132	2.8000e-004	0.0135			39.0723	1.6700e-003	0.0000	39.1073
Total	**0.0280**	**0.1833**	**0.3961**	**1.0300e-003**	**0.0639**	**3.4300e-003**	**0.0674**	**0.0173**	**3.1600e-003**	**0.0204**			**80.9119**	**1.9400e-003**	**0.0000**	**80.9527**

3.7 Architectural Coating - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.9907					0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Off-Road	5.0800e-003	0.0341	0.0315	5.0000e-005		2.5600e-003	2.5600e-003		2.5600e-003	2.5600e-003			4.3405	4.1000e-004	0.0000	4.3492
Total	**0.9958**	**0.0341**	**0.0315**	**5.0000e-005**		**2.5600e-003**	**2.5600e-003**		**2.5600e-003**	**2.5600e-003**			**4.3405**	**4.1000e-004**	**0.0000**	**4.3492**

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
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Worker	5.1000e-004	7.6000e-004	7.6400e-003	2.0000e-005	2.0600e-003	1.0000e-005	2.0700e-003	5.5000e-004	1.0000e-005	5.6000e-004			1.6108	7.0000e-005	0.0000	1.6122
Total	**5.1000e-004**	**7.6000e-004**	**7.6400e-003**	**2.0000e-005**	**2.0600e-003**	**1.0000e-005**	**2.0700e-003**	**5.5000e-004**	**1.0000e-005**	**5.6000e-004**			**1.6108**	**7.0000e-005**	**0.0000**	**1.6122**

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	0.9907					0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Off-Road	1.0100e-003	0.0231	0.0312	5.0000e-005		1.6200e-003	1.6200e-003		1.6200e-003	1.6200e-003			4.3405	4.1000e-004	0.0000	4.3492
Total	**0.9917**	**0.0231**	**0.0312**	**5.0000e-005**		**1.6200e-003**	**1.6200e-003**		**1.6200e-003**	**1.6200e-003**			**4.3405**	**4.1000e-004**	**0.0000**	**4.3492**

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
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Worker	5.1000e-004	7.6000e-004	7.6400e-003	2.0000e-005	2.0600e-003	1.0000e-005	2.0700e-003	5.5000e-004	1.0000e-005	5.6000e-004			1.6108	7.0000e-005	0.0000	1.6122
Total	**5.1000e-004**	**7.6000e-004**	**7.6400e-003**	**2.0000e-005**	**2.0600e-003**	**1.0000e-005**	**2.0700e-003**	**5.5000e-004**	**1.0000e-005**	**5.6000e-004**			**1.6108**	**7.0000e-005**	**0.0000**	**1.6122**

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	0.5276	1.8753	6.0425	0.0169	1.1956	0.0275	1.2232	0.3195	0.0254	0.3449			1,265.8242	0.0397	0.0000	1,266.6580
Unmitigated	0.5276	1.8753	6.0425	0.0169	1.1956	0.0275	1.2232	0.3195	0.0254	0.3449			1,265.8242	0.0397	0.0000	1,266.6580

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Research & Development	1,216.00	285.00	165.30	3,151,943	3,151,943
Total	1,216.00	285.00	165.30	3,151,943	3,151,943

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-	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Research & Development	16.60	8.40	6.90	33.00	48.00	19.00	82	15	3

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.459583	0.069267	0.177530	0.170944	0.045911	0.007406	0.012759	0.044006	0.000935	0.001057	0.006483	0.000867	0.003251

5.0 Energy Detail

4.4 Fleet Mix

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			724.2299	0.0247	5.1100e-003	726.3336
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000			810.9347	0.0277	5.7200e-003	813.2902
NaturalGas Mitigated	0.0268	0.2438	0.2048	1.4600e-003		0.0185	0.0185		0.0185	0.0185			265.4382	5.0900e-003	4.8700e-003	267.0536
NaturalGas Unmitigated	0.0341	0.3101	0.2605	1.8600e-003		0.0236	0.0236		0.0236	0.0236			337.5314	6.4700e-003	6.1900e-003	339.5856

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Research & Development	6.3251e+006	0.0341	0.3101	0.2605	1.8600e-003		0.0236	0.0236		0.0236	0.0236			337.5314	6.4700e-003	6.1900e-003	339.5856
Total		**0.0341**	**0.3101**	**0.2605**	**1.8600e-003**		**0.0236**	**0.0236**		**0.0236**	**0.0236**			**337.5314**	**6.4700e-003**	**6.1900e-003**	**339.5856**

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					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Research & Development	4.97412e+006	0.0268	0.2438	0.2048	1.4600e-003		0.0185	0.0185		0.0185	0.0185			265.4382	5.0900e-003	4.8700e-003	267.0536
Total		**0.0268**	**0.2438**	**0.2048**	**1.4600e-003**		**0.0185**	**0.0185**		**0.0185**	**0.0185**			**265.4382**	**5.0900e-003**	**4.8700e-003**	**267.0536**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Research & Development	2.1033e+006	810.9347	0.0277	5.7200e-003	813.2902
Total		**810.9347**	**0.0277**	**5.7200e-003**	**813.2902**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Research & Development	1.87842e+006	724.2299	0.0247	5.1100e-003	726.3336
Total		**724.2299**	**0.0247**	**5.1100e-003**	**726.3336**

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	0.8762	3.0000e-005	2.7800e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005			5.3400e-003	1.0000e-005	0.0000	5.6400e-003
Unmitigated	0.8762	3.0000e-005	2.7800e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005			5.3400e-003	1.0000e-005	0.0000	5.6400e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0991					0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Consumer Products	0.7769					0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Landscaping	2.7000e-004	3.0000e-005	2.7800e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005			5.3400e-003	1.0000e-005	0.0000	5.6400e-003
Total	**0.8762**	**3.0000e-005**	**2.7800e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**			**5.3400e-003**	**1.0000e-005**	**0.0000**	**5.6400e-003**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0991					0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Consumer Products	0.7769					0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Landscaping	2.7000e-004	3.0000e-005	2.7800e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005			5.3400e-003	1.0000e-005	0.0000	5.6400e-003
Total	**0.8762**	**3.0000e-005**	**2.7800e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**			**5.3400e-003**	**1.0000e-005**	**0.0000**	**5.6400e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	393.6659	2.4155	0.0593	462.7644
Unmitigated	393.6659	2.4159	0.0594	462.8017

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Research & Development	73.7541 / 0	393.6659	2.4159	0.0594	462.8017
Total		**393.6659**	**2.4159**	**0.0594**	**462.8017**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Research & Development	73.7541 / 0	393.6659	2.4155	0.0593	462.7644
Total		**393.6659**	**2.4155**	**0.0593**	**462.7644**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	2.3141	0.1368	0.0000	5.1860
Unmitigated	2.3141	0.1368	0.0000	5.1860

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Research & Development	11.4	2.3141	0.1368	0.0000	5.1860
Total		**2.3141**	**0.1368**	**0.0000**	**5.1860**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Research & Development	11.4	2.3141	0.1368	0.0000	5.1860
Total		**2.3141**	**0.1368**	**0.0000**	**5.1860**

Appendix B

Tree Survey Data

TREE SURVEY DATA

	Tree Species											
Tree No.	**Common Name**	**Botanical Name**	**# Main Trunks**	**Diameter at Breast Height (in.)**	**Sum of Largest 2 Trunks**	**Height (ft)**	**Canopy Diameter (ft)**	**Health Rating**	**Aesthetic Rating**	**Potentially Impacted By Construction**	**Mature Trees to be Relocated where feasible**	**To Be Protected**
1	Peruvian pepper	*Schinus molle*	2	8.0, 5.0	13.0	30	20	4	3	X	X	
2	blue gum	*Eucalyptus globulus*	1	8.5	8.5	45	15	4	4	X		
3	palo verde	*Parkinsonia sp.*	1	12.5	12.5	25	25	4	3	X	X	
4	ash	*Fraxinus sp.*	2	27.8, 3.5	31.3	50	40	3	2	X	X	
5	Peruvian pepper	*Schinus molle*	1	14.0	14.0	35	30	4	3	X	X	
6	ash	*Fraxinus sp.*	1	25.6	25.6	50	45	3	2	X	X	
7	Peruvian pepper	*Schinus molle*	1	8.9	8.9	25	18	3	3	X		
8	acacia	*Acacia sp.*	1	8.0	8.0	15	10	2	2	X		
9	ash	*Fraxinus sp.*	2	7.1, 5.1	13.2	40	20	3	3	X	X	
10	Peruvian pepper	*Schinus molle*	2	6, 5.0	11.0	22	15	3	3	X		
11	California fan palm	*Washingtonia filifera*	1	14.0	14.0	15	5	3	2	X	X	
12	ash	*Fraxinus sp.*	4	6.0, 6.0, 5.0, 4.0	12.0	35	25	3	3	X	X	
13	California fan palm	*Washingtonia filifera*	1	9.0	9.0	12	5	3	2	X		
14	ash	*Fraxinus sp.*	2	8.5, 6.5	15.0	35	30	3	3	X	X	
15	California fan palm	*Washingtonia filifera*	1	15.0	15.0	30	10	3	3	X	X	
16	Peruvian pepper	*Schinus molle*	1	8	8.0	22	15	3	3	X		
17	ash	*Fraxinus sp.*	4	5.0, 4.0, 4.0, 3.5	9.0	30	20	3	2	X		
18	ash	*Fraxinus sp.*	1	8.5	8.5	30	15	3	3	X		
19	ash	*Fraxinus sp.*	2	7.0, 6.5	13.5	30	18	3	3	X	X	
20	blue gum	*Eucalyptus globulus*	1	50.0	50.0	85	60	3	3	X	X	
21	Peruvian pepper	*Schinus molle*	1	8.0	8.0	20	20	2	1	X		
22	Peruvian pepper	*Schinus molle*	4	8.0, 4.0, 4.0, 3.0	12.0	25	25	3	2	X	X	
23	blue gum	*Eucalyptus globulus*	1	52.0	52.0	85	50	4	3	X	X	
24	Peruvian pepper	*Schinus molle*	1	8.0	8.0	25	25	4	2	X		
25	blue gum	*Eucalyptus globulus*	1	34.0	34.0	80	45	4	3	X	X	
26	locust	*Robinia sp.*	1	9.0	9.0	25	30	2	2	X		
27	locust	*Robinia sp.*	1	17.2	17.2	35	35	3	3	X	X	
28	camphor	*Cinnamomum camphora*	1	24.3	24.3	35	40	4	4			X
29	camphor	*Cinnamomum camphora*	1	15.9	15.9	28	35	4	4	X	X	

TREE SURVEY DATA

Tree No.	Tree Species		# Main Trunks	Diameter at Breast Height (in.)	Sum of Largest 2 Trunks	Height (ft)	Canopy Diameter (ft)	Health Rating	Aesthetic Rating	Potentially Impacted By Construction	Mature Trees to be Relocated where feasible	To Be Protected
	Common Name	Botanical Name										
30	camphor	*Cinnamomum camphora*	1	9.3	9.3	20	20	4	4	X		
31	camphor	*Cinnamomum camphora*	1	15.5	15.5	15	10	3	2			X
32	camphor	*Cinnamomum camphora*	1	15.0	15.0	25	20	3	2			X
33	western sycamore	*Platanus racemosa*	1	7.5	7.5	30	20	4	4			X
34	western sycamore	*Platanus racemosa*	1	7.0	7.0	30	18	4	4			X
35	western sycamore	*Platanus racemosa*	1	9.0	9.0	30	22	4	4			X
36	western sycamore	*Platanus racemosa*	1	9.0	9.0	35	25	4	4			X
37	western sycamore	*Platanus racemosa*	1	8	8.0	35	20	4	4			X
38	western sycamore	*Platanus racemosa*	1	7.5	7.5	25	22	4	4			X
39	western sycamore	*Platanus racemosa*	1	4.5	4.5	15	10	4	4			X
40	western sycamore	*Platanus racemosa*	1	7.0	7.0	30	20	4	4			X
41	western sycamore	*Platanus racemosa*	1	5.5	5.5	30	12	4	4			X
42	western sycamore	*Platanus racemosa*	1	9.5	9.5	35	30	4	4			X
43	western sycamore	*Platanus racemosa*	1	11.0	11.0	35	25	4	4			X
44	western sycamore	*Platanus racemosa*	1	5.0	5.0	28	15	4	4			X
45	western sycamore	*Platanus racemosa*	1	7.0	7.0	25	18	4	4			X
46	Peruvian pepper	*Schinus molle*	1	9.0	9.0	30	25	4	4			X
47	Peruvian pepper	*Schinus molle*	1	9.0	9.0	30	25	4	4			X
48	Peruvian pepper	*Schinus molle*	1	8.5	8.5	30	20	4	4			X
49	Peruvian pepper	*Schinus molle*	1	8.0	8.0	30	20	4	4			X
50	Peruvian pepper	*Schinus molle*	1	54.0	54.0	55	50	4	3			X
51	Peruvian pepper	*Schinus molle*	1	58.0	58.0	55	50	4	3			X
52	western sycamore	*Platanus racemosa*	1	27.3	27.3	80	40	4	4	X	X	
53	western sycamore	*Platanus racemosa*	1	20.0	20.0	75	30	4	4	X	X	
54	western sycamore	*Platanus racemosa*	1	29.4	29.4	75	45	4	4	X	X	
55	pine	*Pinus sp.*	1	11.0	11.0	25	22	4	4	X		
56	pine	*Pinus sp.*	1	9.8	9.8	25	18	4	4	X		
57	western sycamore	*Platanus racemosa*	1	23.9	23.9	75	45	4	4	X	X	
58	western sycamore	*Platanus racemosa*	1	19.5	19.5	75	45	4	4	X	X	

TREE SURVEY DATA

	Tree Species											
Tree No.	**Common Name**	**Botanical Name**	**# Main Trunks**	**Diameter at Breast Height (in.)**	**Sum of Largest 2 Trunks**	**Height (ft)**	**Canopy Diameter (ft)**	**Health Rating**	**Aesthetic Rating**	**Potentially Impacted By Construction**	**Mature Trees to be Relocated where feasible**	**To Be Protected**
59	Chinese flame tree	*Koelreuteria bipinnata*	1	9.5	9.5	25	22	4	4	X		
60	Chinese flame tree	*Koelreuteria bipinnata*	1	9.5	9.5	20	25	4	4	X		
61	Chinese flame tree	*Koelreuteria bipinnata*	1	9.4	9.4	20	20	4	4	X		
62	Chinese flame tree	*Koelreuteria bipinnata*	1	11.4	11.4	25	20	4	4	X		
63	mexican fan palm	*Washingtonia robusta*	1	11.6	11.6	45	12	4	4			X
64	Chinese flame tree	*Koelreuteria bipinnata*	1	13.0	13.0	30	25	4	4			X
65	mexican fan palm	*Washingtonia robusta*	1	12.4	12.4	45	10	4	4			X
66	Chinese flame tree	*Koelreuteria bipinnata*	1	11.7	11.7	30	25	4	4			X
67	mexican fan palm	*Washingtonia robusta*	1	10.5	10.5	45	12	4	4			X
68	mexican fan palm	*Washingtonia robusta*	1	10.9	10.9	45	12	4	3			X
69	Chinese flame tree	*Koelreuteria bipinnata*	1	9.3	9.3	20	25	4	4			X
70	pine	*Pinus sp.*	1	8.0	8.0	30	15	4	4			X
71	pine	*Pinus sp.*	1	12.0	12.0	45	25	4	4			X
		TOTAL										

Tree health and aesthetic values are rated in the following manner: 5=excellent, 4=good, 3=average/fair, 2=poor, 1=very poor

Appendix C

Cultural Resources Record Search Letter Report

BonTerra
PSOMAS

Balancing the Natural and Built Environment

January 7, 2016

Tricia D. Thrasher, ASLA, LEED AP
Principal Environmental Planner
University of California, Riverside
Capital Asset Strategies – Capital Planning
1223 University Avenue, Suite 240
Riverside, California 92521

VIA EMAIL
tricia.thrasher@ucr.edu

Subject: Results of Cultural Resources Records Search and Field Survey for the University of California, Riverside Multidisciplinary Research Building 1 Project

Dear Ms. Thrasher:

The Eastern Information Center (EIC) at University of California, Riverside (UCR) has completed a records search and literature review of the proposed development site for the Multidisciplinary Research Building (MRB) 1 Project (Attachment A). The EIC is one of nine regional clearinghouses for historical and archaeological records in California. The EIC maintains records for Riverside, Inyo, and Mono Counties. BonTerra Psomas provided the EIC a portion of the U.S. Geological Survey's (USGS') Riverside East 7.5-Minute quadrangle map that depicts the parcel's location. The parcel is located generally northwest of the intersection of Aberdeen Drive and North Campus Drive in the north-central part of the UCR campus.

The review of the records and topographical maps on file at the EIC indicate that there have been eight cultural resources investigations conducted within a ¼-mile radius of the subject property. Of those, three large surveys included the entire subject property (Love et al. 2002; McKenna et al. 2001; LSA 1990). The remaining five studies did not include any portion of the subject property (see References).

The review also indicated that a historic district, the Canyon Crest Heights neighborhood (P-33-011475), has been recorded north of Linden Street, but is not near the subject property.

Additionally, EIC personnel provided photocopied portions of historic maps depicting the general area where the parcel is located. These consisted of the 1901 USGS Elsinore 30-minute topographic map; the 1901 USGS Riverside 15-minute topographic map; and the 1942 USGS Riverside 15-minute topographic map. With the exception of a possible roadway in the vicinity of the subject parcel on each of the maps, no permanent structures are depicted on or immediately adjacent to the parcel.

Additional sources consulted include the National Register of Historic Places and the Office of Historic Preservation's Archaeological Determinations of Eligibility and Historic Property Directory. No resources associated with the subject property were listed in these sources.

On December 18, 2015, Senior Archaeologist David Smith visited the site to determine if any prehistoric or historic artifacts or features were present. Visibility was generally excellent overall, but the westernmost portion of the site was fenced and covered with grass.

Low-lying foothills in this part of the campus have been graded extensively to create roads, buildings, parking lots, sports facilities, landscaping, and other campus features. The subject parcel was constructed by cutting and filling from areas to the north and east, resulting in the deposition of fill materials over the entire western half of the parcel. The eastern portion was likely the result of deep cutting into native sediments to create a level pad (Attachment B).

Recently deposited sediments from an unknown location were piled in the northeastern corner of the parcel. The unfenced eastern portion is almost entirely bare, gravely, sandy soils. Remnants of two concrete slabs are present in that portion of the parcel that were mostly covered with soils and that were associated with an unknown athletic activity. An examination of the parcel and the slabs on Google Earth clearly shows that none of the athletic facilities observed in the western half of the property were present in 2006, while the concrete slabs in the eastern half likely supported seating for spectators of an athletic event. The concrete slab is not present in the 2003 view of the parcel. The remaining features on the parcel are not of significant age to warrant consideration as cultural resources (Attachment B).

A functioning fenced athletic facility occupies the western half of the parcel. Most of this area was covered in sparse grass, but soils were visible over most of the area.

No prehistoric artifacts or features were observed in the heavily disturbed and reworked sediments.

Thank you for this opportunity to provide these services. If you have any questions regarding our findings please contact me at Pat.Maxon@Psomas.com or (714) 751-7373.

Respectfully,
BonTerra Psomas

Patrick O. Maxon, M.A., RPA
Director of Cultural Resources

Attachments: A – EIC Records Search
B – Site Photographs

R:\Projects\UCR\3UCR000500\Cultural\Cultural Letter Rpt-010716.docx

REFERENCES

Bonner, Wayne H. and Sarah Williams
2012 *Cultural Resources Records Search and Site Visit Results for T-Mobile West, LCC Candidate IE25999A (UCR Parking Lot 1), 900 University Avenue, Riverside, Riverside County, California* (Report No. RI- RI-08840). On file at the Eastern Information Center, University of California, Riverside, California.

Bonner, Wayne H., Sarah Williams, and Kathleen A. Crawford
2009 *Letter Report: Cultural Resources Records and Site Visit Results for T-Mobile USA Candidate IE05098A, (TM098 UCR Monopine) UC Riverside, Riverside County* (Report No. RI-08308). On file at the Eastern Information Center, University of California, Riverside, California.

Duke, Curt
1999 *Cultural Resource Assessment for Pacific Bell Mobile Services Facility CM 681-02, County Of Riverside, California* (LSA Associates, Inc. Report No. 1085795). On file at the Eastern Information Center, University of California, Riverside, California.

Love, Bruce, Tang Bai, Michael Hogan, and Mariam Dahdul
2002 *Cultural Resources Technical Report, UCR Long Range Development Plan* (CRM Tech. Report No. RI-05873). On file at the Eastern Information Center, University of California, Riverside, California.

LSA Associates
1990 *An Inventory and Assessment of Cultural Resources on the Campus of UC Riverside*. LSA Associates, Inc., Irvine, California.

McKenna et al.
2001a *A Phase I Cultural Resources Investigation of the Proposed Chiller Plant, Tank, and Pipeline System on The University Of California, Riverside* (Report No. RI- 1086359). On file at the Eastern Information Center, University of California, Riverside, California.

2001b *A Phase I Cultural Resources Investigation of the Islander Park Retention Basins and Channel Improvements Project Area, Riverside, Riverside County, California* (Report No. RI-1086360). On file at the Eastern Information Center, University of California, Riverside, California.

Tibbet, Casey
2010 *Historic Resources Assessment: The Barn Group and University Cottage; University of California, Riverside City of Riverside, Riverside County, California* (Report No. RI-08577). On file at the Eastern Information Center, University of California, Riverside, California.

ATTACHMENT A

EIC RECORDS SEARCH

EASTERN INFORMATION CENTER
CALIFORNIA HISTORICAL RESOURCES INFORMATION SYSTEM
Department of Anthropology, University of California, Riverside, CA 92521-0418
(951) 827-5745 - Fax (951) 827-5409 - eickw@ucr.edu
Inyo, Mono, and Riverside Counties

CHRIS Access and Use Agreement No.: 16
EIC-RIV-ST-3438
January 4, 2016

David M. Smith
BonTerra Psomas
3 Hutton Centre Drive, Suite 200
Santa Ana, CA 92707-8794

Re: Cultural Resources Records Search for the Multidisciplinary Research Building 1

Dear Mr. Smith,

We received your request on December 21, 2015, for a cultural resources records search for the Multidisciplinary Research Building 1 Project located in Section 20, T.2S, R.4W, SBBM, in the Riverside East area in Riverside County. We have reviewed our site records, maps, and manuscripts against the location map you provided.

Our records indicate that seven cultural resources studies have been conducted within a quarter-mile radius of your project area. Two of these studies involved the project area. PDF copies of these reports are included for your reference. Three additional studies provide overviews of cultural resources in the general project vicinity. All of these reports are listed on the attachment entitled "Eastern Information Center Report Listing," "Eastern Information Center Report Detail," and "Eastern Information Center Report Spreadsheet." These reports are available upon request at 15¢/page plus $40/hour for hard copies, or 15¢/page plus $40/hour and a $25 flat fee for PDFs.

Our records indicate that one cultural resource properties has been recorded within a quarter-mile radius of your project area. The property does not involve the project area. A PDF copy of the record is included for your reference. All of these resources are listed on the attachment entitled "Eastern Information Center Resource Listing," "Eastern Information Center Resource Detail," and "Eastern Information Center Resource Spreadsheet."

The above information is reflected on the enclosed maps. Areas that have been surveyed are highlighted in yellow. Numbers marked in blue ink refer to the report number (RI#). Cultural resources properties are marked in red, numbers in black refer Trinomial designations, those in green to Primary number designations. National register properties are indicated in light blue.

Additional sources of information consulted are identified below.

National Register of Historic Places: no listed properties are located within the boundaries of the project area.

Office of Historic Preservation (OHP), Archaeological Determinations of Eligibility (ADOE): no listed properties are located within the boundaries of the project area.

Office of Historic Preservation (OHP), Historic Property Directory (HPD): no listed properties are located within the boundaries of the project area.

Note: not all properties in the California Historical Resources Information System are listed in the OHP ADOE and HPD; the ADOE and HPD comprise lists of properties submitted to the OHP for review.

Copies of the relevant portions of the 1901 USGS Elsinore 30', 1901 USGS Riverside 15', and 1942 USGS Riverside 15' topographic maps are included for your reference.

As the Information Center for Riverside County, it is necessary that we receive a copy of all cultural resources reports and site information pertaining to this county in order to maintain our map and manuscript files. Confidential information provided with this records search regarding the location of cultural resources outside the boundaries of your project area should not be included in reports addressing the project area.

Sincerely,

Jose Jimenez

Jose Jimenez
Information Officer

Enclosures

Report List

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
RI-04450	NADB-R - 1085795	1999	DUKE, CURT	CULTURAL RESOURCE ASSESSMENT FOR PACIFIC BELL MOBILE SERVICES FACILITY CM 681-02, COUNTY OF RIVERSIDE, CALIFORNIA	LSA ASSOCIATES, INC.	
RI-04997	NADB-R - 1086359; Submitter - 09-01-11-594	2001	MCKENNA ET AL.	A PHASE I CULTURAL RESOURCES INVESTIGATION OF THE PROPOSED CHILLER PLANT, TANK, AND PIPELINE SYSTEM ON THE UNIVERSITY OF CALIFORNIA, RIVERSIDE CAMPUS, RIVERSIDE, RIVERSIDE COUNTY, CALIFORNIA.	MCKENNA ET AL.	33-000495
RI-04998	NADB-R - 1086360; Submitter - 04-01-05-566	2001	MCKENNA ET AL.	A PHASE I CULTURAL RESOURCES INVESTIGATION OF THE ISLANDER PARK RETENTION BASINS AND CHANNEL IMPROVEMENTS PROJECT AREA, RIVERSIDE, RIVERSIDE COUNTY, CALIFORNIA.	MCKENNA ET AL.	33-000495, 33-011219
RI-05873	NADB-R - 1087236; Submitter - 627	2002	LOVE, BRUCE, BAI TANG, MICHAEL HOGAN, and MARIAM DAHDUL	CULTURAL RESOURCES TECHNICAL REPORT, UCR LONG RANGE DEVELOPMENT PLAN	CRM TECH	33-000495, 33-004768, 33-006015, 33-007877, 33-007878, 33-008090
RI-08308		2009	Sarah A. Williams, Wayne H. Bonner, and Kathleen A, Crawford	Letter Report: Cultural Resources Records and Site Visit Results for T-Mobile USA Candidate IE05098A, (TM098 UCR Monopine) UC Riverside, Riverside County, California.	Michael Brandman Associates, San Bernardino, CA	
RI-08577	Other - Project No. UCR1001; Submitter - Project No. UCR1001	2010	Casey Tibbet	Historic Resources Assessment: The Barn Group and University Cottage; University of California, Riverside City of Riverside, Riverside County, California	LSA	33-007877, 33-007878
RI-08840		2012	Wayne H. Bonner and Sarah A. Williams	Cultural Resources Records Search and Site Visit Results for T-Mobile West, LCC Candidate IE25999A (UCR Parking Lot 1), 900 University Avenue, Riverside, Riverside County, California	Michael Brandman Associates	33-004768, 33-007375, 33-007877, 33-011475

Report Detail: RI-04450

Identifiers

Report No.: RI-04450

Other IDs:

Type	*Name*
NADB-R	1085795

Cross-refs:

Citation information

Author(s): DUKE, CURT

Year: 1999

Title: CULTURAL RESOURCE ASSESSMENT FOR PACIFIC BELL MOBILE SERVICES FACILITY CM 681-02, COUNTY OF RIVERSIDE, CALIFORNIA

Affliliation: LSA ASSOCIATES, INC.

No. pages: 7

No. maps:

Attributes: Literature search

Inventory size:

Disclosure: Not for publication

Collections: No

General notes

Associated resources

No. resources: 0

Has informals:

Location information

County(ies): Riverside

USGS quad(s): RIVERSIDE EAST

Address:

PLSS:

Database record metadata

	Date	*User*
Entered:	9/12/2003	EIC
Last modified:	8/1/2007	chris

IC actions:	*Date*	*User*	*Action taken*
	3/28/2007	jay	Imported records from NADB.
	8/1/2007	chris	ELB, Report info updated

Record status:

Report Detail: RI-04997

Identifiers

Report No.: RI-04997

Other IDs:	*Type*	*Name*
	NADB-R	1086359
	Submitter	09-01-11-594

Cross-refs:

Citation information

Author(s): MCKENNA ET AL.

Year: 2001

Title: A PHASE I CULTURAL RESOURCES INVESTIGATION OF THE PROPOSED CHILLER PLANT, TANK, AND PIPELINE SYSTEM ON THE UNIVERSITY OF CALIFORNIA, RIVERSIDE CAMPUS, RIVERSIDE, RIVERSIDE COUNTY, CALIFORNIA.

Afflliation: MCKENNA ET AL.

No. pages: 32

No. maps:

Attributes: Archaeological, Field study

Inventory size: 246 Acres surveyed

Disclosure: Not for publication

Collections: No

General notes

Associated resources

Primary No.	*Trinomial*	*Name*
P-33-000495	CA-RIV-000495	

No. resources: 1

Has informals:

Location information

County(ies): Riverside

USGS quad(s): RIVERSIDE EAST

Address:

PLSS:

Database record metadata

	Date	*User*
Entered:	10/24/200	EIC
Last modified:	7/12/2007	chris

IC actions:	*Date*	*User*	*Action taken*
	3/28/2007	jay	Imported records from NADB.

Record status:

Report Detail: RI-04998

Identifiers

Report No.: RI-04998

Other IDs:

Type	*Name*
NADB-R	1086360
Submitter	04-01-05-566

Cross-refs:

Citation information

Author(s): MCKENNA ET AL.

Year: 2001

Title: A PHASE I CULTURAL RESOURCES INVESTIGATION OF THE ISLANDER PARK RETENTION BASINS AND CHANNEL IMPROVEMENTS PROJECT AREA, RIVERSIDE, RIVERSIDE COUNTY, CALIFORNIA.

Affliliation: MCKENNA ET AL.

No. pages: 23

No. maps:

Attributes: Archaeological, Field study

Inventory size: 55 Acres surveyed

Disclosure: Not for publication

Collections: No

General notes

Associated resources

Primary No.	*Trinomial*	*Name*
P-33-000495	CA-RIV-000495	
P-33-011219		

No. resources: 2

Has informals:

Location information

County(ies): Riverside

USGS quad(s): RIVERSIDE EAST

Address:

PLSS:

Database record metadata

	Date	*User*
Entered:	10/24/200	EIC
Last modified:	7/12/2007	chris

IC actions:	*Date*	*User*	*Action taken*
	3/28/2007	jay	Imported records from NADB.

Record status:

Report Detail: RI-05873

Identifiers

Report No.: RI-05873

Other IDs:

Type	*Name*
NADB-R	1087236
Submitter	627

Cross-refs:

Citation information

Author(s): LOVE, BRUCE, BAI TANG, MICHAEL HOGAN, and MARIAM DAHDUL

Year: 2002

Title: CULTURAL RESOURCES TECHNICAL REPORT, UCR LONG RANGE DEVELOPMENT PLAN

Affliliation: CRM TECH

No. pages: 28

No. maps:

Attributes: Archaeological, Field study

Inventory size: 1300 Acres surveyed

Disclosure: Not for publication

Collections: No

General notes

Associated resources

Primary No.	*Trinomial*	*Name*
P-33-000495	CA-RIV-000495	
P-33-004768	CA-RIV-004768	
P-33-006015		
P-33-007877		
P-33-007878		
P-33-008090		

No. resources: 6

Has informals:

Location information

County(ies): Riverside

USGS quad(s): RIVERSIDE EAST

Address:

PLSS:

Database record metadata

	Date	*User*
Entered:	8/23/2006	EIC
Last modified:	7/13/2007	chris

	Date	*User*	*Action taken*
IC actions:	3/28/2007	jay	Imported records from NADB.

Record status:

Report Detail: RI-08308

Identifiers

Report No.: RI-08308
Other IDs:
Cross-refs:

Citation information

Author(s): Sarah A. Williams, Wayne H. Bonner, and Kathleen A, Crawford
Year: 2009
Title: Letter Report: Cultural Resources Records and Site Visit Results for T-Mobile USA Candidate IE05098A, (TM098 UCR Monopine) UC Riverside, Riverside County, California.
Affliliation: Michael Brandman Associates, San Bernardino, CA
No. pages: 17
No. maps:
Attributes: Literature search
Inventory size:
Disclosure: Not for publication
Collections: No

General notes

Associated resources

No. resources: 0
Has informals:

Location information

County(ies): Riverside
USGS quad(s): RIVERSIDE EAST
Address:
PLSS:

Database record metadata

	Date	*User*
Entered:	6/14/2010	Jackie
Last modified:	6/14/2010	Jackie

IC actions:
Record status:

Report Detail: RI-08577

Identifiers

Report No.: RI-08577

Other IDs:

Type	*Name*
Submitter	Project No. UCR1001
Other	Project No. UCR1001

Cross-refs:

Citation information

Author(s): Casey Tibbet

Year: 2010

Title: Historic Resources Assessment: The Barn Group and University Cottage; University of California, Riverside City of Riverside, Riverside County, California

Affliliation: LSA

No. pages: 2010

No. maps:

Attributes: Archaeological, Evaluation, Field study, Literature search

Inventory size:

Disclosure: Not for publication

Collections: No

General notes

Associated resources

Primary No.	*Trinomial*	*Name*
P-33-007877		
P-33-007878		

No. resources: 2

Has informals:

Location information

County(ies): Riverside

USGS quad(s): RIVERSIDE EAST

Address:

PLSS:

Database record metadata

	Date	*User*
Entered:	5/13/2011	Gaby
Last modified:	5/13/2011	Gaby

IC actions:

Date	*User*	*Action taken*
5/13/2011	Gaby	Entered into database

Record status:

Report Detail: RI-08840

Identifiers

Report No.: RI-08840
Other IDs:
Cross-refs:

Citation information

Author(s): Wayne H. Bonner and Sarah A. Williams
Year: 2012
Title: Cultural Resources Records Search and Site Visit Results for T-Mobile West, LCC Candidate IE25999A (UCR Parking Lot 1), 900 University Avenue, Riverside, Riverside County, California
Affliliation: Michael Brandman Associates
No. pages: 19
No. maps:
Attributes: Archaeological, Field study
Inventory size:
Disclosure: Unrestricted
Collections: No

General notes

Associated resources

Primary No.	*Trinomial*	*Name*
P-33-004768	CA-RIV-004768	
P-33-007375		
P-33-007877		
P-33-011475		

No. resources: 4
Has informals:

Location information

County(ies): Riverside
USGS quad(s): RIVERSIDE EAST
Address:
PLSS:

Database record metadata

	Date	*User*
Entered:	1/2/2013	kimi
Last modified:	1/2/2013	kimi

IC actions:	*Date*	*User*	*Action taken*
	1/2/2013	kimi	Bibliographic info entered.

Record status:

Resource List

Primary No.	Trinomial	Other IDs	Type	Age	Attribute codes	Recorded by	Reports
P-33-011475			District	Historic			RI-08840

ATTACHMENT B

SITE PHOTOGRAPHS

Existing Site Views

UCR Multidisciplinary Research Building 1

Bon Terra PSOMAS

(01/07/2016 JAZ) R:\Projects\UCR\3UCR000500\Graphics\StandAlones\20160107_SP\ex_SP1.pdf

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Existing Site Views

UCR Multidisciplinary Research Building 1

BonTerra
PSOMAS

Appendix D

Geotechnical Study

REPORT OF
LIMITED GEOTECHNICAL INVESTIGATION
PROPOSED MULTIDISCIPLINARY RESEARCH BUILDING

UNIVERSITY OF CALIFORNIA, RIVERSIDE
NEAR INTERSECTION OF NORTH CAMPUS DRIVE AND ABERDEEN DRIVE
RIVERSIDE, CALIFORNIA

Prepared for:

UNIVERSITY OF CALIFORNIA, RIVERSIDE

Riverside, California

December 4, 2015

Project 4953-15-1021

amec
foster
wheeler

December 4, 2015

Ms. Jacqueline Norman
Senior Project Manager
University of California, Riverside
1223 University Avenue, Suite 240
Riverside, California 92507

Subject: **LETTER OF TRANSMITTAL**
Report of Limited Geotechnical Investigation
Proposed Multidisciplinary Research Building 1
University of California, Riverside
Near Intersection of North Campus Drive and Aberdeen Drive
Riverside, California
Amec Foster Wheeler Project 4953-15-1021

Dear Ms. Norman:

We are pleased to submit this report presenting the results of our limited geotechnical investigation for the proposed Multidisciplinary Research Building 1 (MRB 1) Project to be constructed on the campus of University of California, Riverside (UCR) in Riverside, California. This investigation for the building was performed in accordance with our proposal dated September 11, 2015 and under Professional Service Agreement No. 958025-PSA-2016-35 dated September 23, 2015.

The scope of our services was planned based on our discussions with you and our understanding of the proposed project.

Amec Foster Wheeler
Environment & Infrastructure, Inc.
6001 Rickenbacker Road
Los Angeles, California 90040
USA
Ph +1 (323) 889-5300
Fax+1 (323) 721-6700
www.amecfw.com

It has been a pleasure to be of professional service to you. Please contact us if you have any questions or if we can be of further assistance.

Sincerely,

Amec Foster Wheeler Environment & Infrastructure, Inc.

ALEK HAROUNIAN
NO 80521
CIVIL

Alek Harounian
Senior Engineer

MARK ANDREW MURPHY
No. 2777
GEOTECHNICAL

Mark A. Murphy
Associate Geotechnical Engineer
Project Manager

Paul Elliott

PAUL JAMES ELLIOTT
NO. 1435
CERTIFIED
ENGINEERING
GEOLOGIST

Paul Elliott
Principal Engineering Geologist

Reviewed By:

Marshall Lew

MARSHALL LEW
No. 522
GEOTECHNICAL

Marshall Lew, Ph.D.
Principal Engineer

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(electronic copy submitted)

REPORT OF LIMITED GEOTECHNICAL INVESTIGATION
PROPOSED MULTIDISCIPLINARY RESEARCH BUILDING 1

UNIVERSITY OF CALIFORNIA, RIVERSIDE
NEAR INTERSECTION OF NORTH CAMPUS DRIVE AND ABERDEEN DRIVE
RIVERSIDE, CALIFORNIA

Prepared for:

UNIVERSITY OF CALIFORNIA, RIVERSIDE

Riverside, California

Amec Foster Wheeler

Los Angeles, California

December 4, 2015

Project 4953-15-1021

TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

1.0 SCOPE

This report presents the results of our field explorations (including environmental and geotechnical sampling), environmental and geotechnical laboratory testing, and limited geologic-seismic hazards study for the proposed Multidisciplinary Research Building 1 (MRB 1) project within the University of California, Riverside (UCR) campus in Riverside, California. Geotechnical recommendations are not provided in this report. The general location of the proposed site is shown on Figure 1, Vicinity Map.

The main objectives of the investigation were to evaluate the existing soil and groundwater conditions at the site and to evaluate the physical characteristics of the soil materials underneath the sites. We also evaluated geologic-seismic hazards at the site and their impact on the proposed development. More specifically, the scope of this investigation included the following:

- Review of available information.
- Performance of an environmental field investigation, consisting of advancing of a total of twenty environmental borings.
- Performance of environmental laboratory testing of soil samples collected from the environmental borings.
- Performance of a geotechnical field exploration, consisting of drilling of a total of twenty exploratory soil borings.
- Performance of geotechnical laboratory testing of soil samples collected from the geotechnical borings.
- Performance of a limited geologic-seismic hazards evaluation of the site.
- Preparation of this report summarizing our findings.

The locations of the environmental and geotechnical borings are shown on Figure 2, Plot Plan. Logs of the geotechnical borings and the laboratory test results are presented in Appendix A. Logs of the environmental borings and the laboratory test results are presented in Appendix B.

2.0 PROJECT DESCRIPTION AND SITE CONDITIONS

It is proposed to construct the MRB 1 on the university campus, to be located north of the existing Materials Sciences and Engineering Building on North Campus Drive, east of the soccer field, west of Aberdeen Drive, and south of the Student Recreation Center. MRB 1 will be a 125,000 to 150,000 gross square foot (GSF) multi-story facility housing research laboratories, research support space, faculty offices, office support, and building support spaces. Since the project will utilize the design-build project delivery method, the precise building location, architectural, and structural details are not available at this time.

The project site area is approximately 100,000 square feet. The majority of the site is relatively level with slopes up to approximately 15 to 20 feet in height near the north, and east edges. The site is currently vacant and primarily covered with sparse vegetation.

Several underground utilities may cross the site.

3.0 FIELD EXPLORATIONS AND LABORATORY TEST RESULTS

The field exploration program was developed based on our discussions with UCR. Prior to commencing field activities, a site reconnaissance was conducted to assess the site accessibility and to evaluate potential conflict with existing underground utilities. Borings were marked during our site reconnaissance and Underground Service Alert (USA) was contacted for preliminary utility clearance.

Prior to drilling, GEOVision was retained to locate existing subsurface obstructions and/or utilities at the proposed boring locations using geophysical methods. Hand auger tools were used to advance the borings near the ground surface to avoid damage to existing shallow utilities.

The soil conditions beneath the proposed project site were explored by drilling a total of 20 environmental borings (Borings E-1 through E-20) between October 12 and 15, 2015 and a total of 20 geotechnical borings (Borings B-1 through B-20) between October 21 and 29, 2015. The boring locations are shown on Figure 2, Plot Plan.

Geotechnical Borings

The geotechnical borings were drilled with truck-mounted hollow-stem auger drilling equipment. The borings were 8 inches in diameter, and were drilled to depths ranging from 50 to 76 feet below grade. The soil materials encountered were logged by our field technician. Relatively undisturbed and bulk samples were obtained for laboratory inspection and testing. The logs of the geotechnical borings are presented on Figures A-1.1 through A-1.20 in Appendix A; the depths at which undisturbed samples were obtained are indicated on the left side of the boring logs. The standard penetration test (SPT) N-value blow counts and the number of blows required to drive the Crandall sampler 12 inches using a 140 pound automatic hammer falling 30 inches are shown on the boring logs. The soils are classified in accordance with the Unified Soil Classification System described on Figure A-2 in Appendix A.

Environmental Borings

The environmental borings were to be advanced to a depth of about 40 feet below ground surface using a direct-push rig. Borings E-5, E-6, and E-19 could not be advanced beyond a depth of 16, 20½, and 39 feet, respectively, due to refusal. The soils encountered were logged by our field technician, and samples were obtained for analytical laboratory testing. The logs of the environmental borings are presented on Figure B-1.1 through B-1.20 in Appendix B; the depths at which soil samples were collected are indicated on the left side of the boring logs. The soils are classified in accordance with the Unified Soil Classification System described on Figure A-2 in Appendix A.

Geotechnical Laboratory Testing

Laboratory tests were performed on selected samples obtained from the geotechnical borings to aid in the classification of the soil materials and to evaluate the pertinent engineering properties of the foundation soil. The following tests were performed:

- Moisture content and dry density determination
- Direct shear
- Consolidation
- Hydroconsolidation
- Compaction
- Passing No. 200 sieve
- Stabilometer (R-Value)
- Soil corrosivity

All testing was performed in general accordance with applicable ASTM specifications. Details of the laboratory testing program and test results are presented in Appendix A.

A corrosion study was performed by Universal Corrosion Services, LLC under subcontract with Amec Foster Wheeler. The corrosion test results and the corrosion report are also included in Appendix A.

Environmental Laboratory Testing

Soil samples were analyzed for total petroleum hydrocarbons (TPH) using United States Environmental Protection Agency (U.S. EPA) Method 8015B (M), volatile organic compounds (VOCs) using U.S. EPA Method 8260B (following U.S. EPA Method 5035 field preservation methods), and Title 22 metals (metals) using U.S. EPA Method 6010B/7471A. Analytical laboratory reports are provided in Appendix B.

A summary of findings in each potentially impacted area is presented below:

- Total TPH (C6 to C28+) was not detected above the laboratory reporting detection limit in any of the samples analyzed.
- VOCs were not detected above the laboratory reporting detection limits in any of the soil samples analyzed.
- Various metals were detected above the laboratory reporting detection limits as shown in the results presented in Appendix B. None of the metals concentrations are considered to be significant with regard to potential environmental impacts and are likely representative of typical background concentrations for soils in the vicinity of the boring locations. However, this data should be considered with respect to evaluating management options for the materials to be excavated and/or removed from the site.

Based on the analytical results, the excavation spoils are considered to be non-hazardous.

4.0 LIMITED GEOLOGIC-SEISMIC HAZARDS EVALUATION

4.1 GEOLOGIC SETTING

The site is located in northwestern Riverside County within the geologic structure known as the Perris block. The Perris block, an eroded mass of Cretaceous and older crystalline rock, includes the Chino Plain and is bounded by the San Jacinto fault and San Bernardino Valley on the northeast, by the Sierra Madre and Cucamonga fault zones and San Gabriel Mountains on the north, and by the Chino-Elsinore fault system and Santa Ana Mountains on the southwest (Woodford et al., 1971). The site is located within the northern Peninsular Ranges geomorphic province, an area characterized by northwest/southeast trending alignments of mountains and hills and intervening basins, reflecting the influence of northwest trending major faults and folds controlling the general geologic structural fabric of the region. This province extends northwesterly from Baja California into the Los Angeles Basin and westerly into the offshore area, including Santa Catalina, Santa Barbara, San Clemente and San Nicolas islands. It is bounded by the Colorado Desert along the San Jacinto fault zone on the east. The Los Angeles Basin and the San Bernardino Valley are the northernmost part of the Peninsular Ranges province bordering the Transverse Ranges geomorphic province.

Locally, the site is situated at the base of the western flank of the Box Springs Mountains. Additionally, the site is within the path of a historic Santa Ana River tributary drainage. The Santa Ana River is located about 3½ miles northwest of the site. The site is at an approximate Elevation of 1040 feet above mean sea level (MSL) (NGVD29).

The topography of the area is shown on Figure 1, Vicinity Map. The local geology is shown on Figure 3, Local Geologic Map. A generalized geologic map of the region is shown on Figure 4, Regional Geologic Map. The site is shown in relation to major fault zones and earthquake epicenters on Figure 5, Regional Faults and Seismicity Map.

4.2 GEOLOGIC MATERIALS

Artificial Fill

Based on the materials encountered in our exploratory borings, the site is locally mantled with artificial fill to a depth up to approximately 21½ feet; these deeper fills occur primarily in the slope areas along the east side of the site. The deep fill soils encountered are likely the result of grading to infill the former drainage channel and establish the grade at the current location of Aberdeen Drive. As encountered in our borings, the fill soils generally consist of silty sand; deeper and/or poorer quality fill may be encountered between borings.

Alluvial Deposits

Surficial materials in the site area have been mapped and described as Holocene and late Pleistocene young alluvial channel deposits (Morton and Cox, 2002). The borings from this investigation, drilled to a maximum depth of 76 feet, indicate that the alluvium at the site consists predominantly of massive- to crudely-stratified interbedded poorly graded sand and silty sand. Gravel was generally encountered in well-graded sand layers. The sands are generally medium dense to very dense. Some loose sandy layers were encountered. The upper soils are subject to hydroconsolidation and may become weaker and more compressible when wet.

4.3 GROUNDWATER

The site is located in the Riverside-Arlington Subbasin of the Upper Santa Ana Valley groundwater basin according to the California Department of Water Resources (DWR, 2003). Groundwater was not encountered in our current borings to a maximum depth of 76 feet. Similarly, our prior geotechnical borings drilled at the campus did not encounter groundwater to a maximum depth of 70 feet. Our ground motion studies report for the Carillon Tower (LeRoy Crandall and Associates, 1990) stated that Well 25/4W-29M01 had a rise in water surface from Elevation 984 to 991 feet MSL. This corresponds to approximately 56 to 49 feet below the existing ground surface at our current site. The well is approximately 0.7 mile southwest of the site.

4.4 FAULTS

The numerous faults in Southern California include active, potentially active, and inactive faults. The criteria for these major groups are based on criteria developed by the California Geological Survey (formerly the California Division of Mines and Geology) for the Alquist-Priolo Earthquake Fault Zoning Program (Bryant and Hart, 2007). By definition, an active fault is one that has had surface displacement within Holocene time (about the last 11,700 years). A potentially active fault is a fault that has demonstrated surface displacement of Quaternary age deposits (within the last 1.6 million years) but not Holocene deposits. Inactive faults have not moved in the last 1.6 million years. A list of nearby active faults and the distance in miles between the nearest point on the fault and the site, the maximum magnitude, and the slip rate for the fault, is given in Table 1. A similar list for potentially active faults is presented in Table 2. The faults in the vicinity of the site are shown on Figure 5.

Active Faults

San Jacinto Fault Zone

The active San Jacinto fault zone, considered one of the most seismically active faults in Southern California, is located approximately 4.9 miles northeast of the site. This fault zone includes several en echelon branches or segments and displays many features characteristic of recent activity such as fault line scarps, sag ponds, and ground-water barriers. Historically, the San Jacinto fault zone has triggered a number of small to moderate-sized earthquakes and at least four large tremors of local magnitudes greater than 6.0. These four tremors were the Imperial Valley earthquake of May 18, 1940 (local magnitude of 7.1), the Borrego Mountain earthquake of April 9, 1968 (local magnitude of 6.5), and the November 23 and 24, 1987 Westmorland earthquakes (local magnitudes of 6.0 and 6.3, respectively). The Imperial Valley and the Borrego Mountain earthquakes occurred on the Imperial fault and the Coyote Creek fault, respectively, which are both considered to be part of the San Jacinto fault zone. The Westmorland earthquakes resulted from movement on the Superstition Hills fault, which is also considered to be part of the San Jacinto fault zone. An average slip rate of 6 and 16 mm/yr and maximum moment magnitude of 6.7 and 6.9 are estimated by the California Geological Survey (Cao et al., 2003; Field et al., 2013) for the San Jacinto fault San Bernardino and San Jacinto Valley sections, respectively.

San Andreas Fault Zone

The active San Bernardino section of the San Andreas fault zone is located about 13 miles north-northeast of the site. This fault zone is California's most prominent structural feature, trending in a general northwest direction for almost the entire length of the state. The southern section of the fault is approximately 450 kilometers long and extends from the Transverse Ranges west of Tejon Pass on the north to the Mexican border and beyond on the south. An Alquist-Priolo Earthquake Zone has been established for the San Andreas, San Bernardino Section, CGS (1977). An average slip rate of 34 mm/yr and a maximum moment magnitude of 7.4 are estimated by the California Geological Survey (Cao et al., 2003; Field et al., 2013) for the Mojave South section of the San Andreas fault. The last major earthquake along the San Andreas fault zone in Southern California was the 1857 Magnitude 8.3 Fort Tejon earthquake.

Cucamonga Fault

The active Cucamonga fault is located approximately 15 miles north-northwest of the site. This fault zone borders the southern front of the San Gabriel Mountains and consists of an approximately ½ mile wide east-striking thrust fault complex. Although the east and west terminations of the Cucamonga fault are not well defined, the fault is generally considered to extend from San Antonio Canyon eastward to Lytle Creek. Along its 15½ mile extent, movement on the Cucamonga fault zone has created prominent fault scarps that disrupt Quaternary alluvial fans flanking the southern margin of the San Gabriel Mountains (Morton and Matti, 1987). Recent studies indicate alluvial deposits as young as 1,000 to 1,750 years old have been offset by the fault. Also, fault scarp morphology and relations with alluvial units suggest that the eastern 9 miles of the Cucamonga fault zone may have been more seismically active than the western portion over the last 4,000 years. An average slip rate of 1.5 mm/yr and a maximum moment magnitude of 6.9 are estimated by the California Geological Survey (Cao et al., 2003; Field et al., 2013) for the Cucamonga fault.

Elsinore Fault Zone

The Elsinore fault zone is located approximately 17 miles to the southwest of the site. It is a major, but historically quiet, strike-slip fault zone striking southeastward at least 190 miles towards Mexico (USGS, 2013). The closest section, the Glen Ivy section, strikes along the northeastern flank of the Santa Ana Mountains. Generally, the Elsinore fault zone dips steeply toward the southwest and displacement is both right-lateral and reverse-dip separation. The fault zone contains several parallel to sub-parallel fault segments, and characteristically occupies a trough-like depression. An average slip rate of 5 mm/yr and a maximum moment magnitude of 6.8 are estimated by the California Geological Survey (Cao et al., 2003; Field et al., 2013) for the Glen Ivy Section of the Elsinore fault.

Chino Fault

The active Chino fault is located approximately 18 miles west-southwest of the site. The fault splays from the active Elsinore fault zone in the vicinity of Corona and extends northwestward along the eastern flank of the Puente Hills. According to SCEC (2015), the Chino fault has an overall length of approximately 21 kilometers. Geomorphic evidence for Pleistocene age movement is indicated along the Chino portion of the fault trace by right deflected drainages and northeast-facing scarps. However, recent paleoseismic research indicates the fault has ruptured as recent as the mid-Holocene. (Madden and Yeats, 2008). The CGS considers the Chino fault to be capable of a moment magnitude 6.7 earthquake and estimates an annual slip rate of 1 millimeter per year (Cao et al., 2003; Field et al., 2013).

Blind Thrust Fault Zones

Although buried thrust faults, commonly referred to as blind thrusts, are not known to underlie the Perris structural block, the Los Angeles Basin contains several at depth. These faults do not present a potential surface fault rupture hazard. However, the following described blind thrust faults are considered active and potential sources for future earthquakes.

Puente Hills Blind Thrust

The Puente Hills Blind Thrust (PHBT) is defined based on seismic reflection profiles, petroleum well data, and precisely located seismicity (Shaw et al., 2002). This blind thrust fault system extends eastward from downtown Los Angeles to Brea (in northern Orange County). The PHBT includes three north-dipping segments, named from east to west as the Coyote Hills segment, the Santa Fe Springs segment, and the Los Angeles segment. These segments are overlain by folds expressed at the surface as the Coyote Hills, Santa Fe Springs Anticline, and the Montebello Hills. The Santa Fe Springs segment of the PHBT is believed to be the causative fault of the October 1, 1987 Whittier Narrows Earthquake (Shaw et al., 2002). The PHBT is not exposed at the ground surface and does not present a potential for surface fault rupture. However, based on deformation of late Quaternary age sediments above this fault system and the occurrence of the Whittier Narrows earthquake, the PHBT is considered an active fault capable of generating future earthquakes beneath the Los Angeles Basin. The CGS considers the PHBT to be capable of a moment magnitude 7.1 earthquake and estimates an annual slip rate of 0.9 millimeters per year (Cao et al. 2003; Field et al. 2013). The vertical surface projection of the PHBT is approximately 31 mile west of the site at its closest point.

San Joaquin Hills Thrust

Until recently, the southern Los Angeles Basin has been estimated to have a low seismic hazard relative to the greater Los Angeles region. This estimation is generally based on the fewer number of known active faults and the lower rates of historic seismicity for this area. However, several recent studies by Grant et al. (2000, 2002) suggest that an active blind thrust fault system underlies the San Joaquin Hills. This postulated blind thrust fault is believed to be a faulted anticlinal fold, parallel to the Newport-Inglewood fault zone (NIFZ) but considered a distinctly separate seismic source (Grant et al., 2002). The vertical surface projection of the San Joaquin Hills Thrust is approximately 30 miles south of the site at the closest point. This thrust fault is not exposed at the surface and does not present a potential surface fault rupture hazard. However, the San Joaquin Hills Thrust may be an active feature that can generate future earthquakes. The California Geological Survey estimates an average slip rate of 0.6 millimeters per year and a maximum moment magnitude of 6.6 for the San Joaquin Hills Thrust (Cao et al., 2003; Field et al., 2013).

The closest point to the vertical surface projection of the San Joaquin Hills thrust fault is approximately 33 miles to the southwest. The San Joaquin Hills thrust fault is not exposed at the surface and does not present a potential surface fault rupture hazard. However, the San Joaquin Hills Thrust is an active feature that is believed to be capable of generating future earthquakes. The California Geological Survey estimates an average slip rate of 0.5 millimeters per year and a maximum moment magnitude of 6.6 for the San Joaquin Hills Thrust (Cao et al., 2003; Field et al., 2013).

Potentially Active Faults

Rialto-Colton

The Rialto-Colton fault is located about 6.9 miles northeast of the site. It is primary identified by a 7-mile long groundwater anomaly called the “Rialto-Colton barrier” according to Hart (1977) and Fife et al. (1976). The barrier is postulated to be a concealed fault that offsets groundwater in older alluvium at depths less than 200 feet (Hart, 1977). Structurally, the fault is presumed to be two vertical en-echelon strands striking approximately northwest (Ziony, 1985). Although the Rialto-Colton fault does not demonstrate any surface expression, it is estimated to be a total of 16 miles long (Ziony, 1985).

Central Avenue

The Central Avenue fault is located about 16 miles west of the site. The fault splays from the Elsinore fault zone and extends at least 5 miles northwestward along the eastern flank of the Puente Hills (Morton, 1976; Jennings and Bryant, 2010). The fault does not have any surface expression, but it parallels the Chino fault on its southern end and is primarily identified by groundwater barriers towards the north (Fife et al., 1976; Morton, 1976). According to Yeats (2002), the fault does not demonstrate any Quaternary activity and is presumed to be the hinge line between the Chino Basin and the Perris Block. The California Geological Survey and USGS currently considers this to fault to be potentially active (Jennings and Bryant, 2010).

Seismicity

Historic Earthquakes

A number of earthquakes of moderate to major magnitude have occurred in the Southern California area within the last 116 years. A partial list of these earthquakes is included in the following table.

List of Historic Earthquakes

Earthquake (Oldest to Youngest)	Date of Earthquake	Magnitude	Distance to Epicenter (Miles)	Direction to Epicenter
Lytle Creek	July 22, 1899	5.9	15	N
San Bernardino Mtns.	September 20, 1907	5.8	21	NE
Lake Elsinore	May 15, 1910	6.0	19	SSW
San Jacinto-Hemet area	April 21, 1918	6.8	27	SSE
Loma Linda area	July 23, 1923	6.3	8	E
Long Beach	March 11, 1933	6.4	42	SW
Tehachapi	July 21, 1952	7.5	117	NW
San Fernando	February 9, 1971	6.6	65	NW
Whittier Narrows	October 1, 1987	5.9	40	W
Sierra Madre	June 28, 1991	5.8	40	NW
Landers	June 28, 1992	7.3	57	ENE
Big Bear	June 28, 1992	6.3	36	ENE
Northridge	January 17, 1994	6.7	68	WNW
Hector Mine	October 16, 1999	7.1	76	NE
Sierra El Mayor	April 4, 2010	7.2	183	SE

4.5 GEOLOGIC HAZARDS

Fault Rupture

The site is not within a currently established Alquist-Priolo Earthquake Fault Zone for surface fault rupture hazards. The closest active fault to the site with the potential for surface fault rupture is the San Bernardino section of the San Jacinto fault located approximately 4.9 miles to northeast. The closest Alquist-Priolo Earthquake Fault Zone is for the San Bernardino section of the San Jacinto fault.

Based on the available geologic data, active or potentially active faults with the potential for surface fault rupture are not known to be located directly beneath or projecting toward the site. Therefore, the potential for surface rupture due to fault plane displacement propagating to the surface at the site during the design life of the proposed development is considered low.

Seismicity and Ground Shaking

The location of the site relative to known active or potentially active faults indicates the site could be subjected to significant ground shaking caused by earthquakes. This hazard is common in Southern California and the effects of ground shaking can be mitigated by proper engineering design and construction in conformance with current building codes and engineering practices.

Slope Stability

The majority of the site is relatively level although there are slopes along the north and east sides of the site. There are no known landslides at the site, nor is the site in the path of any known or potential landslides. The site is not within an area identified as having a potential for slope instability according to the County of Riverside (2008).

Liquefaction and Seismically-Induced Settlement

Liquefaction is the process in which loose granular soils below the groundwater table temporarily lose strength during strong ground shaking as a consequence of increased pore pressure and, thereby, reduced effective stress. The vast majority of liquefaction hazards are associated with sandy soils and silty soils of low plasticity (California Geological Survey, 2008). Potentially liquefiable soils (based on composition) must be saturated or nearly saturated to be susceptible to liquefaction (California Geological Survey, 2008).

According to the City of Riverside Public Safety Element (2012) and the Riverside County General Plan (2012) the site is located within a liquefaction zone classified as “Moderate.” This zone is defined as having soils possibly being susceptible to liquefaction if groundwater levels rise considerably. Groundwater was not encountered within the upper 76 feet beneath the site in our current or previous nearby investigation. Furthermore, based on data from nearby wells, the historic-high groundwater level is at a depth greater than 49 feet below the existing grade at the site. Therefore, the potential for liquefaction impacting the proposed project is considered to be low.

Seismically-induced settlement is often caused by loose to medium-dense granular soils densified during ground shaking. Uniform settlement beneath a given structure would cause minimal damage; however, because of variations in distribution, density, and confining conditions of the soils, seismic-induced settlement is generally non-uniform and can cause serious structural damage. Dry and partially saturated soils as well as saturated granular soils are subject to seismically-induced settlement. Based on the results of our analyses, there is a potential for seismically-induced settlement within the loose to medium dense silty sand and poorly graded sand soils beneath the site. We estimate that the seismically-induced settlement will be on the order of 1 inch or less in the event of the Maximum Considered Earthquake throughout the majority of the project site. However, since loose soils were encountered primarily along the eastern edge of the site, we estimate that the seismically-induced settlement could be up to 3 inches in this area in the event of the Maximum Considered Earthquake ground motions. However, when considering the Design Earthquake ground motions, we estimate that the seismically-induced settlement will not exceed 1 inch throughout the site.

Tsunamis, Inundation, and Seiches

The site located approximately 40 miles inland from the Pacific Ocean and at an elevation of approximately 1040 feet MSL (NGVD 29). The site is not within a potential tsunami inundation hazard zone and the risk of tsunami affecting the site is nil.

According to the City of Riverside Public Safety Element (2012) and the Riverside County General Plan (2008), the site is not within a dam inundation area. Therefore, the potential for inundation at the site as a result of an earthquake-induced dam failure is considered low.

The site is not located downslope of any large bodies of water that could adversely affect the site in the event of earthquake-induced seiches (wave oscillations in an enclosed or semi-enclosed body of water).

Flooding

According to the Federal Emergency Management Agency (FEMA, 2010), Riverside County (2016), and the City of Riverside Public Safety Element (2012), the site is outside a flood hazard area and higher than the elevation of the 100-year flood (Zone X). Therefore, the potential for flooding to affect the site is considered low.

Oil Wells and Methane Gas

According to the DOGGR Well Finder System (2015) by the California Division of Oil, Gas, and Geothermal Resources (DOGGR, 2015), the site is not situated in an oil field. Therefore, the potential for encountering hazardous amounts of methane will be low.

Subsidence

The site is not within an area documented to have experienced subsidence due to large scale groundwater withdrawal.

4.6 GEOLOGIC CONCLUSIONS

Based on the available geologic data, active or potentially active faults with the potential for surface fault rupture are not known to be located beneath or projecting toward the site. In our opinion, the potential for surface rupture at the site due to fault plane displacement propagating to the ground surface during the design life of the project is considered low. Although the site could be subjected to strong ground shaking in the event of an earthquake, this hazard is common in Southern California and the effects of ground shaking can be mitigated by proper engineering design and construction in conformance with current building codes and engineering practices.

The site is relatively level and not susceptible to slope stability hazards. The potential for other geologic hazards such as liquefaction, seismic settlement, tsunamis, inundation, seiches, flooding, methane gas, asbestos, radon gas, and subsidence affecting the site is also considered low. However, there is a potential for seismically-induced settlement within the loose to medium dense silty sand and poorly graded sand soils beneath the site.

5.0 SEISMIC DESIGN PARAMETERS

Based on the subsurface information, the site is classified as Site Class “D”. We have evaluated the seismic design parameters in accordance with the provisions of the 2013 California Building Code and ASCE 7-10 Standard (ASCE, 2010) using the United States Geological Survey (USGS, 2015) online ground motion estimation program. The seismic design parameters are presented in the following table:

Parameter	**Value**
S_S (0.2 second period)	1.50 g
S_1 (1.0 second period)	0.62 g
Site Class	D
F_a	1.0
F_v	1.5
$S_{MS} = F_aS_S$ (0.2 second period)	1.50 g
$S_{M1} = F_vS_1$ (1.0 second period)	0.92 g
S_{DS} = 2/3 x S_{MS} (0.2 second period)	1.00 g
S_{D1} = 2/3 x S_{M1} (1.0 second period)	0.62 g

By: AH 12/4/15
Checked: MM 12/4/15

6.0 GENERAL LIMITATIONS

Our professional services have been performed using that degree of care and skill ordinarily exercised, under similar circumstances, by reputable geotechnical consultants practicing in this or similar localities. No other warranty, express or implied, is made as to the professional advice included in this report. This report has been prepared for University of California, Riverside and their design consultants to be used solely in the design of the proposed MRB 1. This report has not been prepared for use by other parties, and may not contain sufficient information for purpose of other parties or other uses.

7.0 REFERENCES

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TABLES

Table 1
Major Named Faults Considered to be Active in Southern California

Fault (in increasing distance)	Maximum Magnitude			Slip Rate (mm/yr.)	Distance From Site (miles)	Direction From Site
San Jacinto (SB Section)	6.7	(a)	SS	6.0	4.9	NE
San Jacinto (SJV Section)	6.9	(a)	SS	16.0	8.6	E
San Andreas (SB N.Section)	7.5	(a)	SS	19	13	NNE
Cucamonga	6.9	(a)	RO	5.0	15	NNW
Elsinore (Glen Ivy Section)	6.8	(a)	SS	5.0	17	SW
Chino	6.7	(a)	RO	1.0	18	WSW
Cleghorn	6.5	(a)	SS	0.5	20	NNE
Whittier	6.8	(a)	RO	2.5	22	WSW
San Jose	6.4	(a)	RO	0.5	24	WNW
Sierra Madre	7.2	(a)	RO	2.0	24	NW
San Andreas (Mojave S.Section)	7.4	(a)	SS	34	24	NNW
Puente Hills Blind Thrust	7.1	(a)	BT	0.9	31*	W
San Joaquin Thrust	6.6	(a)	BT	0.5	33*	SW
Clamshell-Sawpit	6.5	(a)	RO	0.5	36	NW
Raymond	6.5	(a)	RO	2.0	41	WNW
Newport-Inglewood Zone	7.1	(a)	SS	1.0	41	WSW
Upper Elysian Park Thrust	6.4	(a)	BT	1.9	44*	WNW
Palos Verdes	7.3	(a)	SS	3.0	51	WSW
Verdugo	6.9	(a)	RO	0.5	53	WNW
San Gabriel	7.2	(a)	SS	1.0	54	WNW
Hollywood	6.4	(a)	RO	0.9	55	WNW
Sierra Madre (San Fernando)	6.7	(a)	RO	2.0	59	WNW
Santa Monica	6.6	(a)	RO	1.0	63	WNW
Northridge Thrust	7	(a)	BT	1.5	65	WNW
Santa Susana	6.7	(a)	RO	5.0	68	WNW
Malibu Coast	6.7	(a)	RO	0.3	76	W

(a)	Cao et al., 2003, Field et al., 2013
SS	Strike Slip
NO	Normal Oblique
RO	Reverse Oblique
BT	Blind Thrust
(*)	Distance is closest point to surface projection of thrust fault

Prepared by: PER 12/04/15
Checked by: PJE 12/04/15

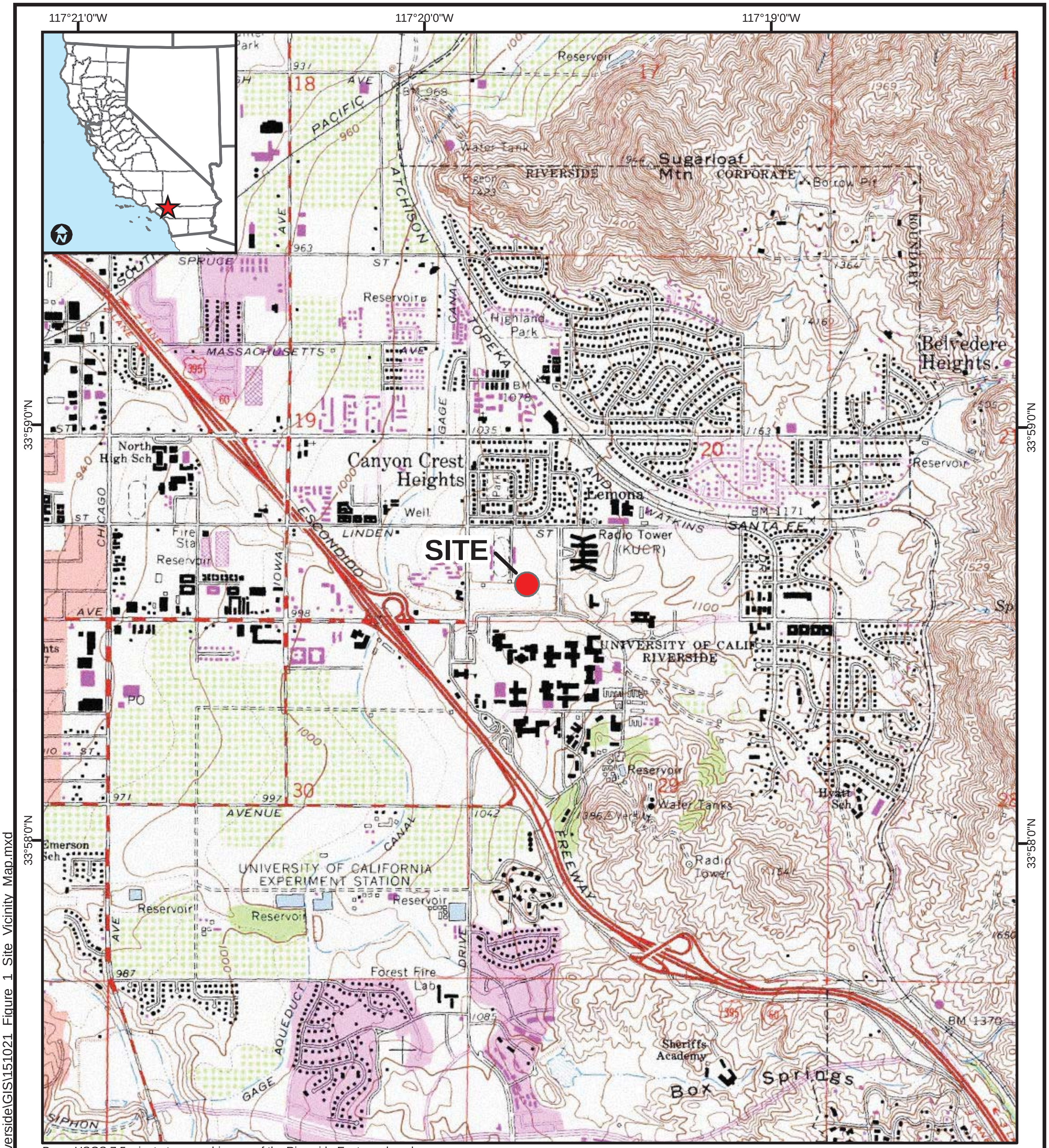
Table 2
Major Named Faults Considered to be Potentially Active in Southern California

Fault (in increasing distance)	Maximum Magnitude			Slip Rate (mm/yr.)	Distance From Site (miles)	Direction From Site
Rialto-Colton	n/a	(f)	n/a	n/a	6.9	NE
Central Avenue	n/a	n/a	RO	n/a	16	W
Red Hill-Etiwanda	6-7	(g)	BT	n/a	17	NW
Waterman Canyon	n/a	(g)	RO	n/a	17	N
Indian Hill	6.6	(b)	RO	0.1	24	NW
San Antonio	n/a	(g)	SS	n/a	24	NW
Peralta Hills	6.5	(b)	RO	0.1	27	WSW
El Modeno	6.5	(b)	NO	0.1	29	WSW
Los Alamitos	6.2	(b)	SS	0.1	45	WSW

(b)	Mark, 1977
(c)	Slemmons, 1979
(d)	Wesnousky, 1986
(e)	Hummon et al., 1994
(f)	Ziony, 1985
(g)	SCEC, 2015
SS	Strike Slip
NO	Normal Oblique
RO	Reverse Oblique
BT	Blind Thrust

Prepared by: PER 12/04/15
Chk: PJE 12/04/15

FIGURES



Base: USGS 7.5 minute topographic map of the Riverside East quadrangle

0 1,000 2,000 4,000
Feet

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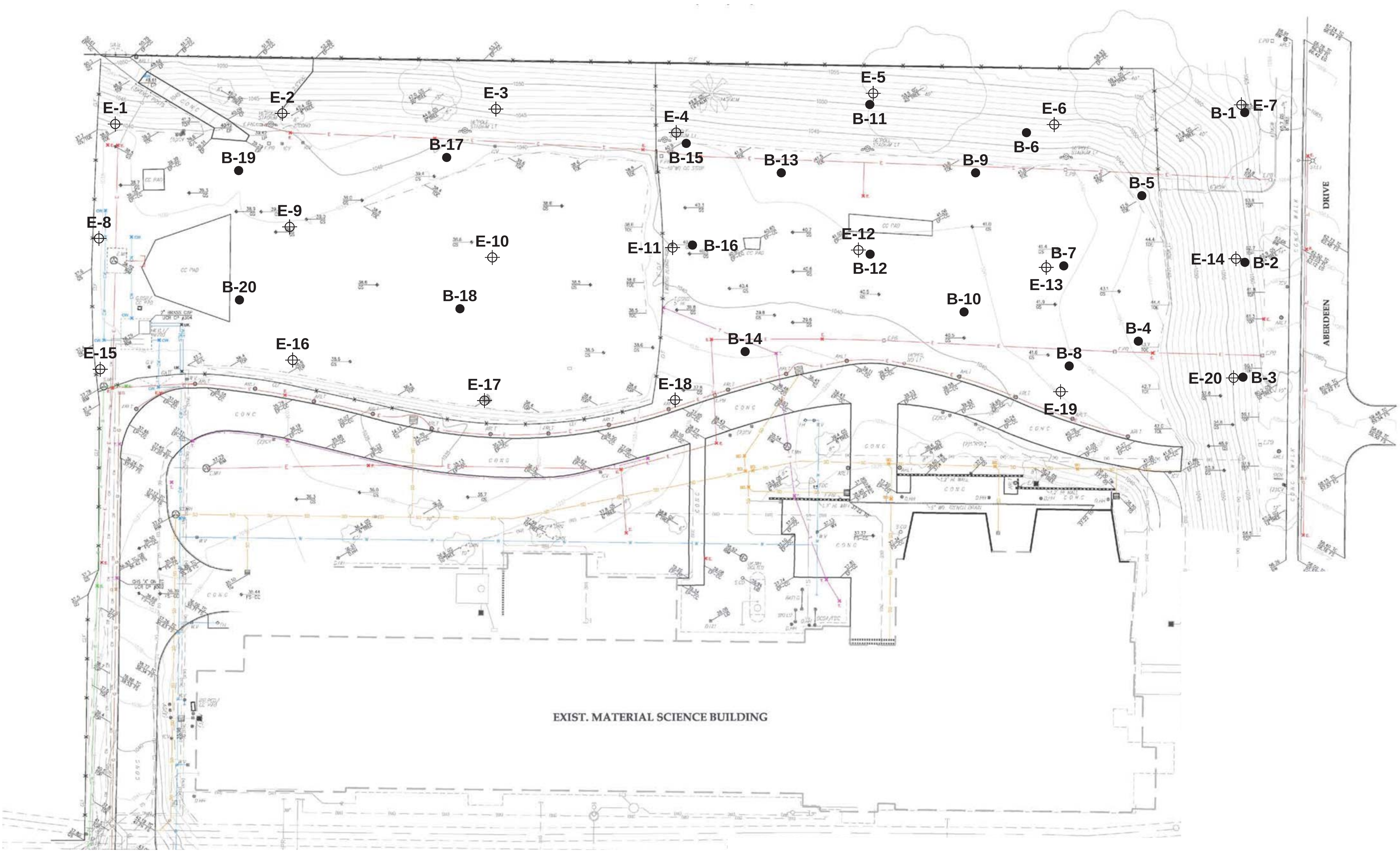
VICINITY MAP

FIGURE:
1

PROJECT:
4953-15-1021

G:\4953 Geotech\2015\151021 UC Riverside\GIS\151021 Figure 1 Site Vicinity Map.mxd



LEGEND

B-20 ● GEOTECHNICAL BOREHOLE LOCATION

E-20 ⊕ ENVIRONMENTAL BORING LOCATION

Reference:
Topographic Survey Plan prepared by TTG,
date of Survey May 19, 2015

0 25' 50' 100'
SCALE: 1" = 50'

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PREPARED BY:	VMN
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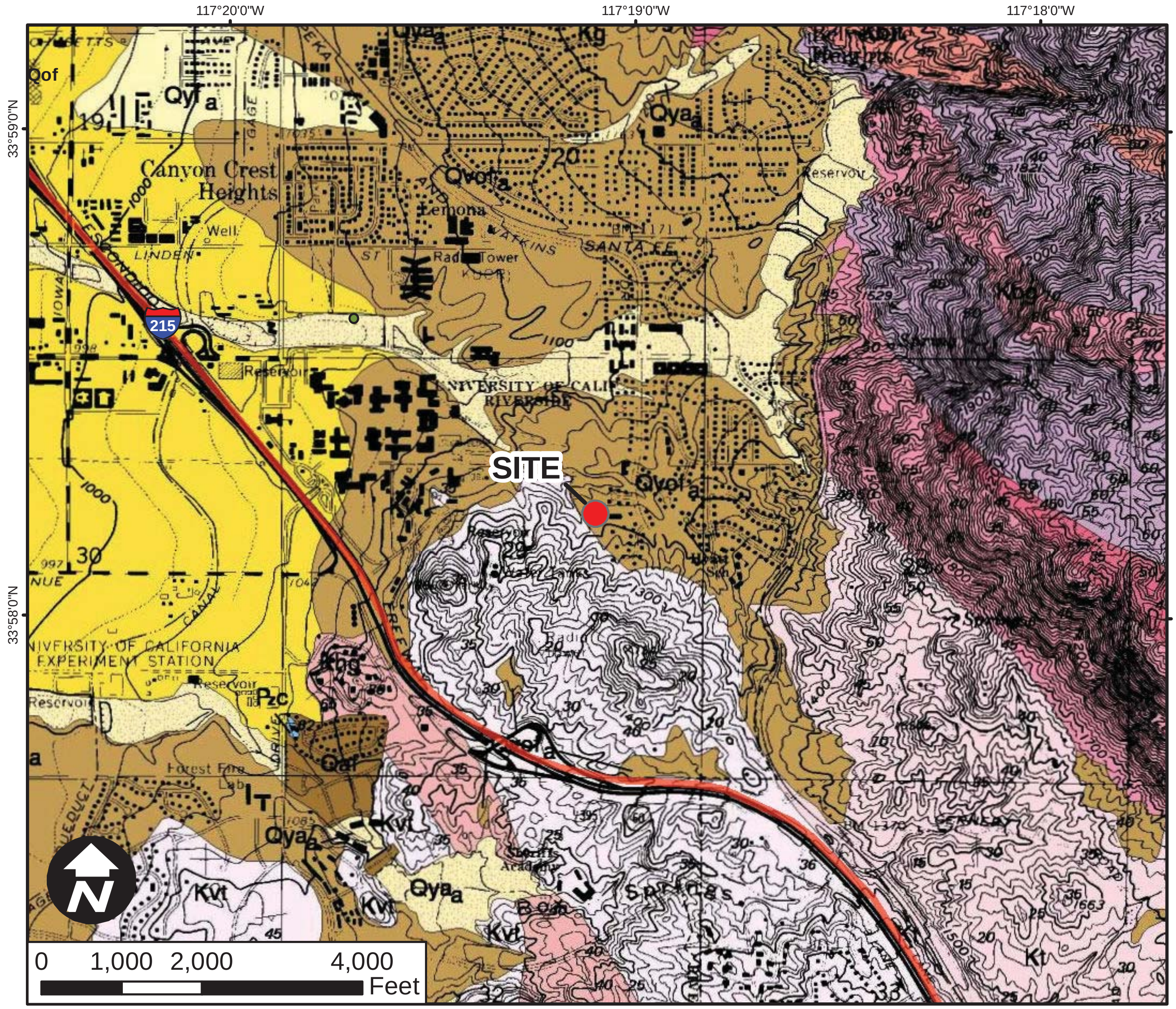
DRAWN:	LH
CHKD:	AH
DATE:	12/3/2015

PLOT PLAN

FIGURE NO.
2

PROJECT NO.
4953-15-1021

Path: G:\4953_Geotech\2015\151021 UC Riverside\CAD\DWG\4953-15-1021_Fig-2_Plot-Plan.dwg [B-17x11]
Date: December 04, 2015 - 4:21pm By: vo.nguyen



Geologic Units

Qaf - Artificial fill (late Holocene)—Deposits of fill resulting from human construction or mining activities.

Qya - Young axial channel deposits (Holocene and late Pleistocene)—Gray, unconsolidated alluvium consisting of coarse- to fine-grained sand and lesser gravel and silt flanking Santa Ana River channel and its tributaries.

Qof - Old alluvial fan deposits (late to middle Pleistocene)—Indurated, to slightly indurated, sandy, alluvial fan deposits. Covers extensive areas north and south of Santa Ana River.

Qvof - Very old alluvial fan deposits (early Pleistocene)—Mostly well dissected, well-indurated, reddish-brown sand deposits. Commonly contains duripans and locally silcretes.

Kbfg - Biotite granodiorite and Tonalite (Cretaceous)

Kbhg - Heterogeneous porphyritic granodiorite (Cretaceous)

Kbht - Biotite-hornblende tonalite (Cretaceous)

Kbg - Porphyritic granodiorite (Cretaceous)

Kbft - Biotite-hornblende tonalite (Cretaceous)

Kvt - Val Verde tonalite (Cretaceous)

Kt - Tonalite, undifferentiated (Cretaceous)

Khg - Heterogeneous granitic rocks (Cretaceous)

PzC - Calc-Silicate rocks (Paleozoic?)

Contacts

——— contact, location accurate

— — contact, location approximate

-------- contact, location concealed

– – – contact, location inferred

Morton, D.M., Cox, B.F., Dawson, Michael, and O'Brien, Timothy, 2002, Geologic map of the Riverside East 7.5' quadrangle, Riverside County, California: U.S. Geological Survey, Open-File Report OF-2001-452, scale 1:24,000.

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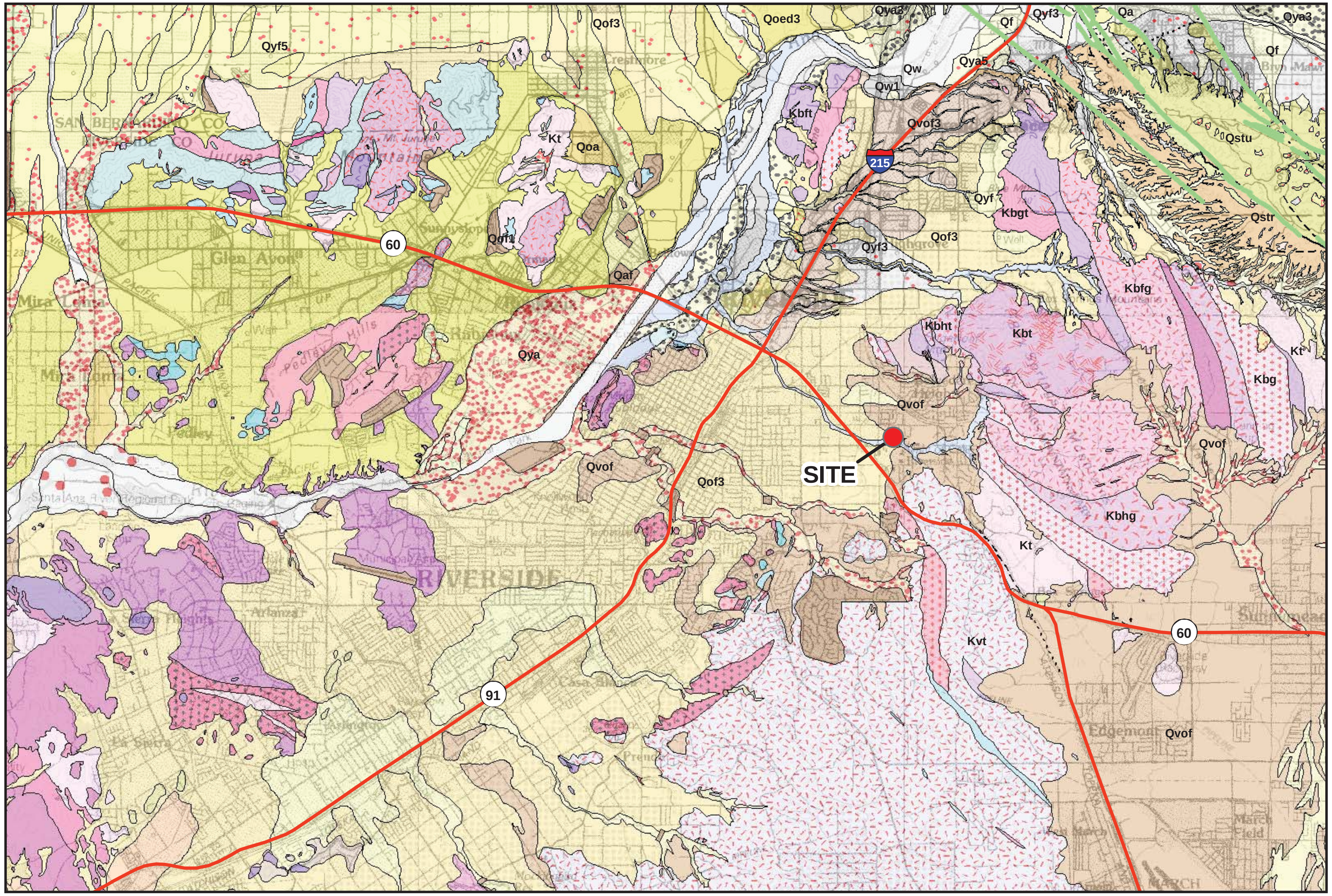
LOCAL GEOLOGIC MAP

FIGURE:
3

PROJECT:
4953-15-1021

Geologic Units

Qaf - Artificial fill
Qc - Very young colluvial deposits
Qa - Very young axial-channel deposits
Qls - Very young landslide deposits
Qf - Very young alluvial-fan deposits
Qw - Very young wash deposits
Qyw - Young wash deposits
Qyls - Young landslide deposits
Qya - Young axial-channel deposits
Qyf - Young alluvial-fan deposits
Qyed - Young eolian deposits (dune sand)
Qyes - Young eolian deposits (sheet sand)
Qoa - Old axial-channel deposits
Qoed - Old eolian deposits (dune sand)
Qof - Old alluvial-fan deposits
Qols - Old landslide deposits
Qvoa - Very old axial-channel deposits
Qvof - Very old alluvial-fan deposits
Qvols - Very old landslide deposits
Qvor - Very old regolith
Qvos - Very old surficial deposits
Qstcq - San Timoteo Beds
Qstr - San Timoteo Beds
Qsts - San Timoteo Beds
Qstu - San Timoteo Beds
Tgh - Hypabyssal granitic rocks
Tsg - Conglomerate, sandstone, and arkose
Tstd - San Timoteo Beds
Tstl - San Timoteo Beds
Tstm - San Timoteo Beds
gg - Gneissic granitoid rocks and gneiss
Kba - Box Springs plutonic complex
Kcc - Monzogranite of City Creek
Kg - Granitic dikes
Khg - Heterogeneous granitic rocks
Kmgt - Monzogranite and tonalite, undifferentiated
Kps - Pelona Schist
Krg - Granite of Riverside area
Kt - Tonalite, undifferentiated
Kvt - Val Verde Pluton
Mzfg - Foliated granitoid rocks
Pzmp - Marble, Peninsular Ranges
Pzmp - Marble, Peninsular Ranges
Pzmp - Marble, Peninsular Ranges
Pzms - Marble and schist, undifferentiated
Pzsgp - Biotite schist and gneiss
Pzsgp - Biotite schist and gneiss
Pzsgp - Biotite schist and gneiss



Morton, D.M., Miller, F.K., 2006, "Geologic Map of the San Bernardino and Santa Ana 30' x 60' quadrangles, California", U.S. Geological Survey Open-File Report 2006-1217 Version 1.0.

Geologic Contacts

contact, identity and existence certain, location accurate
contact, identity and existence certain, location approximate
contact, identity and existence certain, location concealed
contact, identity and existence certain, location inferred
fault, identity and existence certain, location accurate
fault, identity and existence certain, location approximate
fault, identity and existence certain, location concealed
fault, identity and existence certain, location inferred
fault, identity or existence questionable, location accurate
fault, identity or existence questionable, location concealed
(Queried where contacts are questionable)

Regional Map

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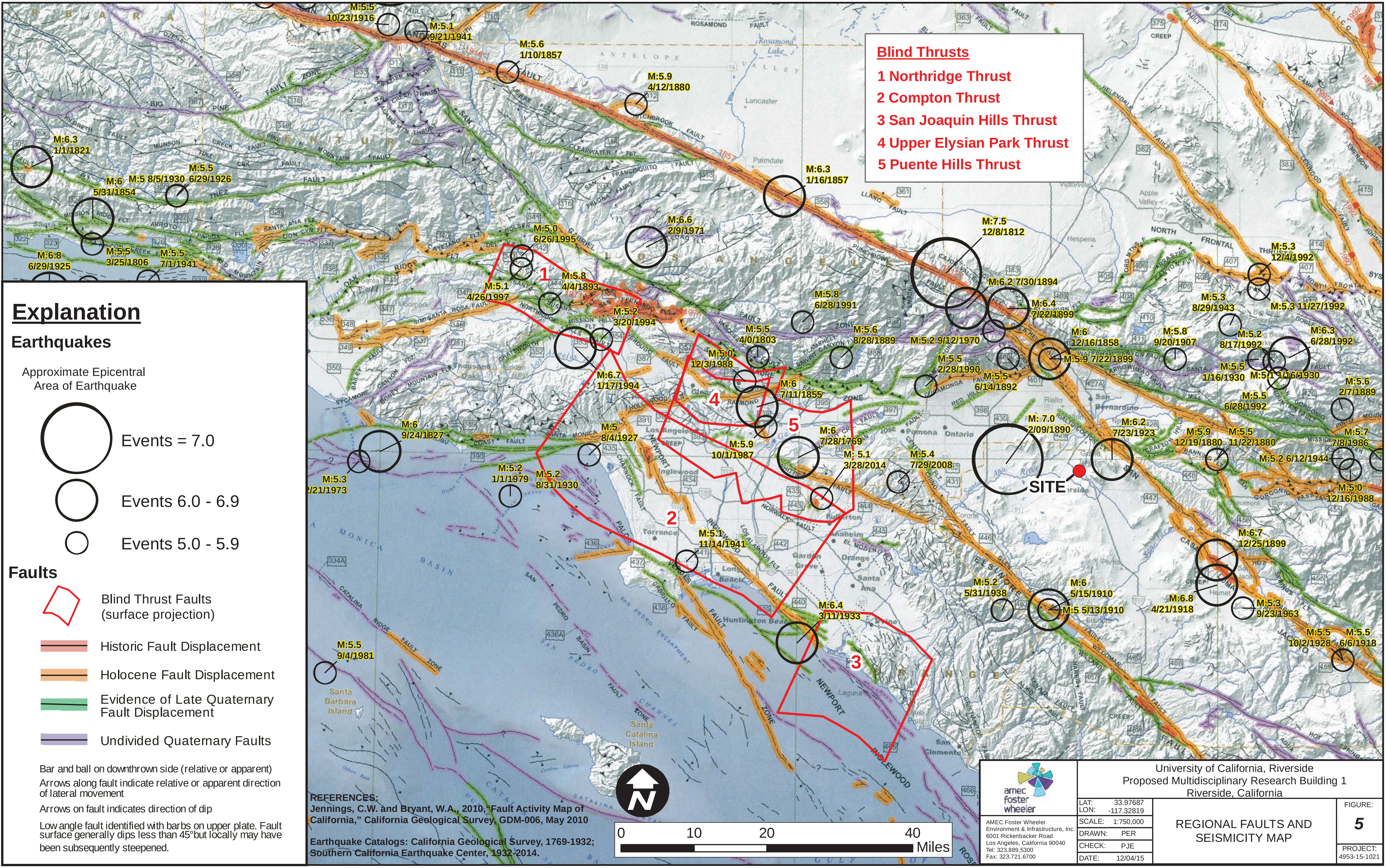
REGIONAL GEOLOGIC MAP

FIGURE: 4

PROJECT: 4953-15-1021

Path: G:\4953 Geotech\2015\151021 UC Riverside\151021 Figure 4 Regional Geologic Map.mxd



Blind Thrusts

1 Northridge Thrust
2 Compton Thrust
3 San Joaquin Hills Thrust
4 Upper Elysian Park Thrust
5 Puente Hills Thrust

Explanation

Earthquakes

Approximate Epicentral Area of Earthquake

◯	Events = 7.0
◯	Events 6.0 - 6.9
○	Events 5.0 - 5.9

Faults

⬠	Blind Thrust Faults (surface projection)
🟥	Historic Fault Displacement
🟧	Holocene Fault Displacement
🟩	Evidence of Late Quaternary Fault Displacement
🟪	Undivided Quaternary Faults

Bar and ball on downthrown side (relative or apparent)

Arrows along fault indicate relative or apparent direction of lateral movement

Arrows on fault indicates direction of dip

Low angle fault identified with barbs on upper plate. Fault surface generally dips less than 45°but locally may have been subsequently steepened.

REFERENCES:
Jennings, C.W. and Bryant, W.A., 2010, "Fault Activity Map of California," California Geological Survey, GDM-006, May 2010

Earthquake Catalogs: California Geological Survey, 1769-1932; Southern California Earthquake Center, 1932-2014.

Path: G:\4953_Geotech\2015\151021 UC Riverside\GIS\151021_Figure_5_Faults_Seismicity_Map_thrusts.mxd

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DATE:	12/04/15

REGIONAL FAULTS AND SEISMICITY MAP

FIGURE: 5

PROJECT: 4953-15-1021

APPENDIX A

LOGS OF GEOTECHNICAL BORINGS AND LABORATORY TEST RESULTS

APPENDIX A

LOGS OF GEOTECHNICAL BORINGS AND LABORATORY TEST RESULTS

FIELD EXPLORATIONS

The soil conditions beneath the proposed project site were explored by drilling a total of 20 geotechnical borings (Borings B-1 through B-20) between October 21 and 29, 2015. The boring locations are shown on Figure 2, Plot Plan. The geotechnical borings were drilled with truck-mounted hollow-stem auger drilling equipment. The borings were 8 inches in diameter, and were drilled to depths ranging from 50 to 76 feet below grade.

The soil materials encountered were logged by our field technician. Relatively undisturbed and bulk samples were obtained for laboratory inspection and testing. The logs of the borings are presented on Figures A-1.1 through A-1.20; the depths at which undisturbed samples were obtained are indicated on the left side of the boring logs. In addition to SPT N-value, the number of blows required to drive the Crandall sampler 12 inches using a 140 pound automatic hammer falling 30 inches is indicated on the logs. The soils are classified in accordance with the Unified Soil Classification System described on Figure A-2.

LABORATORY TESTS

Laboratory tests were performed on selected samples obtained from the borings to aid in the classification of the soil materials and to evaluate the pertinent engineering properties of the foundation soil. All testing was performed in general accordance with applicable ASTM specifications.

The field moisture content and dry density of the soils encountered were evaluated by performing tests on the undisturbed samples. The results of the tests are shown on the left side of the boring logs.

To evaluate the percentage of fines (material passing through a No. 200 sieve), tests were performed in selected samples. The results of these tests are presented on the boring logs.

Direct shear tests were performed on selected undisturbed samples to evaluate the strength of the soils. The tests were performed at field moisture content and after soaking to near-saturated moisture content and at various surcharge pressures. The peak shear strength values evaluated from the direct shear tests are presented on Figure A-3, Direct Shear Test Data.

Confined consolidation tests were performed on four undisturbed samples to evaluate the compressibility of the soils. Water was added to the samples during the test to illustrate the effect of moisture on the compressibility. The results of the tests are presented on Figures A-4.1 and A-4.2, Consolidation Test Data.

In addition to the normal consolidation tests, “quick” consolidation tests were performed on selected undisturbed samples to evaluate the hydrocompaction potential of the soils. The tests were performed by confining the sample under a normal surcharge pressure, allowing the sample to consolidate at its field moisture content, and then saturating the sample and measuring the consolidation resulting from the addition of water. The test results (percent hydroconsolidation) of these tests are presented on Figures A-5.1 through A-5.3, Hydroconsolidation Test Data.

The optimum moisture content and maximum dry density of the upper soils were evaluated by performing compaction tests on samples obtained from Borings 3, 7, and 18. The tests were performed in accordance with the ASTM Designation D1557 method of compaction. The results of the tests are presented on Figures A-6.1 through A-6.3, Compaction Test Results.

To provide information for paving design, stabilometer tests (R-Value test) were performed on four bulk samples. The tests were performed for us by LaBelle Marvin. The results of the tests are presented on Figures A-7.1 through A-7.9.

Soil corrosivity tests were performed on selected samples of the on-site soils. The corrosivity study was performed by Universal Corrosion Services, LLC. The test results, the results of the study and recommendations for mitigating procedures are presented at the end of this Appendix.

B12SOIL_CRANDALL (NO DECIMAL) 4953-15-1021.GPJ LAW_CRAN.GDT 12/4/15

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE; REFER TO PLOT PLAN FOR MORE ACCURATE LOCATION INFORMATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

BORING B-1

DATE DRILLED: October 21, 2015
EQUIPMENT USED: Hollow Stem Auger
HOLE DIAMETER (in.): 8
ELEVATION: 1,063.0 **

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	SAMPLE LOC.		
							SM	FILL - SILTY SAND - moist, brown, fine grained, some roots, trace fine gravel (up to 1/2 inch in size)
							SM	SILTY SAND - medium dense, slightly moist, brown, fine grained, trace medium to coarse
1060								
	5							
			4.7	122	36	▩		
1055			4.3	116	23	▩		More medium to coarse grained
	10							
		15				☒		(23% Passing No. 200 Sieve), slightly finer
1050			4.5	111	11	▩		
	15							
		2				☒		Becomes very loose, yellowish brown, very fine grained
1045			3.6	113	11	▩		(23% Passing No. 200 Sieve)
	20							
		2				☒		Layer of Poorly Graded Sand with Silt, slightly moist, yellowish brown to brownish yellow, fine grained, trace medium
							SP	POORLY GRADED SAND - medium dense, dry, yellow to light yellowish brown, fine to medium grained, some coarse, some fine gravel (up to 1/2 inch in size), some silt
1040			1.3	111	17	▩		
	25							
		27				☒		
1035			0.9	113	70	▩		Interbedded with Silty Sand layer
	30						SM	SILTY SAND - medium dense, moist, light yellowish brown, very fine to fine grained, trace medium
		28				☒		
1030								
	35						SP-SM	POORLY GRADED SAND with SILT - medium dense, slightly moist, light olive brown, fine to medium grained, trace coarse, some fine gravel (up to 1/4 inch in size)
			2.8	113	29	▩		
1025								
							SM	SILTY SAND - dense, slightly moist, olive brown, fine grained, some medium, trace coarse
	40							

Field Tech: LH
Prepared By: JF
Checked By: LT

(CONTINUED ON FOLLOWING FIGURE)

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE; REFER TO PLOT PLAN FOR MORE ACCURATE LOCATION INFORMATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

BORING B-1 (Continued)

DATE DRILLED: October 21, 2015
EQUIPMENT USED: Hollow Stem Auger
HOLE DIAMETER (in.): 8
ELEVATION: 1,063.0 **

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	SAMPLE LOC.		
		31				☒		
1020								Less silt, thin interbedded layers of Poorly Graded Sand with Silt
	45		4.8	121	59	▩		
1015								
	50	57				☒	SP-SM	POORLY GRADED SAND with SILT - very dense, slightly moist, light yellowish brown, fine grained, some medium
1010								Becomes fine to medium grained, trace coarse
	55		2.8	107	45	▩		Grades coarse, less silt
1005							SM	SILTY SAND - very dense, moist, brown to olive brown, fine grained, some medium
	60	52				☒		
1000								
	65		9.7	120	71	▩		More silt
995							SP	POORLY GRADED SAND - very dense, slightly moist, light yellowish brown, fine grained, some medium, trace silt
	70	59				☒		
990								Grades fine to medium grained, some coarse
	75		2.7	119	61	▩		Thin layer of Silty Sand, dense, slightly moist, olive brown, fine grained END OF BORING AT 76 FEET
985								
	80							

* Number of blows required to drive the Crandall Sampler 12 inches using a 140 pound automatic hammer falling 30 inches.

** Elevations based on Topographic Survey Plan prepared by TTG, dated May 19, 2015.

NOTES:
Hand augered upper 5 feet to avoid damage to utilities. Groundwater was not encountered. Borehole was backfilled with soil cuttings and tamped.

Field Tech: LH
Prepared By: JF
Checked By: LT

B12SOIL_CRANDALL (NO DECIMAL) 4953-15-1021.GPJ LAW_CRAN.GDT 12/4/15

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LOG OF BORING
Project: 4953-15-1021 Figure: A-1.1b

BORING B-2

DATE DRILLED: October 21, 2015
EQUIPMENT USED: Hollow Stem Auger
HOLE DIAMETER (in.): 8
ELEVATION: 1,059.0 **

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE; REFER TO PLOT PLAN FOR MORE ACCURATE LOCATION INFORMATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	SAMPLE LOC.		
							SM	FILL - SILTY SAND - slightly moist to moist, olive brown, fine grained, some fine gravel (up to 1/2 inch in size)
								Some medium grained, weakly cemented, trace calcium carbonate stringers, some clay
1055	5							
			4.4	122	46	▨		
			5.3	122	31	▨		More medium grained, more calcium carbonate stringers
1050	10							
			5.3	123	28	▨		Some medium to coarse grained
		21				☒		Becomes fine to medium grained, more calcium carbonate stringers, some clay
1045	15							
			10.4	121	22	▨		Less silt, fine grained, some medium, some clay
		14				☒	SC	FILL - CLAYEY SAND - moist, dark gray, fine grained, some medium
1040	20							
			11.6	121	20	▨		(37% Passing No. 200 Sieve), more medium to coarse grained
							SM	SILTY SAND - medium dense, moist, olive brown, fine grained, some medium to coarse
		12				☒		
1035	25							
							SP-SM	POORLY GRADED SAND with SILT - loose, slightly moist, reddish brown, fine grained, some medium
			5.6	110	8	▨		
		10				☒		Interbedded with Silty Sand, coarse gravel (up to 1½ inches in size)
1030	30							
			6.7	104	10	▨		More fine grained, some fine gravel (up to 1/2 inch in size)
1025							SP	POORLY GRADED SAND - loose, slightly moist, olive brown, fine grained, trace medium, some silt
	35							
		6				☒		
1020	40							

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: LH
Prepared By: JF
Checked By: LT

B12SOIL_CRANDALL (NO DECIMAL) 4953-15-1021.GPJ LAW_CRAN.GDT 12/4/15

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LOG OF BORING
Project: 4953-15-1021 Figure: A-1.2a

BORING B-2 (Continued)

DATE DRILLED: October 21, 2015
EQUIPMENT USED: Hollow Stem Auger
HOLE DIAMETER (in.): 8
ELEVATION: 1,059.0 **

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	SAMPLE LOC.		
			10.2	111	18	⊠	SC	CLAYEY SAND - moist, olive brown, fine grained, some medium, (19% Passing No. 200 Sieve)
							SP	POORLY GRADED SAND - very dense, slightly moist, brown, fine grained, some medium, trace coarse, trace silt
1015								
	45							
		53				☒		
1010								
	50							
			7.4	126	60	⊠		Becomes dense, more medium to coarse grained, trace fine gravel (up to 1/2 inch in size) END OF BORING AT 51 FEET
1005								
	55							
1000								
	60							
995								
	65							
990								
	70							
985								
	75							
980								
	80							

NOTES:

Hand augered upper 5 feet to avoid damage to utilities. Groundwater was not encountered. Borehole was backfilled with soil cuttings and tamped.

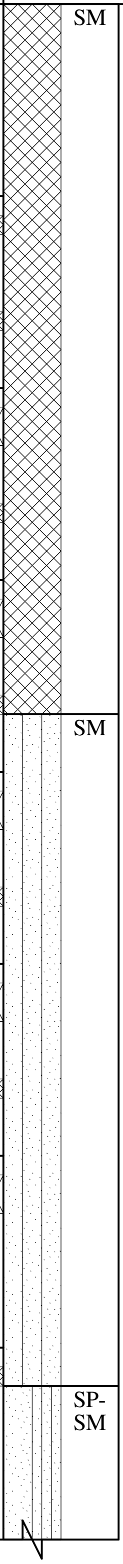
THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE; REFER TO PLOT PLAN FOR MORE ACCURATE LOCATION INFORMATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

B12SOIL_CRANDALL (NO DECIMAL) 4953-15-1021.GPJ LAW_CRAN.GDT 12/4/15

Field Tech: LH
Prepared By: JF
Checked By: LT

BORING B-3

DATE DRILLED: October 21, 2015
EQUIPMENT USED: Hollow Stem Auger
HOLE DIAMETER (in.): 8
ELEVATION: 1,057.0 **



ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	SAMPLE LOC.		
							SM	FILL - SILTY SAND - slightly moist, olive brown, fine grained, some medium, some rootlets, some fine to coarse gravel (up to 1/2 inch in size)
1055								Becomes light yellowish brown, trace medium grained, trace to some fine gravel (up to 1/4 inch in size)
	5		6.7	125	25	▨		
1050			7.5	125	26	▨		Some clay
	10	10				☒		Less silt
1045			8.2	122	25	▨		
	15	11				☒		Becomes dark gray, some medium grained, some clay, low plasticity
1040			9.3	123	28	▨		
							SM	SILTY SAND - medium dense, slightly moist, olive brown, fine grained, some medium to coarse
	20	17				☒		
1035			5.9	107	10	▨		Becomes loose, grades finer, trace medium, more silt
	25	8				☒		Becomes orangish brown, more silt
1030			6.4	109	8	▨		
	30	6				☒		
1025								
	35		7.8	114	10	▨		
							SP-SM	POORLY GRADED SAND with SILT - medium dense, slightly moist, yellowish brown, fine grained, some medium
1020								
	40							

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE; REFER TO PLOT PLAN FOR MORE ACCURATE LOCATION INFORMATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: LH
Prepared By: JF
Checked By: LT

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LOG OF BORING
Project: 4953-15-1021 Figure: A-1.3a

BORING B-3 (Continued)

DATE DRILLED: October 21, 2015
EQUIPMENT USED: Hollow Stem Auger
HOLE DIAMETER (in.): 8
ELEVATION: 1,057.0 **

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	SAMPLE LOC.		
		24				☒		
							SM	SILTY SAND - medium dense, moist, yellowish brown, fine grained, some medium
1015								Some interbedded layers of Poorly Graded Sand with Silt
	45							More silt
			10.5	122	44	▨		Thin layers of Poorly Graded Sand with Silt
1010								
	50							
		25				☒		(33% Passing No. 200 Sieve), some clay
1005								
							SP-SM	POORLY GRADED SAND with SILT - medium dense, moist, yellowish brown, fine grained, some medium, interbedded with Silty Sand layers
	55							
			9.5	119	43	▨		
1000								
							SM	SILTY SAND - dense, moist, brown, fine grained, some medium
	60							
		34				☒		
995								
	65							
			9.2	119	46	▨		Thin layer of Poorly Graded Sand, medium dense, yellowish brown
990								
	70							
		43				☒		Slightly less silt
985								
							SP-SM	POORLY GRADED SAND with SILT - very dense, slightly moist, yellowish brown, fine grained, some medium
	75							
			5.7	123	83/10"	▨		
								END OF BORING AT 76 FEET
980								
	80							

NOTES:
Hand augered upper 5 feet to avoid damage to utilities. Groundwater was not encountered. Borehole was backfilled with soil cuttings and tamped.

Field Tech: LH
Prepared By: JF
Checked By: LT

B12SOIL_CRANDALL (NO DECIMAL) 4953-15-1021.GPJ LAW_CRAN.GDT 12/4/15

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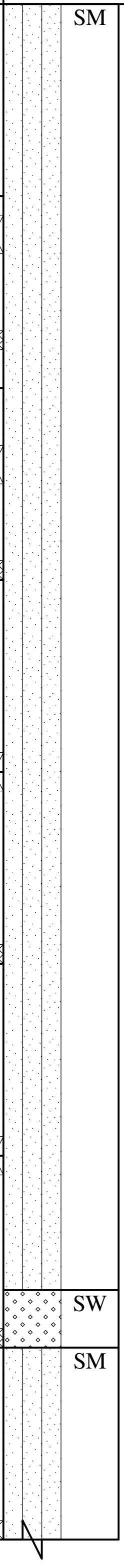
LOG OF BORING
Project: 4953-15-1021 Figure: A-1.3b

B12SOIL_CRANDALL (NO DECIMAL) 4953-15-1021.GPJ LAW_CRAN.GDT 12/4/15

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE; REFER TO PLOT PLAN FOR MORE ACCURATE LOCATION INFORMATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

BORING B-4

DATE DRILLED: October 27, 2015
EQUIPMENT USED: Hollow Stem Auger
HOLE DIAMETER (in.): 8
ELEVATION: 1,043.3 **



ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	SAMPLE LOC.		
							SM	SILTY SAND - dense, slightly moist to moist, light brownish orange, fine to medium grained, disturbed at surface
1040								
	5							
		36				☒		
1035			10.7	99	11	▩		Becomes loose, some clean sand seams
	10							
		7				☒		
1030								
	15		7.6	116	40	▩		Becomes medium dense, thin layer of Poorly Graded Sand, light gray, fine to coarse grained, trace gravel (up to 1/4 inch in size)
1025								
	20	24				☒		
1020								
	25		10.0	112	33	▩		Some clay
1015								
	30	40				☒		Becomes dense, thin layer of Poorly Graded Sand, light gray, fine to coarse grained, trace gravel (up to 1/4 inch in size)
1010							SW	WELL-GRADED SAND - dense, slightly moist, light gray, fine to coarse grained, trace gravel (up to 1/4 inch in size)
	35		3.2	115	75	▩		
							SM	SILTY SAND - dense, moist, brownish orange, fine to medium grained, some clay
1005								
	40	47				☒		

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: AR
Prepared By: JF
Checked By: LT

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LOG OF BORING
Project: 4953-15-1021
Figure: A-1.4a

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE; REFER TO PLOT PLAN FOR MORE ACCURATE LOCATION INFORMATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

BORING B-4 (Continued)

DATE DRILLED: October 27, 2015
EQUIPMENT USED: Hollow Stem Auger
HOLE DIAMETER (in.): 8
ELEVATION: 1,043.3 **

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	SAMPLE LOC.	
						☒	(39% Passing No. 200 Sieve)
1000							
	45		10.0	118	74	☒	Becomes light brownish orange, some coarse grained
995							
	50	68				☒	Becomes very dense
							END OF BORING AT 50½ FEET
990							
	55						
985							
	60						
980							
	65						
975							
	70						
970							
	75						
965							
	80						

NOTES:

Hand augered upper 5 feet to avoid damage to utilities. Groundwater was not encountered. Borehole was backfilled with soil cuttings and tamped.

Field Tech: AR
Prepared By: JF
Checked By: LT

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LOG OF BORING
Project: 4953-15-1021 Figure: A-1.4b

BORING B-5

DATE DRILLED: October 26, 2015
EQUIPMENT USED: Hollow Stem Auger
HOLE DIAMETER (in.): 8
ELEVATION: 1,044.0 **

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	SAMPLE LOC.		
							SM	FILL - SILTY SAND - moist, light brown, fine to medium grained, some coarse
							SP	POORLY GRADED SAND - slightly moist, light yellowish brown, fine to medium grained, some coarse
1040								
	5	38				☒	SP-SM	POORLY GRADED SAND with SILT - dense, slightly moist, light yellowish brown, fine to medium grained, some coarse
							SP	POORLY GRADED SAND - dense, dry to slightly moist, light yellowish brown, fine to medium grained, some coarse
1035			1.2	116	66	▩		
	10							
		36				☒		Some silt
1030								
	15		3.3	118	43	▩		Thin layer of Sandy Silt, light brownish orange, very fine sand
1025								
	20	33				☒		Fine to coarse grained, some gravel (up to 1/4 inch in size)
							SM	SILTY SAND - dense, slightly moist, light brownish orange, fine to medium grained
1020								
	25		2.3	125	75	▩		
							SW	WELL-GRADED SAND - slightly moist, light brownish gray, fine to coarse grained, trace gravel (up to 1/4 inch in size)
1015								
							SM	SILTY SAND - dense to very dense, moist, brownish orange, fine to coarse grained, some clay, (39% Passing No. 200 Sieve)
	30	55				☒		
1010								
	35		7.6	118	76/7"	▩		
1005								
	40	55				☒		

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE; REFER TO PLOT PLAN FOR MORE ACCURATE LOCATION INFORMATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: AR
Prepared By: JF
Checked By: LT

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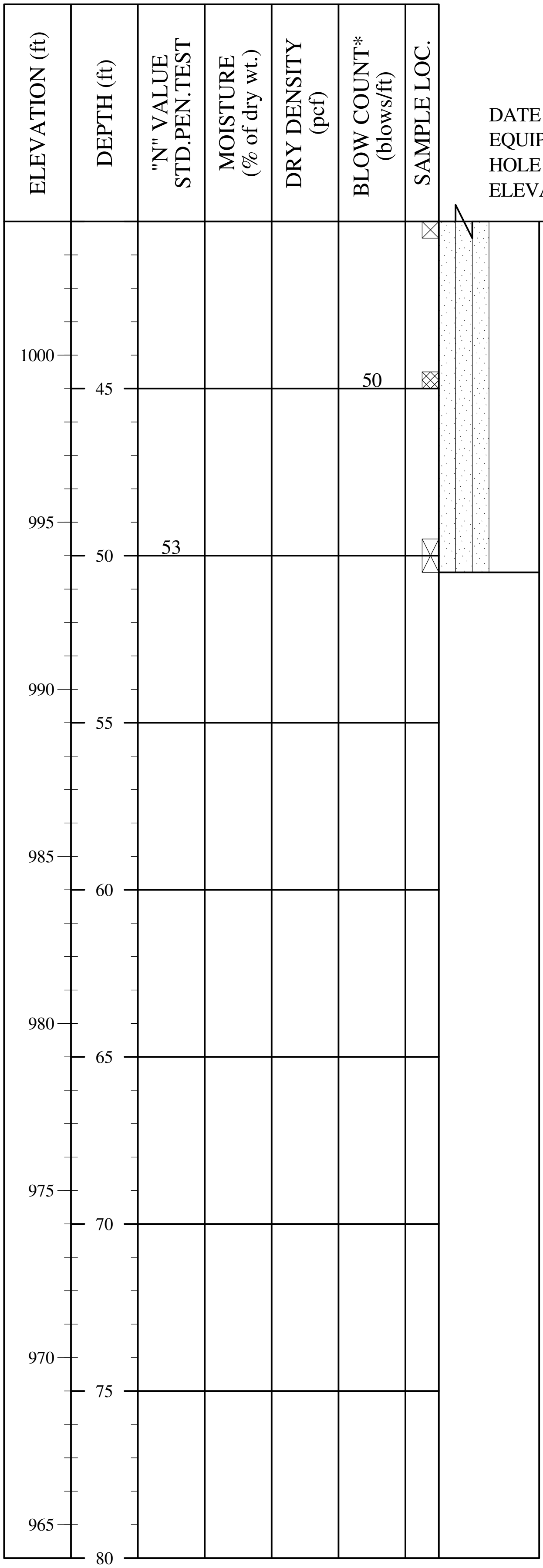
LOG OF BORING
Project: 4953-15-1021
Figure: A-1.5a

BORING B-5 (Continued)

DATE DRILLED: October 26, 2015
EQUIPMENT USED: Hollow Stem Auger
HOLE DIAMETER (in.): 8
ELEVATION: 1,044.0 **



Some clayier seams

Slightly finer, more silt
Becomes more coarse
END OF BORING AT 50½ FEET

NOTES:

Hand augered upper 5 feet to avoid damage to utilities. Groundwater was not encountered. Borehole was backfilled with soil cuttings and tamped.

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE; REFER TO PLOT PLAN FOR MORE ACCURATE LOCATION INFORMATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

Field Tech: AR
Prepared By: JF
Checked By: LT

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LOG OF BORING
Project: 4953-15-1021
Figure: A-1.5b

BORING B-6

DATE DRILLED: October 22, 2015
EQUIPMENT USED: Hollow Stem Auger
HOLE DIAMETER (in.): 8
ELEVATION: 1,047.5 **

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	SAMPLE LOC.		
							SM	SILTY SAND - medium dense, slightly moist, yellowish brown, fine grained, some medium, trace coarse, some fine gravel (up to 1/2 inch in size)
1045								
	5							
			1.7	115	33	▩		
							SP-SM	POORLY GRADED SAND with SILT - medium dense, dry to slightly moist, yellowish brown, fine grained, some medium to coarse
1040								
			0.9	91	37	▩		
	10							
		32				☒		Becomes dense
1035							SP	POORLY GRADED SAND - medium dense, dry to slightly moist, yellow, fine grained, some medium, trace coarse, some silt
			0.8	108	47	▩		
	15							
		40				☒		Becomes dense, yellowish brown, more silt
1030								
			0.9	110	52	▩		More medium grained, some fine to coarse gravel (up to 1 inch in size)
	20							
		46				☒		
1025							SM	SILTY SAND - dense, slightly moist, olive yellow, fine grained, trace to some medium, thin interbeds of Poorly Graded Sand with Silt
	25							
			2.4	112	62	▩		(19% Passing No. 200 Sieve)
1020								
	30							
		44				☒		Slightly less silt, some thin cemented layers, some clean sand
1015								
	35							
			1.9	112	48	▩		Alternating layers of Poorly Graded Sand with Silt, some fine gravel (up to 1/2 inch in size)
1010								
	40							

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE; REFER TO PLOT PLAN FOR MORE ACCURATE LOCATION INFORMATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: LH
Prepared By: JF
Checked By: LT

BORING B-6 (Continued)

DATE DRILLED: October 22, 2015
EQUIPMENT USED: Hollow Stem Auger
HOLE DIAMETER (in.): 8
ELEVATION: 1,047.5 **

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	SAMPLE LOC.		
		62				☒		Becomes very dense
1005								
	45							
			5.0	118	76	☒		Becomes dense, less silt
1000								
							SP-SM	POORLY GRADED SAND with SILT - very dense, slightly moist, olive yellow, fine grained, some medium
	50							
		55				☒		
995								
	55							
990								
	60							
985								
	65							
980								
	70							
975								
	75							
970								
	80							

END OF BORING AT 51½ FEET

NOTES:

Hand augered upper 5 feet to avoid damage to utilities. Groundwater was not encountered. Borehole was backfilled with soil cuttings and tamped.

Field Tech: LH
Prepared By: JF
Checked By: LT

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LOG OF BORING
Project: 4953-15-1021 Figure: A-1.6b

BORING B-7

DATE DRILLED: October 22, 2015
EQUIPMENT USED: Hollow Stem Auger
HOLE DIAMETER (in.): 8
ELEVATION: 1,041.9 **

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	SAMPLE LOC.		
							SM	SILTY SAND - medium dense, moist, light brown, fine to medium grained, some coarse, some gravel, occasional 3-inch cobble, disturbed at surface
1040								
	5							
			8.4	103	19	▨		Trace fine gravel
1035								
		26				☒		Thin layer of Sandy Silt, light brown, very fine sand
							SP	POORLY GRADED SAND - medium dense, moist, light yellowish brown, fine to medium grained, some coarse, trace gravel
	10							
1030			8.1	100	47	▨		
							SM	SILTY SAND - medium dense, moist, light brown, fine to medium grained, some coarse, some clean sand seams, (34% Passing No. 200 Sieve)
	15	26				☒		
1025								
	20		16.0	111	35	▨		Alternating layers of clean sand, light to brownish orange
1020								
								Becomes dense, layer of Poorly Graded Sand, light brown, fine to medium grained, some coarse
	25	42				☒		
1015								
	30		10.0	117	42	▨		
1010								
	35	42				☒		
1005								
	40		8.4	114	48	▨		

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE; REFER TO PLOT PLAN FOR MORE ACCURATE LOCATION INFORMATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

B12SOIL_CRANDALL (NO DECIMAL) 4953-15-1021.GPJ LAW_CRAN.GDT 12/4/15

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: AR
Prepared By: JF
Checked By: LT

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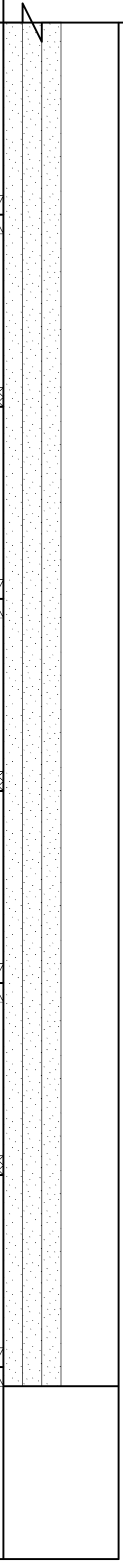
LOG OF BORING
Project: 4953-15-1021
Figure: A-1.7a

BORING B-7 (Continued)

DATE DRILLED: October 22, 2015
EQUIPMENT USED: Hollow Stem Auger
HOLE DIAMETER (in.): 8
ELEVATION: 1,041.9 **

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	SAMPLE LOC.	
1000							
	45	47				☒	Thin layer of clean sand, light brownish gray
995							
	50		7.5	117	67	▨	
990							
	55	40				☒	
985							
	60		9.6	121	76/10"	▨	Becomes light brownish orange
980							
	65	70				☒	Becomes very dense
975							
	70		7.9	118	71/11"	▨	
970							
	75	59				☒	Some clay
965							
	80						



END OF BORING AT 75½ FEET

NOTES:

Hand augered upper 5 feet to avoid damage to utilities. Groundwater was not encountered. Borehole was backfilled with soil cuttings and tamped.

Field Tech: AR
Prepared By: JF
Checked By: LT

BORING B-8

DATE DRILLED: October 23, 2015
EQUIPMENT USED: Hollow Stem Auger
HOLE DIAMETER (in.): 8
ELEVATION: 1,041.9 **

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	SAMPLE LOC.		
							SM	SILTY SAND - medium dense, slightly moist, brown to brownish orange, fine to medium grained, some coarse, disturbed at surface
1040								
	5	18				☒		Thin layer of Silt
1035								
			2.4	98	11	▨		
	10							
1030		6				☒		Becomes loose, brownish orange, trace coarse grained
	15		3.7	111	14	▨		Alternating layers of sand and silt
1025								
	20	24				☒		Becomes medium dense, light brownish orange
1020								
	25		8.0	110	47	▨	SP	POORLY GRADED SAND - medium dense, slightly moist, light brownish gray, fine to medium grained, some coarse, trace gravel (up to 1/4 inch in size)
1015							SM	SILTY SAND - medium dense, moist, brown to brownish orange, fine to medium grained, some coarse, some clay
	30	25				☒		(41% Passing No. 200 Sieve)
1010								
	35		6.8	112	57	▨		Becomes dense, slightly less silt
1005								
	40	41				☒		

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: AR
Prepared By: JF
Checked By: LT

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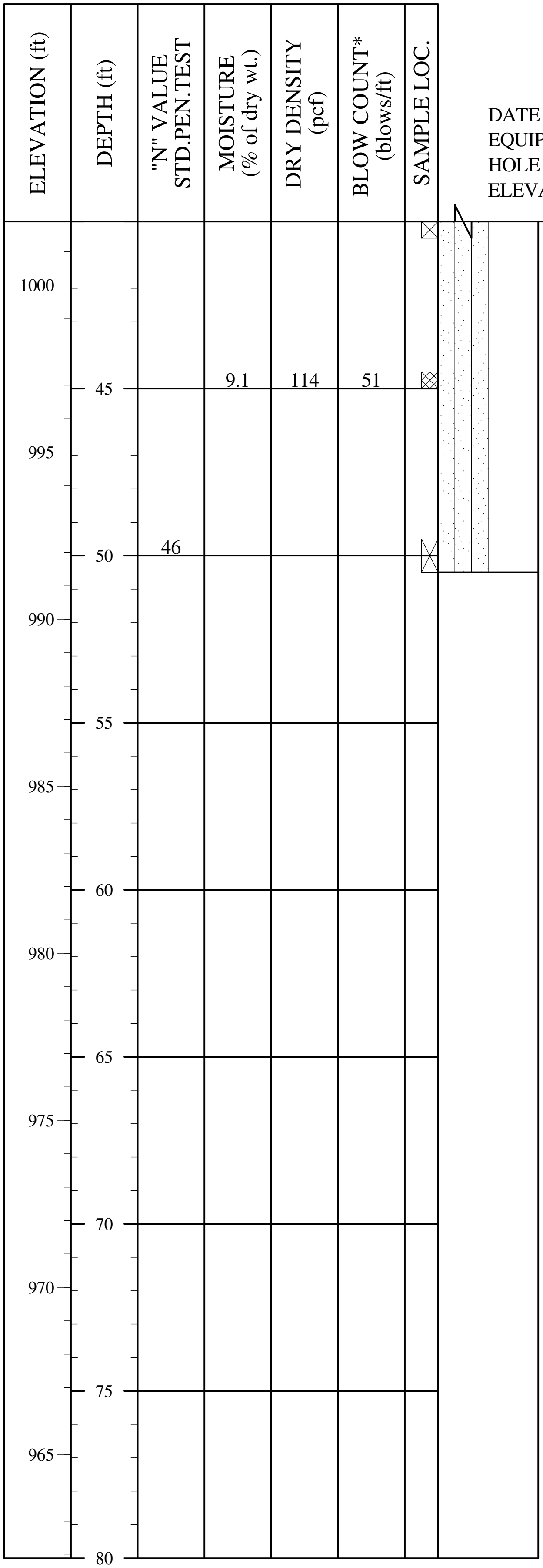
LOG OF BORING
Project: 4953-15-1021
Figure: A-1.8a

BORING B-8 (Continued)

DATE DRILLED: October 23, 2015
EQUIPMENT USED: Hollow Stem Auger
HOLE DIAMETER (in.): 8
ELEVATION: 1,041.9 **



Becomes light brownish orange

Slightly clayier

END OF BORING AT 50½ FEET

NOTES:

Hand augered upper 5 feet to avoid damage to utilities. Groundwater was not encountered. Borehole was backfilled with soil cuttings and tamped.

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE; REFER TO PLOT PLAN FOR MORE ACCURATE LOCATION INFORMATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

Field Tech: AR
Prepared By: JF
Checked By: LT

BORING B-9

DATE DRILLED: October 26, 2015
EQUIPMENT USED: Hollow Stem Auger
HOLE DIAMETER (in.): 8
ELEVATION: 1,041.9 **

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	SAMPLE LOC.		
							SM	SILTY SAND - moist, brownish orange, fine to medium grained, some coarse, disturbed at surface
1040								
							SP	POORLY GRADED SAND - medium dense to dense, moist, light brown, fine to medium grained, some coarse, trace gravel (up to 1/4 inch in size)
	5		8.0	101	37	▨		
1035								
		39				☒		Occasional Silty Sand seams
	10							
			2.1	107	40	▨	SM	SILTY SAND - medium dense, slightly moist, light yellowish brown, fine to medium grained, (16% Passing No. 200 Sieve)
1030								
							SP	POORLY GRADED SAND - dense, slightly moist, light yellowish brown, fine to medium grained
	15	37				☒		
1025								
	20		2.5	111	51	▨		Becomes light grayish brown, fine to coarse grained, trace gravel (up to 1/4 inch in size)
1020								
	25	45				☒	SM	SILTY SAND - dense, slightly moist, brownish orange, fine to medium grained, some clay
1015								
	30		6.1	114	53	▨		
1010								
							ML	SANDY SILT - hard, moist, brownish orange, fine to medium sand, slightly clayier, (52% Passing No. 200 Sieve)
	35	42				☒		
1005								
							SM	SILTY SAND - dense, moist, brownish orange, fine to medium grained,
	40		8.5	122	51	▨		

Field Tech: AR
Prepared By: JF
Checked By: LT

(CONTINUED ON FOLLOWING FIGURE)

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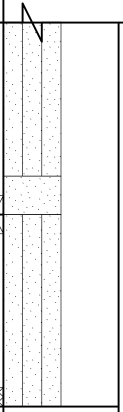
LOG OF BORING
Project: 4953-15-1021
Figure: A-1.9a

BORING B-9 (Continued)

DATE DRILLED: October 26, 2015
EQUIPMENT USED: Hollow Stem Auger
HOLE DIAMETER (in.): 8
ELEVATION: 1,041.9 **



ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	SAMPLE LOC.	
							some coarse, some clay
1000							
							Layer of Poorly Graded Sand, very dense, slightly moist, light gray, fine to medium grained, some coarse
	45	65				☒	
995							
	50		6.9	120	50	▩	END OF BORING AT 50 FEET
990							
	55						
985							
	60						
980							
	65						
975							
	70						
970							
	75						
965							
	80						

NOTES:

Hand augered upper 5 feet to avoid damage to utilities. Groundwater was not encountered. Borehole was backfilled with soil cuttings and tamped.

Field Tech: AR
Prepared By: JF
Checked By: LT

B12SOIL_CRANDALL (NO DECIMAL) 4953-15-1021.GPJ LAW_CRAN.GDT 12/4/15

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE; REFER TO PLOT PLAN FOR MORE ACCURATE LOCATION INFORMATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

BORING B-10

DATE DRILLED: October 23, 2015
EQUIPMENT USED: Hollow Stem Auger
HOLE DIAMETER (in.): 8
ELEVATION: 1,041.7 **

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	SAMPLE LOC.		
							SM	SILTY SAND - loose, moist, light brownish orange, fine to medium grained, some coarse, disturbed at surface
1040								
	5							
		10				☒		
							SP	POORLY GRADED SAND - loose to medium dense, slightly moist, light brownish gray, fine to medium grained, some coarse, some gravel (up to 1/4 inch in size)
1035								
			8.7	100	26	▨		
	10							
							SM	SILTY SAND - dense, slightly moist, brownish orange, fine to medium grained, some coarse, some clay
1030		35				☒		
			6.9	123	45	▨		(27% Passing No. 200 Sieve), slightly clayier
	15							
1025								
							SP	POORLY GRADED SAND - dense, slightly moist, light brownish gray, fine to coarse grained, trace silt, trace gravel (up to 1/4 inch in size)
		33				☒		
	20							
1020								
							SM	SILTY SAND - medium dense to dense, moist, brownish orange, fine to medium grained, some coarse
			16.0	104	25	▨		
	25							
1015								
		30				☒		Becomes dense, some clay
	30							
1010								
			12.5	121	42	▨		
	35							
1005								
		54				☒		
	40							

Field Tech: AR
Prepared By: JF
Checked By: LT

(CONTINUED ON FOLLOWING FIGURE)

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LOG OF BORING
Project: 4953-15-1021 Figure: A-1.10a

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE; REFER TO PLOT PLAN FOR MORE ACCURATE LOCATION INFORMATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

BORING B-10 (Continued)

DATE DRILLED: October 23, 2015
EQUIPMENT USED: Hollow Stem Auger
HOLE DIAMETER (in.): 8
ELEVATION: 1,041.7 **

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	SAMPLE LOC.	
						☒	(24% Passing No. 200 Sieve), becomes very dense
1000							
	45		13.9	111	34	☒	
995							
	50	42				☒	Becomes dense, some clean sand
990							END OF BORING AT 50½ FEET
	55						
985							
	60						
980							
	65						
975							
	70						
970							
	75						
965							
	80						

NOTES:

Hand augered upper 5 feet to avoid damage to utilities. Groundwater was not encountered. Borehole was backfilled with soil cuttings and tamped.

Field Tech: AR
Prepared By: JF
Checked By: LT

B12SOIL_CRANDALL (NO DECIMAL) 4953-15-1021.GPJ LAW_CRAN.GDT 12/4/15

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LOG OF BORING

Project: 4953-15-1021 Figure: A-1.10b

BORING B-11

DATE DRILLED: October 22, 2015
EQUIPMENT USED: Hollow Stem Auger
HOLE DIAMETER (in.): 8
ELEVATION: 1,050.0 **

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	SAMPLE LOC.		
							SP-SM	POORLY GRADED SAND with SILT - dry to slightly moist, light brown, fine grained, some medium, trace coarse, some fine to coarse gravel (up to 1 inch in size)
							SM	SILTY SAND - loose, dry to slightly moist, olive brown to olive yellow, fine grained, thin layer of Poorly Graded Sand with Silt
1045	5		0.3	112	10	▨		
			9.4	106	81	▨		Becomes very dense, more silt
1040	10		3.1	112	55	▨		Becomes dense
		40				☒		(37% Passing No. 200 Sieve)
							SP-SM	POORLY GRADED SAND with SILT - medium dense to dense, slightly moist, olive yellow, fine grained, trace to some medium, trace fine gravel (up to 1/4 inch in size)
1035	15		2.3	117	42	▨		
		32				☒		Less silt
1030	20		3.6	112	50	▨		More silt, interbedded with layers of Silty Sand
							SM	SILTY SAND - dense, slightly moist, olive yellow, fine grained, trace medium
1025	25	37				☒		Some clean sand layers
							SP-SM	POORLY GRADED SAND with SILT - medium dense, slightly moist, olive yellow, fine to medium grained, trace coarse
1020	30		1.9	104	33	▨		Becomes yellowish brown, fine grained, some medium to coarse, more silt
1015	35	59				☒		Becomes very dense
	40							

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(CONTINUED ON FOLLOWING FIGURE)

Field Tech: LH
Prepared By: JF
Checked By: LT

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LOG OF BORING
Project: 4953-15-1021 Figure: A-1.11a

BORING B-11 (Continued)

DATE DRILLED: October 22, 2015
EQUIPMENT USED: Hollow Stem Auger
HOLE DIAMETER (in.): 8
ELEVATION: 1,050.0 **

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	SAMPLE LOC.		
			2.6	110	85	☒		Fine grained, more silt, interbedded with layers of Silty Sand
							SM	SILTY SAND - very dense, slightly moist, olive brown, fine grained, some medium, some calcium carbonate stringers
1005	45							
		57				☒		(33% Passing No. 200 Sieve)
1000	50							
			2.1	114	67	☒		Becomes yellowish brown, less silt Thin layer of Poorly Graded Sand, light brown, fine grained, some medium, trace coarse
								END OF BORING AT 51 FEET
995	55							
990	60							
985	65							
980	70							
975	75							
	80							

NOTES:

Hand augered upper 5 feet to avoid damage to utilities. Groundwater was not encountered. Borehole was backfilled with soil cuttings and tamped.

Field Tech: LH
Prepared By: JF
Checked By: LT

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LOG OF BORING
Project: 4953-15-1021 Figure: A-1.11b

B12SOIL_CRANDALL (NO DECIMAL) 4953-15-1021.GPJ LAW_CRAN.GDT 12/4/15

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BORING B-12

DATE DRILLED: October 22, 2015
EQUIPMENT USED: Hollow Stem Auger
HOLE DIAMETER (in.): 8
ELEVATION: 1,040.7 **

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	SAMPLE LOC.		
1040							SM	SILTY SAND - slightly moist to moist, light brownish orange, fine to medium grained, some coarse
	5							
1035			3.9	120	23	⊠		Becomes medium dense, light brown
		29				☒		Thin layer of Sandy Silt, light brown, fine sand, some clay
	10							
1030								
			9.5	106	21	⊠		(28% Passing No. 200 Sieve)
	15	22				☒		
1025								
							SP-SM	POORLY GRADED SAND with SILT - medium dense, slightly moist, light brown, fine to medium grained
	20		4.5	103	33	⊠		Some coarse grained
1020								
							SM	SILTY SAND - medium dense, moist, light brownish orange, fine to medium grained
	25	30				☒		
1015								
							SP	POORLY GRADED SAND - medium dense, moist, light brown, fine to medium grained, some coarse, (sample not recovered)
	30		--	--	45	○		
1010								
							SM	SILTY SAND - very dense, moist, light brown, fine grained, occasional medium and coarse
	35	52				☒		
1005								
	40		9.9	121	71	⊠		

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: AR
Prepared By: JF
Checked By: LT

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LOG OF BORING

Project: 4953-15-1021 Figure: A-1.12a

BORING B-12 (Continued)

DATE DRILLED: October 22, 2015
EQUIPMENT USED: Hollow Stem Auger
HOLE DIAMETER (in.): 8
ELEVATION: 1,040.7 **

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	SAMPLE LOC.		
1000								Becomes dense, light brownish orange, trace gravel (up to 1/4 inch in size)
							ML	SANDY SILT - hard, moist, light brownish orange, fine to medium sand, (56% Passing No. 200 Sieve)
	45	48				☒		
995								
							SM	SILTY SAND - dense to very dense, moist, light brownish orange, fine to medium grained, some coarse, some clean sand seams
	50		12.8	111	54	▨		
990								
	55	71				☒		
985								
	60		8.3	119	69	▨		Becomes light brown
980								
	65	56				☒		Becomes brown, slightly clayier
975								
	70		5.7	130	74	▨		Some clay
970								
							SP-SM	POORLY GRADED SAND with SILT - very dense, slightly moist, light brown, fine to medium grained, trace coarse, trace gravel (up to 3/4 inch in size)
	75	83				☒		
965								END OF BORING AT 75½ FEET
	80							

NOTES:

Hand augered upper 5 feet to avoid damage to utilities. Groundwater was not encountered. Borehole was backfilled with soil cuttings and tamped.

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE; REFER TO PLOT PLAN FOR MORE ACCURATE LOCATION INFORMATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

Field Tech: AR
Prepared By: JF
Checked By: LT

B12SOIL_CRANDALL (NO DECIMAL) 4953-15-1021.GPJ LAW_CRAN.GDT 12/4/15

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE; REFER TO PLOT PLAN FOR MORE ACCURATE LOCATION INFORMATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

BORING B-13

DATE DRILLED: October 27, 2015
EQUIPMENT USED: Hollow Stem Auger
HOLE DIAMETER (in.): 8
ELEVATION: 1,041.7 **

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	SAMPLE LOC.		
							SM	FILL - SILTY SAND - moist, brownish orange, fine to medium grained
1040								
	5						SM	SILTY SAND - medium dense, slightly moist, brownish orange, fine to medium grained
			7.1	98	28	☒	SP-SM	POORLY GRADED SAND with SILT - dense, slightly moist, light brownish gray, fine to medium grained, occasional coarse
1035								
		43				☒		
	10						SM	SILTY SAND - dense, slightly moist, light brownish orange, fine to medium grained, some coarse
1030			3.4	119	55	☒		
							SP	POORLY GRADED SAND - dense, slightly moist, light grayish yellow, fine to coarse grained, trace gravel (up to 1/4 inch in size)
	15	43				☒		
1025								
							SM	SILTY SAND - medium dense, moist, brownish orange, fine to medium grained, some coarse, some clay
	20		10.0	109	37	☒		Slightly clayier
1020								
							SP	POORLY GRADED SAND - dense, slightly moist, light brown, fine to medium grained, some silt
	25	32				☒		
1015								Fine to coarse grained
								Thin layer of Sandy Silt, brownish orange, very fine sand, (63% Passing No. 200 Sieve)
							SM	SILTY SAND - medium dense, moist, brownish orange, fine to medium grained, some coarse, some clay
	30		16.7	111	45	☒		
1010								
	35	33				☒		Becomes dense
1005								
	40		9.4	122	70	☒		

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: AR
Prepared By: JF
Checked By: LT

B12SOIL_CRANDALL (NO DECIMAL) 4953-15-1021.GPJ LAW_CRAN.GDT 12/4/15

B12SOIL_CRANDALL (NO DECIMAL) 4953-15-1021.GPJ LAW_CRAN.GDT 12/4/15

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE; REFER TO PLOT PLAN FOR MORE ACCURATE LOCATION INFORMATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

BORING B-13 (Continued)

DATE DRILLED: October 27, 2015
EQUIPMENT USED: Hollow Stem Auger
HOLE DIAMETER (in.): 8
ELEVATION: 1,041.7 **

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	SAMPLE LOC.		
								(41% Passing No. 200 Sieve), thin layer of Silt
1000								
	45	40				☒		Becomes light brownish orange
995								
							SP	POORLY GRADED SAND - dense, slightly moist, light gray, fine to medium grained, occasional coarse
	50		2.5	119	68	▦		
							SM	SILTY SAND - dense, moist, light brownish orange, fine to coarse grained, some clay
990								
	55	50				☒		Fine to medium grained, trace coarse
985								
	60		9.2	126	86	▦		Becomes very dense, brownish gray, fine to coarse grained
980								
	65	75				☒		Some clean sand
975								
	70		8.5	125	96/11"	▦		
970								
	75	82				☒		
								END OF BORING AT 75½ FEET
965								
	80							

NOTES:

Hand augered upper 5 feet to avoid damage to utilities. Groundwater was not encountered. Borehole was backfilled with soil cuttings and tamped.

Field Tech: AR
Prepared By: JF
Checked By: LT

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LOG OF BORING
Project: 4953-15-1021
Figure: A-1.13b

BORING B-14

DATE DRILLED: October 29, 2015
EQUIPMENT USED: Hollow Stem Auger
HOLE DIAMETER (in.): 8
ELEVATION: 1,039.1 **

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE; REFER TO PLOT PLAN FOR MORE ACCURATE LOCATION INFORMATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	SAMPLE LOC.		
							SM	FILL - SILTY SAND - moist, brown, fine to medium grained, some coarse
1035							SM	SILTY SAND - medium dense, slightly moist, brownish orange, fine to medium grained
	5							
			3.6	115	23	▩		
		4				☒		Becomes very loose, slight decrease in silt content
1030								
	10							
			4.7	111	12	▩		Becomes loose
1025								
		7				☒		(21% Passing No. 200 Sieve)
	15							
1020								
			5.3	103	11	▩		Becomes brown, less silt
	20							
1015								
		12				☒		(22% Passing No. 200 Sieve), becomes medium dense, some coarse grained
	25							
1010								
			5.7	115	18	▩		
	30						SW	WELL-GRADED SAND - medium dense, slightly moist, light gray, fine to coarse grained, trace gravel (up to 1/4 inch in size)
							SM	SILTY SAND - dense, slightly moist, brown, fine to medium grained, some coarse
1005								
		34				☒		
	35							
1000								
			5.1	125	47	▩		
	40							

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: AR
Prepared By: JF
Checked By: LT

B12SOIL_CRANDALL (NO DECIMAL) 4953-15-1021.GPJ LAW_CRAN.GDT 12/4/15

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LOG OF BORING
Project: 4953-15-1021 Figure: A-1.14a

BORING B-14 (Continued)

DATE DRILLED: October 29, 2015
EQUIPMENT USED: Hollow Stem Auger
HOLE DIAMETER (in.): 8
ELEVATION: 1,039.1 **

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	SAMPLE LOC.		
995								
	45	37				⊠		Becomes light brownish orange, some clean sand
990								
	50		5.8	127	53	▩		
							ML	SANDY SILT - hard, moist, brown, fine sand
985								
	55	41				⊠	SM	SILTY SAND - dense, slightly moist, brownish orange, fine grained
980								
	60		6.6	121	61	▩		
975								
	65	92				⊠		Becomes very dense, fine to medium grained, some coarse
970								
	70		6.7	121	65	▩		
965								
	75	68				⊠		
960								
	80							

END OF BORING AT 75½ FEET

NOTES:

Hand augered upper 5 feet to avoid damage to utilities. Groundwater was not encountered. Borehole was backfilled with soil cuttings and tamped.

Field Tech: AR
Prepared By: JF
Checked By: LT

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE; REFER TO PLOT PLAN FOR MORE ACCURATE LOCATION INFORMATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

BORING B-15

DATE DRILLED: October 22, 2015
EQUIPMENT USED: Hollow Stem Auger
HOLE DIAMETER (in.): 8
ELEVATION: 1,041.0 **

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	SAMPLE LOC.		
							SM	SILTY SAND - medium dense, dry to slightly moist, olive yellow, fine grained, some medium, some fine to coarse gravel (up to 3/4 inch in size)
1040								
	5							
1035			2.3	117	35	▨		
			1.8	97	37	▨		Less gravel, less silt, more medium to coarse grained
	10							
1030		20				☒		Alternating with layers of clean sand, more silt
							SP	POORLY GRADED SAND - medium dense, dry to slightly moist, light grayish brown, fine grained, some medium
			1.2	107	24	▨		
	15							
1025		15				☒		
							SM	SILTY SAND - medium dense to dense, slightly moist, yellowish brown, fine grained, some medium
			7.1	118	33	▨		
	20							
1020		31				☒		(33% Passing No. 200 Sieve), becomes orangish brown, more silt
							SP-SM	POORLY GRADED SAND with SILT - medium dense, slightly moist, yellowish brown, fine grained, some medium
	25							
1015			4.4	123	44	▨		
	30							
1010		33				☒		Becomes dense, olive yellow to brown, more fine grained, trace coarse, slightly more silt
							SM	SILTY SAND - medium dense, moist, yellowish brown, fine grained, some medium, some manganese stains, trace to some fine gravel (up to 1/4 inch in size), alternating layers of Poorly Graded Sand with Silt
	35							
1005			4.9	113	40	▨	SP-SM	POORLY GRADED SAND with SILT - medium dense, slightly moist, light grayish brown, fine to medium grained, some coarse
							SP	POORLY GRADED SAND - dense, dry to slightly moist, light grayish brown, fine to medium grained, some coarse, some fine to coarse gravel (up to 1/2 inch in size)
	40							

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE; REFER TO PLOT PLAN FOR MORE ACCURATE LOCATION INFORMATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

Field Tech: LH
Prepared By: JF
Checked By: LT

(CONTINUED ON FOLLOWING FIGURE)

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LOG OF BORING
Project: 4953-15-1021
Figure: A-1.15a

B12SOIL_CRANDALL (NO DECIMAL) 4953-15-1021.GPJ LAW_CRAN.GDT 12/4/15

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE; REFER TO PLOT PLAN FOR MORE ACCURATE LOCATION INFORMATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

BORING B-15 (Continued)

DATE DRILLED: October 22, 2015
EQUIPMENT USED: Hollow Stem Auger
HOLE DIAMETER (in.): 8
ELEVATION: 1,041.0 **

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	SAMPLE LOC.		
1000		47				☒		
							SM	SILTY SAND - medium dense, moist, yellowish brown, fine grained, some medium, interbedded with Poorly Graded Sand with Silt
	45							
995			10.4	119	44	☒		
	50						ML	SANDY SILT - hard, moist, yellowish brown, fine sand, some medium, (57% Passing No. 200 Sieve)
990		36				☒		
	55							
985								
	60							
980								
	65							
975								
	70							
970								
	75							
965								
	80							

END OF BORING AT 51½ FEET

NOTES:

Hand augered upper 5 feet to avoid damage to utilities. Groundwater was not encountered. Borehole was backfilled with soil cuttings and tamped.

Field Tech: LH
Prepared By: JF
Checked By: LT

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LOG OF BORING
Project: 4953-15-1021 Figure: A-1.15b

B12SOIL_CRANDALL (NO DECIMAL) 4953-15-1021.GPJ LAW_CRAN.GDT 12/4/15

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE; REFER TO PLOT PLAN FOR MORE ACCURATE LOCATION INFORMATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

BORING B-16

DATE DRILLED: October 23, 2015
EQUIPMENT USED: Hollow Stem Auger
HOLE DIAMETER (in.): 8
ELEVATION: 1,040.3 **

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	SAMPLE LOC.		
1040							SM	SILTY SAND - moist, reddish brown, fine to medium grained, some coarse Some gravel (up to 1/4 inch in size)
1035	5		5.5	103	9	☒	SP-SM	POORLY GRADED SAND with SILT - loose, slightly moist, light brown to brownish orange, fine to medium grained, some coarse
		6				☒	SM	SILTY SAND - loose, moist, light brown to brownish orange, fine to medium grained, some coarse, (24% Passing No. 200 Sieve)
1030	10		5.8	104	10	☒		Becomes light brown
							SP	POORLY GRADED SAND - medium dense, moist, light brownish gray, fine to medium grained, some coarse, trace gravel (up to 1/4 inch in size)
1025	15	13				☒		
1020	20		6.8	97	15	☒		
							SM	SILTY SAND - dense, moist, brown, fine to medium grained, some coarse
1015	25	30				☒		
1010	30		8.3	122	46	☒		
1005	35	33				☒		(29% Passing No. 200 Sieve)
	40		10.4	120	37	☒		

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: AR
Prepared By: JF
Checked By: LT

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LOG OF BORING
Project: 4953-15-1021
Figure: A-1.16a

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE; REFER TO PLOT PLAN FOR MORE ACCURATE LOCATION INFORMATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

BORING B-16 (Continued)

DATE DRILLED: October 23, 2015
EQUIPMENT USED: Hollow Stem Auger
HOLE DIAMETER (in.): 8
ELEVATION: 1,040.3 **

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	SAMPLE LOC.		
1000								Becomes light brown
995	45	49				☒		Some clean sand
							SP	POORLY GRADED SAND - very dense, moist, light brownish gray, fine to coarse grained
990	50		6.1	119	85	▩		END OF BORING AT 50 FEET
985	55							
980	60							
975	65							
970	70							
965	75							
	80							

NOTES:

Hand augered upper 5 feet to avoid damage to utilities. Groundwater was not encountered. Borehole was backfilled with soil cuttings and tamped.

Field Tech: AR
Prepared By: JF
Checked By: LT

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LOG OF BORING
Project: 4953-15-1021 Figure: A-1.16b

BORING B-17

DATE DRILLED: October 28, 2015
EQUIPMENT USED: Hollow Stem Auger
HOLE DIAMETER (in.): 8
ELEVATION: 1,039.5 **

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE; REFER TO PLOT PLAN FOR MORE ACCURATE LOCATION INFORMATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	SAMPLE LOC.		
							SM	FILL - SILTY SAND - moist, light brown to brown, fine to medium grained, some coarse
							SM	SILTY SAND - slightly moist, light brownish orange, fine to medium grained, some coarse, (disturbed sample)
1035	5							
			3.2	94	7	▨		
							SP	POORLY GRADED SAND - medium dense, slightly moist, light gray, fine to medium grained, some coarse, trace silt
		26				☒		
1030	10						SM	SILTY SAND - medium dense, moist, brownish orange, fine to medium grained
			15.0	99	27	▨		
							SP	POORLY GRADED SAND - medium dense, moist, light gray, fine to medium grained, trace silt
1025	15	22				☒		
1020	20		5.2	96	20	▨		Slightly coarser
							SM	SILTY SAND - dense, moist, brownish orange, fine to medium grained, some coarse
1015	25	36				☒		
1010	30		8.4	117	36	▨		Thin layer of Sandy Silt, moist, brown, fine to medium sand, (53% Passing No. 200 Sieve)
1005	35	41				☒		Becomes light brownish orange, fine to medium grained
1000	40		6.3	126	45	▨		

Field Tech: AR
Prepared By: JF
Checked By: LT

(CONTINUED ON FOLLOWING FIGURE)

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LOG OF BORING
Project: 4953-15-1021 Figure: A-1.17a

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE; REFER TO PLOT PLAN FOR MORE ACCURATE LOCATION INFORMATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

BORING B-17 (Continued)

DATE DRILLED: October 28, 2015
EQUIPMENT USED: Hollow Stem Auger
HOLE DIAMETER (in.): 8
ELEVATION: 1,039.5 **

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	SAMPLE LOC.	
							Becomes brownish orange, some clay
995	45	45				☒	
990	50		5.0	118	60	▩	
985	55	45				☒	Alternating with layers of clean sand
980	60		4.0	112	52	▩	Becomes light brown
975	65	43				☒	
970	70		5.3	120	42	▩	
965	75	44				☒	
960	80						

END OF BORING AT 75½ FEET

NOTES:

Hand augered upper 5 feet to avoid damage to utilities. Groundwater was not encountered. Borehole was backfilled with soil cuttings and tamped.

Field Tech: AR
Prepared By: JF
Checked By: LT

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LOG OF BORING
Project: 4953-15-1021
Figure: A-1.17b

B12SOIL_CRANDALL (NO DECIMAL) 4953-15-1021.GPJ LAW_CRAN.GDT 12/4/15

BORING B-18

DATE DRILLED: October 28, 2015
EQUIPMENT USED: Hollow Stem Auger
HOLE DIAMETER (in.): 8
ELEVATION: 1,038.5 **

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	SAMPLE LOC.		
							SM	FILL - SILTY SAND - moist, brown, fine to medium grained, some coarse
1035							SM	SILTY SAND - dense, moist, light brownish orange, fine to medium grained, some coarse
	5							
		38				☒		(21% Passing No. 200 Sieve)
1030			14.6	110	21	▩		Becomes slightly more moist, brown
	10							
							SP-SM	POORLY GRADED SAND with SILT - loose, moist, light brown, fine to medium grained
		5				☒		
1025								
	15		5.9	99	9	▩		Fine to coarse grained, some gravel (up to 1/4 inch in size), trace silt
1020								
	20	10				☒		Alternating with Silty Sand seams, fine to medium grained, some coarse
1015							SM	SILTY SAND - medium dense, moist, brown, fine to coarse grained
	25		6.4	101	27	▩		
1010								
	30	27				☒		
1005								
	35		12.3	113	31	▩		
1000								
	40	31				☒		

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE; REFER TO PLOT PLAN FOR MORE ACCURATE LOCATION INFORMATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: AR
Prepared By: JF
Checked By: LT

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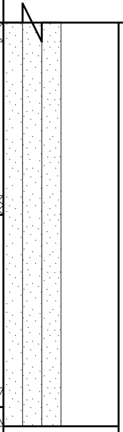
LOG OF BORING
Project: 4953-15-1021 Figure: A-1.18a

BORING B-18 (Continued)

DATE DRILLED: October 28, 2015
EQUIPMENT USED: Hollow Stem Auger
HOLE DIAMETER (in.): 8
ELEVATION: 1,038.5 **

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	SAMPLE LOC.	
						☒	(37% Passing No. 200 Sieve), becomes dense, light brown
995							
	45		6.9	119	46	☒	
990							
	50	51				☒	Becomes very dense
							END OF BORING AT 50½ FEET
985							
	55						
980							
	60						
975							
	65						
970							
	70						
965							
	75						
960							
	80						



NOTES:

Hand augered upper 5 feet to avoid damage to utilities. Groundwater was not encountered. Borehole was backfilled with soil cuttings and tamped.

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE; REFER TO PLOT PLAN FOR MORE ACCURATE LOCATION INFORMATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

B12SOIL_CRANDALL (NO DECIMAL) 4953-15-1021.GPJ LAW_CRAN.GDT 12/4/15

Field Tech: AR
Prepared By: JF
Checked By: LT

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LOG OF BORING
Project: 4953-15-1021 Figure: A-1.18b

BORING B-19

DATE DRILLED: October 28, 2015
EQUIPMENT USED: Hollow Stem Auger
HOLE DIAMETER (in.): 8
ELEVATION: 1,039.5 **

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	SAMPLE LOC.		
							SM	SILTY SAND - medium dense, slightly moist, light brown, fine to medium grained, some coarse, disturbed at surface
1035								
	5							
		11				☒		
			2.2	107	14	☒		
1030								
	10							
		30				☒		
							SP	POORLY GRADED SAND - medium dense, slightly moist, light gray, fine to coarse grained, some gravel (up to 1/4 inch in size)
1025								
			2.7	112	26	☒		
	15						SM	SILTY SAND - medium dense, slightly moist, brownish orange, fine to medium grained
							SP	POORLY GRADED SAND - medium dense, slightly moist, light gray, fine to coarse grained
1020		29				☒		Becomes moist, fine to medium grained, some coarse, some gravel (up to 1/4 inch in size)
	20							
1015								
			4.0	106	38	☒		
	25							
								Layer of Sandy Silt, hard, moist, light brown, very fine sand
1010								
		39				☒	SM	SILTY SAND - dense, moist, brownish orange, fine to medium grained, some coarse
	30							
1005								
			5.7	120	40	☒		
	35							
1000								
		31				☒		
	40							

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: AR
Prepared By: JF
Checked By: LT

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LOG OF BORING
Project: 4953-15-1021 Figure: A-1.19a

B12SOIL_CRANDALL (NO DECIMAL) 4953-15-1021.GPJ LAW_CRAN.GDT 12/4/15

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BORING B-19 (Continued)

DATE DRILLED: October 28, 2015
EQUIPMENT USED: Hollow Stem Auger
HOLE DIAMETER (in.): 8
ELEVATION: 1,039.5 **

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	SAMPLE LOC.	
						☒	Becomes trace fine gravel, some clay
995	45		4.5	122	40	▩	(25% Passing No. 200 Sieve)
990	50	37				☒	
							END OF BORING AT 50½ FEET
985	55						
980	60						
975	65						
970	70						
965	75						
960	80						

NOTES:

Hand augered upper 5 feet to avoid damage to utilities. Groundwater was not encountered. Borehole was backfilled with soil cuttings and tamped.

Field Tech: AR
Prepared By: JF
Checked By: LT

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LOG OF BORING
Project: 4953-15-1021
Figure: A-1.19b

B12SOIL_CRANDALL (NO DECIMAL) 4953-15-1021.GPJ LAW_CRAN.GDT 12/4/15

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BORING B-20

DATE DRILLED: October 28, 2015
EQUIPMENT USED: Hollow Stem Auger
HOLE DIAMETER (in.): 8
ELEVATION: 1,038.5 **

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	SAMPLE LOC.		
							SM	FILL - SILTY SAND - moist, brown to brownish gray, fine to medium grained, some coarse
1035								
	5		12.1	111	33	▨	SM	SILTY SAND - medium dense, moist, brownish gray, fine to medium grained, some coarse, (25% Passing No. 200 Sieve)
1030		18				☒		Becomes brownish orange
	10							
			3.8	104	5	▨		Becomes very loose, alternating with clean sand seams
1025		6				☒		
							SP	POORLY GRADED SAND - loose, slightly moist, light brownish orange, fine to coarse grained, some gravel (up to 1/4 inch in size)
	15							
							SM	SILTY SAND - loose, slightly moist, light brownish orange, fine to medium grained, some coarse
1020								
	20		3.6	110	12	▨		(20% Passing No. 200 Sieve), alternating with clean sand seams
1015								
							SP	POORLY GRADED SAND - loose, slightly moist, brownish orange, fine to coarse grained, some silt, some gravel (up to 1/4 inch in size)
	25	10				☒		
1010								
	30		2.8	103	15	▨		
1005								
	35	39				☒		Becomes dense
							SM	SILTY SAND - dense, moist, brownish orange, fine to medium grained, some coarse
1000								
	40		7.0	115	48	▨		

(CONTINUED ON FOLLOWING FIGURE)

Field Tech: AR
Prepared By: JF
Checked By: LT

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LOG OF BORING

Project: 4953-15-1021 Figure: A-1.20a

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BORING B-20 (Continued)

DATE DRILLED: October 28, 2015
EQUIPMENT USED: Hollow Stem Auger
HOLE DIAMETER (in.): 8
ELEVATION: 1,038.5 **

ELEVATION (ft)	DEPTH (ft)	"N" VALUE STD.PEN.TEST	MOISTURE (% of dry wt.)	DRY DENSITY (pcf)	BLOW COUNT* (blows/ft)	SAMPLE LOC.		
995								
	45	38				☒		Becomes light brownish orange
990								
	50		6.3	127	48	▨		Becomes brownish orange
985								
	55	60				☒		(28% Passing No. 200 Sieve), becomes very dense
980								
	60		5.0	118	46	▨		Becomes light brownish orange
975								
	65	55				☒		Becomes light brown, some gravel (up to 1/4 inch in size), some clean sand seams
							SP	POORLY GRADED SAND - dense, slightly moist, light brown, fine to medium grained, some coarse, some gravel
970								
	70		2.8	114	52	▨		
							SM	SILTY SAND - dense, moist, light brownish orange, fine to medium grained, trace coarse
965								
	75	49				☒		
								END OF BORING AT 75½ FEET
960								
	80							

NOTES:

Hand augered upper 5 feet to avoid damage to utilities. Groundwater was not encountered. Borehole was backfilled with soil cuttings and tamped.

Field Tech: AR
Prepared By: JF
Checked By: LT

B12SOIL_CRANDALL (NO DECIMAL) 4953-15-1021.GPJ LAW_CRAN.GDT 12/4/15

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LOG OF BORING
Project: 4953-15-1021
Figure: A-1.20b

MAJOR DIVISIONS			GROUP SYMBOLS		TYPICAL NAMES
COARSE GRAINED SOILS (More than 50% of material is LARGER than No. 200 sieve size)	GRAVELS (More than 50% of coarse fraction is LARGER than the No. 4 sieve size)	CLEAN GRAVELS (Little or no fines)	●	GW	Well graded gravels, gravel - sand mixtures, little or no fines.
			○	GP	Poorly graded gravels or grave - 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.
	SANDS (More than 50% of coarse fraction is SMALLER than the No. 4 Sieve Size)	CLEAN SANDS (Little or no fines)	⁘	SW	Well graded sands, gravelly sands, little or no fines.
			░	SP	Poorly graded sands or gravelly sands, 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 of clayey fine sands or clayey silts and with slight plasticity.
			▨	CL	Inorganic lays 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 sandy or silty soils, elastic silts.
			▨	CH	Inorganic clays of high plasticity, fat clays
Bedrock			░		SANDSTONE

<u>BOUNDARY CLASSIFICATIONS:</u> Soils possessing characteristics of two groups are designated by combinations of group symbols.

SILT OR CLAY	SAND			GRAVEL		Cobbles	Boulders
	Fine	Medium	Coarse	Fine	Coarse		

No.200 No.40 No.10 No.4 3/4" 3" 12"

U.S. STANDARD SIEVE SIZE

<u>Reference:</u> The Unified Soil Classification System, Corps of Engineers, U.S. Army Technical Memorandum No. 3-357, Vol. 1, March, 1953 (Revised April, 1960)

■	Undisturbed Sample	▮	Auger Cuttings
☒	Split Spoon Sample	≀	Bulk Sample
▥	Rock Core	▩	Crandall Sampler
▩	Dilatometer	^	Pressure Meter
☐	California-Modified Sampler	○	No Recovery
▽	Water Table at time of drilling	▼	Water Table after drilling

Correlation of Penetration Resistance with Relative Density and Consistency

SAND & GRAVEL		SILT & CLAY	
No. of Blows	Relative Density	No. of Blows	Consistency
0 - 4	Very Loose	0 - 1	Very Soft
5 - 10	Loose	2 - 4	Soft
11 - 30	Medium Dense	5 - 8	Medium Stiff
31 - 50	Dense	9 - 15	Stiff
Over 50	Very Dense	16 - 30	Very Stiff
		Over 30	Hard

KEY TO SYMBOLS AND DESCRIPTIONS

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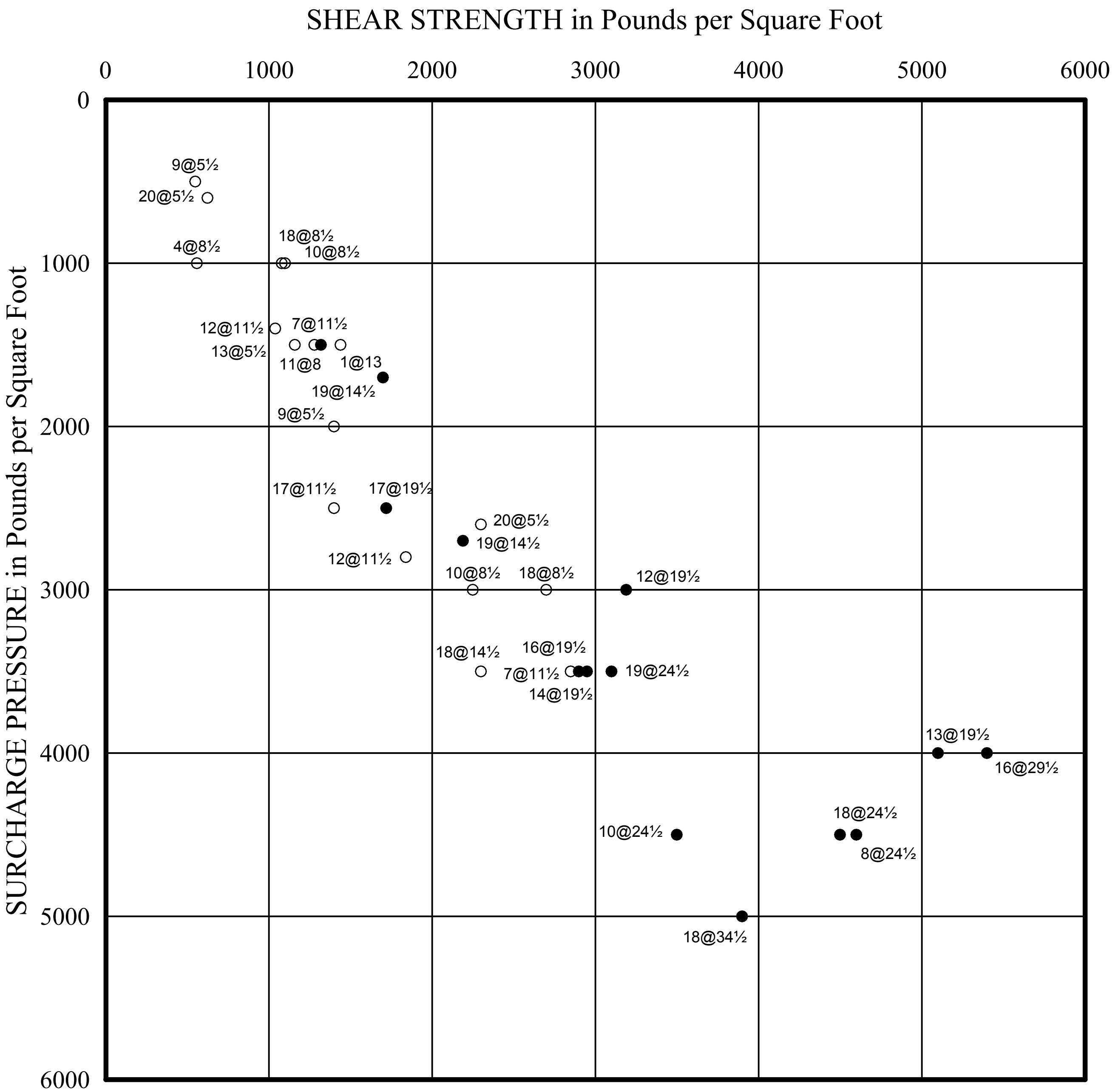
Figure A-2



● Samples tested at field moisture content

○ Samples soaked to a moisture content near saturation

Peak Shear Strength Values

Prepared/Date: WL 12/3/2015
Checked/Date: JF 12/3/2015

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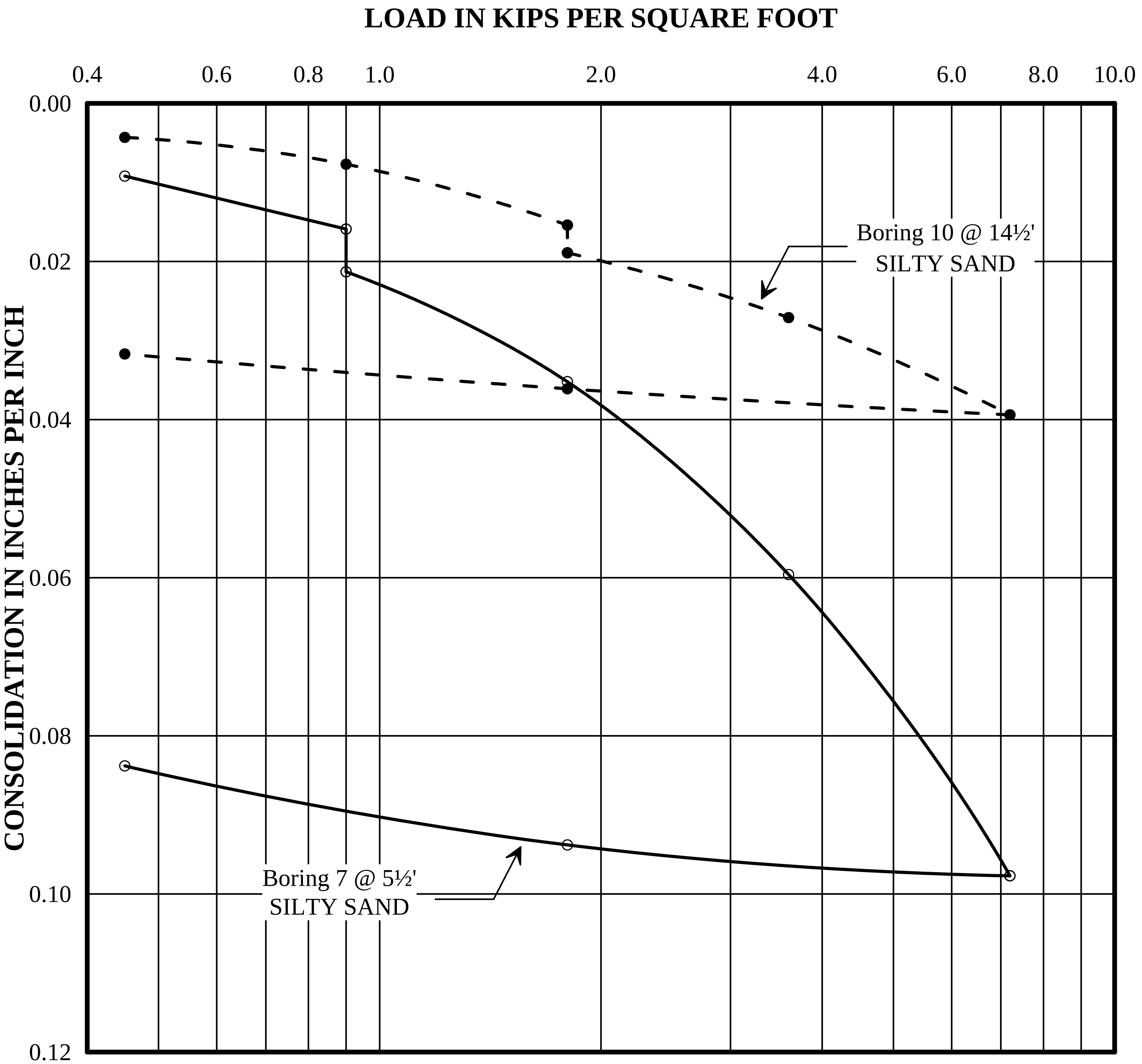
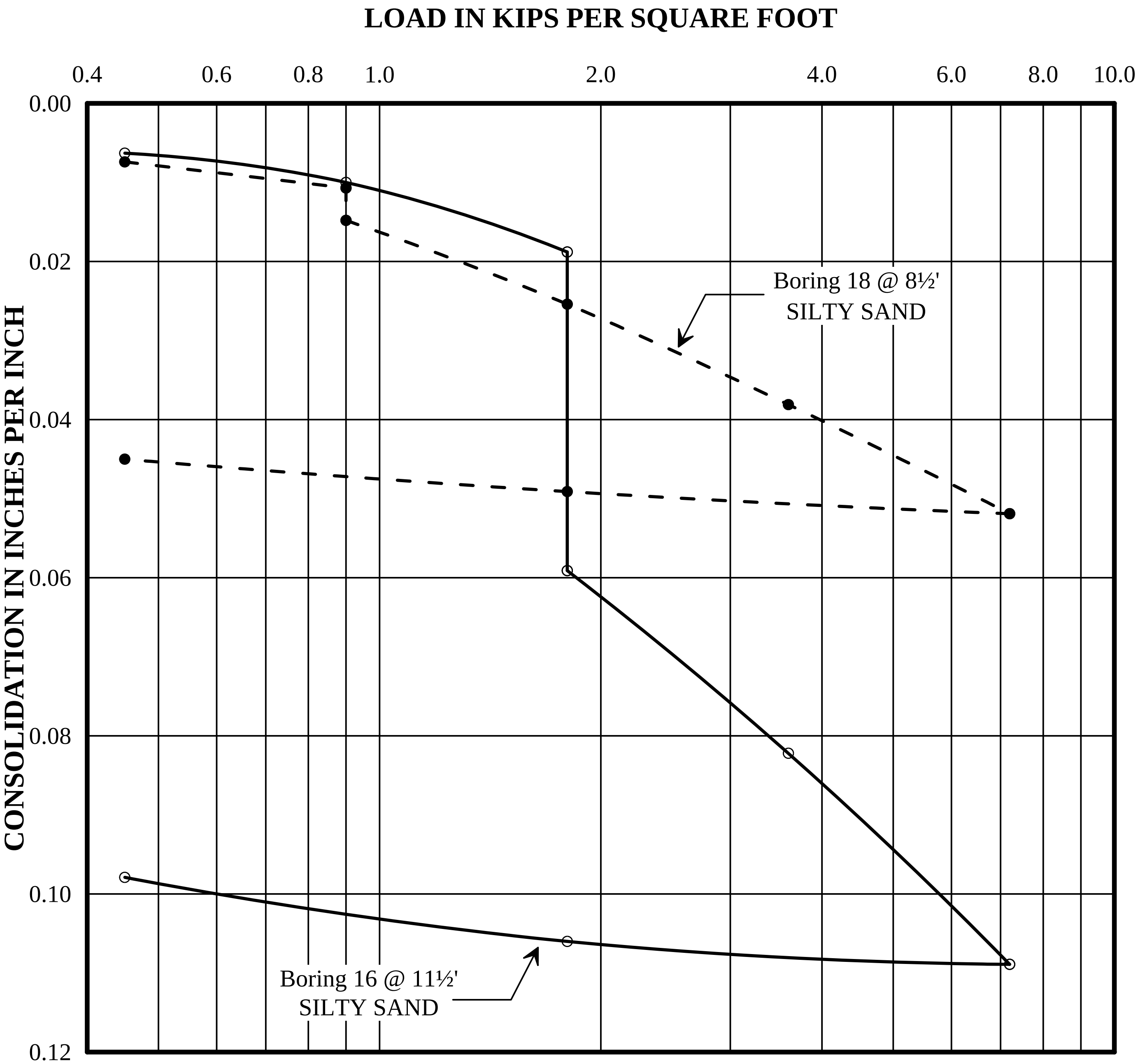
DIRECT SHEAR TEST DATA
Project No. 4953-15-1021
Figure A-3



Note: Water added to Boring 7 at 5½' and Boring 10 at 14½' after consolidation under a load of 0.9 and 1.8 kips per square foot, respectively.

Prepared/Date: JF 11/24/2015
Checked/Date: LT 12/3/2015

University of California, Riverside Proposed Multidisciplinary Research Building 1 Riverside, California	amec foster wheeler	CONSOLIDATION TEST DATA Project No.: 4953-15-1021 Figure A-4.1



Note: Water added to Boring 16 at 11½' and Boring 18 at 8½' after consolidation under a load of 1.8 and 0.9 kips per square foot, respectively.

Prepared/Date: JF 11/24/2015
Checked/Date: LT 12/3/2015

University of California, Riverside Proposed Multidisciplinary Research Building 1 Riverside, California	amec foster wheeler	CONSOLIDATION TEST DATA Project No.: 4953-15-1021 Figure A-4.2

BORING NUMBER AND SAMPLE DEPTH:	4 at 8½'	8 at 8½'	9 at 11½'
SOIL TYPE:	SILTY SAND	SILTY SAND	SILTY SAND
SURCHARGE PRESSURE: (lbs./sq.ft.)	1,800	1,800	1,800
PERCENT HYDROCONSOLIDATION: (%)	2.7	2.15	1.96

Prepared/Date: JF 11/25/2015
Checked/Date: LT 12/3/2015

University of California, Riverside
Proposed Multidisciplinary Research Building 1
Riverside, California

amec foster wheeler

HYDROCONSOLIDATION TEST DATA
Project No.: 4953-15-1021
Figure A-5.1

BORING NUMBER AND SAMPLE DEPTH:	12 at 11½'	13 at 5½'	14 at 19½'
SOIL TYPE:	SILTY SAND	SILTY SAND	SILTY SAND
SURCHARGE PRESSURE: (lbs./sq.ft.)	1,800	900	3,600
PERCENT HYDROCONSOLIDATION: (%)	1.0	0.93	1.43

Prepared/Date: JF 11/25/2015
Checked/Date: LT 12/3/2015

University of California, Riverside
Proposed Multidisciplinary Research Building 1
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HYDROCONSOLIDATION TEST DATA
Project No.: 4953-15-1021
Figure A-5.2

BORING NUMBER AND SAMPLE DEPTH:	16 at 5½'	17 at 5½'	20 at 11½'
SOIL TYPE:	POORLY GRADED SAND with SILT	SILTY SAND	SILTY SAND
SURCHARGE PRESSURE: (lbs./sq.ft.)	900	900	1,800
PERCENT HYDROCONSOLIDATION: (%)	4.11	5.06	1.96

Prepared/Date: JF 11/25/2015
Checked/Date: LT 12/3/2015

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Proposed Multidisciplinary Research Building 1
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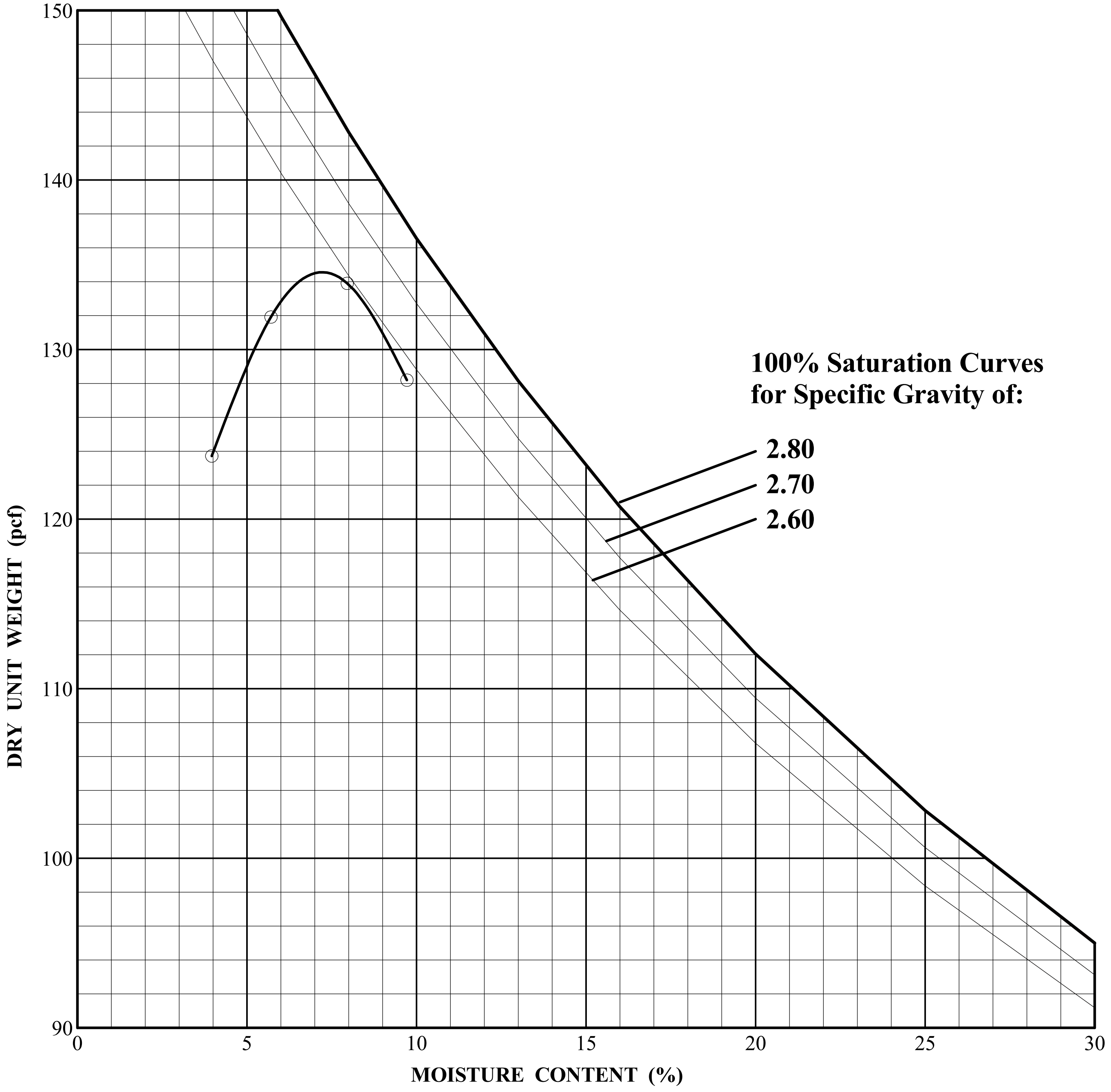
HYDROCONSOLIDATION TEST DATA
Project No.: 4953-15-1021
Figure A-5.3



SYMBOL	BORING	DEPTH (ft)	CLASSIFICATION	OPTIMUM MOISTURE CONTENT (%)	MAXIMUM DRY UNIT WEIGHT (pcf)
○	3	5-10	FILL - SILTY SAND (SM)	7	134

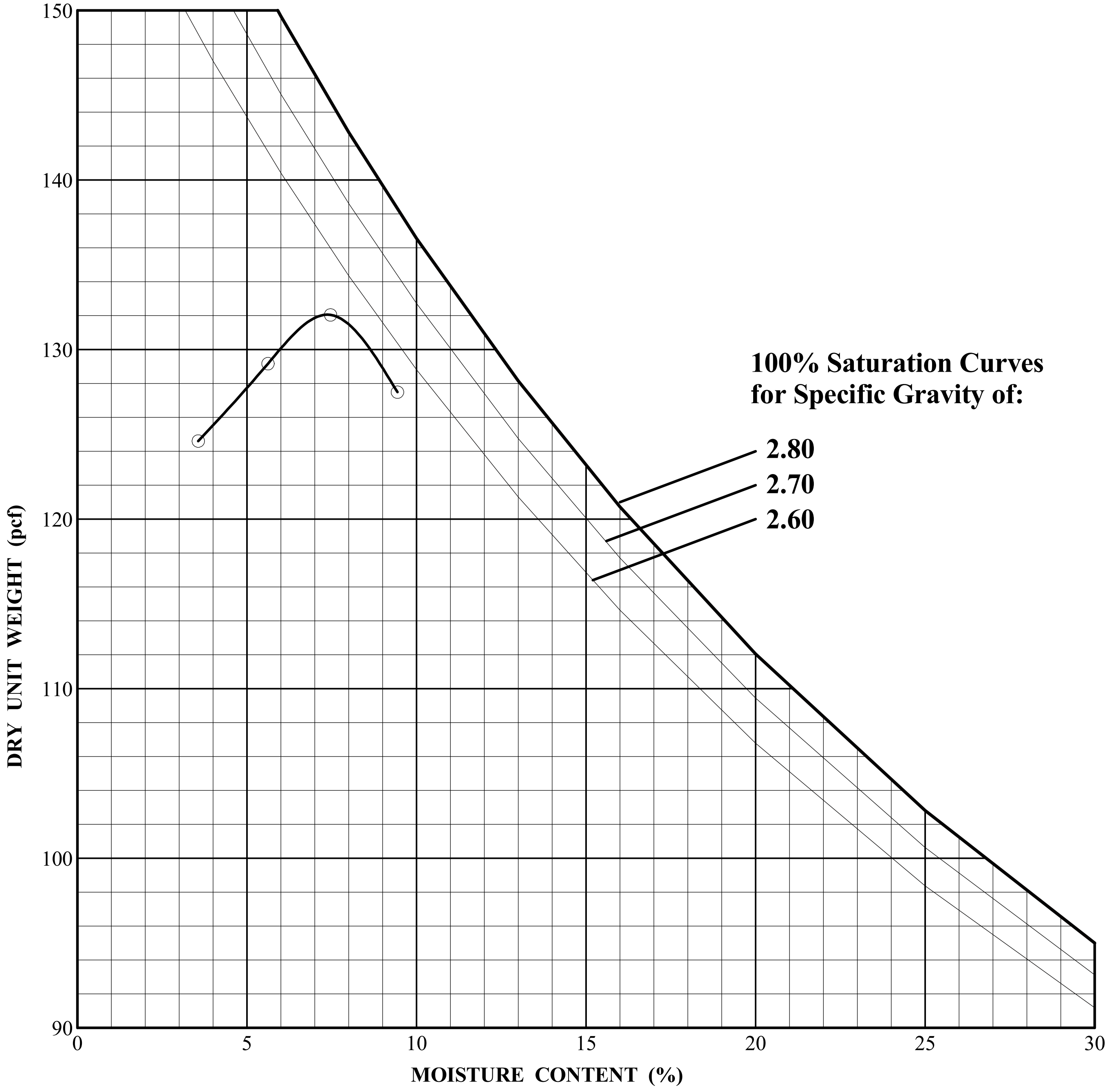
Laboratory Test Method: ASTM D 1557, Method A

Prepared/Date: JF 12/3/2015
Checked/Date: LT 12/3/2015

University of California, Riverside
Proposed Multidisciplinary Research Building 1
Riverside, California

amec foster wheeler

COMPACTION TEST RESULTS
Project No.: 4953-15-1021
Figure: A-6.1



SYMBOL	BORING	DEPTH (ft)	CLASSIFICATION	OPTIMUM MOISTURE CONTENT (%)	MAXIMUM DRY UNIT WEIGHT (pcf)
○	7	1-5	SILTY SAND (SM)	8	132

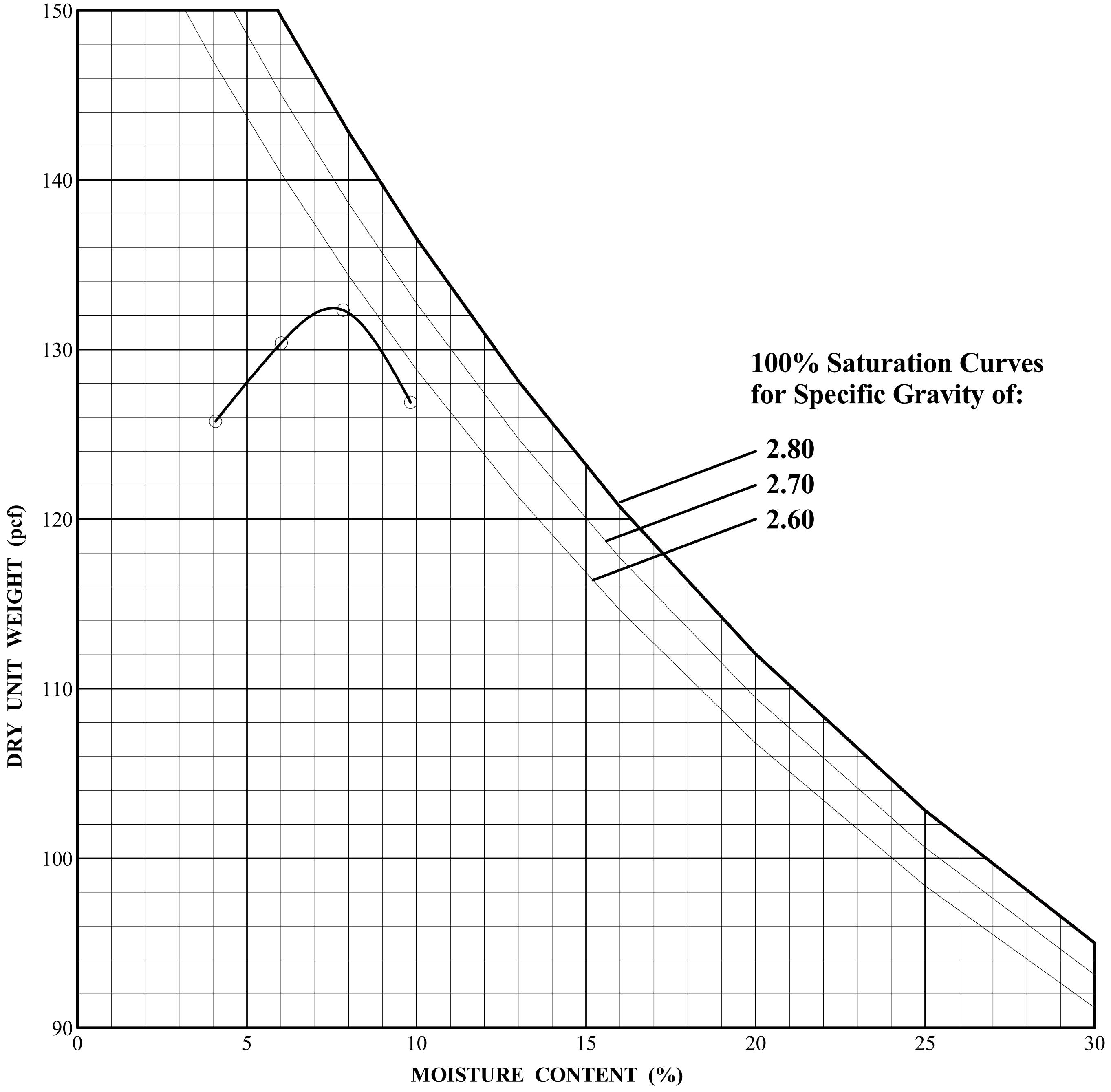
Laboratory Test Method: ASTM D 1557, Method A

Prepared/Date: JF 12/3/2015
Checked/Date: LT 12/3/2015

University of California, Riverside
Proposed Multidisciplinary Research Building 1
Riverside, California

amec foster wheeler

COMPACTION TEST RESULTS
Project No.: 4953-15-1021
Figure: A-6.2



SYMBOL	BORING	DEPTH (ft)	CLASSIFICATION	OPTIMUM MOISTURE CONTENT (%)	MAXIMUM DRY UNIT WEIGHT (pcf)
○	18	3-8	SILTY SAND (SM)	8	132

Laboratory Test Method: ASTM D 1557, Method A

Prepared/Date: JF 12/3/2015
Checked/Date: LT 12/3/2015

University of California, Riverside
Proposed Multidisciplinary Research Building 1
Riverside, California

amec foster wheeler

COMPACTION TEST RESULTS
Project No.: 4953-15-1021
Figure: A-6.3

- ANALYSIS
- DESIGN

LaBelle • Marvin

PROFESSIONAL PAVEMENT ENGINEERING
A CALIFORNIA CORPORATION

- SOILS, ASPHALT TECHNOLOGY

November 30, 2015

Mr. Alek Harounian
AMEC Foster Wheeler
6001 Rickenbacker Road
Los Angeles, California 90040-1554

Project No. 40809

Dear Mr. Harounian:

Testing of the bulk soil samples delivered to our laboratory on 11/19/2015 has been completed.

Reference: ***4953-15-1021 APO No. C012207400***
Project: ***UC Riverside Proposed Multidisciplinary Bldg. 1***
Samples: ***B-4 @ 3'-8'***
B-7@ 0'-5'
B-16@ 0'-5'
B-20@ 0'-5'

R-Value data sheets are attached for your use and file. Any untested portion of the sample will be retained for a period of 60 days prior to disposal. The opportunity to be of service is sincerely appreciated and should you have any questions, kindly call.

Very truly yours,

STEVEN R. MARVIN
NO. 30659

Steven R. Marvin
RCE 30659

SRM:tw
Enclosure

R - VALUE DATA SHEET

P.N. 4953-15-1021
Research Bldg. 1

PROJECT NUMBER 40809

BORING NUMBER: B-4 @ 3'-8'

SAMPLE DESCRIPTION: Brown Silty Sand

Item	SPECIMEN		
	a	b	c
Mold Number	1	2	3
Water added, grams	84	64	58
Initial Test Water, %	10.0	8.3	7.8
Compact Gage Pressure,psi	60	165	240
Exudation Pressure, psi	215	380	752
Height Sample, Inches	2.60	2.60	2.55
Gross Weight Mold, grams	3128	3159	3143
Tare Weight Mold, grams	1965	1969	1977
Sample Wet Weight, grams	1163	1190	1166
Expansion, Inches x 10exp-4	3	19	39
Stability 2,000 lbs (160psi)	31 / 67	19 / 40	17 / 31
Turns Displacement	5.57	4.90	4.74
R-Value Uncorrected	38	60	69
R-Value Corrected	41	63	69
Dry Density, pcf	123.2	128.0	128.5
	DESIGN CALCULATION DATA		
Traffic Index Assumed:	4.0	4.0	4.0
G.E. by Stability	0.60	0.38	0.32
G. E. by Expansion	0.10	0.63	1.30

Equilibrium R-Value	58 by EXUDATION	Examined & Checked: 11 /30/ 15

REMARKS:

Gf = 1.25
0.2% Retained on the
3/4" Sieve.

Steven R. Marvin, RCE 30659

The data above is based upon processing and testing samples as received from the field. Test procedures in accordance with latest revisions to Department of Transportation, State of California, Materials & Research Test Method No. 301.

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Figure A-7.2

R-VALUE GRAPHICAL PRESENTATION

PROJECT NO. 40809
P.N. 4953-15-1021

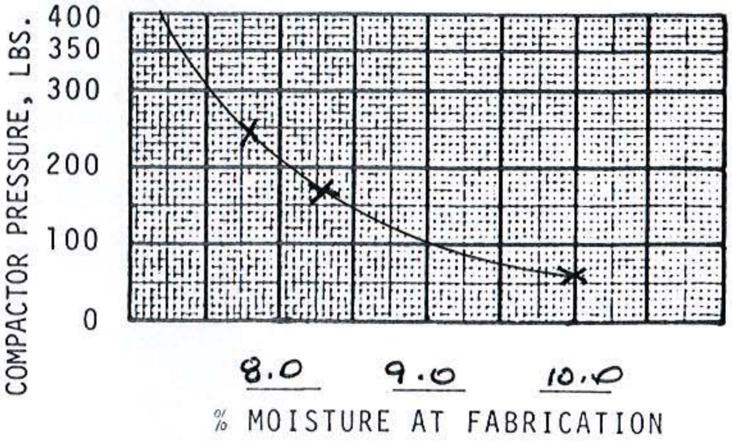
BORING NO. B-4 @ 3'-8'
Research Bldg. 1

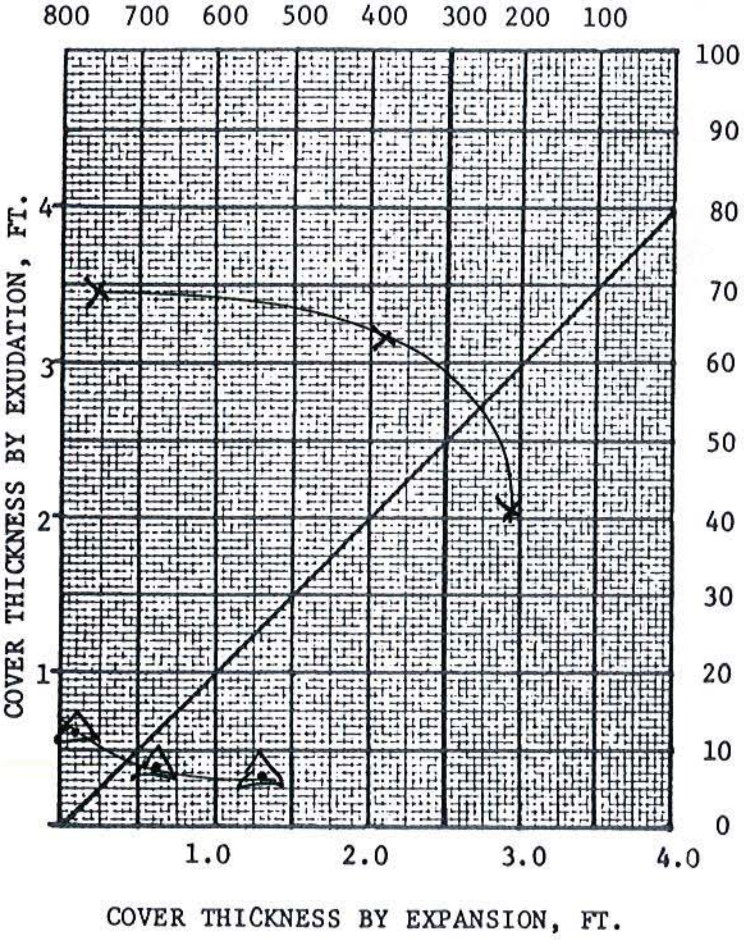
DATE 11/30/15

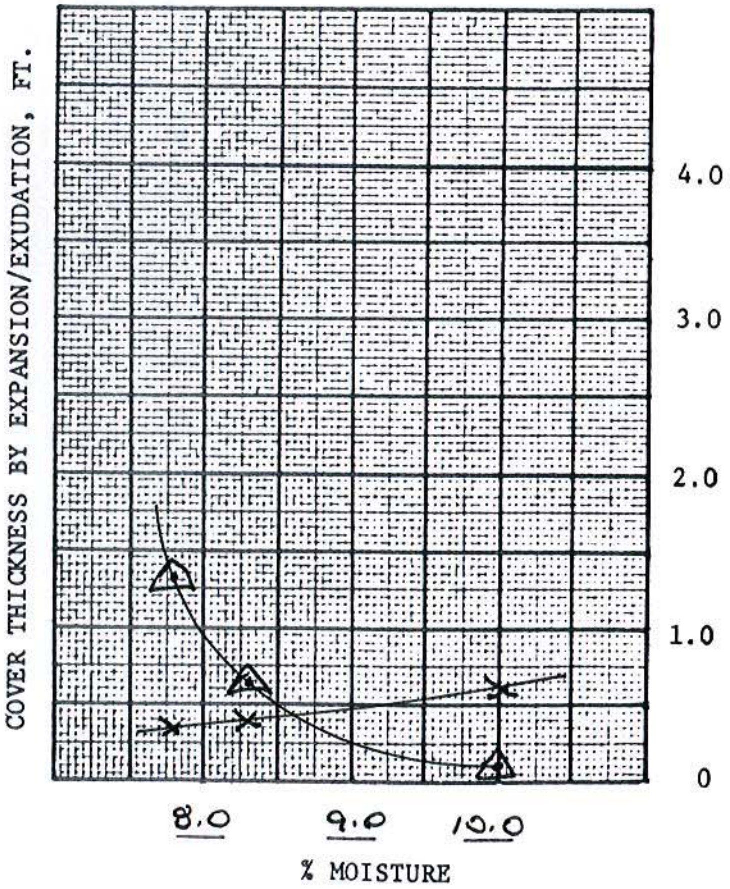
TRAFFIC INDEX Assume 4.0

R-VALUE BY EXUDATION 58

R-VALUE BY EXPANSION







—✕——✕——✕— R-VALUE vs. EXUD. PRES.

—✕——✕——✕— T by EXUDATION

—△——△——△— EXUD. T vs. EXPAN. T

—△——△——△— T by EXPANSION

REMARKS

GF=1.25

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Figure A-7.3

R - VALUE DATA SHEET

P.N. 4953-15-1021
Research Bldg. 1

PROJECT NUMBER 40809

BORING NUMBER: B-7 @ 0'-5'

SAMPLE DESCRIPTION: Brown Silty Sand

Item	SPECIMEN		
	a	b	c
Mold Number	10	11	12
Water added, grams	110	87	95
Initial Test Water, %	11.5	9.5	10.2
Compact Gage Pressure,psi	50	170	140
Exudation Pressure, psi	155	607	346
Height Sample, Inches	2.68	2.64	2.63
Gross Weight Mold, grams	3149	3163	3153
Tare Weight Mold, grams	1959	1965	1963
Sample Wet Weight, grams	1190	1198	1190
Expansion, Inches x 10exp-4	6	22	10
Stability 2,000 lbs (160psi)	25 / 57	17 / 32	19 / 39
Turns Displacement	5.92	5.20	5.38
R-Value Uncorrected	43	66	59
R-Value Corrected	48	69	63
Dry Density, pcf	120.7	125.5	124.4
DESIGN CALCULATION DATA			
Traffic Index Assumed:	4.0	4.0	4.0
G.E. by Stability	0.53	0.32	0.38
G. E. by Expansion	0.20	0.73	0.33

Equilibrium R-Value 60 by EXUDATION

Examined & Checked: 11 /30/ 15

REMARKS:
Gf = 1.25
0.0% Retained on the
3/4" Sieve.

C 30659

Steven R. Marvin, RCE 30659

The data above is based upon processing and testing samples as received from the field. Test procedures in accordance with latest revisions to Department of Transportation, State of California, Materials & Research Test Method No. 301.

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Figure A-7.4

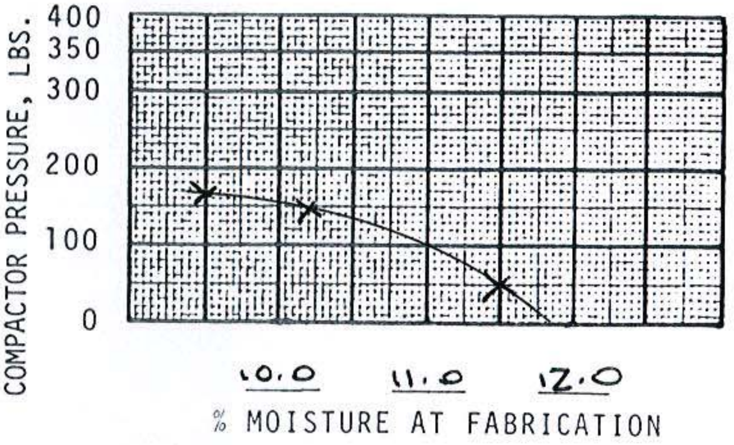
R-VALUE GRAPHICAL PRESENTATION

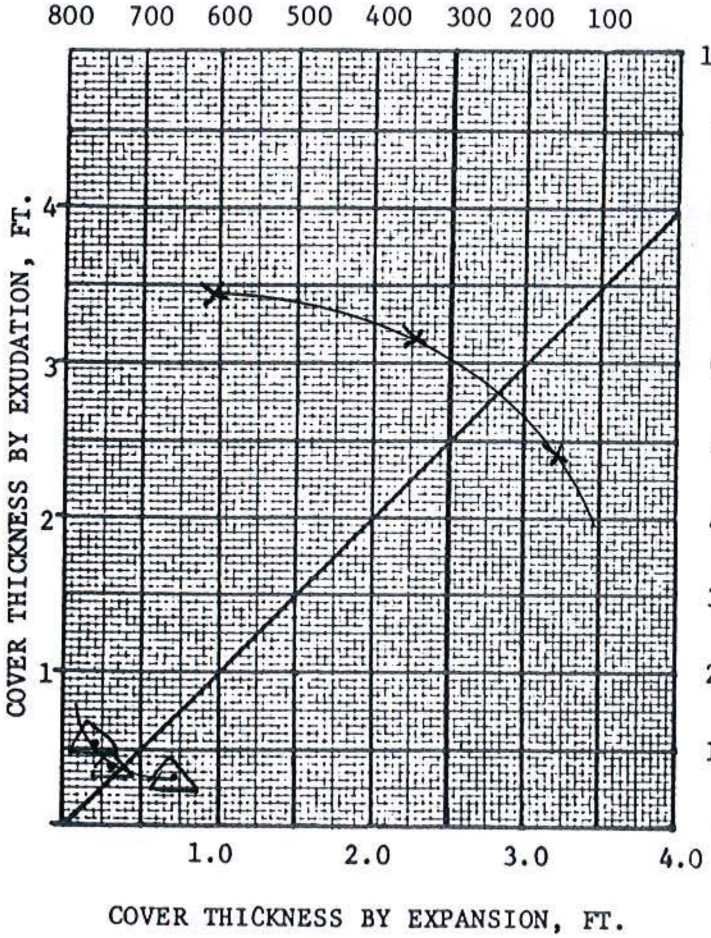
PROJECT NO. 40809
P.N. 4953-15-1021
BORING NO. B-7 @ 1'-5'
Research Bldg. 1
DATE 11/30/15

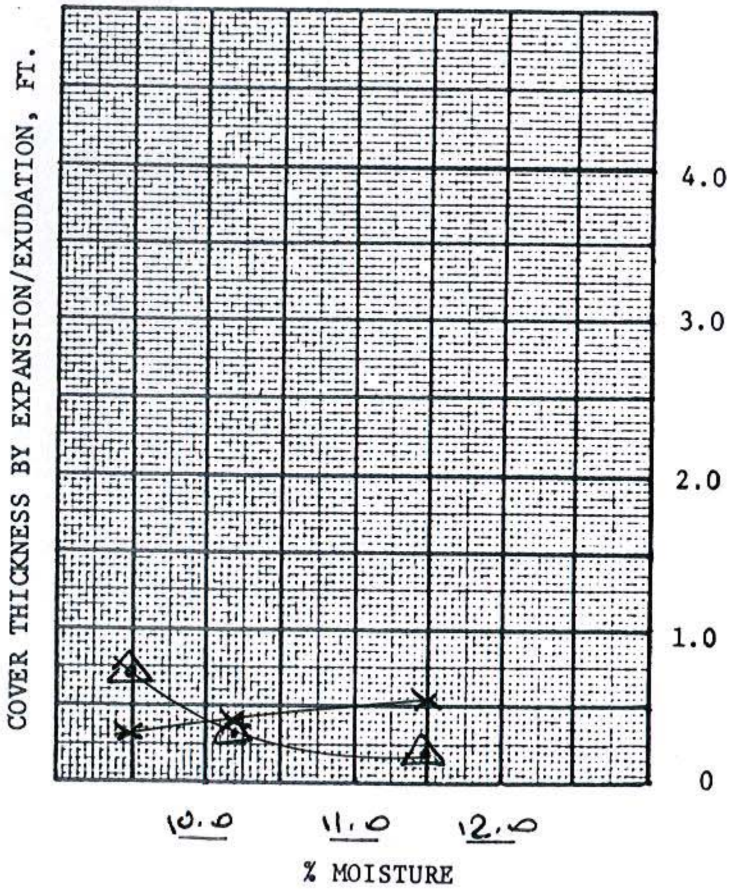
TRAFFIC INDEX Assume 4.0

R-VALUE BY EXUDATION 60

R-VALUE BY EXPANSION







× —— × —— × R-VALUE vs. EXUD. PRES.

× —— × —— × T by EXUDATION

△ —— △ —— △ EXUD. T vs. EXPAN. T

△ —— △ —— △ T by EXPANSION

REMARKS

Gf=1.25

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Figure A-7.5

R - VALUE DATA SHEET

P.N. 4953-15-1021
Research Bldg. 1

PROJECT NUMBER 40809
BORING NUMBER: B-16 @ 0'-5'

SAMPLE DESCRIPTION: Brown Silty Sand

Item	SPECIMEN		
	a	b	c
Mold Number	4	5	6
Water added, grams	72	86	65
Initial Test Water, %	9.5	10.7	8.9
Compact Gage Pressure,psi	210	120	330
Exudation Pressure, psi	324	114	445
Height Sample, Inches	2.58	2.59	2.62
Gross Weight Mold, grams	3111	3110	3138
Tare Weight Mold, grams	1977	1975	1976
Sample Wet Weight, grams	1134	1135	1162
Expansion, Inches x 10exp-4	8	4	13
Stability 2,000 lbs (160psi)	14 / 27	18 / 35	13 / 25
Turns Displacement	5.44	5.91	5.12
R-Value Uncorrected	69	60	73
R-Value Corrected	71	62	75
Dry Density, pcf	121.7	120.0	123.4
DESIGN CALCULATION DATA			
Traffic Index Assumed:	4.0	4.0	4.0
G.E. by Stability	0.30	0.39	0.26
G. E. by Expansion	0.27	0.13	0.43

Equilibrium R-Value 70 by EXUDATION

Examined & Checked: 11 /30/ 15

REMARKS:
Gf = 1.25
0.0% Retained on the
3/4" Sieve.

C 30659

Steven R. Marvin, RCE 30659

The data above is based upon processing and testing samples as received from the field. Test procedures in accordance with latest revisions to Department of Transportation, State of California, Materials & Research Test Method No. 301.

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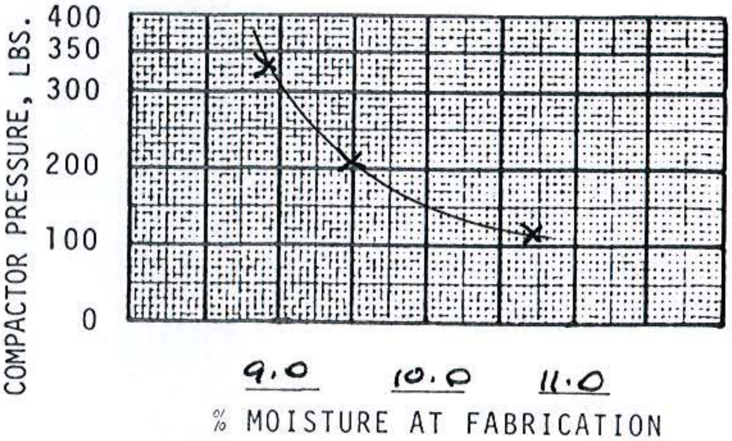
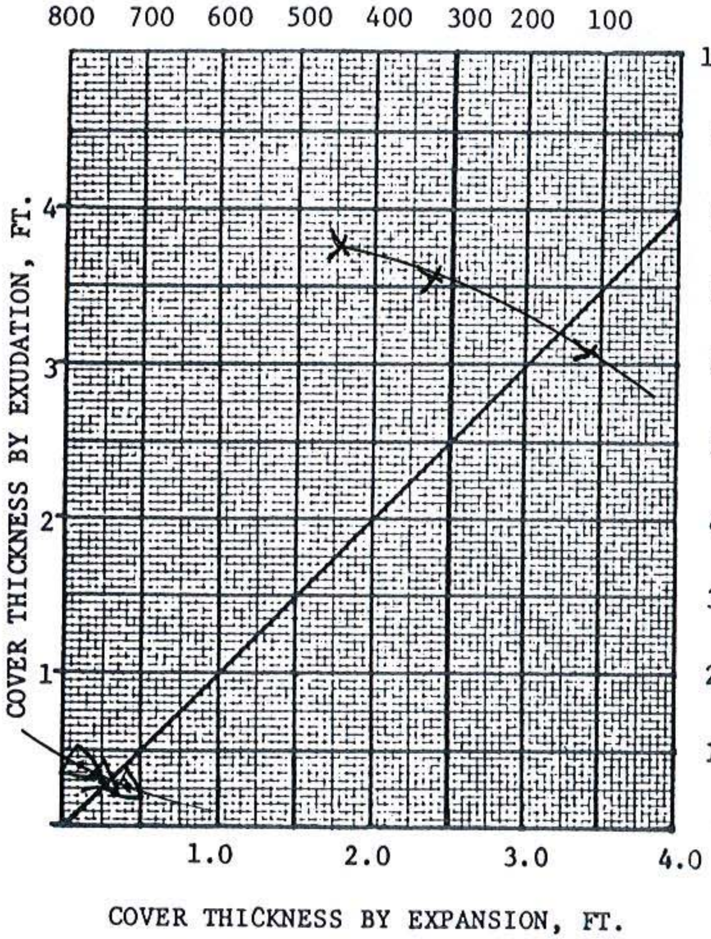
Figure A-7.6

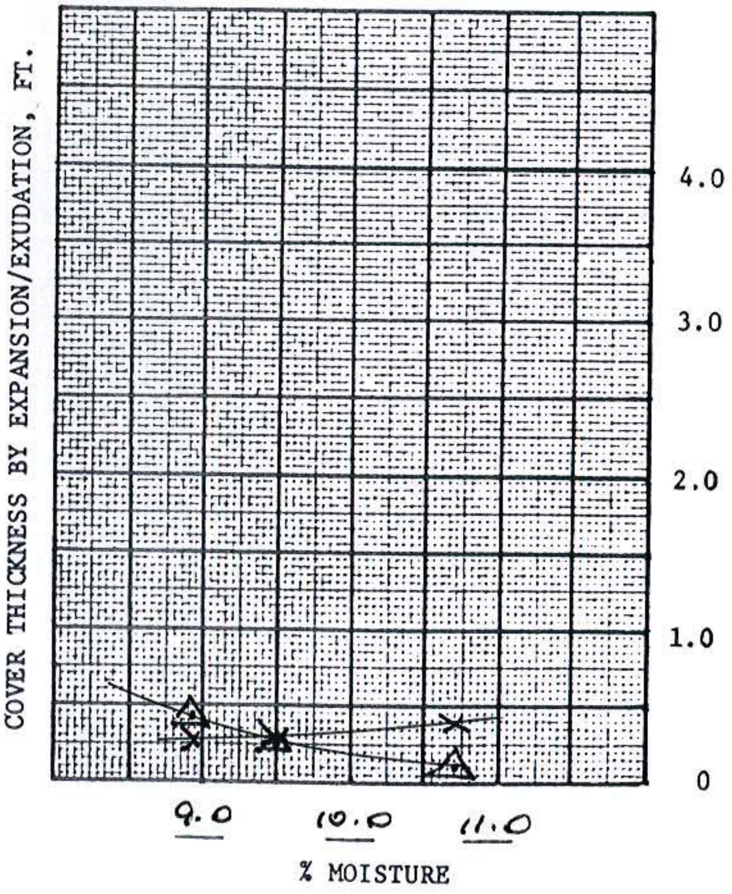
R-VALUE GRAPHICAL PRESENTATION

PROJECT NO. 40809 P.N. 4953-15-1021
BORING NO. B-16 @ 0'-5' Research Bldg. 1
DATE 11/30/15

TRAFFIC INDEX Assume 4.0
R-VALUE BY EXUDATION 70
R-VALUE BY EXPANSION







R-VALUE vs. EXUD. PRES.

T by EXUDATION

EXUD. T vs. EXPAN. T

T by EXPANSION

REMARKS

Gf=1.25

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Figure A-7.7

R - VALUE DATA SHEET

P.N. 4953-15-1021
Research Bldg. 1

PROJECT NUMBER 40809 BORING NUMBER: B-20 @ 0'-5'

SAMPLE DESCRIPTION: Brown Silty Sand

Item	SPECIMEN		
	a	b	c
Mold Number	1	2	3
Water added, grams	62	42	50
Initial Test Water, %	10.7	8.9	9.6
Compact Gage Pressure,psi	70	170	130
Exudation Pressure, psi	155	513	267
Height Sample, Inches	2.70	2.63	2.63
Gross Weight Mold, grams	3166	3165	3150
Tare Weight Mold, grams	1965	1969	1977
Sample Wet Weight, grams	1201	1196	1173
Expansion, Inches x 10exp-4	5	15	14
Stability 2,000 lbs (160psi)	25 / 50	16 / 32	18 / 36
Turns Displacement	5.62	5.00	5.27
R-Value Uncorrected	49	67	62
R-Value Corrected	54	70	65
Dry Density, pcf	121.7	126.5	123.2
	DESIGN CALCULATION DATA		
Traffic Index Assumed:	4.0	4.0	4.0
G.E. by Stability	0.47	0.31	0.36
G. E. by Expansion	0.17	0.50	0.47

Equilibrium R-Value	63 by EXPANSION	Examined & Checked: 11 /30/ 15

REMARKS:
Gf = 1.25
0.0% Retained on the
3/4" Sieve.

C 30659

Steven R. Marvin, RCE 30659

The data above is based upon processing and testing samples as received from the field. Test procedures in accordance with latest revisions to Department of Transportation, State of California, Materials & Research Test Method No. 301.

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Figure A-7.8

R-VALUE GRAPHICAL PRESENTATION

PROJECT NO. 40809
P.N. 4953-15-1021

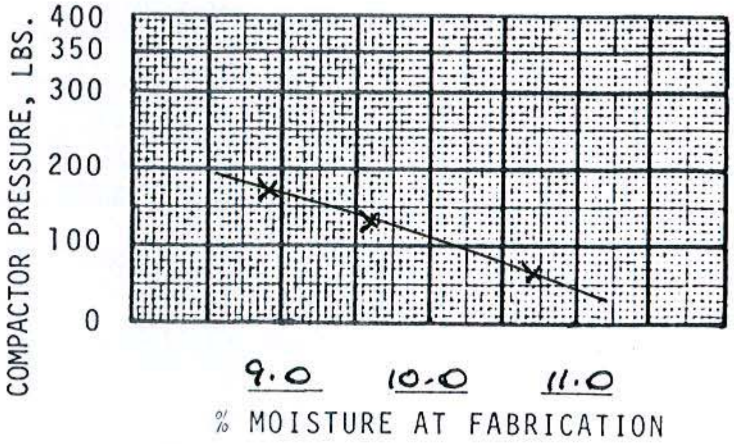
BORING NO. B-20 @ 0'-5'
Research Bldg. 1

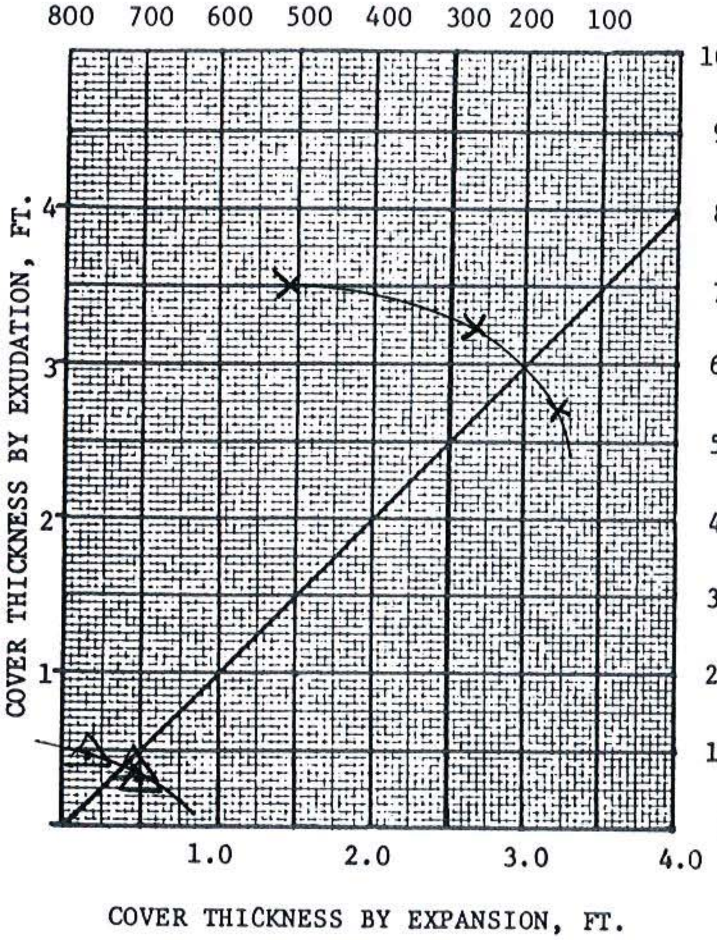
DATE 11/30/15

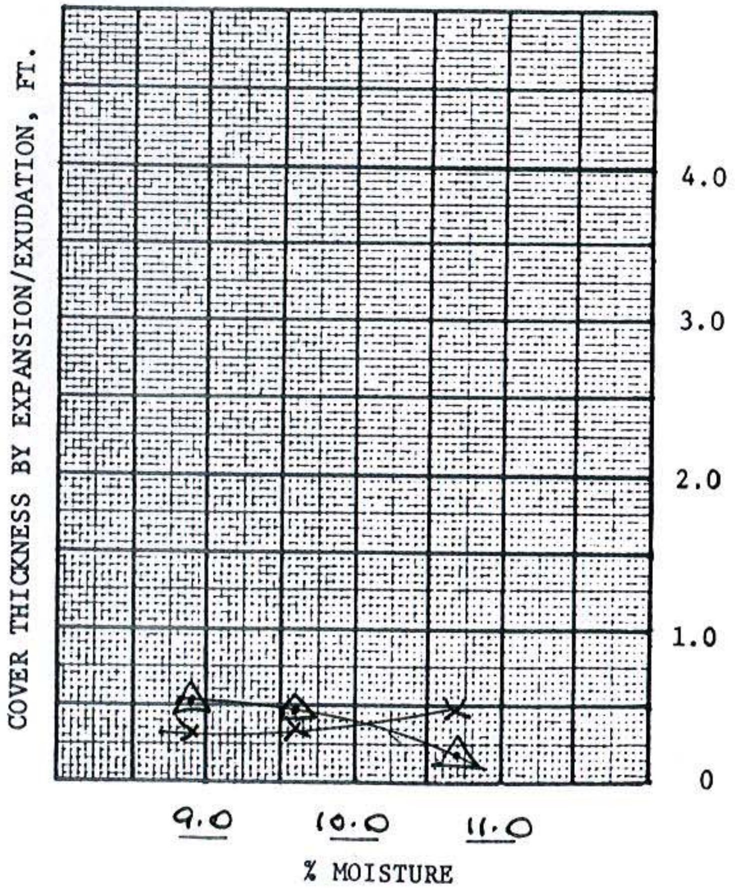
TRAFFIC INDEX Assume 4.0

R-VALUE BY EXUDATION 66

R-VALUE BY EXPANSION 63







× × × R-VALUE vs. EXUD. PRES.

× × × T by EXUDATION

△ △ △ EXUD. T vs. EXPAN. T

△ △ △ T by EXPANSION

REMARKS

GF=1.25

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Figure A-7.9

Amec Foster Wheeler
Environment & Infrastructure, Inc.
6001 Rickenbacker Road
Los Angeles, CA 90040

AMEC-P15-1101-Rev02

Attn: Alek Harounian
Senior Engineer

RE: UC Riverside – Proposed Multidisciplinary
Research Building 1, Soil Chemical Analysis

INTRODUCTION

Universal Corrosion Services, LLC (Ucorr) has completed the UC Riverside – Proposed Multidisciplinary Research Building 1, Soil Chemical Analysis project for Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec) in accordance with Amec's Work Order No. C012207398. Ucorr received five soil samples provided by Amec on November 20, 2015. Figure 1 displays the five samples as-received.

Figure 1 - Soil Samples As-Received

The soil samples were immediately transported to A&R Laboratories (A&R), a third-party laboratory for chemical analysis upon receipt. Table 1 outlines which borings the samples were received from, the sample depths, and the soil classification of each sample.

Table 1 - Soil Sample Locations, Depths, and Classifications

Boring ID	Sample Depth (feet)	Soil Classification	Soil Type
B-1	5.5	SM	Silty sand
B-10	5.5	SM	Silty sand
B-16	15.5	SP	Poorly graded sand
B-18	5.5	SM	Silty sand
B-19	11.5	SM	Silty sand

Chemical analysis and resistivity testing was completed on each of the samples to develop recommendations for buried utility piping and concrete structures at the project site.

This project scope is limited to soil corrosivity analysis and general corrosion control measures for materials possibly being employed in the design. Ucorr's recommendations are established from a corrosion standpoint and shall not be used in place of any other phases of the design or construction.

TEST PROCEDURES

Table 2 summarizes the chemical testing performed by A&R on each of the provided samples. Detailed chemical analysis test results are enclosed within this report.

Table 2 - Chemical Tests Performed by A&R Laboratories

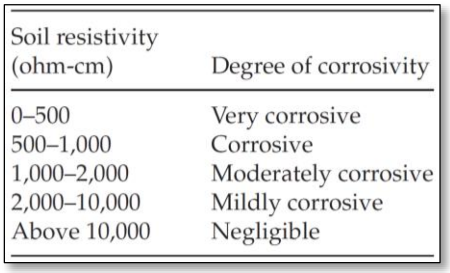
Chemical Test	Test Method
pH	EPA 9045C
Alkalinity, Carbonate/Bicarbonate	SM 2320B – modified
Chloride, Fluoride, Nitrate, Sulfate	EPA 300.0
Oxidation Redox Potential (ORP)	RE 300
Sulfide, Total	SM 4500S2 D
Nitrogen, Ammonium	SM 4500NH3-B,C
Phosphate	EPA 300.0
Metals Acid Digestions	EPA 3050B
Calcium, Magnesium, Potassium, Sodium	EPA 6010B

Ucorr performed the as-received and saturated resistivity testing on November 25, 2015 after completion of all chemical testing. The resistivity testing was performed utilizing a soil box per ASTM G57 as-received and after being saturated with distilled water. Detailed soil resistivity testing results are enclosed within this report.

DISCUSSION

Soil resistivity is a key component in determining the type of protective measures to be taken with regards to corrosion of buried metallic structures. Resistivity is an electrical characteristic of an electrolyte affecting the ability of corrosion currents to flow through that electrolyte. Table 3 describes the relationship between soil resistivity and the degree of corrosivity of that particular soil.[1]

Table 3 - Soil Resistivity vs. Degree of Corrosivity



Soil resistivity (ohm-cm)	Degree of corrosivity
0–500	Very corrosive
500–1,000	Corrosive
1,000–2,000	Moderately corrosive
2,000–10,000	Mildly corrosive
Above 10,000	Negligible

Soil resistivity varies widely by region due to seasonal changes in the soil's electrolyte content and temperature. Therefore, two major factors affecting resistivity in soils is moisture content and temperature. Figure 2 illustrates the relationship between moisture and electrical resistivity as well as temperature and electrical resistivity.[2]

---

[1] *Peabody, A.W. Peabody's Control of Pipeline Corrosion, Second Edition.*

[2] *Motorola. Standards and Guidelines for Communication Sites, Appendix B.*

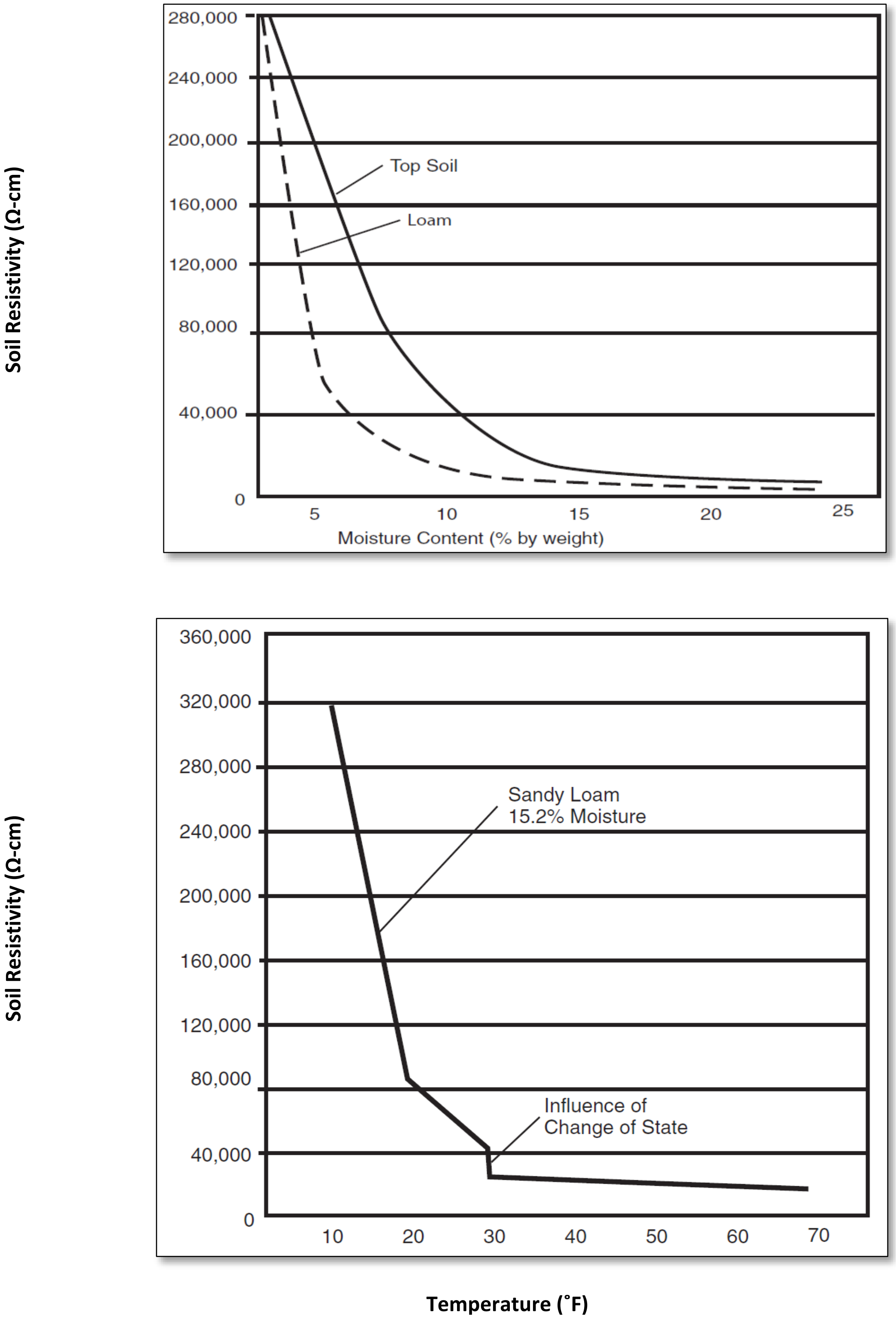
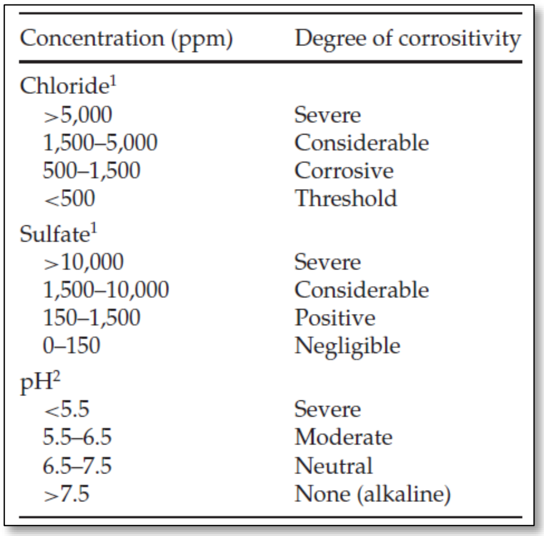


Figure 2 - Soil Resistivity Changes as a Result of Soil Moisture (top) and Soil Temperature (bottom)

Galvanic corrosion cells can form on any buried structures spanning through regions of greatly varied soil resistivities. Buried metallic structures in lower resistivity environments tend to have a more active corrosion potential versus structures in higher resistivity environments.

Chlorides, sulfates, and pH (acidity) are also major constituents that accelerate corrosion. Table 4 describes the corrosivity effects of chlorides, sulfates, and pH on buried steel structures.[1]

Table 4 - The Effects of Chlorides, Sulfates, and pH on Corrosion of Buried Steel Pipelines



Concentration (ppm)	Degree of corrosivity
Chloride[1]	
>5,000	Severe
1,500–5,000	Considerable
500–1,500	Corrosive
<500	Threshold
Sulfate[1]	
>10,000	Severe
1,500–10,000	Considerable
150–1,500	Positive
0–150	Negligible
pH[2]	
<5.5	Severe
5.5–6.5	Moderate
6.5–7.5	Neutral
>7.5	None (alkaline)

Chloride ions can break down protective surface (passive) deposits on buried metallic structures, causing corrosion and corrosion pitting. Chlorides can also diffuse into reinforced concrete structures and come into contact with the steel reinforcement. When chloride ions come in contact with reinforcing steel, the chlorides will break down the protective passive layer and aggressively corrode the rebar. The corrosion products from this corrosion activity are larger in volume than the reinforcing steel in its protected state causing the concrete structures to crack around the corrosion reactions. This cracking creates less-resistant pathways for chloride diffusion leading increased corrosion activity once cracking has initiated.

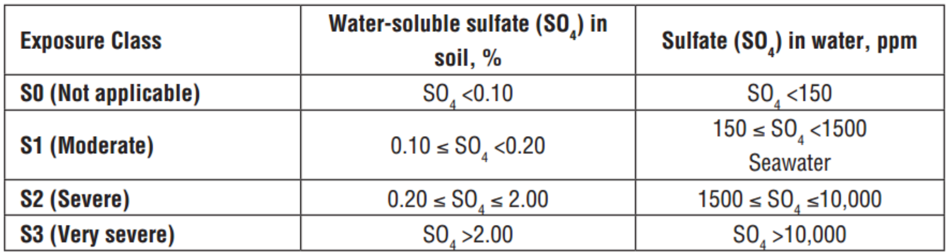
When the pH of an environment is acidic, the greater the corrosivity of the environment is on buried metallic structures. When the pH of a soil approaches a neutral state, the soil becomes more alkaline and the soil becomes less corrosive. Current requirements for cathodic protection systems increase in acidic soils as acids tend to act as depolarizing agents.

Not only are sulfate ions corrosive to buried metallic structures in high concentrations, they also are detrimental to concrete admixtures. Table 5 summarizes the types of sulfate exposure categories and the concrete requirements associated with those sulfate exposure levels as defined by the American Concrete Institute.[3]

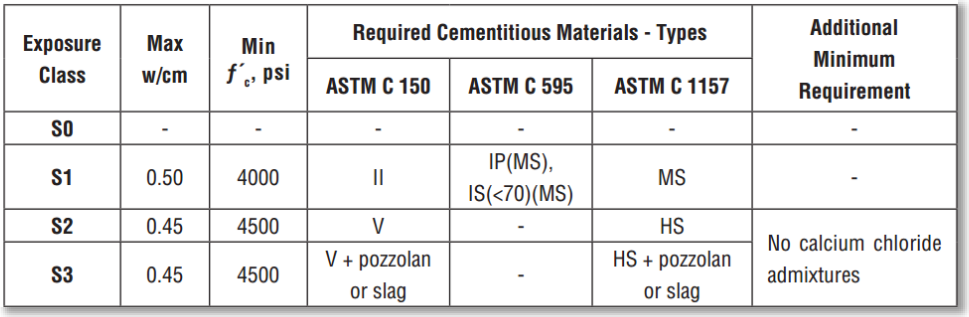
---

[3] *American Concrete Institute. Building Code Requirements for Structural Concrete.*

Table 5 - Sulfate Exposure Classes (top) and Requirements for Concrete in Contact with Water-Soluble Sulfate (bottom)



Exposure Class	Water-soluble sulfate (SO_4) in soil, %	Sulfate (SO_4) in water, ppm
S0 (Not applicable)	$SO_4 < 0.10$	$SO_4 < 150$
S1 (Moderate)	$0.10 \leq SO_4 < 0.20$	$150 \leq SO_4 < 1500$ Seawater
S2 (Severe)	$0.20 \leq SO_4 \leq 2.00$	$1500 \leq SO_4 \leq 10{,}000$
S3 (Very severe)	$SO_4 > 2.00$	$SO_4 > 10{,}000$



Exposure Class	Max w/cm	Min f'_c, psi	Required Cementitious Materials - Types			Additional Minimum Requirement
			ASTM C 150	ASTM C 595	ASTM C 1157	
S0	-	-	-	-	-	-
S1	0.50	4000	II	IP(MS), IS(<70)(MS)	MS	-
S2	0.45	4500	V	-	HS	No calcium chloride admixtures
S3	0.45	4500	V + pozzolan or slag	-	HS + pozzolan or slag	

In large enough concentrations, ammonium ions promote stress-corrosion cracking of copper and its alloys.

The presence of any nitrate ions can initiate corrosion activity on the surface of copper structures. Additionally, in large concentrations, nitrate ions can cause corrosion activity on select grades of stainless steel.

Phosphate and nitrate ions act as oxidizing agents and are used in industry as oxidizing corrosion inhibitors. These ions do not directly affect corrosivity in soils other than increasing the conductivity.

The presence of ionic soluble salts in humid environments, (refer to Figure 2) such as calcium, magnesium, potassium, and sodium lower the resistivity of the environment by increasing the conductivity of the environment.

When oxygen is consumed in the presence of microbiologically induced corrosion (MIC), the redox potential in the soil decreases causing any present nitrates, ferric ions, and sulfates to be reduced. The following equation represents the sulfate-reducing process in the presence of sulfate reducing bacteria (SRB) known as the cathodic depolarization phenomenon:[4]

$$8H + SO_4^{2-} \Rightarrow S^2 + 4H_20$$

SRB reduces/removes hydrogen from metallic surfaces and produces anodic sites where corrosion activity may occur. Positive redox potentials are indicative of oxidizing conditions in which SRB is inactive. Negative redox potentials are indicative of anaerobic conditions in which SRB is active.

---

[4] *Javaherdashti, Reza. Microbiologically Influenced Corrosion – An Engineering Insight.*

In high concentrations, bicarbonates tend to lower the resistivity of the electrolyte, but are not typically detrimental to the buried metal structures. Carbonates and bicarbonates can also passivate the surface of zinc cathodic protection anodes and carbon steel alloys in water and soil environments depending on the ion concentrations, temperature, and pH. Carbonate and bicarbonate can cause stress corrosion cracking on metallic structures as well in alkaline pH environments ranging between 9 and 13.

Fluoride has no direct effect on corrosion, but can increase the conductivity. Recent studies show that fluoride can have adverse corrosion effects on titanium alloys.

TEST RESULTS

The soil resistivities of the samples range from 5,172 Ω-cm to 72,670 Ω-cm for as-received and from 3,778 Ω-cm to 66,328 Ω-cm for saturated. The shallow samples (5.5-foot depths) from borings B-1, B-10, and B-18 are classified as having a negligible degree of corrosivity, whereas the deeper samples (15.5-foot and 11.5-foot depths) from borings B-16 and B-19 are classified as having a mildly corrosive degree of corrosivity per Table 3. Galvanic corrosion can occur on any buried structures spanning within these regions of greatly varied soil resistivities as mentioned in the Discussion section of this report.

Chloride ion concentrations in the samples range between 22 and 76 ppm and fall below the corrosive threshold as seen in Table 4.

Sulfate ion concentrations in the samples range between 19 and 310 ppm. The sulfate content in the sample from boring B-19 is in the positive range for corrosivity effects on metallic structures, whereas the remaining samples were in the negligible range per Table 4. Additionally, the sulfate concentrations fell into the “S0 (Not applicable)” exposure class with respect to concrete requirements from Table 5 as the concentration was less than 0.10% or 1000 ppm.

The pH levels in the samples ranged between 7.10 and 8.33. The samples are classified as being either neutral or alkaline and have no adverse corrosivity effects on buried metallic structures as seen in Table 3.

The ammonium concentrations in all samples was negligible (<5.0 ppm) and are not considered aggressive to copper.

Nitrate concentrations in the samples ranged from negligible (<2.2 ppm) to 7.9 ppm. These concentrations could be aggressive to copper, but is not high enough to utilize additional protective measures.

The negligible sulfide concentrations, (<2.5 ppm) in concurrence with the positive redox potentials, indicate that anaerobic SRB is not active in this environment.

The carbonate concentrations in each of the samples was negligible (<20 ppm) and the bicarbonate concentrations ranged from 31 ppm to 63 ppm. Considering the low concentrations and near neutral pH, carbonate and bicarbonate ions should have no considerable corrosion effects on buried structures.

RECOMMENDATIONS

Ucorr recommends the following corrosion control measures based on the soil chemical analysis and resistivity testing results:

STEEL PIPELINES/PIPING & STRUCTURES

Design and install a cathodic protection/monitoring system for all buried steel utility pipelines/structures and steel piling systems per NACE SP0169-2013.

1. Buried steel piping is electrically continuous due to its installation methods. Care should be taken to install, as-required, isolation flanges for CP needs and for above ground facilities.
2. The following standards will apply for coatings system designs:
    a. Polyurethane per AWWA C222
    b. Polyolefin per AWWA C215
    c. Tape coating system per AWWA C214
    d. Hot applied coal tar enamel per AWWA C203
    e. Fusion bonded epoxy per AWWA C213
    f. Mortar coating per AWWA C205 (see Note 4)
3. Design a proper cathodic protection/monitoring system per the following general design recommendations:
    a. Install corrosion monitoring test stations to facilitate corrosion monitoring and the application of cathodic protection:
        i. Ends of the pipelines
        ii. Ends of casings (for pipelines inside of casings, both the casing/carrier pipe shall be monitored concurrently using 4-wire test stations)
        iii. Isolated valves, fittings, and flanges/joints (for isolation flanges, both sides of the isolation device shall be monitored concurrently using a 4-wire test station)
        iv. Foreign pipeline/structure crossings
        v. Water crossings
        vi. Other locations as necessary so test station spacing does not exceed 1,500 feet

Notes:

1. *Oil, gas, and high-pressure steel piping systems have special corrosion and cathodic protection requirements that must be evaluated for each specific application according to applied CFR regulations.*
2. *To prevent dissimilar metal corrosion cells and to facilitate the application of cathodic protection, electrically isolate each buried steel pipeline per NACE SP0286-2007 from:*
    a. Dissimilar metals
    b. Dissimilarly coated pipelines
    c. All existing pipelines
3. *When designing cathodic protection systems, certain coatings are not compatible with cathodic protection. The cathodic protection may not be efficient enough if these coatings are selected.*

Special care shall be taken when selecting the type of coating to be used. Cathodic protection systems will be most effective when designed in conjunction with the protective coatings systems.

4. *Due to the nature of cement-mortar coatings (auto passivation), if a cement-mortar coating system is applied, a monitoring system shall be installed and monitored at regular intervals to determine if/when a cathodic protection system is required.*

IRON PIPELINES/PIPING

Design and install a cathodic protection/monitoring system for all buried iron utility pipelines/structures and steel piling systems per NACE SP0169-2013.

1. Buried iron piping shall be designed to be electrically continuous using jumper bonds and/or bond clips. Care should be taken to install, as-required, isolation flanges for CP needs and for above ground facilities.
2. The following standards will apply for coatings system designs:
    a. Polyethylene encasement per AWWA C105-10
    b. Wax tape coatings
    c. Mortar coatings (see Note 3)
    d. Coal tar epoxy/coal tar enamel coatings
3. Design a proper cathodic protection/monitoring system per the following general design recommendations:
    a. Install corrosion monitoring test stations to facilitate corrosion monitoring and the application of cathodic protection:
        i. Ends of the pipelines
        ii. Ends of casings (for pipelines inside of casings, both the casing/carrier pipe shall be monitored concurrently using 4-wire test stations)
        iii. Isolated valves, fittings, and flanges/joints (for isolation flanges, both sides of the isolation device shall be monitored concurrently using a 4-wire test station)
        iv. Foreign pipeline/structure crossings
        v. Water crossings
        vi. Other locations as necessary so test station spacing does not exceed 1,500 feet

Notes:

1. *To prevent dissimilar metal corrosion cells and to facilitate the application of cathodic protection, electrically isolate each buried steel pipeline per NACE SP0286-2007 from:*
    a. Dissimilar metals
    b. Dissimilarly coated pipelines
    c. All existing pipelines
2. *When designing cathodic protection systems, certain coatings are not compatible with cathodic protection. The cathodic protection may not be efficient enough if these coatings are selected. Special care shall be taken when selecting the type of coating to be used. Cathodic protection systems will be most effective when designed in conjunction with the protective coatings systems.*

3. *Due to the nature of cement-mortar coatings (auto passivation), if a cement-mortar coating system is applied, a monitoring system shall be installed and monitored at regular intervals to determine if/when a cathodic protection system is required.*

COPPER PIPING

1. Hot water copper piping shall be protect by one of the following measures due to the possibility of accelerated corrosion rates associated with higher temperatures as described in the Discussion section of this report:
    a. Apply cathodic protection per NACE SP0169-2013. The cathodic protection current requirement can be reduced by also applying protective coatings/linings.
    b. Preventing soil contact by placing the copper piping above ground or encasing the piping with PVC pipe with solvent-welded joints.
2. Consider encasing any cold water copper piping in an 8-mil polyethylene sleeve or encasing cold water copper piping in two 4-mil thick polyethylene sleeves and surround with at least two inches of clean sand backfill.

    Note: The protective measures for hot water copper piping can be used for cold water copper piping as well.

NONMETALLIC PIPELINES/PIPING

1. No special precautions are required for buried nonmetallic pipelines/piping.
2. Cathodic protection and monitoring systems shall be designed for all metallic valves and fittings.
3. Protect all metallic fittings and valves with epoxy or wax tape per AWWA C217.

ELEVATOR ENCLOSURES

1. If elevator enclosures are designed as steel cylinders, all steel pipeline & structure recommendations will apply for the portion in contact with soils. It is recommended to electrically isolate the steel elevator enclosure from other metallic members of the building.
2. If elevator enclosures are constructed with reinforced concrete, no additional protective measures are recommended.

CONCRETE STRUCTURES

1. Due to the negligible chloride concentrations, standard concrete cover over reinforcing steel members shall be used for concrete structures and piping in contact with the site soils.
2. Due to the negligible sulfate concentrations at the site, any type of cement may be used for concrete structures and piping.
3. Cyclical wetting and drying of buried structures may be an issue if high groundwater is encountered at the project site. Contact between concrete structures and ground water shall be prevented by an impermeable waterproofing system.

CLOSURE

Please do not hesitate to call with any questions or comments regarding this report.

Respectfully Submitted,
Universal Corrosion Services, LLC

Ian Budner, E.I.T.
Manager - Operations

Omidreza Moghbeli, P.Eng.
Principal Engineer

Enclosed:

- Ucorr Soil Resistivity Data
- A&R Laboratories Soil Chemical Data

SOIL RESISTIVITY DATA

Sample #	Boring ID	Soil Classification	Sample Depth (ft)	Resistivity (Ω-cm)	
				As-Received	Saturated
1	B-1	SM	5.5	71,851	63,858
2	B-10	SM	5.5	72,670	66,328
3	B-16	SP	15.5	8,871	6,857
4	B-18	SM	5.5	30,355	24,336
5	B-19	SM	11.5	5,172	3,778

Testing Date: November 25, 2015

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FDA#	2030513
LA City#	10261
ELAP#'s	2789 2790 2122

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FOOD · COSMETICS · WATER · SOIL · SOIL VAPOR · WASTES

CASE NARRATIVE

Authorized Signature Name / Title (print)	Ken Zheng, President
Signature / Date	Ken Zheng Ken Zheng, President 12/01/2015 14:53:00
Laboratory Job No. (Certificate of Analysis No.)	1511-00165
Project Name / No.	AMEC-P15-1101 / U.C. RIVERSIDE
Dates Sampled (from/to)	10/21/15 To 10/28/15
Dates Received (from/to)	11/20/15 To 11/20/15
Dates Reported (from/to)	11/25/15 To 12/1/2015
Chains of Custody Received	Yes

Comments:

This report is a re-issue. The data herein is a revised reporting of the results for these analyses and supersedes any other version issued previously.

Subcontracting

Inorganic Analyses

No analyses sub-contracted

Sample Condition(s)

All samples intact

Positive Results (Organic Compounds)

None

CERTIFICATE OF ANALYSIS

1511-00165

UNIVERSAL CORROSION SERVICES
REZA MOGHBELI
8350 ARCHIBALD AVE.
SUITE 224
RANCHO CUCAMONGA, CA 91730

Project: AMEC-P15-1101 / U.C. RIVERSIDE

Date Reported 11/25/15
Date Received 11/20/15
Invoice No. 74721
Cust # U040
Permit Number
Customer P.O.

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 001 B-1 Sample Matrix: Soil				Date & Time Sampled:			10/21/15	
pH	8.16		units	EPA 9045C	1	0	11/20/15	AR
Alkalinity, Bicarbonate	63		mg/Kg	SM 2320B - modified	1	20	11/20/15	AR
Alkalinity, Carbonate	<20		mg/Kg	SM 2320B - modified	1	20	11/20/15	AR
Chloride	22		mg/Kg	EPA 300.0	2	10	11/24/15	TLB
Fluoride	<10		mg/Kg	EPA 300.0	2	10	11/24/15	TLB
Nitrate, N	5.9		mg/Kg	EPA 300.0	2	2.2	11/24/15	TLB
Sulfate	29		mg/Kg	EPA 300.0	2	10	11/24/15	TLB
ORP	90		MV	RE 300	1	0	11/20/15	AR
Sulfide, Total	<2.5		mg/Kg	SM 4500S2 D	1	2.5	11/23/15	AR
Ammonium	<5.0		mg/Kg	SM 4500NH3-B,C	1	5.0	11/23/15	AR
Phosphate	27.1		mg/Kg	EPA 300.0	1	2.5	11/23/15	AR
[Metals]								
Metals Acid Digestion	Complete			EPA 3050B	1		11/24/15	TLB
Calcium	1190		mg/Kg	EPA 6010B	1	5.00	11/24/15	TLB
Magnesium	2790		mg/Kg	EPA 6010B	1	10.0	11/24/15	TLB
Potassium	3650		mg/Kg	EPA 6010B	1	10.0	11/24/15	TLB
Sodium	399		mg/Kg	EPA 6010B	1	10.0	11/24/15	TLB
Sample: 002 B-10 Sample Matrix: Soil				Date & Time Sampled:			10/23/15	
pH	8.33		units	EPA 9045C	1	0	11/20/15	AR
Alkalinity, Bicarbonate	31		mg/Kg	SM 2320B - modified	1	20	11/20/15	AR
Alkalinity, Carbonate	<20		mg/Kg	SM 2320B - modified	1	20	11/20/15	AR
Chloride	46		mg/Kg	EPA 300.0	2	10	11/24/15	TLB
Fluoride	<10		mg/Kg	EPA 300.0	2	10	11/24/15	TLB
Nitrate, N	7.9		mg/Kg	EPA 300.0	2	2.2	11/24/15	TLB
Sulfate	29		mg/Kg	EPA 300.0	2	10	11/24/15	TLB
ORP	132		MV	RE 300	1	0	11/20/15	AR
Sulfide, Total	<2.5		mg/Kg	SM 4500S2 D	1	2.5	11/23/15	AR
Ammonium	<5.0		mg/Kg	SM 4500NH3-B,C	1	5.0	11/23/15	AR
Phosphate	11.9		mg/Kg	EPA 300.0	1	2.5	11/23/15	AR
[Metals]								

CERTIFICATE OF ANALYSIS

1511-00165

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REZA MOGHBELI
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RANCHO CUCAMONGA, CA 91730

Date Reported	11/25/15
Date Received	11/20/15
Invoice No.	74721
Cust #	U040
Permit Number	
Customer P.O.	

Project: AMEC-P15-1101 / U.C. RIVERSIDE

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 002 B-10					Date & Time Sampled:		10/23/15	
Sample Matrix: Soil								
.....continued								
Metals Acid Digestion	Complete			EPA 3050B	1		11/24/15	TLB
Calcium	1360		mg/Kg	EPA 6010B	1	5.00	11/24/15	TLB
Magnesium	1960		mg/Kg	EPA 6010B	1	10.0	11/24/15	TLB
Potassium	3260		mg/Kg	EPA 6010B	1	10.0	11/24/15	TLB
Sodium	169		mg/Kg	EPA 6010B	1	10.0	11/24/15	TLB
Sample: 003 B-16					Date & Time Sampled:		10/23/15	
Sample Matrix: Soil								
pH	7.10		units	EPA 9045C	1	0	11/20/15	AR
Alkalinity, Bicarbonate	63		mg/Kg	SM 2320B - modified	1	20	11/20/15	AR
Alkalinity, Carbonate	<20		mg/Kg	SM 2320B - modified	1	20	11/20/15	AR
Chloride	42		mg/Kg	EPA 300.0	2	10	11/24/15	TLB
Fluoride	<10		mg/Kg	EPA 300.0	2	10	11/24/15	TLB
Nitrate, N	<2.2		mg/Kg	EPA 300.0	2	2.2	11/24/15	TLB
Sulfate	19		mg/Kg	EPA 300.0	2	10	11/24/15	TLB
ORP	155		MV	RE 300	1	0	11/20/15	AR
Sulfide, Total	<2.5		mg/Kg	SM 4500S2 D	1	2.5	11/23/15	AR
Ammonium	<5.0		mg/Kg	SM 4500NH3-B,C	1	5.0	11/23/15	AR
Phosphate	11.9		mg/Kg	EPA 300.0	1	2.5	11/23/15	AR
[Metals]								
Metals Acid Digestion	Complete			EPA 3050B	1		11/24/15	TLB
Calcium	764		mg/Kg	EPA 6010B	1	5.00	11/24/15	TLB
Magnesium	1840		mg/Kg	EPA 6010B	1	10.0	11/24/15	TLB
Potassium	3030		mg/Kg	EPA 6010B	1	10.0	11/24/15	TLB
Sodium	182		mg/Kg	EPA 6010B	1	10.0	11/24/15	TLB
Sample: 004 B-18					Date & Time Sampled:		10/28/15	
Sample Matrix: Soil								
pH	7.58		units	EPA 9045C	1	0	11/20/15	AR
Alkalinity, Bicarbonate	34		mg/Kg	SM 2320B - modified	1	20	11/20/15	AR
Alkalinity, Carbonate	<20		mg/Kg	SM 2320B - modified	1	20	11/20/15	AR
Chloride	76		mg/Kg	EPA 300.0	2	10	11/24/15	TLB

Figure A-8.14

CERTIFICATE OF ANALYSIS

1511-00165

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SUITE 224
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Project: AMEC-P15-1101 / U.C. RIVERSIDE

Date Reported	11/25/15
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Permit Number	
Customer P.O.	

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 004 B-18 Sample Matrix: Soil .....continued					Date & Time Sampled:		10/28/15	
Fluoride	<10		mg/Kg	EPA 300.0	2	10	11/24/15	TLB
Nitrate, N	6.4		mg/Kg	EPA 300.0	2	2.2	11/24/15	TLB
Sulfate	140		mg/Kg	EPA 300.0	2	10	11/24/15	TLB
ORP	190		MV	RE 300	1	0	11/20/15	AR
Sulfide, Total	<2.5		mg/Kg	SM 4500S2 D	1	2.5	11/23/15	AR
Ammonium	<5.0		mg/Kg	SM 4500NH3-B,C	1	5.0	11/23/15	AR
Phosphate	11.3		mg/Kg	EPA 300.0	1	2.5	11/23/15	AR
[Metals]								
Metals Acid Digestion	Complete			EPA 3050B	1		11/24/15	TLB
Calcium	1410		mg/Kg	EPA 6010B	1	5.00	11/24/15	TLB
Magnesium	2340		mg/Kg	EPA 6010B	1	10.0	11/24/15	TLB
Potassium	3400		mg/Kg	EPA 6010B	1	10.0	11/24/15	TLB
Sodium	259		mg/Kg	EPA 6010B	1	10.0	11/24/15	TLB
Sample: 005 B-19 Sample Matrix: Soil					Date & Time Sampled:		10/27/15	
pH	7.99		units	EPA 9045C	1	0	11/20/15	AR
Alkalinity, Bicarbonate	36		mg/Kg	SM 2320B - modified	1	20	11/20/15	AR
Alkalinity, Carbonate	<20		mg/Kg	SM 2320B - modified	1	20	11/20/15	AR
Chloride	38		mg/Kg	EPA 300.0	2	10	11/24/15	TLB
Fluoride	<10		mg/Kg	EPA 300.0	2	10	11/24/15	TLB
Nitrate, N	2.5		mg/Kg	EPA 300.0	2	2.2	11/24/15	TLB
Sulfate	310		mg/Kg	EPA 300.0	2	10	11/24/15	TLB
ORP	240		MV	RE 300	1	0	11/20/15	AR
Sulfide, Total	<2.5		mg/Kg	SM 4500S2 D	1	2.5	11/23/15	AR
Ammonium	<5.0		mg/Kg	SM 4500NH3-B,C	1	5.0	11/23/15	AR
Phosphate	11.8		mg/Kg	EPA 300.0	1	2.5	11/23/15	AR
[Metals]								
Metals Acid Digestion	Complete			EPA 3050B	1		11/24/15	TLB
Calcium	2670		mg/Kg	EPA 6010B	1	5.00	11/24/15	TLB
Magnesium	3990		mg/Kg	EPA 6010B	1	10.0	11/24/15	TLB

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LA City#	10261
ELAP#'s	2789 2790 2122

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CERTIFICATE OF ANALYSIS

1511-00165

UNIVERSAL CORROSION SERVICES
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Date Reported	11/25/15
Date Received	11/20/15
Invoice No.	74721
Cust #	U040
Permit Number	
Customer P.O.	

Project: AMEC-P15-1101 / U.C. RIVERSIDE

Sample: 005 B-19
Sample Matrix: Soil
Date & Time Sampled: 10/27/15

.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Potassium	8430		mg/Kg	EPA 6010B	1	10.0	11/24/15	TLB
Sodium	361		mg/Kg	EPA 6010B	1	10.0	11/24/15	TLB

Respectfully Submitted: Ken Zheng

Ken Zheng - Lab Director

QUALIFIERS

B = Detected in the associated Method Blank at a concentration above the routine RL.
B1 = BOD dilution water is over specifications . The reported result may be biased high.
D = Surrogate recoveries are not calculated due to sample dilution.
E = Estimated value; Value exceeds calibration level of instrument.
H = Analyte was prepared and/or analyzed outside of the analytical method holding time
I = Matrix Interference.
J = Analyte concentration detected between RL and MDL.
Q = One or more quality control criteria did not meet specifications. See Comments for further explanation.
S = Customer provided specification limit exceeded.

ABBREVIATIONS

DF = Dilution Factor
RL = Reporting Limit, Adjusted by DF
MDL = Method Detection Limit, Adjusted by DF
Qual = Qualifier
Tech = Technician

As regulatory limits change frequently, A & R Laboratories advises the recipient of this report to confirm such limits with the appropriate federal, state, or local authorities before acting in reliance on the regulatory limits provided.

For any feedback concerning our services, please contact Jenny Jiang, Project Manager at 951.779.0310. You may also contact Ken Zheng, President at office@arlaboratories.com.

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FDA#	2030513
LA City#	10261
ELAP#'s	2789 2790 2122

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QUALITY CONTROL DATA REPORT

1511-00165

UNIVERSAL CORROSION SERVICES
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SUITE 224
RANCHO CUCAMONGA, CA 91730

Project: AMEC-P15-1101 / U.C. RIVERSIDE

Date Reported	**11/25/2015**
Date Received	**11/20/2015**
Date Sampled	**10/23/2015**
Invoice No.	**74721**
Customer #	**U040**
Customer P.O.	

Method # **EPA 300.0**

QC Reference # 51180 **Date Analyzed:** 11/24/2015 **Technician:** TLB

Samples 001 002 003 004 005

Results / **Control Ranges**

	LCS %REC	LCS %DUP	LCS %RPD	DUP %RPD	LCS %REC	LCS %RPD
Fluoride	87	83	4.5	0.0	80 - 120	0 - 25

QC Reference # 51181 **Date Analyzed:** 11/24/2015 **Technician:** TLB

Samples 001 002 003 004 005

Results / **Control Ranges**

	LCS %REC	LCS %DUP	LCS %RPD	DUP %RPD	LCS %REC	LCS %RPD
Chloride	104	103	0.9	0.6	80 - 120	0 - 25

QC Reference # 51182 **Date Analyzed:** 11/24/2015 **Technician:** TLB

Samples 001 002 003 004 005

Results / **Control Ranges**

	LCS %REC	LCS %DUP	LCS %RPD	DUP %RPD	LCS %REC	LCS %RPD
Nitrate, N	100	100	0.9	2.1	80 - 120	0 - 25

QC Reference # 51183 **Date Analyzed:** 11/24/2015 **Technician:** TLB

Samples 001 002 003 004 005

Results / **Control Ranges**

	LCS %REC	LCS %DUP	LCS %RPD	DUP %RPD	LCS %REC	LCS %RPD
Sulfate	102	100	2.1	0.7	80 - 120	0 - 25

Method # **EPA 6010B**

QC Reference # 51184 **Date Analyzed:** 11/24/2015 **Technician:** TLB

Samples 001 002 003 004 005

Results / **Control Ranges**

	LCS %REC	LCS %DUP	LCS %RPD	LCS %REC	LCS %RPD
Calcium	108	109	0.9	75 - 125	0 - 20
Magnesium	107	108	1.0	75 - 125	0 - 20
Potassium	92	92	0.2	75 - 125	0 - 20
Sodium	109	108	1.3	75 - 125	0 - 20

Method # **SM 4500NH3-B,C**

QC Reference # 51195 **Date Analyzed:** 11/23/2015 **Technician:** AR

Samples 001 002 003 004 005

QUALITY CONTROL DATA REPORT

1511-00165

UNIVERSAL CORROSION SERVICES
REZA MOGHBELI

Date Reported	**11/25/2015**
Date Received	**11/20/2015**
Date Sampled	**10/23/2015**

Project: AMEC-P15-1101 / U.C. RIVERSIDE

Method # **SM 4500NH3-B,C**

QC Reference # 51195 **Date Analyzed:** 11/23/2015 **Technician:** AR

Samples 001 002 003 004 005

Results	LCS %REC	LCS %DUP	LCS %RPD	DUP %RPD	SPIKE %REC	SPIKE %DUP	SPIKE %RPD	**Control Ranges** LCS %REC	LCS %RPD	SPIKE %RPD
Ammonium	115	110	5	5	112	110	2	80 - 120	0 - 20	0 - 20

No method blank results were above reporting limit

Respectfully Submitted: Ken Zheng

Ken Zheng - President

For any feedback concerning our services, please contact Jenny Jiang, Project Manager at 951.779.0310. You may also contact Ken Zheng, President at office@arlaboratories.com.

APPENDIX B

LOGS OF ENVIRONEMNTAL BORINGS AND RESULTS OF ENVIRONMENTAL TESTING

APPENDIX B
LOGS OF ENVIRONMENTAL BORINGS AND RESULTS OF ENVIRONMENTAL TESTING

FIELD EXPLORATIONS

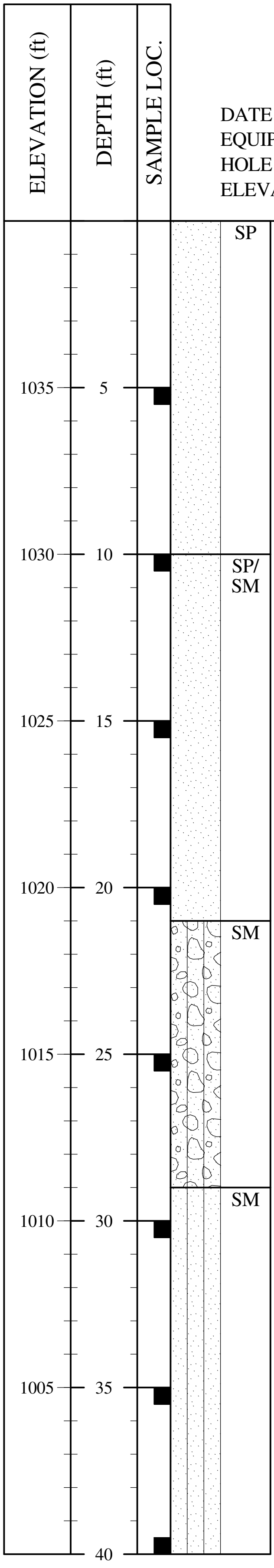
The soil conditions beneath the proposed project site were explored by drilling a total of 20 environmental borings (Borings E-1 through E-20) between October 12 and 15, 2015. The boring locations are shown on Figure 2, Plot Plan. The environmental borings were to be advanced using a direct-push rig to a depth of about 40 feet below ground surface. However, Borings E-5, E-6, and E-19 could not be advanced beyond a depth of 16, 20½, and 39 feet, respectively, due to refusal.

The soils encountered were logged by our field technician, and samples were obtained for analytical laboratory testing. The logs of the borings are presented on Figure B-1.1 through B-1.20; the depths which soil samples were collected are indicated on the left side of the boring logs. The soils are classified in accordance with the Unified Soil Classification System described on Figure A-2 in Appendix A.

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE; REFER TO PLOT PLAN FOR MORE ACCURATE LOCATION INFORMATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

BORING E-1

DATE DRILLED: October 14, 2015
EQUIPMENT USED: Direct Push
HOLE DIAMETER (in.): 2.5
ELEVATION: 1,040.0*



POORLY GRADED SAND - moist, brownish gray, fine to coarse grained

POORLY GRADED SAND to SILTY SAND - dry to moist, light gray, fine to coarse grained, some clay

SILTY SAND with GRAVEL - dry to moist, brown, fine to medium grained

SILTY SAND - moist, brown, fine to medium grained, with some silt interbeds

Notes:
Hand augered upper 7 feet to avoid damage to utilities. Boring was backfilled with bentonite chips and tamped.

** Elevations based on Topographic Survey Plan prepared by TTG, dated May 19, 2015.

END OF BORING AT 40 FEET

Field Tech: IC
Prepared By: WL
Checked By: LH

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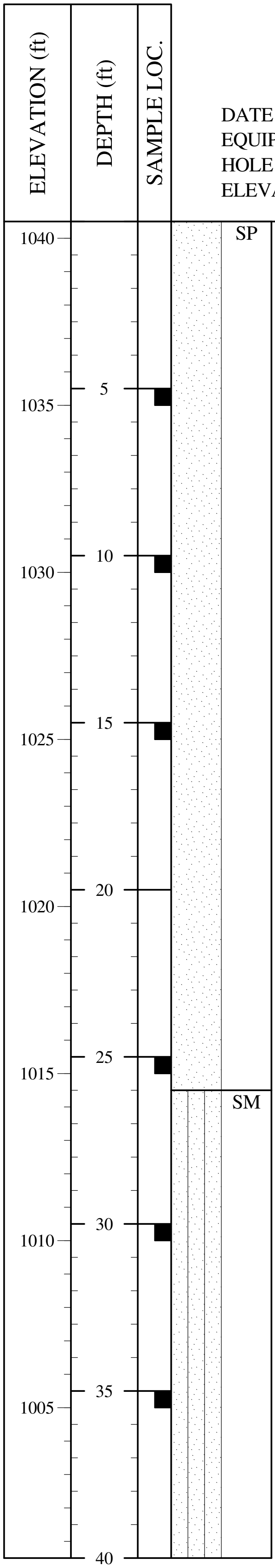
LOG OF BORING
Project: 4953-15-1021
Figure: B-1.1

BORING E-2

DATE DRILLED: October 13, 2015
EQUIPMENT USED: Direct Push
HOLE DIAMETER (in.): 2.5
ELEVATION: 1,040.5*



SP POORLY GRADED SAND - moist to dry, light grayish brown, fine to medium grained, some coarse

SM SILTY SAND - moist, light brown, fine to medium grained, some coarse

Notes:
Hand augered upper 4½ feet to avoid damage to utilities. Boring was backfilled with bentonite chips and tamped.

END OF BORING AT 40 FEET

Field Tech: IC
Prepared By: WL
Checked By: LH

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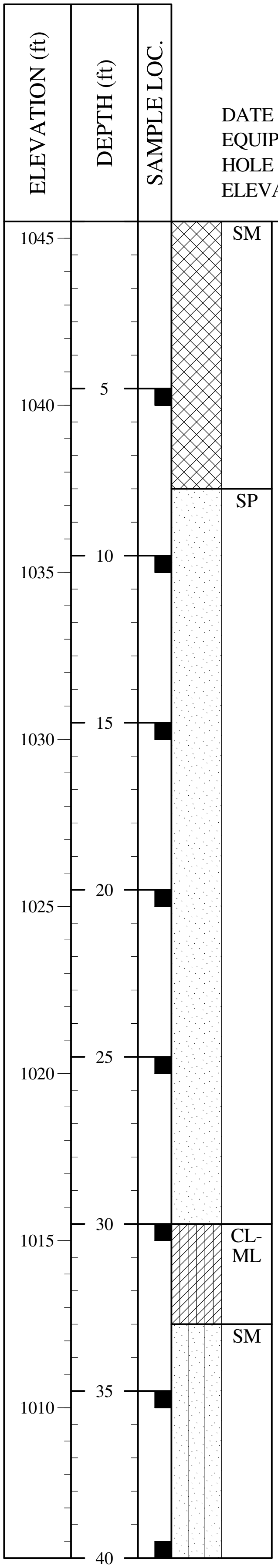
LOG OF BORING
Project: 4953-15-1021
Figure: B-1.2

BORING E-3

DATE DRILLED: October 14, 2015
EQUIPMENT USED: Direct Push
HOLE DIAMETER (in.): 2.5
ELEVATION: 1,045.5*

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE; REFER TO PLOT PLAN FOR MORE ACCURATE LOCATION INFORMATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.



FILL - SILTY SAND - moist to dry, light brown, fine to medium grained

POORLY GRADED SAND - moist, gray, fine to coarse grained

Becomes grayish brown

Notes:
Hand augered upper 4½ feet to avoid damage to utilities. Boring was backfilled with bentonite chips and tamped.

SILTY CLAY - moist, brownish green

SILTY SAND - moist, brown, fine to medium grained, some clay

More silt

END OF BORING AT 40 FEET

Field Tech: IC
Prepared By: WL
Checked By: LH

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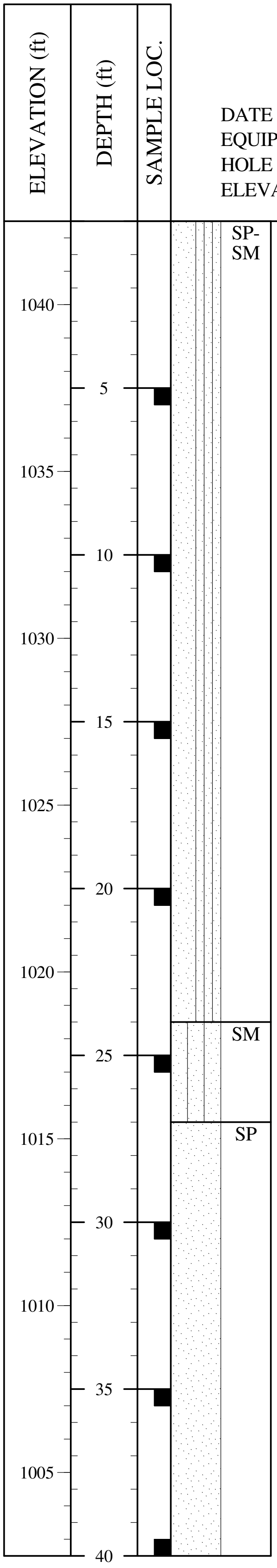
LOG OF BORING
Project: 4953-15-1021
Figure: B-1.3

BORING E-4

DATE DRILLED: October 13, 2015
EQUIPMENT USED: Direct Push
HOLE DIAMETER (in.): 2.5
ELEVATION: 1,042.5*



POORLY GRADED SAND with SILT - moist, light gray, fine to coarse grained

More silt

SILTY SAND - moist, brown, fine to medium grained

POORLY GRADED SAND - moist, light gray and brown, fine to coarse grained, some silt

Some silt

Notes:
Boring was backfilled with bentonite chips and tamped.

END OF BORING AT 40 FEET

Field Tech: IC
Prepared By: WL
Checked By: LH

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE; REFER TO PLOT PLAN FOR MORE ACCURATE LOCATION INFORMATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

B23SOIL_CRANDALL 4953-15-1021 (E-BORINGS).GPJ LAW_CRAN.GDT 12/4/15

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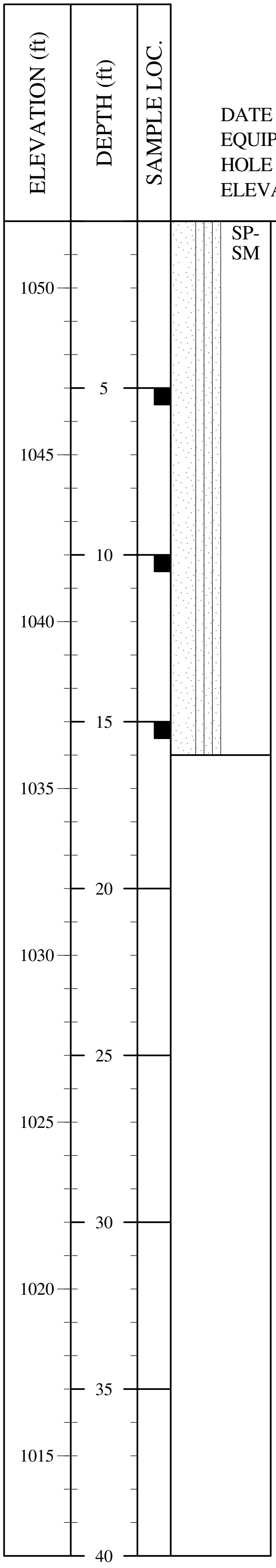
LOG OF BORING
Project: 4953-15-1021
Figure: B-1.4

BORING E-5

DATE DRILLED: October 12, 2015
EQUIPMENT USED: Direct Push
HOLE DIAMETER (in.): 2.5
ELEVATION: 1,052.0*



POORLY GRADED SAND with SILT - moist, light brown, fine to medium grained, some gravel.

END OF BORING AT 16 FEET DUE TO REFUSAL

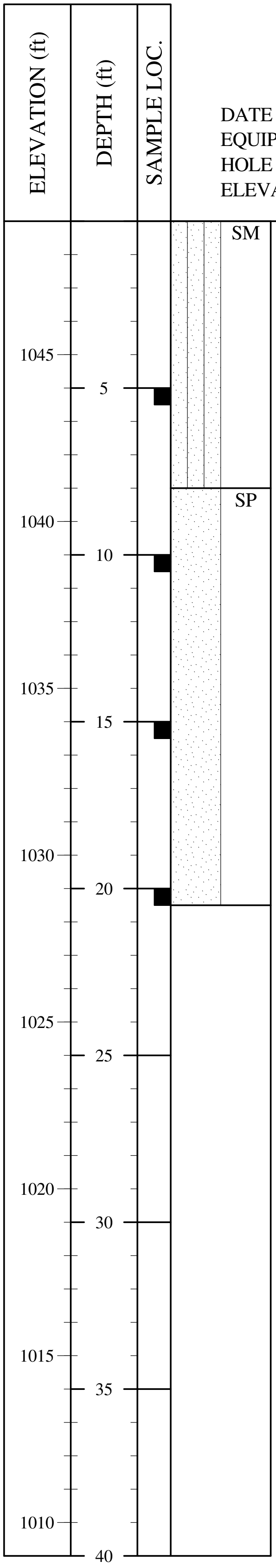
Notes:
Boring was backfilled with bentonite chips and tamped.

Field Tech: IC
Prepared By: WL
Checked By: LH

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE; REFER TO PLOT PLAN FOR MORE ACCURATE LOCATION INFORMATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

BORING E-6

DATE DRILLED: October 12, 2015
EQUIPMENT USED: Direct Push
HOLE DIAMETER (in.): 2.5
ELEVATION: 1,049.0*



SILTY SAND - moist, light brown, fine to medium grained

POORLY GRADED SAND - moist, light gray, fine to coarse grained

Some silt

END OF BORING AT 20½ FEET DUE TO REFUSAL

Notes:
Hand augered upper 4½ feet to avoid damage to utilities. Boring was backfilled with bentonite chips and tamped.

Field Tech: IC
Prepared By: WL
Checked By: LH

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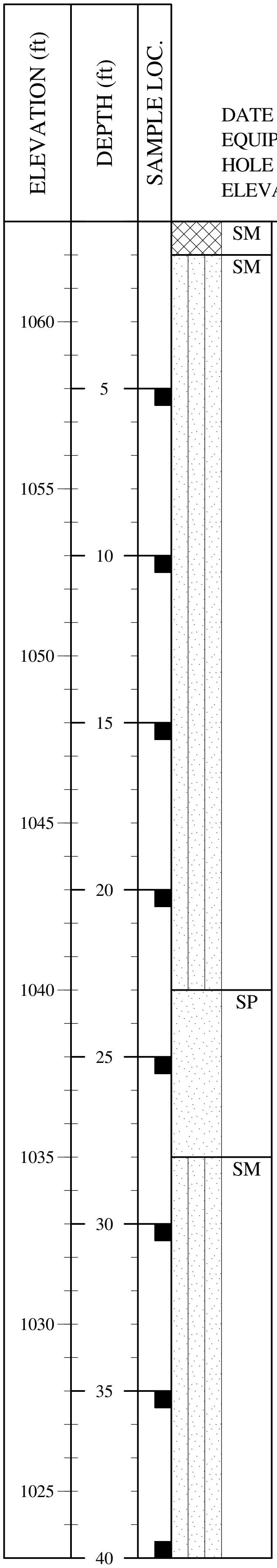
LOG OF BORING
Project: 4953-15-1021

B23SOIL_CRANDALL 4953-15-1021 (E-BORINGS).GPJ LAW_CRAN.GDT 12/4/15

BORING E-7

DATE DRILLED: October 12, 2015
EQUIPMENT USED: Direct Push
HOLE DIAMETER (in.): 2.5
ELEVATION: 1,063.0*



FILL - SILTY SAND - moist, light brown, fine grained.

SILTY SAND - moist, brown, fine grained, trace medium to coarse

POORLY GRADED SAND - moist, light brown and gray, fine to coarse grained

SILTY SAND - moist, light brown, fine to medium grained

Becomes sandier

Notes:
Hand augered upper 4½ feet to avoid damage to utilities. Boring was backfilled with bentonite chips and tamped.

END OF BORING AT 40 FEET

Field Tech: IC
Prepared By: WL
Checked By: LH

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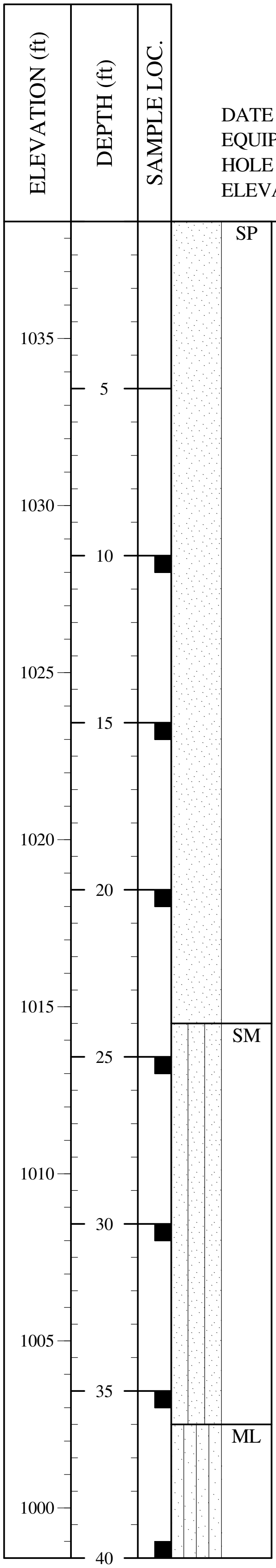
LOG OF BORING
Project: 4953-15-1021 Figure: B-1.7

BORING E-8

DATE DRILLED: October 14, 2015
EQUIPMENT USED: Direct Push
HOLE DIAMETER (in.): 2.5
ELEVATION: 1,038.5*



POORLY GRADED SAND - moist, brown, fine to medium grained, some coarse

Becomes light brown, interbedded silty sand layers

SILT SAND - moist, brown, fine to medium sand, some gravel

Some clay

SANDY SILT - moist, brown, fine to medium sand, some clay

Notes:
Hand augered upper 7 feet to avoid damage to utilities. Boring was backfilled with bentonite chips and tamped.

END OF BORING AT 40 FEET

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Field Tech: IC
Prepared By: WL
Checked By: LH

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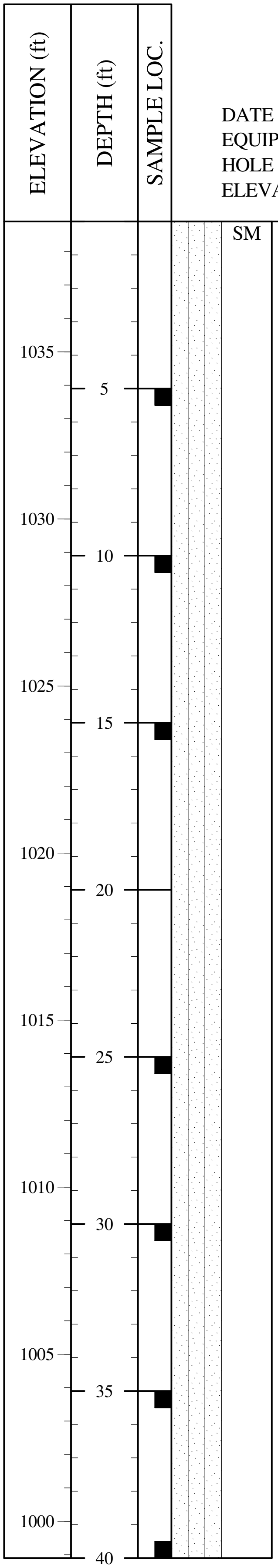
LOG OF BORING
Project: 4953-15-1021
Figure: B-1.8

BORING E-9

DATE DRILLED: October 13, 2015
EQUIPMENT USED: Direct Push
HOLE DIAMETER (in.): 2.5
ELEVATION: 1,038.9*



SILTY SAND - moist, brown, fine to medium grained.

Siltier seam

Becomes light brown, some coarse

Some Poorly Graded Sand interbeds.

Becomes brown, fine to medium grained, some gravel

Notes:
Hand augered upper 4½ feet to avoid damage to utilities. Boring was backfilled with bentonite chips and tamped.

Thin layer of Silty Clay, moist, dark brown

More gravel

END OF BORING AT 40 FEET

Field Tech: IC
Prepared By: WL
Checked By: LH

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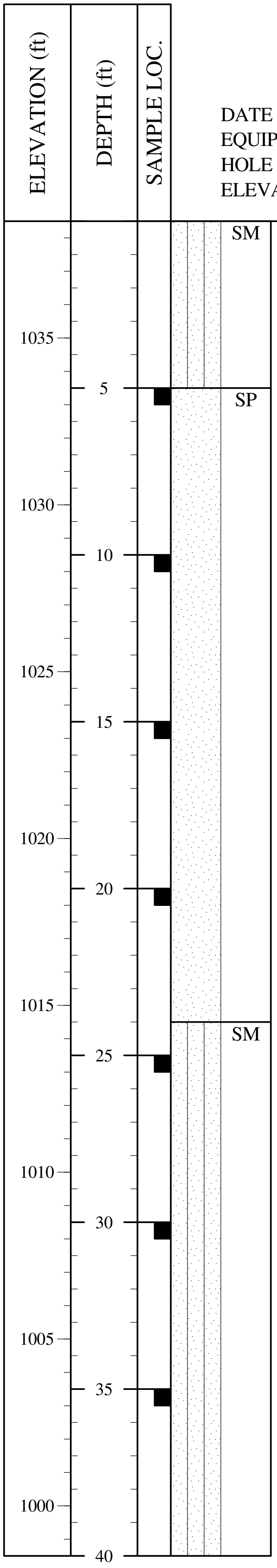
LOG OF BORING
Project: 4953-15-1021 Figure: B-1.9

BORING E-10

DATE DRILLED: October 13, 2015
EQUIPMENT USED: Direct Push
HOLE DIAMETER (in.): 2.5
ELEVATION: 1,038.5*



SILTY SAND - moist, brown, fine to medium grained.

POORLY GRADED SAND - moist, light brown, fine to coarse grained

SILTY SAND - moist, dark brown, some clay

Becomes brown, fine to medium grained, some gravel

Notes:
Hand augered upper 4½ feet to avoid damage to utilities. Boring was backfilled with bentonite chips and tamped.

END OF BORING AT 40 FEET

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE; REFER TO PLOT PLAN FOR MORE ACCURATE LOCATION INFORMATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

Field Tech: IC
Prepared By: WL
Checked By: LH

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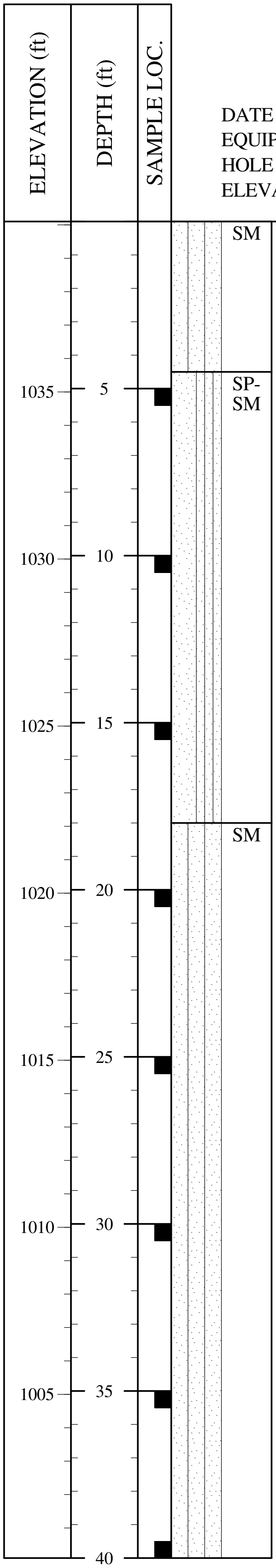
LOG OF BORING
Project: 4953-15-1021 Figure: B-1.10

BORING E-11

DATE DRILLED: October 13, 2015
EQUIPMENT USED: Direct Push
HOLE DIAMETER (in.): 2.5
ELEVATION: 1,040.1*



SILTY SAND - moist, reddish brown, fine to medium grained, some coarse

POORLY GRADED SAND with SILT - moist, brown, fine to medium grained, some coarse

SILTY SAND - moist, brown, fine to medium grained

More fines, some clay

Notes:
Hand augered upper 4½ feet to avoid damage to utilities. Boring was backfilled with bentonite chips and tamped.

END OF BORING AT 40 FEET

Field Tech: IC
Prepared By: WL
Checked By: LH

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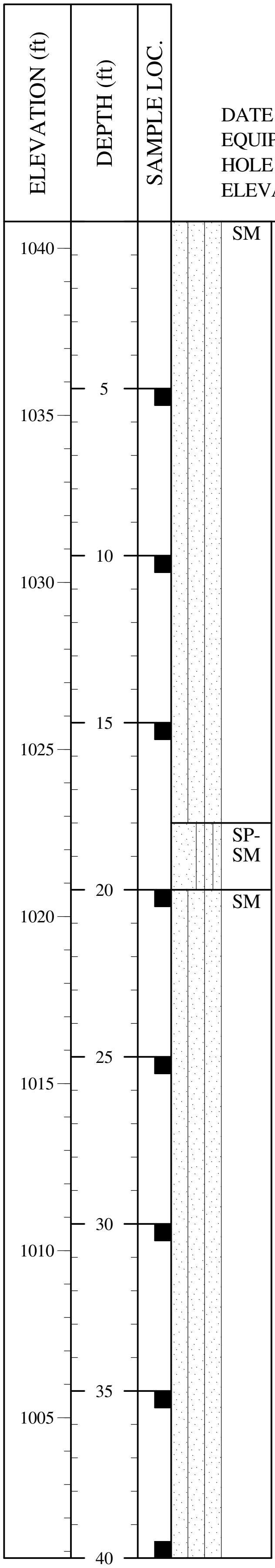
LOG OF BORING
Project: 4953-15-1021
Figure: B-1.11

BORING E-12

DATE DRILLED: October 15, 2015
EQUIPMENT USED: Direct Push
HOLE DIAMETER (in.): 2.5
ELEVATION: 1,040.8*



SILTY SAND - moist, dark brown, fine to medium grained, some coarse

Some clay

POORLY GRADED SAND with SILT - moist, light brown, fine to medium grained

SILTY SAND - moist, light brown and gray, fine to medium grained

Some clay

Notes:
Hand augered upper 4½ feet to avoid damage to utilities. Boring was backfilled with bentonite chips and tamped.

Becomes dark brown and gray

END OF BORING AT 40 FEET

Field Tech: IC
Prepared By: WL
Checked By: LH

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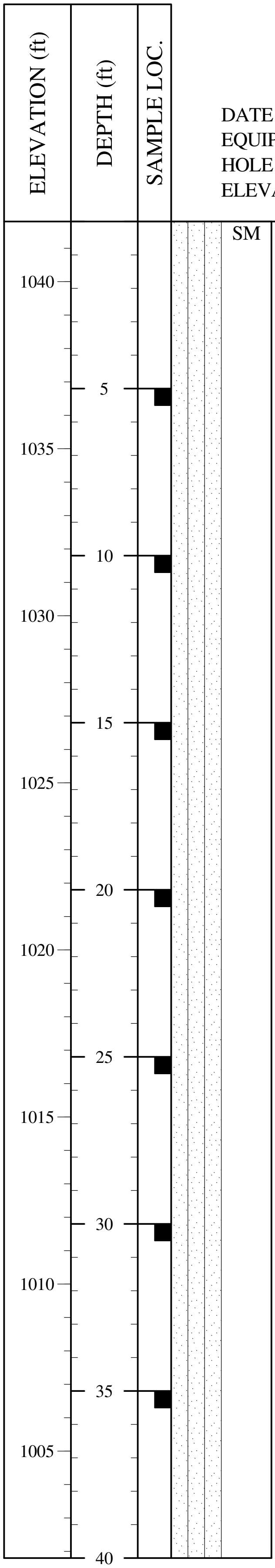
BORING E-13

DATE DRILLED: October 15, 2015
EQUIPMENT USED: Direct Push
HOLE DIAMETER (in.): 2.5
ELEVATION: 1,041.8*



SILTY SAND - moist, light brown, fine to medium grained, some coarse

Some thin Poorly Graded Sand interbeds.

Becomes brownish olive, more silt

Notes:
Hand augered upper 4½ feet to avoid damage to utilities. Boring was backfilled with bentonite chips and tamped.

END OF BORING AT 40 FEET

Field Tech: IC
Prepared By: WL
Checked By: LH

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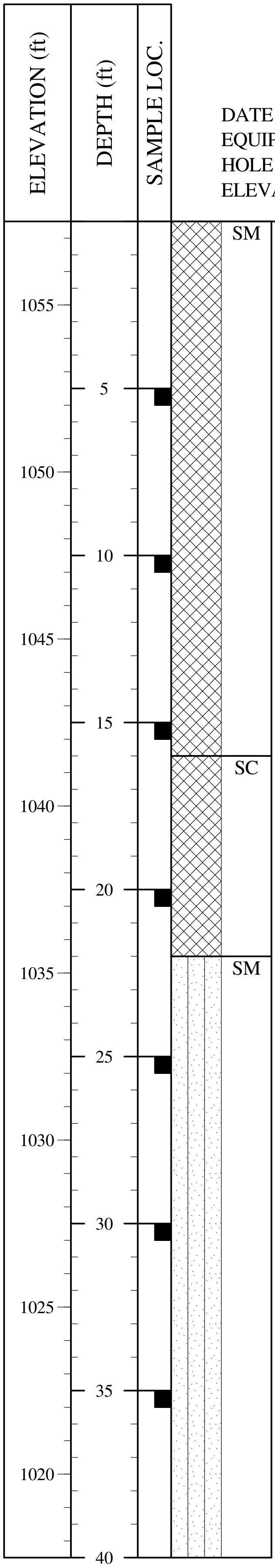
LOG OF BORING
Project: 4953-15-1021 Figure: B-1.13

B23SOIL_CRANDALL 4953-15-1021 (E-BORINGS).GPJ LAW_CRAN.GDT 12/4/15

BORING E-14

DATE DRILLED: October 12, 2015
EQUIPMENT USED: Direct Push
HOLE DIAMETER (in.): 2.5
ELEVATION: 1,057.5*



FILL - SILTY SAND - moist, light brown, fine to medium grained

Some gravel

FILL - CLAYEY SAND - moist, light brown, fine grained

SILTY SAND - moist, brown, fine to medium grained, some clay

Less silt

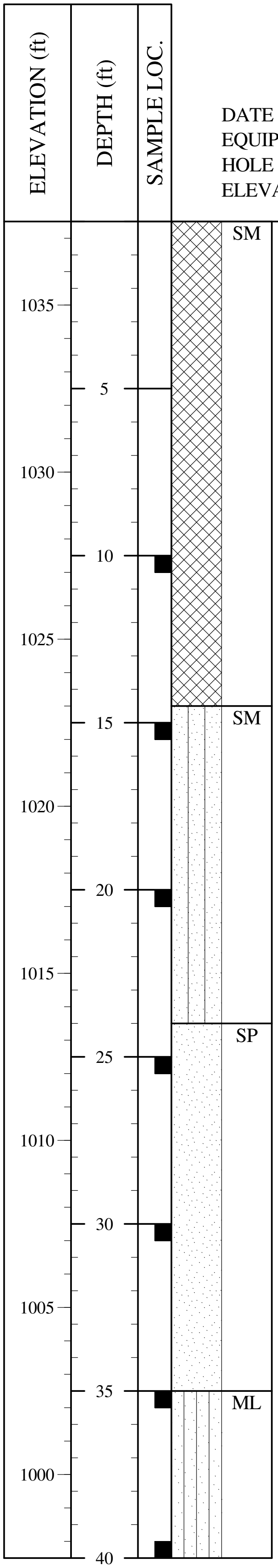
Notes:
Hand augered upper 4½ feet to avoid damage to utilities. Boring was backfilled with bentonite chips and tamped.

END OF BORING AT 40 FEET

Field Tech: IC
Prepared By: WL
Checked By: LH

BORING E-15

DATE DRILLED: October 14, 2015
EQUIPMENT USED: Direct Push
HOLE DIAMETER (in.): 2.5
ELEVATION: 1,037.5*



FILL - SILTY SAND - moist, brown, fine to medium grained

Siltier seam

SILTY SAND - moist, brown, fine to medium grained

POORLY GRADED SAND - moist, light brown, fine to medium grained, some coarse, some clay

SANDY SILT - moist, brown, fine to medium sand

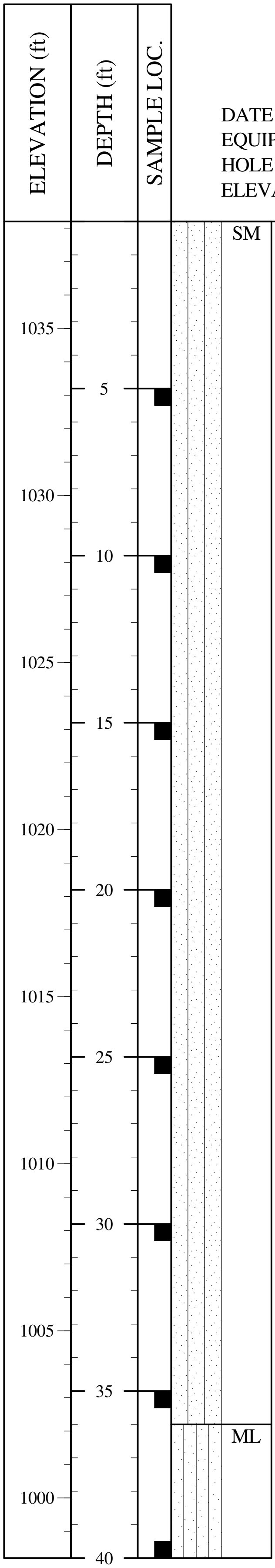
Notes:
Hand augered upper 7 feet to avoid damage to utilities. Boring was backfilled with bentonite chips and tamped.

END OF BORING AT 40 FEET

Field Tech: IC
Prepared By: WL
Checked By: LH

BORING E-16

DATE DRILLED: October 14, 2015
EQUIPMENT USED: Direct Push
HOLE DIAMETER (in.): 2.5
ELEVATION: 1,038.2*



SILTY SAND - moist, brown, fine to medium grained

Thin layer of Lean Clay

Becomes greenish brown, some clay

Becomes light gray, some gravel

Becomes brown

SANDY SILT - moist, light brown, fine to medium sand

Notes:
Hand augered upper 4½ feet to avoid damage to utilities. Boring was backfilled with bentonite chips and tamped.

END OF BORING AT 40 FEET

Field Tech: IC
Prepared By: WL
Checked By: LH

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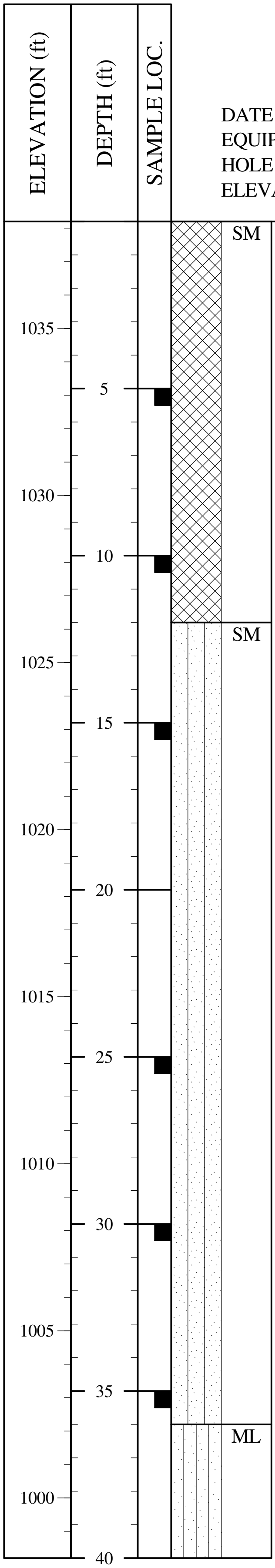
LOG OF BORING
Project: 4953-15-1021 Figure: B-1.16

BORING E-17

DATE DRILLED: October 14, 2015
EQUIPMENT USED: Direct Push
HOLE DIAMETER (in.): 2.5
ELEVATION: 1,038.2*



FILL - SILTY SAND - moist, dark brown and green, some clay interbeds

Siltier layer

SILTY SAND - moist, dark brown to light brown, fine to medium grained, some coarse

Becomes light brownish gray, more fines, some gravel

Notes:
Hand augered upper 4½ feet to avoid damage to utilities. Boring was backfilled with bentonite chips and tamped.

Siltier seam

Some clay

SANDY SILT - moist, light brown, fine to medium sand

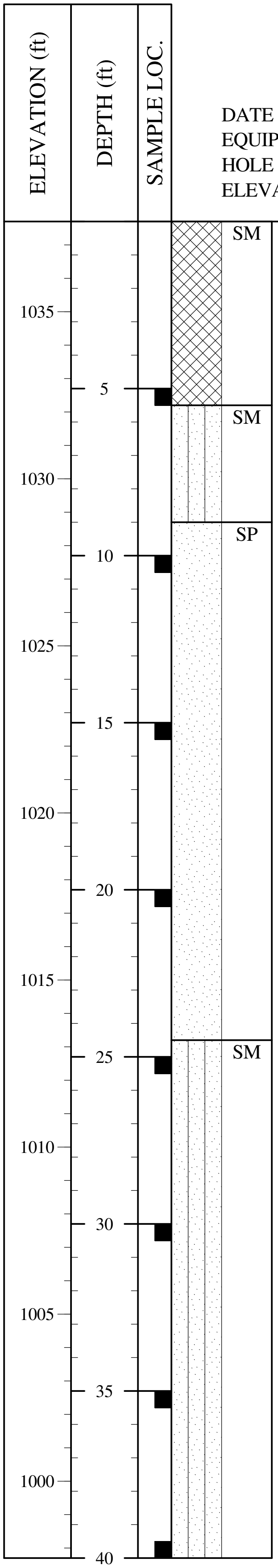
END OF BORING AT 40 FEET

Field Tech: IC
Prepared By: WL
Checked By: LH

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE; REFER TO PLOT PLAN FOR MORE ACCURATE LOCATION INFORMATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

BORING E-18

DATE DRILLED: October 13, 2015
EQUIPMENT USED: Direct Push
HOLE DIAMETER (in.): 2.5
ELEVATION: 1,037.7*



FILL - SILTY SAND - moist, brown, fine to medium grained

SILTY SAND - moist, brown, fine to medium grained

POORLY GRADED SAND - moisst, brown, fine to medium grained

SILTY SAND - moist, brown, fine to medium grained

Thin layer of Silty Clay, moist, brown

Notes:
Hand augered upper 4½ feet to avoid damage to utilities. Boring was backfilled with bentonite chips and tamped.

Less silt

END OF BORING AT 40 FEET

Field Tech: IC
Prepared By: WL
Checked By: LH

University of California Riverside
Proposed Multidisciplinary Research Building 1
Riverside, California

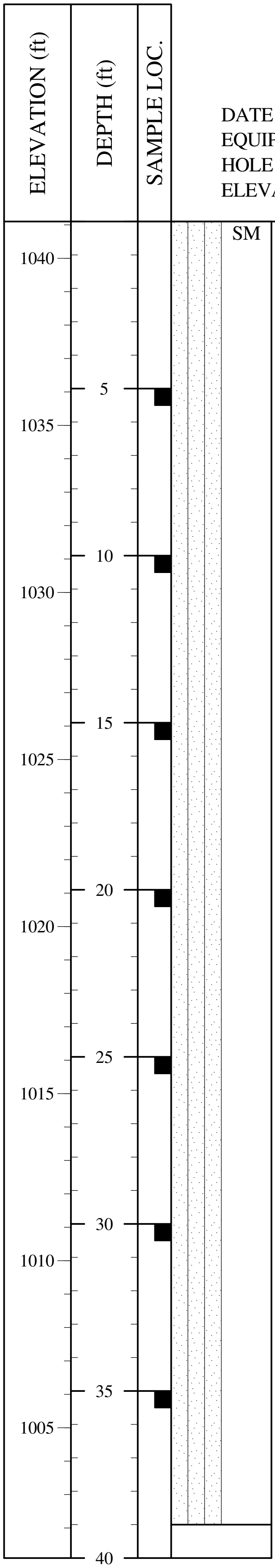
amec foster wheeler

LOG OF BORING
Project: 4953-15-1021 Figure: B-1.18

B23SOIL_CRANDALL 4953-15-1021 (E-BORINGS).GPJ LAW_CRAN.GDT 12/4/15

BORING E-19

DATE DRILLED: October 15, 2015
EQUIPMENT USED: Direct Push
HOLE DIAMETER (in.): 2.5
ELEVATION: 1,041.1*



SILTY SAND - moist, brown, fine to medium grained

Becomes brownish olive, some clay

Thin layer of Poorly Graded Sand.

Some clay

Notes:
Hand augered upper 4½ feet to avoid damage to utilities. Boring was backfilled with bentonite chips and tamped.

Less silt and clay

END OF BORING AT 39 FEET

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. LATITUDE AND LONGITUDE OF BORING LOCATION SHOWN ON LOGS ARE APPROXIMATE; REFER TO PLOT PLAN FOR MORE ACCURATE LOCATION INFORMATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

Field Tech: IC
Prepared By: WL
Checked By: LH

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Proposed Multidisciplinary Research Building 1
Riverside, California

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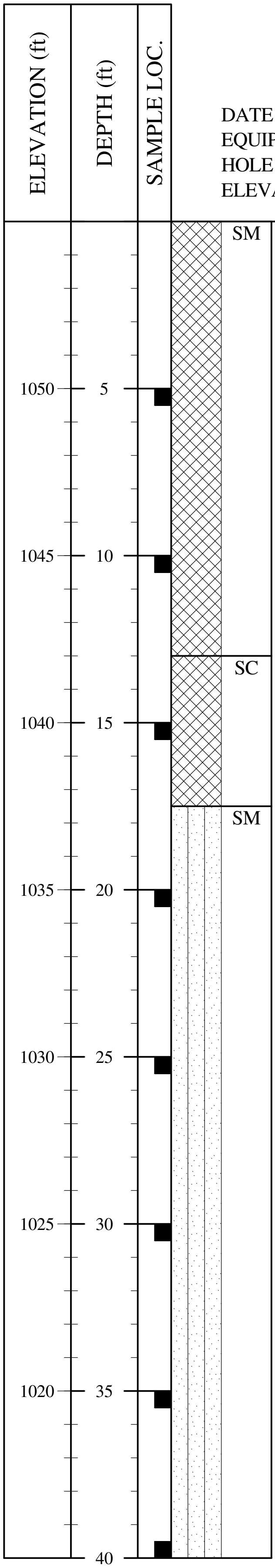
LOG OF BORING
Project: 4953-15-1021 Figure: B-1.19

BORING E-20

DATE DRILLED: October 12, 2015
EQUIPMENT USED: Direct Push
HOLE DIAMETER (in.): 2.5
ELEVATION: 1,055.0*



FILL - SILTY SAND - moist, brown, fine to medium grained

Coarser seam

FILL - CLAYEY SAND - moisst, dark brown, fine grained

SILTY SAND - moist, dark brown, fine to medium grained

Notes:
Hand augered upper 4½ feet to avoid damage to utilities. Boring was backfilled with bentonite chips and tamped.

Some clay

END OF BORING 40 FEET

Field Tech: IC
Prepared By: WL
Checked By: LH

University of California Riverside
Proposed Multidisciplinary Research Building 1
Riverside, California

amec foster wheeler

LOG OF BORING
Project: 4953-15-1021

ANALYTICAL LABORATORY REPORTS

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Rd., Los Angeles, CA 90065 Tel: (323) 223-9700 Fax: (323) 223-9500

Ordered By

Amec Foster Wheeler
6001 Rickenbacker Road
Los Angeles, CA 90040-

Number of Pages 51
Date Received 10/13/2015
Date Reported 10/19/2015

Telephone (323)889-5300
Attn Mark Murphy

Job Number	Ordered	Client
66081	10/13/2015	AMEC

Project ID: 4953-15-1021
Project Name: UCR
Site: North Campus Drive and
Aberdeen Drive
Riverside, CA

Enclosed are the results of analyses on 31 samples analyzed as specified on attached chain of custody.

Rojert G Araghi

Rojert G. Araghi
Laboratory Director

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA, CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

Page 1 Of 3

COC# № 70069 GLOBAL ID ______ E REPORT: ☐ PDF ☐ EDF ☐ EDD ASL JOB# 66081

CHAIN OF CUSTODY RECORD

Company: AMEC FW
Address: 6001 RICKENBACKER
LOS ANGLES, CA, 90040
Telephone: (323) 889-5300
Fax:
Special Instruction:
E-mail:

Project Name: UCR
Site Address: NORTH CAMPUS DRIVE @ ABERDEEN DRIVE RIVERSIDE, CA
Project ID: 4953-15-1021
Project Manager: MARK MURPHY

Report To:
Address:
Invoice To:
Address:
P.O.#:

ANALYSIS REQUESTED

ITEM	Lab ID (LAB USE ONLY)	Sample ID	Date	Time	#	Type	Matrix	Preservation	VOCS METHOD 8260B	TITLE 22 METALS 6010B/7471A	TPH FULL RANGE 8015B	Remarks
1	339106	B-7 @ 5'	10-12-15	758	1	6" SLEEVE	SOIL	ICE CHEST	X	X	X	
2	339107	B-7 @ 10'		800					X	X	X	
3	339108	B-7-@ 15'		802					X	X	X	
4	339109	B-7 @ 20'		806					X	X	X	
5	339110	B-7 @ 25'		815					X	X	X	
6	339111	B-7 @ 30'		824					X	X	X	
7	339112	B-7 @ 35'		827					X	X	X	
8	339113	B-7 @ 40'		831					X	X	X	
9	339114	B-14 @ 5'		910					X	X	X	
10	339115	B-14 @ 10'		915					X	X	X	

Collected By: Date 10-12-15 Time 915
Relinquished By: Date Time
Received By: Date Time

Relinquished By: Date 10-13-15 Time 1:55
Received For Laboratory Janet Chun Date 10-13-15 Time 1:55
Condition of Sample:

TAT
☒ Normal
☐ Rush

White - Report, Yellow - Laboratory, Pink - Client

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
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Page 2 Of 2

COC# **Nº 57301** GLOBAL ID ______ E REPORT: ☐ PDF ☐ EDF ☐ EDD ASL JOB# C6081

CHAIN OF CUSTODY RECORD

Company: AMEC FW

Address: 6001 RICKENBACKER RD, LOS ANGLES CA 90040

Telephone: (323) 889-5300

Fax:

Special Instruction:

E-mail:

Project Name: OCR

Site Address: NORTH CAMPUS DRIVE & ABERDEEN DRIVE RIVERSIDE, CA

Project ID: 4953-15-1021

Project Manager: MARK MURPHY

Report To:

Address:

Invoice To:

Address:

P.O.#:

ANALYSIS REQUESTED

ITEM	LAB USE ONLY Lab ID	Sample ID	Date	Time	#	Type	Matrix	Preservation	VOCS METHOD ~~80~~ 8260B	TITLE 22 METALS 6010B/7471A		TPH FULL RANGE 8015B	Remarks
11	339116	B-14@15'	10-12-15	916	1	6" SLEEVE	SOIL	ICE CHEST	X	X		X	
12	339117	B-14@20'		921					X	X		X	
13	339118	B-14@25'		927					X	X		X	
14	339119	B-14@30'		930					X	X		X	
15	339120	B-14@35'		932					X	X		X	
16	339121	B-14@40'							X	X		X	
17	339122	B-20@5'		1012					X	X		X	
18	339123	B-20@10'		1014					X	X		X	
19	339124	B-20@15		1016					X	X		X	
20	339125	B-20@20'		1018					X	X		X	

Collected By: Date 10-12-15 Time 1018

Relinquished By: Date Time

Received By: Date Time

Relinquished By: Date 10-13-15 Time 1:55

Received For Laboratory Janet Chun Date 10-13-15 Time 1:55

Condition of Sample:

TAT ☐ Normal ☐ Rush

White - Report, Yellow - Laboratory, Pink - Client

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Environmental Testing Services
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Page 3 Of 3

CHAIN OF CUSTODY RECORD

COC# Nº 73362 GLOBAL ID ______ E REPORT: ☐ PDF ☐ EDF ☐ EDD ASL JOB# 66081

Company: AMEC FW
Address: 6001 RICKENBACKER RD, LOS ANGLES, CA 90040
Telephone: (323) 889-5300
Fax:
Special Instruction:
E-mail:

Project Name: UCR
Site Address: NORTH CAMPUS DRIVE & ABERDEEN DRIVE RIVERSIDE, CA
Project ID: 4953-15-1021
Project Manager: MARK MURPHY

Report To:
Address:
Invoice To:
Address:
P.O.#:

ANALYSIS REQUESTED

ITEM	LAB USE ONLY Lab ID	Sample ID	Date	Time	Container(s) #	Container(s) Type	Matrix	Preservation	VOCS METHOD 8260B	TITLES 22 METALS 6010B / 7471A	TPH FULL RANGE 8015B										Remarks
21	339126	B-20@25'	10-12-15 ~~1024~~	1024	1	6" SLEEVE	SOIL	ICE CHEST	X	X	X										
22	339127	B-20@30'	~~1026~~	1026					X	X	X										
23	339128	B-20@35'							X	X	X										
24	339129	B-20@40'							X	X	X										
25	339130	B-6@5'		1117					X	X	X										
26	339131	B-6@10'		1124					X	X	X										
27	339132	B-6@15'		1145					X	X	X										
28	339133	B-6@20'		1152					X	X	X										
29	339134	B-5@5'		1222					X	X	X										
30	339135	B-5@10'		1231					X	X	X										
31	339136	B-5@15'																			

Collected By: Date 10-12-15 Time 1231
Relinquished By: Date 10-13-15 Time 1:55
Relinquished By: Date Time
Received For Laboratory Janet Chen Date 10-13-15 Time 1:55
Received By: Date Time
Condition of Sample:

TAT
☐ Normal
☐ Rush

White - Report, Yellow - Laboratory, Pink - Client

ANALYTICAL RESULTS

Ordered By

Amec Foster Wheeler
6001 Rickenbacker Road
Los Angeles, CA 90040-

Site

North Campus Drive and
Aberdeen Drive
Riverside, CA

Telephone: (323)889-5300
Attn: Mark Murphy

Page: **2**

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QC Batch No: 101515-2

Our Lab I.D.		**339106**	**339107**	**339108**	**339109**	**339110**
Client Sample I.D.		B-7@5'	B-7@10'	B-7@15'	B-7@20'	B-7@25'
Date Sampled		10/12/2015	10/12/2015	10/12/2015	10/12/2015	10/12/2015
Date Prepared		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
AA Metals						
Mercury	0.0500	ND	ND	ND	ND	ND
ICP Metals						
Antimony	0.500	ND	ND	ND	ND	ND
Arsenic	0.250	0.338	ND	0.360	ND	0.341
Barium	0.500	64.1	65.7	56.9	56.0	37.9
Beryllium	0.500	ND	ND	ND	ND	ND
Cadmium	0.500	ND	ND	ND	ND	ND
Chromium	0.500	1.84	1.55	2.78	1.84	ND
Cobalt	0.500	ND	ND	ND	ND	ND
Copper	0.500	1.55	1.44	2.20	1.65	0.533
Lead	0.250	ND	ND	ND	ND	ND
Molybdenum	0.500	ND	ND	ND	ND	ND
Nickel	0.500	ND	ND	ND	ND	ND
Selenium	0.500	ND	ND	ND	ND	ND
Silver	0.500	ND	ND	ND	ND	ND
Thallium	0.500	ND	ND	ND	ND	ND
Vanadium	0.500	8.16	7.54	9.86	8.31	5.21
Zinc	0.500	15.0	15.8	13.7	10.3	10.1

QUALITY CONTROL REPORT

QC Batch No: 101515-2

Analytes	LCS % REC	LCS DUP % REC	LCS RPD % REC	LCS/LCSD % Limit	LCS RPD % Limit					
AA Metals										
Mercury	99	110	10.5	80-120	<20					
ICP Metals										
Antimony	96	99	3.7	80-120	<20					
Arsenic	94	101	7.4	80-120	<20					

ANALYTICAL RESULTS

Page: **3**

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QUALITY CONTROL REPORT

QC Batch No: 101515-2

	LCS	LCS DUP	LCS RPD	LCS/LCSD	LCS RPD					
Analytes	% REC	% REC	% REC	% Limit	% Limit					
ICP Metals										
Barium	**99**	**103**	**4.0**	**80-120**	**<20**					
Beryllium	**103**	**110**	**6.6**	**80-120**	**<20**					
Cadmium	**95**	**103**	**7.8**	**80-120**	**<20**					
Chromium	**98**	**104**	**6.5**	**80-120**	**<20**					
Cobalt	**94**	**101**	**7.3**	**80-120**	**<20**					
Copper	**97**	**104**	**6.7**	**80-120**	**<20**					
Lead	**97**	**104**	**7.5**	**80-120**	**<20**					
Molybdenum	**94**	**100**	**6.1**	**80-120**	**<20**					
Nickel	**96**	**104**	**7.9**	**80-120**	**<20**					
Selenium	**94**	**102**	**8.1**	**80-120**	**<20**					
Silver	**100**	**98**	**1.6**	**80-120**	**<20**					
Thallium	**97**	**105**	**8.2**	**80-120**	**<20**					
Vanadium	**95**	**102**	**6.7**	**80-120**	**<20**					
Zinc	**95**	**105**	**10.3**	**80-120**	**<20**					

ANALYTICAL RESULTS

Ordered By

Amec Foster Wheeler
6001 Rickenbacker Road
Los Angeles, CA 90040-

Site

North Campus Drive and
Aberdeen Drive
Riverside, CA

Telephone: (323)889-5300
Attn: Mark Murphy

Page: **4**

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QC Batch No: 101515-2

Our Lab I.D.		**339111**	**339112**	**339113**	**339114**	**339115**
Client Sample I.D.		B-7@30'	B-7@35'	B-7@40'	B-14@5'	B-14@10'
Date Sampled		10/12/2015	10/12/2015	10/12/2015	10/12/2015	10/12/2015
Date Prepared		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
AA Metals						
Mercury	0.0500	ND	ND	ND	ND	ND
ICP Metals						
Antimony	0.500	ND	ND	ND	ND	ND
Arsenic	0.250	0.437	0.280	ND	0.370	0.419
Barium	0.500	69.5	147	41.5	51.7	58.4
Beryllium	0.500	ND	ND	ND	ND	ND
Cadmium	0.500	ND	ND	ND	ND	ND
Chromium	0.500	1.53	2.44	1.15	2.43	2.60
Cobalt	0.500	ND	ND	ND	ND	ND
Copper	0.500	1.57	2.10	1.19	1.81	1.61
Lead	0.250	ND	ND	ND	ND	ND
Molybdenum	0.500	ND	ND	ND	ND	ND
Nickel	0.500	ND	ND	ND	ND	ND
Selenium	0.500	ND	ND	ND	ND	ND
Silver	0.500	ND	ND	ND	ND	ND
Thallium	0.500	ND	ND	ND	ND	ND
Vanadium	0.500	12.8	13.4	8.42	8.19	8.99
Zinc	0.500	19.0	18.7	12.7	11.0	14.4

QUALITY CONTROL REPORT

QC Batch No: 101515-2

Analytes	LCS % REC	LCS DUP % REC	LCS RPD % REC	LCS/LCSD % Limit	LCS RPD % Limit					
AA Metals										
Mercury	99	110	10.5	80-120	<20					
ICP Metals										
Antimony	96	99	3.7	80-120	<20					
Arsenic	94	101	7.4	80-120	<20					

ANALYTICAL RESULTS

Page: **5**

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QUALITY CONTROL REPORT

QC Batch No: 101515-2

Analytes	LCS % REC	LCS DUP % REC	LCS RPD % REC	LCS/LCSD % Limit	LCS RPD % Limit					
ICP Metals										
Barium	**99**	**103**	**4.0**	**80-120**	**<20**					
Beryllium	**103**	**110**	**6.6**	**80-120**	**<20**					
Cadmium	**95**	**103**	**7.8**	**80-120**	**<20**					
Chromium	**98**	**104**	**6.5**	**80-120**	**<20**					
Cobalt	**94**	**101**	**7.3**	**80-120**	**<20**					
Copper	**97**	**104**	**6.7**	**80-120**	**<20**					
Lead	**97**	**104**	**7.5**	**80-120**	**<20**					
Molybdenum	**94**	**100**	**6.1**	**80-120**	**<20**					
Nickel	**96**	**104**	**7.9**	**80-120**	**<20**					
Selenium	**94**	**102**	**8.1**	**80-120**	**<20**					
Silver	**100**	**98**	**1.6**	**80-120**	**<20**					
Thallium	**97**	**105**	**8.2**	**80-120**	**<20**					
Vanadium	**95**	**102**	**6.7**	**80-120**	**<20**					
Zinc	**95**	**105**	**10.3**	**80-120**	**<20**					

ANALYTICAL RESULTS

Ordered By

Amec Foster Wheeler
6001 Rickenbacker Road
Los Angeles, CA 90040-

Site

North Campus Drive and
Aberdeen Drive
Riverside, CA

Telephone: (323)889-5300
Attn: Mark Murphy

Page: **6**

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QC Batch No: 101515-2

Our Lab I.D.		**339116**	**339117**	**339118**	**339119**	**339120**
Client Sample I.D.		B-14@15'	B-14@20'	B-14@25'	B-14@30'	B-14@35'
Date Sampled		**10/12/2015**	**10/12/2015**	**10/12/2015**	**10/12/2015**	**10/12/2015**
Date Prepared		**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**
Preparation Method						
Date Analyzed		**10/17/2015**	**10/17/2015**	**10/17/2015**	**10/17/2015**	**10/17/2015**
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
AA Metals						
Mercury	**0.0500**	**ND**	**ND**	**ND**	**ND**	**ND**
ICP Metals						
Antimony	**0.500**	**ND**	**ND**	**ND**	**ND**	**ND**
Arsenic	**0.250**	**0.570**	**0.513**	**0.315**	**0.456**	**0.472**
Barium	**0.500**	**34.5**	**49.6**	**36.8**	**44.7**	**49.3**
Beryllium	**0.500**	**ND**	**ND**	**ND**	**ND**	**ND**
Cadmium	**0.500**	**ND**	**ND**	**ND**	**ND**	**ND**
Chromium	**0.500**	**3.96**	**2.29**	**2.55**	**2.89**	**2.69**
Cobalt	**0.500**	**ND**	**ND**	**ND**	**ND**	**ND**
Copper	**0.500**	**3.27**	**1.89**	**1.83**	**2.26**	**2.15**
Lead	**0.250**	**1.15**	**ND**	**ND**	**ND**	**ND**
Molybdenum	**0.500**	**ND**	**ND**	**ND**	**ND**	**ND**
Nickel	**0.500**	**0.910**	**ND**	**ND**	**ND**	**ND**
Selenium	**0.500**	**ND**	**ND**	**ND**	**ND**	**ND**
Silver	**0.500**	**ND**	**ND**	**ND**	**ND**	**ND**
Thallium	**0.500**	**ND**	**ND**	**ND**	**ND**	**ND**
Vanadium	**0.500**	**9.22**	**8.13**	**7.51**	**8.75**	**9.05**
Zinc	**0.500**	**9.36**	**12.0**	**8.59**	**9.58**	**11.0**

QUALITY CONTROL REPORT

QC Batch No: 101515-2

Analytes	LCS % REC	LCS DUP % REC	LCS RPD % REC	LCS/LCSD % Limit	LCS RPD % Limit					
AA Metals										
Mercury	**99**	**110**	**10.5**	**80-120**	**<20**					
ICP Metals										
Antimony	**96**	**99**	**3.7**	**80-120**	**<20**					
Arsenic	**94**	**101**	**7.4**	**80-120**	**<20**					

ANALYTICAL RESULTS

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QUALITY CONTROL REPORT

QC Batch No: 101515-2

Analytes	LCS % REC	LCS DUP % REC	LCS RPD % REC	LCS/LCSD % Limit	LCS RPD % Limit					
ICP Metals										
Barium	99	103	4.0	80-120	<20					
Beryllium	103	110	6.6	80-120	<20					
Cadmium	95	103	7.8	80-120	<20					
Chromium	98	104	6.5	80-120	<20					
Cobalt	94	101	7.3	80-120	<20					
Copper	97	104	6.7	80-120	<20					
Lead	97	104	7.5	80-120	<20					
Molybdenum	94	100	6.1	80-120	<20					
Nickel	96	104	7.9	80-120	<20					
Selenium	94	102	8.1	80-120	<20					
Silver	100	98	1.6	80-120	<20					
Thallium	97	105	8.2	80-120	<20					
Vanadium	95	102	6.7	80-120	<20					
Zinc	95	105	10.3	80-120	<20					

ANALYTICAL RESULTS

Ordered By

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QC Batch No: 101515-3

Our Lab I.D.		**339121**	**339122**	**339123**	**339124**	**339125**
Client Sample I.D.		B-14@40'	B-20@5'	B-20@10'	B-20@15'	B-20@20'
Date Sampled		10/12/2015	10/12/2015	10/12/2015	10/12/2015	10/12/2015
Date Prepared		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
AA Metals						
Mercury	0.0500	ND	ND	ND	ND	ND
ICP Metals						
Antimony	0.500	ND	ND	ND	ND	ND
Arsenic	0.250	0.328	0.461	ND	0.313	1.46
Barium	0.500	67.5	48.7	49.7	61.8	52.3
Beryllium	0.500	ND	ND	ND	ND	ND
Cadmium	0.500	ND	ND	ND	ND	ND
Chromium	0.500	1.80	2.38	2.35	2.27	2.58
Cobalt	0.500	ND	ND	ND	ND	ND
Copper	0.500	1.49	1.60	1.94	1.85	2.28
Lead	0.250	ND	ND	ND	ND	7.07
Molybdenum	0.500	ND	ND	ND	ND	ND
Nickel	0.500	ND	ND	ND	ND	ND
Selenium	0.500	ND	ND	ND	ND	ND
Silver	0.500	ND	ND	ND	ND	ND
Thallium	0.500	ND	ND	ND	ND	ND
Vanadium	0.500	9.23	8.52	9.05	9.21	8.52
Zinc	0.500	14.8	12.1	14.4	18.0	13.4

QUALITY CONTROL REPORT

QC Batch No: 101515-3

Analytes	LCS % REC	LCS DUP % REC	LCS RPD % REC	LCS/LCSD % Limit	LCS RPD % Limit					
AA Metals										
Mercury	102	100	2.0	80-120	<20					
ICP Metals										
Antimony	92	98	6.1	80-120	<20					
Arsenic	90	95	4.8	80-120	<20					

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QUALITY CONTROL REPORT

QC Batch No: 101515-3

Analytes	LCS % REC	LCS DUP % REC	LCS RPD % REC	LCS/LCSD % Limit	LCS RPD % Limit					
ICP Metals										
Barium	**96**	**95**	**<1**	**80-120**	**<20**					
Beryllium	**99**	**104**	**5.0**	**80-120**	**<20**					
Cadmium	**92**	**96**	**4.9**	**80-120**	**<20**					
Chromium	**94**	**98**	**4.9**	**80-120**	**<20**					
Cobalt	**90**	**95**	**4.6**	**80-120**	**<20**					
Copper	**94**	**97**	**3.8**	**80-120**	**<20**					
Lead	**93**	**98**	**5.0**	**80-120**	**<20**					
Molybdenum	**91**	**95**	**4.7**	**80-120**	**<20**					
Nickel	**93**	**97**	**4.5**	**80-120**	**<20**					
Selenium	**90**	**95**	**5.1**	**80-120**	**<20**					
Silver	**97**	**95**	**2.1**	**80-120**	**<20**					
Thallium	**93**	**97**	**3.9**	**80-120**	**<20**					
Vanadium	**92**	**96**	**4.6**	**80-120**	**<20**					
Zinc	**92**	**93**	**1.2**	**80-120**	**<20**					

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QC Batch No: 101515-3

Our Lab I.D.		**339126**	**339127**	**339128**	**339129**	**339130**
Client Sample I.D.		B-20@25'	B-20@30'	B-20@35'	B-20@40'	B-6@5'
Date Sampled		10/12/2015	10/12/2015	10/12/2015	10/12/2015	10/12/2015
Date Prepared		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
AA Metals						
Mercury	0.0500	ND	ND	ND	ND	ND
ICP Metals						
Antimony	0.500	ND	ND	ND	ND	ND
Arsenic	0.250	0.551	0.374	0.317	0.313	0.302
Barium	0.500	48.6	44.1	61.6	54.1	56.1
Beryllium	0.500	ND	ND	ND	ND	ND
Cadmium	0.500	ND	ND	ND	ND	ND
Chromium	0.500	3.74	3.23	2.97	1.78	1.12
Cobalt	0.500	ND	ND	ND	ND	ND
Copper	0.500	2.65	2.32	2.27	1.61	1.31
Lead	0.250	ND	ND	ND	ND	ND
Molybdenum	0.500	ND	ND	ND	ND	ND
Nickel	0.500	0.734	ND	ND	ND	ND
Selenium	0.500	ND	ND	ND	ND	ND
Silver	0.500	ND	ND	ND	ND	ND
Thallium	0.500	ND	ND	ND	ND	ND
Vanadium	0.500	10.2	9.49	11.0	10.5	8.35
Zinc	0.500	11.6	9.89	13.3	16.0	10.7

QUALITY CONTROL REPORT

QC Batch No: 101515-3

Analytes	LCS % REC	LCS DUP % REC	LCS RPD % REC	LCS/LCSD % Limit	LCS RPD % Limit					
AA Metals										
Mercury	102	100	2.0	80-120	<20					
ICP Metals										
Antimony	92	98	6.1	80-120	<20					
Arsenic	90	95	4.8	80-120	<20					

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QUALITY CONTROL REPORT

QC Batch No: 101515-3

Analytes	LCS % REC	LCS DUP % REC	LCS RPD % REC	LCS/LCSD % Limit	LCS RPD % Limit					
ICP Metals										
Barium	**96**	**95**	**<1**	**80-120**	**<20**					
Beryllium	**99**	**104**	**5.0**	**80-120**	**<20**					
Cadmium	**92**	**96**	**4.9**	**80-120**	**<20**					
Chromium	**94**	**98**	**4.9**	**80-120**	**<20**					
Cobalt	**90**	**95**	**4.6**	**80-120**	**<20**					
Copper	**94**	**97**	**3.8**	**80-120**	**<20**					
Lead	**93**	**98**	**5.0**	**80-120**	**<20**					
Molybdenum	**91**	**95**	**4.7**	**80-120**	**<20**					
Nickel	**93**	**97**	**4.5**	**80-120**	**<20**					
Selenium	**90**	**95**	**5.1**	**80-120**	**<20**					
Silver	**97**	**95**	**2.1**	**80-120**	**<20**					
Thallium	**93**	**97**	**3.9**	**80-120**	**<20**					
Vanadium	**92**	**96**	**4.6**	**80-120**	**<20**					
Zinc	**92**	**93**	**1.2**	**80-120**	**<20**					

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QC Batch No: 101515-3

Our Lab I.D.		339131	339132	339133	339134	339135
Client Sample I.D.		B-6@10'	B-6@15'	B-6@20'	B-5@5'	B-5@10'
Date Sampled		10/12/2015	10/12/2015	10/12/2015	10/12/2015	10/12/2015
Date Prepared		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
AA Metals						
Mercury	0.0500	ND	ND	ND	ND	ND
ICP Metals						
Antimony	0.500	ND	ND	ND	ND	ND
Arsenic	0.250	ND	ND	ND	2.77	1.03
Barium	0.500	58.0	71.1	80.4	51.7	46.5
Beryllium	0.500	ND	ND	ND	ND	ND
Cadmium	0.500	ND	ND	ND	ND	ND
Chromium	0.500	2.77	4.22	1.73	2.55	3.29
Cobalt	0.500	ND	ND	ND	ND	ND
Copper	0.500	1.38	2.74	1.69	2.26	1.96
Lead	0.250	ND	ND	ND	1.73	ND
Molybdenum	0.500	ND	ND	ND	ND	ND
Nickel	0.500	ND	ND	ND	ND	ND
Selenium	0.500	ND	ND	ND	ND	ND
Silver	0.500	ND	ND	ND	ND	ND
Thallium	0.500	ND	ND	ND	ND	ND
Vanadium	0.500	8.51	11.4	11.2	7.80	8.57
Zinc	0.500	11.3	15.3	17.1	14.7	10.0

QUALITY CONTROL REPORT

QC Batch No: 101515-3

Analytes	LCS % REC	LCS DUP % REC	LCS RPD % REC	LCS/LCSD % Limit	LCS RPD % Limit					
AA Metals										
Mercury	102	100	2.0	80-120	<20					
ICP Metals										
Antimony	92	98	6.1	80-120	<20					
Arsenic	90	95	4.8	80-120	<20					

ANALYTICAL RESULTS

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QUALITY CONTROL REPORT

QC Batch No: 101515-3

Analytes	LCS % REC	LCS DUP % REC	LCS RPD % REC	LCS/LCSD % Limit	LCS RPD % Limit					
ICP Metals										
Barium	**96**	**95**	**<1**	**80-120**	**<20**					
Beryllium	**99**	**104**	**5.0**	**80-120**	**<20**					
Cadmium	**92**	**96**	**4.9**	**80-120**	**<20**					
Chromium	**94**	**98**	**4.9**	**80-120**	**<20**					
Cobalt	**90**	**95**	**4.6**	**80-120**	**<20**					
Copper	**94**	**97**	**3.8**	**80-120**	**<20**					
Lead	**93**	**98**	**5.0**	**80-120**	**<20**					
Molybdenum	**91**	**95**	**4.7**	**80-120**	**<20**					
Nickel	**93**	**97**	**4.5**	**80-120**	**<20**					
Selenium	**90**	**95**	**5.1**	**80-120**	**<20**					
Silver	**97**	**95**	**2.1**	**80-120**	**<20**					
Thallium	**93**	**97**	**3.9**	**80-120**	**<20**					
Vanadium	**92**	**96**	**4.6**	**80-120**	**<20**					
Zinc	**92**	**93**	**1.2**	**80-120**	**<20**					

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QC Batch No: 101515-3

Our Lab I.D.		**339136**				
Client Sample I.D.		B-5@15'				
Date Sampled		10/12/2015				
Date Prepared		10/16/2015				
Preparation Method						
Date Analyzed		10/17/2015				
Matrix		Soil				
Units		mg/Kg				
Dilution Factor		1				
Analytes	**PQL**	**Results**				
AA Metals						
Mercury	0.0500	ND				
ICP Metals						
Antimony	0.500	ND				
Arsenic	0.250	1.28				
Barium	0.500	76.2				
Beryllium	0.500	ND				
Cadmium	0.500	ND				
Chromium	0.500	9.75				
Cobalt	0.500	ND				
Copper	0.500	3.04				
Lead	0.250	ND				
Molybdenum	0.500	0.998				
Nickel	0.500	ND				
Selenium	0.500	ND				
Silver	0.500	ND				
Thallium	0.500	ND				
Vanadium	0.500	10.9				
Zinc	0.500	18.7				

QUALITY CONTROL REPORT

QC Batch No: 101515-3

Analytes	LCS % REC	LCS DUP % REC	LCS RPD % REC	LCS/LCSD % Limit	LCS RPD % Limit					
AA Metals										
Mercury	102	100	2.0	80-120	<20					
ICP Metals										
Antimony	92	98	6.1	80-120	<20					
Arsenic	90	95	4.8	80-120	<20					

ANALYTICAL RESULTS

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QUALITY CONTROL REPORT

QC Batch No: 101515-3

Analytes	LCS % REC	LCS DUP % REC	LCS RPD % REC	LCS/LCSD % Limit	LCS RPD % Limit					
ICP Metals										
Barium	**96**	**95**	**<1**	**80-120**	**<20**					
Beryllium	**99**	**104**	**5.0**	**80-120**	**<20**					
Cadmium	**92**	**96**	**4.9**	**80-120**	**<20**					
Chromium	**94**	**98**	**4.9**	**80-120**	**<20**					
Cobalt	**90**	**95**	**4.6**	**80-120**	**<20**					
Copper	**94**	**97**	**3.8**	**80-120**	**<20**					
Lead	**93**	**98**	**5.0**	**80-120**	**<20**					
Molybdenum	**91**	**95**	**4.7**	**80-120**	**<20**					
Nickel	**93**	**97**	**4.5**	**80-120**	**<20**					
Selenium	**90**	**95**	**5.1**	**80-120**	**<20**					
Silver	**97**	**95**	**2.1**	**80-120**	**<20**					
Thallium	**93**	**97**	**3.9**	**80-120**	**<20**					
Vanadium	**92**	**96**	**4.6**	**80-120**	**<20**					
Zinc	**92**	**93**	**1.2**	**80-120**	**<20**					

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 8015B, TPH DROs and OROs (Diesel and Oil Range Organics)

QC Batch No: S1D-101415

Our Lab I.D.		**339106**	**339107**	**339108**	**339109**	**339110**
Client Sample I.D.		B-7@5'	B-7@10'	B-7@15'	B-7@20'	B-7@25'
Date Sampled		**10/12/2015**	**10/12/2015**	**10/12/2015**	**10/12/2015**	**10/12/2015**
Date Prepared		**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**
Preparation Method						
Date Analyzed		**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH DROs (C10 to C28)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
TPH OROs (C28+)	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**

Our Lab I.D.		**339106**	**339107**	**339108**	**339109**	**339110**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Chlorobenzene	**70-120**	**102**	**99**	**102**	**98**	**103**

QUALITY CONTROL REPORT

QC Batch No: S1D-101415

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Diesel	**99**	**103**	**4.0**	**75-120**	**<20**					

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 8015B, TPH DROs and OROs (Diesel and Oil Range Organics)

QC Batch No: S1D-101415

Our Lab I.D.		**339111**	**339112**	**339113**	**339114**	**339115**
Client Sample I.D.		B-7@30'	B-7@35'	B-7@40'	B-14@5'	B-14@10'
Date Sampled		10/12/2015	10/12/2015	10/12/2015	10/12/2015	10/12/2015
Date Prepared		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Preparation Method						
Date Analyzed		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH DROs (C10 to C28)	10.0	ND	ND	ND	ND	ND
TPH OROs (C28+)	50.0	ND	ND	ND	ND	ND

Our Lab I.D.		**339111**	**339112**	**339113**	**339114**	**339115**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Chlorobenzene	70-120	104	99	104	99	103

QUALITY CONTROL REPORT

QC Batch No: S1D-101415

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Diesel	99	103	4.0	75-120	<20					

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 8015B, TPH DROs and OROs (Diesel and Oil Range Organics)

QC Batch No: S1D-101415

Our Lab I.D.		**339116**				
Client Sample I.D.		B-14@15'				
Date Sampled		**10/12/2015**				
Date Prepared		**10/14/2015**				
Preparation Method						
Date Analyzed		**10/14/2015**				
Matrix		Soil				
Units		mg/Kg				
Dilution Factor		1				
Analytes	**PQL**	**Results**				
TPH DROs (C10 to C28)	**10.0**	**ND**				
TPH OROs (C28+)	**50.0**	**ND**				

Our Lab I.D.		**339116**				
Surrogates	**% Rec.Limit**	**% Rec.**				
Surrogate Percent Recovery						
Chlorobenzene	**70-120**	**102**				

QUALITY CONTROL REPORT

QC Batch No: S1D-101415

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Diesel	**99**	**103**	**4.0**	**75-120**	**<20**					

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 8015B, TPH DROs and OROs (Diesel and Oil Range Organics)

QC Batch No: S1P-101415

Our Lab I.D.		**339121**	**339122**	**339123**	**339124**	**339125**
Client Sample I.D.		B-14@40'	B-20@5'	B-20@10'	B-20@15'	B-20@20'
Date Sampled		10/12/2015	10/12/2015	10/12/2015	10/12/2015	10/12/2015
Date Prepared		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Preparation Method						
Date Analyzed		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH DROs (C10 to C28)	10.0	ND	ND	ND	ND	ND
TPH OROs (C28+)	50.0	ND	ND	ND	ND	ND

Our Lab I.D.		**339121**	**339122**	**339123**	**339124**	**339125**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Chlorobenzene	70-120	99	98	101	101	100

QUALITY CONTROL REPORT

QC Batch No: S1P-101415

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Diesel	99	102	3.0	75-120	<20					

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 8015B, TPH DROs and OROs (Diesel and Oil Range Organics)

QC Batch No: S1P-101415

Our Lab I.D.		**339126**	**339127**	**339128**	**339129**	**339130**
Client Sample I.D.		B-20@25'	B-20@30'	B-20@35'	B-20@40'	B-6@5'
Date Sampled		**10/12/2015**	**10/12/2015**	**10/12/2015**	**10/12/2015**	**10/12/2015**
Date Prepared		**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**
Preparation Method						
Date Analyzed		**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH DROs (C10 to C28)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
TPH OROs (C28+)	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**

Our Lab I.D.		**339126**	**339127**	**339128**	**339129**	**339130**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Chlorobenzene	**70-120**	**98**	**104**	**104**	**98**	**104**

QUALITY CONTROL REPORT

QC Batch No: S1P-101415

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Diesel	**99**	**102**	**3.0**	**75-120**	**<20**					

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Project ID: 4953-15-1021
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ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 8015B, TPH DROs and OROs (Diesel and Oil Range Organics)

QC Batch No: S1P-101415

Our Lab I.D.		**339131**				
Client Sample I.D.		B-6@10'				
Date Sampled		**10/12/2015**				
Date Prepared		**10/14/2015**				
Preparation Method						
Date Analyzed		**10/14/2015**				
Matrix		Soil				
Units		mg/Kg				
Dilution Factor		1				
Analytes	**PQL**	**Results**				
TPH DROs (C10 to C28)	**10.0**	**ND**				
TPH OROs (C28+)	**50.0**	**ND**				

Our Lab I.D.		**339131**				
Surrogates	**% Rec.Limit**	**% Rec.**				
Surrogate Percent Recovery						
Chlorobenzene	**70-120**	**103**				

QUALITY CONTROL REPORT

QC Batch No: S1P-101415

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Diesel	**99**	**102**	**3.0**	**75-120**	**<20**					

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 8015B, TPH DROs and OROs (Diesel and Oil Range Organics)

QC Batch No: S2D-101415

Our Lab I.D.		**339117**	**339118**	**339119**	**339120**	
Client Sample I.D.		B-14@20'	B-14@25'	B-14@30'	B-14@35'	
Date Sampled		10/12/2015	10/12/2015	10/12/2015	10/12/2015	
Date Prepared		10/14/2015	10/14/2015	10/14/2015	10/14/2015	
Preparation Method						
Date Analyzed		10/15/2015	10/15/2015	10/15/2015	10/15/2015	
Matrix		Soil	Soil	Soil	Soil	
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	
Dilution Factor		1	1	1	1	
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	
TPH DROs (C10 to C28)	10.0	ND	ND	ND	ND	
TPH OROs (C28+)	50.0	ND	ND	ND	ND	

Our Lab I.D.		**339117**	**339118**	**339119**	**339120**	
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	
Surrogate Percent Recovery						
Chlorobenzene	70-120	104	99	103	104	

QUALITY CONTROL REPORT

QC Batch No: S2D-101415

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Diesel	90	94	4.3	75-120	<20					

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 8015B, TPH DROs and OROs (Diesel and Oil Range Organics)

QC Batch No: S2P-101415

Our Lab I.D.		**339132**	**339133**	**339134**	**339135**	**339136**
Client Sample I.D.		B-6@15'	B-6@20'	B-5@5'	B-5@10'	B-5@15'
Date Sampled		10/12/2015	10/12/2015	10/12/2015	10/12/2015	10/12/2015
Date Prepared		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Preparation Method						
Date Analyzed		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH DROs (C10 to C28)	10.0	ND	ND	ND	ND	ND
TPH OROs (C28+)	50.0	ND	ND	ND	ND	ND

Our Lab I.D.		**339132**	**339133**	**339134**	**339135**	**339136**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Chlorobenzene	70-120	102	98	99	102	103

QUALITY CONTROL REPORT

QC Batch No: S2P-101415

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Diesel	93	95	2.1	75-120	<20					

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Project ID: 4953-15-1021
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ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 8015B, TPH GROs (Gasoline Range Organics)

QC Batch No: S1G-101415

Our Lab I.D.		**339106**	**339107**	**339108**	**339109**	**339110**
Client Sample I.D.		B-7@5'	B-7@10'	B-7@15'	B-7@20'	B-7@25'
Date Sampled		10/12/2015	10/12/2015	10/12/2015	10/12/2015	10/12/2015
Date Prepared		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Preparation Method						
Date Analyzed		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH GROs (C6 to C10)	500	ND	ND	ND	ND	ND

Our Lab I.D.		**339106**	**339107**	**339108**	**339109**	**339110**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Bromofluorobenzene	70-120	99	100	103	104	102

QUALITY CONTROL REPORT

QC Batch No: S1G-101415

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	101	98	3.0	75-120	<20					
Toluene	101	99	2.0	75-120	<20					

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 8015B, TPH GROs (Gasoline Range Organics)

QC Batch No: S1G-101415

Our Lab I.D.		**339111**	**339112**	**339113**	**339114**	**339115**
Client Sample I.D.		B-7@30'	B-7@35'	B-7@40'	B-14@5'	B-14@10'
Date Sampled		**10/12/2015**	**10/12/2015**	**10/12/2015**	**10/12/2015**	**10/12/2015**
Date Prepared		**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**
Preparation Method						
Date Analyzed		**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH GROs (C6 to C10)	**500**	**ND**	**ND**	**ND**	**ND**	**ND**

Our Lab I.D.		**339111**	**339112**	**339113**	**339114**	**339115**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Bromofluorobenzene	**70-120**	**100**	**98**	**103**	**97**	**95**

QUALITY CONTROL REPORT

QC Batch No: S1G-101415

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	**101**	**98**	**3.0**	**75-120**	**<20**					
Toluene	**101**	**99**	**2.0**	**75-120**	**<20**					

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Project Name: UCR

ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 8015B, TPH GROs (Gasoline Range Organics)

QC Batch No: S1G-101415

Our Lab I.D.		**339116**	**339119**	**339120**	**339121**	**339122**
Client Sample I.D.		B-14@15'	B-14@30'	B-14@35'	B-14@40'	B-20@5'
Date Sampled		10/12/2015	10/12/2015	10/12/2015	10/12/2015	10/12/2015
Date Prepared		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Preparation Method						
Date Analyzed		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH GROs (C6 to C10)	500	ND	ND	ND	ND	ND

Our Lab I.D.		**339116**	**339119**	**339120**	**339121**	**339122**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Bromofluorobenzene	70-120	99	95	97	92	92

QUALITY CONTROL REPORT

QC Batch No: S1G-101415

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	101	98	3.0	75-120	<20					
Toluene	101	99	2.0	75-120	<20					

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ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 8015B, TPH GROs (Gasoline Range Organics)

QC Batch No: S1G-101415

Our Lab I.D.		**339123**	**339124**	**339125**	**339126**	
Client Sample I.D.		B-20@10'	B-20@15'	B-20@20'	B-20@25'	
Date Sampled		**10/12/2015**	**10/12/2015**	**10/12/2015**	**10/12/2015**	
Date Prepared		**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**	
Preparation Method						
Date Analyzed		**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**	
Matrix		Soil	Soil	Soil	Soil	
Units		ug/kg	ug/kg	ug/kg	ug/kg	
Dilution Factor		1	1	1	1	
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	
TPH GROs (C6 to C10)	**500**	**ND**	**ND**	**ND**	**ND**	

Our Lab I.D.		**339123**	**339124**	**339125**	**339126**	
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	
Surrogate Percent Recovery						
Bromofluorobenzene	**70-120**	**97**	**90**	**92**	**93**	

QUALITY CONTROL REPORT

QC Batch No: S1G-101415

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	**101**	**98**	**3.0**	**75-120**	**<20**					
Toluene	**101**	**99**	**2.0**	**75-120**	**<20**					

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Project ID: 4953-15-1021
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ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 8015B, TPH GROs (Gasoline Range Organics)

QC Batch No: S1G-101515

Our Lab I.D.		**339117**	**339118**	**339127**		
Client Sample I.D.		B-14@20'	B-14@25'	B-20@30'		
Date Sampled		**10/12/2015**	**10/12/2015**	**10/12/2015**		
Date Prepared		**10/15/2015**	**10/15/2015**	**10/15/2015**		
Preparation Method						
Date Analyzed		**10/15/2015**	**10/15/2015**	**10/15/2015**		
Matrix		Soil	Soil	Soil		
Units		ug/kg	ug/kg	ug/kg		
Dilution Factor		1	1	1		
Analytes	**PQL**	**Results**	**Results**	**Results**		
TPH GROs (C6 to C10)	**500**	**ND**	**ND**	**ND**		

Our Lab I.D.		**339117**	**339118**	**339127**		
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**		
Surrogate Percent Recovery						
Bromofluorobenzene	**70-120**	**100**	**103**	**97**		

QUALITY CONTROL REPORT

QC Batch No: S1G-101515

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	**100**	**100**	**<1**	**75-120**	**<20**					
Toluene	**100**	**101**	**<1**	**75-120**	**<20**					

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 8015B, TPH GROs (Gasoline Range Organics)

QC Batch No: S2G-101415

Our Lab I.D.		**339128**	**339129**	**339130**	**339131**	**339132**
Client Sample I.D.		B-20@35'	B-20@40'	B-6@5'	B-6@10'	B-6@15'
Date Sampled		10/12/2015	10/12/2015	10/12/2015	10/12/2015	10/12/2015
Date Prepared		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Preparation Method						
Date Analyzed		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH GROs (C6 to C10)	500	ND	ND	ND	ND	ND

Our Lab I.D.		**339128**	**339129**	**339130**	**339131**	**339132**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Bromofluorobenzene	70-120	95	94	97	86	77

QUALITY CONTROL REPORT

QC Batch No: S2G-101415

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	95	101	6.1	75-120	<20					
Toluene	95	100	5.1	75-120	<20					

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ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 8015B, TPH GROs (Gasoline Range Organics)

QC Batch No: S2G-101415

Our Lab I.D.		**339133**	**339134**	**339135**	**339136**	
Client Sample I.D.		B-6@20'	B-5@5'	B-5@10'	B-5@15'	
Date Sampled		**10/12/2015**	**10/12/2015**	**10/12/2015**	**10/12/2015**	
Date Prepared		**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**	
Preparation Method						
Date Analyzed		**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**	
Matrix		Soil	Soil	Soil	Soil	
Units		ug/kg	ug/kg	ug/kg	ug/kg	
Dilution Factor		1	1	1	1	
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	
TPH GROs (C6 to C10)	**500**	**ND**	**ND**	**ND**	**ND**	

Our Lab I.D.		**339133**	**339134**	**339135**	**339136**	
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	
Surrogate Percent Recovery						
Bromofluorobenzene	**70-120**	**84**	**84**	**87**	**79**	

QUALITY CONTROL REPORT

QC Batch No: S2G-101415

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	**95**	**101**	**6.1**	**75-120**	**<20**					
Toluene	**95**	**100**	**5.1**	**75-120**	**<20**					

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1B-101415

Our Lab I.D.		**339127**	**339128**	**339129**	**339130**	**339131**
Client Sample I.D.		B-20@30'	B-20@35'	B-20@40'	B-6@5'	B-6@10'
Date Sampled		10/12/2015	10/12/2015	10/12/2015	10/12/2015	10/12/2015
Date Prepared		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Preparation Method						
Date Analyzed		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Acetone	50.0	ND	ND	ND	ND	ND
Benzene	2.00	ND	ND	ND	ND	ND
Bromobenzene (Phenyl bromide)	10.0	ND	ND	ND	ND	ND
Bromochloromethane (Chlorobromomethane)	10.0	ND	ND	ND	ND	ND
Bromodichloromethane (Dichlorobromomethane)	10.0	ND	ND	ND	ND	ND
Bromoform (Tribromomethane)	50.0	ND	ND	ND	ND	ND
Bromomethane (Methyl bromide)	30.0	ND	ND	ND	ND	ND
2-Butanone (MEK, Methyl ethyl ketone)	50.0	ND	ND	ND	ND	ND
n-Butylbenzene	10.0	ND	ND	ND	ND	ND
sec-Butylbenzene	10.0	ND	ND	ND	ND	ND
tert-Butylbenzene	10.0	ND	ND	ND	ND	ND
Carbon disulfide	10.0	ND	ND	ND	ND	ND
Carbon tetrachloride (Tetrachloromethane)	10.0	ND	ND	ND	ND	ND
Chlorobenzene	10.0	ND	ND	ND	ND	ND
Chloroethane	30.0	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	50.0	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	10.0	ND	ND	ND	ND	ND
Chloromethane (Methyl chloride)	30.0	ND	ND	ND	ND	ND
4-Chlorotoluene (p-Chlorotoluene)	10.0	ND	ND	ND	ND	ND
2-Chlorotoluene (o-Chlorotoluene)	10.0	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane (DBCP)	50.0	ND	ND	ND	ND	ND
Dibromochloromethane	10.0	ND	ND	ND	ND	ND
1,2-Dibromoethane (EDB, Ethylene dibromide)	10.0	ND	ND	ND	ND	ND
Dibromomethane	10.0	ND	ND	ND	ND	ND
1,2-Dichlorobenzene (o-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
1,3-Dichlorobenzene (m-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
1,4-Dichlorobenzene (p-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
Dichlorodifluoromethane	30.0	ND	ND	ND	ND	ND
1,1-Dichloroethane	10.0	ND	ND	ND	ND	ND

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1B-101415

Our Lab I.D.		**339127**	**339128**	**339129**	**339130**	**339131**
Client Sample I.D.		B-20@30'	B-20@35'	B-20@40'	B-6@5'	B-6@10'
Date Sampled		10/12/2015	10/12/2015	10/12/2015	10/12/2015	10/12/2015
Date Prepared		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Preparation Method						
Date Analyzed		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
1,2-Dichloroethane	10.0	ND	ND	ND	ND	ND
1,1-Dichloroethene (1,1-Dichloroethylene)	10.0	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	10.0	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	10.0	ND	ND	ND	ND	ND
1,2-Dichloropropane	10.0	ND	ND	ND	ND	ND
1,3-Dichloropropane	10.0	ND	ND	ND	ND	ND
2,2-Dichloropropane	10.0	ND	ND	ND	ND	ND
1,1-Dichloropropene	10.0	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	10.0	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	10.0	ND	ND	ND	ND	ND
Ethylbenzene	2.00	ND	ND	ND	ND	ND
Hexachlorobutadiene (1,3-Hexachlorobutadiene)	30.0	ND	ND	ND	ND	ND
2-Hexanone	50.0	ND	ND	ND	ND	ND
Isopropylbenzene	10.0	ND	ND	ND	ND	ND
p-Isopropyltoluene (4-Isopropyltoluene)	10.0	ND	ND	ND	ND	ND
MTBE	5.00	ND	ND	ND	ND	ND
4-Methyl-2-pentanone (MIBK, Methyl isobutyl ketone)	50.0	ND	ND	ND	ND	ND
Methylene chloride (Dichloromethane, DCM)	50.0	ND	ND	ND	ND	ND
Naphthalene	10.0	ND	ND	ND	ND	ND
n-Propylbenzene	10.0	ND	ND	ND	ND	ND
Styrene	10.0	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	10.0	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	10.0	ND	ND	ND	ND	ND
Tetrachloroethene (Tetrachloroethylene)	10.0	ND	ND	ND	ND	ND
Toluene (Methyl benzene)	2.00	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	10.0	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	10.0	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	10.0	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	10.0	ND	ND	ND	ND	ND
Trichloroethene (TCE)	10.0	ND	ND	ND	ND	ND
Trichlorofluoromethane	10.0	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	10.0	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	10.0	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	10.0	ND	ND	ND	ND	ND
Vinyl acetate	50.0	ND	ND	ND	ND	ND

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1B-101415

Our Lab I.D.		**339127**	**339128**	**339129**	**339130**	**339131**
Client Sample I.D.		B-20@30'	B-20@35'	B-20@40'	B-6@5'	B-6@10'
Date Sampled		**10/12/2015**	**10/12/2015**	**10/12/2015**	**10/12/2015**	**10/12/2015**
Date Prepared		**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**
Preparation Method						
Date Analyzed		**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Vinyl chloride (Chloroethene)	**30.0**	**ND**	**ND**	**ND**	**ND**	**ND**
o-Xylene	**2.00**	**ND**	**ND**	**ND**	**ND**	**ND**
m- & p-Xylenes	**4.00**	**ND**	**ND**	**ND**	**ND**	**ND**

Our Lab I.D.		**339127**	**339128**	**339129**	**339130**	**339131**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Bromofluorobenzene	**70-120**	**118**	**118**	**118**	**117**	**119**
Dibromofluoromethane	**70-120**	**95**	**96**	**97**	**97**	**92**
Toluene-d8	**70-120**	**104**	**104**	**104**	**104**	**103**

QUALITY CONTROL REPORT

QC Batch No: S1B-101415

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	**92**	**92**	**<1**	**75-120**	**15**					
Chlorobenzene	**111**	**112**	**<1**	**75-120**	**15**					
1,1-Dichloroethene (1,1-Dichloroethylene)	**76**	**76**	**<1**	**75-120**	**15**					
MTBE	**100**	**104**	**3.9**	**75-120**	**15**					
Toluene (Methyl benzene)	**115**	**116**	**<1**	**75-120**	**15**					
Trichloroethene (TCE)	**88**	**87**	**1.1**	**75-120**	**15**					

ANALYTICAL RESULTS

Ordered By

Amec Foster Wheeler
6001 Rickenbacker Road
Los Angeles, CA 90040-

Site

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Aberdeen Drive
Riverside, CA

Telephone: (323)889-5300
Attn: Mark Murphy

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1B-101415

Our Lab I.D.		**339132**	**339133**	**339134**	**339135**	**339136**
Client Sample I.D.		B-6@15'	B-6@20'	B-5@5'	B-5@10'	B-5@15'
Date Sampled		10/12/2015	10/12/2015	10/12/2015	10/12/2015	10/12/2015
Date Prepared		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Preparation Method						
Date Analyzed		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Acetone	50.0	ND	ND	ND	ND	ND
Benzene	2.00	ND	ND	ND	ND	ND
Bromobenzene (Phenyl bromide)	10.0	ND	ND	ND	ND	ND
Bromochloromethane (Chlorobromomethane)	10.0	ND	ND	ND	ND	ND
Bromodichloromethane (Dichlorobromomethane)	10.0	ND	ND	ND	ND	ND
Bromoform (Tribromomethane)	50.0	ND	ND	ND	ND	ND
Bromomethane (Methyl bromide)	30.0	ND	ND	ND	ND	ND
2-Butanone (MEK, Methyl ethyl ketone)	50.0	ND	ND	ND	ND	ND
n-Butylbenzene	10.0	ND	ND	ND	ND	ND
sec-Butylbenzene	10.0	ND	ND	ND	ND	ND
tert-Butylbenzene	10.0	ND	ND	ND	ND	ND
Carbon disulfide	10.0	ND	ND	ND	ND	ND
Carbon tetrachloride (Tetrachloromethane)	10.0	ND	ND	ND	ND	ND
Chlorobenzene	10.0	ND	ND	ND	ND	ND
Chloroethane	30.0	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	50.0	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	10.0	ND	ND	ND	ND	ND
Chloromethane (Methyl chloride)	30.0	ND	ND	ND	ND	ND
4-Chlorotoluene (p-Chlorotoluene)	10.0	ND	ND	ND	ND	ND
2-Chlorotoluene (o-Chlorotoluene)	10.0	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane (DBCP)	50.0	ND	ND	ND	ND	ND
Dibromochloromethane	10.0	ND	ND	ND	ND	ND
1,2-Dibromoethane (EDB, Ethylene dibromide)	10.0	ND	ND	ND	ND	ND
Dibromomethane	10.0	ND	ND	ND	ND	ND
1,2-Dichlorobenzene (o-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
1,3-Dichlorobenzene (m-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
1,4-Dichlorobenzene (p-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
Dichlorodifluoromethane	30.0	ND	ND	ND	ND	ND
1,1-Dichloroethane	10.0	ND	ND	ND	ND	ND

ANALYTICAL RESULTS

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1B-101415

Our Lab I.D.		**339132**	**339133**	**339134**	**339135**	**339136**
Client Sample I.D.		B-6@15'	B-6@20'	B-5@5'	B-5@10'	B-5@15'
Date Sampled		10/12/2015	10/12/2015	10/12/2015	10/12/2015	10/12/2015
Date Prepared		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Preparation Method						
Date Analyzed		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
1,2-Dichloroethane	10.0	ND	ND	ND	ND	ND
1,1-Dichloroethene (1,1-Dichloroethylene)	10.0	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	10.0	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	10.0	ND	ND	ND	ND	ND
1,2-Dichloropropane	10.0	ND	ND	ND	ND	ND
1,3-Dichloropropane	10.0	ND	ND	ND	ND	ND
2,2-Dichloropropane	10.0	ND	ND	ND	ND	ND
1,1-Dichloropropene	10.0	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	10.0	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	10.0	ND	ND	ND	ND	ND
Ethylbenzene	2.00	ND	ND	ND	ND	ND
Hexachlorobutadiene (1,3-Hexachlorobutadiene)	30.0	ND	ND	ND	ND	ND
2-Hexanone	50.0	ND	ND	ND	ND	ND
Isopropylbenzene	10.0	ND	ND	ND	ND	ND
p-Isopropyltoluene (4-Isopropyltoluene)	10.0	ND	ND	ND	ND	ND
MTBE	5.00	ND	ND	ND	ND	ND
4-Methyl-2-pentanone (MIBK, Methyl isobutyl ketone)	50.0	ND	ND	ND	ND	ND
Methylene chloride (Dichloromethane, DCM)	50.0	ND	ND	ND	ND	ND
Naphthalene	10.0	ND	ND	ND	ND	ND
n-Propylbenzene	10.0	ND	ND	ND	ND	ND
Styrene	10.0	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	10.0	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	10.0	ND	ND	ND	ND	ND
Tetrachloroethene (Tetrachloroethylene)	10.0	ND	ND	ND	ND	ND
Toluene (Methyl benzene)	2.00	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	10.0	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	10.0	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	10.0	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	10.0	ND	ND	ND	ND	ND
Trichloroethene (TCE)	10.0	ND	ND	ND	ND	ND
Trichlorofluoromethane	10.0	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	10.0	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	10.0	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	10.0	ND	ND	ND	ND	ND
Vinyl acetate	50.0	ND	ND	ND	ND	ND

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1B-101415

Our Lab I.D.		**339132**	**339133**	**339134**	**339135**	**339136**
Client Sample I.D.		B-6@15'	B-6@20'	B-5@5'	B-5@10'	B-5@15'
Date Sampled		**10/12/2015**	**10/12/2015**	**10/12/2015**	**10/12/2015**	**10/12/2015**
Date Prepared		**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**
Preparation Method						
Date Analyzed		**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Vinyl chloride (Chloroethene)	**30.0**	**ND**	**ND**	**ND**	**ND**	**ND**
o-Xylene	**2.00**	**ND**	**ND**	**ND**	**ND**	**ND**
m- & p-Xylenes	**4.00**	**ND**	**ND**	**ND**	**ND**	**ND**

Our Lab I.D.		**339132**	**339133**	**339134**	**339135**	**339136**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Bromofluorobenzene	**70-120**	**105**	**107**	**107**	**107**	**117**
Dibromofluoromethane	**70-120**	**97**	**95**	**88**	**88**	**98**
Toluene-d8	**70-120**	**102**	**102**	**101**	**101**	**102**

QUALITY CONTROL REPORT

QC Batch No: S1B-101415

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	**92**	**92**	**<1**	**75-120**	**15**					
Chlorobenzene	**111**	**112**	**<1**	**75-120**	**15**					
1,1-Dichloroethene (1,1-Dichloroethylene)	**76**	**76**	**<1**	**75-120**	**15**					
MTBE	**100**	**104**	**3.9**	**75-120**	**15**					
Toluene (Methyl benzene)	**115**	**116**	**<1**	**75-120**	**15**					
Trichloroethene (TCE)	**88**	**87**	**1.1**	**75-120**	**15**					

ANALYTICAL RESULTS

Ordered By

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Attn: Mark Murphy

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1C-101415

Our Lab I.D.		**339106**	**339107**	**339108**	**339109**	**339110**
Client Sample I.D.		B-7@5'	B-7@10'	B-7@15'	B-7@20'	B-7@25'
Date Sampled		10/12/2015	10/12/2015	10/12/2015	10/12/2015	10/12/2015
Date Prepared		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Preparation Method						
Date Analyzed		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Acetone	50.0	ND	ND	ND	ND	ND
Benzene	2.00	ND	ND	ND	ND	ND
Bromobenzene (Phenyl bromide)	10.0	ND	ND	ND	ND	ND
Bromochloromethane (Chlorobromomethane)	10.0	ND	ND	ND	ND	ND
Bromodichloromethane (Dichlorobromomethane)	10.0	ND	ND	ND	ND	ND
Bromoform (Tribromomethane)	50.0	ND	ND	ND	ND	ND
Bromomethane (Methyl bromide)	30.0	ND	ND	ND	ND	ND
2-Butanone (MEK, Methyl ethyl ketone)	50.0	ND	ND	ND	ND	ND
n-Butylbenzene	10.0	ND	ND	ND	ND	ND
sec-Butylbenzene	10.0	ND	ND	ND	ND	ND
tert-Butylbenzene	10.0	ND	ND	ND	ND	ND
Carbon disulfide	10.0	ND	ND	ND	ND	ND
Carbon tetrachloride (Tetrachloromethane)	10.0	ND	ND	ND	ND	ND
Chlorobenzene	10.0	ND	ND	ND	ND	ND
Chloroethane	30.0	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	50.0	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	10.0	ND	ND	ND	ND	ND
Chloromethane (Methyl chloride)	30.0	ND	ND	ND	ND	ND
4-Chlorotoluene (p-Chlorotoluene)	10.0	ND	ND	ND	ND	ND
2-Chlorotoluene (o-Chlorotoluene)	10.0	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane (DBCP)	50.0	ND	ND	ND	ND	ND
Dibromochloromethane	10.0	ND	ND	ND	ND	ND
1,2-Dibromoethane (EDB, Ethylene dibromide)	10.0	ND	ND	ND	ND	ND
Dibromomethane	10.0	ND	ND	ND	ND	ND
1,2-Dichlorobenzene (o-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
1,3-Dichlorobenzene (m-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
1,4-Dichlorobenzene (p-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
Dichlorodifluoromethane	30.0	ND	ND	ND	ND	ND
1,1-Dichloroethane	10.0	ND	ND	ND	ND	ND

AMERICAN SCIENTIFIC LABORATORIES, LLC
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ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1C-101415

Our Lab I.D.		**339106**	**339107**	**339108**	**339109**	**339110**
Client Sample I.D.		B-7@5'	B-7@10'	B-7@15'	B-7@20'	B-7@25'
Date Sampled		10/12/2015	10/12/2015	10/12/2015	10/12/2015	10/12/2015
Date Prepared		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Preparation Method						
Date Analyzed		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
1,2-Dichloroethane	10.0	ND	ND	ND	ND	ND
1,1-Dichloroethene (1,1-Dichloroethylene)	10.0	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	10.0	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	10.0	ND	ND	ND	ND	ND
1,2-Dichloropropane	10.0	ND	ND	ND	ND	ND
1,3-Dichloropropane	10.0	ND	ND	ND	ND	ND
2,2-Dichloropropane	10.0	ND	ND	ND	ND	ND
1,1-Dichloropropene	10.0	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	10.0	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	10.0	ND	ND	ND	ND	ND
Ethylbenzene	2.00	ND	ND	ND	ND	ND
Hexachlorobutadiene (1,3-Hexachlorobutadiene)	30.0	ND	ND	ND	ND	ND
2-Hexanone	50.0	ND	ND	ND	ND	ND
Isopropylbenzene	10.0	ND	ND	ND	ND	ND
p-Isopropyltoluene (4-Isopropyltoluene)	10.0	ND	ND	ND	ND	ND
MTBE	5.00	ND	ND	ND	ND	ND
4-Methyl-2-pentanone (MIBK, Methyl isobutyl ketone)	50.0	ND	ND	ND	ND	ND
Methylene chloride (Dichloromethane, DCM)	50.0	ND	ND	ND	ND	ND
Naphthalene	10.0	ND	ND	ND	ND	ND
n-Propylbenzene	10.0	ND	ND	ND	ND	ND
Styrene	10.0	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	10.0	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	10.0	ND	ND	ND	ND	ND
Tetrachloroethene (Tetrachloroethylene)	10.0	ND	ND	ND	ND	ND
Toluene (Methyl benzene)	2.00	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	10.0	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	10.0	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	10.0	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	10.0	ND	ND	ND	ND	ND
Trichloroethene (TCE)	10.0	ND	ND	ND	ND	ND
Trichlorofluoromethane	10.0	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	10.0	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	10.0	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	10.0	ND	ND	ND	ND	ND
Vinyl acetate	50.0	ND	ND	ND	ND	ND

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1C-101415

Our Lab I.D.		**339106**	**339107**	**339108**	**339109**	**339110**
Client Sample I.D.		B-7@5'	B-7@10'	B-7@15'	B-7@20'	B-7@25'
Date Sampled		**10/12/2015**	**10/12/2015**	**10/12/2015**	**10/12/2015**	**10/12/2015**
Date Prepared		**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**
Preparation Method						
Date Analyzed		**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Vinyl chloride (Chloroethene)	**30.0**	**ND**	**ND**	**ND**	**ND**	**ND**
o-Xylene	**2.00**	**ND**	**ND**	**ND**	**ND**	**ND**
m- & p-Xylenes	**4.00**	**ND**	**ND**	**ND**	**ND**	**ND**

Our Lab I.D.		**339106**	**339107**	**339108**	**339109**	**339110**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Bromofluorobenzene	**70-120**	**107**	**105**	**106**	**102**	**102**
Dibromofluoromethane	**70-120**	**85**	**85**	**87**	**86**	**71**
Toluene-d8	**70-120**	**100**	**103**	**102**	**102**	**101**

QUALITY CONTROL REPORT

QC Batch No: S1C-101415

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	**96**	**96**	**<1**	**75-120**	**15**					
Chlorobenzene	**120**	**120**	**<1**	**75-120**	**15**					
1,1-Dichloroethene (1,1-Dichloroethylene)	**87**	**88**	**1.1**	**75-120**	**15**					
MTBE	**92**	**87**	**5.6**	**75-120**	**15**					
Toluene (Methyl benzene)	**94**	**97**	**3.1**	**75-120**	**15**					
Trichloroethene (TCE)	**98**	**96**	**2.1**	**75-120**	**15**					

ANALYTICAL RESULTS

Ordered By

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Attn: Mark Murphy

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1C-101415

Our Lab I.D.		**339111**	**339112**	**339113**	**339114**	**339115**
Client Sample I.D.		B-7@30'	B-7@35'	B-7@40'	B-14@5'	B-14@10'
Date Sampled		10/12/2015	10/12/2015	10/12/2015	10/12/2015	10/12/2015
Date Prepared		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Preparation Method						
Date Analyzed		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Acetone	50.0	ND	ND	ND	ND	ND
Benzene	2.00	ND	ND	ND	ND	ND
Bromobenzene (Phenyl bromide)	10.0	ND	ND	ND	ND	ND
Bromochloromethane (Chlorobromomethane)	10.0	ND	ND	ND	ND	ND
Bromodichloromethane (Dichlorobromomethane)	10.0	ND	ND	ND	ND	ND
Bromoform (Tribromomethane)	50.0	ND	ND	ND	ND	ND
Bromomethane (Methyl bromide)	30.0	ND	ND	ND	ND	ND
2-Butanone (MEK, Methyl ethyl ketone)	50.0	ND	ND	ND	ND	ND
n-Butylbenzene	10.0	ND	ND	ND	ND	ND
sec-Butylbenzene	10.0	ND	ND	ND	ND	ND
tert-Butylbenzene	10.0	ND	ND	ND	ND	ND
Carbon disulfide	10.0	ND	ND	ND	ND	ND
Carbon tetrachloride (Tetrachloromethane)	10.0	ND	ND	ND	ND	ND
Chlorobenzene	10.0	ND	ND	ND	ND	ND
Chloroethane	30.0	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	50.0	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	10.0	ND	ND	ND	ND	ND
Chloromethane (Methyl chloride)	30.0	ND	ND	ND	ND	ND
4-Chlorotoluene (p-Chlorotoluene)	10.0	ND	ND	ND	ND	ND
2-Chlorotoluene (o-Chlorotoluene)	10.0	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane (DBCP)	50.0	ND	ND	ND	ND	ND
Dibromochloromethane	10.0	ND	ND	ND	ND	ND
1,2-Dibromoethane (EDB, Ethylene dibromide)	10.0	ND	ND	ND	ND	ND
Dibromomethane	10.0	ND	ND	ND	ND	ND
1,2-Dichlorobenzene (o-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
1,3-Dichlorobenzene (m-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
1,4-Dichlorobenzene (p-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
Dichlorodifluoromethane	30.0	ND	ND	ND	ND	ND
1,1-Dichloroethane	10.0	ND	ND	ND	ND	ND

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1C-101415

Our Lab I.D.		**339111**	**339112**	**339113**	**339114**	**339115**
Client Sample I.D.		B-7@30'	B-7@35'	B-7@40'	B-14@5'	B-14@10'
Date Sampled		**10/12/2015**	**10/12/2015**	**10/12/2015**	**10/12/2015**	**10/12/2015**
Date Prepared		**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**
Preparation Method						
Date Analyzed		**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
1,2-Dichloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1-Dichloroethene (1,1-Dichloroethylene)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
cis-1,2-Dichloroethene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
trans-1,2-Dichloroethene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2-Dichloropropane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,3-Dichloropropane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
2,2-Dichloropropane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1-Dichloropropene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
cis-1,3-Dichloropropene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
trans-1,3-Dichloropropene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Ethylbenzene	**2.00**	**ND**	**ND**	**ND**	**ND**	**ND**
Hexachlorobutadiene (1,3-Hexachlorobutadiene)	**30.0**	**ND**	**ND**	**ND**	**ND**	**ND**
2-Hexanone	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Isopropylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
p-Isopropyltoluene (4-Isopropyltoluene)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
MTBE	**5.00**	**ND**	**ND**	**ND**	**ND**	**ND**
4-Methyl-2-pentanone (MIBK, Methyl isobutyl ketone)	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Methylene chloride (Dichloromethane, DCM)	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Naphthalene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
n-Propylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Styrene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1,1,2-Tetrachloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1,2,2-Tetrachloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Tetrachloroethene (Tetrachloroethylene)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Toluene (Methyl benzene)	**2.00**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2,3-Trichlorobenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2,4-Trichlorobenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1,1-Trichloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1,2-Trichloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Trichloroethene (TCE)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Trichlorofluoromethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2,3-Trichloropropane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2,4-Trimethylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,3,5-Trimethylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Vinyl acetate	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**

ANALYTICAL RESULTS

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1C-101415

Our Lab I.D.		339111	339112	339113	339114	339115
Client Sample I.D.		B-7@30'	B-7@35'	B-7@40'	B-14@5'	B-14@10'
Date Sampled		10/12/2015	10/12/2015	10/12/2015	10/12/2015	10/12/2015
Date Prepared		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Preparation Method						
Date Analyzed		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Vinyl chloride (Chloroethene)	30.0	ND	ND	ND	ND	ND
o-Xylene	2.00	ND	ND	ND	ND	ND
m- & p-Xylenes	4.00	ND	ND	ND	ND	ND

Our Lab I.D.		339111	339112	339113	339114	339115
Surrogates	% Rec.Limit	% Rec.	% Rec.	% Rec.	% Rec.	% Rec.
Surrogate Percent Recovery						
Bromofluorobenzene	70-120	104	106	102	108	109
Dibromofluoromethane	70-120	70	70	72	87	84
Toluene-d8	70-120	102	101	103	102	97

QUALITY CONTROL REPORT

QC Batch No: S1C-101415

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	96	96	<1	75-120	15					
Chlorobenzene	120	120	<1	75-120	15					
1,1-Dichloroethene (1,1-Dichloroethylene)	87	88	1.1	75-120	15					
MTBE	92	87	5.6	75-120	15					
Toluene (Methyl benzene)	94	97	3.1	75-120	15					
Trichloroethene (TCE)	98	96	2.1	75-120	15					

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1C-101415

Our Lab I.D.		**339116**	**339117**	**339118**	**339119**	**339120**
Client Sample I.D.		B-14@15'	B-14@20'	B-14@25'	B-14@30'	B-14@35'
Date Sampled		10/12/2015	10/12/2015	10/12/2015	10/12/2015	10/12/2015
Date Prepared		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Preparation Method						
Date Analyzed		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Acetone	50.0	ND	ND	ND	ND	ND
Benzene	2.00	ND	ND	ND	ND	ND
Bromobenzene (Phenyl bromide)	10.0	ND	ND	ND	ND	ND
Bromochloromethane (Chlorobromomethane)	10.0	ND	ND	ND	ND	ND
Bromodichloromethane (Dichlorobromomethane)	10.0	ND	ND	ND	ND	ND
Bromoform (Tribromomethane)	50.0	ND	ND	ND	ND	ND
Bromomethane (Methyl bromide)	30.0	ND	ND	ND	ND	ND
2-Butanone (MEK, Methyl ethyl ketone)	50.0	ND	ND	ND	ND	ND
n-Butylbenzene	10.0	ND	ND	ND	ND	ND
sec-Butylbenzene	10.0	ND	ND	ND	ND	ND
tert-Butylbenzene	10.0	ND	ND	ND	ND	ND
Carbon disulfide	10.0	ND	ND	ND	ND	ND
Carbon tetrachloride (Tetrachloromethane)	10.0	ND	ND	ND	ND	ND
Chlorobenzene	10.0	ND	ND	ND	ND	ND
Chloroethane	30.0	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	50.0	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	10.0	ND	ND	ND	ND	ND
Chloromethane (Methyl chloride)	30.0	ND	ND	ND	ND	ND
4-Chlorotoluene (p-Chlorotoluene)	10.0	ND	ND	ND	ND	ND
2-Chlorotoluene (o-Chlorotoluene)	10.0	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane (DBCP)	50.0	ND	ND	ND	ND	ND
Dibromochloromethane	10.0	ND	ND	ND	ND	ND
1,2-Dibromoethane (EDB, Ethylene dibromide)	10.0	ND	ND	ND	ND	ND
Dibromomethane	10.0	ND	ND	ND	ND	ND
1,2-Dichlorobenzene (o-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
1,3-Dichlorobenzene (m-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
1,4-Dichlorobenzene (p-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
Dichlorodifluoromethane	30.0	ND	ND	ND	ND	ND
1,1-Dichloroethane	10.0	ND	ND	ND	ND	ND

ANALYTICAL RESULTS

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1C-101415

Our Lab I.D.		**339116**	**339117**	**339118**	**339119**	**339120**
Client Sample I.D.		B-14@15'	B-14@20'	B-14@25'	B-14@30'	B-14@35'
Date Sampled		10/12/2015	10/12/2015	10/12/2015	10/12/2015	10/12/2015
Date Prepared		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Preparation Method						
Date Analyzed		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
1,2-Dichloroethane	10.0	ND	ND	ND	ND	ND
1,1-Dichloroethene (1,1-Dichloroethylene)	10.0	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	10.0	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	10.0	ND	ND	ND	ND	ND
1,2-Dichloropropane	10.0	ND	ND	ND	ND	ND
1,3-Dichloropropane	10.0	ND	ND	ND	ND	ND
2,2-Dichloropropane	10.0	ND	ND	ND	ND	ND
1,1-Dichloropropene	10.0	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	10.0	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	10.0	ND	ND	ND	ND	ND
Ethylbenzene	2.00	ND	ND	ND	ND	ND
Hexachlorobutadiene (1,3-Hexachlorobutadiene)	30.0	ND	ND	ND	ND	ND
2-Hexanone	50.0	ND	ND	ND	ND	ND
Isopropylbenzene	10.0	ND	ND	ND	ND	ND
p-Isopropyltoluene (4-Isopropyltoluene)	10.0	ND	ND	ND	ND	ND
MTBE	5.00	ND	ND	ND	ND	ND
4-Methyl-2-pentanone (MIBK, Methyl isobutyl ketone)	50.0	ND	ND	ND	ND	ND
Methylene chloride (Dichloromethane, DCM)	50.0	ND	ND	ND	ND	ND
Naphthalene	10.0	ND	ND	ND	ND	ND
n-Propylbenzene	10.0	ND	ND	ND	ND	ND
Styrene	10.0	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	10.0	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	10.0	ND	ND	ND	ND	ND
Tetrachloroethene (Tetrachloroethylene)	10.0	ND	ND	ND	ND	ND
Toluene (Methyl benzene)	2.00	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	10.0	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	10.0	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	10.0	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	10.0	ND	ND	ND	ND	ND
Trichloroethene (TCE)	10.0	ND	ND	ND	ND	ND
Trichlorofluoromethane	10.0	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	10.0	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	10.0	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	10.0	ND	ND	ND	ND	ND
Vinyl acetate	50.0	ND	ND	ND	ND	ND

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1C-101415

Our Lab I.D.		**339116**	**339117**	**339118**	**339119**	**339120**
Client Sample I.D.		B-14@15'	B-14@20'	B-14@25'	B-14@30'	B-14@35'
Date Sampled		10/12/2015	10/12/2015	10/12/2015	10/12/2015	10/12/2015
Date Prepared		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Preparation Method						
Date Analyzed		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Vinyl chloride (Chloroethene)	30.0	ND	ND	ND	ND	ND
o-Xylene	2.00	ND	ND	ND	ND	ND
m- & p-Xylenes	4.00	ND	ND	ND	ND	ND

Our Lab I.D.		**339116**	**339117**	**339118**	**339119**	**339120**
Surrogates	% Rec.Limit	% Rec.	% Rec.	% Rec.	% Rec.	% Rec.
Surrogate Percent Recovery						
Bromofluorobenzene	70-120	105	104	104	104	105
Dibromofluoromethane	70-120	73	88	87	81	86
Toluene-d8	70-120	102	102	102	102	102

QUALITY CONTROL REPORT

QC Batch No: S1C-101415

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	96	96	<1	75-120	15					
Chlorobenzene	120	120	<1	75-120	15					
1,1-Dichloroethene (1,1-Dichloroethylene)	87	88	1.1	75-120	15					
MTBE	92	87	5.6	75-120	15					
Toluene (Methyl benzene)	94	97	3.1	75-120	15					
Trichloroethene (TCE)	98	96	2.1	75-120	15					

ANALYTICAL RESULTS

Ordered By

Amec Foster Wheeler
6001 Rickenbacker Road
Los Angeles, CA 90040-

Site

North Campus Drive and
Aberdeen Drive
Riverside, CA

Telephone: (323)889-5300
Attn: Mark Murphy

Page: **46**

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1C-101415

Our Lab I.D.		**339121**	**339122**	**339123**	**339124**	**339125**
Client Sample I.D.		B-14@40'	B-20@5'	B-20@10'	B-20@15'	B-20@20'
Date Sampled		10/12/2015	10/12/2015	10/12/2015	10/12/2015	10/12/2015
Date Prepared		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Preparation Method						
Date Analyzed		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Acetone	50.0	ND	ND	ND	ND	ND
Benzene	2.00	ND	ND	ND	ND	ND
Bromobenzene (Phenyl bromide)	10.0	ND	ND	ND	ND	ND
Bromochloromethane (Chlorobromomethane)	10.0	ND	ND	ND	ND	ND
Bromodichloromethane (Dichlorobromomethane)	10.0	ND	ND	ND	ND	ND
Bromoform (Tribromomethane)	50.0	ND	ND	ND	ND	ND
Bromomethane (Methyl bromide)	30.0	ND	ND	ND	ND	ND
2-Butanone (MEK, Methyl ethyl ketone)	50.0	ND	ND	ND	ND	ND
n-Butylbenzene	10.0	ND	ND	ND	ND	ND
sec-Butylbenzene	10.0	ND	ND	ND	ND	ND
tert-Butylbenzene	10.0	ND	ND	ND	ND	ND
Carbon disulfide	10.0	ND	ND	ND	ND	ND
Carbon tetrachloride (Tetrachloromethane)	10.0	ND	ND	ND	ND	ND
Chlorobenzene	10.0	ND	ND	ND	ND	ND
Chloroethane	30.0	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	50.0	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	10.0	ND	ND	ND	ND	ND
Chloromethane (Methyl chloride)	30.0	ND	ND	ND	ND	ND
4-Chlorotoluene (p-Chlorotoluene)	10.0	ND	ND	ND	ND	ND
2-Chlorotoluene (o-Chlorotoluene)	10.0	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane (DBCP)	50.0	ND	ND	ND	ND	ND
Dibromochloromethane	10.0	ND	ND	ND	ND	ND
1,2-Dibromoethane (EDB, Ethylene dibromide)	10.0	ND	ND	ND	ND	ND
Dibromomethane	10.0	ND	ND	ND	ND	ND
1,2-Dichlorobenzene (o-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
1,3-Dichlorobenzene (m-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
1,4-Dichlorobenzene (p-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
Dichlorodifluoromethane	30.0	ND	ND	ND	ND	ND
1,1-Dichloroethane	10.0	ND	ND	ND	ND	ND

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1C-101415

Our Lab I.D.		**339121**	**339122**	**339123**	**339124**	**339125**
Client Sample I.D.		B-14@40'	B-20@5'	B-20@10'	B-20@15'	B-20@20'
Date Sampled		**10/12/2015**	**10/12/2015**	**10/12/2015**	**10/12/2015**	**10/12/2015**
Date Prepared		**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**
Preparation Method						
Date Analyzed		**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
1,2-Dichloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1-Dichloroethene (1,1-Dichloroethylene)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
cis-1,2-Dichloroethene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
trans-1,2-Dichloroethene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2-Dichloropropane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,3-Dichloropropane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
2,2-Dichloropropane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1-Dichloropropene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
cis-1,3-Dichloropropene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
trans-1,3-Dichloropropene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Ethylbenzene	**2.00**	**ND**	**ND**	**ND**	**ND**	**ND**
Hexachlorobutadiene (1,3-Hexachlorobutadiene)	**30.0**	**ND**	**ND**	**ND**	**ND**	**ND**
2-Hexanone	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Isopropylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
p-Isopropyltoluene (4-Isopropyltoluene)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
MTBE	**5.00**	**ND**	**ND**	**ND**	**ND**	**ND**
4-Methyl-2-pentanone (MIBK, Methyl isobutyl ketone)	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Methylene chloride (Dichloromethane, DCM)	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Naphthalene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
n-Propylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Styrene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1,1,2-Tetrachloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1,2,2-Tetrachloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Tetrachloroethene (Tetrachloroethylene)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Toluene (Methyl benzene)	**2.00**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2,3-Trichlorobenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2,4-Trichlorobenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1,1-Trichloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1,2-Trichloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Trichloroethene (TCE)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Trichlorofluoromethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2,3-Trichloropropane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2,4-Trimethylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,3,5-Trimethylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Vinyl acetate	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**

ANALYTICAL RESULTS

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1C-101415

Our Lab I.D.		339121	339122	339123	339124	339125
Client Sample I.D.		B-14@40'	B-20@5'	B-20@10'	B-20@15'	B-20@20'
Date Sampled		10/12/2015	10/12/2015	10/12/2015	10/12/2015	10/12/2015
Date Prepared		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Preparation Method						
Date Analyzed		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Vinyl chloride (Chloroethene)	30.0	ND	ND	ND	ND	ND
o-Xylene	2.00	ND	ND	ND	ND	ND
m- & p-Xylenes	4.00	ND	ND	ND	ND	ND

Our Lab I.D.		339121	339122	339123	339124	339125
Surrogates	% Rec.Limit	% Rec.	% Rec.	% Rec.	% Rec.	% Rec.
Surrogate Percent Recovery						
Bromofluorobenzene	70-120	111	105	104	104	108
Dibromofluoromethane	70-120	86	87	88	72	74
Toluene-d8	70-120	110	108	105	102	103

QUALITY CONTROL REPORT

QC Batch No: S1C-101415

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	96	96	<1	75-120	15					
Chlorobenzene	120	120	<1	75-120	15					
1,1-Dichloroethene (1,1-Dichloroethylene)	87	88	1.1	75-120	15					
MTBE	92	87	5.6	75-120	15					
Toluene (Methyl benzene)	94	97	3.1	75-120	15					
Trichloroethene (TCE)	98	96	2.1	75-120	15					

ANALYTICAL RESULTS

Ordered By

Amec Foster Wheeler
6001 Rickenbacker Road
Los Angeles, CA 90040-

Site

North Campus Drive and
Aberdeen Drive
Riverside, CA

Telephone: (323)889-5300
Attn: Mark Murphy

Page: **49**

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1C-101415

Our Lab I.D.		**339126**				
Client Sample I.D.		B-20@25'				
Date Sampled		10/12/2015				
Date Prepared		10/14/2015				
Preparation Method						
Date Analyzed		10/14/2015				
Matrix		Soil				
Units		ug/kg				
Dilution Factor		1				
Analytes	**PQL**	**Results**				
Acetone	50.0	ND				
Benzene	2.00	ND				
Bromobenzene (Phenyl bromide)	10.0	ND				
Bromochloromethane (Chlorobromomethane)	10.0	ND				
Bromodichloromethane (Dichlorobromomethane)	10.0	ND				
Bromoform (Tribromomethane)	50.0	ND				
Bromomethane (Methyl bromide)	30.0	ND				
2-Butanone (MEK, Methyl ethyl ketone)	50.0	ND				
n-Butylbenzene	10.0	ND				
sec-Butylbenzene	10.0	ND				
tert-Butylbenzene	10.0	ND				
Carbon disulfide	10.0	ND				
Carbon tetrachloride (Tetrachloromethane)	10.0	ND				
Chlorobenzene	10.0	ND				
Chloroethane	30.0	ND				
2-Chloroethyl vinyl ether	50.0	ND				
Chloroform (Trichloromethane)	10.0	ND				
Chloromethane (Methyl chloride)	30.0	ND				
4-Chlorotoluene (p-Chlorotoluene)	10.0	ND				
2-Chlorotoluene (o-Chlorotoluene)	10.0	ND				
1,2-Dibromo-3-chloropropane (DBCP)	50.0	ND				
Dibromochloromethane	10.0	ND				
1,2-Dibromoethane (EDB, Ethylene dibromide)	10.0	ND				
Dibromomethane	10.0	ND				
1,2-Dichlorobenzene (o-Dichlorobenzene)	10.0	ND				
1,3-Dichlorobenzene (m-Dichlorobenzene)	10.0	ND				
1,4-Dichlorobenzene (p-Dichlorobenzene)	10.0	ND				
Dichlorodifluoromethane	30.0	ND				
1,1-Dichloroethane	10.0	ND				

ANALYTICAL RESULTS

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1C-101415

Our Lab I.D.		**339126**				
Client Sample I.D.		B-20@25'				
Date Sampled		**10/12/2015**				
Date Prepared		**10/14/2015**				
Preparation Method						
Date Analyzed		**10/14/2015**				
Matrix		Soil				
Units		ug/kg				
Dilution Factor		1				
Analytes	**PQL**	**Results**				
1,2-Dichloroethane	**10.0**	**ND**				
1,1-Dichloroethene (1,1-Dichloroethylene)	**10.0**	**ND**				
cis-1,2-Dichloroethene	**10.0**	**ND**				
trans-1,2-Dichloroethene	**10.0**	**ND**				
1,2-Dichloropropane	**10.0**	**ND**				
1,3-Dichloropropane	**10.0**	**ND**				
2,2-Dichloropropane	**10.0**	**ND**				
1,1-Dichloropropene	**10.0**	**ND**				
cis-1,3-Dichloropropene	**10.0**	**ND**				
trans-1,3-Dichloropropene	**10.0**	**ND**				
Ethylbenzene	**2.00**	**ND**				
Hexachlorobutadiene (1,3-Hexachlorobutadiene)	**30.0**	**ND**				
2-Hexanone	**50.0**	**ND**				
Isopropylbenzene	**10.0**	**ND**				
p-Isopropyltoluene (4-Isopropyltoluene)	**10.0**	**ND**				
MTBE	**5.00**	**ND**				
4-Methyl-2-pentanone (MIBK, Methyl isobutyl ketone)	**50.0**	**ND**				
Methylene chloride (Dichloromethane, DCM)	**50.0**	**ND**				
Naphthalene	**10.0**	**ND**				
n-Propylbenzene	**10.0**	**ND**				
Styrene	**10.0**	**ND**				
1,1,1,2-Tetrachloroethane	**10.0**	**ND**				
1,1,2,2-Tetrachloroethane	**10.0**	**ND**				
Tetrachloroethene (Tetrachloroethylene)	**10.0**	**ND**				
Toluene (Methyl benzene)	**2.00**	**ND**				
1,2,3-Trichlorobenzene	**10.0**	**ND**				
1,2,4-Trichlorobenzene	**10.0**	**ND**				
1,1,1-Trichloroethane	**10.0**	**ND**				
1,1,2-Trichloroethane	**10.0**	**ND**				
Trichloroethene (TCE)	**10.0**	**ND**				
Trichlorofluoromethane	**10.0**	**ND**				
1,2,3-Trichloropropane	**10.0**	**ND**				
1,2,4-Trimethylbenzene	**10.0**	**ND**				
1,3,5-Trimethylbenzene	**10.0**	**ND**				
Vinyl acetate	**50.0**	**ND**				

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66081	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1C-101415

Our Lab I.D.		339126				
Client Sample I.D.		B-20@25'				
Date Sampled		10/12/2015				
Date Prepared		10/14/2015				
Preparation Method						
Date Analyzed		10/14/2015				
Matrix		Soil				
Units		ug/kg				
Dilution Factor		1				
Analytes	**PQL**	**Results**				
Vinyl chloride (Chloroethene)	30.0	ND				
o-Xylene	2.00	ND				
m- & p-Xylenes	4.00	ND				

Our Lab I.D.		339126				
Surrogates	% Rec.Limit	% Rec.				
Surrogate Percent Recovery						
Bromofluorobenzene	70-120	104				
Dibromofluoromethane	70-120	75				
Toluene-d8	70-120	102				

QUALITY CONTROL REPORT

QC Batch No: S1C-101415

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	96	96	<1	75-120	15					
Chlorobenzene	120	120	<1	75-120	15					
1,1-Dichloroethene (1,1-Dichloroethylene)	87	88	1.1	75-120	15					
MTBE	92	87	5.6	75-120	15					
Toluene (Methyl benzene)	94	97	3.1	75-120	15					
Trichloroethene (TCE)	98	96	2.1	75-120	15					

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Rd., Los Angeles, CA 90065 Tel: (323) 223-9700 Fax: (323) 223-9500

Ordered By

Amec Foster Wheeler
6001 Rickenbacker Road
Los Angeles, CA 90040-

Number of Pages	**81**
Date Received	**10/13/2015**
Date Reported	**10/19/2015**

Telephone (323)889-5300
Attn **Mark Murphy**

Job Number	Ordered	Client
66082	10/13/2015	AMEC

Project ID: 4953-15-1021
Project Name: UCR
Site: North Campus Drive and
Aberdeen Drive
Riverside, CA

Enclosed are the results of analyses on 48 samples analyzed as specified on attached chain of custody.

Rojert G Araghi

Rojert G. Araghi
Laboratory Director

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA, CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

Page 1 Of 5

CHAIN OF CUSTODY RECORD

COC# Nº 73363 GLOBAL ID ______ E REPORT: ☐ PDF ☐ EDF ☐ EDD ASL JOB# 66082

Company: AMEC FW
Address: 6001 RICKENBACKER RD, LOS ANGLES CA 90040
Telephone: (323) 889-5300
Fax:
Special Instruction:
E-mail:

Project Name: UCR
Site Address: NORTH CAMPUS DRIVE & ABERDEEN DRIVE RIVERSIDE, CA
Project ID: 4953-15-1021
Project Manager: MARK MURPHY

Report To:
Address:
Invoice To:
Address:
P.O.#:

ANALYSIS REQUESTED

ITEM	LAB USE ONLY Lab ID	Sample ID	Date	Time	#	Type	Matrix	Preservation	VOCs METHOD 8260B	TITLE 22 METALS 6010B / 7471A		TPH FULL RANGE 8015B							Remarks
1	339137	B-10@5'	10-13-15	701	1	6" SLEEVE	SOIL	ICE CHEST	X	X		X							
2	339138	B-10@10'		704					X	X		X							
3	339139	B-10@15'							X	X		X							
4	339140	B-10@20'		708					X	X		X							
5	339141	B-10@25'		711					X	X		X							
6	339142	B-10@30'		713					X	X		X							
7	339143	B-10@35'		719					X	X		X							
8	339144	B-10@40'							X	X		X							
9	339145	B-9@5'		742					X	X		X							
10	339146	B9@10'		745					X	X		X							

Collected By: Date 10-13-15 Time 745
Relinquished By: Date Time
Received By: Date Time

Relinquished By: Date 10-13-15 Time 200
Received For Laboratory Janet Chin Date 10/13/15 Time 2:00
Condition of Sample:

TAT
☒ Normal
☐ Rush

White - Report, Yellow - Laboratory, Pink - Client

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA, CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

Page 2 of 5

CHAIN OF CUSTODY RECORD

COC# Nº 73364 GLOBAL ID

E REPORT: ☐ PDF ☐ EDF ☐ EDD ASL JOB# 66082

Company: " "
Address: " "
Telephone: " "
Fax:
Special Instruction:
E-mail:

Project Name: OCR
Site Address: " "
Project ID: 4953-15-1021
Project Manager: MARK MURPHY

Report To:
Address:
Invoice To:
Address:
P.O.#:

ANALYSIS REQUESTED

ITEM	LAB USE ONLY Lab ID	Sample ID	Date	Time	#	Type	Matrix	Preservation	" "	" "	" "								Remarks
11	339147	B-9 @ 25'	10-13-15	754	1	6" SLEEVE	SOIL	ICE CHEST	X	X	X								
12	339148	B-9 @ 30'		756					X	X	X								
13	339149	B-9 @ 35'		805					X	X	X								
14	339150	B-9 @ 40'		811					X	X	X								
15	339151	B-2 @ 5'		834					X	X	X								
16	339152	B2 @ 10'		840					X	X	X								
17	339153	B-2 @ 15'		844					X	X	X								
18	339154	B-2 @ 20'							X	X	X								
19	339155	B-2 @ 25'		851					X	X	X								
20	339156	B-2 @ 30'		855					X	X	X								

Collected By: Date 10-13-15 Time 855
Relinquished By: Date Time
Received By: Date Time

Relinquished By: Date 10-13-15 Time 200
Received For Laboratory Janet Chin Date 10/13/15 Time 2:00
Condition of Sample:

TAT
☒ Normal
☐ Rush

White - Report, Yellow - Laboratory, Pink - Client

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA, CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

Page 3 of 5

COC# Nº 73365 GLOBAL ID

E REPORT: ☐ PDF ☐ EDF ☐ EDD

ASL JOB# 66082

CHAIN OF CUSTODY RECORD

Company: " "

Address: " "

Project Name: UCR

Site Address: " "

Telephone: " "
Fax:

Special Instruction:

Project ID: 4953-15-1021

E-mail:

Project Manager: MARK MURPHY

Report To:

Address:

Invoice To:

Address:

P.O.#:

ANALYSIS REQUESTED

ITEM	LAB USE ONLY Lab ID	Sample ID	Date	Time	#	Type	Matrix	Preservation	" "	" "	" "	Remarks
21	339157	B-2@35'	10-13-15	857	1	6" SLEEVE	Soil	ICE	X	X	X	
22	339158	B-2@40'		900					X	X	X	
23	339159	B-18@5'		934					X	X	X	
24	339160	B-18@10'		935					X	X	X	
25	339161	B-18@15'							X	X	X	
26	339162	B-18@20'		942					X	X	X	
27	339163	B-18@25'		948					X	X	X	
28	339164	B-18@30'		950					X	X	X	
29	339165	B-18@35'		952					X	X	X	
30	339166	B-18@40'		956					X	X	X	

Collected By: Date 10-13-15 Time 954

Relinquished By: Date Time

Received By: Date Time

Relinquished By: Date 10-13-15 Time 200

Received For Laboratory Janet Chin Date 10/13/15 Time 2:00

Condition of Sample:

TAT
☒ Normal
☐ Rush

White - Report, Yellow - Laboratory, Pink - Client

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA, CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

Page 4 of 5

CHAIN OF CUSTODY RECORD

COC# Nº 73366 GLOBAL ID ______ E REPORT: ☐ PDF ☐ EDF ☐ EDD ASL JOB# 66082

Company: " "
Address: " "
Telephone: " "
Fax:
Special Instruction:
E-mail:

Project Name: " UBR
Site Address: " "
Project ID: 4953-15-1021
Project Manager: MARK MURPHY

Report To:
Address:
Invoice To:
Address:
P.O.#:

ANALYSIS REQUESTED

ITEM	LAB USE ONLY Lab ID	Sample ID	Date	Time	#	Type	Matrix	Preservation	" "	" "	" "	Remarks
31	339167	B-11 @ 5'	10-13-15	1020	1	6" SLEEVE	SOIL	ICE	X	X	X	
32	339168	B-11 @ 10'		1024					X	X	X	
33	339169	B-11 @ 15'		1028					X	X	X	
34	339170	B-11 @ 20'		1030					X	X	X	
35	339171	B-11 @ 25'		1034					X	X	X	
36	339172	B-11 @ 30'		1035					X	X	X	
37	339173	B-11 @ 35		1037					X	X	X	
38	339174	B-11 @ 40'		1040					X	X	X	
39	339175	B-4 @ 5'		1113					X	X	X	
40	339176	B-4 @ 10		1115					X	X	X	

Collected By: Date 10-13-15 Time 1115
Relinquished By: Date 10-13-15 Time 200
Relinquished By: Date Time
Received For Laboratory Janet Chin Date 10/13/15 Time 2:00
Received By: Date Time
Condition of Sample:

TAT
☒ Normal
☐ Rush

White - Report, Yellow - Laboratory, Pink - Client

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Environmental Testing Services
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Page 5 Of 5

CHAIN OF CUSTODY RECORD

COC# №. 73367 GLOBAL ID ______ E REPORT: ☐ PDF ☐ EDF ☐ EDD ASL JOB# 66082

Company: " "
Address: " "
Telephone: " "
Fax:
Special Instruction:
E-mail:

Project Name: UCR
Site Address: " "
Project ID: 4953-15-1021
Project Manager: MARK ~~P~~ MURPHY

Report To:
Address:
Invoice To:
Address:
P.O.#:

ANALYSIS REQUESTED

ITEM	LAB USE ONLY Lab ID	Sample ID	Date	Time	#	Type	Matrix	Preservation				Remarks
41	339177	B-4 @ 15	10-13-15	1117	1	6" SLEEVE	SOIL	ICE	X	X	X	
42	339178	B-4 @ 20'		1120					X	X	X	
43	339179	B-4 @ 25'		1127					X	X	X	
44	339180	B-4 @ 30		1131					X	X	X	
45	339181	B-4 @ 35'		1135					X	X	X	
46	339182	B-4 @ 40		1140					X	X	X	
47	339183	B-9 @ 15'		7:45					X	X	X	
48	339184	B-9 @ 20'		7:48					X	X	X	
									X	X	X	
									X	X	X	

Collected By: Date 10-13-15 Time 1140
Relinquished By: Date Time
Received By: Date Time

Relinquished By: Date 10-13-15 Time 200
Received For Laboratory: Janet Chin Date 10/13/15 Time 2:00
Condition of Sample:

TAT
☒ Normal
☐ Rush

White - Report, Yellow - Laboratory, Pink - Client

ANALYTICAL RESULTS

Ordered By

Amec Foster Wheeler
6001 Rickenbacker Road
Los Angeles, CA 90040-

Site

North Campus Drive and
Aberdeen Drive
Riverside, CA

Telephone: (323)889-5300
Attn: Mark Murphy

Page: **2**

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QC Batch No: 101615-2

Our Lab I.D.		**339137**	**339138**	**339139**	**339140**	**339141**
Client Sample I.D.		B-10@5'	B-10@10'	B-10@15'	B-10@20'	B-10@25'
Date Sampled		10/13/2015	10/13/2015	10/13/2015	10/13/2015	10/13/2015
Date Prepared		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
AA Metals						
Mercury	0.0500	ND	ND	ND	ND	ND
ICP Metals						
Antimony	0.500	ND	ND	ND	ND	ND
Arsenic	0.250	0.259	ND	ND	ND	ND
Barium	0.500	61.0	80.3	93.7	38.4	69.8
Beryllium	0.500	ND	ND	ND	ND	ND
Cadmium	0.500	ND	ND	ND	ND	ND
Chromium	0.500	1.83	0.689	1.76	0.601	1.87
Cobalt	0.500	ND	ND	ND	ND	ND
Copper	0.500	1.49	0.617	1.70	ND	1.65
Lead	0.250	ND	ND	ND	ND	ND
Molybdenum	0.500	ND	ND	ND	ND	ND
Nickel	0.500	ND	ND	ND	ND	ND
Selenium	0.500	ND	ND	ND	ND	ND
Silver	0.500	ND	ND	ND	ND	ND
Thallium	0.500	ND	ND	ND	ND	ND
Vanadium	0.500	8.24	5.00	9.94	3.77	10.8
Zinc	0.500	15.2	11.0	26.7	8.70	21.7

QUALITY CONTROL REPORT

QC Batch No: 101615-2

Analytes	LCS % REC	LCS/LCSD % Limit								
AA Metals										
Mercury	93	80-120								
ICP Metals										
Antimony	94	80-120								
Arsenic	97	80-120								

ANALYTICAL RESULTS

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QUALITY CONTROL REPORT

QC Batch No: 101615-2

Analytes	LCS % REC	LCS/LCSD % Limit								
ICP Metals										
Barium	**98**	**80-120**								
Beryllium	**106**	**80-120**								
Cadmium	**96**	**80-120**								
Chromium	**98**	**80-120**								
Cobalt	**94**	**80-120**								
Copper	**101**	**80-120**								
Lead	**99**	**80-120**								
Molybdenum	**93**	**80-120**								
Nickel	**96**	**80-120**								
Selenium	**94**	**80-120**								
Silver	**101**	**80-120**								
Thallium	**98**	**80-120**								
Vanadium	**98**	**80-120**								
Zinc	**95**	**80-120**								

ANALYTICAL RESULTS

Ordered By

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Attn: Mark Murphy

Page: **4**

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QC Batch No: 101615-2

Our Lab I.D.		**339142**	**339143**	**339144**	**339145**	**339146**
Client Sample I.D.		B-10@30'	B-10@35'	B-10@40'	B-9@5'	B-9@10'
Date Sampled		**10/13/2015**	**10/13/2015**	**10/13/2015**	**10/13/2015**	**10/13/2015**
Date Prepared		**10/16/2015**	**10/16/2015**	**10/16/2015**	**10/16/2015**	**10/16/2015**
Preparation Method						
Date Analyzed		**10/17/2015**	**10/17/2015**	**10/17/2015**	**10/17/2015**	**10/17/2015**
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
AA Metals						
Mercury	**0.0500**	**ND**	**ND**	**ND**	**ND**	**ND**
ICP Metals						
Antimony	**0.500**	**ND**	**ND**	**ND**	**ND**	**ND**
Arsenic	**0.250**	**ND**	**ND**	**ND**	**ND**	**0.511**
Barium	**0.500**	**73.2**	**35.0**	**42.1**	**46.8**	**54.1**
Beryllium	**0.500**	**ND**	**ND**	**ND**	**ND**	**ND**
Cadmium	**0.500**	**ND**	**ND**	**ND**	**ND**	**ND**
Chromium	**0.500**	**2.04**	**0.839**	**2.60**	**2.76**	**2.78**
Cobalt	**0.500**	**ND**	**ND**	**ND**	**ND**	**ND**
Copper	**0.500**	**1.89**	**1.27**	**1.65**	**1.98**	**2.06**
Lead	**0.250**	**ND**	**ND**	**ND**	**ND**	**ND**
Molybdenum	**0.500**	**ND**	**ND**	**ND**	**ND**	**ND**
Nickel	**0.500**	**ND**	**ND**	**ND**	**ND**	**ND**
Selenium	**0.500**	**ND**	**ND**	**ND**	**ND**	**ND**
Silver	**0.500**	**ND**	**ND**	**ND**	**ND**	**ND**
Thallium	**0.500**	**ND**	**ND**	**ND**	**ND**	**ND**
Vanadium	**0.500**	**10.7**	**5.72**	**8.31**	**8.33**	**8.75**
Zinc	**0.500**	**18.1**	**7.25**	**14.3**	**11.0**	**12.4**

QUALITY CONTROL REPORT

QC Batch No: 101615-2

Analytes	LCS % REC	LCS/LCSD % Limit								
AA Metals										
Mercury	**93**	**80-120**								
ICP Metals										
Antimony	**94**	**80-120**								
Arsenic	**97**	**80-120**								

ANALYTICAL RESULTS

Page: **5**

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QUALITY CONTROL REPORT

QC Batch No: 101615-2

Analytes	LCS % REC	LCS/LCSD % Limit							
ICP Metals									
Barium	**98**	**80-120**							
Beryllium	**106**	**80-120**							
Cadmium	**96**	**80-120**							
Chromium	**98**	**80-120**							
Cobalt	**94**	**80-120**							
Copper	**101**	**80-120**							
Lead	**99**	**80-120**							
Molybdenum	**93**	**80-120**							
Nickel	**96**	**80-120**							
Selenium	**94**	**80-120**							
Silver	**101**	**80-120**							
Thallium	**98**	**80-120**							
Vanadium	**98**	**80-120**							
Zinc	**95**	**80-120**							

ANALYTICAL RESULTS

Ordered By

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Los Angeles, CA 90040-

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Attn: Mark Murphy

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QC Batch No: 101615-2

Our Lab I.D.		339147	339148	339149	339150	339151
Client Sample I.D.		B-9@25'	B-9@30'	B-9@35'	B-9@40'	B-2@5'
Date Sampled		10/13/2015	10/13/2015	10/13/2015	10/13/2015	10/13/2015
Date Prepared		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
AA Metals						
Mercury	0.0500	ND	ND	ND	ND	ND
ICP Metals						
Antimony	0.500	ND	ND	ND	ND	ND
Arsenic	0.250	ND	0.370	0.261	0.331	ND
Barium	0.500	89.8	57.3	45.0	53.8	64.1
Beryllium	0.500	ND	ND	ND	ND	ND
Cadmium	0.500	ND	ND	ND	ND	ND
Chromium	0.500	2.24	1.41	1.11	3.14	1.25
Cobalt	0.500	ND	ND	ND	ND	ND
Copper	0.500	1.44	1.32	1.24	2.34	1.19
Lead	0.250	ND	ND	ND	ND	ND
Molybdenum	0.500	ND	ND	ND	ND	ND
Nickel	0.500	ND	ND	ND	ND	ND
Selenium	0.500	ND	ND	ND	ND	ND
Silver	0.500	ND	ND	ND	ND	ND
Thallium	0.500	ND	ND	ND	ND	ND
Vanadium	0.500	9.38	8.98	6.77	9.79	8.27
Zinc	0.500	17.8	16.6	10.8	16.4	17.4

QUALITY CONTROL REPORT

QC Batch No: 101615-2

Analytes	LCS % REC	LCS/LCSD % Limit								
AA Metals										
Mercury	93	80-120								
ICP Metals										
Antimony	94	80-120								
Arsenic	97	80-120								

ANALYTICAL RESULTS

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QUALITY CONTROL REPORT

QC Batch No: 101615-2

Analytes	LCS % REC	LCS/LCSD % Limit								
ICP Metals										
Barium	**98**	**80-120**								
Beryllium	**106**	**80-120**								
Cadmium	**96**	**80-120**								
Chromium	**98**	**80-120**								
Cobalt	**94**	**80-120**								
Copper	**101**	**80-120**								
Lead	**99**	**80-120**								
Molybdenum	**93**	**80-120**								
Nickel	**96**	**80-120**								
Selenium	**94**	**80-120**								
Silver	**101**	**80-120**								
Thallium	**98**	**80-120**								
Vanadium	**98**	**80-120**								
Zinc	**95**	**80-120**								

ANALYTICAL RESULTS

Ordered By

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Los Angeles, CA 90040-

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Aberdeen Drive
Riverside, CA

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Attn: Mark Murphy

Page: **8**

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QC Batch No: 101615-3

Our Lab I.D.		**339152**	**339153**	**339154**	**339155**	**339156**
Client Sample I.D.		B-2@10'	B-2@15'	B-2@20'	B-2@25'	B-2@30'
Date Sampled		10/13/2015	10/13/2015	10/13/2015	10/13/2015	10/13/2015
Date Prepared		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
AA Metals						
Mercury	0.0500	ND	ND	ND	ND	ND
ICP Metals						
Antimony	0.500	ND	ND	ND	ND	ND
Arsenic	0.250	0.328	ND	ND	ND	0.464
Barium	0.500	52.7	52.4	86.1	51.6	91.4
Beryllium	0.500	ND	ND	ND	ND	ND
Cadmium	0.500	ND	ND	ND	ND	ND
Chromium	0.500	0.548	0.572	1.49	1.58	3.02
Cobalt	0.500	ND	ND	ND	ND	ND
Copper	0.500	ND	ND	1.45	1.46	2.36
Lead	0.250	ND	ND	ND	ND	ND
Molybdenum	0.500	ND	ND	ND	ND	ND
Nickel	0.500	ND	ND	ND	ND	0.579
Selenium	0.500	ND	ND	ND	ND	ND
Silver	0.500	ND	ND	ND	ND	ND
Thallium	0.500	ND	ND	ND	ND	ND
Vanadium	0.500	3.52	4.43	11.6	8.87	13.3
Zinc	0.500	11.7	11.6	25.8	12.4	25.1

QUALITY CONTROL REPORT

QC Batch No: 101615-3

Analytes	LCS % REC	LCS/LCSD % Limit								
AA Metals										
Mercury	104	80-120								
ICP Metals										
Antimony	93	80-120								
Arsenic	93	80-120								

ANALYTICAL RESULTS

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QUALITY CONTROL REPORT

QC Batch No: 101615-3

Analytes	LCS % REC	LCS/LCSD % Limit								
ICP Metals										
Barium	**95**	**80-120**								
Beryllium	**102**	**80-120**								
Cadmium	**93**	**80-120**								
Chromium	**95**	**80-120**								
Cobalt	**92**	**80-120**								
Copper	**96**	**80-120**								
Lead	**96**	**80-120**								
Molybdenum	**92**	**80-120**								
Nickel	**94**	**80-120**								
Selenium	**91**	**80-120**								
Silver	**95**	**80-120**								
Thallium	**96**	**80-120**								
Vanadium	**94**	**80-120**								
Zinc	**94**	**80-120**								

ANALYTICAL RESULTS

Ordered By

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Page: **10**

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QC Batch No: 101615-3

Our Lab I.D.		**339157**	**339158**	**339159**	**339160**	**339161**
Client Sample I.D.		B-2@35'	B-2@40'	B-18@5'	B-18@10'	B-18@15'
Date Sampled		10/13/2015	10/13/2015	10/13/2015	10/13/2015	10/13/2015
Date Prepared		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
AA Metals						
Mercury	0.0500	ND	ND	ND	ND	ND
ICP Metals						
Antimony	0.500	ND	ND	ND	ND	ND
Arsenic	0.250	0.290	ND	0.260	ND	0.428
Barium	0.500	59.5	70.4	91.4	88.1	62.9
Beryllium	0.500	ND	ND	ND	ND	ND
Cadmium	0.500	ND	ND	ND	ND	ND
Chromium	0.500	2.42	2.57	1.92	2.97	2.83
Cobalt	0.500	ND	ND	ND	ND	ND
Copper	0.500	2.10	2.15	1.73	2.93	2.09
Lead	0.250	ND	ND	ND	ND	ND
Molybdenum	0.500	ND	ND	ND	ND	ND
Nickel	0.500	ND	0.733	ND	ND	ND
Selenium	0.500	ND	ND	ND	ND	ND
Silver	0.500	ND	ND	ND	ND	ND
Thallium	0.500	ND	ND	ND	ND	ND
Vanadium	0.500	8.47	8.61	9.46	13.2	9.84
Zinc	0.500	13.7	13.6	21.1	16.7	14.4

QUALITY CONTROL REPORT

QC Batch No: 101615-3

Analytes	LCS % REC	LCS/LCSD % Limit								
AA Metals										
Mercury	104	80-120								
ICP Metals										
Antimony	93	80-120								
Arsenic	93	80-120								

ANALYTICAL RESULTS

Page: **11**

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QUALITY CONTROL REPORT

QC Batch No: 101615-3

Analytes	LCS % REC	LCS/LCSD % Limit								
ICP Metals										
Barium	**95**	**80-120**								
Beryllium	**102**	**80-120**								
Cadmium	**93**	**80-120**								
Chromium	**95**	**80-120**								
Cobalt	**92**	**80-120**								
Copper	**96**	**80-120**								
Lead	**96**	**80-120**								
Molybdenum	**92**	**80-120**								
Nickel	**94**	**80-120**								
Selenium	**91**	**80-120**								
Silver	**95**	**80-120**								
Thallium	**96**	**80-120**								
Vanadium	**94**	**80-120**								
Zinc	**94**	**80-120**								

ANALYTICAL RESULTS

Ordered By

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Los Angeles, CA 90040-

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North Campus Drive and
Aberdeen Drive
Riverside, CA

Telephone: (323)889-5300
Attn: Mark Murphy

Page: **12**

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QC Batch No: 101615-3

Our Lab I.D.		**339162**	**339163**	**339164**	**339165**	**339166**
Client Sample I.D.		B-18@20'	B-18@25'	B-18@30'	B-18@35'	B-18@40'
Date Sampled		10/13/2015	10/13/2015	10/13/2015	10/13/2015	10/13/2015
Date Prepared		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
AA Metals						
Mercury	0.0500	ND	ND	ND	ND	ND
ICP Metals						
Antimony	0.500	ND	ND	ND	ND	ND
Arsenic	0.250	ND	0.362	ND	ND	0.260
Barium	0.500	60.0	62.7	85.3	48.6	75.7
Beryllium	0.500	ND	ND	ND	ND	ND
Cadmium	0.500	ND	ND	ND	ND	ND
Chromium	0.500	0.980	1.32	2.78	1.13	1.57
Cobalt	0.500	ND	ND	ND	ND	ND
Copper	0.500	0.833	1.21	2.35	1.08	1.38
Lead	0.250	ND	ND	ND	ND	ND
Molybdenum	0.500	ND	ND	ND	ND	ND
Nickel	0.500	ND	ND	ND	ND	ND
Selenium	0.500	ND	ND	ND	ND	ND
Silver	0.500	ND	ND	ND	ND	ND
Thallium	0.500	ND	ND	ND	ND	ND
Vanadium	0.500	6.61	8.01	12.0	6.02	1.54
Zinc	0.500	11.7	13.3	21.4	9.67	19.4

QUALITY CONTROL REPORT

QC Batch No: 101615-3

Analytes	LCS % REC	LCS/LCSD % Limit								
AA Metals										
Mercury	104	80-120								
ICP Metals										
Antimony	93	80-120								
Arsenic	93	80-120								

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QUALITY CONTROL REPORT

QC Batch No: 101615-3

Analytes	LCS % REC	LCS/LCSD % Limit							
ICP Metals									
Barium	**95**	**80-120**							
Beryllium	**102**	**80-120**							
Cadmium	**93**	**80-120**							
Chromium	**95**	**80-120**							
Cobalt	**92**	**80-120**							
Copper	**96**	**80-120**							
Lead	**96**	**80-120**							
Molybdenum	**92**	**80-120**							
Nickel	**94**	**80-120**							
Selenium	**91**	**80-120**							
Silver	**95**	**80-120**							
Thallium	**96**	**80-120**							
Vanadium	**94**	**80-120**							
Zinc	**94**	**80-120**							

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QC Batch No: 101615-4

Our Lab I.D.		**339167**	**339168**	**339169**	**339170**	**339171**
Client Sample I.D.		B-11@5'	B-11@10'	B-11@15'	B-11@20'	B-11@25'
Date Sampled		10/13/2015	10/13/2015	10/13/2015	10/13/2015	10/13/2015
Date Prepared		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
AA Metals						
Mercury	0.0500	ND	ND	ND	ND	ND
ICP Metals						
Antimony	0.500	ND	ND	ND	ND	ND
Arsenic	0.250	0.504	0.413	ND	ND	0.397
Barium	0.500	61.3	91.2	88.0	92.8	51.2
Beryllium	0.500	ND	ND	ND	ND	ND
Cadmium	0.500	ND	ND	ND	ND	ND
Chromium	0.500	2.37	1.58	0.883	1.49	3.16
Cobalt	0.500	ND	ND	ND	ND	ND
Copper	0.500	1.87	1.33	0.763	1.25	2.39
Lead	0.250	ND	ND	ND	ND	ND
Molybdenum	0.500	ND	ND	ND	ND	ND
Nickel	0.500	ND	ND	ND	ND	ND
Selenium	0.500	ND	ND	ND	ND	ND
Silver	0.500	ND	ND	ND	ND	ND
Thallium	0.500	ND	ND	ND	ND	ND
Vanadium	0.500	8.25	8.52	6.83	9.48	10.6
Zinc	0.500	13.7	21.6	21.0	21.6	15.6

QUALITY CONTROL REPORT

QC Batch No: 101615-4

Analytes	LCS % REC	LCS/LCSD % Limit								
AA Metals										
Mercury	108	80-120								
ICP Metals										
Antimony	94	80-120								
Arsenic	92	80-120								

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QUALITY CONTROL REPORT

QC Batch No: 101615-4

Analytes	LCS % REC	LCS/LCSD % Limit								
ICP Metals										
Barium	**95**	**80-120**								
Beryllium	**102**	**80-120**								
Cadmium	**93**	**80-120**								
Chromium	**95**	**80-120**								
Cobalt	**92**	**80-120**								
Copper	**96**	**80-120**								
Lead	**96**	**80-120**								
Molybdenum	**92**	**80-120**								
Nickel	**94**	**80-120**								
Selenium	**91**	**80-120**								
Silver	**97**	**80-120**								
Thallium	**95**	**80-120**								
Vanadium	**94**	**80-120**								
Zinc	**94**	**80-120**								

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QC Batch No: 101615-4

Our Lab I.D.		**339172**	**339173**	**339174**	**339175**	**339176**
Client Sample I.D.		B-11@30'	B-11@35'	B-11@40'	B-4@5'	B-4@10'
Date Sampled		10/13/2015	10/13/2015	10/13/2015	10/13/2015	10/13/2015
Date Prepared		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
AA Metals						
Mercury	0.0500	ND	ND	ND	ND	ND
ICP Metals						
Antimony	0.500	ND	ND	ND	ND	ND
Arsenic	0.250	ND	0.598	0.300	ND	ND
Barium	0.500	44.4	148	47.9	37.6	124
Beryllium	0.500	ND	ND	ND	ND	ND
Cadmium	0.500	ND	ND	ND	ND	ND
Chromium	0.500	2.36	2.30	1.87	1.84	1.45
Cobalt	0.500	ND	ND	ND	ND	ND
Copper	0.500	1.80	1.68	1.55	1.49	1.16
Lead	0.250	ND	ND	ND	ND	ND
Molybdenum	0.500	ND	ND	ND	ND	ND
Nickel	0.500	ND	ND	ND	ND	ND
Selenium	0.500	ND	ND	ND	ND	ND
Silver	0.500	ND	ND	ND	ND	ND
Thallium	0.500	ND	ND	ND	ND	ND
Vanadium	0.500	8.88	13.4	9.17	8.02	9.10
Zinc	0.500	14.1	32.6	13.6	13.5	32.2

QUALITY CONTROL REPORT

QC Batch No: 101615-4

Analytes	LCS % REC	LCS/LCSD % Limit								
AA Metals										
Mercury	108	80-120								
ICP Metals										
Antimony	94	80-120								
Arsenic	92	80-120								

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QUALITY CONTROL REPORT

QC Batch No: 101615-4

Analytes	LCS % REC	LCS/LCSD % Limit								
ICP Metals										
Barium	**95**	**80-120**								
Beryllium	**102**	**80-120**								
Cadmium	**93**	**80-120**								
Chromium	**95**	**80-120**								
Cobalt	**92**	**80-120**								
Copper	**96**	**80-120**								
Lead	**96**	**80-120**								
Molybdenum	**92**	**80-120**								
Nickel	**94**	**80-120**								
Selenium	**91**	**80-120**								
Silver	**97**	**80-120**								
Thallium	**95**	**80-120**								
Vanadium	**94**	**80-120**								
Zinc	**94**	**80-120**								

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QC Batch No: 101615-4

Our Lab I.D.		**339177**	**339178**	**339179**	**339180**	**339181**
Client Sample I.D.		B-4@15'	B-4@20'	B-4@25'	B-4@30'	B-4@35'
Date Sampled		10/13/2015	10/13/2015	10/13/2015	10/13/2015	10/13/2015
Date Prepared		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
AA Metals						
Mercury	0.0500	ND	ND	ND	ND	ND
ICP Metals						
Antimony	0.500	ND	ND	ND	ND	ND
Arsenic	0.250	ND	ND	0.321	0.284	0.322
Barium	0.500	116	85.6	57.5	61.2	45.6
Beryllium	0.500	ND	ND	ND	ND	ND
Cadmium	0.500	ND	ND	ND	ND	ND
Chromium	0.500	2.48	ND	3.58	2.09	1.90
Cobalt	0.500	ND	ND	ND	ND	ND
Copper	0.500	2.03	ND	2.50	1.24	1.51
Lead	0.250	ND	ND	ND	ND	ND
Molybdenum	0.500	ND	ND	ND	ND	ND
Nickel	0.500	ND	ND	1.03	ND	ND
Selenium	0.500	ND	ND	ND	ND	ND
Silver	0.500	ND	ND	ND	ND	ND
Thallium	0.500	ND	ND	ND	ND	ND
Vanadium	0.500	11.4	4.88	10.6	7.91	7.48
Zinc	0.500	29.1	19.8	17.0	14.9	13.3

QUALITY CONTROL REPORT

QC Batch No: 101615-4

Analytes	LCS % REC	LCS/LCSD % Limit								
AA Metals										
Mercury	108	80-120								
ICP Metals										
Antimony	94	80-120								
Arsenic	92	80-120								

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ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QUALITY CONTROL REPORT

QC Batch No: 101615-4

Analytes	LCS % REC	LCS/LCSD % Limit							
ICP Metals									
Barium	**95**	**80-120**							
Beryllium	**102**	**80-120**							
Cadmium	**93**	**80-120**							
Chromium	**95**	**80-120**							
Cobalt	**92**	**80-120**							
Copper	**96**	**80-120**							
Lead	**96**	**80-120**							
Molybdenum	**92**	**80-120**							
Nickel	**94**	**80-120**							
Selenium	**91**	**80-120**							
Silver	**97**	**80-120**							
Thallium	**95**	**80-120**							
Vanadium	**94**	**80-120**							
Zinc	**94**	**80-120**							

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QC Batch No: 101615-4

Our Lab I.D.		**339182**	**339183**	**339184**		
Client Sample I.D.		B-4@40'	B-9@15'	B-9@20'		
Date Sampled		10/13/2015	10/13/2015	10/13/2015		
Date Prepared		10/16/2015	10/16/2015	10/16/2015		
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015		
Matrix		Soil	Soil	Soil		
Units		mg/Kg	mg/Kg	mg/Kg		
Dilution Factor		1	1	1		
Analytes	**PQL**	**Results**	**Results**	**Results**		
AA Metals						
Mercury	0.0500	ND	ND	ND		
ICP Metals						
Antimony	0.500	ND	ND	ND		
Arsenic	0.250	0.289	0.371	ND		
Barium	0.500	44.6	63.4	72.7		
Beryllium	0.500	ND	ND	ND		
Cadmium	0.500	ND	ND	ND		
Chromium	0.500	2.29	2.99	2.45		
Cobalt	0.500	ND	ND	ND		
Copper	0.500	1.79	2.27	1.70		
Lead	0.250	ND	ND	ND		
Molybdenum	0.500	ND	ND	ND		
Nickel	0.500	ND	ND	ND		
Selenium	0.500	ND	ND	ND		
Silver	0.500	ND	ND	ND		
Thallium	0.500	ND	ND	ND		
Vanadium	0.500	9.17	10.3	9.59		
Zinc	0.500	15.0	16.0	17.0		

QUALITY CONTROL REPORT

QC Batch No: 101615-4

Analytes	LCS % REC	LCS/LCSD % Limit								
AA Metals										
Mercury	108	80-120								
ICP Metals										
Antimony	94	80-120								
Arsenic	92	80-120								

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QUALITY CONTROL REPORT

QC Batch No: 101615-4

Analytes	LCS % REC	LCS/LCSD % Limit								
ICP Metals										
Barium	**95**	**80-120**								
Beryllium	**102**	**80-120**								
Cadmium	**93**	**80-120**								
Chromium	**95**	**80-120**								
Cobalt	**92**	**80-120**								
Copper	**96**	**80-120**								
Lead	**96**	**80-120**								
Molybdenum	**92**	**80-120**								
Nickel	**94**	**80-120**								
Selenium	**91**	**80-120**								
Silver	**97**	**80-120**								
Thallium	**95**	**80-120**								
Vanadium	**94**	**80-120**								
Zinc	**94**	**80-120**								

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8015B, TPH DROs and OROs (Diesel and Oil Range Organics)

QC Batch No: S1D-101515

Our Lab I.D.		**339145**	**339150**	**339151**	**339152**	**339153**
Client Sample I.D.		B-9@5'	B-9@40'	B-2@5'	B-2@10'	B-2@15'
Date Sampled		**10/13/2015**	**10/13/2015**	**10/13/2015**	**10/13/2015**	**10/13/2015**
Date Prepared		**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**
Preparation Method						
Date Analyzed		**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH DROs (C10 to C28)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
TPH OROs (C28+)	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**

Our Lab I.D.		**339145**	**339150**	**339151**	**339152**	**339153**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Chlorobenzene	**70-120**	**102**	**99**	**95**	**98**	**93**

QUALITY CONTROL REPORT

QC Batch No: S1D-101515

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Diesel	**94**	**98**	**4.2**	**75-120**	**<20**					

ANALYTICAL RESULTS

Ordered By

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8015B, TPH DROs and OROs (Diesel and Oil Range Organics)

QC Batch No: S1D-101515

Our Lab I.D.		**339154**	**339155**	**339156**	**339157**	**339158**
Client Sample I.D.		B-2@20'	B-2@25'	B-2@30'	B-2@35'	B-2@40'
Date Sampled		10/13/2015	10/13/2015	10/13/2015	10/13/2015	10/13/2015
Date Prepared		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Preparation Method						
Date Analyzed		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH DROs (C10 to C28)	10.0	ND	ND	ND	ND	ND
TPH OROs (C28+)	50.0	ND	ND	ND	ND	ND

Our Lab I.D.		**339154**	**339155**	**339156**	**339157**	**339158**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Chlorobenzene	70-120	97	99	97	96	98

QUALITY CONTROL REPORT

QC Batch No: S1D-101515

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Diesel	94	98	4.2	75-120	<20					

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8015B, TPH DROs and OROs (Diesel and Oil Range Organics)

QC Batch No: S1D-101515

Our Lab I.D.		**339159**				
Client Sample I.D.		B-18@5'				
Date Sampled		**10/13/2015**				
Date Prepared		**10/14/2015**				
Preparation Method						
Date Analyzed		**10/15/2015**				
Matrix		Soil				
Units		mg/Kg				
Dilution Factor		1				
Analytes	**PQL**	**Results**				
TPH DROs (C10 to C28)	**10.0**	**ND**				
TPH OROs (C28+)	**50.0**	**ND**				

Our Lab I.D.		**339159**				
Surrogates	**% Rec.Limit**	**% Rec.**				
Surrogate Percent Recovery						
Chlorobenzene	**70-120**	**99**				

QUALITY CONTROL REPORT

QC Batch No: S1D-101515

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Diesel	**94**	**98**	**4.2**	**75-120**	**<20**					

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8015B, TPH DROs and OROs (Diesel and Oil Range Organics)

QC Batch No: S1P-101515

Our Lab I.D.		**339170**	**339171**	**339172**	**339173**	**339174**
Client Sample I.D.		B-11@20'	B-11@25'	B-11@30'	B-11@35'	B-11@40'
Date Sampled		10/13/2015	10/13/2015	10/13/2015	10/13/2015	10/13/2015
Date Prepared		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Preparation Method						
Date Analyzed		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH DROs (C10 to C28)	10.0	ND	ND	ND	ND	ND
TPH OROs (C28+)	50.0	ND	ND	ND	ND	ND

Our Lab I.D.		**339170**	**339171**	**339172**	**339173**	**339174**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Chlorobenzene	70-120	98	100	95	96	97

QUALITY CONTROL REPORT

QC Batch No: S1P-101515

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Diesel	100	108	7.7	75-120	<20					

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8015B, TPH DROs and OROs (Diesel and Oil Range Organics)

QC Batch No: S1P-101515

Our Lab I.D.		**339175**	**339176**	**339177**	**339178**	**339179**
Client Sample I.D.		B-4@5'	B-4@10'	B-4@15'	B-4@20'	B-4@25'
Date Sampled		10/13/2015	10/13/2015	10/13/2015	10/13/2015	10/13/2015
Date Prepared		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Preparation Method						
Date Analyzed		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH DROs (C10 to C28)	10.0	ND	ND	ND	ND	ND
TPH OROs (C28+)	50.0	ND	ND	ND	ND	ND

Our Lab I.D.		**339175**	**339176**	**339177**	**339178**	**339179**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Chlorobenzene	70-120	98	95	101	98	97

QUALITY CONTROL REPORT

QC Batch No: S1P-101515

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Diesel	100	108	7.7	75-120	<20					

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8015B, TPH DROs and OROs (Diesel and Oil Range Organics)

QC Batch No: S1P-101515

Our Lab I.D.		**339180**	**339181**			
Client Sample I.D.		B-4@30'	B-4@35'			
Date Sampled		**10/13/2015**	**10/13/2015**			
Date Prepared		**10/14/2015**	**10/14/2015**			
Preparation Method						
Date Analyzed		**10/16/2015**	**10/16/2015**			
Matrix		Soil	Soil			
Units		mg/Kg	mg/Kg			
Dilution Factor		1	1			
Analytes	**PQL**	**Results**	**Results**			
TPH DROs (C10 to C28)	**10.0**	**ND**	**ND**			
TPH OROs (C28+)	**50.0**	**ND**	**ND**			

Our Lab I.D.		**339180**	**339181**			
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**			
Surrogate Percent Recovery						
Chlorobenzene	**70-120**	**98**	**97**			

QUALITY CONTROL REPORT

QC Batch No: S1P-101515

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Diesel	**100**	**108**	**7.7**	**75-120**	**<20**					

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8015B, TPH DROs and OROs (Diesel and Oil Range Organics)

QC Batch No: S2D-101415

Our Lab I.D.		**339143**	**339144**	**339146**	**339147**	**339148**
Client Sample I.D.		B-10@35'	B-10@40'	B-9@10'	B-9@25'	B-9@30'
Date Sampled		10/13/2015	10/13/2015	10/13/2015	10/13/2015	10/13/2015
Date Prepared		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Preparation Method						
Date Analyzed		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH DROs (C10 to C28)	10.0	ND	ND	ND	ND	ND
TPH OROs (C28+)	50.0	ND	ND	ND	ND	ND

Our Lab I.D.		**339143**	**339144**	**339146**	**339147**	**339148**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Chlorobenzene	70-120	103	107	100	105	97

QUALITY CONTROL REPORT

QC Batch No: S2D-101415

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Diesel	90	94	4.3	75-120	<20					

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8015B, TPH DROs and OROs (Diesel and Oil Range Organics)

QC Batch No: S2D-101415

Our Lab I.D.		**339149**				
Client Sample I.D.		B-9@35'				
Date Sampled		**10/13/2015**				
Date Prepared		**10/14/2015**				
Preparation Method						
Date Analyzed		**10/15/2015**				
Matrix		Soil				
Units		mg/Kg				
Dilution Factor		1				
Analytes	**PQL**	**Results**				
TPH DROs (C10 to C28)	**10.0**	**ND**				
TPH OROs (C28+)	**50.0**	**ND**				

Our Lab I.D.		**339149**				
Surrogates	**% Rec.Limit**	**% Rec.**				
Surrogate Percent Recovery						
Chlorobenzene	**70-120**	**101**				

QUALITY CONTROL REPORT

QC Batch No: S2D-101415

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Diesel	**90**	**94**	**4.3**	**75-120**	**<20**					

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8015B, TPH DROs and OROs (Diesel and Oil Range Organics)

QC Batch No: S2D-101515

Our Lab I.D.		**339160**	**339161**	**339162**	**339163**	**339164**
Client Sample I.D.		B-18@10'	B-18@15'	B-18@20'	B-18@25'	B-18@30'
Date Sampled		10/13/2015	10/13/2015	10/13/2015	10/13/2015	10/13/2015
Date Prepared		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Preparation Method						
Date Analyzed		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH DROs (C10 to C28)	10.0	ND	ND	ND	ND	ND
TPH OROs (C28+)	50.0	ND	ND	ND	ND	ND

Our Lab I.D.		**339160**	**339161**	**339162**	**339163**	**339164**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Chlorobenzene	70-120	100	101	97	96	99

QUALITY CONTROL REPORT

QC Batch No: S2D-101515

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Diesel	89	90	1.1	75-120	<20					

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8015B, TPH DROs and OROs (Diesel and Oil Range Organics)

QC Batch No: S2D-101515

Our Lab I.D.		**339165**	**339166**	**339167**	**339168**	**339169**
Client Sample I.D.		B-18@35'	B-18@40'	B-11@5'	B-11@10'	B-11@15'
Date Sampled		**10/13/2015**	**10/13/2015**	**10/13/2015**	**10/13/2015**	**10/13/2015**
Date Prepared		**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**
Preparation Method						
Date Analyzed		**10/16/2015**	**10/16/2015**	**10/16/2015**	**10/16/2015**	**10/16/2015**
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH DROs (C10 to C28)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
TPH OROs (C28+)	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**

Our Lab I.D.		**339165**	**339166**	**339167**	**339168**	**339169**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Chlorobenzene	**70-120**	**96**	**102**	**99**	**97**	**98**

QUALITY CONTROL REPORT

QC Batch No: S2D-101515

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Diesel	**89**	**90**	**1.1**	**75-120**	**<20**					

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8015B, TPH DROs and OROs (Diesel and Oil Range Organics)

QC Batch No: S2P-101415

Our Lab I.D.		**339137**	**339138**	**339139**	**339140**	**339141**
Client Sample I.D.		B-10@5'	B-10@10'	B-10@15'	B-10@20'	B-10@25'
Date Sampled		**10/13/2015**	**10/13/2015**	**10/13/2015**	**10/13/2015**	**10/13/2015**
Date Prepared		**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**
Preparation Method						
Date Analyzed		**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH DROs (C10 to C28)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
TPH OROs (C28+)	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**

Our Lab I.D.		**339137**	**339138**	**339139**	**339140**	**339141**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Chlorobenzene	**70-120**	**102**	**102**	**100**	**101**	**100**

QUALITY CONTROL REPORT

QC Batch No: S2P-101415

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Diesel	**93**	**95**	**2.1**	**75-120**	**<20**					

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8015B, TPH DROs and OROs (Diesel and Oil Range Organics)

QC Batch No: S2P-101415

Our Lab I.D.		**339142**				
Client Sample I.D.		B-10@30'				
Date Sampled		**10/13/2015**				
Date Prepared		**10/14/2015**				
Preparation Method						
Date Analyzed		**10/15/2015**				
Matrix		Soil				
Units		mg/Kg				
Dilution Factor		1				
Analytes	**PQL**	**Results**				
TPH DROs (C10 to C28)	**10.0**	**ND**				
TPH OROs (C28+)	**50.0**	**ND**				

Our Lab I.D.		**339142**				
Surrogates	**% Rec.Limit**	**% Rec.**				
Surrogate Percent Recovery						
Chlorobenzene	**70-120**	**102**				

QUALITY CONTROL REPORT

QC Batch No: S2P-101415

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Diesel	**93**	**95**	**2.1**	**75-120**	**<20**					

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8015B, TPH DROs and OROs (Diesel and Oil Range Organics)

QC Batch No: S2P-101515

Our Lab I.D.		**339182**	**339183**	**339184**		
Client Sample I.D.		B-4@40'	B-9@15'	B-9@20'		
Date Sampled		**10/13/2015**	**10/13/2015**	**10/13/2015**		
Date Prepared		**10/14/2015**	**10/14/2015**	**10/14/2015**		
Preparation Method						
Date Analyzed		**10/16/2015**	**10/16/2015**	**10/16/2015**		
Matrix		Soil	Soil	Soil		
Units		mg/Kg	mg/Kg	mg/Kg		
Dilution Factor		1	1	1		
Analytes	**PQL**	**Results**	**Results**	**Results**		
TPH DROs (C10 to C28)	**10.0**	**ND**	**ND**	**ND**		
TPH OROs (C28+)	**50.0**	**ND**	**ND**	**ND**		

Our Lab I.D.		**339182**	**339183**	**339184**		
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**		
Surrogate Percent Recovery						
Chlorobenzene	**70-120**	**93**	**95**	**97**		

QUALITY CONTROL REPORT

QC Batch No: S2P-101515

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Diesel	**86**	**87**	**1.2**	**75-120**	**<20**					

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8015B, TPH GROs (Gasoline Range Organics)

QC Batch No: S1G-101515

Our Lab I.D.		**339182**	**339183**	**339184**		
Client Sample I.D.		B-4@40'	B-9@15'	B-9@20'		
Date Sampled		**10/13/2015**	**10/13/2015**	**10/13/2015**		
Date Prepared		**10/15/2015**	**10/15/2015**	**10/15/2015**		
Preparation Method						
Date Analyzed		**10/15/2015**	**10/15/2015**	**10/15/2015**		
Matrix		Soil	Soil	Soil		
Units		ug/kg	ug/kg	ug/kg		
Dilution Factor		1	1	1		
Analytes	**PQL**	**Results**	**Results**	**Results**		
TPH GROs (C6 to C10)	**500**	**ND**	**ND**	**ND**		

Our Lab I.D.		**339182**	**339183**	**339184**		
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**		
Surrogate Percent Recovery						
Bromofluorobenzene	**70-120**	**102**	**103**	**103**		

QUALITY CONTROL REPORT

QC Batch No: S1G-101515

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	**100**	**100**	**<1**	**75-120**	**<20**					
Toluene	**100**	**101**	**<1**	**75-120**	**<20**					

ANALYTICAL RESULTS

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Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8015B, TPH GROs (Gasoline Range Organics)

QC Batch No: S1H-101415

Our Lab I.D.		**339147**	**339148**	**339149**	**339150**	**339151**
Client Sample I.D.		B-9@25'	B-9@30'	B-9@35'	B-9@40'	B-2@5'
Date Sampled		**10/13/2015**	**10/13/2015**	**10/13/2015**	**10/13/2015**	**10/13/2015**
Date Prepared		**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**
Preparation Method						
Date Analyzed		**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH GROs (C6 to C10)	**500**	**ND**	**ND**	**ND**	**ND**	**ND**

Our Lab I.D.		**339147**	**339148**	**339149**	**339150**	**339151**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Bromofluorobenzene	**70-120**	**79**	**101**	**106**	**79**	**107**

QUALITY CONTROL REPORT

QC Batch No: S1H-101415

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	**104**	**104**	**<1**	**75-120**	**<20**					
Toluene	**105**	**106**	**<1**	**75-120**	**<20**					

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8015B, TPH GROs (Gasoline Range Organics)

QC Batch No: S1H-101415

Our Lab I.D.		**339152**	**339153**	**339154**	**339155**	**339156**
Client Sample I.D.		B-2@10'	B-2@15'	B-2@20'	B-2@25'	B-2@30'
Date Sampled		10/13/2015	10/13/2015	10/13/2015	10/13/2015	10/13/2015
Date Prepared		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Preparation Method						
Date Analyzed		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH GROs (C6 to C10)	500	ND	ND	ND	ND	ND

Our Lab I.D.		**339152**	**339153**	**339154**	**339155**	**339156**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Bromofluorobenzene	70-120	104	108	71	74	82

QUALITY CONTROL REPORT

QC Batch No: S1H-101415

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	104	104	<1	75-120	<20					
Toluene	105	106	<1	75-120	<20					

ANALYTICAL RESULTS

Ordered By

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Attn: Mark Murphy

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8015B, TPH GROs (Gasoline Range Organics)

QC Batch No: S1H-101415

Our Lab I.D.		**339157**	**339158**	**339159**	**339160**	**339161**
Client Sample I.D.		B-2@35'	B-2@40'	B-18@5'	B-18@10'	B-18@15'
Date Sampled		**10/13/2015**	**10/13/2015**	**10/13/2015**	**10/13/2015**	**10/13/2015**
Date Prepared		**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**
Preparation Method						
Date Analyzed		**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH GROs (C6 to C10)	**500**	**ND**	**ND**	**ND**	**ND**	**ND**

Our Lab I.D.		**339157**	**339158**	**339159**	**339160**	**339161**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Bromofluorobenzene	**70-120**	**79**	**76**	**80**	**72**	**97**

QUALITY CONTROL REPORT

QC Batch No: S1H-101415

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	**104**	**104**	**<1**	**75-120**	**<20**					
Toluene	**105**	**106**	**<1**	**75-120**	**<20**					

ANALYTICAL RESULTS

Ordered By

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8015B, TPH GROs (Gasoline Range Organics)

QC Batch No: S1H-101415

Our Lab I.D.		**339162**	**339163**	**339164**	**339165**	
Client Sample I.D.		B-18@20'	B-18@25'	B-18@30'	B-18@35'	
Date Sampled		10/13/2015	10/13/2015	10/13/2015	10/13/2015	
Date Prepared		10/14/2015	10/14/2015	10/14/2015	10/14/2015	
Preparation Method						
Date Analyzed		10/14/2015	10/14/2015	10/14/2015	10/14/2015	
Matrix		Soil	Soil	Soil	Soil	
Units		ug/kg	ug/kg	ug/kg	ug/kg	
Dilution Factor		1	1	1	1	
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	
TPH GROs (C6 to C10)	500	ND	ND	ND	ND	

Our Lab I.D.		**339162**	**339163**	**339164**	**339165**	
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	
Surrogate Percent Recovery						
Bromofluorobenzene	70-120	75	73	77	78	

QUALITY CONTROL REPORT

QC Batch No: S1H-101415

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	104	104	<1	75-120	<20					
Toluene	105	106	<1	75-120	<20					

ANALYTICAL RESULTS

Ordered By

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8015B, TPH GROs (Gasoline Range Organics)

QC Batch No: S2G-101415

Our Lab I.D.		**339137**	**339138**	**339139**	**339140**	**339141**
Client Sample I.D.		B-10@5'	B-10@10'	B-10@15'	B-10@20'	B-10@25'
Date Sampled		10/13/2015	10/13/2015	10/13/2015	10/13/2015	10/13/2015
Date Prepared		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Preparation Method						
Date Analyzed		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH GROs (C6 to C10)	500	ND	ND	ND	ND	ND

Our Lab I.D.		**339137**	**339138**	**339139**	**339140**	**339141**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Bromofluorobenzene	70-120	94	98	94	99	104

QUALITY CONTROL REPORT

QC Batch No: S2G-101415

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	95	101	6.1	75-120	<20					
Toluene	95	100	5.1	75-120	<20					

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8015B, TPH GROs (Gasoline Range Organics)

QC Batch No: S2G-101415

Our Lab I.D.		**339142**	**339143**	**339144**	**339145**	**339146**
Client Sample I.D.		B-10@30'	B-10@35'	B-10@40'	B-9@5'	B-9@10'
Date Sampled		10/13/2015	10/13/2015	10/13/2015	10/13/2015	10/13/2015
Date Prepared		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Preparation Method						
Date Analyzed		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH GROs (C6 to C10)	500	ND	ND	ND	ND	ND

Our Lab I.D.		**339142**	**339143**	**339144**	**339145**	**339146**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Bromofluorobenzene	70-120	104	103	101	99	100

QUALITY CONTROL REPORT

QC Batch No: S2G-101415

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	95	101	6.1	75-120	<20					
Toluene	95	100	5.1	75-120	<20					

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8015B, TPH GROs (Gasoline Range Organics)

QC Batch No: S2H-101415

Our Lab I.D.		**339166**	**339167**	**339168**	**339169**	**339170**
Client Sample I.D.		B-18@40'	B-11@5'	B-11@10'	B-11@15'	B-11@20'
Date Sampled		**10/13/2015**	**10/13/2015**	**10/13/2015**	**10/13/2015**	**10/13/2015**
Date Prepared		**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**
Preparation Method						
Date Analyzed		**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH GROs (C6 to C10)	**500**	**ND**	**ND**	**ND**	**ND**	**ND**

Our Lab I.D.		**339166**	**339167**	**339168**	**339169**	**339170**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Bromofluorobenzene	**70-120**	**71**	**97**	**73**	**95**	**90**

QUALITY CONTROL REPORT

QC Batch No: S2H-101415

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	**96**	**99**	**3.1**	**75-120**	**<20**					
Toluene	**96**	**98**	**2.1**	**75-120**	**<20**					

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8015B, TPH GROs (Gasoline Range Organics)

QC Batch No: S2H-101415

Our Lab I.D.		**339171**	**339172**	**339173**	**339174**	**339175**
Client Sample I.D.		B-11@25'	B-11@30'	B-11@35'	B-11@40'	B-4@5'
Date Sampled		10/13/2015	10/13/2015	10/13/2015	10/13/2015	10/13/2015
Date Prepared		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Preparation Method						
Date Analyzed		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH GROs (C6 to C10)	500	ND	ND	ND	ND	ND

Our Lab I.D.		**339171**	**339172**	**339173**	**339174**	**339175**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Bromofluorobenzene	70-120	104	105	108	72	100

QUALITY CONTROL REPORT

QC Batch No: S2H-101415

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	96	99	3.1	75-120	<20					
Toluene	96	98	2.1	75-120	<20					

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8015B, TPH GROs (Gasoline Range Organics)

QC Batch No: S2H-101415

Our Lab I.D.		**339176**	**339177**	**339178**	**339179**	**339180**
Client Sample I.D.		B-4@10'	B-4@15'	B-4@20'	B-4@25'	B-4@30'
Date Sampled		**10/13/2015**	**10/13/2015**	**10/13/2015**	**10/13/2015**	**10/13/2015**
Date Prepared		**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**
Preparation Method						
Date Analyzed		**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH GROs (C6 to C10)	**500**	**ND**	**ND**	**ND**	**ND**	**ND**

Our Lab I.D.		**339176**	**339177**	**339178**	**339179**	**339180**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Bromofluorobenzene	**70-120**	**108**	**103**	**108**	**74**	**70**

QUALITY CONTROL REPORT

QC Batch No: S2H-101415

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	**96**	**99**	**3.1**	**75-120**	**<20**					
Toluene	**96**	**98**	**2.1**	**75-120**	**<20**					

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8015B, TPH GROs (Gasoline Range Organics)

QC Batch No: S2H-101415

Our Lab I.D.		**339181**				
Client Sample I.D.		B-4@35'				
Date Sampled		10/13/2015				
Date Prepared		10/15/2015				
Preparation Method						
Date Analyzed		10/15/2015				
Matrix		Soil				
Units		ug/kg				
Dilution Factor		1				
Analytes	**PQL**	**Results**				
TPH GROs (C6 to C10)	500	ND				

Our Lab I.D.		**339181**				
Surrogates	**% Rec.Limit**	**% Rec.**				
Surrogate Percent Recovery						
Bromofluorobenzene	70-120	97				

QUALITY CONTROL REPORT

QC Batch No: S2H-101415

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	96	99	3.1	75-120	<20					
Toluene	96	98	2.1	75-120	<20					

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1B-101415

Our Lab I.D.		**339137**	**339138**	**339139**	**339140**	**339141**
Client Sample I.D.		B-10@5'	B-10@10'	B-10@15'	B-10@20'	B-10@25'
Date Sampled		10/13/2015	10/13/2015	10/13/2015	10/13/2015	10/13/2015
Date Prepared		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Preparation Method						
Date Analyzed		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Acetone	50.0	ND	ND	ND	ND	ND
Benzene	2.00	ND	ND	ND	ND	ND
Bromobenzene (Phenyl bromide)	10.0	ND	ND	ND	ND	ND
Bromochloromethane (Chlorobromomethane)	10.0	ND	ND	ND	ND	ND
Bromodichloromethane (Dichlorobromomethane)	10.0	ND	ND	ND	ND	ND
Bromoform (Tribromomethane)	50.0	ND	ND	ND	ND	ND
Bromomethane (Methyl bromide)	30.0	ND	ND	ND	ND	ND
2-Butanone (MEK, Methyl ethyl ketone)	50.0	ND	ND	ND	ND	ND
n-Butylbenzene	10.0	ND	ND	ND	ND	ND
sec-Butylbenzene	10.0	ND	ND	ND	ND	ND
tert-Butylbenzene	10.0	ND	ND	ND	ND	ND
Carbon disulfide	10.0	ND	ND	ND	ND	ND
Carbon tetrachloride (Tetrachloromethane)	10.0	ND	ND	ND	ND	ND
Chlorobenzene	10.0	ND	ND	ND	ND	ND
Chloroethane	30.0	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	50.0	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	10.0	ND	ND	ND	ND	ND
Chloromethane (Methyl chloride)	30.0	ND	ND	ND	ND	ND
4-Chlorotoluene (p-Chlorotoluene)	10.0	ND	ND	ND	ND	ND
2-Chlorotoluene (o-Chlorotoluene)	10.0	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane (DBCP)	50.0	ND	ND	ND	ND	ND
Dibromochloromethane	10.0	ND	ND	ND	ND	ND
1,2-Dibromoethane (EDB, Ethylene dibromide)	10.0	ND	ND	ND	ND	ND
Dibromomethane	10.0	ND	ND	ND	ND	ND
1,2-Dichlorobenzene (o-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
1,3-Dichlorobenzene (m-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
1,4-Dichlorobenzene (p-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
Dichlorodifluoromethane	30.0	ND	ND	ND	ND	ND
1,1-Dichloroethane	10.0	ND	ND	ND	ND	ND

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1B-101415

Our Lab I.D.		**339137**	**339138**	**339139**	**339140**	**339141**
Client Sample I.D.		B-10@5'	B-10@10'	B-10@15'	B-10@20'	B-10@25'
Date Sampled		10/13/2015	10/13/2015	10/13/2015	10/13/2015	10/13/2015
Date Prepared		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Preparation Method						
Date Analyzed		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
1,2-Dichloroethane	10.0	ND	ND	ND	ND	ND
1,1-Dichloroethene (1,1-Dichloroethylene)	10.0	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	10.0	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	10.0	ND	ND	ND	ND	ND
1,2-Dichloropropane	10.0	ND	ND	ND	ND	ND
1,3-Dichloropropane	10.0	ND	ND	ND	ND	ND
2,2-Dichloropropane	10.0	ND	ND	ND	ND	ND
1,1-Dichloropropene	10.0	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	10.0	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	10.0	ND	ND	ND	ND	ND
Ethylbenzene	2.00	ND	ND	ND	ND	ND
Hexachlorobutadiene (1,3-Hexachlorobutadiene)	30.0	ND	ND	ND	ND	ND
2-Hexanone	50.0	ND	ND	ND	ND	ND
Isopropylbenzene	10.0	ND	ND	ND	ND	ND
p-Isopropyltoluene (4-Isopropyltoluene)	10.0	ND	ND	ND	ND	ND
MTBE	5.00	ND	ND	ND	ND	ND
4-Methyl-2-pentanone (MIBK, Methyl isobutyl ketone)	50.0	ND	ND	ND	ND	ND
Methylene chloride (Dichloromethane, DCM)	50.0	ND	ND	ND	ND	ND
Naphthalene	10.0	ND	ND	ND	ND	ND
n-Propylbenzene	10.0	ND	ND	ND	ND	ND
Styrene	10.0	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	10.0	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	10.0	ND	ND	ND	ND	ND
Tetrachloroethene (Tetrachloroethylene)	10.0	ND	ND	ND	ND	ND
Toluene (Methyl benzene)	2.00	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	10.0	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	10.0	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	10.0	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	10.0	ND	ND	ND	ND	ND
Trichloroethene (TCE)	10.0	ND	ND	ND	ND	ND
Trichlorofluoromethane	10.0	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	10.0	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	10.0	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	10.0	ND	ND	ND	ND	ND
Vinyl acetate	50.0	ND	ND	ND	ND	ND

ANALYTICAL RESULTS

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1B-101415

Our Lab I.D.		339137	339138	339139	339140	339141
Client Sample I.D.		B-10@5'	B-10@10'	B-10@15'	B-10@20'	B-10@25'
Date Sampled		10/13/2015	10/13/2015	10/13/2015	10/13/2015	10/13/2015
Date Prepared		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Preparation Method						
Date Analyzed		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Vinyl chloride (Chloroethene)	30.0	ND	ND	ND	ND	ND
o-Xylene	2.00	ND	ND	ND	ND	ND
m- & p-Xylenes	4.00	ND	ND	ND	ND	ND

Our Lab I.D.		339137	339138	339139	339140	339141
Surrogates	% Rec.Limit	% Rec.	% Rec.	% Rec.	% Rec.	% Rec.
Surrogate Percent Recovery						
Bromofluorobenzene	70-120	103	118	103	103	99
Dibromofluoromethane	70-120	91	92	94	92	93
Toluene-d8	70-120	103	106	103	103	102

QUALITY CONTROL REPORT

QC Batch No: S1B-101415

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	92	92	<1	75-120	15					
Chlorobenzene	111	112	<1	75-120	15					
1,1-Dichloroethene (1,1-Dichloroethylene)	76	76	<1	75-120	15					
MTBE	100	104	3.9	75-120	15					
Toluene (Methyl benzene)	115	116	<1	75-120	15					
Trichloroethene (TCE)	88	87	1.1	75-120	15					

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1B-101415

Our Lab I.D.		**339142**	**339143**			
Client Sample I.D.		B-10@30'	B-10@35'			
Date Sampled		10/13/2015	10/13/2015			
Date Prepared		10/14/2015	10/14/2015			
Preparation Method						
Date Analyzed		10/14/2015	10/14/2015			
Matrix		Soil	Soil			
Units		ug/kg	ug/kg			
Dilution Factor		1	1			
Analytes	**PQL**	**Results**	**Results**			
Acetone	50.0	ND	ND			
Benzene	2.00	ND	ND			
Bromobenzene (Phenyl bromide)	10.0	ND	ND			
Bromochloromethane (Chlorobromomethane)	10.0	ND	ND			
Bromodichloromethane (Dichlorobromomethane)	10.0	ND	ND			
Bromoform (Tribromomethane)	50.0	ND	ND			
Bromomethane (Methyl bromide)	30.0	ND	ND			
2-Butanone (MEK, Methyl ethyl ketone)	50.0	ND	ND			
n-Butylbenzene	10.0	ND	ND			
sec-Butylbenzene	10.0	ND	ND			
tert-Butylbenzene	10.0	ND	ND			
Carbon disulfide	10.0	ND	ND			
Carbon tetrachloride (Tetrachloromethane)	10.0	ND	ND			
Chlorobenzene	10.0	ND	ND			
Chloroethane	30.0	ND	ND			
2-Chloroethyl vinyl ether	50.0	ND	ND			
Chloroform (Trichloromethane)	10.0	ND	ND			
Chloromethane (Methyl chloride)	30.0	ND	ND			
4-Chlorotoluene (p-Chlorotoluene)	10.0	ND	ND			
2-Chlorotoluene (o-Chlorotoluene)	10.0	ND	ND			
1,2-Dibromo-3-chloropropane (DBCP)	50.0	ND	ND			
Dibromochloromethane	10.0	ND	ND			
1,2-Dibromoethane (EDB, Ethylene dibromide)	10.0	ND	ND			
Dibromomethane	10.0	ND	ND			
1,2-Dichlorobenzene (o-Dichlorobenzene)	10.0	ND	ND			
1,3-Dichlorobenzene (m-Dichlorobenzene)	10.0	ND	ND			
1,4-Dichlorobenzene (p-Dichlorobenzene)	10.0	ND	ND			
Dichlorodifluoromethane	30.0	ND	ND			
1,1-Dichloroethane	10.0	ND	ND			

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1B-101415

Our Lab I.D.		**339142**	**339143**			
Client Sample I.D.		B-10@30'	B-10@35'			
Date Sampled		**10/13/2015**	**10/13/2015**			
Date Prepared		**10/14/2015**	**10/14/2015**			
Preparation Method						
Date Analyzed		**10/14/2015**	**10/14/2015**			
Matrix		Soil	Soil			
Units		ug/kg	ug/kg			
Dilution Factor		1	1			
Analytes	**PQL**	**Results**	**Results**			
1,2-Dichloroethane	**10.0**	**ND**	**ND**			
1,1-Dichloroethene (1,1-Dichloroethylene)	**10.0**	**ND**	**ND**			
cis-1,2-Dichloroethene	**10.0**	**ND**	**ND**			
trans-1,2-Dichloroethene	**10.0**	**ND**	**ND**			
1,2-Dichloropropane	**10.0**	**ND**	**ND**			
1,3-Dichloropropane	**10.0**	**ND**	**ND**			
2,2-Dichloropropane	**10.0**	**ND**	**ND**			
1,1-Dichloropropene	**10.0**	**ND**	**ND**			
cis-1,3-Dichloropropene	**10.0**	**ND**	**ND**			
trans-1,3-Dichloropropene	**10.0**	**ND**	**ND**			
Ethylbenzene	**2.00**	**ND**	**ND**			
Hexachlorobutadiene (1,3-Hexachlorobutadiene)	**30.0**	**ND**	**ND**			
2-Hexanone	**50.0**	**ND**	**ND**			
Isopropylbenzene	**10.0**	**ND**	**ND**			
p-Isopropyltoluene (4-Isopropyltoluene)	**10.0**	**ND**	**ND**			
MTBE	**5.00**	**ND**	**ND**			
4-Methyl-2-pentanone (MIBK, Methyl isobutyl ketone)	**50.0**	**ND**	**ND**			
Methylene chloride (Dichloromethane, DCM)	**50.0**	**ND**	**ND**			
Naphthalene	**10.0**	**ND**	**ND**			
n-Propylbenzene	**10.0**	**ND**	**ND**			
Styrene	**10.0**	**ND**	**ND**			
1,1,1,2-Tetrachloroethane	**10.0**	**ND**	**ND**			
1,1,2,2-Tetrachloroethane	**10.0**	**ND**	**ND**			
Tetrachloroethene (Tetrachloroethylene)	**10.0**	**ND**	**ND**			
Toluene (Methyl benzene)	**2.00**	**ND**	**ND**			
1,2,3-Trichlorobenzene	**10.0**	**ND**	**ND**			
1,2,4-Trichlorobenzene	**10.0**	**ND**	**ND**			
1,1,1-Trichloroethane	**10.0**	**ND**	**ND**			
1,1,2-Trichloroethane	**10.0**	**ND**	**ND**			
Trichloroethene (TCE)	**10.0**	**ND**	**ND**			
Trichlorofluoromethane	**10.0**	**ND**	**ND**			
1,2,3-Trichloropropane	**10.0**	**ND**	**ND**			
1,2,4-Trimethylbenzene	**10.0**	**ND**	**ND**			
1,3,5-Trimethylbenzene	**10.0**	**ND**	**ND**			
Vinyl acetate	**50.0**	**ND**	**ND**			

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1B-101415

Our Lab I.D.		**339142**	**339143**			
Client Sample I.D.		B-10@30'	B-10@35'			
Date Sampled		**10/13/2015**	**10/13/2015**			
Date Prepared		**10/14/2015**	**10/14/2015**			
Preparation Method						
Date Analyzed		**10/14/2015**	**10/14/2015**			
Matrix		Soil	Soil			
Units		ug/kg	ug/kg			
Dilution Factor		1	1			
Analytes	**PQL**	**Results**	**Results**			
Vinyl chloride (Chloroethene)	**30.0**	**ND**	**ND**			
o-Xylene	**2.00**	**ND**	**ND**			
m- & p-Xylenes	**4.00**	**ND**	**ND**			

Our Lab I.D.		**339142**	**339143**			
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**			
Surrogate Percent Recovery						
Bromofluorobenzene	**70-120**	**105**	**103**			
Dibromofluoromethane	**70-120**	**94**	**95**			
Toluene-d8	**70-120**	**104**	**103**			

QUALITY CONTROL REPORT

QC Batch No: S1B-101415

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	**92**	**92**	**<1**	**75-120**	**15**					
Chlorobenzene	**111**	**112**	**<1**	**75-120**	**15**					
1,1-Dichloroethene (1,1-Dichloroethylene)	**76**	**76**	**<1**	**75-120**	**15**					
MTBE	**100**	**104**	**3.9**	**75-120**	**15**					
Toluene (Methyl benzene)	**115**	**116**	**<1**	**75-120**	**15**					
Trichloroethene (TCE)	**88**	**87**	**1.1**	**75-120**	**15**					

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1C-101515

Our Lab I.D.		**339144**	**339145**	**339146**	**339147**	**339148**
Client Sample I.D.		B-10@40'	B-9@5'	B-9@10'	B-9@25'	B-9@30'
Date Sampled		10/13/2015	10/13/2015	10/13/2015	10/13/2015	10/13/2015
Date Prepared		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Preparation Method						
Date Analyzed		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Acetone	50.0	ND	ND	ND	ND	ND
Benzene	2.00	ND	ND	ND	ND	ND
Bromobenzene (Phenyl bromide)	10.0	ND	ND	ND	ND	ND
Bromochloromethane (Chlorobromomethane)	10.0	ND	ND	ND	ND	ND
Bromodichloromethane (Dichlorobromomethane)	10.0	ND	ND	ND	ND	ND
Bromoform (Tribromomethane)	50.0	ND	ND	ND	ND	ND
Bromomethane (Methyl bromide)	30.0	ND	ND	ND	ND	ND
2-Butanone (MEK, Methyl ethyl ketone)	50.0	ND	ND	ND	ND	ND
n-Butylbenzene	10.0	ND	ND	ND	ND	ND
sec-Butylbenzene	10.0	ND	ND	ND	ND	ND
tert-Butylbenzene	10.0	ND	ND	ND	ND	ND
Carbon disulfide	10.0	ND	ND	ND	ND	ND
Carbon tetrachloride (Tetrachloromethane)	10.0	ND	ND	ND	ND	ND
Chlorobenzene	10.0	ND	ND	ND	ND	ND
Chloroethane	30.0	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	50.0	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	10.0	ND	ND	ND	ND	ND
Chloromethane (Methyl chloride)	30.0	ND	ND	ND	ND	ND
4-Chlorotoluene (p-Chlorotoluene)	10.0	ND	ND	ND	ND	ND
2-Chlorotoluene (o-Chlorotoluene)	10.0	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane (DBCP)	50.0	ND	ND	ND	ND	ND
Dibromochloromethane	10.0	ND	ND	ND	ND	ND
1,2-Dibromoethane (EDB, Ethylene dibromide)	10.0	ND	ND	ND	ND	ND
Dibromomethane	10.0	ND	ND	ND	ND	ND
1,2-Dichlorobenzene (o-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
1,3-Dichlorobenzene (m-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
1,4-Dichlorobenzene (p-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
Dichlorodifluoromethane	30.0	ND	ND	ND	ND	ND
1,1-Dichloroethane	10.0	ND	ND	ND	ND	ND

ANALYTICAL RESULTS

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1C-101515

Our Lab I.D.		**339144**	**339145**	**339146**	**339147**	**339148**
Client Sample I.D.		B-10@40'	B-9@5'	B-9@10'	B-9@25'	B-9@30'
Date Sampled		10/13/2015	10/13/2015	10/13/2015	10/13/2015	10/13/2015
Date Prepared		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Preparation Method						
Date Analyzed		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
1,2-Dichloroethane	10.0	ND	ND	ND	ND	ND
1,1-Dichloroethene (1,1-Dichloroethylene)	10.0	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	10.0	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	10.0	ND	ND	ND	ND	ND
1,2-Dichloropropane	10.0	ND	ND	ND	ND	ND
1,3-Dichloropropane	10.0	ND	ND	ND	ND	ND
2,2-Dichloropropane	10.0	ND	ND	ND	ND	ND
1,1-Dichloropropene	10.0	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	10.0	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	10.0	ND	ND	ND	ND	ND
Ethylbenzene	2.00	ND	ND	ND	ND	ND
Hexachlorobutadiene (1,3-Hexachlorobutadiene)	30.0	ND	ND	ND	ND	ND
2-Hexanone	50.0	ND	ND	ND	ND	ND
Isopropylbenzene	10.0	ND	ND	ND	ND	ND
p-Isopropyltoluene (4-Isopropyltoluene)	10.0	ND	ND	ND	ND	ND
MTBE	5.00	ND	ND	ND	ND	ND
4-Methyl-2-pentanone (MIBK, Methyl isobutyl ketone)	50.0	ND	ND	ND	ND	ND
Methylene chloride (Dichloromethane, DCM)	50.0	ND	ND	ND	ND	ND
Naphthalene	10.0	ND	ND	ND	ND	ND
n-Propylbenzene	10.0	ND	ND	ND	ND	ND
Styrene	10.0	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	10.0	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	10.0	ND	ND	ND	ND	ND
Tetrachloroethene (Tetrachloroethylene)	10.0	ND	ND	ND	ND	ND
Toluene (Methyl benzene)	2.00	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	10.0	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	10.0	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	10.0	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	10.0	ND	ND	ND	ND	ND
Trichloroethene (TCE)	10.0	ND	ND	ND	ND	ND
Trichlorofluoromethane	10.0	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	10.0	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	10.0	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	10.0	ND	ND	ND	ND	ND
Vinyl acetate	50.0	ND	ND	ND	ND	ND

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1C-101515

Our Lab I.D.		**339144**	**339145**	**339146**	**339147**	**339148**
Client Sample I.D.		B-10@40'	B-9@5'	B-9@10'	B-9@25'	B-9@30'
Date Sampled		**10/13/2015**	**10/13/2015**	**10/13/2015**	**10/13/2015**	**10/13/2015**
Date Prepared		**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**
Preparation Method						
Date Analyzed		**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Vinyl chloride (Chloroethene)	**30.0**	**ND**	**ND**	**ND**	**ND**	**ND**
o-Xylene	**2.00**	**ND**	**ND**	**ND**	**ND**	**ND**
m- & p-Xylenes	**4.00**	**ND**	**ND**	**ND**	**ND**	**ND**

Our Lab I.D.		**339144**	**339145**	**339146**	**339147**	**339148**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Bromofluorobenzene	**70-120**	**98**	**98**	**100**	**98**	**102**
Dibromofluoromethane	**70-120**	**82**	**82**	**85**	**90**	**93**
Toluene-d8	**70-120**	**94**	**95**	**94**	**96**	**96**

QUALITY CONTROL REPORT

QC Batch No: S1C-101515

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit				
Benzene	**89**	**81**	**9.4**	**75-120**	**15**				
Chlorobenzene	**120**	**112**	**6.9**	**75-120**	**15**				
1,1-Dichloroethene (1,1-Dichloroethylene)	**95**	**90**	**5.4**	**75-120**	**15**				
MTBE	**95**	**96**	**1.0**	**75-120**	**15**				
Toluene (Methyl benzene)	**86**	**80**	**7.2**	**75-120**	**15**				
Trichloroethene (TCE)	**98**	**92**	**6.3**	**75-120**	**15**				

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1C-101515

Our Lab I.D.		**339149**	**339150**	**339151**	**339152**	**339153**
Client Sample I.D.		B-9@35'	B-9@40'	B-2@5'	B-2@10'	B-2@15'
Date Sampled		10/13/2015	10/13/2015	10/13/2015	10/13/2015	10/13/2015
Date Prepared		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Preparation Method						
Date Analyzed		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Acetone	50.0	ND	ND	ND	ND	ND
Benzene	2.00	ND	ND	ND	ND	ND
Bromobenzene (Phenyl bromide)	10.0	ND	ND	ND	ND	ND
Bromochloromethane (Chlorobromomethane)	10.0	ND	ND	ND	ND	ND
Bromodichloromethane (Dichlorobromomethane)	10.0	ND	ND	ND	ND	ND
Bromoform (Tribromomethane)	50.0	ND	ND	ND	ND	ND
Bromomethane (Methyl bromide)	30.0	ND	ND	ND	ND	ND
2-Butanone (MEK, Methyl ethyl ketone)	50.0	ND	ND	ND	ND	ND
n-Butylbenzene	10.0	ND	ND	ND	ND	ND
sec-Butylbenzene	10.0	ND	ND	ND	ND	ND
tert-Butylbenzene	10.0	ND	ND	ND	ND	ND
Carbon disulfide	10.0	ND	ND	ND	ND	ND
Carbon tetrachloride (Tetrachloromethane)	10.0	ND	ND	ND	ND	ND
Chlorobenzene	10.0	ND	ND	ND	ND	ND
Chloroethane	30.0	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	50.0	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	10.0	ND	ND	ND	ND	ND
Chloromethane (Methyl chloride)	30.0	ND	ND	ND	ND	ND
4-Chlorotoluene (p-Chlorotoluene)	10.0	ND	ND	ND	ND	ND
2-Chlorotoluene (o-Chlorotoluene)	10.0	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane (DBCP)	50.0	ND	ND	ND	ND	ND
Dibromochloromethane	10.0	ND	ND	ND	ND	ND
1,2-Dibromoethane (EDB, Ethylene dibromide)	10.0	ND	ND	ND	ND	ND
Dibromomethane	10.0	ND	ND	ND	ND	ND
1,2-Dichlorobenzene (o-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
1,3-Dichlorobenzene (m-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
1,4-Dichlorobenzene (p-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
Dichlorodifluoromethane	30.0	ND	ND	ND	ND	ND
1,1-Dichloroethane	10.0	ND	ND	ND	ND	ND

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1C-101515

Our Lab I.D.		**339149**	**339150**	**339151**	**339152**	**339153**
Client Sample I.D.		B-9@35'	B-9@40'	B-2@5'	B-2@10'	B-2@15'
Date Sampled		**10/13/2015**	**10/13/2015**	**10/13/2015**	**10/13/2015**	**10/13/2015**
Date Prepared		**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**
Preparation Method						
Date Analyzed		**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
1,2-Dichloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1-Dichloroethene (1,1-Dichloroethylene)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
cis-1,2-Dichloroethene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
trans-1,2-Dichloroethene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2-Dichloropropane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,3-Dichloropropane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
2,2-Dichloropropane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1-Dichloropropene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
cis-1,3-Dichloropropene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
trans-1,3-Dichloropropene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Ethylbenzene	**2.00**	**ND**	**ND**	**ND**	**ND**	**ND**
Hexachlorobutadiene (1,3-Hexachlorobutadiene)	**30.0**	**ND**	**ND**	**ND**	**ND**	**ND**
2-Hexanone	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Isopropylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
p-Isopropyltoluene (4-Isopropyltoluene)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
MTBE	**5.00**	**ND**	**ND**	**ND**	**ND**	**ND**
4-Methyl-2-pentanone (MIBK, Methyl isobutyl ketone)	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Methylene chloride (Dichloromethane, DCM)	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Naphthalene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
n-Propylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Styrene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1,1,2-Tetrachloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1,2,2-Tetrachloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Tetrachloroethene (Tetrachloroethylene)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Toluene (Methyl benzene)	**2.00**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2,3-Trichlorobenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2,4-Trichlorobenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1,1-Trichloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1,2-Trichloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Trichloroethene (TCE)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Trichlorofluoromethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2,3-Trichloropropane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2,4-Trimethylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,3,5-Trimethylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Vinyl acetate	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**

ANALYTICAL RESULTS

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1C-101515

Our Lab I.D.		339149	339150	339151	339152	339153
Client Sample I.D.		B-9@35'	B-9@40'	B-2@5'	B-2@10'	B-2@15'
Date Sampled		10/13/2015	10/13/2015	10/13/2015	10/13/2015	10/13/2015
Date Prepared		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Preparation Method						
Date Analyzed		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Vinyl chloride (Chloroethene)	30.0	ND	ND	ND	ND	ND
o-Xylene	2.00	ND	ND	ND	ND	ND
m- & p-Xylenes	4.00	ND	ND	ND	ND	ND

Our Lab I.D.		339149	339150	339151	339152	339153
Surrogates	% Rec.Limit	% Rec.	% Rec.	% Rec.	% Rec.	% Rec.
Surrogate Percent Recovery						
Bromofluorobenzene	70-120	98	101	88	100	102
Dibromofluoromethane	70-120	93	85	71	80	90
Toluene-d8	70-120	94	94	98	96	98

QUALITY CONTROL REPORT

QC Batch No: S1C-101515

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	89	81	9.4	75-120	15					
Chlorobenzene	120	112	6.9	75-120	15					
1,1-Dichloroethene (1,1-Dichloroethylene)	95	90	5.4	75-120	15					
MTBE	95	96	1.0	75-120	15					
Toluene (Methyl benzene)	86	80	7.2	75-120	15					
Trichloroethene (TCE)	98	92	6.3	75-120	15					

ANALYTICAL RESULTS

Ordered By

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Attn: Mark Murphy

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1C-101515

Our Lab I.D.		**339154**	**339155**	**339156**	**339157**	**339172**
Client Sample I.D.		B-2@20'	B-2@25'	B-2@30'	B-2@35'	B-11@30'
Date Sampled		10/13/2015	10/13/2015	10/13/2015	10/13/2015	10/13/2015
Date Prepared		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Preparation Method						
Date Analyzed		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Acetone	50.0	ND	ND	ND	ND	ND
Benzene	2.00	ND	ND	ND	ND	ND
Bromobenzene (Phenyl bromide)	10.0	ND	ND	ND	ND	ND
Bromochloromethane (Chlorobromomethane)	10.0	ND	ND	ND	ND	ND
Bromodichloromethane (Dichlorobromomethane)	10.0	ND	ND	ND	ND	ND
Bromoform (Tribromomethane)	50.0	ND	ND	ND	ND	ND
Bromomethane (Methyl bromide)	30.0	ND	ND	ND	ND	ND
2-Butanone (MEK, Methyl ethyl ketone)	50.0	ND	ND	ND	ND	ND
n-Butylbenzene	10.0	ND	ND	ND	ND	ND
sec-Butylbenzene	10.0	ND	ND	ND	ND	ND
tert-Butylbenzene	10.0	ND	ND	ND	ND	ND
Carbon disulfide	10.0	ND	ND	ND	ND	ND
Carbon tetrachloride (Tetrachloromethane)	10.0	ND	ND	ND	ND	ND
Chlorobenzene	10.0	ND	ND	ND	ND	ND
Chloroethane	30.0	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	50.0	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	10.0	ND	ND	ND	ND	ND
Chloromethane (Methyl chloride)	30.0	ND	ND	ND	ND	ND
4-Chlorotoluene (p-Chlorotoluene)	10.0	ND	ND	ND	ND	ND
2-Chlorotoluene (o-Chlorotoluene)	10.0	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane (DBCP)	50.0	ND	ND	ND	ND	ND
Dibromochloromethane	10.0	ND	ND	ND	ND	ND
1,2-Dibromoethane (EDB, Ethylene dibromide)	10.0	ND	ND	ND	ND	ND
Dibromomethane	10.0	ND	ND	ND	ND	ND
1,2-Dichlorobenzene (o-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
1,3-Dichlorobenzene (m-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
1,4-Dichlorobenzene (p-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
Dichlorodifluoromethane	30.0	ND	ND	ND	ND	ND
1,1-Dichloroethane	10.0	ND	ND	ND	ND	ND

ANALYTICAL RESULTS

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1C-101515

Our Lab I.D.		**339154**	**339155**	**339156**	**339157**	**339172**
Client Sample I.D.		B-2@20'	B-2@25'	B-2@30'	B-2@35'	B-11@30'
Date Sampled		**10/13/2015**	**10/13/2015**	**10/13/2015**	**10/13/2015**	**10/13/2015**
Date Prepared		**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**
Preparation Method						
Date Analyzed		**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
1,2-Dichloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1-Dichloroethene (1,1-Dichloroethylene)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
cis-1,2-Dichloroethene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
trans-1,2-Dichloroethene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2-Dichloropropane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,3-Dichloropropane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
2,2-Dichloropropane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1-Dichloropropene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
cis-1,3-Dichloropropene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
trans-1,3-Dichloropropene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Ethylbenzene	**2.00**	**ND**	**ND**	**ND**	**ND**	**ND**
Hexachlorobutadiene (1,3-Hexachlorobutadiene)	**30.0**	**ND**	**ND**	**ND**	**ND**	**ND**
2-Hexanone	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Isopropylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
p-Isopropyltoluene (4-Isopropyltoluene)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
MTBE	**5.00**	**ND**	**ND**	**ND**	**ND**	**ND**
4-Methyl-2-pentanone (MIBK, Methyl isobutyl ketone)	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Methylene chloride (Dichloromethane, DCM)	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Naphthalene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
n-Propylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Styrene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1,1,2-Tetrachloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1,2,2-Tetrachloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Tetrachloroethene (Tetrachloroethylene)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Toluene (Methyl benzene)	**2.00**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2,3-Trichlorobenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2,4-Trichlorobenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1,1-Trichloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1,2-Trichloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Trichloroethene (TCE)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Trichlorofluoromethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2,3-Trichloropropane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2,4-Trimethylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,3,5-Trimethylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Vinyl acetate	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**

ANALYTICAL RESULTS

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1C-101515

Our Lab I.D.		339154	339155	339156	339157	339172
Client Sample I.D.		B-2@20'	B-2@25'	B-2@30'	B-2@35'	B-11@30'
Date Sampled		10/13/2015	10/13/2015	10/13/2015	10/13/2015	10/13/2015
Date Prepared		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Preparation Method						
Date Analyzed		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Vinyl chloride (Chloroethene)	30.0	ND	ND	ND	ND	ND
o-Xylene	2.00	ND	ND	ND	ND	ND
m- & p-Xylenes	4.00	ND	ND	ND	ND	ND

Our Lab I.D.		339154	339155	339156	339157	339172
Surrogates	% Rec.Limit	% Rec.	% Rec.	% Rec.	% Rec.	% Rec.
Surrogate Percent Recovery						
Bromofluorobenzene	70-120	101	101	102	102	102
Dibromofluoromethane	70-120	85	90	82	83	82
Toluene-d8	70-120	96	98	96	96	98

QUALITY CONTROL REPORT

QC Batch No: S1C-101515

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	89	81	9.4	75-120	15					
Chlorobenzene	120	112	6.9	75-120	15					
1,1-Dichloroethene (1,1-Dichloroethylene)	95	90	5.4	75-120	15					
MTBE	95	96	1.0	75-120	15					
Toluene (Methyl benzene)	86	80	7.2	75-120	15					
Trichloroethene (TCE)	98	92	6.3	75-120	15					

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1C-101515

Our Lab I.D.		**339173**	**339174**	**339175**	**339176**	**339177**
Client Sample I.D.		B-11@35'	B-11@40'	B-4@5'	B-4@10'	B-4@15'
Date Sampled		10/13/2015	10/13/2015	10/13/2015	10/13/2015	10/13/2015
Date Prepared		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Preparation Method						
Date Analyzed		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Acetone	50.0	ND	ND	ND	ND	ND
Benzene	2.00	ND	ND	ND	ND	ND
Bromobenzene (Phenyl bromide)	10.0	ND	ND	ND	ND	ND
Bromochloromethane (Chlorobromomethane)	10.0	ND	ND	ND	ND	ND
Bromodichloromethane (Dichlorobromomethane)	10.0	ND	ND	ND	ND	ND
Bromoform (Tribromomethane)	50.0	ND	ND	ND	ND	ND
Bromomethane (Methyl bromide)	30.0	ND	ND	ND	ND	ND
2-Butanone (MEK, Methyl ethyl ketone)	50.0	ND	ND	ND	ND	ND
n-Butylbenzene	10.0	ND	ND	ND	ND	ND
sec-Butylbenzene	10.0	ND	ND	ND	ND	ND
tert-Butylbenzene	10.0	ND	ND	ND	ND	ND
Carbon disulfide	10.0	ND	ND	ND	ND	ND
Carbon tetrachloride (Tetrachloromethane)	10.0	ND	ND	ND	ND	ND
Chlorobenzene	10.0	ND	ND	ND	ND	ND
Chloroethane	30.0	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	50.0	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	10.0	ND	ND	ND	ND	ND
Chloromethane (Methyl chloride)	30.0	ND	ND	ND	ND	ND
4-Chlorotoluene (p-Chlorotoluene)	10.0	ND	ND	ND	ND	ND
2-Chlorotoluene (o-Chlorotoluene)	10.0	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane (DBCP)	50.0	ND	ND	ND	ND	ND
Dibromochloromethane	10.0	ND	ND	ND	ND	ND
1,2-Dibromoethane (EDB, Ethylene dibromide)	10.0	ND	ND	ND	ND	ND
Dibromomethane	10.0	ND	ND	ND	ND	ND
1,2-Dichlorobenzene (o-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
1,3-Dichlorobenzene (m-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
1,4-Dichlorobenzene (p-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
Dichlorodifluoromethane	30.0	ND	ND	ND	ND	ND
1,1-Dichloroethane	10.0	ND	ND	ND	ND	ND

ANALYTICAL RESULTS

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1C-101515

Our Lab I.D.		**339173**	**339174**	**339175**	**339176**	**339177**
Client Sample I.D.		B-11@35'	B-11@40'	B-4@5'	B-4@10'	B-4@15'
Date Sampled		**10/13/2015**	**10/13/2015**	**10/13/2015**	**10/13/2015**	**10/13/2015**
Date Prepared		**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**
Preparation Method						
Date Analyzed		**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
1,2-Dichloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1-Dichloroethene (1,1-Dichloroethylene)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
cis-1,2-Dichloroethene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
trans-1,2-Dichloroethene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2-Dichloropropane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,3-Dichloropropane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
2,2-Dichloropropane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1-Dichloropropene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
cis-1,3-Dichloropropene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
trans-1,3-Dichloropropene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Ethylbenzene	**2.00**	**ND**	**ND**	**ND**	**ND**	**ND**
Hexachlorobutadiene (1,3-Hexachlorobutadiene)	**30.0**	**ND**	**ND**	**ND**	**ND**	**ND**
2-Hexanone	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Isopropylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
p-Isopropyltoluene (4-Isopropyltoluene)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
MTBE	**5.00**	**ND**	**ND**	**ND**	**ND**	**ND**
4-Methyl-2-pentanone (MIBK, Methyl isobutyl ketone)	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Methylene chloride (Dichloromethane, DCM)	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Naphthalene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
n-Propylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Styrene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1,1,2-Tetrachloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1,2,2-Tetrachloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Tetrachloroethene (Tetrachloroethylene)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Toluene (Methyl benzene)	**2.00**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2,3-Trichlorobenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2,4-Trichlorobenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1,1-Trichloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1,2-Trichloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Trichloroethene (TCE)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Trichlorofluoromethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2,3-Trichloropropane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2,4-Trimethylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,3,5-Trimethylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Vinyl acetate	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**

ANALYTICAL RESULTS

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1C-101515

Our Lab I.D.		**339173**	**339174**	**339175**	**339176**	**339177**
Client Sample I.D.		B-11@35'	B-11@40'	B-4@5'	B-4@10'	B-4@15'
Date Sampled		**10/13/2015**	**10/13/2015**	**10/13/2015**	**10/13/2015**	**10/13/2015**
Date Prepared		**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**
Preparation Method						
Date Analyzed		**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Vinyl chloride (Chloroethene)	**30.0**	**ND**	**ND**	**ND**	**ND**	**ND**
o-Xylene	**2.00**	**ND**	**ND**	**ND**	**ND**	**ND**
m- & p-Xylenes	**4.00**	**ND**	**ND**	**ND**	**ND**	**ND**

Our Lab I.D.		**339173**	**339174**	**339175**	**339176**	**339177**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Bromofluorobenzene	**70-120**	**103**	**100**	**102**	**104**	**102**
Dibromofluoromethane	**70-120**	**82**	**80**	**82**	**83**	**93**
Toluene-d8	**70-120**	**98**	**98**	**98**	**98**	**96**

QUALITY CONTROL REPORT

QC Batch No: S1C-101515

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	**89**	**81**	**9.4**	**75-120**	**15**					
Chlorobenzene	**120**	**112**	**6.9**	**75-120**	**15**					
1,1-Dichloroethene (1,1-Dichloroethylene)	**95**	**90**	**5.4**	**75-120**	**15**					
MTBE	**95**	**96**	**1.0**	**75-120**	**15**					
Toluene (Methyl benzene)	**86**	**80**	**7.2**	**75-120**	**15**					
Trichloroethene (TCE)	**98**	**92**	**6.3**	**75-120**	**15**					

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1C-101515

Our Lab I.D.		**339178**	**339179**	**339180**		
Client Sample I.D.		B-4@20'	B-4@25'	B-4@30'		
Date Sampled		10/13/2015	10/13/2015	10/13/2015		
Date Prepared		10/15/2015	10/15/2015	10/15/2015		
Preparation Method						
Date Analyzed		10/15/2015	10/15/2015	10/15/2015		
Matrix		Soil	Soil	Soil		
Units		ug/kg	ug/kg	ug/kg		
Dilution Factor		1	1	1		
Analytes	**PQL**	**Results**	**Results**	**Results**		
Acetone	50.0	ND	ND	ND		
Benzene	2.00	ND	ND	ND		
Bromobenzene (Phenyl bromide)	10.0	ND	ND	ND		
Bromochloromethane (Chlorobromomethane)	10.0	ND	ND	ND		
Bromodichloromethane (Dichlorobromomethane)	10.0	ND	ND	ND		
Bromoform (Tribromomethane)	50.0	ND	ND	ND		
Bromomethane (Methyl bromide)	30.0	ND	ND	ND		
2-Butanone (MEK, Methyl ethyl ketone)	50.0	ND	ND	ND		
n-Butylbenzene	10.0	ND	ND	ND		
sec-Butylbenzene	10.0	ND	ND	ND		
tert-Butylbenzene	10.0	ND	ND	ND		
Carbon disulfide	10.0	ND	ND	ND		
Carbon tetrachloride (Tetrachloromethane)	10.0	ND	ND	ND		
Chlorobenzene	10.0	ND	ND	ND		
Chloroethane	30.0	ND	ND	ND		
2-Chloroethyl vinyl ether	50.0	ND	ND	ND		
Chloroform (Trichloromethane)	10.0	ND	ND	ND		
Chloromethane (Methyl chloride)	30.0	ND	ND	ND		
4-Chlorotoluene (p-Chlorotoluene)	10.0	ND	ND	ND		
2-Chlorotoluene (o-Chlorotoluene)	10.0	ND	ND	ND		
1,2-Dibromo-3-chloropropane (DBCP)	50.0	ND	ND	ND		
Dibromochloromethane	10.0	ND	ND	ND		
1,2-Dibromoethane (EDB, Ethylene dibromide)	10.0	ND	ND	ND		
Dibromomethane	10.0	ND	ND	ND		
1,2-Dichlorobenzene (o-Dichlorobenzene)	10.0	ND	ND	ND		
1,3-Dichlorobenzene (m-Dichlorobenzene)	10.0	ND	ND	ND		
1,4-Dichlorobenzene (p-Dichlorobenzene)	10.0	ND	ND	ND		
Dichlorodifluoromethane	30.0	ND	ND	ND		
1,1-Dichloroethane	10.0	ND	ND	ND		

ANALYTICAL RESULTS

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1C-101515

Our Lab I.D.		**339178**	**339179**	**339180**		
Client Sample I.D.		B-4@20'	B-4@25'	B-4@30'		
Date Sampled		10/13/2015	10/13/2015	10/13/2015		
Date Prepared		10/15/2015	10/15/2015	10/15/2015		
Preparation Method						
Date Analyzed		10/15/2015	10/15/2015	10/15/2015		
Matrix		Soil	Soil	Soil		
Units		ug/kg	ug/kg	ug/kg		
Dilution Factor		1	1	1		
Analytes	**PQL**	**Results**	**Results**	**Results**		
1,2-Dichloroethane	10.0	ND	ND	ND		
1,1-Dichloroethene (1,1-Dichloroethylene)	10.0	ND	ND	ND		
cis-1,2-Dichloroethene	10.0	ND	ND	ND		
trans-1,2-Dichloroethene	10.0	ND	ND	ND		
1,2-Dichloropropane	10.0	ND	ND	ND		
1,3-Dichloropropane	10.0	ND	ND	ND		
2,2-Dichloropropane	10.0	ND	ND	ND		
1,1-Dichloropropene	10.0	ND	ND	ND		
cis-1,3-Dichloropropene	10.0	ND	ND	ND		
trans-1,3-Dichloropropene	10.0	ND	ND	ND		
Ethylbenzene	2.00	ND	ND	ND		
Hexachlorobutadiene (1,3-Hexachlorobutadiene)	30.0	ND	ND	ND		
2-Hexanone	50.0	ND	ND	ND		
Isopropylbenzene	10.0	ND	ND	ND		
p-Isopropyltoluene (4-Isopropyltoluene)	10.0	ND	ND	ND		
MTBE	5.00	ND	ND	ND		
4-Methyl-2-pentanone (MIBK, Methyl isobutyl ketone)	50.0	ND	ND	ND		
Methylene chloride (Dichloromethane, DCM)	50.0	ND	ND	ND		
Naphthalene	10.0	ND	ND	ND		
n-Propylbenzene	10.0	ND	ND	ND		
Styrene	10.0	ND	ND	ND		
1,1,1,2-Tetrachloroethane	10.0	ND	ND	ND		
1,1,2,2-Tetrachloroethane	10.0	ND	ND	ND		
Tetrachloroethene (Tetrachloroethylene)	10.0	ND	ND	ND		
Toluene (Methyl benzene)	2.00	ND	ND	ND		
1,2,3-Trichlorobenzene	10.0	ND	ND	ND		
1,2,4-Trichlorobenzene	10.0	ND	ND	ND		
1,1,1-Trichloroethane	10.0	ND	ND	ND		
1,1,2-Trichloroethane	10.0	ND	ND	ND		
Trichloroethene (TCE)	10.0	ND	ND	ND		
Trichlorofluoromethane	10.0	ND	ND	ND		
1,2,3-Trichloropropane	10.0	ND	ND	ND		
1,2,4-Trimethylbenzene	10.0	ND	ND	ND		
1,3,5-Trimethylbenzene	10.0	ND	ND	ND		
Vinyl acetate	50.0	ND	ND	ND		

ANALYTICAL RESULTS

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1C-101515

Our Lab I.D.		**339178**	**339179**	**339180**		
Client Sample I.D.		B-4@20'	B-4@25'	B-4@30'		
Date Sampled		**10/13/2015**	**10/13/2015**	**10/13/2015**		
Date Prepared		**10/15/2015**	**10/15/2015**	**10/15/2015**		
Preparation Method						
Date Analyzed		**10/15/2015**	**10/15/2015**	**10/15/2015**		
Matrix		Soil	Soil	Soil		
Units		ug/kg	ug/kg	ug/kg		
Dilution Factor		1	1	1		
Analytes	**PQL**	**Results**	**Results**	**Results**		
Vinyl chloride (Chloroethene)	**30.0**	**ND**	**ND**	**ND**		
o-Xylene	**2.00**	**ND**	**ND**	**ND**		
m- & p-Xylenes	**4.00**	**ND**	**ND**	**ND**		

Our Lab I.D.		**339178**	**339179**	**339180**		
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**		
Surrogate Percent Recovery						
Bromofluorobenzene	**70-120**	**107**	**104**	**107**		
Dibromofluoromethane	**70-120**	**80**	**75**	**79**		
Toluene-d8	**70-120**	**95**	**98**	**98**		

QUALITY CONTROL REPORT

QC Batch No: S1C-101515

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	**89**	**81**	**9.4**	**75-120**	**15**					
Chlorobenzene	**120**	**112**	**6.9**	**75-120**	**15**					
1,1-Dichloroethene (1,1-Dichloroethylene)	**95**	**90**	**5.4**	**75-120**	**15**					
MTBE	**95**	**96**	**1.0**	**75-120**	**15**					
Toluene (Methyl benzene)	**86**	**80**	**7.2**	**75-120**	**15**					
Trichloroethene (TCE)	**98**	**92**	**6.3**	**75-120**	**15**					

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S2B-101515

Our Lab I.D.		**339162**	**339168**			
Client Sample I.D.		B-18@20'	B-11@10'			
Date Sampled		10/13/2015	10/13/2015			
Date Prepared		10/15/2015	10/15/2015			
Preparation Method						
Date Analyzed		10/15/2015	10/15/2015			
Matrix		Soil	Soil			
Units		ug/kg	ug/kg			
Dilution Factor		1	1			
Analytes	**PQL**	**Results**	**Results**			
Acetone	50.0	ND	ND			
Benzene	2.00	ND	ND			
Bromobenzene (Phenyl bromide)	10.0	ND	ND			
Bromochloromethane (Chlorobromomethane)	10.0	ND	ND			
Bromodichloromethane (Dichlorobromomethane)	10.0	ND	ND			
Bromoform (Tribromomethane)	50.0	ND	ND			
Bromomethane (Methyl bromide)	30.0	ND	ND			
2-Butanone (MEK, Methyl ethyl ketone)	50.0	ND	ND			
n-Butylbenzene	10.0	ND	ND			
sec-Butylbenzene	10.0	ND	ND			
tert-Butylbenzene	10.0	ND	ND			
Carbon disulfide	10.0	ND	ND			
Carbon tetrachloride (Tetrachloromethane)	10.0	ND	ND			
Chlorobenzene	10.0	ND	ND			
Chloroethane	30.0	ND	ND			
2-Chloroethyl vinyl ether	50.0	ND	ND			
Chloroform (Trichloromethane)	10.0	ND	ND			
Chloromethane (Methyl chloride)	30.0	ND	ND			
4-Chlorotoluene (p-Chlorotoluene)	10.0	ND	ND			
2-Chlorotoluene (o-Chlorotoluene)	10.0	ND	ND			
1,2-Dibromo-3-chloropropane (DBCP)	50.0	ND	ND			
Dibromochloromethane	10.0	ND	ND			
1,2-Dibromoethane (EDB, Ethylene dibromide)	10.0	ND	ND			
Dibromomethane	10.0	ND	ND			
1,2-Dichlorobenzene (o-Dichlorobenzene)	10.0	ND	ND			
1,3-Dichlorobenzene (m-Dichlorobenzene)	10.0	ND	ND			
1,4-Dichlorobenzene (p-Dichlorobenzene)	10.0	ND	ND			
Dichlorodifluoromethane	30.0	ND	ND			
1,1-Dichloroethane	10.0	ND	ND			

ANALYTICAL RESULTS

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S2B-101515

Our Lab I.D.		**339162**	**339168**			
Client Sample I.D.		B-18@20'	B-11@10'			
Date Sampled		**10/13/2015**	**10/13/2015**			
Date Prepared		**10/15/2015**	**10/15/2015**			
Preparation Method						
Date Analyzed		**10/15/2015**	**10/15/2015**			
Matrix		Soil	Soil			
Units		ug/kg	ug/kg			
Dilution Factor		1	1			
Analytes	**PQL**	**Results**	**Results**			
1,2-Dichloroethane	**10.0**	**ND**	**ND**			
1,1-Dichloroethene (1,1-Dichloroethylene)	**10.0**	**ND**	**ND**			
cis-1,2-Dichloroethene	**10.0**	**ND**	**ND**			
trans-1,2-Dichloroethene	**10.0**	**ND**	**ND**			
1,2-Dichloropropane	**10.0**	**ND**	**ND**			
1,3-Dichloropropane	**10.0**	**ND**	**ND**			
2,2-Dichloropropane	**10.0**	**ND**	**ND**			
1,1-Dichloropropene	**10.0**	**ND**	**ND**			
cis-1,3-Dichloropropene	**10.0**	**ND**	**ND**			
trans-1,3-Dichloropropene	**10.0**	**ND**	**ND**			
Ethylbenzene	**2.00**	**ND**	**ND**			
Hexachlorobutadiene (1,3-Hexachlorobutadiene)	**30.0**	**ND**	**ND**			
2-Hexanone	**50.0**	**ND**	**ND**			
Isopropylbenzene	**10.0**	**ND**	**ND**			
p-Isopropyltoluene (4-Isopropyltoluene)	**10.0**	**ND**	**ND**			
MTBE	**5.00**	**ND**	**ND**			
4-Methyl-2-pentanone (MIBK, Methyl isobutyl ketone)	**50.0**	**ND**	**ND**			
Methylene chloride (Dichloromethane, DCM)	**50.0**	**ND**	**ND**			
Naphthalene	**10.0**	**ND**	**ND**			
n-Propylbenzene	**10.0**	**ND**	**ND**			
Styrene	**10.0**	**ND**	**ND**			
1,1,1,2-Tetrachloroethane	**10.0**	**ND**	**ND**			
1,1,2,2-Tetrachloroethane	**10.0**	**ND**	**ND**			
Tetrachloroethene (Tetrachloroethylene)	**10.0**	**ND**	**ND**			
Toluene (Methyl benzene)	**2.00**	**ND**	**ND**			
1,2,3-Trichlorobenzene	**10.0**	**ND**	**ND**			
1,2,4-Trichlorobenzene	**10.0**	**ND**	**ND**			
1,1,1-Trichloroethane	**10.0**	**ND**	**ND**			
1,1,2-Trichloroethane	**10.0**	**ND**	**ND**			
Trichloroethene (TCE)	**10.0**	**ND**	**ND**			
Trichlorofluoromethane	**10.0**	**ND**	**ND**			
1,2,3-Trichloropropane	**10.0**	**ND**	**ND**			
1,2,4-Trimethylbenzene	**10.0**	**ND**	**ND**			
1,3,5-Trimethylbenzene	**10.0**	**ND**	**ND**			
Vinyl acetate	**50.0**	**ND**	**ND**			

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S2B-101515

Our Lab I.D.		**339162**	**339168**			
Client Sample I.D.		B-18@20'	B-11@10'			
Date Sampled		**10/13/2015**	**10/13/2015**			
Date Prepared		**10/15/2015**	**10/15/2015**			
Preparation Method						
Date Analyzed		**10/15/2015**	**10/15/2015**			
Matrix		Soil	Soil			
Units		ug/kg	ug/kg			
Dilution Factor		1	1			
Analytes	**PQL**	**Results**	**Results**			
Vinyl chloride (Chloroethene)	**30.0**	**ND**	**ND**			
o-Xylene	**2.00**	**ND**	**ND**			
m- & p-Xylenes	**4.00**	**ND**	**ND**			

Our Lab I.D.		**339162**	**339168**			
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**			
Surrogate Percent Recovery						
Bromofluorobenzene	**70-120**	**116**	**116**			
Dibromofluoromethane	**70-120**	**83**	**83**			
Toluene-d8	**70-120**	**105**	**105**			

QUALITY CONTROL REPORT

QC Batch No: S2B-101515

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	**92**	**95**	**3.2**	**75-120**	**15**					
Chlorobenzene	**109**	**113**	**3.6**	**75-120**	**15**					
1,1-Dichloroethene (1,1-Dichloroethylene)	**78**	**83**	**6.2**	**75-120**	**15**					
MTBE	**119**	**118**	**<1**	**75-120**	**15**					
Toluene (Methyl benzene)	**109**	**113**	**3.6**	**75-120**	**15**					
Trichloroethene (TCE)	**86**	**88**	**2.3**	**75-120**	**15**					

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S2C-101415

Our Lab I.D.		**339158**	**339159**	**339160**	**339161**	**339163**
Client Sample I.D.		B-2@40'	B-18@5'	B-18@10'	B-18@15'	B-18@25'
Date Sampled		10/13/2015	10/13/2015	10/13/2015	10/13/2015	10/13/2015
Date Prepared		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Preparation Method						
Date Analyzed		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Acetone	50.0	ND	ND	ND	ND	ND
Benzene	2.00	ND	ND	ND	ND	ND
Bromobenzene (Phenyl bromide)	10.0	ND	ND	ND	ND	ND
Bromochloromethane (Chlorobromomethane)	10.0	ND	ND	ND	ND	ND
Bromodichloromethane (Dichlorobromomethane)	10.0	ND	ND	ND	ND	ND
Bromoform (Tribromomethane)	50.0	ND	ND	ND	ND	ND
Bromomethane (Methyl bromide)	30.0	ND	ND	ND	ND	ND
2-Butanone (MEK, Methyl ethyl ketone)	50.0	ND	ND	ND	ND	ND
n-Butylbenzene	10.0	ND	ND	ND	ND	ND
sec-Butylbenzene	10.0	ND	ND	ND	ND	ND
tert-Butylbenzene	10.0	ND	ND	ND	ND	ND
Carbon disulfide	10.0	ND	ND	ND	ND	ND
Carbon tetrachloride (Tetrachloromethane)	10.0	ND	ND	ND	ND	ND
Chlorobenzene	10.0	ND	ND	ND	ND	ND
Chloroethane	30.0	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	50.0	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	10.0	ND	ND	ND	ND	ND
Chloromethane (Methyl chloride)	30.0	ND	ND	ND	ND	ND
4-Chlorotoluene (p-Chlorotoluene)	10.0	ND	ND	ND	ND	ND
2-Chlorotoluene (o-Chlorotoluene)	10.0	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane (DBCP)	50.0	ND	ND	ND	ND	ND
Dibromochloromethane	10.0	ND	ND	ND	ND	ND
1,2-Dibromoethane (EDB, Ethylene dibromide)	10.0	ND	ND	ND	ND	ND
Dibromomethane	10.0	ND	ND	ND	ND	ND
1,2-Dichlorobenzene (o-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
1,3-Dichlorobenzene (m-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
1,4-Dichlorobenzene (p-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
Dichlorodifluoromethane	30.0	ND	ND	ND	ND	ND
1,1-Dichloroethane	10.0	ND	ND	ND	ND	ND

ANALYTICAL RESULTS

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S2C-101415

Our Lab I.D.		**339158**	**339159**	**339160**	**339161**	**339163**
Client Sample I.D.		B-2@40'	B-18@5'	B-18@10'	B-18@15'	B-18@25'
Date Sampled		**10/13/2015**	**10/13/2015**	**10/13/2015**	**10/13/2015**	**10/13/2015**
Date Prepared		**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**
Preparation Method						
Date Analyzed		**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
1,2-Dichloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1-Dichloroethene (1,1-Dichloroethylene)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
cis-1,2-Dichloroethene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
trans-1,2-Dichloroethene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2-Dichloropropane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,3-Dichloropropane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
2,2-Dichloropropane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1-Dichloropropene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
cis-1,3-Dichloropropene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
trans-1,3-Dichloropropene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Ethylbenzene	**2.00**	**ND**	**ND**	**ND**	**ND**	**ND**
Hexachlorobutadiene (1,3-Hexachlorobutadiene)	**30.0**	**ND**	**ND**	**ND**	**ND**	**ND**
2-Hexanone	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Isopropylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
p-Isopropyltoluene (4-Isopropyltoluene)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
MTBE	**5.00**	**ND**	**ND**	**ND**	**ND**	**ND**
4-Methyl-2-pentanone (MIBK, Methyl isobutyl ketone)	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Methylene chloride (Dichloromethane, DCM)	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Naphthalene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
n-Propylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Styrene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1,1,2-Tetrachloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1,2,2-Tetrachloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Tetrachloroethene (Tetrachloroethylene)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Toluene (Methyl benzene)	**2.00**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2,3-Trichlorobenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2,4-Trichlorobenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1,1-Trichloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1,2-Trichloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Trichloroethene (TCE)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Trichlorofluoromethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2,3-Trichloropropane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2,4-Trimethylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,3,5-Trimethylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Vinyl acetate	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S2C-101415

Our Lab I.D.		**339158**	**339159**	**339160**	**339161**	**339163**
Client Sample I.D.		B-2@40'	B-18@5'	B-18@10'	B-18@15'	B-18@25'
Date Sampled		10/13/2015	10/13/2015	10/13/2015	10/13/2015	10/13/2015
Date Prepared		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Preparation Method						
Date Analyzed		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Vinyl chloride (Chloroethene)	30.0	ND	ND	ND	ND	ND
o-Xylene	2.00	ND	ND	ND	ND	ND
m- & p-Xylenes	4.00	ND	ND	ND	ND	ND

Our Lab I.D.		**339158**	**339159**	**339160**	**339161**	**339163**
Surrogates	% Rec.Limit	% Rec.	% Rec.	% Rec.	% Rec.	% Rec.
Surrogate Percent Recovery						
Bromofluorobenzene	70-120	107	101	111	102	97
Dibromofluoromethane	70-120	84	76	84	80	85
Toluene-d8	70-120	103	97	95	96	96

QUALITY CONTROL REPORT

QC Batch No: S2C-101415

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit				
Benzene	88	91	3.4	75-120	15				
Chlorobenzene	116	117	<1	75-120	15				
1,1-Dichloroethene (1,1-Dichloroethylene)	104	92	12.2	75-120	15				
MTBE	78	78	<1	75-120	15				
Toluene (Methyl benzene)	84	87	3.5	75-120	15				
Trichloroethene (TCE)	94	95	1.1	75-120	15				

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S2C-101415

Our Lab I.D.		**339164**	**339165**	**339166**	**339167**	**339169**
Client Sample I.D.		B-18@30'	B-18@35'	B-18@40'	B-11@5'	B-11@15'
Date Sampled		10/13/2015	10/13/2015	10/13/2015	10/13/2015	10/13/2015
Date Prepared		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Preparation Method						
Date Analyzed		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Acetone	50.0	ND	ND	ND	ND	ND
Benzene	2.00	ND	ND	ND	ND	ND
Bromobenzene (Phenyl bromide)	10.0	ND	ND	ND	ND	ND
Bromochloromethane (Chlorobromomethane)	10.0	ND	ND	ND	ND	ND
Bromodichloromethane (Dichlorobromomethane)	10.0	ND	ND	ND	ND	ND
Bromoform (Tribromomethane)	50.0	ND	ND	ND	ND	ND
Bromomethane (Methyl bromide)	30.0	ND	ND	ND	ND	ND
2-Butanone (MEK, Methyl ethyl ketone)	50.0	ND	ND	ND	ND	ND
n-Butylbenzene	10.0	ND	ND	ND	ND	ND
sec-Butylbenzene	10.0	ND	ND	ND	ND	ND
tert-Butylbenzene	10.0	ND	ND	ND	ND	ND
Carbon disulfide	10.0	ND	ND	ND	ND	ND
Carbon tetrachloride (Tetrachloromethane)	10.0	ND	ND	ND	ND	ND
Chlorobenzene	10.0	ND	ND	ND	ND	ND
Chloroethane	30.0	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	50.0	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	10.0	ND	ND	ND	ND	ND
Chloromethane (Methyl chloride)	30.0	ND	ND	ND	ND	ND
4-Chlorotoluene (p-Chlorotoluene)	10.0	ND	ND	ND	ND	ND
2-Chlorotoluene (o-Chlorotoluene)	10.0	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane (DBCP)	50.0	ND	ND	ND	ND	ND
Dibromochloromethane	10.0	ND	ND	ND	ND	ND
1,2-Dibromoethane (EDB, Ethylene dibromide)	10.0	ND	ND	ND	ND	ND
Dibromomethane	10.0	ND	ND	ND	ND	ND
1,2-Dichlorobenzene (o-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
1,3-Dichlorobenzene (m-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
1,4-Dichlorobenzene (p-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
Dichlorodifluoromethane	30.0	ND	ND	ND	ND	ND
1,1-Dichloroethane	10.0	ND	ND	ND	ND	ND

ANALYTICAL RESULTS

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S2C-101415

Our Lab I.D.		**339164**	**339165**	**339166**	**339167**	**339169**
Client Sample I.D.		B-18@30'	B-18@35'	B-18@40'	B-11@5'	B-11@15'
Date Sampled		**10/13/2015**	**10/13/2015**	**10/13/2015**	**10/13/2015**	**10/13/2015**
Date Prepared		**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**
Preparation Method						
Date Analyzed		**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
1,2-Dichloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1-Dichloroethene (1,1-Dichloroethylene)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
cis-1,2-Dichloroethene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
trans-1,2-Dichloroethene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2-Dichloropropane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,3-Dichloropropane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
2,2-Dichloropropane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1-Dichloropropene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
cis-1,3-Dichloropropene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
trans-1,3-Dichloropropene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Ethylbenzene	**2.00**	**ND**	**ND**	**ND**	**ND**	**ND**
Hexachlorobutadiene (1,3-Hexachlorobutadiene)	**30.0**	**ND**	**ND**	**ND**	**ND**	**ND**
2-Hexanone	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Isopropylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
p-Isopropyltoluene (4-Isopropyltoluene)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
MTBE	**5.00**	**ND**	**ND**	**ND**	**ND**	**ND**
4-Methyl-2-pentanone (MIBK, Methyl isobutyl ketone)	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Methylene chloride (Dichloromethane, DCM)	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Naphthalene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
n-Propylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Styrene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1,1,2-Tetrachloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1,2,2-Tetrachloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Tetrachloroethene (Tetrachloroethylene)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Toluene (Methyl benzene)	**2.00**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2,3-Trichlorobenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2,4-Trichlorobenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1,1-Trichloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1,2-Trichloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Trichloroethene (TCE)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Trichlorofluoromethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2,3-Trichloropropane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2,4-Trimethylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,3,5-Trimethylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Vinyl acetate	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S2C-101415

Our Lab I.D.		**339164**	**339165**	**339166**	**339167**	**339169**
Client Sample I.D.		B-18@30'	B-18@35'	B-18@40'	B-11@5'	B-11@15'
Date Sampled		**10/13/2015**	**10/13/2015**	**10/13/2015**	**10/13/2015**	**10/13/2015**
Date Prepared		**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**
Preparation Method						
Date Analyzed		**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Vinyl chloride (Chloroethene)	**30.0**	**ND**	**ND**	**ND**	**ND**	**ND**
o-Xylene	**2.00**	**ND**	**ND**	**ND**	**ND**	**ND**
m- & p-Xylenes	**4.00**	**ND**	**ND**	**ND**	**ND**	**ND**

Our Lab I.D.		**339164**	**339165**	**339166**	**339167**	**339169**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Bromofluorobenzene	**70-120**	**101**	**97**	**100**	**104**	**100**
Dibromofluoromethane	**70-120**	**78**	**78**	**76**	**70**	**80**
Toluene-d8	**70-120**	**94**	**94**	**93**	**94**	**94**

QUALITY CONTROL REPORT

QC Batch No: S2C-101415

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	**88**	**91**	**3.4**	**75-120**	**15**					
Chlorobenzene	**116**	**117**	**<1**	**75-120**	**15**					
1,1-Dichloroethene (1,1-Dichloroethylene)	**104**	**92**	**12.2**	**75-120**	**15**					
MTBE	**78**	**78**	**<1**	**75-120**	**15**					
Toluene (Methyl benzene)	**84**	**87**	**3.5**	**75-120**	**15**					
Trichloroethene (TCE)	**94**	**95**	**1.1**	**75-120**	**15**					

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S2C-101415

Our Lab I.D.		**339170**	**339171**			
Client Sample I.D.		B-11@20'	B-11@25'			
Date Sampled		10/13/2015	10/13/2015			
Date Prepared		10/15/2015	10/15/2015			
Preparation Method						
Date Analyzed		10/15/2015	10/15/2015			
Matrix		Soil	Soil			
Units		ug/kg	ug/kg			
Dilution Factor		1	1			
Analytes	**PQL**	**Results**	**Results**			
Acetone	50.0	ND	ND			
Benzene	2.00	ND	ND			
Bromobenzene (Phenyl bromide)	10.0	ND	ND			
Bromochloromethane (Chlorobromomethane)	10.0	ND	ND			
Bromodichloromethane (Dichlorobromomethane)	10.0	ND	ND			
Bromoform (Tribromomethane)	50.0	ND	ND			
Bromomethane (Methyl bromide)	30.0	ND	ND			
2-Butanone (MEK, Methyl ethyl ketone)	50.0	ND	ND			
n-Butylbenzene	10.0	ND	ND			
sec-Butylbenzene	10.0	ND	ND			
tert-Butylbenzene	10.0	ND	ND			
Carbon disulfide	10.0	ND	ND			
Carbon tetrachloride (Tetrachloromethane)	10.0	ND	ND			
Chlorobenzene	10.0	ND	ND			
Chloroethane	30.0	ND	ND			
2-Chloroethyl vinyl ether	50.0	ND	ND			
Chloroform (Trichloromethane)	10.0	ND	ND			
Chloromethane (Methyl chloride)	30.0	ND	ND			
4-Chlorotoluene (p-Chlorotoluene)	10.0	ND	ND			
2-Chlorotoluene (o-Chlorotoluene)	10.0	ND	ND			
1,2-Dibromo-3-chloropropane (DBCP)	50.0	ND	ND			
Dibromochloromethane	10.0	ND	ND			
1,2-Dibromoethane (EDB, Ethylene dibromide)	10.0	ND	ND			
Dibromomethane	10.0	ND	ND			
1,2-Dichlorobenzene (o-Dichlorobenzene)	10.0	ND	ND			
1,3-Dichlorobenzene (m-Dichlorobenzene)	10.0	ND	ND			
1,4-Dichlorobenzene (p-Dichlorobenzene)	10.0	ND	ND			
Dichlorodifluoromethane	30.0	ND	ND			
1,1-Dichloroethane	10.0	ND	ND			

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S2C-101415

Our Lab I.D.		**339170**	**339171**			
Client Sample I.D.		B-11@20'	B-11@25'			
Date Sampled		**10/13/2015**	**10/13/2015**			
Date Prepared		**10/15/2015**	**10/15/2015**			
Preparation Method						
Date Analyzed		**10/15/2015**	**10/15/2015**			
Matrix		Soil	Soil			
Units		ug/kg	ug/kg			
Dilution Factor		1	1			
Analytes	**PQL**	**Results**	**Results**			
1,2-Dichloroethane	**10.0**	**ND**	**ND**			
1,1-Dichloroethene (1,1-Dichloroethylene)	**10.0**	**ND**	**ND**			
cis-1,2-Dichloroethene	**10.0**	**ND**	**ND**			
trans-1,2-Dichloroethene	**10.0**	**ND**	**ND**			
1,2-Dichloropropane	**10.0**	**ND**	**ND**			
1,3-Dichloropropane	**10.0**	**ND**	**ND**			
2,2-Dichloropropane	**10.0**	**ND**	**ND**			
1,1-Dichloropropene	**10.0**	**ND**	**ND**			
cis-1,3-Dichloropropene	**10.0**	**ND**	**ND**			
trans-1,3-Dichloropropene	**10.0**	**ND**	**ND**			
Ethylbenzene	**2.00**	**ND**	**ND**			
Hexachlorobutadiene (1,3-Hexachlorobutadiene)	**30.0**	**ND**	**ND**			
2-Hexanone	**50.0**	**ND**	**ND**			
Isopropylbenzene	**10.0**	**ND**	**ND**			
p-Isopropyltoluene (4-Isopropyltoluene)	**10.0**	**ND**	**ND**			
MTBE	**5.00**	**ND**	**ND**			
4-Methyl-2-pentanone (MIBK, Methyl isobutyl ketone)	**50.0**	**ND**	**ND**			
Methylene chloride (Dichloromethane, DCM)	**50.0**	**ND**	**ND**			
Naphthalene	**10.0**	**ND**	**ND**			
n-Propylbenzene	**10.0**	**ND**	**ND**			
Styrene	**10.0**	**ND**	**ND**			
1,1,1,2-Tetrachloroethane	**10.0**	**ND**	**ND**			
1,1,2,2-Tetrachloroethane	**10.0**	**ND**	**ND**			
Tetrachloroethene (Tetrachloroethylene)	**10.0**	**ND**	**ND**			
Toluene (Methyl benzene)	**2.00**	**ND**	**ND**			
1,2,3-Trichlorobenzene	**10.0**	**ND**	**ND**			
1,2,4-Trichlorobenzene	**10.0**	**ND**	**ND**			
1,1,1-Trichloroethane	**10.0**	**ND**	**ND**			
1,1,2-Trichloroethane	**10.0**	**ND**	**ND**			
Trichloroethene (TCE)	**10.0**	**ND**	**ND**			
Trichlorofluoromethane	**10.0**	**ND**	**ND**			
1,2,3-Trichloropropane	**10.0**	**ND**	**ND**			
1,2,4-Trimethylbenzene	**10.0**	**ND**	**ND**			
1,3,5-Trimethylbenzene	**10.0**	**ND**	**ND**			
Vinyl acetate	**50.0**	**ND**	**ND**			

ANALYTICAL RESULTS

Page: **78**

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S2C-101415

Our Lab I.D.		**339170**	**339171**			
Client Sample I.D.		B-11@20'	B-11@25'			
Date Sampled		**10/13/2015**	**10/13/2015**			
Date Prepared		**10/15/2015**	**10/15/2015**			
Preparation Method						
Date Analyzed		**10/15/2015**	**10/15/2015**			
Matrix		Soil	Soil			
Units		ug/kg	ug/kg			
Dilution Factor		1	1			
Analytes	**PQL**	**Results**	**Results**			
Vinyl chloride (Chloroethene)	**30.0**	**ND**	**ND**			
o-Xylene	**2.00**	**ND**	**ND**			
m- & p-Xylenes	**4.00**	**ND**	**ND**			

Our Lab I.D.		**339170**	**339171**			
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**			
Surrogate Percent Recovery						
Bromofluorobenzene	**70-120**	**100**	**100**			
Dibromofluoromethane	**70-120**	**79**	**86**			
Toluene-d8	**70-120**	**95**	**95**			

QUALITY CONTROL REPORT

QC Batch No: S2C-101415

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	**88**	**91**	**3.4**	**75-120**	**15**					
Chlorobenzene	**116**	**117**	**<1**	**75-120**	**15**					
1,1-Dichloroethene (1,1-Dichloroethylene)	**104**	**92**	**12.2**	**75-120**	**15**					
MTBE	**78**	**78**	**<1**	**75-120**	**15**					
Toluene (Methyl benzene)	**84**	**87**	**3.5**	**75-120**	**15**					
Trichloroethene (TCE)	**94**	**95**	**1.1**	**75-120**	**15**					

ANALYTICAL RESULTS

Ordered By

Amec Foster Wheeler
6001 Rickenbacker Road
Los Angeles, CA 90040-

Site

North Campus Drive and
Aberdeen Drive
Riverside, CA

Telephone: (323)889-5300
Attn: Mark Murphy

Page: **79**

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S2C-101515

Our Lab I.D.		**339181**	**339182**	**339183**	**339184**	
Client Sample I.D.		B-4@35'	B-4@40'	B-9@15'	B-9@20'	
Date Sampled		10/13/2015	10/13/2015	10/13/2015	10/13/2015	
Date Prepared		10/15/2015	10/15/2015	10/15/2015	10/15/2015	
Preparation Method						
Date Analyzed		10/15/2015	10/15/2015	10/15/2015	10/15/2015	
Matrix		Soil	Soil	Soil	Soil	
Units		ug/kg	ug/kg	ug/kg	ug/kg	
Dilution Factor		1	1	1	1	
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	
Acetone	50.0	ND	ND	ND	ND	
Benzene	2.00	ND	ND	ND	ND	
Bromobenzene (Phenyl bromide)	10.0	ND	ND	ND	ND	
Bromochloromethane (Chlorobromomethane)	10.0	ND	ND	ND	ND	
Bromodichloromethane (Dichlorobromomethane)	10.0	ND	ND	ND	ND	
Bromoform (Tribromomethane)	50.0	ND	ND	ND	ND	
Bromomethane (Methyl bromide)	30.0	ND	ND	ND	ND	
2-Butanone (MEK, Methyl ethyl ketone)	50.0	ND	ND	ND	ND	
n-Butylbenzene	10.0	ND	ND	ND	ND	
sec-Butylbenzene	10.0	ND	ND	ND	ND	
tert-Butylbenzene	10.0	ND	ND	ND	ND	
Carbon disulfide	10.0	ND	ND	ND	ND	
Carbon tetrachloride (Tetrachloromethane)	10.0	ND	ND	ND	ND	
Chlorobenzene	10.0	ND	ND	ND	ND	
Chloroethane	30.0	ND	ND	ND	ND	
2-Chloroethyl vinyl ether	50.0	ND	ND	ND	ND	
Chloroform (Trichloromethane)	10.0	ND	ND	ND	ND	
Chloromethane (Methyl chloride)	30.0	ND	ND	ND	ND	
4-Chlorotoluene (p-Chlorotoluene)	10.0	ND	ND	ND	ND	
2-Chlorotoluene (o-Chlorotoluene)	10.0	ND	ND	ND	ND	
1,2-Dibromo-3-chloropropane (DBCP)	50.0	ND	ND	ND	ND	
Dibromochloromethane	10.0	ND	ND	ND	ND	
1,2-Dibromoethane (EDB, Ethylene dibromide)	10.0	ND	ND	ND	ND	
Dibromomethane	10.0	ND	ND	ND	ND	
1,2-Dichlorobenzene (o-Dichlorobenzene)	10.0	ND	ND	ND	ND	
1,3-Dichlorobenzene (m-Dichlorobenzene)	10.0	ND	ND	ND	ND	
1,4-Dichlorobenzene (p-Dichlorobenzene)	10.0	ND	ND	ND	ND	
Dichlorodifluoromethane	30.0	ND	ND	ND	ND	
1,1-Dichloroethane	10.0	ND	ND	ND	ND	

ANALYTICAL RESULTS

Page:	**80**
Project ID:	4953-15-1021
Project Name:	UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S2C-101515

Our Lab I.D.		**339181**	**339182**	**339183**	**339184**	
Client Sample I.D.		B-4@35'	B-4@40'	B-9@15'	B-9@20'	
Date Sampled		**10/13/2015**	**10/13/2015**	**10/13/2015**	**10/13/2015**	
Date Prepared		**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**	
Preparation Method						
Date Analyzed		**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**	
Matrix		Soil	Soil	Soil	Soil	
Units		ug/kg	ug/kg	ug/kg	ug/kg	
Dilution Factor		1	1	1	1	
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	
1,2-Dichloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	
1,1-Dichloroethene (1,1-Dichloroethylene)	**10.0**	**ND**	**ND**	**ND**	**ND**	
cis-1,2-Dichloroethene	**10.0**	**ND**	**ND**	**ND**	**ND**	
trans-1,2-Dichloroethene	**10.0**	**ND**	**ND**	**ND**	**ND**	
1,2-Dichloropropane	**10.0**	**ND**	**ND**	**ND**	**ND**	
1,3-Dichloropropane	**10.0**	**ND**	**ND**	**ND**	**ND**	
2,2-Dichloropropane	**10.0**	**ND**	**ND**	**ND**	**ND**	
1,1-Dichloropropene	**10.0**	**ND**	**ND**	**ND**	**ND**	
cis-1,3-Dichloropropene	**10.0**	**ND**	**ND**	**ND**	**ND**	
trans-1,3-Dichloropropene	**10.0**	**ND**	**ND**	**ND**	**ND**	
Ethylbenzene	**2.00**	**ND**	**ND**	**ND**	**ND**	
Hexachlorobutadiene (1,3-Hexachlorobutadiene)	**30.0**	**ND**	**ND**	**ND**	**ND**	
2-Hexanone	**50.0**	**ND**	**ND**	**ND**	**ND**	
Isopropylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	
p-Isopropyltoluene (4-Isopropyltoluene)	**10.0**	**ND**	**ND**	**ND**	**ND**	
MTBE	**5.00**	**ND**	**ND**	**ND**	**ND**	
4-Methyl-2-pentanone (MIBK, Methyl isobutyl ketone)	**50.0**	**ND**	**ND**	**ND**	**ND**	
Methylene chloride (Dichloromethane, DCM)	**50.0**	**ND**	**ND**	**ND**	**ND**	
Naphthalene	**10.0**	**ND**	**ND**	**ND**	**ND**	
n-Propylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	
Styrene	**10.0**	**ND**	**ND**	**ND**	**ND**	
1,1,1,2-Tetrachloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	
1,1,2,2-Tetrachloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	
Tetrachloroethene (Tetrachloroethylene)	**10.0**	**ND**	**ND**	**ND**	**ND**	
Toluene (Methyl benzene)	**2.00**	**ND**	**ND**	**ND**	**ND**	
1,2,3-Trichlorobenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	
1,2,4-Trichlorobenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	
1,1,1-Trichloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	
1,1,2-Trichloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	
Trichloroethene (TCE)	**10.0**	**ND**	**ND**	**ND**	**ND**	
Trichlorofluoromethane	**10.0**	**ND**	**ND**	**ND**	**ND**	
1,2,3-Trichloropropane	**10.0**	**ND**	**ND**	**ND**	**ND**	
1,2,4-Trimethylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	
1,3,5-Trimethylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	
Vinyl acetate	**50.0**	**ND**	**ND**	**ND**	**ND**	

ANALYTICAL RESULTS

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66082	10/13/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S2C-101515

Our Lab I.D.		**339181**	**339182**	**339183**	**339184**	
Client Sample I.D.		B-4@35'	B-4@40'	B-9@15'	B-9@20'	
Date Sampled		**10/13/2015**	**10/13/2015**	**10/13/2015**	**10/13/2015**	
Date Prepared		**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**	
Preparation Method						
Date Analyzed		**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**	
Matrix		Soil	Soil	Soil	Soil	
Units		ug/kg	ug/kg	ug/kg	ug/kg	
Dilution Factor		1	1	1	1	
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	
Vinyl chloride (Chloroethene)	**30.0**	**ND**	**ND**	**ND**	**ND**	
o-Xylene	**2.00**	**ND**	**ND**	**ND**	**ND**	
m- & p-Xylenes	**4.00**	**ND**	**ND**	**ND**	**ND**	

Our Lab I.D.		**339181**	**339182**	**339183**	**339184**	
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	
Surrogate Percent Recovery						
Bromofluorobenzene	**70-120**	**111**	**108**	**109**	**110**	
Dibromofluoromethane	**70-120**	**89**	**91**	**96**	**85**	
Toluene-d8	**70-120**	**103**	**104**	**103**	**104**	

QUALITY CONTROL REPORT

QC Batch No: S2C-101515

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	**96**	**96**	**<1**	**75-120**	**15**					
Chlorobenzene	**120**	**116**	**3.4**	**75-120**	**15**					
1,1-Dichloroethene (1,1-Dichloroethylene)	**104**	**109**	**4.7**	**75-120**	**15**					
MTBE	**103**	**106**	**2.9**	**75-120**	**15**					
Toluene (Methyl benzene)	**94**	**96**	**2.1**	**75-120**	**15**					
Trichloroethene (TCE)	**94**	**92**	**2.2**	**75-120**	**15**					

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Rd., Los Angeles, CA 90065 Tel: (323) 223-9700 Fax: (323) 223-9500

Ordered By

Amec Foster Wheeler
6001 Rickenbacker Road
Los Angeles, CA 90040-

Number of Pages 40
Date Received 10/15/2015
Date Reported 10/19/2015

Telephone (323)889-5300
Attn Mark Murphy

Job Number	Ordered	Client
66105	10/15/2015	AMEC

Project ID: 4953-15-1021
Project Name: UCR
Site: North Campus Drive and
Aberdeen Drive
Riverside, CA

Enclosed are the results of analyses on 23 samples analyzed as specified on attached chain of custody.

Rojert G Araghi

Rojert G. Araghi
Laboratory Director

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA, CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

Page 1 Of 3

COC# Nº 73374 GLOBAL ID ____ E REPORT: ☐ PDF ☐ EDF ☐ EDD ASL JOB# 66105

CHAIN OF CUSTODY RECORD

Company: AMEC FW
Address: 6001 RICKENBACKER RD, LOS ANGLES CA 90040
Telephone: (323) 889-5300
Fax:
Special Instruction:
E-mail:

Project Name: UCR
Site Address: NORTH CAMPUS DRIVE & ABERDEEN DR RIVERSIDE, CA
Project ID: 4953-15-1021
Project Manager: MARK MURPHY

Report To:
Address:
Invoice To:
Address:
P.O.#:

ANALYSIS REQUESTED

ITEM	LAB USE ONLY Lab ID	Sample ID	Date	Time	Container(s) #	Container(s) Type	Matrix	Preservation	VOCS METHOD @8260B	TITLE METALS 6010B/7471A	TPH 8015B	Remarks
1	339281	B-12 @ 5'	10-15-15	716	1	6" SLEEVE	SOIL	ICE CHEST	X	X	X	
2	339282	B-12 @ 10'		718					X	X	X	
3	339283	B-12 @ 15'		720					X	X	X	
4	339284	B-12 @ 20'		721					X	X	X	
5	339285	B-12 @ 25'		725					X	X	X	
6	339286	B-12 @ 30'		727					X	X	X	
7	339287	B-12 @ 35'		731					X	X	X	
8	339288	B-12 @ 40'		745					X	X	X	
9	339289	B-19 @ 5'		800					X	X	X	
10	339290	B-19 @ 10'		802					X	X	X	

Collected By: Date 10-15-15 Time 802
Relinquished By: Date Time
Received By: Date Time

Relinquished By: Date Time
Received For Laboratory: alex Date 10-15-15 Time 1515
Condition of Sample: Revised to Rush, Due 10/19/15

TAT
☐ Normal
☒ Rush

White - Report, Yellow - Laboratory, Pink - Client

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA, CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

Page 2 of 3

COC# Nº 73375 GLOBAL ID ____

E REPORT: ☐ PDF ☐ EDF ☐ EDD ASL JOB# 66105

CHAIN OF CUSTODY RECORD

Company: AMEC FW
Address: " "
" "
Telephone: " "
Fax:
Special Instruction:
E-mail:

Project Name: UCR
Site Address: " "
" "
Project ID: 4953-15-1021
Project Manager: MARK MURPHY

Report To:
Address:
Invoice To:
Address:
P.O.#:

ANALYSIS REQUESTED

ITEM	Lab ID	Sample ID	Date	Time	#	Type	Matrix	Preservation	VOC's	TPH "D&G"	Title 22 metals	Remarks
11 12	339291 339292	B-19@15' B-19@20'	101515	806	1	6" SLEEVE	SOIL	ICE CHEST	X	X	X	
13	339293	B-19@25'		811					X	X	X	
14	339294	B-19@30'		813					X	X	X	
15	339295	B-19@35'		818					X	X	X	
		~~B-19@40'~~							X	X	X	No Sample
16	339296	B-13@5'		852					X	X	X	
17	339297	B-13@10'		855					X	X	X	
18	339298	B-13@15'		856					X	X	X	
19	339299	B-13@20'		859					X	X	X	
20	339300	B-13@25'		903					X	X	X	

Collected By: Date 1015-16 Time 903
Relinquished By: Date Time
Received By: Date Time

Relinquished By: Date Time
Received For Laboratory Date 101515 Time 1515
Condition of Sample:

TAT
☐ Normal
☒ Rush

White - Report, Yellow - Laboratory, Pink - Client

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Road, LA, CA 90065 Tel: (323) 223-9700 • Fax: (323) 223-9500

Page 3 of 3

CHAIN OF CUSTODY RECORD

COC# Nº 73376 GLOBAL ID

E REPORT: ☐ PDF ☐ EDF ☐ EDD ASL JOB# 66105

Company: AMEC FW

Address: " "

" "

Telephone: " "
Fax:

Special Instruction:

E-mail:

Project Name: UCR

Site Address: " "

" "

Project ID: 4953-15-1021

Project Manager: MARK MURPHY

Report To:

Address:

Invoice To:

Address:

P.O.#:

ANALYSIS REQUESTED

ITEM	LAB USE ONLY Lab ID	Sample ID	Date	Time	Container(s) #	Container(s) Type	Matrix	Preservation	" VOCs	" TPH	" Title 22 metals	Remarks
21	339301	B-13@30'	10-15-15	908	1	6" SLEEVE	SOIL	ICE CHEST	X	X	X	
22	339302	B-13@35'	10-15-15	910	1	6" SLEEVE	Soil	ICE CHEST	X	X	X	
23	339303	~~B-13@~~ B-13@40'							X	X	X	

Collected By: Date 10-15-15 Time 910

Relinquished By: Date Time

Received By: Date Time

Relinquished By: Date Time

Received For Laboratory Alex Date 10-15-15 Time 1515

Condition of Sample:

TAT
☐ Normal
☒ Rush

White - Report, Yellow - Laboratory, Pink - Client

ANALYTICAL RESULTS

Ordered By

Amec Foster Wheeler
6001 Rickenbacker Road
Los Angeles, CA 90040-

Telephone: (323)889-5300
Attn: Mark Murphy

Site

North Campus Drive and
Aberdeen Drive
Riverside, CA

Page: **2**

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66105	10/15/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QC Batch No: 101515-2

Our Lab I.D.		**339281**	**339282**	**339283**	**339284**	**339285**
Client Sample I.D.		B-12@5'	B-12@10'	B-12@15'	B-12@20'	B-12@25'
Date Sampled		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Date Prepared		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
AA Metals						
Mercury	0.0500	ND	ND	ND	ND	ND
ICP Metals						
Antimony	0.500	ND	ND	ND	ND	ND
Arsenic	0.250	ND	ND	ND	ND	ND
Barium	0.500	76.0	63.9	37.7	29.4	55.6
Beryllium	0.500	ND	ND	ND	ND	ND
Cadmium	0.500	ND	ND	ND	ND	ND
Chromium	0.500	1.71	1.85	1.13	0.632	ND
Cobalt	0.500	ND	ND	ND	ND	ND
Copper	0.500	1.45	1.14	1.06	0.703	ND
Lead	0.250	ND	ND	ND	ND	ND
Molybdenum	0.500	ND	ND	ND	ND	ND
Nickel	0.500	ND	ND	ND	ND	ND
Selenium	0.500	ND	ND	ND	ND	ND
Silver	0.500	ND	ND	ND	ND	ND
Thallium	0.500	ND	ND	ND	ND	ND
Vanadium	0.500	8.85	10.4	7.31	5.37	3.45
Zinc	0.500	18.1	17.5	8.46	7.15	4.19

QUALITY CONTROL REPORT

QC Batch No: 101515-2

Analytes	LCS % REC	LCS/LCSD % Limit								
AA Metals										
Mercury	100	80-120								
ICP Metals										
Antimony	98	80-120								
Arsenic	95	80-120								

ANALYTICAL RESULTS

Page: **3**

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66105	10/15/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QUALITY CONTROL REPORT

QC Batch No: 101515-2

Analytes	LCS % REC	LCS/LCSD % Limit								
ICP Metals										
Barium	**95**	**80-120**								
Beryllium	**104**	**80-120**								
Cadmium	**96**	**80-120**								
Chromium	**98**	**80-120**								
Cobalt	**95**	**80-120**								
Copper	**97**	**80-120**								
Lead	**98**	**80-120**								
Molybdenum	**95**	**80-120**								
Nickel	**97**	**80-120**								
Selenium	**95**	**80-120**								
Silver	**95**	**80-120**								
Thallium	**97**	**80-120**								
Vanadium	**96**	**80-120**								
Zinc	**93**	**80-120**								

ANALYTICAL RESULTS

Ordered By

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66105	10/15/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QC Batch No: 101515-2

Our Lab I.D.		**339286**	**339287**	**339288**	**339289**	**339290**
Client Sample I.D.		B-12@30'	B-12@35'	B-12@40'	B-19@5'	B-19@10'
Date Sampled		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Date Prepared		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
AA Metals						
Mercury	0.0500	ND	ND	ND	ND	ND
ICP Metals						
Antimony	0.500	ND	ND	ND	ND	ND
Arsenic	0.250	ND	ND	ND	ND	ND
Barium	0.500	27.8	30.1	64.4	52.3	53.4
Beryllium	0.500	ND	ND	ND	ND	ND
Cadmium	0.500	ND	ND	ND	ND	ND
Chromium	0.500	ND	0.919	1.77	3.01	2.76
Cobalt	0.500	ND	ND	ND	ND	ND
Copper	0.500	ND	1.20	1.73	2.44	1.86
Lead	0.250	ND	ND	ND	ND	ND
Molybdenum	0.500	ND	ND	ND	ND	ND
Nickel	0.500	ND	ND	ND	ND	ND
Selenium	0.500	ND	ND	ND	ND	ND
Silver	0.500	ND	ND	ND	ND	ND
Thallium	0.500	ND	ND	ND	ND	ND
Vanadium	0.500	3.97	6.68	10.3	8.39	8.53
Zinc	0.500	5.94	6.39	11.0	9.44	8.54

QUALITY CONTROL REPORT

QC Batch No: 101515-2

Analytes	LCS % REC	LCS/LCSD % Limit								
AA Metals										
Mercury	100	80-120								
ICP Metals										
Antimony	98	80-120								
Arsenic	95	80-120								

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66105	10/15/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QUALITY CONTROL REPORT

QC Batch No: 101515-2

Analytes	LCS % REC	LCS/LCSD % Limit								
ICP Metals										
Barium	95	80-120								
Beryllium	104	80-120								
Cadmium	96	80-120								
Chromium	98	80-120								
Cobalt	95	80-120								
Copper	97	80-120								
Lead	98	80-120								
Molybdenum	95	80-120								
Nickel	97	80-120								
Selenium	95	80-120								
Silver	95	80-120								
Thallium	97	80-120								
Vanadium	96	80-120								
Zinc	93	80-120								

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66105	10/15/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QC Batch No: 101515-2

Our Lab I.D.		**339291**	**339292**	**339293**	**339294**	**339295**
Client Sample I.D.		B-19@15'	B-19@20'	B-19@25'	B-19@30'	B-19@35'
Date Sampled		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Date Prepared		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
AA Metals						
Mercury	0.0500	ND	ND	ND	ND	ND
ICP Metals						
Antimony	0.500	ND	ND	ND	ND	ND
Arsenic	0.250	ND	ND	ND	ND	ND
Barium	0.500	50.7	55.5	37.3	48.0	60.5
Beryllium	0.500	ND	ND	ND	ND	ND
Cadmium	0.500	ND	ND	ND	ND	ND
Chromium	0.500	2.37	1.93	0.952	2.08	2.17
Cobalt	0.500	ND	ND	ND	ND	ND
Copper	0.500	1.87	1.76	0.808	1.94	1.99
Lead	0.250	ND	ND	ND	ND	ND
Molybdenum	0.500	ND	ND	ND	ND	ND
Nickel	0.500	ND	ND	ND	ND	ND
Selenium	0.500	ND	ND	ND	ND	ND
Silver	0.500	ND	ND	ND	ND	ND
Thallium	0.500	ND	ND	ND	ND	ND
Vanadium	0.500	8.97	10.8	6.38	12.3	12.3
Zinc	0.500	10.6	13.7	8.94	12.9	10.6

QUALITY CONTROL REPORT

QC Batch No: 101515-2

Analytes	LCS % REC	LCS/LCSD % Limit								
AA Metals										
Mercury	100	80-120								
ICP Metals										
Antimony	98	80-120								
Arsenic	95	80-120								

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66105	10/15/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QUALITY CONTROL REPORT

QC Batch No: 101515-2

Analytes	LCS % REC	LCS/LCSD % Limit								
ICP Metals										
Barium	**95**	**80-120**								
Beryllium	**104**	**80-120**								
Cadmium	**96**	**80-120**								
Chromium	**98**	**80-120**								
Cobalt	**95**	**80-120**								
Copper	**97**	**80-120**								
Lead	**98**	**80-120**								
Molybdenum	**95**	**80-120**								
Nickel	**97**	**80-120**								
Selenium	**95**	**80-120**								
Silver	**95**	**80-120**								
Thallium	**97**	**80-120**								
Vanadium	**96**	**80-120**								
Zinc	**93**	**80-120**								

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66105	10/15/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QC Batch No: 101615-2

Our Lab I.D.		**339296**	**339297**	**339298**	**339299**	**339300**
Client Sample I.D.		B-13@5'	B-13@10'	B-13@15'	B-13@20'	B-13@25'
Date Sampled		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Date Prepared		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
AA Metals						
Mercury	0.0500	ND	ND	ND	ND	ND
ICP Metals						
Antimony	0.500	ND	ND	ND	ND	ND
Arsenic	0.250	ND	ND	ND	ND	ND
Barium	0.500	56.0	53.6	62.5	99.8	43.7
Beryllium	0.500	ND	ND	ND	ND	ND
Cadmium	0.500	ND	ND	ND	ND	ND
Chromium	0.500	0.862	1.40	1.32	1.38	0.627
Cobalt	0.500	ND	ND	ND	ND	ND
Copper	0.500	1.04	1.13	1.24	1.25	0.659
Lead	0.250	ND	ND	ND	ND	ND
Molybdenum	0.500	ND	ND	ND	ND	ND
Nickel	0.500	ND	ND	ND	ND	ND
Selenium	0.500	ND	ND	ND	ND	ND
Silver	0.500	ND	ND	ND	ND	ND
Thallium	0.500	ND	ND	ND	ND	ND
Vanadium	0.500	7.96	8.70	9.77	8.48	5.62
Zinc	0.500	11.1	10.7	13.8	9.73	11.6

QUALITY CONTROL REPORT

QC Batch No: 101615-2

Analytes	LCS % REC	LCS/LCSD % Limit								
AA Metals										
Mercury	115	80-120								
ICP Metals										
Antimony	96	80-120								
Arsenic	95	80-120								

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66105	10/15/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QUALITY CONTROL REPORT

QC Batch No: 101615-2

Analytes	LCS % REC	LCS/LCSD % Limit								
ICP Metals										
Barium	**95**	**80-120**								
Beryllium	**103**	**80-120**								
Cadmium	**96**	**80-120**								
Chromium	**98**	**80-120**								
Cobalt	**95**	**80-120**								
Copper	**98**	**80-120**								
Lead	**97**	**80-120**								
Molybdenum	**95**	**80-120**								
Nickel	**97**	**80-120**								
Selenium	**95**	**80-120**								
Silver	**95**	**80-120**								
Thallium	**97**	**80-120**								
Vanadium	**96**	**80-120**								
Zinc	**92**	**80-120**								

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66105	10/15/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QC Batch No: 101615-2

Our Lab I.D.		**339301**	**339302**	**339303**		
Client Sample I.D.		B-13@30'	B-13@35'	B-13@40'		
Date Sampled		10/15/2015	10/15/2015	10/15/2015		
Date Prepared		10/16/2015	10/16/2015	10/16/2015		
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015		
Matrix		Soil	Soil	Soil		
Units		mg/Kg	mg/Kg	mg/Kg		
Dilution Factor		1	1	1		
Analytes	**PQL**	**Results**	**Results**	**Results**		
AA Metals						
Mercury	0.0500	ND	ND	ND		
ICP Metals						
Antimony	0.500	ND	ND	ND		
Arsenic	0.250	ND	ND	ND		
Barium	0.500	52.9	54.6	67.0		
Beryllium	0.500	ND	ND	ND		
Cadmium	0.500	ND	ND	ND		
Chromium	0.500	1.96	1.97	2.00		
Cobalt	0.500	ND	ND	ND		
Copper	0.500	1.81	1.97	1.67		
Lead	0.250	ND	ND	ND		
Molybdenum	0.500	ND	ND	ND		
Nickel	0.500	ND	ND	ND		
Selenium	0.500	ND	ND	ND		
Silver	0.500	ND	ND	ND		
Thallium	0.500	ND	ND	ND		
Vanadium	0.500	11.8	11.3	12.7		
Zinc	0.500	12.6	12.4	15.7		

QUALITY CONTROL REPORT

QC Batch No: 101615-2

Analytes	LCS % REC	LCS/LCSD % Limit								
AA Metals										
Mercury	115	80-120								
ICP Metals										
Antimony	96	80-120								
Arsenic	95	80-120								

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66105	10/15/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QUALITY CONTROL REPORT

QC Batch No: 101615-2

Analytes	LCS % REC	LCS/LCSD % Limit								
ICP Metals										
Barium	**95**	**80-120**								
Beryllium	**103**	**80-120**								
Cadmium	**96**	**80-120**								
Chromium	**98**	**80-120**								
Cobalt	**95**	**80-120**								
Copper	**98**	**80-120**								
Lead	**97**	**80-120**								
Molybdenum	**95**	**80-120**								
Nickel	**97**	**80-120**								
Selenium	**95**	**80-120**								
Silver	**95**	**80-120**								
Thallium	**97**	**80-120**								
Vanadium	**96**	**80-120**								
Zinc	**92**	**80-120**								

ANALYTICAL RESULTS

Ordered By

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66105	10/15/2015	AMEC

Method: 8015B, TPH DROs and OROs (Diesel and Oil Range Organics)

QC Batch No: S1D-101615

Our Lab I.D.		**339281**	**339282**	**339283**	**339284**	**339285**
Client Sample I.D.		B-12@5'	B-12@10'	B-12@15'	B-12@20'	B-12@25'
Date Sampled		**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**
Date Prepared		**10/16/2015**	**10/16/2015**	**10/16/2015**	**10/16/2015**	**10/16/2015**
Preparation Method						
Date Analyzed		**10/16/2015**	**10/16/2015**	**10/16/2015**	**10/16/2015**	**10/16/2015**
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH DROs (C10 to C28)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
TPH OROs (C28+)	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**

Our Lab I.D.		**339281**	**339282**	**339283**	**339284**	**339285**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Chlorobenzene	**70-120**	**96**	**95**	**95**	**94**	**96**

QUALITY CONTROL REPORT

QC Batch No: S1D-101615

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Diesel	**108**	**108**	**<1**	**75-120**	**<20**					

ANALYTICAL RESULTS

Ordered By

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66105	10/15/2015	AMEC

Method: 8015B, TPH DROs and OROs (Diesel and Oil Range Organics)

QC Batch No: S1D-101615

Our Lab I.D.		**339286**	**339287**	**339288**	**339289**	**339290**
Client Sample I.D.		B-12@30'	B-12@35'	B-12@40'	B-19@5'	B-19@10'
Date Sampled		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Date Prepared		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Preparation Method						
Date Analyzed		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH DROs (C10 to C28)	10.0	ND	ND	ND	ND	ND
TPH OROs (C28+)	50.0	ND	ND	ND	ND	ND

Our Lab I.D.		**339286**	**339287**	**339288**	**339289**	**339290**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Chlorobenzene	70-120	95	96	96	97	97

QUALITY CONTROL REPORT

QC Batch No: S1D-101615

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Diesel	108	108	<1	75-120	<20					

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66105	10/15/2015	AMEC

Method: 8015B, TPH DROs and OROs (Diesel and Oil Range Organics)

QC Batch No: S1D-101615

Our Lab I.D.		**339291**				
Client Sample I.D.		B-19@15'				
Date Sampled		**10/15/2015**				
Date Prepared		**10/16/2015**				
Preparation Method						
Date Analyzed		**10/16/2015**				
Matrix		Soil				
Units		mg/Kg				
Dilution Factor		1				
Analytes	**PQL**	**Results**				
TPH DROs (C10 to C28)	**10.0**	**ND**				
TPH OROs (C28+)	**50.0**	**ND**				

Our Lab I.D.		**339291**				
Surrogates	**% Rec.Limit**	**% Rec.**				
Surrogate Percent Recovery						
Chlorobenzene	**70-120**	**98**				

QUALITY CONTROL REPORT

QC Batch No: S1D-101615

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Diesel	**108**	**108**	**<1**	**75-120**	**<20**					

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66105	10/15/2015	AMEC

Method: 8015B, TPH DROs and OROs (Diesel and Oil Range Organics)

QC Batch No: S1P-101615

Our Lab I.D.		**339294**	**339295**	**339296**	**339297**	**339298**
Client Sample I.D.		B-19@30'	B-19@35'	B-13@5'	B-13@10'	B-13@15'
Date Sampled		**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**
Date Prepared		**10/16/2015**	**10/16/2015**	**10/16/2015**	**10/16/2015**	**10/16/2015**
Preparation Method						
Date Analyzed		**10/16/2015**	**10/16/2015**	**10/16/2015**	**10/16/2015**	**10/16/2015**
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH DROs (C10 to C28)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
TPH OROs (C28+)	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**

Our Lab I.D.		**339294**	**339295**	**339296**	**339297**	**339298**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Chlorobenzene	**70-120**	**93**	**92**	**94**	**92**	**94**

QUALITY CONTROL REPORT

QC Batch No: S1P-101615

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Diesel	**111**	**105**	**5.6**	**75-120**	**<20**					

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66105	10/15/2015	AMEC

Method: 8015B, TPH DROs and OROs (Diesel and Oil Range Organics)

QC Batch No: S1P-101615

Our Lab I.D.		**339299**	**339300**	**339301**	**339302**	**339303**
Client Sample I.D.		B-13@20'	B-13@25'	B-13@30'	B-13@35'	B-13@40'
Date Sampled		**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**
Date Prepared		**10/16/2015**	**10/16/2015**	**10/16/2015**	**10/16/2015**	**10/16/2015**
Preparation Method						
Date Analyzed		**10/16/2015**	**10/16/2015**	**10/16/2015**	**10/16/2015**	**10/16/2015**
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH DROs (C10 to C28)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
TPH OROs (C28+)	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**

Our Lab I.D.		**339299**	**339300**	**339301**	**339302**	**339303**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Chlorobenzene	**70-120**	**95**	**92**	**91**	**96**	**96**

QUALITY CONTROL REPORT

QC Batch No: S1P-101615

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Diesel	**111**	**105**	**5.6**	**75-120**	**<20**					

ANALYTICAL RESULTS

Ordered By

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	**Submitted**	**Client**
66105	10/15/2015	AMEC

Method: 8015B, TPH DROs and OROs (Diesel and Oil Range Organics)

QC Batch No: S2D-101615

Our Lab I.D.		**339292**	**339293**			
Client Sample I.D.		B-19@20'	B-19@25'			
Date Sampled		**10/15/2015**	**10/15/2015**			
Date Prepared		**10/16/2015**	**10/16/2015**			
Preparation Method						
Date Analyzed		**10/17/2015**	**10/17/2015**			
Matrix		Soil	Soil			
Units		mg/Kg	mg/Kg			
Dilution Factor		1	1			
Analytes	**PQL**	**Results**	**Results**			
TPH DROs (C10 to C28)	**10.0**	**ND**	**ND**			
TPH OROs (C28+)	**50.0**	**ND**	**ND**			

Our Lab I.D.		**339292**	**339293**			
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**			
Surrogate Percent Recovery						
Chlorobenzene	**70-120**	**99**	**92**			

QUALITY CONTROL REPORT

QC Batch No: S2D-101615

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Diesel	**87**	**91**	**4.5**	**75-120**	**<20**					

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66105	10/15/2015	AMEC

Method: 8015B, TPH GROs (Gasoline Range Organics)

QC Batch No: S1G-101615

Our Lab I.D.		**339281**	**339282**	**339283**	**339284**	**339285**
Client Sample I.D.		B-12@5'	B-12@10'	B-12@15'	B-12@20'	B-12@25'
Date Sampled		**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**
Date Prepared		**10/16/2015**	**10/16/2015**	**10/16/2015**	**10/16/2015**	**10/16/2015**
Preparation Method						
Date Analyzed		**10/16/2015**	**10/16/2015**	**10/16/2015**	**10/16/2015**	**10/16/2015**
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH GROs (C6 to C10)	**500**	**ND**	**ND**	**ND**	**ND**	**ND**

Our Lab I.D.		**339281**	**339282**	**339283**	**339284**	**339285**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Bromofluorobenzene	**70-120**	**98**	**96**	**97**	**103**	**102**

QUALITY CONTROL REPORT

QC Batch No: S1G-101615

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	**100**	**97**	**3.0**	**75-120**	**<20**					
Toluene	**99**	**100**	**1.0**	**75-120**	**<20**					

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66105	10/15/2015	AMEC

Method: 8015B, TPH GROs (Gasoline Range Organics)

QC Batch No: S1G-101615

Our Lab I.D.		339286	339287	339288	339289	339290
Client Sample I.D.		B-12@30'	B-12@35'	B-12@40'	B-19@5'	B-19@10'
Date Sampled		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Date Prepared		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Preparation Method						
Date Analyzed		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH GROs (C6 to C10)	500	ND	ND	ND	ND	ND

Our Lab I.D.		339286	339287	339288	339289	339290
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Bromofluorobenzene	70-120	103	104	109	105	78

QUALITY CONTROL REPORT

QC Batch No: S1G-101615

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	100	97	3.0	75-120	<20					
Toluene	99	100	1.0	75-120	<20					

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66105	10/15/2015	AMEC

Method: 8015B, TPH GROs (Gasoline Range Organics)

QC Batch No: S1G-101615

Our Lab I.D.		**339291**	**339292**	**339293**	**339294**	**339295**
Client Sample I.D.		B-19@15'	B-19@20'	B-19@25'	B-19@30'	B-19@35'
Date Sampled		**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**
Date Prepared		**10/16/2015**	**10/16/2015**	**10/16/2015**	**10/16/2015**	**10/16/2015**
Preparation Method						
Date Analyzed		**10/16/2015**	**10/16/2015**	**10/16/2015**	**10/16/2015**	**10/16/2015**
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH GROs (C6 to C10)	**500**	**ND**	**ND**	**ND**	**ND**	**ND**

Our Lab I.D.		**339291**	**339292**	**339293**	**339294**	**339295**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Bromofluorobenzene	**70-120**	**96**	**98**	**95**	**98**	**94**

QUALITY CONTROL REPORT

QC Batch No: S1G-101615

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	**100**	**97**	**3.0**	**75-120**	**<20**					
Toluene	**99**	**100**	**1.0**	**75-120**	**<20**					

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66105	10/15/2015	AMEC

Method: 8015B, TPH GROs (Gasoline Range Organics)

QC Batch No: S1G-101615

Our Lab I.D.		**339296**	**339297**	**339298**		
Client Sample I.D.		B-13@5'	B-13@10'	B-13@15'		
Date Sampled		**10/15/2015**	**10/15/2015**	**10/15/2015**		
Date Prepared		**10/16/2015**	**10/16/2015**	**10/16/2015**		
Preparation Method						
Date Analyzed		**10/16/2015**	**10/16/2015**	**10/16/2015**		
Matrix		Soil	Soil	Soil		
Units		ug/kg	ug/kg	ug/kg		
Dilution Factor		1	1	1		
Analytes	**PQL**	**Results**	**Results**	**Results**		
TPH GROs (C6 to C10)	**500**	**ND**	**ND**	**ND**		

Our Lab I.D.		**339296**	**339297**	**339298**		
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**		
Surrogate Percent Recovery						
Bromofluorobenzene	**70-120**	**102**	**99**	**97**		

QUALITY CONTROL REPORT

QC Batch No: S1G-101615

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	**100**	**97**	**3.0**	**75-120**	**<20**					
Toluene	**99**	**100**	**1.0**	**75-120**	**<20**					

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66105	10/15/2015	AMEC

Method: 8015B, TPH GROs (Gasoline Range Organics)

QC Batch No: S1H-101615

Our Lab I.D.		**339299**	**339300**	**339301**	**339302**	**339303**
Client Sample I.D.		B-13@20'	B-13@25'	B-13@30'	B-13@35'	B-13@40'
Date Sampled		**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**
Date Prepared		**10/16/2015**	**10/16/2015**	**10/16/2015**	**10/16/2015**	**10/16/2015**
Preparation Method						
Date Analyzed		**10/16/2015**	**10/16/2015**	**10/16/2015**	**10/16/2015**	**10/16/2015**
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH GROs (C6 to C10)	**500**	**ND**	**ND**	**ND**	**ND**	**ND**

Our Lab I.D.		**339299**	**339300**	**339301**	**339302**	**339303**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Bromofluorobenzene	**70-120**	**83**	**88**	**95**	**84**	**94**

QUALITY CONTROL REPORT

QC Batch No: S1H-101615

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	**103**	**102**	**<1**	**75-120**	**<20**					
Toluene	**104**	**103**	**<1**	**75-120**	**<20**					

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66105	10/15/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1B-101615

Our Lab I.D.		**339293**	**339294**	**339295**	**339296**	**339297**
Client Sample I.D.		B-19@25'	B-19@30'	B-19@35'	B-13@5'	B-13@10'
Date Sampled		**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**
Date Prepared		**10/16/2015**	**10/16/2015**	**10/16/2015**	**10/16/2015**	**10/16/2015**
Preparation Method						
Date Analyzed		**10/16/2015**	**10/16/2015**	**10/16/2015**	**10/16/2015**	**10/16/2015**
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Acetone	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Benzene	**2.00**	**ND**	**ND**	**ND**	**ND**	**ND**
Bromobenzene (Phenyl bromide)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Bromochloromethane (Chlorobromomethane)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Bromodichloromethane (Dichlorobromomethane)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Bromoform (Tribromomethane)	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Bromomethane (Methyl bromide)	**30.0**	**ND**	**ND**	**ND**	**ND**	**ND**
2-Butanone (MEK, Methyl ethyl ketone)	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**
n-Butylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
sec-Butylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
tert-Butylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Carbon disulfide	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Carbon tetrachloride (Tetrachloromethane)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Chlorobenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Chloroethane	**30.0**	**ND**	**ND**	**ND**	**ND**	**ND**
2-Chloroethyl vinyl ether	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Chloroform (Trichloromethane)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Chloromethane (Methyl chloride)	**30.0**	**ND**	**ND**	**ND**	**ND**	**ND**
4-Chlorotoluene (p-Chlorotoluene)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
2-Chlorotoluene (o-Chlorotoluene)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2-Dibromo-3-chloropropane (DBCP)	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Dibromochloromethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2-Dibromoethane (EDB, Ethylene dibromide)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Dibromomethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2-Dichlorobenzene (o-Dichlorobenzene)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,3-Dichlorobenzene (m-Dichlorobenzene)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,4-Dichlorobenzene (p-Dichlorobenzene)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Dichlorodifluoromethane	**30.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1-Dichloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66105	10/15/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1B-101615

Our Lab I.D.		**339293**	**339294**	**339295**	**339296**	**339297**
Client Sample I.D.		B-19@25'	B-19@30'	B-19@35'	B-13@5'	B-13@10'
Date Sampled		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Date Prepared		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Preparation Method						
Date Analyzed		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
1,2-Dichloroethane	10.0	ND	ND	ND	ND	ND
1,1-Dichloroethene (1,1-Dichloroethylene)	10.0	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	10.0	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	10.0	ND	ND	ND	ND	ND
1,2-Dichloropropane	10.0	ND	ND	ND	ND	ND
1,3-Dichloropropane	10.0	ND	ND	ND	ND	ND
2,2-Dichloropropane	10.0	ND	ND	ND	ND	ND
1,1-Dichloropropene	10.0	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	10.0	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	10.0	ND	ND	ND	ND	ND
Ethylbenzene	2.00	ND	ND	ND	ND	ND
Hexachlorobutadiene (1,3-Hexachlorobutadiene)	30.0	ND	ND	ND	ND	ND
2-Hexanone	50.0	ND	ND	ND	ND	ND
Isopropylbenzene	10.0	ND	ND	ND	ND	ND
p-Isopropyltoluene (4-Isopropyltoluene)	10.0	ND	ND	ND	ND	ND
MTBE	5.00	ND	ND	ND	ND	ND
4-Methyl-2-pentanone (MIBK, Methyl isobutyl ketone)	50.0	ND	ND	ND	ND	ND
Methylene chloride (Dichloromethane, DCM)	50.0	ND	ND	ND	ND	ND
Naphthalene	10.0	ND	ND	ND	ND	ND
n-Propylbenzene	10.0	ND	ND	ND	ND	ND
Styrene	10.0	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	10.0	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	10.0	ND	ND	ND	ND	ND
Tetrachloroethene (Tetrachloroethylene)	10.0	ND	ND	ND	ND	ND
Toluene (Methyl benzene)	2.00	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	10.0	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	10.0	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	10.0	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	10.0	ND	ND	ND	ND	ND
Trichloroethene (TCE)	10.0	ND	ND	ND	ND	ND
Trichlorofluoromethane	10.0	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	10.0	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	10.0	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	10.0	ND	ND	ND	ND	ND
Vinyl acetate	50.0	ND	ND	ND	ND	ND

ANALYTICAL RESULTS

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66105	10/15/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1B-101615

Our Lab I.D.		339293	339294	339295	339296	339297
Client Sample I.D.		B-19@25'	B-19@30'	B-19@35'	B-13@5'	B-13@10'
Date Sampled		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Date Prepared		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Preparation Method						
Date Analyzed		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Vinyl chloride (Chloroethene)	30.0	ND	ND	ND	ND	ND
o-Xylene	2.00	ND	ND	ND	ND	ND
m- & p-Xylenes	4.00	ND	ND	ND	ND	ND

Our Lab I.D.		339293	339294	339295	339296	339297
Surrogates	% Rec.Limit	% Rec.	% Rec.	% Rec.	% Rec.	% Rec.
Surrogate Percent Recovery						
Bromofluorobenzene	70-120	115	114	117	102	107
Dibromofluoromethane	70-120	95	104	106	93	93
Toluene-d8	70-120	104	105	104	105	103

QUALITY CONTROL REPORT

QC Batch No: S1B-101615

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	95	99	4.1	75-120	15					
Chlorobenzene	114	119	4.3	75-120	15					
1,1-Dichloroethene (1,1-Dichloroethylene)	84	82	2.4	75-120	15					
MTBE	107	109	1.9	75-120	15					
Toluene (Methyl benzene)	94	97	3.1	75-120	15					
Trichloroethene (TCE)	91	95	4.3	75-120	15					

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66105	10/15/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1B-101615

Our Lab I.D.		**339298**	**339299**	**339300**	**339301**	**339302**
Client Sample I.D.		B-13@15'	B-13@20'	B-13@25'	B-13@30'	B-13@35'
Date Sampled		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Date Prepared		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Preparation Method						
Date Analyzed		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Acetone	50.0	ND	ND	ND	ND	ND
Benzene	2.00	ND	ND	ND	ND	ND
Bromobenzene (Phenyl bromide)	10.0	ND	ND	ND	ND	ND
Bromochloromethane (Chlorobromomethane)	10.0	ND	ND	ND	ND	ND
Bromodichloromethane (Dichlorobromomethane)	10.0	ND	ND	ND	ND	ND
Bromoform (Tribromomethane)	50.0	ND	ND	ND	ND	ND
Bromomethane (Methyl bromide)	30.0	ND	ND	ND	ND	ND
2-Butanone (MEK, Methyl ethyl ketone)	50.0	ND	ND	ND	ND	ND
n-Butylbenzene	10.0	ND	ND	ND	ND	ND
sec-Butylbenzene	10.0	ND	ND	ND	ND	ND
tert-Butylbenzene	10.0	ND	ND	ND	ND	ND
Carbon disulfide	10.0	ND	ND	ND	ND	ND
Carbon tetrachloride (Tetrachloromethane)	10.0	ND	ND	ND	ND	ND
Chlorobenzene	10.0	ND	ND	ND	ND	ND
Chloroethane	30.0	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	50.0	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	10.0	ND	ND	ND	ND	ND
Chloromethane (Methyl chloride)	30.0	ND	ND	ND	ND	ND
4-Chlorotoluene (p-Chlorotoluene)	10.0	ND	ND	ND	ND	ND
2-Chlorotoluene (o-Chlorotoluene)	10.0	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane (DBCP)	50.0	ND	ND	ND	ND	ND
Dibromochloromethane	10.0	ND	ND	ND	ND	ND
1,2-Dibromoethane (EDB, Ethylene dibromide)	10.0	ND	ND	ND	ND	ND
Dibromomethane	10.0	ND	ND	ND	ND	ND
1,2-Dichlorobenzene (o-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
1,3-Dichlorobenzene (m-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
1,4-Dichlorobenzene (p-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
Dichlorodifluoromethane	30.0	ND	ND	ND	ND	ND
1,1-Dichloroethane	10.0	ND	ND	ND	ND	ND

ANALYTICAL RESULTS

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66105	10/15/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1B-101615

Our Lab I.D.		**339298**	**339299**	**339300**	**339301**	**339302**
Client Sample I.D.		B-13@15'	B-13@20'	B-13@25'	B-13@30'	B-13@35'
Date Sampled		**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**	**10/15/2015**
Date Prepared		**10/16/2015**	**10/16/2015**	**10/16/2015**	**10/16/2015**	**10/16/2015**
Preparation Method						
Date Analyzed		**10/16/2015**	**10/16/2015**	**10/16/2015**	**10/16/2015**	**10/16/2015**
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
1,2-Dichloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1-Dichloroethene (1,1-Dichloroethylene)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
cis-1,2-Dichloroethene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
trans-1,2-Dichloroethene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2-Dichloropropane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,3-Dichloropropane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
2,2-Dichloropropane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1-Dichloropropene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
cis-1,3-Dichloropropene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
trans-1,3-Dichloropropene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Ethylbenzene	**2.00**	**ND**	**ND**	**ND**	**ND**	**ND**
Hexachlorobutadiene (1,3-Hexachlorobutadiene)	**30.0**	**ND**	**ND**	**ND**	**ND**	**ND**
2-Hexanone	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Isopropylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
p-Isopropyltoluene (4-Isopropyltoluene)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
MTBE	**5.00**	**ND**	**ND**	**ND**	**ND**	**ND**
4-Methyl-2-pentanone (MIBK, Methyl isobutyl ketone)	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Methylene chloride (Dichloromethane, DCM)	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Naphthalene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
n-Propylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Styrene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1,1,2-Tetrachloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1,2,2-Tetrachloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Tetrachloroethene (Tetrachloroethylene)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Toluene (Methyl benzene)	**2.00**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2,3-Trichlorobenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2,4-Trichlorobenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1,1-Trichloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1,2-Trichloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Trichloroethene (TCE)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Trichlorofluoromethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2,3-Trichloropropane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2,4-Trimethylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,3,5-Trimethylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Vinyl acetate	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66105	10/15/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1B-101615

Our Lab I.D.		**339298**	**339299**	**339300**	**339301**	**339302**
Client Sample I.D.		B-13@15'	B-13@20'	B-13@25'	B-13@30'	B-13@35'
Date Sampled		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Date Prepared		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Preparation Method						
Date Analyzed		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Vinyl chloride (Chloroethene)	30.0	ND	ND	ND	ND	ND
o-Xylene	2.00	ND	ND	ND	ND	ND
m- & p-Xylenes	4.00	ND	ND	ND	ND	ND

Our Lab I.D.		**339298**	**339299**	**339300**	**339301**	**339302**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Bromofluorobenzene	70-120	118	105	119	115	116
Dibromofluoromethane	70-120	96	95	95	97	98
Toluene-d8	70-120	105	105	104	103	105

QUALITY CONTROL REPORT

QC Batch No: S1B-101615

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	95	99	4.1	75-120	15					
Chlorobenzene	114	119	4.3	75-120	15					
1,1-Dichloroethene (1,1-Dichloroethylene)	84	82	2.4	75-120	15					
MTBE	107	109	1.9	75-120	15					
Toluene (Methyl benzene)	94	97	3.1	75-120	15					
Trichloroethene (TCE)	91	95	4.3	75-120	15					

ANALYTICAL RESULTS

Ordered By

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66105	10/15/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1B-101615

Our Lab I.D.		**339303**				
Client Sample I.D.		B-13@40'				
Date Sampled		**10/15/2015**				
Date Prepared		**10/16/2015**				
Preparation Method						
Date Analyzed		**10/16/2015**				
Matrix		Soil				
Units		ug/kg				
Dilution Factor		1				
Analytes	**PQL**	**Results**				
Acetone	50.0	ND				
Benzene	2.00	ND				
Bromobenzene (Phenyl bromide)	10.0	ND				
Bromochloromethane (Chlorobromomethane)	10.0	ND				
Bromodichloromethane (Dichlorobromomethane)	10.0	ND				
Bromoform (Tribromomethane)	50.0	ND				
Bromomethane (Methyl bromide)	30.0	ND				
2-Butanone (MEK, Methyl ethyl ketone)	50.0	ND				
n-Butylbenzene	10.0	ND				
sec-Butylbenzene	10.0	ND				
tert-Butylbenzene	10.0	ND				
Carbon disulfide	10.0	ND				
Carbon tetrachloride (Tetrachloromethane)	10.0	ND				
Chlorobenzene	10.0	ND				
Chloroethane	30.0	ND				
2-Chloroethyl vinyl ether	50.0	ND				
Chloroform (Trichloromethane)	10.0	ND				
Chloromethane (Methyl chloride)	30.0	ND				
4-Chlorotoluene (p-Chlorotoluene)	10.0	ND				
2-Chlorotoluene (o-Chlorotoluene)	10.0	ND				
1,2-Dibromo-3-chloropropane (DBCP)	50.0	ND				
Dibromochloromethane	10.0	ND				
1,2-Dibromoethane (EDB, Ethylene dibromide)	10.0	ND				
Dibromomethane	10.0	ND				
1,2-Dichlorobenzene (o-Dichlorobenzene)	10.0	ND				
1,3-Dichlorobenzene (m-Dichlorobenzene)	10.0	ND				
1,4-Dichlorobenzene (p-Dichlorobenzene)	10.0	ND				
Dichlorodifluoromethane	30.0	ND				
1,1-Dichloroethane	10.0	ND				

ANALYTICAL RESULTS

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66105	10/15/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1B-101615

Our Lab I.D.		**339303**				
Client Sample I.D.		B-13@40'				
Date Sampled		10/15/2015				
Date Prepared		10/16/2015				
Preparation Method						
Date Analyzed		10/16/2015				
Matrix		Soil				
Units		ug/kg				
Dilution Factor		1				
Analytes	**PQL**	**Results**				
1,2-Dichloroethane	10.0	ND				
1,1-Dichloroethene (1,1-Dichloroethylene)	10.0	ND				
cis-1,2-Dichloroethene	10.0	ND				
trans-1,2-Dichloroethene	10.0	ND				
1,2-Dichloropropane	10.0	ND				
1,3-Dichloropropane	10.0	ND				
2,2-Dichloropropane	10.0	ND				
1,1-Dichloropropene	10.0	ND				
cis-1,3-Dichloropropene	10.0	ND				
trans-1,3-Dichloropropene	10.0	ND				
Ethylbenzene	2.00	ND				
Hexachlorobutadiene (1,3-Hexachlorobutadiene)	30.0	ND				
2-Hexanone	50.0	ND				
Isopropylbenzene	10.0	ND				
p-Isopropyltoluene (4-Isopropyltoluene)	10.0	ND				
MTBE	5.00	ND				
4-Methyl-2-pentanone (MIBK, Methyl isobutyl ketone)	50.0	ND				
Methylene chloride (Dichloromethane, DCM)	50.0	ND				
Naphthalene	10.0	ND				
n-Propylbenzene	10.0	ND				
Styrene	10.0	ND				
1,1,1,2-Tetrachloroethane	10.0	ND				
1,1,2,2-Tetrachloroethane	10.0	ND				
Tetrachloroethene (Tetrachloroethylene)	10.0	ND				
Toluene (Methyl benzene)	2.00	ND				
1,2,3-Trichlorobenzene	10.0	ND				
1,2,4-Trichlorobenzene	10.0	ND				
1,1,1-Trichloroethane	10.0	ND				
1,1,2-Trichloroethane	10.0	ND				
Trichloroethene (TCE)	10.0	ND				
Trichlorofluoromethane	10.0	ND				
1,2,3-Trichloropropane	10.0	ND				
1,2,4-Trimethylbenzene	10.0	ND				
1,3,5-Trimethylbenzene	10.0	ND				
Vinyl acetate	50.0	ND				

ANALYTICAL RESULTS

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66105	10/15/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1B-101615

Our Lab I.D.		339303				
Client Sample I.D.		B-13@40'				
Date Sampled		10/15/2015				
Date Prepared		10/16/2015				
Preparation Method						
Date Analyzed		10/16/2015				
Matrix		Soil				
Units		ug/kg				
Dilution Factor		1				
Analytes	**PQL**	**Results**				
Vinyl chloride (Chloroethene)	30.0	ND				
o-Xylene	2.00	ND				
m- & p-Xylenes	4.00	ND				

Our Lab I.D.		339303				
Surrogates	% Rec.Limit	% Rec.				
Surrogate Percent Recovery						
Bromofluorobenzene	70-120	115				
Dibromofluoromethane	70-120	99				
Toluene-d8	70-120	104				

QUALITY CONTROL REPORT

QC Batch No: S1B-101615

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	95	99	4.1	75-120	15					
Chlorobenzene	114	119	4.3	75-120	15					
1,1-Dichloroethene (1,1-Dichloroethylene)	84	82	2.4	75-120	15					
MTBE	107	109	1.9	75-120	15					
Toluene (Methyl benzene)	94	97	3.1	75-120	15					
Trichloroethene (TCE)	91	95	4.3	75-120	15					

ANALYTICAL RESULTS

Ordered By

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Telephone: (323)889-5300
Attn: Mark Murphy

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66105	10/15/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1C-101615

Our Lab I.D.		**339281**	**339282**	**339283**	**339284**	**339285**
Client Sample I.D.		B-12@5'	B-12@10'	B-12@15'	B-12@20'	B-12@25'
Date Sampled		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Date Prepared		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Preparation Method						
Date Analyzed		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Acetone	50.0	ND	ND	ND	ND	ND
Benzene	2.00	ND	ND	ND	ND	ND
Bromobenzene (Phenyl bromide)	10.0	ND	ND	ND	ND	ND
Bromochloromethane (Chlorobromomethane)	10.0	ND	ND	ND	ND	ND
Bromodichloromethane (Dichlorobromomethane)	10.0	ND	ND	ND	ND	ND
Bromoform (Tribromomethane)	50.0	ND	ND	ND	ND	ND
Bromomethane (Methyl bromide)	30.0	ND	ND	ND	ND	ND
2-Butanone (MEK, Methyl ethyl ketone)	50.0	ND	ND	ND	ND	ND
n-Butylbenzene	10.0	ND	ND	ND	ND	ND
sec-Butylbenzene	10.0	ND	ND	ND	ND	ND
tert-Butylbenzene	10.0	ND	ND	ND	ND	ND
Carbon disulfide	10.0	ND	ND	ND	ND	ND
Carbon tetrachloride (Tetrachloromethane)	10.0	ND	ND	ND	ND	ND
Chlorobenzene	10.0	ND	ND	ND	ND	ND
Chloroethane	30.0	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	50.0	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	10.0	ND	ND	ND	ND	ND
Chloromethane (Methyl chloride)	30.0	ND	ND	ND	ND	ND
4-Chlorotoluene (p-Chlorotoluene)	10.0	ND	ND	ND	ND	ND
2-Chlorotoluene (o-Chlorotoluene)	10.0	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane (DBCP)	50.0	ND	ND	ND	ND	ND
Dibromochloromethane	10.0	ND	ND	ND	ND	ND
1,2-Dibromoethane (EDB, Ethylene dibromide)	10.0	ND	ND	ND	ND	ND
Dibromomethane	10.0	ND	ND	ND	ND	ND
1,2-Dichlorobenzene (o-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
1,3-Dichlorobenzene (m-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
1,4-Dichlorobenzene (p-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
Dichlorodifluoromethane	30.0	ND	ND	ND	ND	ND
1,1-Dichloroethane	10.0	ND	ND	ND	ND	ND

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66105	10/15/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1C-101615

Our Lab I.D.		**339281**	**339282**	**339283**	**339284**	**339285**
Client Sample I.D.		B-12@5'	B-12@10'	B-12@15'	B-12@20'	B-12@25'
Date Sampled		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Date Prepared		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Preparation Method						
Date Analyzed		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
1,2-Dichloroethane	10.0	ND	ND	ND	ND	ND
1,1-Dichloroethene (1,1-Dichloroethylene)	10.0	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	10.0	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	10.0	ND	ND	ND	ND	ND
1,2-Dichloropropane	10.0	ND	ND	ND	ND	ND
1,3-Dichloropropane	10.0	ND	ND	ND	ND	ND
2,2-Dichloropropane	10.0	ND	ND	ND	ND	ND
1,1-Dichloropropene	10.0	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	10.0	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	10.0	ND	ND	ND	ND	ND
Ethylbenzene	2.00	ND	ND	ND	ND	ND
Hexachlorobutadiene (1,3-Hexachlorobutadiene)	30.0	ND	ND	ND	ND	ND
2-Hexanone	50.0	ND	ND	ND	ND	ND
Isopropylbenzene	10.0	ND	ND	ND	ND	ND
p-Isopropyltoluene (4-Isopropyltoluene)	10.0	ND	ND	ND	ND	ND
MTBE	5.00	ND	ND	ND	ND	ND
4-Methyl-2-pentanone (MIBK, Methyl isobutyl ketone)	50.0	ND	ND	ND	ND	ND
Methylene chloride (Dichloromethane, DCM)	50.0	ND	ND	ND	ND	ND
Naphthalene	10.0	ND	ND	ND	ND	ND
n-Propylbenzene	10.0	ND	ND	ND	ND	ND
Styrene	10.0	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	10.0	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	10.0	ND	ND	ND	ND	ND
Tetrachloroethene (Tetrachloroethylene)	10.0	ND	ND	ND	ND	ND
Toluene (Methyl benzene)	2.00	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	10.0	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	10.0	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	10.0	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	10.0	ND	ND	ND	ND	ND
Trichloroethene (TCE)	10.0	ND	ND	ND	ND	ND
Trichlorofluoromethane	10.0	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	10.0	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	10.0	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	10.0	ND	ND	ND	ND	ND
Vinyl acetate	50.0	ND	ND	ND	ND	ND

ANALYTICAL RESULTS

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66105	10/15/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1C-101615

Our Lab I.D.		**339281**	**339282**	**339283**	**339284**	**339285**
Client Sample I.D.		B-12@5'	B-12@10'	B-12@15'	B-12@20'	B-12@25'
Date Sampled		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Date Prepared		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Preparation Method						
Date Analyzed		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Vinyl chloride (Chloroethene)	30.0	ND	ND	ND	ND	ND
o-Xylene	2.00	ND	ND	ND	ND	ND
m- & p-Xylenes	4.00	ND	ND	ND	ND	ND

Our Lab I.D.		**339281**	**339282**	**339283**	**339284**	**339285**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Bromofluorobenzene	70-120	114	110	107	120	117
Dibromofluoromethane	70-120	106	82	80	85	77
Toluene-d8	70-120	110	109	102	106	109

QUALITY CONTROL REPORT

QC Batch No: S1C-101615

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	98	98	<1	75-120	15					
Chlorobenzene	114	114	<1	75-120	15					
1,1-Dichloroethene (1,1-Dichloroethylene)	87	90	3.4	75-120	15					
MTBE	103	103	<1	75-120	15					
Toluene (Methyl benzene)	94	94	<1	75-120	15					
Trichloroethene (TCE)	86	85	1.2	75-120	15					

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
2520 N. San Fernando Rd., Los Angeles, CA 90065 Tel: (323) 223-9700 Fax: (323) 223-9500

ANALYTICAL RESULTS

Ordered By

Amec Foster Wheeler
6001 Rickenbacker Road
Los Angeles, CA 90040-

Site

North Campus Drive and
Aberdeen Drive
Riverside, CA

Telephone: (323)889-5300
Attn: Mark Murphy

Page: **35**

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66105	10/15/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1C-101615

Our Lab I.D.		**339286**	**339287**	**339288**	**339289**	**339290**
Client Sample I.D.		B-12@30'	B-12@35'	B-12@40'	B-19@5'	B-19@10'
Date Sampled		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Date Prepared		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Preparation Method						
Date Analyzed		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Acetone	50.0	ND	ND	ND	ND	ND
Benzene	2.00	ND	ND	ND	ND	ND
Bromobenzene (Phenyl bromide)	10.0	ND	ND	ND	ND	ND
Bromochloromethane (Chlorobromomethane)	10.0	ND	ND	ND	ND	ND
Bromodichloromethane (Dichlorobromomethane)	10.0	ND	ND	ND	ND	ND
Bromoform (Tribromomethane)	50.0	ND	ND	ND	ND	ND
Bromomethane (Methyl bromide)	30.0	ND	ND	ND	ND	ND
2-Butanone (MEK, Methyl ethyl ketone)	50.0	ND	ND	ND	ND	ND
n-Butylbenzene	10.0	ND	ND	ND	ND	ND
sec-Butylbenzene	10.0	ND	ND	ND	ND	ND
tert-Butylbenzene	10.0	ND	ND	ND	ND	ND
Carbon disulfide	10.0	ND	ND	ND	ND	ND
Carbon tetrachloride (Tetrachloromethane)	10.0	ND	ND	ND	ND	ND
Chlorobenzene	10.0	ND	ND	ND	ND	ND
Chloroethane	30.0	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	50.0	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	10.0	ND	ND	ND	ND	ND
Chloromethane (Methyl chloride)	30.0	ND	ND	ND	ND	ND
4-Chlorotoluene (p-Chlorotoluene)	10.0	ND	ND	ND	ND	ND
2-Chlorotoluene (o-Chlorotoluene)	10.0	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane (DBCP)	50.0	ND	ND	ND	ND	ND
Dibromochloromethane	10.0	ND	ND	ND	ND	ND
1,2-Dibromoethane (EDB, Ethylene dibromide)	10.0	ND	ND	ND	ND	ND
Dibromomethane	10.0	ND	ND	ND	ND	ND
1,2-Dichlorobenzene (o-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
1,3-Dichlorobenzene (m-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
1,4-Dichlorobenzene (p-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
Dichlorodifluoromethane	30.0	ND	ND	ND	ND	ND
1,1-Dichloroethane	10.0	ND	ND	ND	ND	ND

ANALYTICAL RESULTS

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66105	10/15/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1C-101615

Our Lab I.D.		**339286**	**339287**	**339288**	**339289**	**339290**
Client Sample I.D.		B-12@30'	B-12@35'	B-12@40'	B-19@5'	B-19@10'
Date Sampled		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Date Prepared		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Preparation Method						
Date Analyzed		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
1,2-Dichloroethane	10.0	ND	ND	ND	ND	ND
1,1-Dichloroethene (1,1-Dichloroethylene)	10.0	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	10.0	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	10.0	ND	ND	ND	ND	ND
1,2-Dichloropropane	10.0	ND	ND	ND	ND	ND
1,3-Dichloropropane	10.0	ND	ND	ND	ND	ND
2,2-Dichloropropane	10.0	ND	ND	ND	ND	ND
1,1-Dichloropropene	10.0	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	10.0	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	10.0	ND	ND	ND	ND	ND
Ethylbenzene	2.00	ND	ND	ND	ND	ND
Hexachlorobutadiene (1,3-Hexachlorobutadiene)	30.0	ND	ND	ND	ND	ND
2-Hexanone	50.0	ND	ND	ND	ND	ND
Isopropylbenzene	10.0	ND	ND	ND	ND	ND
p-Isopropyltoluene (4-Isopropyltoluene)	10.0	ND	ND	ND	ND	ND
MTBE	5.00	ND	ND	ND	ND	ND
4-Methyl-2-pentanone (MIBK, Methyl isobutyl ketone)	50.0	ND	ND	ND	ND	ND
Methylene chloride (Dichloromethane, DCM)	50.0	ND	ND	ND	ND	ND
Naphthalene	10.0	ND	ND	ND	ND	ND
n-Propylbenzene	10.0	ND	ND	ND	ND	ND
Styrene	10.0	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	10.0	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	10.0	ND	ND	ND	ND	ND
Tetrachloroethene (Tetrachloroethylene)	10.0	ND	ND	ND	ND	ND
Toluene (Methyl benzene)	2.00	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	10.0	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	10.0	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	10.0	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	10.0	ND	ND	ND	ND	ND
Trichloroethene (TCE)	10.0	ND	ND	ND	ND	ND
Trichlorofluoromethane	10.0	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	10.0	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	10.0	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	10.0	ND	ND	ND	ND	ND
Vinyl acetate	50.0	ND	ND	ND	ND	ND

ANALYTICAL RESULTS

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66105	10/15/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1C-101615

Our Lab I.D.		339286	339287	339288	339289	339290
Client Sample I.D.		B-12@30'	B-12@35'	B-12@40'	B-19@5'	B-19@10'
Date Sampled		10/15/2015	10/15/2015	10/15/2015	10/15/2015	10/15/2015
Date Prepared		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Preparation Method						
Date Analyzed		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Vinyl chloride (Chloroethene)	30.0	ND	ND	ND	ND	ND
o-Xylene	2.00	ND	ND	ND	ND	ND
m- & p-Xylenes	4.00	ND	ND	ND	ND	ND

Our Lab I.D.		339286	339287	339288	339289	339290
Surrogates	% Rec.Limit	% Rec.	% Rec.	% Rec.	% Rec.	% Rec.
Surrogate Percent Recovery						
Bromofluorobenzene	70-120	113	114	114	115	112
Dibromofluoromethane	70-120	90	87	82	85	90
Toluene-d8	70-120	110	112	110	110	110

QUALITY CONTROL REPORT

QC Batch No: S1C-101615

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	98	98	<1	75-120	15					
Chlorobenzene	114	114	<1	75-120	15					
1,1-Dichloroethene (1,1-Dichloroethylene)	87	90	3.4	75-120	15					
MTBE	103	103	<1	75-120	15					
Toluene (Methyl benzene)	94	94	<1	75-120	15					
Trichloroethene (TCE)	86	85	1.2	75-120	15					

ANALYTICAL RESULTS

Ordered By

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6001 Rickenbacker Road
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Telephone: (323)889-5300
Attn: Mark Murphy

Page: **38**

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66105	10/15/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1C-101615

Our Lab I.D.		**339291**	**339292**			
Client Sample I.D.		B-19@15'	B-19@20'			
Date Sampled		10/15/2015	10/15/2015			
Date Prepared		10/16/2015	10/16/2015			
Preparation Method						
Date Analyzed		10/16/2015	10/16/2015			
Matrix		Soil	Soil			
Units		ug/kg	ug/kg			
Dilution Factor		1	1			
Analytes	**PQL**	**Results**	**Results**			
Acetone	50.0	ND	ND			
Benzene	2.00	ND	ND			
Bromobenzene (Phenyl bromide)	10.0	ND	ND			
Bromochloromethane (Chlorobromomethane)	10.0	ND	ND			
Bromodichloromethane (Dichlorobromomethane)	10.0	ND	ND			
Bromoform (Tribromomethane)	50.0	ND	ND			
Bromomethane (Methyl bromide)	30.0	ND	ND			
2-Butanone (MEK, Methyl ethyl ketone)	50.0	ND	ND			
n-Butylbenzene	10.0	ND	ND			
sec-Butylbenzene	10.0	ND	ND			
tert-Butylbenzene	10.0	ND	ND			
Carbon disulfide	10.0	ND	ND			
Carbon tetrachloride (Tetrachloromethane)	10.0	ND	ND			
Chlorobenzene	10.0	ND	ND			
Chloroethane	30.0	ND	ND			
2-Chloroethyl vinyl ether	50.0	ND	ND			
Chloroform (Trichloromethane)	10.0	ND	ND			
Chloromethane (Methyl chloride)	30.0	ND	ND			
4-Chlorotoluene (p-Chlorotoluene)	10.0	ND	ND			
2-Chlorotoluene (o-Chlorotoluene)	10.0	ND	ND			
1,2-Dibromo-3-chloropropane (DBCP)	50.0	ND	ND			
Dibromochloromethane	10.0	ND	ND			
1,2-Dibromoethane (EDB, Ethylene dibromide)	10.0	ND	ND			
Dibromomethane	10.0	ND	ND			
1,2-Dichlorobenzene (o-Dichlorobenzene)	10.0	ND	ND			
1,3-Dichlorobenzene (m-Dichlorobenzene)	10.0	ND	ND			
1,4-Dichlorobenzene (p-Dichlorobenzene)	10.0	ND	ND			
Dichlorodifluoromethane	30.0	ND	ND			
1,1-Dichloroethane	10.0	ND	ND			

ANALYTICAL RESULTS

Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66105	10/15/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1C-101615

Our Lab I.D.		**339291**	**339292**			
Client Sample I.D.		B-19@15'	B-19@20'			
Date Sampled		**10/15/2015**	**10/15/2015**			
Date Prepared		**10/16/2015**	**10/16/2015**			
Preparation Method						
Date Analyzed		**10/16/2015**	**10/16/2015**			
Matrix		Soil	Soil			
Units		ug/kg	ug/kg			
Dilution Factor		1	1			
Analytes	**PQL**	**Results**	**Results**			
1,2-Dichloroethane	**10.0**	**ND**	**ND**			
1,1-Dichloroethene (1,1-Dichloroethylene)	**10.0**	**ND**	**ND**			
cis-1,2-Dichloroethene	**10.0**	**ND**	**ND**			
trans-1,2-Dichloroethene	**10.0**	**ND**	**ND**			
1,2-Dichloropropane	**10.0**	**ND**	**ND**			
1,3-Dichloropropane	**10.0**	**ND**	**ND**			
2,2-Dichloropropane	**10.0**	**ND**	**ND**			
1,1-Dichloropropene	**10.0**	**ND**	**ND**			
cis-1,3-Dichloropropene	**10.0**	**ND**	**ND**			
trans-1,3-Dichloropropene	**10.0**	**ND**	**ND**			
Ethylbenzene	**2.00**	**ND**	**ND**			
Hexachlorobutadiene (1,3-Hexachlorobutadiene)	**30.0**	**ND**	**ND**			
2-Hexanone	**50.0**	**ND**	**ND**			
Isopropylbenzene	**10.0**	**ND**	**ND**			
p-Isopropyltoluene (4-Isopropyltoluene)	**10.0**	**ND**	**ND**			
MTBE	**5.00**	**ND**	**ND**			
4-Methyl-2-pentanone (MIBK, Methyl isobutyl ketone)	**50.0**	**ND**	**ND**			
Methylene chloride (Dichloromethane, DCM)	**50.0**	**ND**	**ND**			
Naphthalene	**10.0**	**ND**	**ND**			
n-Propylbenzene	**10.0**	**ND**	**ND**			
Styrene	**10.0**	**ND**	**ND**			
1,1,1,2-Tetrachloroethane	**10.0**	**ND**	**ND**			
1,1,2,2-Tetrachloroethane	**10.0**	**ND**	**ND**			
Tetrachloroethene (Tetrachloroethylene)	**10.0**	**ND**	**ND**			
Toluene (Methyl benzene)	**2.00**	**ND**	**ND**			
1,2,3-Trichlorobenzene	**10.0**	**ND**	**ND**			
1,2,4-Trichlorobenzene	**10.0**	**ND**	**ND**			
1,1,1-Trichloroethane	**10.0**	**ND**	**ND**			
1,1,2-Trichloroethane	**10.0**	**ND**	**ND**			
Trichloroethene (TCE)	**10.0**	**ND**	**ND**			
Trichlorofluoromethane	**10.0**	**ND**	**ND**			
1,2,3-Trichloropropane	**10.0**	**ND**	**ND**			
1,2,4-Trimethylbenzene	**10.0**	**ND**	**ND**			
1,3,5-Trimethylbenzene	**10.0**	**ND**	**ND**			
Vinyl acetate	**50.0**	**ND**	**ND**			

ANALYTICAL RESULTS

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Project ID: 4953-15-1021
Project Name: UCR

ASL Job Number	Submitted	Client
66105	10/15/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1C-101615

Our Lab I.D.		**339291**	**339292**			
Client Sample I.D.		B-19@15'	B-19@20'			
Date Sampled		**10/15/2015**	**10/15/2015**			
Date Prepared		**10/16/2015**	**10/16/2015**			
Preparation Method						
Date Analyzed		**10/16/2015**	**10/16/2015**			
Matrix		Soil	Soil			
Units		ug/kg	ug/kg			
Dilution Factor		1	1			
Analytes	**PQL**	**Results**	**Results**			
Vinyl chloride (Chloroethene)	**30.0**	**ND**	**ND**			
o-Xylene	**2.00**	**ND**	**ND**			
m- & p-Xylenes	**4.00**	**ND**	**ND**			

Our Lab I.D.		**339291**	**339292**			
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**			
Surrogate Percent Recovery						
Bromofluorobenzene	**70-120**	**114**	**115**			
Dibromofluoromethane	**70-120**	**85**	**88**			
Toluene-d8	**70-120**	**111**	**111**			

QUALITY CONTROL REPORT

QC Batch No: S1C-101615

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	**98**	**98**	**<1**	**75-120**	**15**					
Chlorobenzene	**114**	**114**	**<1**	**75-120**	**15**					
1,1-Dichloroethene (1,1-Dichloroethylene)	**87**	**90**	**3.4**	**75-120**	**15**					
MTBE	**103**	**103**	**<1**	**75-120**	**15**					
Toluene (Methyl benzene)	**94**	**94**	**<1**	**75-120**	**15**					
Trichloroethene (TCE)	**86**	**85**	**1.2**	**75-120**	**15**					

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Ordered By

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6001 Rickenbacker Road
Los Angeles, CA 90040-

Number of Pages 71
Date Received 10/16/2015
Date Reported 10/19/2015

Telephone (323)889-5300
Attn **Mark Murphy**

Job Number	Ordered	Client
66110	10/16/2015	AMEC

Project ID:
Project Name: UCR
Site: North Campus Drive and
Aberdeen Drive
Riverside, CA

Enclosed are the results of analyses on 46 samples analyzed as specified on attached chain of custody.

Rojert G Araghi

Rojert G. Araghi
Laboratory Director

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
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COC# № 73369 GLOBAL ID ______ E REPORT: ☐ PDF ☐ EDF ☐ EDD ASL JOB# 66110

Company: AMEC FW
Address: 6001 RICKENBACKER RD, LOS ANGELES, CA 90040
Telephone: (323) 889-5300
Fax:
Special Instruction:
E-mail:

Project Name: UCR
Site Address: NORTH CAMPUS DRIVE & ABERDEEN DRIVE RIVERSIDE, CA
Project ID:
Project Manager:

Report To:
Address:
Invoice To:
Address:
P.O.#:

ANALYSIS REQUESTED

ITEM	LAB USE ONLY Lab ID	Sample ID	Date	Time	Container(s) #	Container(s) Type	Matrix	Preservation	VOCS METHOD 8260B	TITLE 22 METALS	6010B/7471A	TPH METHOD 8015B								Remarks
1	339314	B-3@5'	10-14-15	738	1	6" SLEEVE	SOIL	ICE CHEST	X	X	~~X~~	X								
2	339315	B-3@10'		742					X	X		X								
3	339316	B-3@15'		744					X	X		X								
4	339317	B-3@20'		747					X	X		X								
5	339318	B-3@25'		752					X	X		X								
6	339319	B-3@30'		755					X	X		X								
7	339320	B-3@35'		800					X	X		X								
8	339321	B-3@40'		802					X	X		X								
9	339322	B-1@5'		857					X	X		X								
10	339323	B-1@10'		900					X	X		X								

Collected By: Date 10-1~~3~~4-15 Time 900
Relinquished By: Date Time
Received By: Date Time

Relinquished By: Date Time
Received For Laboratory Janet Chin Date 10/16/15 Time 13:15
Condition of Sample:

TAT
☐ Normal
☒ Rush 24 hr

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
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COC# Nº 73368 GLOBAL ID ______ E REPORT: ☐ PDF ☐ EDF ☐ EDD ASL JOB# 66110

Company: " "
Address: " "
Telephone: " "
Fax:
Special Instruction:
E-mail:

Project Name: UCR
Site Address: " "
Project ID: 4953-15-1021
Project Manager: MARK MURPHY

Report To:
Address:
Invoice To:
Address:
P.O.#:

ANALYSIS REQUESTED

ITEM	LAB USE ONLY Lab ID	Sample ID	Date	Time	Container(s) #	Container(s) Type	Matrix	Preservation	"	"	"									Remarks
11	339324	B-1@15'	10-14-15	901	1	6" SLEEVE	SOIL	ICE CHEST	X	X	X									
12	339325	B-1@20'		904					X	X	X									
13	339326	B-1@25'		908					X	X	X									
14	339327	B-1@30'		914					X	X	X									
15	339328	B-1@35'		916					X	X	X									
16	339329	B-1@40'		918					X	X	X									
		~~B-8@5~~							~~X~~	~~X~~	~~X~~									
17	339330	B-8@10'		941					X	X	X									
18	339331	B-8@15'		945					X	X	X									
19	339332	B-8@20'		947					X	X	X									

Collected By: Date 10-14-15 Time 944
Relinquished By: Date Time
Received By: Date Time

Relinquished By: Date Time
Received For Laboratory Janet Chin Date 10/16/15 Time 13:15
Condition of Sample:

TAT
☐ Normal
☒ Rush 24 hr

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COC# № 73371 GLOBAL ID ______ E REPORT: ☐ PDF ☐ EDF ☐ EDD ASL JOB# 66110

Company: AMEC FW		Report To:	
Address: " --	Project Name: UCR	Address:	
" --	Site Address: " --	Invoice To:	
Telephone: " -- Fax:	" --	Address:	
Special Instruction:	Project ID: 4953-15-1021		
E-mail:	Project Manager: MARK MURPHY	P.O.#:	

ANALYSIS REQUESTED

ITEM	LAB USE ONLY Lab ID	Sample ID	Date	Time	#	Type	Matrix	Preservation												Remarks
20	339333	B-8 @ 25	10-14-15	951	1	6" SLEEVE	SOIL	ICE CHEST	X	X	X									
21	339334	B-8 @ 30'		953					X	X	X									
22	339335	B-8 @ 35'		956					X	X	X									
23	339336	B-8 @ 40'		1000					X	X	X									
24	339337	B-15 @ 10'		1035					X	X	X									
25	339338	B-15 @ 15'		1037					X	X	X									
26	339339	B-15 @ 20'		1039					X	X	X									
27	339340	B-15 @ 25'		1046					X	X	X									
28	339341	B-15 @ 30'		1048					X	X	X									
29	339342	B-15 @ 35		1050					X	X	X									
30	339343	B-15 @ 40'		1052					X	X	X									

Collected By:	Date 10-14-15	Time 1050	Relinquished By:	Date	Time
Relinquished By:	Date	Time	Received For Laboratory Janet Chin	Date 10/16/15	Time 13:15
Received By:	Date	Time	Condition of Sample:		

TAT
☐ Normal
☒ Rush
24 hr

AMERICAN SCIENTIFIC LABORATORIES, LLC
Environmental Testing Services
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COC# Nº 73373 GLOBAL ID ____ E REPORT: ☐ PDF ☐ EDF ☐ EDD ASL JOB# 66110

Company: AMEC FW
Address: " "
" "
Telephone: " "
Fax:
Special Instruction:
E-mail:

Project Name: UCR
Site Address: " "
" "
Project ID: 4953-15-1021
Project Manager: MARK MURPHY

Report To:
Address:
Invoice To:
Address:
P.O.#:

ANALYSIS REQUESTED

ITEM	LAB USE ONLY Lab ID	Sample ID	Date	Time	#	Type	Matrix	Preservation	"	"	"	Remarks
31	339344	B-16@5'	10-14-15	1122	1	6" SLEEVE	SOIL	ICE CHEST	X	X	X	
32	339345	B16@10'		1124					X	X	X	
33	339346	B-16@15'		1126					X	X	X	
34	339347	B-16@20'		1127					X	X	X	
35	339348	B-16@25'		1130					X	X	X	
36	339349	B-16@30'		1133					X	X	X	
37	339350	B-16@35		1135					X	X	X	
38	339351	B-16@40'		1138					X	X	X	
39	339352	B-17@5'		1212					X	X	X	
40	339353	B-17@10		1213					X	X	X	

Collected By: Date 10-14-15 Time 1213
Relinquished By: Date Time
Received By: Date Time

Relinquished By: Date Time
Received For Laboratory Janet Chin Date 10/16/15 Time 13:15
Condition of Sample:

TAT
☐ Normal
☒ Rush 24h

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Environmental Testing Services
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COC# Nº 73372 GLOBAL ID ______ E REPORT: ☐ PDF ☐ EDF ☐ EDD ASL JOB# 66110

Company: AMEC FW
Address: " "
" "
Telephone: " "
Fax:
Special Instruction:
E-mail:

Project Name: UCR
Site Address: " "
" "
Project ID: 4953-15-1021
Project Manager: MARK MURPHY

Report To:
Address:
Invoice To:
Address:
P.O.#:

ANALYSIS REQUESTED

ITEM	LAB USE ONLY Lab ID	Sample ID	Date	Time	#	Type	Matrix	Preservation	"	"	"	Remarks
41	339354	B-17 e 15'	10-14-15	1215	1	6" SLEEVE	SOIL	ICE CHEST	X	X	X	
42	339355	B-17e 20'							X	X	X	
43	339356	B-17e 25'		1219					X	X	X	
44	339357	B-17e 30'		1222					X	X	X	
45	339358	B-17 e 35'		1225					X	X	X	
46	339359	B-17e 40'							X	X	X	
									X	X	X	

Collected By: ~~Date~~ 10-14-15 Time 1225
Relinquished By: Date Time
Received By: Date Time

Relinquished By: Date Time
Received For Laboratory Janet Chin Date 10/16/15 Time 13:15
Condition of Sample:

TAT
☐ Normal
☐ Rush

ANALYTICAL RESULTS

Ordered By

Amec Foster Wheeler
6001 Rickenbacker Road
Los Angeles, CA 90040-

Site

North Campus Drive and
Aberdeen Drive
Riverside, CA

Telephone: (323)889-5300
Attn: Mark Murphy

Page: **2**

Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QC Batch No: 101715-1

Our Lab I.D.		**339314**	**339315**	**339316**	**339317**	**339318**
Client Sample I.D.		B-3@5'	B-3@10'	B-3@15'	B-3@20'	B-3@25'
Date Sampled		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Date Prepared		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
AA Metals						
Mercury	0.0500	ND	ND	ND	ND	ND
ICP Metals						
Antimony	0.500	ND	ND	ND	ND	ND
Arsenic	0.250	ND	ND	ND	ND	ND
Barium	0.500	72.1	81.7	99.8	85.4	81.2
Beryllium	0.500	ND	ND	ND	ND	ND
Cadmium	0.500	ND	ND	ND	ND	ND
Chromium	0.500	1.92	1.42	ND	2.85	0.542
Cobalt	0.500	ND	ND	ND	ND	ND
Copper	0.500	1.67	1.02	ND	1.81	ND
Lead	0.250	ND	ND	ND	ND	ND
Molybdenum	0.500	ND	ND	ND	ND	ND
Nickel	0.500	ND	ND	ND	ND	ND
Selenium	0.500	ND	ND	ND	ND	ND
Silver	0.500	ND	ND	ND	ND	ND
Thallium	0.500	ND	ND	ND	ND	ND
Vanadium	0.500	9.46	8.11	4.52	10.2	5.17
Zinc	0.500	15.5	17.0	17.7	20.9	16.9

QUALITY CONTROL REPORT

QC Batch No: 101715-1

Analytes	LCS % REC	LCS DUP % REC	LCS RPD % REC	LCS/LCSD % Limit	LCS RPD % Limit					
AA Metals										
Mercury	113	115	1.8	80-120	<20					
ICP Metals										
Antimony	95	94	1.4	80-120	<20					
Arsenic	98	97	1.1	80-120	<20					

ANALYTICAL RESULTS

Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QUALITY CONTROL REPORT

QC Batch No: 101715-1

Analytes	LCS % REC	LCS DUP % REC	LCS RPD % REC	LCS/LCSD % Limit	LCS RPD % Limit					
ICP Metals										
Barium	**98**	**96**	**1.9**	**80-120**	**<20**					
Beryllium	**107**	**105**	**1.9**	**80-120**	**<20**					
Cadmium	**100**	**99**	**1.4**	**80-120**	**<20**					
Chromium	**101**	**99**	**1.8**	**80-120**	**<20**					
Cobalt	**98**	**96**	**1.5**	**80-120**	**<20**					
Copper	**99**	**98**	**1.1**	**80-120**	**<20**					
Lead	**101**	**99**	**1.8**	**80-120**	**<20**					
Molybdenum	**97**	**96**	**1.7**	**80-120**	**<20**					
Nickel	**100**	**99**	**1.2**	**80-120**	**<20**					
Selenium	**98**	**97**	**<1**	**80-120**	**<20**					
Silver	**85**	**87**	**2.3**	**80-120**	**<20**					
Thallium	**101**	**99**	**1.9**	**80-120**	**<20**					
Vanadium	**98**	**97**	**1.5**	**80-120**	**<20**					
Zinc	**97**	**95**	**2.0**	**80-120**	**<20**					

ANALYTICAL RESULTS

Ordered By

Amec Foster Wheeler
6001 Rickenbacker Road
Los Angeles, CA 90040-

Site

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Riverside, CA

Telephone: (323)889-5300
Attn: Mark Murphy

Page: **4**

Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QC Batch No: 101715-1

Our Lab I.D.		**339319**	**339320**	**339321**	**339322**	**339323**
Client Sample I.D.		B-3@30'	B-3@35'	B-3@40'	B-1@5'	B-1@10'
Date Sampled		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Date Prepared		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
AA Metals						
Mercury	0.0500	ND	ND	ND	ND	ND
ICP Metals						
Antimony	0.500	ND	ND	ND	ND	ND
Arsenic	0.250	ND	ND	ND	ND	ND
Barium	0.500	68.4	68.7	47.4	66.1	59.4
Beryllium	0.500	ND	ND	ND	ND	ND
Cadmium	0.500	ND	ND	ND	ND	ND
Chromium	0.500	2.35	3.73	1.61	1.02	ND
Cobalt	0.500	ND	ND	ND	ND	ND
Copper	0.500	1.49	2.72	1.43	0.855	ND
Lead	0.250	ND	ND	ND	ND	ND
Molybdenum	0.500	ND	ND	ND	ND	ND
Nickel	0.500	ND	0.553	ND	ND	ND
Selenium	0.500	ND	ND	ND	ND	ND
Silver	0.500	ND	ND	ND	ND	ND
Thallium	0.500	ND	ND	ND	ND	ND
Vanadium	0.500	11.4	11.6	5.49	8.40	5.82
Zinc	0.500	18.3	16.4	7.92	16.4	14.6

QUALITY CONTROL REPORT

QC Batch No: 101715-1

Analytes	LCS % REC	LCS DUP % REC	LCS RPD % REC	LCS/LCSD % Limit	LCS RPD % Limit					
AA Metals										
Mercury	113	115	1.8	80-120	<20					
ICP Metals										
Antimony	95	94	1.4	80-120	<20					
Arsenic	98	97	1.1	80-120	<20					

Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QUALITY CONTROL REPORT

QC Batch No: 101715-1

Analytes	LCS % REC	LCS DUP % REC	LCS RPD % REC	LCS/LCSD % Limit	LCS RPD % Limit					
ICP Metals										
Barium	98	96	1.9	80-120	<20					
Beryllium	107	105	1.9	80-120	<20					
Cadmium	100	99	1.4	80-120	<20					
Chromium	101	99	1.8	80-120	<20					
Cobalt	98	96	1.5	80-120	<20					
Copper	99	98	1.1	80-120	<20					
Lead	101	99	1.8	80-120	<20					
Molybdenum	97	96	1.7	80-120	<20					
Nickel	100	99	1.2	80-120	<20					
Selenium	98	97	<1	80-120	<20					
Silver	85	87	2.3	80-120	<20					
Thallium	101	99	1.9	80-120	<20					
Vanadium	98	97	1.5	80-120	<20					
Zinc	97	95	2.0	80-120	<20					

ANALYTICAL RESULTS

Ordered By

Amec Foster Wheeler
6001 Rickenbacker Road
Los Angeles, CA 90040-

Site

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Aberdeen Drive
Riverside, CA

Telephone: (323)889-5300
Attn: Mark Murphy

Page: **6**

Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QC Batch No: 101715-1

Our Lab I.D.		**339324**	**339325**	**339326**	**339327**	**339328**
Client Sample I.D.		B-1@15'	B-1@20'	B-1@25'	B-1@30'	B-1@35'
Date Sampled		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Date Prepared		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
AA Metals						
Mercury	0.0500	ND	ND	ND	ND	ND
ICP Metals						
Antimony	0.500	ND	ND	ND	ND	ND
Arsenic	0.250	ND	ND	ND	ND	ND
Barium	0.500	43.8	37.5	52.3	31.4	39.8
Beryllium	0.500	ND	ND	ND	ND	ND
Cadmium	0.500	ND	ND	ND	ND	ND
Chromium	0.500	0.557	ND	1.88	1.44	1.98
Cobalt	0.500	ND	ND	ND	ND	ND
Copper	0.500	ND	ND	1.16	1.30	1.86
Lead	0.250	ND	ND	ND	ND	ND
Molybdenum	0.500	ND	ND	ND	ND	ND
Nickel	0.500	ND	ND	ND	ND	ND
Selenium	0.500	ND	ND	ND	ND	ND
Silver	0.500	ND	ND	ND	ND	ND
Thallium	0.500	ND	ND	ND	ND	ND
Vanadium	0.500	4.63	3.29	8.83	6.22	7.35
Zinc	0.500	7.64	6.66	14.7	7.47	9.53

QUALITY CONTROL REPORT

QC Batch No: 101715-1

Analytes	LCS % REC	LCS DUP % REC	LCS RPD % REC	LCS/LCSD % Limit	LCS RPD % Limit					
AA Metals										
Mercury	113	115	1.8	80-120	<20					
ICP Metals										
Antimony	95	94	1.4	80-120	<20					
Arsenic	98	97	1.1	80-120	<20					

ANALYTICAL RESULTS

Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QUALITY CONTROL REPORT

QC Batch No: 101715-1

Analytes	LCS % REC	LCS DUP % REC	LCS RPD % REC	LCS/LCSD % Limit	LCS RPD % Limit					
ICP Metals										
Barium	**98**	**96**	**1.9**	**80-120**	**<20**					
Beryllium	**107**	**105**	**1.9**	**80-120**	**<20**					
Cadmium	**100**	**99**	**1.4**	**80-120**	**<20**					
Chromium	**101**	**99**	**1.8**	**80-120**	**<20**					
Cobalt	**98**	**96**	**1.5**	**80-120**	**<20**					
Copper	**99**	**98**	**1.1**	**80-120**	**<20**					
Lead	**101**	**99**	**1.8**	**80-120**	**<20**					
Molybdenum	**97**	**96**	**1.7**	**80-120**	**<20**					
Nickel	**100**	**99**	**1.2**	**80-120**	**<20**					
Selenium	**98**	**97**	**<1**	**80-120**	**<20**					
Silver	**85**	**87**	**2.3**	**80-120**	**<20**					
Thallium	**101**	**99**	**1.9**	**80-120**	**<20**					
Vanadium	**98**	**97**	**1.5**	**80-120**	**<20**					
Zinc	**97**	**95**	**2.0**	**80-120**	**<20**					

ANALYTICAL RESULTS

Ordered By

Amec Foster Wheeler
6001 Rickenbacker Road
Los Angeles, CA 90040-

Site

North Campus Drive and
Aberdeen Drive
Riverside, CA

Telephone: (323)889-5300
Attn: Mark Murphy

Page: **8**

Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QC Batch No: 101715-2

Our Lab I.D.		**339329**	**339330**	**339331**	**339332**	**339333**
Client Sample I.D.		B-1@40'	B-8@10'	B-8@15'	B-8@20'	B-8@25'
Date Sampled		**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**
Date Prepared		**10/17/2015**	**10/17/2015**	**10/17/2015**	**10/17/2015**	**10/17/2015**
Preparation Method						
Date Analyzed		**10/17/2015**	**10/17/2015**	**10/17/2015**	**10/17/2015**	**10/17/2015**
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
AA Metals						
Mercury	**0.0500**	**ND**	**ND**	**ND**	**ND**	**ND**
ICP Metals						
Antimony	**0.500**	**ND**	**ND**	**ND**	**ND**	**ND**
Arsenic	**0.250**	**ND**	**ND**	**ND**	**ND**	**ND**
Barium	**0.500**	**45.5**	**44.9**	**58.1**	**49.4**	**85.5**
Beryllium	**0.500**	**ND**	**ND**	**ND**	**ND**	**ND**
Cadmium	**0.500**	**ND**	**ND**	**ND**	**ND**	**ND**
Chromium	**0.500**	**5.01**	**2.31**	**2.01**	**1.21**	**1.08**
Cobalt	**0.500**	**ND**	**ND**	**ND**	**ND**	**ND**
Copper	**0.500**	**1.70**	**1.69**	**1.46**	**0.944**	**0.870**
Lead	**0.250**	**ND**	**ND**	**ND**	**ND**	**ND**
Molybdenum	**0.500**	**ND**	**ND**	**ND**	**ND**	**ND**
Nickel	**0.500**	**ND**	**ND**	**ND**	**ND**	**ND**
Selenium	**0.500**	**ND**	**ND**	**ND**	**ND**	**ND**
Silver	**0.500**	**ND**	**ND**	**ND**	**ND**	**ND**
Thallium	**0.500**	**ND**	**ND**	**ND**	**ND**	**ND**
Vanadium	**0.500**	**8.02**	**7.14**	**7.01**	**6.52**	**7.69**
Zinc	**0.500**	**12.0**	**8.05**	**8.64**	**10.3**	**13.8**

QUALITY CONTROL REPORT

QC Batch No: 101715-2

Analytes	LCS % REC	LCS DUP % REC	LCS RPD % REC	LCS/LCSD % Limit	LCS RPD % Limit					
AA Metals										
Mercury	**115**	**113**	**1.8**	**80-120**	**<20**					
ICP Metals										
Antimony	**94**	**95**	**1.2**	**80-120**	**<20**					
Arsenic	**97**	**98**	**1.1**	**80-120**	**<20**					

ANALYTICAL RESULTS

Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QUALITY CONTROL REPORT

QC Batch No: 101715-2

Analytes	LCS % REC	LCS DUP % REC	LCS RPD % REC	LCS/LCSD % Limit	LCS RPD % Limit					
ICP Metals										
Barium	96	98	1.7	80-120	<20					
Beryllium	105	106	<1	80-120	<20					
Cadmium	99	100	1.4	80-120	<20					
Chromium	99	101	1.8	80-120	<20					
Cobalt	96	98	1.2	80-120	<20					
Copper	98	100	1.4	80-120	<20					
Lead	99	100	<1	80-120	<20					
Molybdenum	96	97	1.2	80-120	<20					
Nickel	99	100	1.1	80-120	<20					
Selenium	97	98	<1	80-120	<20					
Silver	90	87	3.2	80-120	<20					
Thallium	99	101	1.9	80-120	<20					
Vanadium	97	98	1.4	80-120	<20					
Zinc	95	97	1.6	80-120	<20					

ANALYTICAL RESULTS

Ordered By

Amec Foster Wheeler
6001 Rickenbacker Road
Los Angeles, CA 90040-

Site

North Campus Drive and
Aberdeen Drive
Riverside, CA

Telephone: (323)889-5300
Attn: Mark Murphy

Page: **10**

Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QC Batch No: 101715-2

Our Lab I.D.		**339334**	**339335**	**339336**	**339337**	**339338**
Client Sample I.D.		B-8@30'	B-8@35'	B-8@40'	B-15@10'	B-15@15'
Date Sampled		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Date Prepared		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
AA Metals						
Mercury	0.0500	ND	ND	ND	ND	ND
ICP Metals						
Antimony	0.500	ND	ND	ND	ND	ND
Arsenic	0.250	ND	ND	ND	1.46	ND
Barium	0.500	69.0	185	42.1	53.5	70.9
Beryllium	0.500	ND	ND	ND	ND	ND
Cadmium	0.500	ND	ND	ND	ND	ND
Chromium	0.500	2.14	2.56	2.05	2.42	1.72
Cobalt	0.500	ND	ND	ND	ND	ND
Copper	0.500	1.91	1.95	1.58	2.02	1.77
Lead	0.250	ND	ND	ND	8.16	ND
Molybdenum	0.500	ND	ND	ND	ND	ND
Nickel	0.500	ND	ND	ND	ND	ND
Selenium	0.500	ND	ND	ND	ND	ND
Silver	0.500	ND	ND	ND	ND	ND
Thallium	0.500	ND	ND	ND	ND	ND
Vanadium	0.500	10.7	8.40	8.18	7.85	9.10
Zinc	0.500	16.9	12.1	12.5	11.6	10.9

QUALITY CONTROL REPORT

QC Batch No: 101715-2

Analytes	LCS % REC	LCS DUP % REC	LCS RPD % REC	LCS/LCSD % Limit	LCS RPD % Limit					
AA Metals										
Mercury	115	113	1.8	80-120	<20					
ICP Metals										
Antimony	94	95	1.2	80-120	<20					
Arsenic	97	98	1.1	80-120	<20					

Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QUALITY CONTROL REPORT

QC Batch No: 101715-2

Analytes	LCS % REC	LCS DUP % REC	LCS RPD % REC	LCS/LCSD % Limit	LCS RPD % Limit					
ICP Metals										
Barium	**96**	**98**	**1.7**	**80-120**	**<20**					
Beryllium	**105**	**106**	**<1**	**80-120**	**<20**					
Cadmium	**99**	**100**	**1.4**	**80-120**	**<20**					
Chromium	**99**	**101**	**1.8**	**80-120**	**<20**					
Cobalt	**96**	**98**	**1.2**	**80-120**	**<20**					
Copper	**98**	**100**	**1.4**	**80-120**	**<20**					
Lead	**99**	**100**	**<1**	**80-120**	**<20**					
Molybdenum	**96**	**97**	**1.2**	**80-120**	**<20**					
Nickel	**99**	**100**	**1.1**	**80-120**	**<20**					
Selenium	**97**	**98**	**<1**	**80-120**	**<20**					
Silver	**90**	**87**	**3.2**	**80-120**	**<20**					
Thallium	**99**	**101**	**1.9**	**80-120**	**<20**					
Vanadium	**97**	**98**	**1.4**	**80-120**	**<20**					
Zinc	**95**	**97**	**1.6**	**80-120**	**<20**					

ANALYTICAL RESULTS

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Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QC Batch No: 101715-2

Our Lab I.D.		**339339**	**339340**	**339341**	**339342**	**339343**
Client Sample I.D.		B-15@20'	B-15@25'	B-15@30'	B-15@35'	B-15@40'
Date Sampled		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Date Prepared		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
AA Metals						
Mercury	0.0500	ND	ND	ND	ND	ND
ICP Metals						
Antimony	0.500	ND	ND	ND	ND	ND
Arsenic	0.250	ND	ND	ND	ND	ND
Barium	0.500	53.6	45.6	86.7	30.4	25.6
Beryllium	0.500	ND	ND	ND	ND	ND
Cadmium	0.500	ND	ND	ND	ND	ND
Chromium	0.500	1.98	0.816	1.42	0.546	1.43
Cobalt	0.500	ND	ND	ND	ND	ND
Copper	0.500	1.55	0.931	1.29	0.518	1.51
Lead	0.250	ND	ND	ND	ND	ND
Molybdenum	0.500	ND	ND	ND	ND	ND
Nickel	0.500	ND	ND	ND	ND	ND
Selenium	0.500	ND	ND	ND	ND	ND
Silver	0.500	ND	ND	ND	ND	ND
Thallium	0.500	ND	ND	ND	ND	ND
Vanadium	0.500	8.60	5.18	7.96	3.60	5.64
Zinc	0.500	10.0	6.83	12.2	4.22	3.55

QUALITY CONTROL REPORT

QC Batch No: 101715-2

Analytes	LCS % REC	LCS DUP % REC	LCS RPD % REC	LCS/LCSD % Limit	LCS RPD % Limit					
AA Metals										
Mercury	115	113	1.8	80-120	<20					
ICP Metals										
Antimony	94	95	1.2	80-120	<20					
Arsenic	97	98	1.1	80-120	<20					

ANALYTICAL RESULTS

Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QUALITY CONTROL REPORT

QC Batch No: 101715-2

Analytes	LCS % REC	LCS DUP % REC	LCS RPD % REC	LCS/LCSD % Limit	LCS RPD % Limit					
ICP Metals										
Barium	**96**	**98**	**1.7**	**80-120**	**<20**					
Beryllium	**105**	**106**	**<1**	**80-120**	**<20**					
Cadmium	**99**	**100**	**1.4**	**80-120**	**<20**					
Chromium	**99**	**101**	**1.8**	**80-120**	**<20**					
Cobalt	**96**	**98**	**1.2**	**80-120**	**<20**					
Copper	**98**	**100**	**1.4**	**80-120**	**<20**					
Lead	**99**	**100**	**<1**	**80-120**	**<20**					
Molybdenum	**96**	**97**	**1.2**	**80-120**	**<20**					
Nickel	**99**	**100**	**1.1**	**80-120**	**<20**					
Selenium	**97**	**98**	**<1**	**80-120**	**<20**					
Silver	**90**	**87**	**3.2**	**80-120**	**<20**					
Thallium	**99**	**101**	**1.9**	**80-120**	**<20**					
Vanadium	**97**	**98**	**1.4**	**80-120**	**<20**					
Zinc	**95**	**97**	**1.6**	**80-120**	**<20**					

ANALYTICAL RESULTS

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Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QC Batch No: 101715-3

Our Lab I.D.		**339344**	**339345**	**339346**	**339347**	**339348**
Client Sample I.D.		B-16@5'	B-16@10'	B-16@15'	B-16@20'	B-16@25'
Date Sampled		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Date Prepared		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
AA Metals						
Mercury	0.0500	ND	ND	ND	ND	ND
ICP Metals						
Antimony	0.500	ND	ND	ND	ND	ND
Arsenic	0.250	ND	ND	ND	ND	ND
Barium	0.500	47.6	64.2	73.7	52.0	74.7
Beryllium	0.500	ND	ND	ND	ND	ND
Cadmium	0.500	ND	ND	ND	ND	ND
Chromium	0.500	3.09	1.70	1.96	1.71	0.914
Cobalt	0.500	ND	ND	ND	ND	0.715
Copper	0.500	1.80	1.53	1.85	1.30	0.751
Lead	0.250	ND	ND	ND	ND	ND
Molybdenum	0.500	ND	ND	ND	ND	ND
Nickel	0.500	ND	ND	ND	ND	ND
Selenium	0.500	ND	ND	ND	ND	ND
Silver	0.500	ND	ND	ND	ND	ND
Thallium	0.500	ND	ND	ND	ND	ND
Vanadium	0.500	8.61	7.79	10.2	8.25	7.00
Zinc	0.500	8.20	11.6	12.0	10.0	6.15

QUALITY CONTROL REPORT

QC Batch No: 101715-3

Analytes	LCS % REC	LCS DUP % REC	LCS RPD % REC	LCS/LCSD % Limit	LCS RPD % Limit					
AA Metals										
Mercury	113	110	2.7	80-120	<20					
ICP Metals										
Antimony	94	96	2.5	80-120	<20					
Arsenic	98	98	<1	80-120	<20					

ANALYTICAL RESULTS

Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QUALITY CONTROL REPORT

QC Batch No: 101715-3

	LCS	LCS DUP	LCS RPD	LCS/LCSD	LCS RPD					
Analytes	% REC	% REC	% REC	% Limit	% Limit					
ICP Metals										
Barium	**98**	**97**	**<1**	**80-120**	**<20**					
Beryllium	**106**	**106**	**<1**	**80-120**	**<20**					
Cadmium	**100**	**100**	**<1**	**80-120**	**<20**					
Chromium	**100**	**100**	**<1**	**80-120**	**<20**					
Cobalt	**97**	**97**	**<1**	**80-120**	**<20**					
Copper	**100**	**99**	**<1**	**80-120**	**<20**					
Lead	**100**	**100**	**<1**	**80-120**	**<20**					
Molybdenum	**97**	**97**	**<1**	**80-120**	**<20**					
Nickel	**100**	**100**	**<1**	**80-120**	**<20**					
Selenium	**97**	**97**	**<1**	**80-120**	**<20**					
Silver	**87**	**90**	**2.9**	**80-120**	**<20**					
Thallium	**100**	**100**	**<1**	**80-120**	**<20**					
Vanadium	**98**	**98**	**<1**	**80-120**	**<20**					
Zinc	**96**	**96**	**<1**	**80-120**	**<20**					

ANALYTICAL RESULTS

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Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QC Batch No: 101715-3

Our Lab I.D.		**339349**	**339350**	**339351**	**339352**	**339353**
Client Sample I.D.		B-16@30'	B-16@35'	B-16@40'	B-17@5'	B-17@10'
Date Sampled		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Date Prepared		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
AA Metals						
Mercury	0.0500	ND	ND	ND	ND	ND
ICP Metals						
Antimony	0.500	ND	ND	ND	ND	ND
Arsenic	0.250	ND	ND	ND	ND	0.407
Barium	0.500	64.8	48.8	63.6	49.2	52.0
Beryllium	0.500	ND	ND	ND	ND	ND
Cadmium	0.500	ND	ND	ND	ND	ND
Chromium	0.500	0.557	1.12	1.89	0.894	3.75
Cobalt	0.500	ND	ND	ND	ND	ND
Copper	0.500	0.561	0.936	1.66	0.893	2.97
Lead	0.250	ND	ND	ND	ND	0.627
Molybdenum	0.500	ND	ND	ND	ND	ND
Nickel	0.500	ND	ND	ND	ND	0.514
Selenium	0.500	ND	ND	ND	ND	ND
Silver	0.500	ND	ND	ND	ND	ND
Thallium	0.500	ND	ND	ND	ND	ND
Vanadium	0.500	6.68	6.80	10.5	5.83	9.91
Zinc	0.500	12.8	12.9	15.1	10.0	11.6

QUALITY CONTROL REPORT

QC Batch No: 101715-3

Analytes	LCS % REC	LCS DUP % REC	LCS RPD % REC	LCS/LCSD % Limit	LCS RPD % Limit					
AA Metals										
Mercury	113	110	2.7	80-120	<20					
ICP Metals										
Antimony	94	96	2.5	80-120	<20					
Arsenic	98	98	<1	80-120	<20					

ANALYTICAL RESULTS

Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QUALITY CONTROL REPORT

QC Batch No: 101715-3

Analytes	LCS % REC	LCS DUP % REC	LCS RPD % REC	LCS/LCSD % Limit	LCS RPD % Limit					
ICP Metals										
Barium	**98**	**97**	**<1**	**80-120**	**<20**					
Beryllium	**106**	**106**	**<1**	**80-120**	**<20**					
Cadmium	**100**	**100**	**<1**	**80-120**	**<20**					
Chromium	**100**	**100**	**<1**	**80-120**	**<20**					
Cobalt	**97**	**97**	**<1**	**80-120**	**<20**					
Copper	**100**	**99**	**<1**	**80-120**	**<20**					
Lead	**100**	**100**	**<1**	**80-120**	**<20**					
Molybdenum	**97**	**97**	**<1**	**80-120**	**<20**					
Nickel	**100**	**100**	**<1**	**80-120**	**<20**					
Selenium	**97**	**97**	**<1**	**80-120**	**<20**					
Silver	**87**	**90**	**2.9**	**80-120**	**<20**					
Thallium	**100**	**100**	**<1**	**80-120**	**<20**					
Vanadium	**98**	**98**	**<1**	**80-120**	**<20**					
Zinc	**96**	**96**	**<1**	**80-120**	**<20**					

ANALYTICAL RESULTS

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Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QC Batch No: 101715-3

Our Lab I.D.		**339354**	**339355**	**339356**	**339357**	**339358**
Client Sample I.D.		B-17@15'	B-17@20'	B-17@25'	B-17@30'	B-17@35'
Date Sampled		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Date Prepared		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
AA Metals						
Mercury	0.0500	ND	ND	ND	ND	ND
ICP Metals						
Antimony	0.500	ND	ND	ND	ND	ND
Arsenic	0.250	ND	ND	ND	ND	ND
Barium	0.500	64.3	65.0	45.7	77.3	78.9
Beryllium	0.500	ND	ND	ND	ND	ND
Cadmium	0.500	ND	ND	ND	ND	ND
Chromium	0.500	2.61	1.87	0.703	2.56	2.14
Cobalt	0.500	ND	ND	ND	ND	ND
Copper	0.500	2.16	1.67	0.530	2.12	2.11
Lead	0.250	ND	ND	ND	ND	ND
Molybdenum	0.500	ND	ND	ND	ND	ND
Nickel	0.500	ND	ND	ND	ND	ND
Selenium	0.500	ND	ND	ND	ND	ND
Silver	0.500	ND	ND	ND	ND	ND
Thallium	0.500	ND	ND	ND	ND	ND
Vanadium	0.500	10.5	8.70	5.26	11.0	9.16
Zinc	0.500	11.3	10.4	6.52	14.3	15.9

QUALITY CONTROL REPORT

QC Batch No: 101715-3

Analytes	LCS % REC	LCS DUP % REC	LCS RPD % REC	LCS/LCSD % Limit	LCS RPD % Limit					
AA Metals										
Mercury	113	110	2.7	80-120	<20					
ICP Metals										
Antimony	94	96	2.5	80-120	<20					
Arsenic	98	98	<1	80-120	<20					

ANALYTICAL RESULTS

Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QUALITY CONTROL REPORT

QC Batch No: 101715-3

Analytes	LCS % REC	LCS DUP % REC	LCS RPD % REC	LCS/LCSD % Limit	LCS RPD % Limit					
ICP Metals										
Barium	**98**	**97**	**<1**	**80-120**	**<20**					
Beryllium	**106**	**106**	**<1**	**80-120**	**<20**					
Cadmium	**100**	**100**	**<1**	**80-120**	**<20**					
Chromium	**100**	**100**	**<1**	**80-120**	**<20**					
Cobalt	**97**	**97**	**<1**	**80-120**	**<20**					
Copper	**100**	**99**	**<1**	**80-120**	**<20**					
Lead	**100**	**100**	**<1**	**80-120**	**<20**					
Molybdenum	**97**	**97**	**<1**	**80-120**	**<20**					
Nickel	**100**	**100**	**<1**	**80-120**	**<20**					
Selenium	**97**	**97**	**<1**	**80-120**	**<20**					
Silver	**87**	**90**	**2.9**	**80-120**	**<20**					
Thallium	**100**	**100**	**<1**	**80-120**	**<20**					
Vanadium	**98**	**98**	**<1**	**80-120**	**<20**					
Zinc	**96**	**96**	**<1**	**80-120**	**<20**					

ANALYTICAL RESULTS

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Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QC Batch No: 101715-3

Our Lab I.D.		**339359**				
Client Sample I.D.		B-17@40'				
Date Sampled		**10/14/2015**				
Date Prepared		**10/17/2015**				
Preparation Method						
Date Analyzed		**10/17/2015**				
Matrix		Soil				
Units		mg/Kg				
Dilution Factor		1				
Analytes	**PQL**	**Results**				
AA Metals						
Mercury	**0.0500**	**ND**				
ICP Metals						
Antimony	**0.500**	**ND**				
Arsenic	**0.250**	**ND**				
Barium	**0.500**	**60.6**				
Beryllium	**0.500**	**ND**				
Cadmium	**0.500**	**ND**				
Chromium	**0.500**	**1.70**				
Cobalt	**0.500**	**ND**				
Copper	**0.500**	**1.53**				
Lead	**0.250**	**ND**				
Molybdenum	**0.500**	**ND**				
Nickel	**0.500**	**ND**				
Selenium	**0.500**	**ND**				
Silver	**0.500**	**ND**				
Thallium	**0.500**	**ND**				
Vanadium	**0.500**	**9.41**				
Zinc	**0.500**	**12.3**				

QUALITY CONTROL REPORT

QC Batch No: 101715-3

Analytes	LCS % REC	LCS DUP % REC	LCS RPD % REC	LCS/LCSD % Limit	LCS RPD % Limit				
AA Metals									
Mercury	**113**	**110**	**2.7**	**80-120**	**<20**				
ICP Metals									
Antimony	**94**	**96**	**2.5**	**80-120**	**<20**				
Arsenic	**98**	**98**	**<1**	**80-120**	**<20**				

ANALYTICAL RESULTS

Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 6010B/7471A, CCR Title 22 Metals (TTLC)

QUALITY CONTROL REPORT

QC Batch No: 101715-3

Analytes	LCS % REC	LCS DUP % REC	LCS RPD % REC	LCS/LCSD % Limit	LCS RPD % Limit					
ICP Metals										
Barium	**98**	**97**	**<1**	**80-120**	**<20**					
Beryllium	**106**	**106**	**<1**	**80-120**	**<20**					
Cadmium	**100**	**100**	**<1**	**80-120**	**<20**					
Chromium	**100**	**100**	**<1**	**80-120**	**<20**					
Cobalt	**97**	**97**	**<1**	**80-120**	**<20**					
Copper	**100**	**99**	**<1**	**80-120**	**<20**					
Lead	**100**	**100**	**<1**	**80-120**	**<20**					
Molybdenum	**97**	**97**	**<1**	**80-120**	**<20**					
Nickel	**100**	**100**	**<1**	**80-120**	**<20**					
Selenium	**97**	**97**	**<1**	**80-120**	**<20**					
Silver	**87**	**90**	**2.9**	**80-120**	**<20**					
Thallium	**100**	**100**	**<1**	**80-120**	**<20**					
Vanadium	**98**	**98**	**<1**	**80-120**	**<20**					
Zinc	**96**	**96**	**<1**	**80-120**	**<20**					

ANALYTICAL RESULTS

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Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 8015B, TPH DROs and OROs (Diesel and Oil Range Organics)

QC Batch No: S1D-101715

Our Lab I.D.		**339346**	**339347**	**339348**	**339349**	**339350**
Client Sample I.D.		B-16@15'	B-16@20'	B-16@25'	B-16@30'	B-16@35'
Date Sampled		**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**
Date Prepared		**10/16/2015**	**10/16/2015**	**10/16/2015**	**10/16/2015**	**10/16/2015**
Preparation Method						
Date Analyzed		**10/17/2015**	**10/17/2015**	**10/17/2015**	**10/17/2015**	**10/17/2015**
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH DROs (C10 to C28)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
TPH OROs (C28+)	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**

Our Lab I.D.		**339346**	**339347**	**339348**	**339349**	**339350**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Chlorobenzene	**70-120**	**97**	**95**	**96**	**96**	**94**

QUALITY CONTROL REPORT

QC Batch No: S1D-101715

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Diesel	**104**	**100**	**3.9**	**75-120**	**<20**					

ANALYTICAL RESULTS

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Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 8015B, TPH DROs and OROs (Diesel and Oil Range Organics)

QC Batch No: S1D-101715

Our Lab I.D.		**339351**	**339352**	**339353**	**339354**	**339355**
Client Sample I.D.		B-16@40'	B-17@5'	B-17@10'	B-17@15'	B-17@20'
Date Sampled		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Date Prepared		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH DROs (C10 to C28)	10.0	ND	ND	ND	ND	ND
TPH OROs (C28+)	50.0	ND	ND	ND	ND	ND

Our Lab I.D.		**339351**	**339352**	**339353**	**339354**	**339355**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Chlorobenzene	70-120	97	96	95	95	97

QUALITY CONTROL REPORT

QC Batch No: S1D-101715

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Diesel	104	100	3.9	75-120	<20					

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Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 8015B, TPH DROs and OROs (Diesel and Oil Range Organics)

QC Batch No: S1D-101715

Our Lab I.D.		**339356**	**339357**	**339358**	**339359**	
Client Sample I.D.		B-17@25'	B-17@30'	B-17@35'	B-17@40'	
Date Sampled		**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**	
Date Prepared		**10/16/2015**	**10/16/2015**	**10/16/2015**	**10/16/2015**	
Preparation Method						
Date Analyzed		**10/17/2015**	**10/17/2015**	**10/17/2015**	**10/17/2015**	
Matrix		Soil	Soil	Soil	Soil	
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	
Dilution Factor		1	1	1	1	
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	
TPH DROs (C10 to C28)	**10.0**	**ND**	**ND**	**ND**	**ND**	
TPH OROs (C28+)	**50.0**	**ND**	**ND**	**ND**	**ND**	

Our Lab I.D.		**339356**	**339357**	**339358**	**339359**	
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	
Surrogate Percent Recovery						
Chlorobenzene	**70-120**	**97**	**96**	**95**	**95**	

QUALITY CONTROL REPORT

QC Batch No: S1D-101715

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Diesel	**104**	**100**	**3.9**	**75-120**	**<20**					

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Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 8015B, TPH DROs and OROs (Diesel and Oil Range Organics)

QC Batch No: S1P-101715

Our Lab I.D.		**339331**	**339332**	**339333**	**339334**	**339335**
Client Sample I.D.		B-8@15'	B-8@20'	B-8@25'	B-8@30'	B-8@35'
Date Sampled		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Date Prepared		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH DROs (C10 to C28)	10.0	ND	ND	ND	ND	ND
TPH OROs (C28+)	50.0	ND	ND	ND	ND	ND

Our Lab I.D.		**339331**	**339332**	**339333**	**339334**	**339335**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Chlorobenzene	70-120	94	95	93	96	98

QUALITY CONTROL REPORT

QC Batch No: S1P-101715

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Diesel	107	106	<1	75-120	<20					

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Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 8015B, TPH DROs and OROs (Diesel and Oil Range Organics)

QC Batch No: S1P-101715

Our Lab I.D.		**339336**	**339337**	**339338**	**339339**	**339340**
Client Sample I.D.		B-8@40'	B-15@10'	B-15@15'	B-15@20'	B-15@25'
Date Sampled		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Date Prepared		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH DROs (C10 to C28)	10.0	ND	ND	ND	ND	ND
TPH OROs (C28+)	50.0	ND	ND	ND	ND	ND

Our Lab I.D.		**339336**	**339337**	**339338**	**339339**	**339340**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Chlorobenzene	70-120	94	97	92	89	92

QUALITY CONTROL REPORT

QC Batch No: S1P-101715

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Diesel	107	106	<1	75-120	<20					

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Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 8015B, TPH DROs and OROs (Diesel and Oil Range Organics)

QC Batch No: S1P-101715

Our Lab I.D.		**339341**	**339342**	**339343**	**339344**	**339345**
Client Sample I.D.		B-15@30'	B-15@35'	B-15@40'	B-16@5'	B-16@10'
Date Sampled		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Date Prepared		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH DROs (C10 to C28)	10.0	ND	ND	ND	ND	ND
TPH OROs (C28+)	50.0	ND	ND	ND	ND	ND

Our Lab I.D.		**339341**	**339342**	**339343**	**339344**	**339345**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Chlorobenzene	70-120	94	91	92	94	98

QUALITY CONTROL REPORT

QC Batch No: S1P-101715

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Diesel	107	106	<1	75-120	<20					

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Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 8015B, TPH DROs and OROs (Diesel and Oil Range Organics)

QC Batch No: S2D-101615

Our Lab I.D.		**339324**	**339325**	**339326**	**339327**	**339328**
Client Sample I.D.		B-1@15'	B-1@20'	B-1@25'	B-1@30'	B-1@35'
Date Sampled		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Date Prepared		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH DROs (C10 to C28)	10.0	ND	ND	ND	ND	ND
TPH OROs (C28+)	50.0	ND	ND	ND	ND	ND

Our Lab I.D.		**339324**	**339325**	**339326**	**339327**	**339328**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Chlorobenzene	70-120	98	97	95	97	98

QUALITY CONTROL REPORT

QC Batch No: S2D-101615

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Diesel	87	91	4.5	75-120	<20					

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Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 8015B, TPH DROs and OROs (Diesel and Oil Range Organics)

QC Batch No: S2D-101615

Our Lab I.D.		**339329**	**339330**			
Client Sample I.D.		B-1@40'	B-8@10'			
Date Sampled		**10/14/2015**	**10/14/2015**			
Date Prepared		**10/16/2015**	**10/16/2015**			
Preparation Method						
Date Analyzed		**10/17/2015**	**10/17/2015**			
Matrix		Soil	Soil			
Units		mg/Kg	mg/Kg			
Dilution Factor		1	1			
Analytes	**PQL**	**Results**	**Results**			
TPH DROs (C10 to C28)	**10.0**	**ND**	**ND**			
TPH OROs (C28+)	**50.0**	**ND**	**ND**			

Our Lab I.D.		**339329**	**339330**			
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**			
Surrogate Percent Recovery						
Chlorobenzene	**70-120**	**98**	**95**			

QUALITY CONTROL REPORT

QC Batch No: S2D-101615

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Diesel	**87**	**91**	**4.5**	**75-120**	**<20**					

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Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 8015B, TPH DROs and OROs (Diesel and Oil Range Organics)

QC Batch No: S2P-101615

Our Lab I.D.		**339314**	**339315**	**339316**	**339317**	**339318**
Client Sample I.D.		B-3@5'	B-3@10'	B-3@15'	B-3@20'	B-3@25'
Date Sampled		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Date Prepared		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH DROs (C10 to C28)	10.0	ND	ND	ND	ND	ND
TPH OROs (C28+)	50.0	ND	ND	ND	ND	ND

Our Lab I.D.		**339314**	**339315**	**339316**	**339317**	**339318**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Chlorobenzene	70-120	94	97	98	97	99

QUALITY CONTROL REPORT

QC Batch No: S2P-101615

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Diesel	98	96	2.1	75-120	<20					

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Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 8015B, TPH DROs and OROs (Diesel and Oil Range Organics)

QC Batch No: S2P-101615

Our Lab I.D.		**339319**	**339320**	**339321**	**339322**	**339323**
Client Sample I.D.		B-3@30'	B-3@35'	B-3@40'	B-1@5'	B-1@10'
Date Sampled		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Date Prepared		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH DROs (C10 to C28)	10.0	ND	ND	ND	ND	ND
TPH OROs (C28+)	50.0	ND	ND	ND	ND	ND

Our Lab I.D.		**339319**	**339320**	**339321**	**339322**	**339323**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Chlorobenzene	70-120	96	93	97	96	98

QUALITY CONTROL REPORT

QC Batch No: S2P-101615

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Diesel	98	96	2.1	75-120	<20					

ANALYTICAL RESULTS

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Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 8015B, TPH GROs (Gasoline Range Organics)

QC Batch No: S1G-101615

Our Lab I.D.		**339314**	**339315**	**339316**	**339317**	**339318**
Client Sample I.D.		B-3@5'	B-3@10'	B-3@15'	B-3@20'	B-3@25'
Date Sampled		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Date Prepared		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Preparation Method						
Date Analyzed		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH GROs (C6 to C10)	500	ND	ND	ND	ND	ND

Our Lab I.D.		**339314**	**339315**	**339316**	**339317**	**339318**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Bromofluorobenzene	70-120	101	101	108	105	105

QUALITY CONTROL REPORT

QC Batch No: S1G-101615

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	100	97	3.0	75-120	<20					
Toluene	99	100	1.0	75-120	<20					

ANALYTICAL RESULTS

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ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 8015B, TPH GROs (Gasoline Range Organics)

QC Batch No: S1H-101615

Our Lab I.D.		**339339**	**339340**	**339341**	**339342**	**339343**
Client Sample I.D.		B-15@20'	B-15@25'	B-15@30'	B-15@35'	B-15@40'
Date Sampled		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Date Prepared		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Preparation Method						
Date Analyzed		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH GROs (C6 to C10)	500	ND	ND	ND	ND	ND

Our Lab I.D.		**339339**	**339340**	**339341**	**339342**	**339343**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Bromofluorobenzene	70-120	80	72	87	101	75

QUALITY CONTROL REPORT

QC Batch No: S1H-101615

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	103	102	<1	75-120	<20					
Toluene	104	103	<1	75-120	<20					

ANALYTICAL RESULTS

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Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 8015B, TPH GROs (Gasoline Range Organics)

QC Batch No: S1H-101615

Our Lab I.D.		**339344**	**339345**	**339346**	**339347**	**339348**
Client Sample I.D.		B-16@5'	B-16@10'	B-16@15'	B-16@20'	B-16@25'
Date Sampled		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Date Prepared		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Preparation Method						
Date Analyzed		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH GROs (C6 to C10)	500	ND	ND	ND	ND	ND

Our Lab I.D.		**339344**	**339345**	**339346**	**339347**	**339348**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Bromofluorobenzene	70-120	88	93	74	90	90

QUALITY CONTROL REPORT

QC Batch No: S1H-101615

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	103	102	<1	75-120	<20					
Toluene	104	103	<1	75-120	<20					

ANALYTICAL RESULTS

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ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Project Name: UCR

Method: 8015B, TPH GROs (Gasoline Range Organics)

QC Batch No: S1H-101615

Our Lab I.D.		**339349**	**339350**	**339351**	**339352**	**339353**
Client Sample I.D.		B-16@30'	B-16@35'	B-16@40'	B-17@5'	B-17@10'
Date Sampled		**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**
Date Prepared		**10/16/2015**	**10/16/2015**	**10/16/2015**	**10/16/2015**	**10/16/2015**
Preparation Method						
Date Analyzed		**10/16/2015**	**10/16/2015**	**10/16/2015**	**10/16/2015**	**10/16/2015**
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH GROs (C6 to C10)	**500**	**ND**	**ND**	**ND**	**ND**	**ND**

Our Lab I.D.		**339349**	**339350**	**339351**	**339352**	**339353**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Bromofluorobenzene	**70-120**	**76**	**93**	**92**	**90**	**93**

QUALITY CONTROL REPORT

QC Batch No: S1H-101615

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	**103**	**102**	**<1**	**75-120**	**<20**					
Toluene	**104**	**103**	**<1**	**75-120**	**<20**					

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ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 8015B, TPH GROs (Gasoline Range Organics)

QC Batch No: S1H-101615

Our Lab I.D.		**339354**				
Client Sample I.D.		B-17@15'				
Date Sampled		**10/14/2015**				
Date Prepared		**10/16/2015**				
Preparation Method						
Date Analyzed		**10/16/2015**				
Matrix		Soil				
Units		ug/kg				
Dilution Factor		1				
Analytes	**PQL**	**Results**				
TPH GROs (C6 to C10)	**500**	**ND**				

Our Lab I.D.		**339354**				
Surrogates	**% Rec.Limit**	**% Rec.**				
Surrogate Percent Recovery						
Bromofluorobenzene	**70-120**	**101**				

QUALITY CONTROL REPORT

QC Batch No: S1H-101615

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	**103**	**102**	**<1**	**75-120**	**<20**					
Toluene	**104**	**103**	**<1**	**75-120**	**<20**					

ANALYTICAL RESULTS

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Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 8015B, TPH GROs (Gasoline Range Organics)

QC Batch No: S2G-101615

Our Lab I.D.		**339319**	**339320**	**339321**	**339322**	**339323**
Client Sample I.D.		B-3@30'	B-3@35'	B-3@40'	B-1@5'	B-1@10'
Date Sampled		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Date Prepared		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH GROs (C6 to C10)	500	ND	ND	ND	ND	ND

Our Lab I.D.		**339319**	**339320**	**339321**	**339322**	**339323**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Bromofluorobenzene	70-120	105	106	110	87	101

QUALITY CONTROL REPORT

QC Batch No: S2G-101615

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	93	90	3.3	75-120	<20					
Toluene	95	95	<1	75-120	<20					

ANALYTICAL RESULTS

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Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 8015B, TPH GROs (Gasoline Range Organics)

QC Batch No: S2G-101615

Our Lab I.D.		**339324**	**339325**	**339326**	**339327**	**339328**
Client Sample I.D.		B-1@15'	B-1@20'	B-1@25'	B-1@30'	B-1@35'
Date Sampled		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Date Prepared		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH GROs (C6 to C10)	500	ND	ND	ND	ND	ND

Our Lab I.D.		339324	339325	339326	339327	339328
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Bromofluorobenzene	70-120	104	105	98	99	102

QUALITY CONTROL REPORT

QC Batch No: S2G-101615

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	93	90	3.3	75-120	<20					
Toluene	95	95	<1	75-120	<20					

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ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 8015B, TPH GROs (Gasoline Range Organics)

QC Batch No: S2G-101615

Our Lab I.D.		**339329**	**339330**	**339331**	**339332**	**339333**
Client Sample I.D.		B-1@40'	B-8@10'	B-8@15'	B-8@20'	B-8@25'
Date Sampled		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Date Prepared		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH GROs (C6 to C10)	500	ND	ND	ND	ND	ND

Our Lab I.D.		**339329**	**339330**	**339331**	**339332**	**339333**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Bromofluorobenzene	70-120	101	101	95	99	103

QUALITY CONTROL REPORT

QC Batch No: S2G-101615

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	93	90	3.3	75-120	<20					
Toluene	95	95	<1	75-120	<20					

ANALYTICAL RESULTS

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Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 8015B, TPH GROs (Gasoline Range Organics)

QC Batch No: S2G-101615

Our Lab I.D.		**339334**	**339335**	**339336**	**339337**	**339338**
Client Sample I.D.		B-8@30'	B-8@35'	B-8@40'	B-15@10'	B-15@15'
Date Sampled		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Date Prepared		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH GROs (C6 to C10)	500	ND	ND	ND	ND	ND

Our Lab I.D.		**339334**	**339335**	**339336**	**339337**	**339338**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Bromofluorobenzene	70-120	96	103	106	98	99

QUALITY CONTROL REPORT

QC Batch No: S2G-101615

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	93	90	3.3	75-120	<20					
Toluene	95	95	<1	75-120	<20					

ANALYTICAL RESULTS

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Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 8015B, TPH GROs (Gasoline Range Organics)

QC Batch No: S2H-101615

Our Lab I.D.		**339355**	**339356**	**339357**	**339358**	**339359**
Client Sample I.D.		B-17@20'	B-17@25'	B-17@30'	B-17@35'	B-17@40'
Date Sampled		**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**
Date Prepared		**10/17/2015**	**10/17/2015**	**10/17/2015**	**10/17/2015**	**10/17/2015**
Preparation Method						
Date Analyzed		**10/17/2015**	**10/17/2015**	**10/17/2015**	**10/17/2015**	**10/17/2015**
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
TPH GROs (C6 to C10)	**500**	**ND**	**ND**	**ND**	**ND**	**ND**

Our Lab I.D.		**339355**	**339356**	**339357**	**339358**	**339359**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Bromofluorobenzene	**70-120**	**85**	**87**	**101**	**89**	**99**

QUALITY CONTROL REPORT

QC Batch No: S2H-101615

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	**99**	**99**	**<1**	**75-120**	**<20**					
Toluene	**97**	**97**	**<1**	**75-120**	**<20**					

ANALYTICAL RESULTS

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Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1B-101615

Our Lab I.D.		**339314**	**339315**	**339316**	**339317**	**339318**
Client Sample I.D.		B-3@5'	B-3@10'	B-3@15'	B-3@20'	B-3@25'
Date Sampled		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Date Prepared		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Preparation Method						
Date Analyzed		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Acetone	50.0	ND	ND	ND	ND	ND
Benzene	2.00	ND	ND	ND	ND	ND
Bromobenzene (Phenyl bromide)	10.0	ND	ND	ND	ND	ND
Bromochloromethane (Chlorobromomethane)	10.0	ND	ND	ND	ND	ND
Bromodichloromethane (Dichlorobromomethane)	10.0	ND	ND	ND	ND	ND
Bromoform (Tribromomethane)	50.0	ND	ND	ND	ND	ND
Bromomethane (Methyl bromide)	30.0	ND	ND	ND	ND	ND
2-Butanone (MEK, Methyl ethyl ketone)	50.0	ND	ND	ND	ND	ND
n-Butylbenzene	10.0	ND	ND	ND	ND	ND
sec-Butylbenzene	10.0	ND	ND	ND	ND	ND
tert-Butylbenzene	10.0	ND	ND	ND	ND	ND
Carbon disulfide	10.0	ND	ND	ND	ND	ND
Carbon tetrachloride (Tetrachloromethane)	10.0	ND	ND	ND	ND	ND
Chlorobenzene	10.0	ND	ND	ND	ND	ND
Chloroethane	30.0	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	50.0	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	10.0	ND	ND	ND	ND	ND
Chloromethane (Methyl chloride)	30.0	ND	ND	ND	ND	ND
4-Chlorotoluene (p-Chlorotoluene)	10.0	ND	ND	ND	ND	ND
2-Chlorotoluene (o-Chlorotoluene)	10.0	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane (DBCP)	50.0	ND	ND	ND	ND	ND
Dibromochloromethane	10.0	ND	ND	ND	ND	ND
1,2-Dibromoethane (EDB, Ethylene dibromide)	10.0	ND	ND	ND	ND	ND
Dibromomethane	10.0	ND	ND	ND	ND	ND
1,2-Dichlorobenzene (o-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
1,3-Dichlorobenzene (m-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
1,4-Dichlorobenzene (p-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
Dichlorodifluoromethane	30.0	ND	ND	ND	ND	ND
1,1-Dichloroethane	10.0	ND	ND	ND	ND	ND

ANALYTICAL RESULTS

Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1B-101615

Our Lab I.D.		**339314**	**339315**	**339316**	**339317**	**339318**
Client Sample I.D.		B-3@5'	B-3@10'	B-3@15'	B-3@20'	B-3@25'
Date Sampled		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Date Prepared		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Preparation Method						
Date Analyzed		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
1,2-Dichloroethane	10.0	ND	ND	ND	ND	ND
1,1-Dichloroethene (1,1-Dichloroethylene)	10.0	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	10.0	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	10.0	ND	ND	ND	ND	ND
1,2-Dichloropropane	10.0	ND	ND	ND	ND	ND
1,3-Dichloropropane	10.0	ND	ND	ND	ND	ND
2,2-Dichloropropane	10.0	ND	ND	ND	ND	ND
1,1-Dichloropropene	10.0	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	10.0	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	10.0	ND	ND	ND	ND	ND
Ethylbenzene	2.00	ND	ND	ND	ND	ND
Hexachlorobutadiene (1,3-Hexachlorobutadiene)	30.0	ND	ND	ND	ND	ND
2-Hexanone	50.0	ND	ND	ND	ND	ND
Isopropylbenzene	10.0	ND	ND	ND	ND	ND
p-Isopropyltoluene (4-Isopropyltoluene)	10.0	ND	ND	ND	ND	ND
MTBE	5.00	ND	ND	ND	ND	ND
4-Methyl-2-pentanone (MIBK, Methyl isobutyl ketone)	50.0	ND	ND	ND	ND	ND
Methylene chloride (Dichloromethane, DCM)	50.0	ND	ND	ND	ND	ND
Naphthalene	10.0	ND	ND	ND	ND	ND
n-Propylbenzene	10.0	ND	ND	ND	ND	ND
Styrene	10.0	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	10.0	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	10.0	ND	ND	ND	ND	ND
Tetrachloroethene (Tetrachloroethylene)	10.0	ND	ND	ND	ND	ND
Toluene (Methyl benzene)	2.00	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	10.0	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	10.0	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	10.0	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	10.0	ND	ND	ND	ND	ND
Trichloroethene (TCE)	10.0	ND	ND	ND	ND	ND
Trichlorofluoromethane	10.0	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	10.0	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	10.0	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	10.0	ND	ND	ND	ND	ND
Vinyl acetate	50.0	ND	ND	ND	ND	ND

ANALYTICAL RESULTS

Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1B-101615

Our Lab I.D.		**339314**	**339315**	**339316**	**339317**	**339318**
Client Sample I.D.		B-3@5'	B-3@10'	B-3@15'	B-3@20'	B-3@25'
Date Sampled		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Date Prepared		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Preparation Method						
Date Analyzed		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Vinyl chloride (Chloroethene)	30.0	ND	ND	ND	ND	ND
o-Xylene	2.00	ND	ND	ND	ND	ND
m- & p-Xylenes	4.00	ND	ND	ND	ND	ND

Our Lab I.D.		**339314**	**339315**	**339316**	**339317**	**339318**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Bromofluorobenzene	70-120	119	119	119	119	117
Dibromofluoromethane	70-120	96	97	95	95	93
Toluene-d8	70-120	106	104	105	104	105

QUALITY CONTROL REPORT

QC Batch No: S1B-101615

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	95	99	4.1	75-120	15					
Chlorobenzene	114	119	4.3	75-120	15					
1,1-Dichloroethene (1,1-Dichloroethylene)	84	82	2.4	75-120	15					
MTBE	107	109	1.9	75-120	15					
Toluene (Methyl benzene)	94	97	3.1	75-120	15					
Trichloroethene (TCE)	91	95	4.3	75-120	15					

ANALYTICAL RESULTS

Ordered By

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Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1C-101615

Our Lab I.D.		**339334**	**339335**	**339336**	**339337**	**339338**
Client Sample I.D.		B-8@30'	B-8@35'	B-8@40'	B-15@10'	B-15@15'
Date Sampled		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Date Prepared		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Preparation Method						
Date Analyzed		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Acetone	50.0	ND	ND	ND	ND	ND
Benzene	2.00	ND	ND	ND	ND	ND
Bromobenzene (Phenyl bromide)	10.0	ND	ND	ND	ND	ND
Bromochloromethane (Chlorobromomethane)	10.0	ND	ND	ND	ND	ND
Bromodichloromethane (Dichlorobromomethane)	10.0	ND	ND	ND	ND	ND
Bromoform (Tribromomethane)	50.0	ND	ND	ND	ND	ND
Bromomethane (Methyl bromide)	30.0	ND	ND	ND	ND	ND
2-Butanone (MEK, Methyl ethyl ketone)	50.0	ND	ND	ND	ND	ND
n-Butylbenzene	10.0	ND	ND	ND	ND	ND
sec-Butylbenzene	10.0	ND	ND	ND	ND	ND
tert-Butylbenzene	10.0	ND	ND	ND	ND	ND
Carbon disulfide	10.0	ND	ND	ND	ND	ND
Carbon tetrachloride (Tetrachloromethane)	10.0	ND	ND	ND	ND	ND
Chlorobenzene	10.0	ND	ND	ND	ND	ND
Chloroethane	30.0	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	50.0	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	10.0	ND	ND	ND	ND	ND
Chloromethane (Methyl chloride)	30.0	ND	ND	ND	ND	ND
4-Chlorotoluene (p-Chlorotoluene)	10.0	ND	ND	ND	ND	ND
2-Chlorotoluene (o-Chlorotoluene)	10.0	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane (DBCP)	50.0	ND	ND	ND	ND	ND
Dibromochloromethane	10.0	ND	ND	ND	ND	ND
1,2-Dibromoethane (EDB, Ethylene dibromide)	10.0	ND	ND	ND	ND	ND
Dibromomethane	10.0	ND	ND	ND	ND	ND
1,2-Dichlorobenzene (o-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
1,3-Dichlorobenzene (m-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
1,4-Dichlorobenzene (p-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
Dichlorodifluoromethane	30.0	ND	ND	ND	ND	ND
1,1-Dichloroethane	10.0	ND	ND	ND	ND	ND

ANALYTICAL RESULTS

Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1C-101615

Our Lab I.D.		**339334**	**339335**	**339336**	**339337**	**339338**
Client Sample I.D.		B-8@30'	B-8@35'	B-8@40'	B-15@10'	B-15@15'
Date Sampled		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Date Prepared		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Preparation Method						
Date Analyzed		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
1,2-Dichloroethane	10.0	ND	ND	ND	ND	ND
1,1-Dichloroethene (1,1-Dichloroethylene)	10.0	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	10.0	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	10.0	ND	ND	ND	ND	ND
1,2-Dichloropropane	10.0	ND	ND	ND	ND	ND
1,3-Dichloropropane	10.0	ND	ND	ND	ND	ND
2,2-Dichloropropane	10.0	ND	ND	ND	ND	ND
1,1-Dichloropropene	10.0	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	10.0	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	10.0	ND	ND	ND	ND	ND
Ethylbenzene	2.00	ND	ND	ND	ND	ND
Hexachlorobutadiene (1,3-Hexachlorobutadiene)	30.0	ND	ND	ND	ND	ND
2-Hexanone	50.0	ND	ND	ND	ND	ND
Isopropylbenzene	10.0	ND	ND	ND	ND	ND
p-Isopropyltoluene (4-Isopropyltoluene)	10.0	ND	ND	ND	ND	ND
MTBE	5.00	ND	ND	ND	ND	ND
4-Methyl-2-pentanone (MIBK, Methyl isobutyl ketone)	50.0	ND	ND	ND	ND	ND
Methylene chloride (Dichloromethane, DCM)	50.0	ND	ND	ND	ND	ND
Naphthalene	10.0	ND	ND	ND	ND	ND
n-Propylbenzene	10.0	ND	ND	ND	ND	ND
Styrene	10.0	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	10.0	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	10.0	ND	ND	ND	ND	ND
Tetrachloroethene (Tetrachloroethylene)	10.0	ND	ND	ND	ND	ND
Toluene (Methyl benzene)	2.00	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	10.0	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	10.0	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	10.0	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	10.0	ND	ND	ND	ND	ND
Trichloroethene (TCE)	10.0	ND	ND	ND	ND	ND
Trichlorofluoromethane	10.0	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	10.0	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	10.0	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	10.0	ND	ND	ND	ND	ND
Vinyl acetate	50.0	ND	ND	ND	ND	ND

ANALYTICAL RESULTS

Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1C-101615

Our Lab I.D.		**339334**	**339335**	**339336**	**339337**	**339338**
Client Sample I.D.		B-8@30'	B-8@35'	B-8@40'	B-15@10'	B-15@15'
Date Sampled		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Date Prepared		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Preparation Method						
Date Analyzed		10/16/2015	10/16/2015	10/16/2015	10/16/2015	10/16/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Vinyl chloride (Chloroethene)	30.0	ND	ND	ND	ND	ND
o-Xylene	2.00	ND	ND	ND	ND	ND
m- & p-Xylenes	4.00	ND	ND	ND	ND	ND

Our Lab I.D.		**339334**	**339335**	**339336**	**339337**	**339338**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Bromofluorobenzene	70-120	116	119	118	119	105
Dibromofluoromethane	70-120	82	84	82	83	84
Toluene-d8	70-120	111	113	113	112	112

QUALITY CONTROL REPORT

QC Batch No: S1C-101615

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	98	98	<1	75-120	15					
Chlorobenzene	114	114	<1	75-120	15					
1,1-Dichloroethene (1,1-Dichloroethylene)	87	90	3.4	75-120	15					
MTBE	103	103	<1	75-120	15					
Toluene (Methyl benzene)	94	94	<1	75-120	15					
Trichloroethene (TCE)	86	85	1.2	75-120	15					

ANALYTICAL RESULTS

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Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1C-101615

Our Lab I.D.		**339339**	**339340**	**339341**		
Client Sample I.D.		B-15@20'	B-15@25'	B-15@30'		
Date Sampled		10/14/2015	10/14/2015	10/14/2015		
Date Prepared		10/16/2015	10/16/2015	10/16/2015		
Preparation Method						
Date Analyzed		10/16/2015	10/16/2015	10/16/2015		
Matrix		Soil	Soil	Soil		
Units		ug/kg	ug/kg	ug/kg		
Dilution Factor		1	1	1		
Analytes	**PQL**	**Results**	**Results**	**Results**		
Acetone	50.0	ND	ND	ND		
Benzene	2.00	ND	ND	ND		
Bromobenzene (Phenyl bromide)	10.0	ND	ND	ND		
Bromochloromethane (Chlorobromomethane)	10.0	ND	ND	ND		
Bromodichloromethane (Dichlorobromomethane)	10.0	ND	ND	ND		
Bromoform (Tribromomethane)	50.0	ND	ND	ND		
Bromomethane (Methyl bromide)	30.0	ND	ND	ND		
2-Butanone (MEK, Methyl ethyl ketone)	50.0	ND	ND	ND		
n-Butylbenzene	10.0	ND	ND	ND		
sec-Butylbenzene	10.0	ND	ND	ND		
tert-Butylbenzene	10.0	ND	ND	ND		
Carbon disulfide	10.0	ND	ND	ND		
Carbon tetrachloride (Tetrachloromethane)	10.0	ND	ND	ND		
Chlorobenzene	10.0	ND	ND	ND		
Chloroethane	30.0	ND	ND	ND		
2-Chloroethyl vinyl ether	50.0	ND	ND	ND		
Chloroform (Trichloromethane)	10.0	ND	ND	ND		
Chloromethane (Methyl chloride)	30.0	ND	ND	ND		
4-Chlorotoluene (p-Chlorotoluene)	10.0	ND	ND	ND		
2-Chlorotoluene (o-Chlorotoluene)	10.0	ND	ND	ND		
1,2-Dibromo-3-chloropropane (DBCP)	50.0	ND	ND	ND		
Dibromochloromethane	10.0	ND	ND	ND		
1,2-Dibromoethane (EDB, Ethylene dibromide)	10.0	ND	ND	ND		
Dibromomethane	10.0	ND	ND	ND		
1,2-Dichlorobenzene (o-Dichlorobenzene)	10.0	ND	ND	ND		
1,3-Dichlorobenzene (m-Dichlorobenzene)	10.0	ND	ND	ND		
1,4-Dichlorobenzene (p-Dichlorobenzene)	10.0	ND	ND	ND		
Dichlorodifluoromethane	30.0	ND	ND	ND		
1,1-Dichloroethane	10.0	ND	ND	ND		

ANALYTICAL RESULTS

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Project Name: UCR

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1C-101615

Our Lab I.D.		**339339**	**339340**	**339341**		
Client Sample I.D.		B-15@20'	B-15@25'	B-15@30'		
Date Sampled		10/14/2015	10/14/2015	10/14/2015		
Date Prepared		10/16/2015	10/16/2015	10/16/2015		
Preparation Method						
Date Analyzed		10/16/2015	10/16/2015	10/16/2015		
Matrix		Soil	Soil	Soil		
Units		ug/kg	ug/kg	ug/kg		
Dilution Factor		1	1	1		
Analytes	**PQL**	**Results**	**Results**	**Results**		
1,2-Dichloroethane	10.0	ND	ND	ND		
1,1-Dichloroethene (1,1-Dichloroethylene)	10.0	ND	ND	ND		
cis-1,2-Dichloroethene	10.0	ND	ND	ND		
trans-1,2-Dichloroethene	10.0	ND	ND	ND		
1,2-Dichloropropane	10.0	ND	ND	ND		
1,3-Dichloropropane	10.0	ND	ND	ND		
2,2-Dichloropropane	10.0	ND	ND	ND		
1,1-Dichloropropene	10.0	ND	ND	ND		
cis-1,3-Dichloropropene	10.0	ND	ND	ND		
trans-1,3-Dichloropropene	10.0	ND	ND	ND		
Ethylbenzene	2.00	ND	ND	ND		
Hexachlorobutadiene (1,3-Hexachlorobutadiene)	30.0	ND	ND	ND		
2-Hexanone	50.0	ND	ND	ND		
Isopropylbenzene	10.0	ND	ND	ND		
p-Isopropyltoluene (4-Isopropyltoluene)	10.0	ND	ND	ND		
MTBE	5.00	ND	ND	ND		
4-Methyl-2-pentanone (MIBK, Methyl isobutyl ketone)	50.0	ND	ND	ND		
Methylene chloride (Dichloromethane, DCM)	50.0	ND	ND	ND		
Naphthalene	10.0	ND	ND	ND		
n-Propylbenzene	10.0	ND	ND	ND		
Styrene	10.0	ND	ND	ND		
1,1,1,2-Tetrachloroethane	10.0	ND	ND	ND		
1,1,2,2-Tetrachloroethane	10.0	ND	ND	ND		
Tetrachloroethene (Tetrachloroethylene)	10.0	ND	ND	ND		
Toluene (Methyl benzene)	2.00	ND	ND	ND		
1,2,3-Trichlorobenzene	10.0	ND	ND	ND		
1,2,4-Trichlorobenzene	10.0	ND	ND	ND		
1,1,1-Trichloroethane	10.0	ND	ND	ND		
1,1,2-Trichloroethane	10.0	ND	ND	ND		
Trichloroethene (TCE)	10.0	ND	ND	ND		
Trichlorofluoromethane	10.0	ND	ND	ND		
1,2,3-Trichloropropane	10.0	ND	ND	ND		
1,2,4-Trimethylbenzene	10.0	ND	ND	ND		
1,3,5-Trimethylbenzene	10.0	ND	ND	ND		
Vinyl acetate	50.0	ND	ND	ND		

ANALYTICAL RESULTS

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Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1C-101615

Our Lab I.D.		**339339**	**339340**	**339341**		
Client Sample I.D.		B-15@20'	B-15@25'	B-15@30'		
Date Sampled		**10/14/2015**	**10/14/2015**	**10/14/2015**		
Date Prepared		**10/16/2015**	**10/16/2015**	**10/16/2015**		
Preparation Method						
Date Analyzed		**10/16/2015**	**10/16/2015**	**10/16/2015**		
Matrix		Soil	Soil	Soil		
Units		ug/kg	ug/kg	ug/kg		
Dilution Factor		1	1	1		
Analytes	**PQL**	**Results**	**Results**	**Results**		
Vinyl chloride (Chloroethene)	**30.0**	**ND**	**ND**	**ND**		
o-Xylene	**2.00**	**ND**	**ND**	**ND**		
m- & p-Xylenes	**4.00**	**ND**	**ND**	**ND**		

Our Lab I.D.		**339339**	**339340**	**339341**		
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**		
Surrogate Percent Recovery						
Bromofluorobenzene	**70-120**	**113**	**113**	**117**		
Dibromofluoromethane	**70-120**	**82**	**83**	**84**		
Toluene-d8	**70-120**	**112**	**112**	**111**		

QUALITY CONTROL REPORT

QC Batch No: S1C-101615

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	**98**	**98**	**<1**	**75-120**	**15**					
Chlorobenzene	**114**	**114**	**<1**	**75-120**	**15**					
1,1-Dichloroethene (1,1-Dichloroethylene)	**87**	**90**	**3.4**	**75-120**	**15**					
MTBE	**103**	**103**	**<1**	**75-120**	**15**					
Toluene (Methyl benzene)	**94**	**94**	**<1**	**75-120**	**15**					
Trichloroethene (TCE)	**86**	**85**	**1.2**	**75-120**	**15**					

ANALYTICAL RESULTS

Ordered By

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Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1C-101715

Our Lab I.D.		**339356**	**339357**	**339358**	**339359**	
Client Sample I.D.		B-17@25'	B-17@30'	B-17@35'	B-17@40'	
Date Sampled		10/14/2015	10/14/2015	10/14/2015	10/14/2015	
Date Prepared		10/17/2015	10/17/2015	10/17/2015	10/17/2015	
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	
Matrix		Soil	Soil	Soil	Soil	
Units		ug/kg	ug/kg	ug/kg	ug/kg	
Dilution Factor		1	1	1	1	
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	
Acetone	50.0	ND	ND	ND	ND	
Benzene	2.00	ND	ND	ND	ND	
Bromobenzene (Phenyl bromide)	10.0	ND	ND	ND	ND	
Bromochloromethane (Chlorobromomethane)	10.0	ND	ND	ND	ND	
Bromodichloromethane (Dichlorobromomethane)	10.0	ND	ND	ND	ND	
Bromoform (Tribromomethane)	50.0	ND	ND	ND	ND	
Bromomethane (Methyl bromide)	30.0	ND	ND	ND	ND	
2-Butanone (MEK, Methyl ethyl ketone)	50.0	ND	ND	ND	ND	
n-Butylbenzene	10.0	ND	ND	ND	ND	
sec-Butylbenzene	10.0	ND	ND	ND	ND	
tert-Butylbenzene	10.0	ND	ND	ND	ND	
Carbon disulfide	10.0	ND	ND	ND	ND	
Carbon tetrachloride (Tetrachloromethane)	10.0	ND	ND	ND	ND	
Chlorobenzene	10.0	ND	ND	ND	ND	
Chloroethane	30.0	ND	ND	ND	ND	
2-Chloroethyl vinyl ether	50.0	ND	ND	ND	ND	
Chloroform (Trichloromethane)	10.0	ND	ND	ND	ND	
Chloromethane (Methyl chloride)	30.0	ND	ND	ND	ND	
4-Chlorotoluene (p-Chlorotoluene)	10.0	ND	ND	ND	ND	
2-Chlorotoluene (o-Chlorotoluene)	10.0	ND	ND	ND	ND	
1,2-Dibromo-3-chloropropane (DBCP)	50.0	ND	ND	ND	ND	
Dibromochloromethane	10.0	ND	ND	ND	ND	
1,2-Dibromoethane (EDB, Ethylene dibromide)	10.0	ND	ND	ND	ND	
Dibromomethane	10.0	ND	ND	ND	ND	
1,2-Dichlorobenzene (o-Dichlorobenzene)	10.0	ND	ND	ND	ND	
1,3-Dichlorobenzene (m-Dichlorobenzene)	10.0	ND	ND	ND	ND	
1,4-Dichlorobenzene (p-Dichlorobenzene)	10.0	ND	ND	ND	ND	
Dichlorodifluoromethane	30.0	ND	ND	ND	ND	
1,1-Dichloroethane	10.0	ND	ND	ND	ND	

ANALYTICAL RESULTS

Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1C-101715

Our Lab I.D.		**339356**	**339357**	**339358**	**339359**	
Client Sample I.D.		B-17@25'	B-17@30'	B-17@35'	B-17@40'	
Date Sampled		**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**	
Date Prepared		**10/17/2015**	**10/17/2015**	**10/17/2015**	**10/17/2015**	
Preparation Method						
Date Analyzed		**10/17/2015**	**10/17/2015**	**10/17/2015**	**10/17/2015**	
Matrix		Soil	Soil	Soil	Soil	
Units		ug/kg	ug/kg	ug/kg	ug/kg	
Dilution Factor		1	1	1	1	
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	
1,2-Dichloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	
1,1-Dichloroethene (1,1-Dichloroethylene)	**10.0**	**ND**	**ND**	**ND**	**ND**	
cis-1,2-Dichloroethene	**10.0**	**ND**	**ND**	**ND**	**ND**	
trans-1,2-Dichloroethene	**10.0**	**ND**	**ND**	**ND**	**ND**	
1,2-Dichloropropane	**10.0**	**ND**	**ND**	**ND**	**ND**	
1,3-Dichloropropane	**10.0**	**ND**	**ND**	**ND**	**ND**	
2,2-Dichloropropane	**10.0**	**ND**	**ND**	**ND**	**ND**	
1,1-Dichloropropene	**10.0**	**ND**	**ND**	**ND**	**ND**	
cis-1,3-Dichloropropene	**10.0**	**ND**	**ND**	**ND**	**ND**	
trans-1,3-Dichloropropene	**10.0**	**ND**	**ND**	**ND**	**ND**	
Ethylbenzene	**2.00**	**ND**	**ND**	**ND**	**ND**	
Hexachlorobutadiene (1,3-Hexachlorobutadiene)	**30.0**	**ND**	**ND**	**ND**	**ND**	
2-Hexanone	**50.0**	**ND**	**ND**	**ND**	**ND**	
Isopropylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	
p-Isopropyltoluene (4-Isopropyltoluene)	**10.0**	**ND**	**ND**	**ND**	**ND**	
MTBE	**5.00**	**ND**	**ND**	**ND**	**ND**	
4-Methyl-2-pentanone (MIBK, Methyl isobutyl ketone)	**50.0**	**ND**	**ND**	**ND**	**ND**	
Methylene chloride (Dichloromethane, DCM)	**50.0**	**ND**	**ND**	**ND**	**ND**	
Naphthalene	**10.0**	**ND**	**ND**	**ND**	**ND**	
n-Propylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	
Styrene	**10.0**	**ND**	**ND**	**ND**	**ND**	
1,1,1,2-Tetrachloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	
1,1,2,2-Tetrachloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	
Tetrachloroethene (Tetrachloroethylene)	**10.0**	**ND**	**ND**	**ND**	**ND**	
Toluene (Methyl benzene)	**2.00**	**ND**	**ND**	**ND**	**ND**	
1,2,3-Trichlorobenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	
1,2,4-Trichlorobenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	
1,1,1-Trichloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	
1,1,2-Trichloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	
Trichloroethene (TCE)	**10.0**	**ND**	**ND**	**ND**	**ND**	
Trichlorofluoromethane	**10.0**	**ND**	**ND**	**ND**	**ND**	
1,2,3-Trichloropropane	**10.0**	**ND**	**ND**	**ND**	**ND**	
1,2,4-Trimethylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	
1,3,5-Trimethylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	
Vinyl acetate	**50.0**	**ND**	**ND**	**ND**	**ND**	

ANALYTICAL RESULTS

Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S1C-101715

Our Lab I.D.		339356	339357	339358	339359	
Client Sample I.D.		B-17@25'	B-17@30'	B-17@35'	B-17@40'	
Date Sampled		10/14/2015	10/14/2015	10/14/2015	10/14/2015	
Date Prepared		10/17/2015	10/17/2015	10/17/2015	10/17/2015	
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	
Matrix		Soil	Soil	Soil	Soil	
Units		ug/kg	ug/kg	ug/kg	ug/kg	
Dilution Factor		1	1	1	1	
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	
Vinyl chloride (Chloroethene)	30.0	ND	ND	ND	ND	
o-Xylene	2.00	ND	ND	ND	ND	
m- & p-Xylenes	4.00	ND	ND	ND	ND	

Our Lab I.D.		339356	339357	339358	339359	
Surrogates	% Rec.Limit	% Rec.	% Rec.	% Rec.	% Rec.	
Surrogate Percent Recovery						
Bromofluorobenzene	70-120	87	102	101	101	
Dibromofluoromethane	70-120	80	91	91	88	
Toluene-d8	70-120	102	80	102	102	

QUALITY CONTROL REPORT

QC Batch No: S1C-101715

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	93	95	2.1	75-120	15					
Chlorobenzene	117	118	<1	75-120	15					
1,1-Dichloroethene (1,1-Dichloroethylene)	87	91	4.5	75-120	15					
MTBE	107	113	5.5	75-120	15					
Toluene (Methyl benzene)	93	93	<1	75-120	15					
Trichloroethene (TCE)	84	85	1.2	75-120	15					

ANALYTICAL RESULTS

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Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S2B-101615

Our Lab I.D.		**339319**	**339320**	**339321**	**339322**	**339323**
Client Sample I.D.		B-3@30'	B-3@35'	B-3@40'	B-1@5'	B-1@10'
Date Sampled		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Date Prepared		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Acetone	50.0	ND	ND	ND	ND	ND
Benzene	2.00	ND	ND	ND	ND	ND
Bromobenzene (Phenyl bromide)	10.0	ND	ND	ND	ND	ND
Bromochloromethane (Chlorobromomethane)	10.0	ND	ND	ND	ND	ND
Bromodichloromethane (Dichlorobromomethane)	10.0	ND	ND	ND	ND	ND
Bromoform (Tribromomethane)	50.0	ND	ND	ND	ND	ND
Bromomethane (Methyl bromide)	30.0	ND	ND	ND	ND	ND
2-Butanone (MEK, Methyl ethyl ketone)	50.0	ND	ND	ND	ND	ND
n-Butylbenzene	10.0	ND	ND	ND	ND	ND
sec-Butylbenzene	10.0	ND	ND	ND	ND	ND
tert-Butylbenzene	10.0	ND	ND	ND	ND	ND
Carbon disulfide	10.0	ND	ND	ND	ND	ND
Carbon tetrachloride (Tetrachloromethane)	10.0	ND	ND	ND	ND	ND
Chlorobenzene	10.0	ND	ND	ND	ND	ND
Chloroethane	30.0	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	50.0	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	10.0	ND	ND	ND	ND	ND
Chloromethane (Methyl chloride)	30.0	ND	ND	ND	ND	ND
4-Chlorotoluene (p-Chlorotoluene)	10.0	ND	ND	ND	ND	ND
2-Chlorotoluene (o-Chlorotoluene)	10.0	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane (DBCP)	50.0	ND	ND	ND	ND	ND
Dibromochloromethane	10.0	ND	ND	ND	ND	ND
1,2-Dibromoethane (EDB, Ethylene dibromide)	10.0	ND	ND	ND	ND	ND
Dibromomethane	10.0	ND	ND	ND	ND	ND
1,2-Dichlorobenzene (o-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
1,3-Dichlorobenzene (m-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
1,4-Dichlorobenzene (p-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
Dichlorodifluoromethane	30.0	ND	ND	ND	ND	ND
1,1-Dichloroethane	10.0	ND	ND	ND	ND	ND

ANALYTICAL RESULTS

Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S2B-101615

Our Lab I.D.		**339319**	**339320**	**339321**	**339322**	**339323**
Client Sample I.D.		B-3@30'	B-3@35'	B-3@40'	B-1@5'	B-1@10'
Date Sampled		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Date Prepared		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
1,2-Dichloroethane	10.0	ND	ND	ND	ND	ND
1,1-Dichloroethene (1,1-Dichloroethylene)	10.0	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	10.0	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	10.0	ND	ND	ND	ND	ND
1,2-Dichloropropane	10.0	ND	ND	ND	ND	ND
1,3-Dichloropropane	10.0	ND	ND	ND	ND	ND
2,2-Dichloropropane	10.0	ND	ND	ND	ND	ND
1,1-Dichloropropene	10.0	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	10.0	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	10.0	ND	ND	ND	ND	ND
Ethylbenzene	2.00	ND	ND	ND	ND	ND
Hexachlorobutadiene (1,3-Hexachlorobutadiene)	30.0	ND	ND	ND	ND	ND
2-Hexanone	50.0	ND	ND	ND	ND	ND
Isopropylbenzene	10.0	ND	ND	ND	ND	ND
p-Isopropyltoluene (4-Isopropyltoluene)	10.0	ND	ND	ND	ND	ND
MTBE	5.00	ND	ND	ND	ND	ND
4-Methyl-2-pentanone (MIBK, Methyl isobutyl ketone)	50.0	ND	ND	ND	ND	ND
Methylene chloride (Dichloromethane, DCM)	50.0	ND	ND	ND	ND	ND
Naphthalene	10.0	ND	ND	ND	ND	ND
n-Propylbenzene	10.0	ND	ND	ND	ND	ND
Styrene	10.0	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	10.0	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	10.0	ND	ND	ND	ND	ND
Tetrachloroethene (Tetrachloroethylene)	10.0	ND	ND	ND	ND	ND
Toluene (Methyl benzene)	2.00	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	10.0	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	10.0	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	10.0	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	10.0	ND	ND	ND	ND	ND
Trichloroethene (TCE)	10.0	ND	ND	ND	ND	ND
Trichlorofluoromethane	10.0	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	10.0	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	10.0	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	10.0	ND	ND	ND	ND	ND
Vinyl acetate	50.0	ND	ND	ND	ND	ND

ANALYTICAL RESULTS

Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S2B-101615

Our Lab I.D.		**339319**	**339320**	**339321**	**339322**	**339323**
Client Sample I.D.		B-3@30'	B-3@35'	B-3@40'	B-1@5'	B-1@10'
Date Sampled		**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**
Date Prepared		**10/17/2015**	**10/17/2015**	**10/17/2015**	**10/17/2015**	**10/17/2015**
Preparation Method						
Date Analyzed		**10/17/2015**	**10/17/2015**	**10/17/2015**	**10/17/2015**	**10/17/2015**
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Vinyl chloride (Chloroethene)	**30.0**	**ND**	**ND**	**ND**	**ND**	**ND**
o-Xylene	**2.00**	**ND**	**ND**	**ND**	**ND**	**ND**
m- & p-Xylenes	**4.00**	**ND**	**ND**	**ND**	**ND**	**ND**

Our Lab I.D.		**339319**	**339320**	**339321**	**339322**	**339323**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Bromofluorobenzene	**70-120**	**119**	**113**	**116**	**107**	**100**
Dibromofluoromethane	**70-120**	**92**	**95**	**90**	**86**	**97**
Toluene-d8	**70-120**	**82**	**103**	**105**	**102**	**105**

QUALITY CONTROL REPORT

QC Batch No: S2B-101615

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit				
Benzene	**105**	**102**	**2.9**	**75-120**	**15**				
Chlorobenzene	**107**	**105**	**1.9**	**75-120**	**15**				
1,1-Dichloroethene (1,1-Dichloroethylene)	**96**	**88**	**8.7**	**75-120**	**15**				
MTBE	**99**	**99**	**<1**	**75-120**	**15**				
Toluene (Methyl benzene)	**97**	**92**	**5.3**	**75-120**	**15**				
Trichloroethene (TCE)	**97**	**96**	**1.0**	**75-120**	**15**				

ANALYTICAL RESULTS

Ordered By

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Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S2B-101615

Our Lab I.D.		**339324**	**339325**	**339326**	**339327**	**339328**
Client Sample I.D.		B-1@15'	B-1@20'	B-1@25'	B-1@30'	B-1@35'
Date Sampled		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Date Prepared		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Acetone	50.0	ND	ND	ND	ND	ND
Benzene	2.00	ND	ND	ND	ND	ND
Bromobenzene (Phenyl bromide)	10.0	ND	ND	ND	ND	ND
Bromochloromethane (Chlorobromomethane)	10.0	ND	ND	ND	ND	ND
Bromodichloromethane (Dichlorobromomethane)	10.0	ND	ND	ND	ND	ND
Bromoform (Tribromomethane)	50.0	ND	ND	ND	ND	ND
Bromomethane (Methyl bromide)	30.0	ND	ND	ND	ND	ND
2-Butanone (MEK, Methyl ethyl ketone)	50.0	ND	ND	ND	ND	ND
n-Butylbenzene	10.0	ND	ND	ND	ND	ND
sec-Butylbenzene	10.0	ND	ND	ND	ND	ND
tert-Butylbenzene	10.0	ND	ND	ND	ND	ND
Carbon disulfide	10.0	ND	ND	ND	ND	ND
Carbon tetrachloride (Tetrachloromethane)	10.0	ND	ND	ND	ND	ND
Chlorobenzene	10.0	ND	ND	ND	ND	ND
Chloroethane	30.0	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	50.0	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	10.0	ND	ND	ND	ND	ND
Chloromethane (Methyl chloride)	30.0	ND	ND	ND	ND	ND
4-Chlorotoluene (p-Chlorotoluene)	10.0	ND	ND	ND	ND	ND
2-Chlorotoluene (o-Chlorotoluene)	10.0	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane (DBCP)	50.0	ND	ND	ND	ND	ND
Dibromochloromethane	10.0	ND	ND	ND	ND	ND
1,2-Dibromoethane (EDB, Ethylene dibromide)	10.0	ND	ND	ND	ND	ND
Dibromomethane	10.0	ND	ND	ND	ND	ND
1,2-Dichlorobenzene (o-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
1,3-Dichlorobenzene (m-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
1,4-Dichlorobenzene (p-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
Dichlorodifluoromethane	30.0	ND	ND	ND	ND	ND
1,1-Dichloroethane	10.0	ND	ND	ND	ND	ND

ANALYTICAL RESULTS

Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S2B-101615

Our Lab I.D.		**339324**	**339325**	**339326**	**339327**	**339328**
Client Sample I.D.		B-1@15'	B-1@20'	B-1@25'	B-1@30'	B-1@35'
Date Sampled		**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**
Date Prepared		**10/17/2015**	**10/17/2015**	**10/17/2015**	**10/17/2015**	**10/17/2015**
Preparation Method						
Date Analyzed		**10/17/2015**	**10/17/2015**	**10/17/2015**	**10/17/2015**	**10/17/2015**
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
1,2-Dichloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1-Dichloroethene (1,1-Dichloroethylene)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
cis-1,2-Dichloroethene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
trans-1,2-Dichloroethene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2-Dichloropropane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,3-Dichloropropane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
2,2-Dichloropropane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1-Dichloropropene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
cis-1,3-Dichloropropene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
trans-1,3-Dichloropropene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Ethylbenzene	**2.00**	**ND**	**ND**	**ND**	**ND**	**ND**
Hexachlorobutadiene (1,3-Hexachlorobutadiene)	**30.0**	**ND**	**ND**	**ND**	**ND**	**ND**
2-Hexanone	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Isopropylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
p-Isopropyltoluene (4-Isopropyltoluene)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
MTBE	**5.00**	**ND**	**ND**	**ND**	**ND**	**ND**
4-Methyl-2-pentanone (MIBK, Methyl isobutyl ketone)	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Methylene chloride (Dichloromethane, DCM)	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Naphthalene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
n-Propylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Styrene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1,1,2-Tetrachloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1,2,2-Tetrachloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Tetrachloroethene (Tetrachloroethylene)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Toluene (Methyl benzene)	**2.00**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2,3-Trichlorobenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2,4-Trichlorobenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1,1-Trichloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1,2-Trichloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Trichloroethene (TCE)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Trichlorofluoromethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2,3-Trichloropropane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2,4-Trimethylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,3,5-Trimethylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Vinyl acetate	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**

ANALYTICAL RESULTS

Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S2B-101615

Our Lab I.D.		**339324**	**339325**	**339326**	**339327**	**339328**
Client Sample I.D.		B-1@15'	B-1@20'	B-1@25'	B-1@30'	B-1@35'
Date Sampled		**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**
Date Prepared		**10/17/2015**	**10/17/2015**	**10/17/2015**	**10/17/2015**	**10/17/2015**
Preparation Method						
Date Analyzed		**10/17/2015**	**10/17/2015**	**10/17/2015**	**10/17/2015**	**10/17/2015**
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Vinyl chloride (Chloroethene)	**30.0**	**ND**	**ND**	**ND**	**ND**	**ND**
o-Xylene	**2.00**	**ND**	**ND**	**ND**	**ND**	**ND**
m- & p-Xylenes	**4.00**	**ND**	**ND**	**ND**	**ND**	**ND**

Our Lab I.D.		**339324**	**339325**	**339326**	**339327**	**339328**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Bromofluorobenzene	**70-120**	**118**	**100**	**118**	**118**	**104**
Dibromofluoromethane	**70-120**	**103**	**94**	**91**	**88**	**93**
Toluene-d8	**70-120**	**108**	**105**	**105**	**105**	**104**

QUALITY CONTROL REPORT

QC Batch No: S2B-101615

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	**105**	**102**	**2.9**	**75-120**	**15**					
Chlorobenzene	**107**	**105**	**1.9**	**75-120**	**15**					
1,1-Dichloroethene (1,1-Dichloroethylene)	**96**	**88**	**8.7**	**75-120**	**15**					
MTBE	**99**	**99**	**<1**	**75-120**	**15**					
Toluene (Methyl benzene)	**97**	**92**	**5.3**	**75-120**	**15**					
Trichloroethene (TCE)	**97**	**96**	**1.0**	**75-120**	**15**					

ANALYTICAL RESULTS

Ordered By

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ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Project Name: UCR

Method: 8260B, Volatile Organic Compounds

QC Batch No: S2B-101615

Our Lab I.D.		**339329**	**339330**	**339331**	**339332**	**339333**
Client Sample I.D.		B-1@40'	B-8@10'	B-8@15'	B-8@20'	B-8@25'
Date Sampled		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Date Prepared		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Acetone	50.0	ND	ND	ND	ND	ND
Benzene	2.00	ND	ND	ND	ND	ND
Bromobenzene (Phenyl bromide)	10.0	ND	ND	ND	ND	ND
Bromochloromethane (Chlorobromomethane)	10.0	ND	ND	ND	ND	ND
Bromodichloromethane (Dichlorobromomethane)	10.0	ND	ND	ND	ND	ND
Bromoform (Tribromomethane)	50.0	ND	ND	ND	ND	ND
Bromomethane (Methyl bromide)	30.0	ND	ND	ND	ND	ND
2-Butanone (MEK, Methyl ethyl ketone)	50.0	ND	ND	ND	ND	ND
n-Butylbenzene	10.0	ND	ND	ND	ND	ND
sec-Butylbenzene	10.0	ND	ND	ND	ND	ND
tert-Butylbenzene	10.0	ND	ND	ND	ND	ND
Carbon disulfide	10.0	ND	ND	ND	ND	ND
Carbon tetrachloride (Tetrachloromethane)	10.0	ND	ND	ND	ND	ND
Chlorobenzene	10.0	ND	ND	ND	ND	ND
Chloroethane	30.0	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	50.0	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	10.0	ND	ND	ND	ND	ND
Chloromethane (Methyl chloride)	30.0	ND	ND	ND	ND	ND
4-Chlorotoluene (p-Chlorotoluene)	10.0	ND	ND	ND	ND	ND
2-Chlorotoluene (o-Chlorotoluene)	10.0	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane (DBCP)	50.0	ND	ND	ND	ND	ND
Dibromochloromethane	10.0	ND	ND	ND	ND	ND
1,2-Dibromoethane (EDB, Ethylene dibromide)	10.0	ND	ND	ND	ND	ND
Dibromomethane	10.0	ND	ND	ND	ND	ND
1,2-Dichlorobenzene (o-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
1,3-Dichlorobenzene (m-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
1,4-Dichlorobenzene (p-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
Dichlorodifluoromethane	30.0	ND	ND	ND	ND	ND
1,1-Dichloroethane	10.0	ND	ND	ND	ND	ND

ANALYTICAL RESULTS

Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S2B-101615

Our Lab I.D.		**339329**	**339330**	**339331**	**339332**	**339333**
Client Sample I.D.		B-1@40'	B-8@10'	B-8@15'	B-8@20'	B-8@25'
Date Sampled		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Date Prepared		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
1,2-Dichloroethane	10.0	ND	ND	ND	ND	ND
1,1-Dichloroethene (1,1-Dichloroethylene)	10.0	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	10.0	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	10.0	ND	ND	ND	ND	ND
1,2-Dichloropropane	10.0	ND	ND	ND	ND	ND
1,3-Dichloropropane	10.0	ND	ND	ND	ND	ND
2,2-Dichloropropane	10.0	ND	ND	ND	ND	ND
1,1-Dichloropropene	10.0	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	10.0	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	10.0	ND	ND	ND	ND	ND
Ethylbenzene	2.00	ND	ND	ND	ND	ND
Hexachlorobutadiene (1,3-Hexachlorobutadiene)	30.0	ND	ND	ND	ND	ND
2-Hexanone	50.0	ND	ND	ND	ND	ND
Isopropylbenzene	10.0	ND	ND	ND	ND	ND
p-Isopropyltoluene (4-Isopropyltoluene)	10.0	ND	ND	ND	ND	ND
MTBE	5.00	ND	ND	ND	ND	ND
4-Methyl-2-pentanone (MIBK, Methyl isobutyl ketone)	50.0	ND	ND	ND	ND	ND
Methylene chloride (Dichloromethane, DCM)	50.0	ND	ND	ND	ND	ND
Naphthalene	10.0	ND	ND	ND	ND	ND
n-Propylbenzene	10.0	ND	ND	ND	ND	ND
Styrene	10.0	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	10.0	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	10.0	ND	ND	ND	ND	ND
Tetrachloroethene (Tetrachloroethylene)	10.0	ND	ND	ND	ND	ND
Toluene (Methyl benzene)	2.00	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	10.0	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	10.0	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	10.0	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	10.0	ND	ND	ND	ND	ND
Trichloroethene (TCE)	10.0	ND	ND	ND	ND	ND
Trichlorofluoromethane	10.0	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	10.0	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	10.0	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	10.0	ND	ND	ND	ND	ND
Vinyl acetate	50.0	ND	ND	ND	ND	ND

ANALYTICAL RESULTS

Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S2B-101615

Our Lab I.D.		**339329**	**339330**	**339331**	**339332**	**339333**
Client Sample I.D.		B-1@40'	B-8@10'	B-8@15'	B-8@20'	B-8@25'
Date Sampled		**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**
Date Prepared		**10/17/2015**	**10/17/2015**	**10/17/2015**	**10/17/2015**	**10/17/2015**
Preparation Method						
Date Analyzed		**10/17/2015**	**10/17/2015**	**10/17/2015**	**10/17/2015**	**10/17/2015**
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Vinyl chloride (Chloroethene)	**30.0**	**ND**	**ND**	**ND**	**ND**	**ND**
o-Xylene	**2.00**	**ND**	**ND**	**ND**	**ND**	**ND**
m- & p-Xylenes	**4.00**	**ND**	**ND**	**ND**	**ND**	**ND**

Our Lab I.D.		**339329**	**339330**	**339331**	**339332**	**339333**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Bromofluorobenzene	**70-120**	**118**	**104**	**118**	**113**	**116**
Dibromofluoromethane	**70-120**	**88**	**90**	**91**	**82**	**98**
Toluene-d8	**70-120**	**104**	**104**	**105**	**105**	**105**

QUALITY CONTROL REPORT

QC Batch No: S2B-101615

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	**105**	**102**	**2.9**	**75-120**	**15**					
Chlorobenzene	**107**	**105**	**1.9**	**75-120**	**15**					
1,1-Dichloroethene (1,1-Dichloroethylene)	**96**	**88**	**8.7**	**75-120**	**15**					
MTBE	**99**	**99**	**<1**	**75-120**	**15**					
Toluene (Methyl benzene)	**97**	**92**	**5.3**	**75-120**	**15**					
Trichloroethene (TCE)	**97**	**96**	**1.0**	**75-120**	**15**					

ANALYTICAL RESULTS

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Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S2C-101615

Our Lab I.D.		**339342**	**339343**	**339344**	**339345**	**339346**
Client Sample I.D.		B-15@35'	B-15@40'	B-16@5'	B-16@10'	B-16@15'
Date Sampled		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Date Prepared		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Acetone	50.0	ND	ND	ND	ND	ND
Benzene	2.00	ND	ND	ND	ND	ND
Bromobenzene (Phenyl bromide)	10.0	ND	ND	ND	ND	ND
Bromochloromethane (Chlorobromomethane)	10.0	ND	ND	ND	ND	ND
Bromodichloromethane (Dichlorobromomethane)	10.0	ND	ND	ND	ND	ND
Bromoform (Tribromomethane)	50.0	ND	ND	ND	ND	ND
Bromomethane (Methyl bromide)	30.0	ND	ND	ND	ND	ND
2-Butanone (MEK, Methyl ethyl ketone)	50.0	ND	ND	ND	ND	ND
n-Butylbenzene	10.0	ND	ND	ND	ND	ND
sec-Butylbenzene	10.0	ND	ND	ND	ND	ND
tert-Butylbenzene	10.0	ND	ND	ND	ND	ND
Carbon disulfide	10.0	ND	ND	ND	ND	ND
Carbon tetrachloride (Tetrachloromethane)	10.0	ND	ND	ND	ND	ND
Chlorobenzene	10.0	ND	ND	ND	ND	ND
Chloroethane	30.0	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	50.0	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	10.0	ND	ND	ND	ND	ND
Chloromethane (Methyl chloride)	30.0	ND	ND	ND	ND	ND
4-Chlorotoluene (p-Chlorotoluene)	10.0	ND	ND	ND	ND	ND
2-Chlorotoluene (o-Chlorotoluene)	10.0	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane (DBCP)	50.0	ND	ND	ND	ND	ND
Dibromochloromethane	10.0	ND	ND	ND	ND	ND
1,2-Dibromoethane (EDB, Ethylene dibromide)	10.0	ND	ND	ND	ND	ND
Dibromomethane	10.0	ND	ND	ND	ND	ND
1,2-Dichlorobenzene (o-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
1,3-Dichlorobenzene (m-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
1,4-Dichlorobenzene (p-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
Dichlorodifluoromethane	30.0	ND	ND	ND	ND	ND
1,1-Dichloroethane	10.0	ND	ND	ND	ND	ND

ANALYTICAL RESULTS

Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S2C-101615

Our Lab I.D.		**339342**	**339343**	**339344**	**339345**	**339346**
Client Sample I.D.		B-15@35'	B-15@40'	B-16@5'	B-16@10'	B-16@15'
Date Sampled		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Date Prepared		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
1,2-Dichloroethane	10.0	ND	ND	ND	ND	ND
1,1-Dichloroethene (1,1-Dichloroethylene)	10.0	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	10.0	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	10.0	ND	ND	ND	ND	ND
1,2-Dichloropropane	10.0	ND	ND	ND	ND	ND
1,3-Dichloropropane	10.0	ND	ND	ND	ND	ND
2,2-Dichloropropane	10.0	ND	ND	ND	ND	ND
1,1-Dichloropropene	10.0	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	10.0	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	10.0	ND	ND	ND	ND	ND
Ethylbenzene	2.00	ND	ND	ND	ND	ND
Hexachlorobutadiene (1,3-Hexachlorobutadiene)	30.0	ND	ND	ND	ND	ND
2-Hexanone	50.0	ND	ND	ND	ND	ND
Isopropylbenzene	10.0	ND	ND	ND	ND	ND
p-Isopropyltoluene (4-Isopropyltoluene)	10.0	ND	ND	ND	ND	ND
MTBE	5.00	ND	ND	ND	ND	ND
4-Methyl-2-pentanone (MIBK, Methyl isobutyl ketone)	50.0	ND	ND	ND	ND	ND
Methylene chloride (Dichloromethane, DCM)	50.0	ND	ND	ND	ND	ND
Naphthalene	10.0	ND	ND	ND	ND	ND
n-Propylbenzene	10.0	ND	ND	ND	ND	ND
Styrene	10.0	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	10.0	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	10.0	ND	ND	ND	ND	ND
Tetrachloroethene (Tetrachloroethylene)	10.0	ND	ND	ND	ND	ND
Toluene (Methyl benzene)	2.00	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	10.0	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	10.0	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	10.0	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	10.0	ND	ND	ND	ND	ND
Trichloroethene (TCE)	10.0	ND	ND	ND	ND	ND
Trichlorofluoromethane	10.0	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	10.0	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	10.0	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	10.0	ND	ND	ND	ND	ND
Vinyl acetate	50.0	ND	ND	ND	ND	ND

ANALYTICAL RESULTS

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Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S2C-101615

Our Lab I.D.		**339342**	**339343**	**339344**	**339345**	**339346**
Client Sample I.D.		B-15@35'	B-15@40'	B-16@5'	B-16@10'	B-16@15'
Date Sampled		**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**
Date Prepared		**10/17/2015**	**10/17/2015**	**10/17/2015**	**10/17/2015**	**10/17/2015**
Preparation Method						
Date Analyzed		**10/17/2015**	**10/17/2015**	**10/17/2015**	**10/17/2015**	**10/17/2015**
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Vinyl chloride (Chloroethene)	**30.0**	**ND**	**ND**	**ND**	**ND**	**ND**
o-Xylene	**2.00**	**ND**	**ND**	**ND**	**ND**	**ND**
m- & p-Xylenes	**4.00**	**ND**	**ND**	**ND**	**ND**	**ND**

Our Lab I.D.		**339342**	**339343**	**339344**	**339345**	**339346**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Bromofluorobenzene	**70-120**	**117**	**95**	**118**	**120**	**118**
Dibromofluoromethane	**70-120**	**87**	**85**	**89**	**81**	**85**
Toluene-d8	**70-120**	**112**	**112**	**113**	**111**	**111**

QUALITY CONTROL REPORT

QC Batch No: S2C-101615

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	**93**	**88**	**5.5**	**75-120**	**15**					
Chlorobenzene	**112**	**108**	**3.6**	**75-120**	**15**					
1,1-Dichloroethene (1,1-Dichloroethylene)	**81**	**80**	**1.2**	**75-120**	**15**					
MTBE	**96**	**96**	**<1**	**75-120**	**15**					
Toluene (Methyl benzene)	**91**	**86**	**5.6**	**75-120**	**15**					
Trichloroethene (TCE)	**81**	**76**	**6.4**	**75-120**	**15**					

ANALYTICAL RESULTS

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Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S2C-101615

Our Lab I.D.		**339347**	**339348**	**339349**	**339350**	**339351**
Client Sample I.D.		B-16@20'	B-16@25'	B-16@30'	B-16@35'	B-16@40'
Date Sampled		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Date Prepared		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Acetone	50.0	ND	ND	ND	ND	ND
Benzene	2.00	ND	ND	ND	ND	ND
Bromobenzene (Phenyl bromide)	10.0	ND	ND	ND	ND	ND
Bromochloromethane (Chlorobromomethane)	10.0	ND	ND	ND	ND	ND
Bromodichloromethane (Dichlorobromomethane)	10.0	ND	ND	ND	ND	ND
Bromoform (Tribromomethane)	50.0	ND	ND	ND	ND	ND
Bromomethane (Methyl bromide)	30.0	ND	ND	ND	ND	ND
2-Butanone (MEK, Methyl ethyl ketone)	50.0	ND	ND	ND	ND	ND
n-Butylbenzene	10.0	ND	ND	ND	ND	ND
sec-Butylbenzene	10.0	ND	ND	ND	ND	ND
tert-Butylbenzene	10.0	ND	ND	ND	ND	ND
Carbon disulfide	10.0	ND	ND	ND	ND	ND
Carbon tetrachloride (Tetrachloromethane)	10.0	ND	ND	ND	ND	ND
Chlorobenzene	10.0	ND	ND	ND	ND	ND
Chloroethane	30.0	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	50.0	ND	ND	ND	ND	ND
Chloroform (Trichloromethane)	10.0	ND	ND	ND	ND	ND
Chloromethane (Methyl chloride)	30.0	ND	ND	ND	ND	ND
4-Chlorotoluene (p-Chlorotoluene)	10.0	ND	ND	ND	ND	ND
2-Chlorotoluene (o-Chlorotoluene)	10.0	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane (DBCP)	50.0	ND	ND	ND	ND	ND
Dibromochloromethane	10.0	ND	ND	ND	ND	ND
1,2-Dibromoethane (EDB, Ethylene dibromide)	10.0	ND	ND	ND	ND	ND
Dibromomethane	10.0	ND	ND	ND	ND	ND
1,2-Dichlorobenzene (o-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
1,3-Dichlorobenzene (m-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
1,4-Dichlorobenzene (p-Dichlorobenzene)	10.0	ND	ND	ND	ND	ND
Dichlorodifluoromethane	30.0	ND	ND	ND	ND	ND
1,1-Dichloroethane	10.0	ND	ND	ND	ND	ND

ANALYTICAL RESULTS

Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S2C-101615

Our Lab I.D.		**339347**	**339348**	**339349**	**339350**	**339351**
Client Sample I.D.		B-16@20'	B-16@25'	B-16@30'	B-16@35'	B-16@40'
Date Sampled		**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**	**10/14/2015**
Date Prepared		**10/17/2015**	**10/17/2015**	**10/17/2015**	**10/17/2015**	**10/17/2015**
Preparation Method						
Date Analyzed		**10/17/2015**	**10/17/2015**	**10/17/2015**	**10/17/2015**	**10/17/2015**
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
1,2-Dichloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1-Dichloroethene (1,1-Dichloroethylene)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
cis-1,2-Dichloroethene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
trans-1,2-Dichloroethene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2-Dichloropropane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,3-Dichloropropane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
2,2-Dichloropropane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1-Dichloropropene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
cis-1,3-Dichloropropene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
trans-1,3-Dichloropropene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Ethylbenzene	**2.00**	**ND**	**ND**	**ND**	**ND**	**ND**
Hexachlorobutadiene (1,3-Hexachlorobutadiene)	**30.0**	**ND**	**ND**	**ND**	**ND**	**ND**
2-Hexanone	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Isopropylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
p-Isopropyltoluene (4-Isopropyltoluene)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
MTBE	**5.00**	**ND**	**ND**	**ND**	**ND**	**ND**
4-Methyl-2-pentanone (MIBK, Methyl isobutyl ketone)	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Methylene chloride (Dichloromethane, DCM)	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Naphthalene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
n-Propylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Styrene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1,1,2-Tetrachloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1,2,2-Tetrachloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Tetrachloroethene (Tetrachloroethylene)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Toluene (Methyl benzene)	**2.00**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2,3-Trichlorobenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2,4-Trichlorobenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1,1-Trichloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,1,2-Trichloroethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Trichloroethene (TCE)	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Trichlorofluoromethane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2,3-Trichloropropane	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,2,4-Trimethylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
1,3,5-Trimethylbenzene	**10.0**	**ND**	**ND**	**ND**	**ND**	**ND**
Vinyl acetate	**50.0**	**ND**	**ND**	**ND**	**ND**	**ND**

ANALYTICAL RESULTS

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Project Name: UCR

Method: 8260B, Volatile Organic Compounds

QC Batch No: S2C-101615

Our Lab I.D.		**339347**	**339348**	**339349**	**339350**	**339351**
Client Sample I.D.		B-16@20'	B-16@25'	B-16@30'	B-16@35'	B-16@40'
Date Sampled		10/14/2015	10/14/2015	10/14/2015	10/14/2015	10/14/2015
Date Prepared		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	10/17/2015
Matrix		Soil	Soil	Soil	Soil	Soil
Units		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Dilution Factor		1	1	1	1	1
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	**Results**
Vinyl chloride (Chloroethene)	30.0	ND	ND	ND	ND	ND
o-Xylene	2.00	ND	ND	ND	ND	ND
m- & p-Xylenes	4.00	ND	ND	ND	ND	ND

Our Lab I.D.		**339347**	**339348**	**339349**	**339350**	**339351**
Surrogates	**% Rec.Limit**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**	**% Rec.**
Surrogate Percent Recovery						
Bromofluorobenzene	70-120	107	105	117	120	118
Dibromofluoromethane	70-120	90	106	88	106	93
Toluene-d8	70-120	112	115	111	115	119

QUALITY CONTROL REPORT

QC Batch No: S2C-101615

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	93	88	5.5	75-120	15					
Chlorobenzene	112	108	3.6	75-120	15					
1,1-Dichloroethene (1,1-Dichloroethylene)	81	80	1.2	75-120	15					
MTBE	96	96	<1	75-120	15					
Toluene (Methyl benzene)	91	86	5.6	75-120	15					
Trichloroethene (TCE)	81	76	6.4	75-120	15					

ANALYTICAL RESULTS

Ordered By

Amec Foster Wheeler
6001 Rickenbacker Road
Los Angeles, CA 90040-

Site

North Campus Drive and
Aberdeen Drive
Riverside, CA

Telephone: (323)889-5300
Attn: Mark Murphy

Page: **69**

Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S2C-101615

Our Lab I.D.		**339352**	**339353**	**339354**	**339355**	
Client Sample I.D.		B-17@5'	B-17@10'	B-17@15'	B-17@20'	
Date Sampled		10/14/2015	10/14/2015	10/14/2015	10/14/2015	
Date Prepared		10/17/2015	10/17/2015	10/17/2015	10/17/2015	
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	
Matrix		Soil	Soil	Soil	Soil	
Units		ug/kg	ug/kg	ug/kg	ug/kg	
Dilution Factor		1	1	1	1	
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	
Acetone	50.0	ND	ND	ND	ND	
Benzene	2.00	ND	ND	ND	ND	
Bromobenzene (Phenyl bromide)	10.0	ND	ND	ND	ND	
Bromochloromethane (Chlorobromomethane)	10.0	ND	ND	ND	ND	
Bromodichloromethane (Dichlorobromomethane)	10.0	ND	ND	ND	ND	
Bromoform (Tribromomethane)	50.0	ND	ND	ND	ND	
Bromomethane (Methyl bromide)	30.0	ND	ND	ND	ND	
2-Butanone (MEK, Methyl ethyl ketone)	50.0	ND	ND	ND	ND	
n-Butylbenzene	10.0	ND	ND	ND	ND	
sec-Butylbenzene	10.0	ND	ND	ND	ND	
tert-Butylbenzene	10.0	ND	ND	ND	ND	
Carbon disulfide	10.0	ND	ND	ND	ND	
Carbon tetrachloride (Tetrachloromethane)	10.0	ND	ND	ND	ND	
Chlorobenzene	10.0	ND	ND	ND	ND	
Chloroethane	30.0	ND	ND	ND	ND	
2-Chloroethyl vinyl ether	50.0	ND	ND	ND	ND	
Chloroform (Trichloromethane)	10.0	ND	ND	ND	ND	
Chloromethane (Methyl chloride)	30.0	ND	ND	ND	ND	
4-Chlorotoluene (p-Chlorotoluene)	10.0	ND	ND	ND	ND	
2-Chlorotoluene (o-Chlorotoluene)	10.0	ND	ND	ND	ND	
1,2-Dibromo-3-chloropropane (DBCP)	50.0	ND	ND	ND	ND	
Dibromochloromethane	10.0	ND	ND	ND	ND	
1,2-Dibromoethane (EDB, Ethylene dibromide)	10.0	ND	ND	ND	ND	
Dibromomethane	10.0	ND	ND	ND	ND	
1,2-Dichlorobenzene (o-Dichlorobenzene)	10.0	ND	ND	ND	ND	
1,3-Dichlorobenzene (m-Dichlorobenzene)	10.0	ND	ND	ND	ND	
1,4-Dichlorobenzene (p-Dichlorobenzene)	10.0	ND	ND	ND	ND	
Dichlorodifluoromethane	30.0	ND	ND	ND	ND	
1,1-Dichloroethane	10.0	ND	ND	ND	ND	

ANALYTICAL RESULTS

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Project Name: UCR

ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Method: 8260B, Volatile Organic Compounds

QC Batch No: S2C-101615

Our Lab I.D.		**339352**	**339353**	**339354**	**339355**	
Client Sample I.D.		B-17@5'	B-17@10'	B-17@15'	B-17@20'	
Date Sampled		10/14/2015	10/14/2015	10/14/2015	10/14/2015	
Date Prepared		10/17/2015	10/17/2015	10/17/2015	10/17/2015	
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	
Matrix		Soil	Soil	Soil	Soil	
Units		ug/kg	ug/kg	ug/kg	ug/kg	
Dilution Factor		1	1	1	1	
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	
1,2-Dichloroethane	10.0	ND	ND	ND	ND	
1,1-Dichloroethene (1,1-Dichloroethylene)	10.0	ND	ND	ND	ND	
cis-1,2-Dichloroethene	10.0	ND	ND	ND	ND	
trans-1,2-Dichloroethene	10.0	ND	ND	ND	ND	
1,2-Dichloropropane	10.0	ND	ND	ND	ND	
1,3-Dichloropropane	10.0	ND	ND	ND	ND	
2,2-Dichloropropane	10.0	ND	ND	ND	ND	
1,1-Dichloropropene	10.0	ND	ND	ND	ND	
cis-1,3-Dichloropropene	10.0	ND	ND	ND	ND	
trans-1,3-Dichloropropene	10.0	ND	ND	ND	ND	
Ethylbenzene	2.00	ND	ND	ND	ND	
Hexachlorobutadiene (1,3-Hexachlorobutadiene)	30.0	ND	ND	ND	ND	
2-Hexanone	50.0	ND	ND	ND	ND	
Isopropylbenzene	10.0	ND	ND	ND	ND	
p-Isopropyltoluene (4-Isopropyltoluene)	10.0	ND	ND	ND	ND	
MTBE	5.00	ND	ND	ND	ND	
4-Methyl-2-pentanone (MIBK, Methyl isobutyl ketone)	50.0	ND	ND	ND	ND	
Methylene chloride (Dichloromethane, DCM)	50.0	ND	ND	ND	ND	
Naphthalene	10.0	ND	ND	ND	ND	
n-Propylbenzene	10.0	ND	ND	ND	ND	
Styrene	10.0	ND	ND	ND	ND	
1,1,1,2-Tetrachloroethane	10.0	ND	ND	ND	ND	
1,1,2,2-Tetrachloroethane	10.0	ND	ND	ND	ND	
Tetrachloroethene (Tetrachloroethylene)	10.0	ND	ND	ND	ND	
Toluene (Methyl benzene)	2.00	ND	ND	ND	ND	
1,2,3-Trichlorobenzene	10.0	ND	ND	ND	ND	
1,2,4-Trichlorobenzene	10.0	ND	ND	ND	ND	
1,1,1-Trichloroethane	10.0	ND	ND	ND	ND	
1,1,2-Trichloroethane	10.0	ND	ND	ND	ND	
Trichloroethene (TCE)	10.0	ND	ND	ND	ND	
Trichlorofluoromethane	10.0	ND	ND	ND	ND	
1,2,3-Trichloropropane	10.0	ND	ND	ND	ND	
1,2,4-Trimethylbenzene	10.0	ND	ND	ND	ND	
1,3,5-Trimethylbenzene	10.0	ND	ND	ND	ND	
Vinyl acetate	50.0	ND	ND	ND	ND	

ANALYTICAL RESULTS

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ASL Job Number	Submitted	Client
66110	10/16/2015	AMEC

Project Name: UCR

Method: 8260B, Volatile Organic Compounds

QC Batch No: S2C-101615

Our Lab I.D.		339352	339353	339354	339355	
Client Sample I.D.		B-17@5'	B-17@10'	B-17@15'	B-17@20'	
Date Sampled		10/14/2015	10/14/2015	10/14/2015	10/14/2015	
Date Prepared		10/17/2015	10/17/2015	10/17/2015	10/17/2015	
Preparation Method						
Date Analyzed		10/17/2015	10/17/2015	10/17/2015	10/17/2015	
Matrix		Soil	Soil	Soil	Soil	
Units		ug/kg	ug/kg	ug/kg	ug/kg	
Dilution Factor		1	1	1	1	
Analytes	**PQL**	**Results**	**Results**	**Results**	**Results**	
Vinyl chloride (Chloroethene)	30.0	ND	ND	ND	ND	
o-Xylene	2.00	ND	ND	ND	ND	
m- & p-Xylenes	4.00	ND	ND	ND	ND	

Our Lab I.D.		339352	339353	339354	339355	
Surrogates	% Rec.Limit	% Rec.	% Rec.	% Rec.	% Rec.	
Surrogate Percent Recovery						
Bromofluorobenzene	70-120	118	110	117	108	
Dibromofluoromethane	70-120	80	82	85	81	
Toluene-d8	70-120	112	112	111	114	

QUALITY CONTROL REPORT

QC Batch No: S2C-101615

Analytes	MS % REC	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit					
Benzene	93	88	5.5	75-120	15					
Chlorobenzene	112	108	3.6	75-120	15					
1,1-Dichloroethene (1,1-Dichloroethylene)	81	80	1.2	75-120	15					
MTBE	96	96	<1	75-120	15					
Toluene (Methyl benzene)	91	86	5.6	75-120	15					
Trichloroethene (TCE)	81	76	6.4	75-120	15					

Appendix E

Traffic Data

HCM 2010 Signalized Intersection Summary
7: Canyon Crest Dr & Linden St

Existing AM
12/14/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↱		↰	↑	↱	↰	↑	↱
Traffic Volume (veh/h)	50	60	47	87	57	35	33	130	145	65	191	43
Future Volume (veh/h)	50	60	47	87	57	35	33	130	145	65	191	43
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1937	1863	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	62	74	58	107	70	43	41	160	179	80	236	53
Adj No. of Lanes	1	1	1	1	1	0	1	1	1	1	1	1
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	124	186	164	155	127	78	97	888	755	140	933	793
Arrive On Green	0.07	0.10	0.10	0.09	0.12	0.12	0.05	0.48	0.48	0.08	0.50	0.50
Sat Flow, veh/h	1774	1863	1647	1774	1081	664	1774	1863	1583	1774	1863	1583
Grp Volume(v), veh/h	62	74	58	107	0	113	41	160	179	80	236	53
Grp Sat Flow(s),veh/h/ln	1774	1863	1647	1774	0	1746	1774	1863	1583	1774	1863	1583
Q Serve(g_s), s	2.4	2.6	2.3	4.1	0.0	4.3	1.6	3.4	4.7	3.0	5.1	1.2
Cycle Q Clear(g_c), s	2.4	2.6	2.3	4.1	0.0	4.3	1.6	3.4	4.7	3.0	5.1	1.2
Prop In Lane	1.00		1.00	1.00		0.38	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	124	186	164	155	0	205	97	888	755	140	933	793
V/C Ratio(X)	0.50	0.40	0.35	0.69	0.00	0.55	0.42	0.18	0.24	0.57	0.25	0.07
Avail Cap(c_a), veh/h	190	492	435	203	0	474	177	888	755	177	933	793
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.4	29.5	29.4	31.0	0.0	29.2	32.0	10.5	10.8	31.1	10.0	9.0
Incr Delay (d2), s/veh	3.1	1.4	1.3	6.4	0.0	2.3	2.9	0.4	0.7	3.6	0.7	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	1.4	1.1	2.3	0.0	2.2	0.8	1.9	2.2	1.6	2.7	0.6
LnGrp Delay(d),s/veh	34.4	30.9	30.7	37.4	0.0	31.5	34.9	10.9	11.5	34.7	10.6	9.2
LnGrp LOS	C	C	C	D		C	C	B	B	C	B	A
Approach Vol, veh/h		194			220			380			369	
Approach Delay, s/veh		32.0			34.4			13.8			15.7	
Approach LOS		C			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.5	38.4	10.1	11.0	8.8	40.0	8.9	12.2
Change Period (Y+Rc), s	5.0	5.0	4.0	4.0	5.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	7.0	18.5	8.0	18.5	7.0	18.5	7.5	19.0
Max Q Clear Time (g_c+I1), s	5.0	6.7	6.1	4.6	3.6	7.1	4.4	6.3
Green Ext Time (p_c), s	0.0	2.5	0.0	1.0	0.0	2.4	0.0	1.0

Intersection Summary	
HCM 2010 Ctrl Delay	21.3
HCM 2010 LOS	C

Intersection	
Intersection Delay, s/veh	8.3
Intersection LOS	A

Movement	WBU	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Traffic Vol, veh/h	0	53	74	0	86	39	0	70	87
Future Vol, veh/h	0	53	74	0	86	39	0	70	87
Peak Hour Factor	0.92	0.94	0.94	0.92	0.94	0.94	0.92	0.94	0.94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	56	79	0	91	41	0	74	93
Number of Lanes	0	1	0	0	1	0	0	0	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	8.2	8	8.7
HCM LOS	A	A	A

Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	0%	42%	45%
Vol Thru, %	69%	0%	55%
Vol Right, %	31%	58%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	125	127	157
LT Vol	0	53	70
Through Vol	86	0	87
RT Vol	39	74	0
Lane Flow Rate	133	135	167
Geometry Grp	1	1	1
Degree of Util (X)	0.157	0.163	0.207
Departure Headway (Hd)	4.238	4.339	4.47
Convergence, Y/N	Yes	Yes	Yes
Cap	848	828	805
Service Time	2.254	2.355	2.487
HCM Lane V/C Ratio	0.157	0.163	0.207
HCM Control Delay	8	8.2	8.7
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.6	0.6	0.8

HCM 2010 Signalized Intersection Summary Existing Mid-Day
7: Canyon Crest Dr & Linden St 12/14/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑↱		↰	↑	↱	↰	↑	↱
Traffic Volume (veh/h)	29	56	48	129	89	56	42	158	116	66	156	18
Future Volume (veh/h)	29	56	48	129	89	56	42	158	116	66	156	18
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1937	1863	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	32	61	52	140	97	61	46	172	126	72	170	20
Adj No. of Lanes	1	1	1	1	1	0	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	82	186	164	176	163	103	105	873	742	134	903	768
Arrive On Green	0.05	0.10	0.10	0.10	0.15	0.15	0.06	0.47	0.47	0.08	0.48	0.48
Sat Flow, veh/h	1774	1863	1647	1774	1071	673	1774	1863	1583	1774	1863	1583
Grp Volume(v), veh/h	32	61	52	140	0	158	46	172	126	72	170	20
Grp Sat Flow(s),veh/h/ln	1774	1863	1647	1774	0	1744	1774	1863	1583	1774	1863	1583
Q Serve(g_s), s	1.2	2.1	2.1	5.4	0.0	5.9	1.8	3.8	3.2	2.7	3.6	0.5
Cycle Q Clear(g_c), s	1.2	2.1	2.1	5.4	0.0	5.9	1.8	3.8	3.2	2.7	3.6	0.5
Prop In Lane	1.00		1.00	1.00		0.39	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	82	186	164	176	0	266	105	873	742	134	903	768
V/C Ratio(X)	0.39	0.33	0.32	0.80	0.00	0.59	0.44	0.20	0.17	0.54	0.19	0.03
Avail Cap(c_a), veh/h	190	492	435	203	0	473	177	873	742	177	903	768
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.4	29.3	29.3	30.8	0.0	27.6	31.8	10.9	10.7	31.2	10.2	9.4
Incr Delay (d2), s/veh	3.0	1.0	1.1	17.3	0.0	2.1	2.9	0.5	0.5	3.3	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	1.2	1.0	3.5	0.0	3.0	0.9	2.0	1.5	1.5	2.0	0.2
LnGrp Delay(d),s/veh	35.4	30.3	30.4	48.2	0.0	29.8	34.7	11.4	11.2	34.5	10.7	9.5
LnGrp LOS	D	C	C	D		C	C	B	B	C	B	A
Approach Vol, veh/h		145			298			344			262	
Approach Delay, s/veh		31.5			38.4			14.4			17.1	
Approach LOS		C			D			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.3	37.8	10.9	11.0	9.1	38.9	7.2	14.7
Change Period (Y+Rc), s	5.0	5.0	4.0	4.0	5.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	7.0	18.5	8.0	18.5	7.0	18.5	7.5	19.0
Max Q Clear Time (g_c+I1), s	4.7	5.8	7.4	4.1	3.8	5.6	3.2	7.9
Green Ext Time (p_c), s	0.0	2.0	0.0	1.2	0.0	2.0	0.0	1.1

Intersection Summary	
HCM 2010 Ctrl Delay	24.3
HCM 2010 LOS	C

Intersection	
Intersection Delay, s/veh	8.6
Intersection LOS	A

Movement	WBU	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Traffic Vol, veh/h	0	59	59	0	75	48	0	81	70
Future Vol, veh/h	0	59	59	0	75	48	0	81	70
Peak Hour Factor	0.92	0.81	0.81	0.92	0.81	0.81	0.92	0.81	0.81
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	73	73	0	93	59	0	100	86
Number of Lanes	0	1	0	0	1	0	0	0	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	8.5	8.2	9
HCM LOS	A	A	A

Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	0%	50%	54%
Vol Thru, %	61%	0%	46%
Vol Right, %	39%	50%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	123	118	151
LT Vol	0	59	81
Through Vol	75	0	70
RT Vol	48	59	0
Lane Flow Rate	152	146	186
Geometry Grp	1	1	1
Degree of Util (X)	0.179	0.182	0.235
Departure Headway (Hd)	4.25	4.491	4.542
Convergence, Y/N	Yes	Yes	Yes
Cap	844	800	792
Service Time	2.272	2.513	2.564
HCM Lane V/C Ratio	0.18	0.182	0.235
HCM Control Delay	8.2	8.5	9
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.6	0.7	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑↱		↰	↑	↱	↰	↑	↱
Traffic Volume (veh/h)	34	97	83	177	135	92	63	229	156	97	282	22
Future Volume (veh/h)	34	97	83	177	135	92	63	229	156	97	282	22
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1937	1863	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	39	111	95	203	155	106	72	263	179	111	324	25
Adj No. of Lanes	1	1	1	1	1	0	1	1	1	1	1	1
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	94	246	217	203	199	136	134	761	646	157	785	667
Arrive On Green	0.05	0.13	0.13	0.11	0.19	0.19	0.08	0.41	0.41	0.09	0.42	0.42
Sat Flow, veh/h	1774	1863	1647	1774	1032	706	1774	1863	1583	1774	1863	1583
Grp Volume(v), veh/h	39	111	95	203	0	261	72	263	179	111	324	25
Grp Sat Flow(s),veh/h/ln	1774	1863	1647	1774	0	1738	1774	1863	1583	1774	1863	1583
Q Serve(g_s), s	1.5	3.9	3.7	8.0	0.0	10.0	2.7	6.8	5.3	4.3	8.5	0.6
Cycle Q Clear(g_c), s	1.5	3.9	3.7	8.0	0.0	10.0	2.7	6.8	5.3	4.3	8.5	0.6
Prop In Lane	1.00		1.00	1.00		0.41	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	94	246	217	203	0	335	134	761	646	157	785	667
V/C Ratio(X)	0.41	0.45	0.44	1.00	0.00	0.78	0.54	0.35	0.28	0.71	0.41	0.04
Avail Cap(c_a), veh/h	190	492	435	203	0	472	177	761	646	177	785	667
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.1	28.1	28.0	31.0	0.0	26.8	31.2	14.3	13.8	31.0	14.2	11.9
Incr Delay (d2), s/veh	2.9	1.3	1.4	63.5	0.0	5.4	3.3	1.2	1.1	10.6	1.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	2.1	1.8	7.5	0.0	5.3	1.5	3.8	2.5	2.6	4.7	0.3
LnGrp Delay(d),s/veh	35.0	29.4	29.4	94.5	0.0	32.2	34.5	15.5	14.9	41.6	15.8	12.0
LnGrp LOS	C	C	C	F		C	C	B	B	D	B	B
Approach Vol, veh/h		245			464			514			460	
Approach Delay, s/veh		30.3			59.5			18.0			21.8	
Approach LOS		C			E			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.2	33.6	12.0	13.2	10.3	34.5	7.7	17.5
Change Period (Y+Rc), s	5.0	5.0	4.0	4.0	5.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	7.0	18.5	8.0	18.5	7.0	18.5	7.5	19.0
Max Q Clear Time (g_c+I1), s	6.3	8.8	10.0	5.9	4.7	10.5	3.5	12.0
Green Ext Time (p_c), s	0.0	3.0	0.0	2.2	0.0	2.7	0.0	1.5

Intersection Summary	
HCM 2010 Ctrl Delay	32.2
HCM 2010 LOS	C

Intersection	
Intersection Delay, s/veh	9.7
Intersection LOS	A

Movement	WBU	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Traffic Vol, veh/h	0	66	151	0	66	83	0	125	65
Future Vol, veh/h	0	66	151	0	66	83	0	125	65
Peak Hour Factor	0.92	0.83	0.83	0.92	0.83	0.83	0.92	0.83	0.83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	80	182	0	80	100	0	151	78
Number of Lanes	0	1	0	0	1	0	0	0	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	9.8	8.9	10.1
HCM LOS	A	A	B

Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	0%	30%	66%
Vol Thru, %	44%	0%	34%
Vol Right, %	56%	70%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	149	217	190
LT Vol	0	66	125
Through Vol	66	0	65
RT Vol	83	151	0
Lane Flow Rate	180	261	229
Geometry Grp	1	1	1
Degree of Util (X)	0.224	0.329	0.31
Departure Headway (Hd)	4.495	4.526	4.883
Convergence, Y/N	Yes	Yes	Yes
Cap	795	792	733
Service Time	2.547	2.57	2.934
HCM Lane V/C Ratio	0.226	0.33	0.312
HCM Control Delay	8.9	9.8	10.1
HCM Lane LOS	A	A	B
HCM 95th-tile Q	0.9	1.4	1.3

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↱		↰	↑	↱	↰	↑	↱
Traffic Volume (veh/h)	54	64	50	93	61	38	36	138	154	69	203	46
Future Volume (veh/h)	54	64	50	93	61	38	36	138	154	69	203	46
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1937	1863	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	67	79	62	115	75	47	44	170	190	85	251	57
Adj No. of Lanes	1	1	1	1	1	0	1	1	1	1	1	1
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	129	186	164	158	125	78	102	881	749	143	924	786
Arrive On Green	0.07	0.10	0.10	0.09	0.12	0.12	0.06	0.47	0.47	0.08	0.50	0.50
Sat Flow, veh/h	1774	1863	1647	1774	1072	672	1774	1863	1583	1774	1863	1583
Grp Volume(v), veh/h	67	79	62	115	0	122	44	170	190	85	251	57
Grp Sat Flow(s),veh/h/ln	1774	1863	1647	1774	0	1744	1774	1863	1583	1774	1863	1583
Q Serve(g_s), s	2.5	2.8	2.5	4.4	0.0	4.7	1.7	3.7	5.0	3.2	5.5	1.3
Cycle Q Clear(g_c), s	2.5	2.8	2.5	4.4	0.0	4.7	1.7	3.7	5.0	3.2	5.5	1.3
Prop In Lane	1.00		1.00	1.00		0.39	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	129	186	164	158	0	203	102	881	749	143	924	786
V/C Ratio(X)	0.52	0.42	0.38	0.73	0.00	0.60	0.43	0.19	0.25	0.59	0.27	0.07
Avail Cap(c_a), veh/h	190	492	435	203	0	473	177	881	749	177	924	786
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.3	29.6	29.5	31.0	0.0	29.4	31.9	10.7	11.1	31.1	10.3	9.2
Incr Delay (d2), s/veh	3.2	1.5	1.4	9.0	0.0	2.8	2.9	0.5	0.8	3.9	0.7	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	1.5	1.2	2.6	0.0	2.4	0.9	2.0	2.3	1.7	3.0	0.6
LnGrp Delay(d),s/veh	34.5	31.2	30.9	40.0	0.0	32.2	34.7	11.2	11.9	34.9	11.0	9.4
LnGrp LOS	C	C	C	D		C	C	B	B	C	B	A
Approach Vol, veh/h		208			237			404			393	
Approach Delay, s/veh		32.1			36.0			14.1			15.9	
Approach LOS		C			D			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.7	38.1	10.3	11.0	9.0	39.7	9.1	12.1
Change Period (Y+Rc), s	5.0	5.0	4.0	4.0	5.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	7.0	18.5	8.0	18.5	7.0	18.5	7.5	19.0
Max Q Clear Time (g_c+I1), s	5.2	7.0	6.4	4.8	3.7	7.5	4.5	6.7
Green Ext Time (p_c), s	0.0	2.6	0.0	1.1	0.0	2.5	0.0	1.1

Intersection Summary	
HCM 2010 Ctrl Delay	21.9
HCM 2010 LOS	C

16: Campus Dr & Big Springs Rd

Intersection	
Intersection Delay, s/veh	8.5
Intersection LOS	A

Movement	WBU	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Traffic Vol, veh/h	0	57	79	0	92	42	0	75	93
Future Vol, veh/h	0	57	79	0	92	42	0	75	93
Peak Hour Factor	0.92	0.94	0.94	0.92	0.94	0.94	0.92	0.94	0.94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	61	84	0	98	45	0	80	99
Number of Lanes	0	1	0	0	1	0	0	0	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	8.3	8.2	8.8
HCM LOS	A	A	A

Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	0%	42%	45%
Vol Thru, %	69%	0%	55%
Vol Right, %	31%	58%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	134	136	168
LT Vol	0	57	75
Through Vol	92	0	93
RT Vol	42	79	0
Lane Flow Rate	143	145	179
Geometry Grp	1	1	1
Degree of Util (X)	0.169	0.176	0.224
Departure Headway (Hd)	4.276	4.39	4.506
Convergence, Y/N	Yes	Yes	Yes
Cap	840	819	799
Service Time	2.295	2.41	2.524
HCM Lane V/C Ratio	0.17	0.177	0.224
HCM Control Delay	8.2	8.3	8.8
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.6	0.6	0.9

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑↱		↰	↑	↱	↰	↑	↱
Traffic Volume (veh/h)	31	60	51	137	95	60	45	168	123	71	166	20
Future Volume (veh/h)	31	60	51	137	95	60	45	168	123	71	166	20
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1937	1863	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	34	65	55	149	103	65	49	183	134	77	180	22
Adj No. of Lanes	1	1	1	1	1	0	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	86	186	164	186	167	105	109	858	729	138	888	755
Arrive On Green	0.05	0.10	0.10	0.10	0.16	0.16	0.06	0.46	0.46	0.08	0.48	0.48
Sat Flow, veh/h	1774	1863	1647	1774	1069	675	1774	1863	1583	1774	1863	1583
Grp Volume(v), veh/h	34	65	55	149	0	168	49	183	134	77	180	22
Grp Sat Flow(s),veh/h/ln	1774	1863	1647	1774	0	1744	1774	1863	1583	1774	1863	1583
Q Serve(g_s), s	1.3	2.3	2.2	5.7	0.0	6.3	1.9	4.1	3.5	2.9	3.9	0.5
Cycle Q Clear(g_c), s	1.3	2.3	2.2	5.7	0.0	6.3	1.9	4.1	3.5	2.9	3.9	0.5
Prop In Lane	1.00		1.00	1.00		0.39	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	86	186	164	186	0	272	109	858	729	138	888	755
V/C Ratio(X)	0.40	0.35	0.33	0.80	0.00	0.62	0.45	0.21	0.18	0.56	0.20	0.03
Avail Cap(c_a), veh/h	190	492	435	203	0	473	177	858	729	177	888	755
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.3	29.4	29.3	30.6	0.0	27.6	31.7	11.3	11.1	31.1	10.6	9.7
Incr Delay (d2), s/veh	2.9	1.1	1.2	18.9	0.0	2.3	2.9	0.6	0.6	3.5	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	1.2	1.0	3.8	0.0	3.2	1.0	2.2	1.6	1.6	2.1	0.2
LnGrp Delay(d),s/veh	35.3	30.5	30.5	49.6	0.0	29.9	34.6	11.9	11.7	34.6	11.1	9.8
LnGrp LOS	D	C	C	D		C	C	B	B	C	B	A
Approach Vol, veh/h		154			317			366			279	
Approach Delay, s/veh		31.6			39.1			14.8			17.5	
Approach LOS		C			D			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.4	37.3	11.3	11.0	9.3	38.4	7.4	14.9
Change Period (Y+Rc), s	5.0	5.0	4.0	4.0	5.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	7.0	18.5	8.0	18.5	7.0	18.5	7.5	19.0
Max Q Clear Time (g_c+I1), s	4.9	6.1	7.7	4.3	3.9	5.9	3.3	8.3
Green Ext Time (p_c), s	0.0	2.1	0.0	1.3	0.0	2.1	0.0	1.1

Intersection Summary	
HCM 2010 Ctrl Delay	24.7
HCM 2010 LOS	C

16: Campus Dr & Big Springs Rd

Intersection	
Intersection Delay, s/veh	8.8
Intersection LOS	A

Movement	WBU	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Traffic Vol, veh/h	0	63	63	0	80	51	0	86	75
Future Vol, veh/h	0	63	63	0	80	51	0	86	75
Peak Hour Factor	0.92	0.81	0.81	0.92	0.81	0.81	0.92	0.81	0.81
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	78	78	0	99	63	0	106	93
Number of Lanes	0	1	0	0	1	0	0	0	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	8.7	8.3	9.2
HCM LOS	A	A	A

Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	0%	50%	53%
Vol Thru, %	61%	0%	47%
Vol Right, %	39%	50%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	131	126	161
LT Vol	0	63	86
Through Vol	80	0	75
RT Vol	51	63	0
Lane Flow Rate	162	156	199
Geometry Grp	1	1	1
Degree of Util (X)	0.193	0.196	0.253
Departure Headway (Hd)	4.294	4.542	4.581
Convergence, Y/N	Yes	Yes	Yes
Cap	836	790	785
Service Time	2.317	2.571	2.605
HCM Lane V/C Ratio	0.194	0.197	0.254
HCM Control Delay	8.3	8.7	9.2
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.7	0.7	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑↱		↰	↑	↱	↰	↑	↱
Traffic Volume (veh/h)	37	103	89	188	144	98	67	244	166	103	300	24
Future Volume (veh/h)	37	103	89	188	144	98	67	244	166	103	300	24
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1937	1863	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	43	118	102	216	166	113	77	280	191	118	345	28
Adj No. of Lanes	1	1	1	1	1	0	1	1	1	1	1	1
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	101	270	239	203	210	143	138	733	623	160	756	642
Arrive On Green	0.06	0.15	0.15	0.11	0.20	0.20	0.08	0.39	0.39	0.09	0.41	0.41
Sat Flow, veh/h	1774	1863	1647	1774	1034	704	1774	1863	1583	1774	1863	1583
Grp Volume(v), veh/h	43	118	102	216	0	279	77	280	191	118	345	28
Grp Sat Flow(s),veh/h/ln	1774	1863	1647	1774	0	1738	1774	1863	1583	1774	1863	1583
Q Serve(g_s), s	1.6	4.0	4.0	8.0	0.0	10.7	2.9	7.5	5.8	4.5	9.5	0.7
Cycle Q Clear(g_c), s	1.6	4.0	4.0	8.0	0.0	10.7	2.9	7.5	5.8	4.5	9.5	0.7
Prop In Lane	1.00		1.00	1.00		0.41	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	101	270	239	203	0	353	138	733	623	160	756	642
V/C Ratio(X)	0.43	0.44	0.43	1.07	0.00	0.79	0.56	0.38	0.31	0.74	0.46	0.04
Avail Cap(c_a), veh/h	190	492	435	203	0	472	177	733	623	177	756	642
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.9	27.3	27.3	31.0	0.0	26.5	31.1	15.2	14.6	31.1	15.2	12.6
Incr Delay (d2), s/veh	2.9	1.1	1.2	81.6	0.0	6.5	3.5	1.5	1.3	13.6	2.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	2.1	1.9	8.5	0.0	5.8	1.6	4.1	2.7	2.8	5.2	0.3
LnGrp Delay(d),s/veh	34.8	28.4	28.5	112.6	0.0	33.0	34.6	16.7	15.9	44.7	17.2	12.7
LnGrp LOS	C	C	C	F		C	C	B	B	D	B	B
Approach Vol, veh/h		263			495			548			491	
Approach Delay, s/veh		29.5			67.7			18.9			23.5	
Approach LOS		C			E			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.3	32.5	12.0	14.2	10.4	33.4	8.0	18.2
Change Period (Y+Rc), s	5.0	5.0	4.0	4.0	5.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	7.0	18.5	8.0	18.5	7.0	18.5	7.5	19.0
Max Q Clear Time (g_c+I1), s	6.5	9.5	10.0	6.0	4.9	11.5	3.6	12.7
Green Ext Time (p_c), s	0.0	3.1	0.0	2.3	0.0	2.6	0.0	1.5

Intersection Summary	
HCM 2010 Ctrl Delay	35.2
HCM 2010 LOS	D

Intersection	
Intersection Delay, s/veh	10
Intersection LOS	A

Movement	WBU	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Traffic Vol, veh/h	0	71	161	0	71	89	0	133	69
Future Vol, veh/h	0	71	161	0	71	89	0	133	69
Peak Hour Factor	0.92	0.83	0.83	0.92	0.83	0.83	0.92	0.83	0.83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	86	194	0	86	107	0	160	83
Number of Lanes	0	1	0	0	1	0	0	0	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	10.2	9.1	10.5
HCM LOS	B	A	B

Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	0%	31%	66%
Vol Thru, %	44%	0%	34%
Vol Right, %	56%	69%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	160	232	202
LT Vol	0	71	133
Through Vol	71	0	69
RT Vol	89	161	0
Lane Flow Rate	193	280	243
Geometry Grp	1	1	1
Degree of Util (X)	0.245	0.357	0.335
Departure Headway (Hd)	4.567	4.598	4.95
Convergence, Y/N	Yes	Yes	Yes
Cap	781	777	723
Service Time	2.631	2.653	3.013
HCM Lane V/C Ratio	0.247	0.36	0.336
HCM Control Delay	9.1	10.2	10.5
HCM Lane LOS	A	B	B
HCM 95th-tile Q	1	1.6	1.5

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑↱		↰	↑	↱	↰	↑	↱
Traffic Volume (veh/h)	54	64	62	99	61	38	39	138	156	69	203	46
Future Volume (veh/h)	54	64	62	99	61	38	39	138	156	69	203	46
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1937	1863	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	67	79	77	122	75	47	48	170	193	85	251	57
Adj No. of Lanes	1	1	1	1	1	0	1	1	1	1	1	1
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	129	186	164	161	126	79	108	878	746	143	916	778
Arrive On Green	0.07	0.10	0.10	0.09	0.12	0.12	0.06	0.47	0.47	0.08	0.49	0.49
Sat Flow, veh/h	1774	1863	1647	1774	1072	672	1774	1863	1583	1774	1863	1583
Grp Volume(v), veh/h	67	79	77	122	0	122	48	170	193	85	251	57
Grp Sat Flow(s),veh/h/ln	1774	1863	1647	1774	0	1744	1774	1863	1583	1774	1863	1583
Q Serve(g_s), s	2.5	2.8	3.1	4.7	0.0	4.6	1.8	3.7	5.1	3.2	5.5	1.3
Cycle Q Clear(g_c), s	2.5	2.8	3.1	4.7	0.0	4.6	1.8	3.7	5.1	3.2	5.5	1.3
Prop In Lane	1.00		1.00	1.00		0.39	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	129	186	164	161	0	205	108	878	746	143	916	778
V/C Ratio(X)	0.52	0.42	0.47	0.76	0.00	0.59	0.45	0.19	0.26	0.59	0.27	0.07
Avail Cap(c_a), veh/h	190	492	435	203	0	473	177	878	746	177	916	778
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.3	29.6	29.7	31.1	0.0	29.3	31.7	10.8	11.1	31.1	10.5	9.4
Incr Delay (d2), s/veh	3.2	1.5	2.1	11.9	0.0	2.7	2.9	0.5	0.8	3.9	0.7	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	1.5	1.5	2.8	0.0	2.4	1.0	2.0	2.4	1.7	3.0	0.6
LnGrp Delay(d),s/veh	34.5	31.1	31.8	43.0	0.0	32.0	34.6	11.3	12.0	34.9	11.2	9.6
LnGrp LOS	C	C	C	D		C	C	B	B	C	B	A
Approach Vol, veh/h		223			244			411			393	
Approach Delay, s/veh		32.4			37.5			14.3			16.1	
Approach LOS		C			D			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.7	38.0	10.3	11.0	9.2	39.4	9.1	12.2
Change Period (Y+Rc), s	5.0	5.0	4.0	4.0	5.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	7.0	18.5	8.0	18.5	7.0	18.5	7.5	19.0
Max Q Clear Time (g_c+I1), s	5.2	7.1	6.7	5.1	3.8	7.5	4.5	6.6
Green Ext Time (p_c), s	0.0	2.6	0.0	1.2	0.0	2.5	0.0	1.1

Intersection Summary	
HCM 2010 Ctrl Delay	22.5
HCM 2010 LOS	C

Intersection	
Intersection Delay, s/veh	9
Intersection LOS	A

Movement	WBU	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Traffic Vol, veh/h	0	59	93	0	92	48	0	125	93
Future Vol, veh/h	0	59	93	0	92	48	0	125	93
Peak Hour Factor	0.92	0.94	0.94	0.92	0.94	0.94	0.92	0.94	0.94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	63	99	0	98	51	0	133	99
Number of Lanes	0	1	0	0	1	0	0	0	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	8.7	8.4	9.5
HCM LOS	A	A	A

Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	0%	39%	57%
Vol Thru, %	66%	0%	43%
Vol Right, %	34%	61%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	140	152	218
LT Vol	0	59	125
Through Vol	92	0	93
RT Vol	48	93	0
Lane Flow Rate	149	162	232
Geometry Grp	1	1	1
Degree of Util (X)	0.181	0.203	0.295
Departure Headway (Hd)	4.368	4.509	4.587
Convergence, Y/N	Yes	Yes	Yes
Cap	821	796	784
Service Time	2.399	2.536	2.616
HCM Lane V/C Ratio	0.181	0.204	0.296
HCM Control Delay	8.4	8.7	9.5
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.7	0.8	1.2

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑↱		↰	↑	↱	↰	↑	↱
Traffic Volume (veh/h)	31	60	57	140	95	60	51	168	126	71	166	20
Future Volume (veh/h)	31	60	57	140	95	60	51	168	126	71	166	20
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1937	1863	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	34	65	62	152	103	65	55	183	137	77	180	22
Adj No. of Lanes	1	1	1	1	1	0	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	86	186	164	189	169	107	117	855	727	138	877	745
Arrive On Green	0.05	0.10	0.10	0.11	0.16	0.16	0.07	0.46	0.46	0.08	0.47	0.47
Sat Flow, veh/h	1774	1863	1647	1774	1069	675	1774	1863	1583	1774	1863	1583
Grp Volume(v), veh/h	34	65	62	152	0	168	55	183	137	77	180	22
Grp Sat Flow(s),veh/h/ln	1774	1863	1647	1774	0	1744	1774	1863	1583	1774	1863	1583
Q Serve(g_s), s	1.3	2.3	2.5	5.9	0.0	6.3	2.1	4.1	3.6	2.9	4.0	0.5
Cycle Q Clear(g_c), s	1.3	2.3	2.5	5.9	0.0	6.3	2.1	4.1	3.6	2.9	4.0	0.5
Prop In Lane	1.00		1.00	1.00		0.39	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	86	186	164	189	0	275	117	855	727	138	877	745
V/C Ratio(X)	0.40	0.35	0.38	0.80	0.00	0.61	0.47	0.21	0.19	0.56	0.21	0.03
Avail Cap(c_a), veh/h	190	492	435	203	0	473	177	855	727	177	877	745
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.3	29.4	29.5	30.6	0.0	27.5	31.5	11.4	11.2	31.1	10.8	9.9
Incr Delay (d2), s/veh	2.9	1.1	1.4	19.5	0.0	2.2	2.9	0.6	0.6	3.5	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	1.2	1.2	3.9	0.0	3.2	1.1	2.2	1.7	1.6	2.1	0.2
LnGrp Delay(d),s/veh	35.3	30.5	30.9	50.0	0.0	29.6	34.5	11.9	11.8	34.6	11.4	10.0
LnGrp LOS	D	C	C	D		C	C	B	B	C	B	B
Approach Vol, veh/h		161			320			375			279	
Approach Delay, s/veh		31.7			39.3			15.2			17.7	
Approach LOS		C			D			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.4	37.1	11.5	11.0	9.6	38.0	7.4	15.1
Change Period (Y+Rc), s	5.0	5.0	4.0	4.0	5.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	7.0	18.5	8.0	18.5	7.0	18.5	7.5	19.0
Max Q Clear Time (g_c+I1), s	4.9	6.1	7.9	4.5	4.1	6.0	3.3	8.3
Green Ext Time (p_c), s	0.0	2.1	0.0	1.3	0.0	2.1	0.0	1.1

Intersection Summary	
HCM 2010 Ctrl Delay	24.9
HCM 2010 LOS	C

Intersection	
Intersection Delay, s/veh	9.2
Intersection LOS	A

Movement	WBU	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Traffic Vol, veh/h	0	66	88	0	80	54	0	111	75
Future Vol, veh/h	0	66	88	0	80	54	0	111	75
Peak Hour Factor	0.92	0.81	0.81	0.92	0.81	0.81	0.92	0.81	0.81
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	81	109	0	99	67	0	137	93
Number of Lanes	0	1	0	0	1	0	0	0	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	9.1	8.6	9.7
HCM LOS	A	A	A

Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	0%	43%	60%
Vol Thru, %	60%	0%	40%
Vol Right, %	40%	57%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	134	154	186
LT Vol	0	66	111
Through Vol	80	0	75
RT Vol	54	88	0
Lane Flow Rate	165	190	230
Geometry Grp	1	1	1
Degree of Util (X)	0.203	0.242	0.299
Departure Headway (Hd)	4.41	4.577	4.685
Convergence, Y/N	Yes	Yes	Yes
Cap	812	783	767
Service Time	2.448	2.614	2.722
HCM Lane V/C Ratio	0.203	0.243	0.3
HCM Control Delay	8.6	9.1	9.7
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.8	0.9	1.3

HCM 2010 Signalized Intersection Summary

2019 PM with Projects

7: Canyon Crest Dr & Linden St

12/7/2015

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↱		↰	↑	↱	↰	↑	↱
Traffic Volume (veh/h)	37	103	96	191	144	98	79	244	172	103	300	24
Future Volume (veh/h)	37	103	96	191	144	98	79	244	172	103	300	24
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1937	1863	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	43	118	110	220	166	113	91	280	198	118	345	28
Adj No. of Lanes	1	1	1	1	1	0	1	1	1	1	1	1
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	101	271	239	203	210	143	147	732	623	160	745	634
Arrive On Green	0.06	0.15	0.15	0.11	0.20	0.20	0.08	0.39	0.39	0.09	0.40	0.40
Sat Flow, veh/h	1774	1863	1647	1774	1034	704	1774	1863	1583	1774	1863	1583
Grp Volume(v), veh/h	43	118	110	220	0	279	91	280	198	118	345	28
Grp Sat Flow(s),veh/h/ln	1774	1863	1647	1774	0	1738	1774	1863	1583	1774	1863	1583
Q Serve(g_s), s	1.6	4.0	4.3	8.0	0.0	10.7	3.5	7.5	6.1	4.5	9.5	0.8
Cycle Q Clear(g_c), s	1.6	4.0	4.3	8.0	0.0	10.7	3.5	7.5	6.1	4.5	9.5	0.8
Prop In Lane	1.00		1.00	1.00		0.41	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	101	271	239	203	0	353	147	732	623	160	745	634
V/C Ratio(X)	0.43	0.44	0.46	1.09	0.00	0.79	0.62	0.38	0.32	0.74	0.46	0.04
Avail Cap(c_a), veh/h	190	492	435	203	0	472	177	732	623	177	745	634
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.9	27.3	27.4	31.0	0.0	26.5	31.0	15.2	14.7	31.1	15.5	12.8
Incr Delay (d2), s/veh	2.9	1.1	1.4	87.7	0.0	6.5	4.6	1.5	1.3	13.6	2.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	2.1	2.0	8.8	0.0	5.7	1.9	4.1	2.8	2.8	5.3	0.3
LnGrp Delay(d),s/veh	34.8	28.4	28.8	118.7	0.0	32.9	35.6	16.7	16.1	44.7	17.5	13.0
LnGrp LOS	C	C	C	F		C	D	B	B	D	B	B
Approach Vol, veh/h		271			499			569			491	
Approach Delay, s/veh		29.6			70.8			19.5			23.8	
Approach LOS		C			E			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.3	32.5	12.0	14.2	10.8	33.0	8.0	18.2
Change Period (Y+Rc), s	5.0	5.0	4.0	4.0	5.0	5.0	4.0	4.0
Max Green Setting (Gmax), s	7.0	18.5	8.0	18.5	7.0	18.5	7.5	19.0
Max Q Clear Time (g_c+I1), s	6.5	9.5	10.0	6.3	5.5	11.5	3.6	12.7
Green Ext Time (p_c), s	0.0	3.1	0.0	2.3	0.0	2.6	0.0	1.6

Intersection Summary	
HCM 2010 Ctrl Delay	36.1
HCM 2010 LOS	D

Intersection	
Intersection Delay, s/veh	11.2
Intersection LOS	B

Movement	WBU	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Traffic Vol, veh/h	0	77	212	0	71	92	0	162	69
Future Vol, veh/h	0	77	212	0	71	92	0	162	69
Peak Hour Factor	0.92	0.83	0.83	0.92	0.83	0.83	0.92	0.83	0.83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	93	255	0	86	111	0	195	83
Number of Lanes	0	1	0	0	1	0	0	0	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	11.6	9.6	11.7
HCM LOS	B	A	B

Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	0%	27%	70%
Vol Thru, %	44%	0%	30%
Vol Right, %	56%	73%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	163	289	231
LT Vol	0	77	162
Through Vol	71	0	69
RT Vol	92	212	0
Lane Flow Rate	196	348	278
Geometry Grp	1	1	1
Degree of Util (X)	0.262	0.453	0.398
Departure Headway (Hd)	4.799	4.687	5.149
Convergence, Y/N	Yes	Yes	Yes
Cap	738	763	690
Service Time	2.893	2.761	3.238
HCM Lane V/C Ratio	0.266	0.456	0.403
HCM Control Delay	9.6	11.6	11.7
HCM Lane LOS	A	B	B
HCM 95th-tile Q	1	2.4	1.9