Appendix A:

Comment Letters on the Draft EIR

STATE OF CALIFORNIA

GOVERNOR'S OFFICE *of* PLANNING AND RESEARCH

STATE CLEARINGHOUSE AND PLANNING UNIT

ARNOLD SCHWARZENEGGER
GOVERNOR

CYNTHIA BRYANT
DIRECTOR

June 8, 2010

Randal Lawson
Santa Monica Community College District
1900 Pico Boulevard
Santa Monica, CA 90405

Subject: Santa Monica College Facilities Master Plan 2010 Update
SCH#: 2009091093

Dear Randal Lawson:

The State Clearinghouse submitted the above named Draft EIR to selected state agencies for review. The review period closed on June 7, 2010, 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
Acting Director, State Clearinghouse

Document Details Report
State Clearinghouse Data Base

SCH#	**2009091093**
Project Title	Santa Monica College Facilities Master Plan 2010 Update
Lead Agency	Santa Monica Community College District

Type **EIR** Draft EIR

Description The proposed project will involve renovation, new construction and demolition of facilities on the 41.5-acre SMC Main Campus at 1900 Pico Boulevard, the 3.5-acre Academy of Entertainment and Technology (AET) Campus at 1660 Stewart Street, the 2.4-acre Olympic Shuttle lot at the northeast corner of Stewart Street and Exposition Boulevard, and the 4.5 acre SMC Performing Arts Campus located at 1310 11th Street. All properties are located in the City of Santa Monica. No facility changes are proposed at Emeritus College, the Airport Arts Campus nor the Administration Building. No amendments are proposed to the Bundy Campus Master Plan.

Lead Agency Contact

Name Randal Lawson
Agency Santa Monica Community College District
Phone (310) 434-4000 ***Fax***
email
Address 1900 Pico Boulevard
City Santa Monica ***State*** CA ***Zip*** 90405

Project Location

County Los Angeles
City Santa Monica
Region
Lat / Long 34° 1' 8.1" N / 118° 28' 13.8" W
Cross Streets Pico Boulevard and 16th Street
Parcel No. 4247001900
Township 2S ***Range*** 15W ***Section*** 8 ***Base***

Proximity to:

Highways 10, 405
Airports Santa Monica
Railways
Waterways No
Schools Various SMMUSD
Land Use Educational Facility (Community College Campus)

Project Issues Aesthetic/Visual; Air Quality; Archaeologic-Historic; Biological Resources; Cumulative Effects; Flood Plain/Flooding; Geologic/Seismic; Landuse; Noise; Other Issues; Public Services; Sewer Capacity; Soil Erosion/Compaction/Grading; Solid Waste; Toxic/Hazardous; Traffic/Circulation; Water Quality; Water Supply

Reviewing Agencies Resources Agency; Department of Conservation; Department of Fish and Game, Region 5; Office of Historic Preservation; Department of Parks and Recreation; Department of Water Resources; Resources, Recycling and Recovery; Caltrans, District 7; Regional Water Quality Control Board, Region 4; Department of Toxic Substances Control; Native American Heritage Commission

Date Received 04/22/2010 ***Start of Review*** 04/22/2010 ***End of Review*** 06/07/2010

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

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4182
(909) 396-2000 • www.aqmd.gov

E-mailed: June 4, 2010
lawson_randal@smc.edu

June 4, 2010

Mr. Randal Lawson
Executive Vice-President
Santa Monica College
Santa Monica, CA 90405

Review of the Draft Environmental Impact Report (Draft EIR) for the Santa Monica College Facilities Master Plan 2010 Update

The South Coast Air Quality Management District (AQMD) appreciates the opportunity to comment on the above-mentioned document. The following comments are intended to provide guidance to the lead agency and should be incorporated into the revised Draft or Final Environmental Impact Report (Draft or Final EIR) as appropriate.

AQMD staff is concerned that the lead agency failed to quantify localized air quality impacts from oxides of nitrogen (NOx) and particulate matter (PM10 and PM2.5) emissions during project construction and operation. Without quantifying localized air quality impacts from these pollutants the lead agency is unable to support its conclusion for localized air quality impacts. Therefore, AQMD staff requests that the lead agency quantify potentially significant localized construction and operational air quality impacts from NOX, PM10 and PM2.5 emissions and revise the CEQA document as appropriate. Further, AQMD staff recommends that in the event that the revised CEQA document demonstrates new significant adverse air quality impacts the lead agency require mitigation pursuant to CEQA Guidelines §15370, which could minimize or eliminate potential air quality impacts. Staff is available to work with the lead agency to address these issues and any other questions that may arise.

Pursuant to Public Resources Code Section 21092.5, please provide the AQMD with written responses to all comments contained herein prior to the adoption of the Final EIR. Further, staff is available to work with the lead agency to address these issues and any other questions that may arise. Please contact Dan Garcia, Air Quality Specialist CEQA Section, at (909) 396-3304, if you have any questions regarding the enclosed comments.

Sincerely,

Ian MacMillan
Program Supervisor, CEQA Inter-Governmental Review
Planning, Rule Development & Area Sources

Attachment

IM:DG

LAC100422-02
Control Number

AIR QUALITY ANALYSIS

Localized Significance Threshold

1. In addition to analyzing regional air quality impacts the AQMD staff recommends calculating localized air quality impacts and comparing the results to localized significance thresholds (LSTs). A localized analysis provides information on potential impacts to surrounding neighborhoods that a regional analysis may not reveal. While the lead agency analyzed the project's localized Carbon Monoxide (CO) impacts, potential localized air quality impacts from NOx, PM10 and PM2.5 were not evaluated. A CO analysis alone is insufficient for evaluating localized air quality impacts, therefore, the AQMD staff requests that the lead agency quantify localized impacts by either using the LSTs developed by the AQMD or performing dispersion modeling as necessary. Guidance for performing a localized air quality analysis can be found at: http://www.aqmd.gov/ceqa/handbook/LST/LST.htm.

AIR QUALITY MITIGATION

Regional and Localized Mitigation Measures

2. In the event that the lead agency's Revised Draft EIR or Final EIR demonstrates that any criteria pollutant emissions from the localized construction emissions analysis requested in comment #1 create significant adverse impacts, AQMD staff recommends that the lead agency require mitigation pursuant to CEQA Guidelines §15370, which could minimize or eliminate significant adverse air quality impacts. To assist the lead agency with identifying possible mitigation measures for the project, please refer to Chapter 11 of the AQMD CEQA Air Quality Handbook for sample air quality mitigation measures. A list of mitigation measures can be found on the AQMD's CEQA webpage at the following internet address: www.aqmd.gov/ceqa/handbook/mitigation/MM_intro.htm

   Additionally, AQMD's Rule 403 – Fugitive Dust, and the Implementation Handbook contain numerous measures for controlling construction-related emissions that should be considered for use as CEQA mitigation if not otherwise required.

President
Zina Josephs
Vice-President
Lorraine Sanchez
Treasurer
John Reynolds
Secretary
Charles R. Donaldson

FRIENDS OF SUNSET PARK

www.friendsofsunsetpark.org • friendsofsp@yahoo.com • P.O.Box 5823, Santa Monica, CA 90409-5823 • (310) 358-7117

June 3, 2010

To: Mr. Randal Lawson
Executive Vice President
Santa Monica College
1900 Pico Boulevard
Santa Monica, CA 90405

From: Board of Directors
Friends of Sunset Park
P.O. Box 5823
Santa Monica, CA 90405

RE: Comments regarding the adequacy and completeness of the SMC Facilities Master Plan (2010 Update) Draft EIR (due by 5 PM on June 4, 2010) – Comments to be included in the EIR

1. **Access to the Draft EIR documents:**

   a. **Notice of availability of the Draft EIR**

   SMC's public notice in the Santa Monica Daily Press, dated 04/22/10, was illegible due to the extremely small font size and use of gray ink on gray background. The subsequent Daily Press notices, including 5/25/10, were published very close to the June 4 comment deadline and, while more legible, were also misleading as the replacement of Corsair Stadium was not listed.

   b. **Availability of Draft EIR documents**

   Having hard copies of the documents available only at the Administration Building, and only during business hours Monday through Friday, does not make them available for residents who work 9-to-5 jobs.

   Only one hard copy was made available to the local neighborhood organization, Friends of Sunset Park. We don't know if hard copies were made available to:

   i. the Pico Neighborhood Association,
   ii. John Adams Middle School,
   iii. the pre-school on the John Adams campus,

iv. Will Rogers Elementary School (between 14th and 16th Streets),
v. the pre-school adjacent to the church on the SW corner of Pearl and 16th, or
vi. the WISE and Healthy Aging adult daycare center on Pico just west of 16th St.

When a resident living near the college requested a hard copy, it took 2 weeks for the college to provide that. With $590 million in bond money at its disposal from the last three ballot measures (Measure U in 2002, Measure S in 2004, and Measure AA in 2008), we don't understand the college's inability to provide these documents in a timely manner.

c. Protected status of online DEIR files

The documents posted online at www.smc.edu/facilities_masterplan contain up to 48 megabytes, more than many people can download on their home computers. Due to the "protected" pdf status of the online document, "copy and paste" commands are disabled. In order to quote language from the document, one has to try to print out and then re-type the sections under discussion.

Conclusion: The result is that many residents living near the SMC campuses and parents of children attending schools nearby have not have adequate access to the information needed in order to comment on the Draft EIR. The public process is thwarted when this happens.

This is especially galling since these same residents are providing the funds for the proposed construction projects in the plan.

2. Adequate information not included in the DEIR:

The DEIR is incomplete, as it does not address, for example, the impact demolishing and rebuilding the 3-story cement Corsair Stadium will have on schools and homes around the Main Campus.

The following issues will have to be explained in the EIR:

The EIR will have to list guarantees to assure neighbors, and parents of school children from any of the schools surrounding this location, that SMC is prepared to deal with lawsuits ensuing from health problems resulting from concrete dust created by the demolition and rebuilding of the stadium.

The EIR also will have to list guarantees to homeowners/neighbors that SMC will repair structural and other potential damage created by the replacement of the stadium.

Page II-21, paragraph 1) states that the concrete stadium structure is showing some deterioration of the concrete and does not meet current seismic standards. We do not dispute that. We are requesting, however, that the Corsair Stadium be repaired properly and retrofitted. Building handicap access can be incorporated in this process. Relocating the ESL buildings will provide space for this adjustment.

The EIR will have to show, in detail, the option and the results of repairing and retro-fitting of the stadium, with inclusion of handicap access.

Page II-21, paragraph 2) states: To provide for a central plant. A central heating and cooling system for the Main Campus would provide cost savings and energy savings.

We do not dispute this. However, the exact location of this proposed central plant is not included.

Page IV, K-1, Main Campus, paragraph 4) The omission of Will Rogers Elementary School, the Preschool on 17th St. just south of Pearl, the Preschool adjacent to the church on the SW corner of Pearl and 16th Street, and Mount Olive Preschool on 14th St. is unacceptable. Children at these schools, in addition to John Adams Middle School, will be negatively affected by concrete dust and noise. Depending on weather conditions, even Grant Elementary School, as well as the neighborhoods south and east of the college, will be affected. So will Pico Neighborhood residents.

The EIR will have to explain in details, the process of Asbestos testing and removal, as well as concrete dust containment, during the planned demolition and rebuilding.

Santa Monica College Career & Educational Facilities Master Plan 2010 Update

Draft, 4.0 Project Criteria, page 45, 4.6.2 Health/P.E./Fitness/Dance Central Plan, paragraph 3) states: Some facilities of the Central Plant are built underground and may be located in the Corsair Field area.

The Central Plant is not discussed in the following Program and Performance sections.

The EIR will have to state, very clearly, where this Central Plant will be built.

What else is the college planning to build under the Corsair Field, without proper notification to the public?

The EIR will have to state, in detail, any other plans the college has for the Corsair Field.

Does the college, for example, have undisclosed plans for developing a new performance venue at Corsair Field? Is the vision to have it become another Universal Amphitheatre, a new Greek Theatre, a mini-Hollywood Bowl, right across the street from homes? During a recent "Celebrate America!" event, the amplified "music" from the stadium could be heard all the way down to Dewey St., next to Penmar Golf Course.

Sunset Park does not aspire to become a "college town," nor does it aspire to become the Entertainment Capitol of the World.

Conclusion Regarding Corsair Stadium: We request that the college choose the **No Project Alternative for the Corsair Stadium**. Repairing properly, retrofitting and adding handicap access is a practical and far less expensive solution than demolishing and rebuilding. The stadium has been used repeatedly and has apparently been functioning safely since the 1994 earthquake, so we don't understand the need to replace, rather than repair.

3. **Transportation/Traffic/Parking:**

   a. **Page IV.J-55 – Traffic Analysis** – 29 intersections "are determined to have significant traffic impacts due to the Project" including Lincoln at Pico and Ocean Park Blvd., 18th at Pico and Ocean Park Blvd., 20th at Olympic and Pearl, 21st and 22nd at Ocean Park Blvd., 23rd at Pico, Pearl, and Ocean Park Blvd., Cloverfield at the I-10 and Pearl, Stewart at Exposition, etc.

      The EIR will have to state mitigations for those traffic impacts.

   b. **Page IV.J-61 – Street Segment Impacts** – The proposed update is expected to create siginificant impacts at 13 studied street segments, including 14th St., Pearl St., 20th St., 23rd St., Colorado Avenue, Stewart St., and Yale St.

      The EIR will have to state mitigations for those street segment impacts.

   c. **Page IV.J-62 – Bus transportation** – This section suggests that the solution to an overabundance of bus routes on residential streets near the Main Campus (Crosstown, Sunset Ride, SMC Commuter, Bundy Evening Shuttle, and the Intercampus Shuttle) is to have the *Crosstown route stop at Pico*, rather than continuing south to Ocean Park Blvd.

      The Crosstown is the one bus route that serves residents, so to shorten its route so that it no longer connects with the #8 bus line on Ocean Park Blvd. solves nothing. The solution is to re-route the college-serving bus routes off of residential streets and onto arterials.

      The EIR will have to state solutions other than shortening the Crosstown route.

   d. **Cycling issues:** The document lacks an analysis of the current conditions for bicycle traffic near the various campuses. No baseline bicycle traffic counts are included, although the U.S. Department of Transportation requires traffic counts for "active transportation trips." (www.dot.gov/affairs/2010/bicycle-ped.html)

      The study does not seem to address the current lack of a safe bicycle route from 17th St. and Pico onto the Main Campus, or a safe route across the campus from 17th and Pico to 17th and Pearl.

      The EIR will have to provide the missing information and include options for improving bicycle access to the various campuses, as well as a safe bike route across the Main Campus.

4. Inaccurate information on college enrollment.

The documents state the SMC enrollment at 30,000. According to the California Community College Chancellor's Office, enrollment in Fall 2009 was 32,327, including 2,103 students from out-of-state, and 2,954 students from foreign countries.

The EIR will have to include accurate enrollment information.

5. Providing facilities for an ever-growing SMC enrollment

At its July 7, 2009 meeting, the SMC Board of Trustees budgeted $681,700 for advertising in 2009-2010 for student recruitment (KPWR 105.9 FM Radio, KROQ 106.7 FM Radio, *LA Weekly* newspaper, *Santa Monica Daily Press*, *La Opinion* newspaper, *Los Angeles Sentinel*, *Korean Directory*, SurfSantaMonica.com, Big Blue Bus, Facebook, Google, and Fluid Design).

The current document does not show how all the planned projects will be funded.

The EIR will have to state the number of future facilities bond measures, and the amount to be included in each, that the college plans to put on the ballot for Santa Monica and Malibu residents to pay for all of the facilities included in the Master Plan Update.

Santa Monica Spoke

Comments SMC Master Plan (2010 Update) Draft EIR

Randal Lawson
lawson_randal@smc.edu
Santa Monica College

Santa Monica Spoke is a local bicycle advocacy group. We are pleased to submit the following comments on the project above. SMC currently has 3500 parking spaces. The plan under review will add approx 1400 parking spaces.

Lacking expertise on bicycle issues: Both the DEIR and the Appendix F have very little to say about bicycles. It appears that the authors of the study have never cycled to or through the campus locations, have never attempted to park their bikes there, and study suffers from this lack of familiarity with bicycle traffic. This is disappointing, unprofessional, and we hope that future reports are produced with the collaboration of experts who can substantially assess the situation of bicycle traffic, furnish data baselines, address specific bicycle challenges and point to necessary improvements as traffic mitigation measures for the impacts of the project. The list of bike facilities in the vicinity of the campus is the most disappointing piece of bicycle traffic analysis we have seen in a long time. The reference to bicycle parking is just as disappointing, because it does not take into account the quality of these structures. Indeed, the report displays **a pervasive inability to evaluate and comment on bicycle infrastructure in any substantial sense**. The study recommends installation of bicycle parking, and in the framework of the outlined TDM program the usual language about bicycles is in evidence. However, none of these reference are specific to the site, and no attempt has been made to analyze the conditions of bicycle traffic in the vicinity of the SMC sites. Section 4.9.2 and 4.14.2 of the Master Plan 2010 Update are superficial and unsatisfactory.

Bicycle Counts: The study provides extensive surveys of car traffic, but **fails to provide bicycle traffic counts**. This constitutes an inadequate analysis of the existing condition. Such counts are useful as baseline figures and should be part of the DEIR. At one point (p 112) the study states that bicycle counts were not required. The legal basis for the exclusion of bicycle counts is not apparent, and the exclusion contradicts the recent policy guidance issued by the US DOT which specifically demands traffic counts for active transportation trips. www.dot.gov/affairs/2010/bicycle-ped.html. Additional analysis to provide data, and surveys to identify issues active transportation users confront on their trip to campus locations are necessary.

The study is silent about current **shortcomings for bicycle access to campus locations**: For example, riding your bicycle from 17th Street across Pico into campus is not at all trivial and a striking example for the low standard of bicycle implementation at this location. This location is an essential bicycle gateway waiting to happen, obstructed by a multiplicity of conflicting routes for car parking, lacking multimodal accommodation at a crucial location. Based on the current study, there is no indication that this poor level of bicycle infrastructure will see any improvements. The inadequate treatment of bicycle access to SMC campus sites has been justified with language about "lead agency" in the report. Of course the college is not free to build bike infrastructure on public roads (lead agency), but at the same time the Facilities Masterplan Update, especially its traffic chapter, would be an appropriate place to present a detailed bicycle traffic analysis, and suggestions for improvements. The DEIR fails to do so. In addition, substandard bicycle access points to the main campus (eg Pico & 17th Street) can not be justified with reference to local authorities.

Failure to discuss issues pertaining to bicycle access to campus is paired with a lack of recognition of issues of **permeability of campus sites for active transportation users**. The study does not address the manner in which the main campus is a significant barrier for cross-town bicycle traffic and does not offer mitigation for this impact. There are no routes for cyclists who want to ride through the campus in either direction. This barrier function created through the design of the site for bicycle through traffic has impacts for ongoing and future Safe Routes to School programs at the adjacent Schools (John Adams Middle School and Will Rogers Elementary). There are opportunities for institutional collaboration which are not covered in the DEIR. The recent project at SAMOHI, which envisions a bike lane through the school campus, is an example for the vision to accommodate bicycle traffic through a campus site which the DEIR at hand does not present.

Coordinate with the City: On page 102 of the Traffic Study the DEIR recommends that SMC coordinate with the city to expand the bike route network (J-21). This is certainly a laudable recommendation. It is also a very naïve recommendation, of general application, but unaware of the specific bicycle issues at localized SMC sites. Unaware also of the historical failure of the campus to engage in precisely such a process. We know that SMC Associated Students have entered into an agreement with a local community bicycle workshop (Bikerowave) which gives SMC students free access to workshop time. We are also aware that a bicycle shaped bike rack has been installed on campus, and we appreciate the positive symbolic gesture this striking design presents. But we are not aware of substantial initiatives to benefit cyclists originating from the college administration. With reference to www01.smgov.net/cityclerk/council/agendas/2009/20091110/s2009111001-C-2.pdf we can note that the college has not taken an interest in the process which has culminated in the vacation of Ivy Avenue in the immediate vicinity of the main campus. Ivy Avenue would have offered a potential bicycle access route to the main campus through the idyllic surroundings of the cemetery. It connects with Pico through a decorative gate which is currently closed. The DEIR does not outline the tools which would endow the college with the vision, the expertise, and the willingness to "coordinate with the city" and intervene on behalf of cyclists when a potential bicycle route in the immediate vicinity is vacated. How then are we to imagine that SMC will improve its ability to act in the interest of those who cycle by coordinating with the city? In view of past in-action, the laudable recommendation for SMC and the City to work together for the benefit of cyclists must be revisited in order to become implementable. The DEIR should therefore spell out the demand to establish the position of **a full time bicycle coordinator** for the campus. The DEIR should also set a **commitment and timeline for the completion of a Bicycle Master Plan** for the campus. In addition to Employee Transportation Coordinator, the bicycle coordinator will oversee the creation of the Bicycle Master Plan and can offer many benefits for active transportation users and help to increase their number and facilitate their commute. Furthermore, **bicycle counts and**

setting mode share targets for bicycle traffic should be listed among the mitigation measures for traffic impacts, and should be included in the Performance Monitoring section (J-3)

The Exposition Line is one of the most significant developments in the area of the college, and it is referenced in the Study (J 8), but not with reference to intermodal opportunities this line presents (associated bike path, opportunities for a short term bike rental to cover the distance between campus and station, etc). A similar potential exists at 26th Street and Olympic Ave.

Pearl Street: The study correctly identifies Pearl Street as a Bike Lane. It is not aware of local plans to upgrade this to a bicycle priority street (Bicycle Boulevard). On street car parking configuration on Pearl is less then optimal for either bicycle facility and creates significant safety hazards. For increased safety in the area, back-in angled parking, instead of the pull-in kind, would be an ideal solution (www.pspe.org/delco/nawn.pdf). It is much safer for bicyclists — and motorists have an easier time driving out and seeing bicyclists and other moving vehicles. It also keeps headlights from shining into buildings at night. This solution has been successfully implemented in more than 70 cities, including Ventura CA, Washington DC. Seattle has more than 200 blocks of back-in angled parking. The street is excessively wide here, and other options should be explored.

Terminology: On page 394 (pdf) = Page VI3 of the DEIR we find a paragraph (unable to copy) which speaks about bicycling as "alternative transportation." This terminology is found throughout the document. It devalues some of the good ideas expressed in this paragraph. Cyclists generally prefer to their mode as "active transportation" because it is more descriptive of the behavior of cyclists, who do not recognize their mode of transportation as an "alternative"

Protected Status of DEIR files: We would like to request that the DEIR and related documents produced for public access and made available to the public in a robust and suitable manner. The document under discussion is "protected." As a consequence, even simple copy and paste commands are disabled. It also obstructs the production of partial pdf files to overcome the significant challenges of file size. Such "protection" does not serve the public and limits the ability of the public to refer to such documents in a consistent manner, forces the public, when it wants to quote language from the document, to re-type large sections. Such restrictions do not promote the process of public input, and make discussion of the issues at hand difficult.

Dr Michael Cahn, with thanks to Barbara Filet and Alison Kendall

JUN 03 2010

1418 Grant Street
Santa Monica, CA 90405

Mr. Randal Lawson
Executive Vice-President
Santa Monica College
1900 Pico Boulevard
Santa Monica, CA 90405

June 1, 2010

RE: Career & Educational Facilities Master Plan (2010 Update)
Draft Environmental Impact Report – Comments to be included in the EIR

Dear Mr. Lawson,

Following are our comments / questions to be addressed in the EIR, regarding the proposed replacement of the Corsair Stadium.

SMC's public notice in the Santa Monica Daily Press, dated 05/25/10, is not only too little, too late, but also misleading. The replacement of the stadium is not listed, and publishing only 10 days before the comment deadline does not provide enough time for residents to get familiar with the extensive DEIR, and voice their concerns.
We do expect more consideration from a neighbor, especially after we, Santa Monica and Malibu voters, have provided the funds for these proposed plans.

The DEIR is incomplete, besides showing studies and comparisons, it does not address the impact this enormous undertaking of demolishing and rebuilding of the stadium will have on schools and homes, in every direction, within several blocks of this location.

The following issues will have to be explained in the EIR:

The EIR will have to list guarantees to assure neighbors, and parents of school children from any of the schools surrounding this location, that SMC is prepared to deal with lawsuits ensuing from health problems resulting from concrete dust created by the demolition and rebuilding of the stadium.
The EIR also will have to list guarantees to homeowners/neighbors that SMC will repair structural and other potential damage created by the replacement of the stadium.

<u>Page II-21, par 1)</u> states that the concrete stadium structure is showing some deterioration of the concrete and does not meet current seismic standards. We do not dispute that. We are requesting, however, that the Corsair Stadium be repaired properly and retrofitted. Building Handicap access can be incorporated in this process. Relocating the ESL buildings will provide space for this adjustment.
The EIR will have to show, in details, the option, and results, of repairing and retrofitting of the stadium, with inclusion of Handicap access.

<u>Page II-21, par 2)</u> states: To Provide for a central plant. A central heating and cooling system for the Main Campus would provide cost savings and energy savings;

We do not dispute this. However, you have not listed in your DEIR where, exactly, this central plant will be located.

Page IV, K-1, Main Campus, par 4) The omission of Will Rogers Elementary School, as well as the Preschool on 17th Street, and the Preschool adjacent to the Church on the SW corner of Pearl and 17th Street, as well as Mount Olive Preschool, is unacceptable. Children at these schools, in addition to John Adams Middle School, will be negatively affected by concrete dust and noise. Depending on weather conditions, even Grant Elementary School, as well as the neighborhoods E and S of the college, will be affected. So will Pico Neighborhood residents.
The EIR will have to explain in details, the process of Asbestos testing and removal, as well as concrete dust containment during the planned demolition and rebuilding.

Santa Monica College Career & Educational Facilities Master Plan 2010 Update Draft, 4.0 Project Criteria, page 45, 4.6.2 Health/P.E./Fitness/Dance Central Plant, par 3) states: Some facilities of the Central Plant are built underground and may be located in the Corsair Field area. The Central Plant is not discussed in the following Program and Performance sections.
The EIR will have to state, very clearly, where this Central Plant will be built.

What else are you planning to build under the Corsair Field, without proper notification to the public?
The EIR will have to state, in details, any other plans you have for the Corsair Field.

We, and many of our neighbors, request that you choose the No Project Alternative for the Corsair Stadium. Repairing properly, retrofitting and adding Handicap Access can be done and will be less expensive.
You simply cannot justify your proposed replacement of the stadium, especially considering the current economic situation resulting in State cutbacks for Educational Institutions.

We look forward to work with you to achieve the necessary modernization and growth, without damage to health and safety of the surrounding neighborhoods.

Sincerely,

[signature]
1418 Grant St
Santa Monica Ca
90405

JUN 03 2010

Mr. Randal Lawson
Executive Vice-President
Santa Monica College
1900 Pico Boulevard
Santa Monica, CA 90405

June 1, 2010

RE: Career & Educational Facilities Master Plan (2010 Update)
Draft Environmental Impact Report – Comments to be included in the EIR

Dear Mr. Lawson,

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We look forward to work with you to achieve the necessary modernization and growth, without damage to health and safety of the surrounding neighborhoods.

Sincerely,

Betty A. Barker
1417 Grant St.
Santa Monica, CA 90405

JUN 03 2010

Mr. Randal Lawson
Executive Vice-President
Santa Monica College
1900 Pico Boulevard
Santa Monica, CA 90405

June 1, 2010

RE: Career & Educational Facilities Master Plan (2010 Update)
Draft Environmental Impact Report – Comments to be included in the EIR

Dear Mr. Lawson,

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Sincerely,

Jennifer L Johnson
1424 Bay ST
Santa Monica
90405

JUN 03 2010

Mr. Randal Lawson
Executive Vice-President
Santa Monica College
1900 Pico Boulevard
Santa Monica, CA 90405

June 1, 2010

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Sincerely,

Carla and Kurt Rundla
1339 Pacific St.
Santa Monica, CA
90405

Subject: <no subject>
Date: Friday, June 4, 2010 2:36 PM
From: Jamie Yarow <jamie@earthjam.net>
To: LAWSON_RANDAL <lawson_randal@smc.edu>

Mr. Randal Lawson
Executive Vice-President
Santa Monica College
1900 Pico Boulevard
Santa Monica, CA 90405
June 1, 2010

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Sincerely,

Jamie Yarow
1128 Pacific Street
Santa Monica, Ca. 90405
www.Fununderthesun.com

JUN 03 2010

Mr. Randal Lawson
Executive Vice-President
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1900 Pico Boulevard
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Mary Ellen Young

Sincerely,

1418 Grant St.

Santa Monica, Ca 90405

JUN 03 2010

Mr. Randal Lawson
Executive Vice-President
Santa Monica College
1900 Pico Boulevard
Santa Monica, CA 90405

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Sincerely,

Heinz Ziegler
Regula W. Ziegler

Heinz and Regula Ziegler
1516 Grant Street, Santa Monica, CA 90405

Subject: SMC
Date: Friday, June 4, 2010 2:35 PM
From: lakazajo@aol.com
To: LAWSON_RANDAL <lawson_randal@smc.edu>
Cc: <ZinaJosephs@aol.com>

Dear SMC,

I've lived at the corner of 16th & Hill since 1986, and just wanted you to know that we love SMC!

Seems like our local neighborhood association, (FOSP) while reasonably sane about most things, is kind of nuts when it comes to the college. As you probably know, they came out against the last bond measure, and have a long list of complaints about the plans for building, a couple of which have merit, (they think the college should repair and rebuild the stadium rather than tear it down and build a new one, a reasonable idea, and complain about the Big Blue busses on 20th st, which are too big and noisy for the street) but many of their complaints are simply bizarre.

A regular part of their complaining always includes the fact that many SMC students come from elsewhere, including quite a lot from all over the world. I've never understood why this is a bad thing. (It's a good thing, a very, very good thing!) These students come and go right past our house, and we always love to watch them coming and going.

The college has brought so much to the city and to the neighborhood. My wife and I recently joined the SMC Concert Chorate, my wife has sung in the SMC Emeritus College Lyric Chorus for many years, and she took a music class on campus, which she loved. I've used the library from time to time, we just saw a terrific production of Damn Yankees on campus, a neighbor plays with the SMC orchestra, The new Broad Center has brought world-class music to our city, and facilities like the track and swimming pool are available to the general public.

At a time when the cost of college is soaring, SMC makes it affordable to many who would otherwise not be able to afford it. It strikes me that while they are not lacking in high spirits, most of your students have a seriousness of purpose not always matched by students at way more expensive colleges and universities.

You could maybe do a better job listening patiently to the various concerns of FOSP, but please know that many residents, and I hope other members of FOSP besides myself, are supportive of the college.

Larry Arnstein
1601 Hill St.
Santa Monica, CA 90405

From: "Charchut, Tom" <tcharchut@hbblaw.com>
Date: Fri, 4 Jun 2010 11:47:32 -0700
To: LAWSON_RANDAL <lawson_randal@smc.edu>
Cc: Laurie Charchut <laurie.charchut@legacyefx.com>
Subject: Santa Monica College Draft EIR

Dear Mr. Lawson,

I would begin by echoing on a personal level the detailed and thoughtful comments on the College's EIR submitted by the FOSP Board. Based on my limited personal experience, I have generally been amazed at the insensitivity of the College to the inconveniences (to put it mildly) caused to its neighbors by the ambitious building projects at the College. Increased traffic and congestion are their consistent byproducts, whatever their perceived benefit to the College. The question may properly be asked -- whose interests does the College serve? Based on the College's conduct over the years, the interest served certainly is not that of the citizens of Santa Monica -- rather it is the interest of the College in becoming a mega institution to serve the universe at Santa Monica' s expense.

The limited availability of this EIR is just another example of the College's insensitivity to its neighbors. How can there be fair comment when getting access to the relevant materials is so difficult and inconvenient? And, even if one were miraculously successful in getting a copy, it appears that the EIR is incomplete and lacking in many significant details. Seeking fair comment requires that the College be fair in providing sufficient access to a full and complete presentation of the issues under consideration. Anything less amounts to mere lip service and is completely unfair to Santa Monica residents. This EIR should be sent back for substantial revision and, when ready, opportunity for comment must include fair and reasonable access.

Thank you for taking the time to read these comments and I sincerely hope they will be given reasonable consideration.

Tom Charchut
2010 Navy Street
Santa Monica, CA 90405

Thomas N. Charchut
Certified Specialist, Appellate Law
State Bar of California Board of Legal Specialization

Haight, Brown & Bonesteel, LLP
6080 Center Drive, Ste 800
Los Angeles, CA 90045
charchut@hbblaw.com
310-215-7730 DD
1-877-350-0313 Fax 310-702-9416 cell

Subject: SMC construction
Date: Friday, June 4, 2010 1:43 PM
From: C Dickinson <texart68@verizon.net>

Dear Mr. Lawson,
We have been living here two blocks from SMC since 1982.
As you may imaging what we all have to endure with the dust, traffic and noise from SMC years after years.
Now we have learned that the college is going to expand during one of the worse economic turmoil, and why?
And if necessary, why not building away from the residential neighborhood? What would be the environmental impact for a bigger scale of SMC on this small residential neighborhood?

I like to post some more important questions.

1) how much does this cost and how could SMC stick to the budget?
2) how are the heavy traffic get to the site, the Blue Bus, the students' cars, and the construction trucks?
   Note: Pearl Street and the neighboring streets are not designed nor built to be sustain heavy traffic.
3) how many more students are to fill the school and what impact of more traffic, and more noise to our neighborhood?
4) how high are the buildings and how would that change the look of our neighborhood?
5) how is the grand scheme going to improve our present quality of life?
6) how long does it take to complete the work?

I hope the college will consider us as neighbors and when every student and member of the faculty leaves at the end of their day we still live here.

Sincerely,
C Dickinson

From: Dubois [mailto:dubois207@gmail.com]
Sent: Thursday, June 03, 2010 12:02 AM
To: LAWSON_RANDAL
Subject: RE: EIR for Cosair Stadium

Mr. Randal Lawson

Executive Vice-President

Santa Monica College

1900 Pico Boulevard

Santa Monica, CA 90405

I would like to request that you choose the No Project Alternative for the Corsair Stadium.

Repairing and properly retrofitting can be done and will be less expensive.

Considering the current economic conditions, as well as the neighborhood impact, try another solution.

Homeowner (Sunset Part)

James F. Dubois

1502 Grant St.

Santa Monica, CA, 90049

From: Tdelias@aol.com [mailto:Tdelias@aol.com]
Sent: Friday, June 04, 2010 2:16 PM
To: LAWSON_RANDAL
Subject: need for Corsair Field rebuild?

Dear Mr. Lawson -- Is there a substantial reason for rebuilding the stands at Corsair Field, when they are already equivalent in size and quality to those at the vast majority of other community colleges? If so, that reason should be plainly stated to the community, along with SMC's plans for uses of Corsair Field beyond today's. This lack of information, plus the lack of detail on environmental effects for the surrounding residents, schools and pre-schools, renders your current Draft EIR unacceptable. Is the college prepared to fund defense of lawsuits demanding such changes and additions to the EIR, in addition to plaintiffs' fees when the courts find in their favor? If not, it's time to take this ill-advised plan back to the drawing board.

Thomas Elias

1720 Oak Street

Santa Monica, 90405

-----Original Message-----
From: ahellwarth@roadrunner.com [mailto:ahellwarth@roadrunner.com]
Sent: Friday, June 04, 2010 11:22 AM
To: LAWSON_RANDAL
Subject: Draft EIR

Dear Mr. Lawson:

I am very disappointed at the way SMC handles its Bond money. The proposal to tear down Corsair Stadium seems totally unnecessary and dangerous to the environment of the residents, the employees and the school children in the area.

Instead of always asking for funds through Bond Measures, it is time for SMC to act like an educational institution which demonstrates to the students and the public that it is capable of using resources responsibly.

Please make the draft of the plan more accessible to the public and listen carefully to our comments.

Thank you,

Abby Hellwarth
Sunset Park Resident

DOUG LEVITT

1720 CEDAR STREET SANTA MONICA, CA 90405
douglevitt@mac.com

June 3, 2010

Dr. Chui L. Tsang
Superintendent and President
Santa Monica College
1900 Santa Monica Boulevard
Santa Monica, California 90405

Dear Dr. Tsang,

I write as an appreciator of the great service that Santa Monica College provides the community at-large. I also write as someone who enjoys the diversity and increasing beauty of the campus, only a block and a half from our front door on Cedar Street between 17th and 18th.

Therefore, I hope it's with great appreciation for the college's impact on us (both positive and negative) that the following is read. My wife and I share extraordinary concern with respect to the university's Draft EIR of the SMC Facilities Master Plan (2010 Update), which appears to have obfuscated the impact on the community, both through incomplete information, lack of dissemination and transparancy.

We are particularly concerned about any notion of demolshing the concrete Corsair Stadium, which can be retrofitted to meet all standards. This will be a terrible disservice to the community that serves as a home and funder of Santa Monica College, with its now 32,000+ attendance, including 5,000 from beyond the state. The number, I ought add, is just another discrepancy between actuality and a plan that sees expansion as its primary goal at all -- and all others' -- costs.

In closing, I do want to repeat my sincere appreciation for all you do to help educate our communities.

I would be grateful for a response to this letter.

Warmest wishes,

Doug Levitt

CC: The Honorable David B. Finkel, Randal Lawson, Dr. Andrew Walz, Dr. Susan Aminoff, Dr. Nancy Greenstein, Louise Jaffe, Dr. Margaret Quiñones-Perez, Rob Rader

Subject: DEIR
Date: Friday, June 4, 2010 1:03 PM
From: jandjpayne <jandjpayne.jp@verizon.net>
To: LAWSON_RANDAL <lawson_randal@smc.edu>
Cc: <ZinaJosephs@aol.com>

As usual, SMC is up to no good, completely oblivious to the neighborhood around it. And as usual, SMC is being sneaky about it, trying to get by by not addressing the issues honestly and in a forthcoming manner.

They always make it very clear that they "march to a different drummer" and don't give a hoot about the neighbors!
Their greed is famous!
Jeanne Payne
1703 Pine St
Santa Monica,

Subject: Draft EIR & SMC transparency
Date: Friday, June 4, 2010 1:07 PM
From: John Reynolds <johnreynolds@kavichreynolds.com>
To: LAWSON_RANDAL <lawson_randal@smc.edu>
Cc: GREENSTEIN_NANCY <greenstein_nancy@smc.edu>, AMINOFF_SUSAN <aminoff_susan@smc.edu>, JAFFE_LOUISE <jaffe_louise@smc.edu>, WALZER_ANDREW <walzer_andrew@smc.edu>, TSANG_CHUI <tsang_chui@smc.edu>, FINKEL_DAVID <finkel_david@smc.edu>, RADER_ROB <rader_rob@smc.edu>

Dear Mr Lawson,
I'm fairly certain that academically you are making a significant contributions to the lives of your students and for that I thank you. I live on 17th street and witness the impact SMC has on the community in another way. The added traffic, pollution, litter, parking and noise are what I see, smell and hear on a daily basis. When I heard you were going to be undertaking a massive campus expansion project, including the demolition of Corsair Stadium, I sighed in resignation knowing the the college would just power it through and not reach out to those of us in the neighborhood that are most impacted by this endeavor. I am opposed to this expansion, mostly because I don't know what purpose it serves. I request that you make a meaningful attempt to educate and listen to the community in which you serve. If we, your neighbors, were more informed about your plans we might just be enrolled in what you are setting out to achieve but with the lack of transparency and arrogant approach you take with regard to the EIR and outreach I will remain a staunch opponent to this and any future campus expansion.
Respectfully,

John Reynolds
Sunset Park

Subject: SMC Master Plan & Corsair Stadium
Date: Friday, June 4, 2010 12:40 PM
From: Susan Salem <susanksalem@gmail.com>
To: LAWSON_RANDAL <lawson_randal@smc.edu>

Dear Mr. Lawson,
I want to thank SMC for your partnership with Santa Monica High School, especially for having the Varsity football games at Corsair stadium on Friday nights. I have tried to review the plan online, but the length makes it rather difficult. I am concerned that you are planning to demolish Corsair stadium and I cannot find a timeline for when and if you have considered the impact on the Santa Monica High School's football team. Perhaps you have been working with someone at Samohi. As you may or may not know, the Athletic Director, Norm Lacy passed away suddenly last week. As a parent of a high school student, I wanted to express my concerns.
Sincerely,
Susan Salem

From: Robert Konecki [mailto:rkonecki@hotmail.com]
Sent: Friday, June 04, 2010 5:50 PM
To: LAWSON_RANDAL
Cc: SM Govt
Subject: SMC Expansion

Dear Randal Lawson VP:
We have been here in SM for now over 42 years and have seen this College go from a Community college to now what has become a University size Campus, and is still growing according to the new plans.
With the parking problems down 16th and other neighborhood streets, which are at least a mile away from the school and the new Parking structure,this school is becoming **too large**.
You now also have small campuses all over SM at the Airport, North of town etc.
You do not need to be all things to all students Internationally etc or those students coming from LA,or other areas, etc. SMC is starting to be a burden on the City and the local community residents.
Enough building already!! Repair what you have!!
Thank you Bob and Merlee Konecki
42 year residents of SM

Robert W. Konecki
Office Tel: 310-392-0901 Cell Phone: 310-383-6067
Every obstacle presents an opportunity to improve our condition.

COMMENT LETTTER No. 17
JUN 04 2010

Michael T. Tanouye
20 Village Park Way
Santa Monica, CA 90405

June 3, 2010

Randal Lawson
Executive Vice-President
Santa Monica College
1900 Pico Blvd.,
Santa Monica, CA 90405

Re: SMC Facilities Master Plan

As a homeowner in the Sunset Park area of Santa Monica, I wish to register my opposition to the proposed plan. My reasons are as follows:

1. The facilities listed in the plan seem to be in satisfactory structural and operational condition.
2. Demolition and rebuilding of Corsair Stadium would have a tremendous disruptive and polluting effect on the neighborhood.
3. Even if the new facilities are outfitted with so-called "green" features, the demolition and hauling of current facilities, the extraction, processing and transport of materials for the new facilities would create a carbon footprint so large that small incremental reductions after construction would not come close to compensating for the pre-construction footprint.

I encourage you to leave well enough alone and help Santa Monica College live up to its stated desire to be an environmentally progressive institution.

Sincerely,

Michael T. Tanouye

Appendix B:

LST Air Quality Worksheets

Grading Phase

Santa Monica College		Construction Activity		
AET		Grading	203,400	Square Feet[a]
Grading Schedule -	81	days[a]		

Equipment Type[a,b]	No. of Equipment	hr/day	Crew Size
Rubber Tired Dozers	1	6.0	4
Graders	1	6.0	
Tractors/Loaders/Backhoes	1	7.0	

Construction Equipment Emission Factors

	CO	NOx	PM10
Equipment Type[c]	lb/hr	lb/hr	lb/hr
Rubber Tired Dozers	1.328	2.834	0.121
Graders	0.622	1.340	0.071
Tractors/Loaders/Backhoes	0.387	0.628	0.048

Fugitive Dust Grading Parameters

Vehicle Speed (mph)[d]	Vehicle Miles Traveled[e]
3	0.04

Fugitive Dust Stockpiling Parameters

Silt Content[f]	Precipitation Days[g]	Mean Wind Speed Percent[h]	TSP Fraction	Area[i] (acres)
6.9	10	2.5	0.5	0.21

Fugitive Dust Material Handling

Aerodynamic Particle Size Multiplier[j]	Mean Wind Speed[k]	Moisture Content[f]	Dirt Handled[a]	Dirt Handled[l]
	mph		cy	lb/day
0.35	2.77	7.9	76,582	2,363,642

Construction Vehicle (Mobile Source) Emission Factors

	CO	NOx	PM10
	lb/mile	lb/mile	lb/mile
Heavy-Duty Truck[m]	0.011125	0.034558	0.001661

Grading Phase

Construction Worker Number of Trips and Trip Length

Vehicle	No. of One-Way Trips/Day	One WayTrip Length (miles)
Haul Truck[n]	48	0.1
Water Truck[o]	3	6.4

Incremental Increase in Onsite Combustion Emissions from Construction Equipment

Equation: Emission Factor (lb/BHP-hr) x No. of Equipment x Work Day (hr/day) x Equipment rating (hp) x Load Factor (%/100) = Onsite Construction Emissions (lb/day)

Equipment Type	CO lb/day	NOx lb/day	PM10 lb/day
Rubber Tired Dozers	7.97	17.00	0.73
Graders	3.73	8.04	0.42
Tractors/Loaders/Backhoes	2.71	4.39	0.34
Total	**14.4**	**29.4**	**1.49**

Incremental Increase in Fugitive Dust Emissions from Construction Operations

Equations:

Gradingp: PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMT x (1 - control efficiency)

Storage Piles[q]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[r]: PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton)
(1 - control efficiency)

Description	Control Efficiency %	Unmitigated PM10[s] lb/day
Earthmoving	61	0
Storage Piles	61	0.08
Material Handling	61	0.04
Total		**0.12**

Incremental Increase in Onsite Combustion Emissions from Onroad Mobile Vehicle			
Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Mobile Emissions (lb/day)			
	CO	**NOx**	**PM10**
Vehicle	lb/day	lb/day	lb/day
Haul Truck	0.11	0.33	0.02
Water Truck	0.43	1.33	0.06
Total	**0.54**	**1.66**	**0.08**

Total Incremental Localized Emissions from Construction Activities			
	CO	**NOx**	**PM10**
Sources	lb/day	lb/day	lb/day
On-site Emissions	**14.9**	**31.1**	**1.7**

Combustion and Fugitive Summary	**PM2.5 Fraction[t]**	**PM10**	**PM2.5**
		lb/day	lb/day
Combustion (Offroad)	0.92	1.5	1.4
Combustion (Onroad)	0.96	0.08	0.07
Fugitive	0.21	0.1	0
Total		**1.7**	**1.5**

Notes:

a) Based on information provided by applicant and URBEMIS defaults.
b) Equipment name match CARB Off-Road Model equipment name for look-up purposes.
c) SCAB values provided by the ARB, Oct 2006. Assumed equipment is diesel fueled.
d) Caterpillar Performance Handbook, Edition 33, October 2003 Operating Speeds, p 2-3.
e) Assuming 76,582 cubic yards of dirt handled [(76,582 cyd x 2,500 lb/cyd)/81 days = 2,363,642 lb/day]
f) USEPA, AP-42, July 1998, Table 11.9-3 Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations
g) Table A9-9-E2, SCAQMD CEQA Air Quality Handbook, 1993
h) Mean wind speed percent - percent of time mean wind speed exceeds 12 mph.
i) Assumed storage piles are 0.21 acres in size
j) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggregate Handling and Storage Piles, p 13.2.4-3 Aerodynamic particle size multiplier for < 10 µm
i) Mean wind speed - maximum of daily average wind speeds reported in 2005-2007 meteorological data for West Los Angeles.
l) Assuming 76,582 cubic yards of dirt handled [(76,582 cyd x 2,500 lb/cyd)/81 days = 2,363,642 lb/day]
m) 2011 fleet year. http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html.
n) Assumed 20 cubic yd truck capacity 76,582 cyd of dirt [(76,582 cyd x truck/20 cyd)/81 days = 48 one-way truck trips/day]. Assumed haul truck travels 0.1 miles through facility
o) Assumed six foot wide water truck traverses over 203,400 square feet of disturbed area
p) USEPA, AP-42, July 1998, Table 11.9-1, Equation for Site Grading ≤ 10 µm
q) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggregate Handling and Storage Piles, Equation 1
r) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, Sept 1992, EPA-450/2-92-004, Equation 2-12

s) Includes watering at least three times a day per Rule 403 (61% control efficiency).
t) ARB's CEIDARS database PM2.5 fractions - construction dust category for fugitive and diesel vehicle exhaust category for combustion.

Structure Construction 2011

Santa Monica College		**Construction Activity**		
AET		Building	95,920	Square Foot Structure[a]
Construction Schedule				

Equipment Type[a,b]	**No. of Equipment**	**hr/day**	**Crew Size**
Cranes	1	6.0	10
Forklifts	2	6.0	
Tractors/Loaders/Backhoes	1	8.0	
Generator Sets	1	8.0	
Electric Welders	3	8.0	

Construction Equipment Combustion Emission Factors

	CO	**NOx**	**PM10**
Equipment Type[c]	lb/hr	lb/hr	lb/hr
Cranes	0.518	1.362	0.060
Forklifts	0.228	0.474	0.026
Tractors/Loaders/Backhoes	0.387	0.628	0.048
Generator Sets	0.320	0.612	0.038
Electric Welders	N/A	N/A	N/A

Construction Vehicle (Mobile Source) Emission Factors

	CO	**NOx**	**PM10**
	lb/mile	lb/mile	lb/mile
Heavy-Duty Truck[d]	0.011125	0.034558	0.001661

Construction Worker Number of Trips and Trip Length

Vehicle	**No. of One-Way Trips/Day**	**Trip Length (miles)**
Flatbed Truck[a,e]	3	0.1
Water Truck[f]	3	6.4

Structure Construction 2011

Incremental Increase in Onsite Combustion Emissions from Construction Equipment

Equation: Emission Factor (lb/BHP-hr) x No. of Equipment x Work Day (hr/day) x Equipment rating (hp) x Load Factor (%/100) = Onsite Construction Emissions (lb/day)

	CO	NOx	PM10
Equipment Type	lb/day	lb/day	lb/day
Cranes	3.11	8.17	0.36
Forklifts	2.74	5.69	0.31
Tractors/Loaders/Backhoes	3.10	5.02	0.39
Generator Sets	2.56	4.90	0.30
Electric Welders	N/A	N/A	N/A
Total	**11.5**	**23.8**	**1.4**

Incremental Increase in Onsite Combustion Emissions from Onroad Mobile Vehicles

Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Mobile Emissions (lb/day)

	CO	NOx	PM10
Vehicle	lb/day	lb/day	lb/day
Flatbed Truck	0.01	0.02	0.00
Water Truck	0.43	1.33	0.06
Total	**0.44**	**1.35**	**0.06**

Total Incremental Combustion Emissions from Construction Activities

	CO	NOx	PM10
Sources	lb/day	lb/day	lb/day
On-Site Emissions	**11.9**	**25.1**	**1.4**

Combustion and Fugitive Summary	**PM2.5 Fraction**[h]	**PM10**	**PM2.5**
		lb/day	lb/day
Combustion (Offroad)	0.92	1.4	1.2
Combustion (Onroad)	0.96	0.06	0.06
Fugitive	0.21	0	0
Total		**1.4**	**1.3**

Structure Construction 2011

Notes:
a) Based on information provided by applicant and URBEMIS defaults.
b) Equipment name match CARB Off-Road Model equipment name for look-up purposes.
c) SCAB values provided by the ARB, Oct 2006. Assumed equipment is diesel fueled except the welders which are powered by the generator.
d) 2011 fleet year. http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html.
e) Assumed haul truck travels 0.1 miles through facility
f) Assumed six foot wide water truck traverses over 200,000 square feet of disturbed area
g) ARB's CEIDARS database PM2.5 fractions - construction dust category for fugitive and diesel vehicle exhaust category for combustion.

Structure Construction 2014

Santa Monica College		**Construction Activity**		
AET		Building	95,920	Square Foot Structure[a]
Construction Schedule				

Equipment Type[a,b]	**No. of Equipment**	**hr/day**	**Crew Size**
Cranes	1	6.0	10
Forklifts	2	6.0	
Tractors/Loaders/Backhoes	1	8.0	
Generator Sets	1	8.0	
Electric Welders	3	8.0	

Construction Equipment Combustion Emission Factors

	CO	**NOx**	**PM10**
Equipment Type[c]	lb/hr	lb/hr	lb/hr
Cranes	0.455	1.106	0.047
Forklifts	0.221	0.355	0.018
Tractors/Loaders/Backhoes	0.375	0.497	0.034
Generator Sets	0.297	0.508	0.030
Electric Welders	N/A	N/A	N/A

Construction Vehicle (Mobile Source) Emission Factors

	CO	**NOx**	**PM10**
	lb/mile	lb/mile	lb/mile
Heavy-Duty Truck[d]	0.008464	0.024180	0.001185

Construction Worker Number of Trips and Trip Length

Vehicle	**No. of One-Way Trips/Day**	**Trip Length (miles)**
Flatbed Truck[a,e]	3	0.1
Water Truck[f]	3	6.4

Incremental Increase in Onsite Combustion Emissions from Construction Equipment

Equation: Emission Factor (lb/BHP-hr) x No. of Equipment x Work Day (hr/day) x Equipment rating (hp) x Load Factor (%/100) = Onsite Construction Emissions (lb/day)

	CO	**NOx**	**PM10**
Equipment Type	lb/day	lb/day	lb/day
Cranes	2.73	6.64	0.28
Forklifts	2.66	4.26	0.21
Tractors/Loaders/Backhoes	3.00	3.98	0.27
Generator Sets	2.38	4.07	0.24
Electric Welders	N/A	N/A	N/A
Total	**10.8**	**18.9**	**1.0**

Incremental Increase in Onsite Combustion Emissions from Onroad Mobile Vehicles

Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Mobile Emissions (lb/day)

	CO	**NOx**	**PM10**
Vehicle	lb/day	lb/day	lb/day
Flatbed Truck	0.01	0.01	0.00
Water Truck	0.33	0.93	0.05
Total	**0.34**	**0.94**	**0.05**

Total Incremental Combustion Emissions from Construction Activities

	CO	**NOx**	**PM10**
Sources	lb/day	lb/day	lb/day
On-Site Emissions	**11.1**	**19.9**	**1.1**

Combustion and Fugitive Summary	**PM2.5 Fraction[h]**	**PM10**	**PM2.5**
		lb/day	lb/day
Combustion (Offroad)	0.92	1.0	0.9
Combustion (Onroad)	0.96	0.05	0.05
Fugitive	0.21	0	0
Total		**1.1**	**1.0**

Notes:

a) Based on information provided by applicant and URBEMIS defaults.

b) Equipment name match CARB Off-Road Model equipment name for look-up purposes.

c) SCAB values provided by the ARB, Oct 2006. Assumed equipment is diesel fueled except the welders which are powered by the generator.

d) 2014 fleet year. http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html.

e) Assumed haul truck travels 0.1 miles through facility
f) Assumed six foot wide water truck traverses over 200,000 square feet of disturbed area
g) ARB's CEIDARS database PM2.5 fractions - construction dust category for fugitive and diesel vehicle exhaust category for combustion.

Architectural Coating and Asphalt Paving

Santa Monica College	**Construction Activity**
AET	Architectural Coating and Asphalt Paving of Parking Lot
Construction Schedule - **18**	**days**[a]

Equipment Type[a,b]	No. of Equipment	hr/day	Crew Size
Pavers	1	7.0	10
Rollers	1	7.0	
Paving Equipment	1	8.0	
Cement and Mortar Mixers	4	6.0	
Tractors/Loaders/Backhoes	1	7.0	

Construction Equipment Combustion Emission Factors

	CO	NOx	PM10
Equipment Type[c]	lb/hr	lb/hr	lb/hr
Pavers	0.528	0.811	0.056
Rollers	0.402	0.616	0.042
Paving Equipment	0.427	0.731	0.050
Cement and Mortar Mixers	0.042	0.055	0.002
Tractors/Loaders/Backhoes	0.375	0.497	0.034

Construction Vehicle (Mobile Source) Emission Factors

	CO	NOx	PM10
	lb/mile	lb/mile	lb/mile
Heavy-Duty Truck[d]	0.008464	0.024180	0.001185

Construction Worker Number of Trips and Trip Length

Vehicle	No. of One-Way Trips/Day	Trip Length (miles)
Delivery Truck[e]	9	0.1
Water Truck[f]	3	6.4

Architectural Coating and Asphalt Paving

Incremental Increase in Onsite Combustion Emissions from Construction Equipment

Equation: Emission Factor (lb/BHP-hr) x No. of Equipment x Work Day (hr/day) x Equipment rating (hp) x Load Factor (%/100) = Onsite Construction Emissions (lb/day

Equipment Type	CO lb/day	NOx lb/day	PM10 lb/day
Pavers	3.69	5.68	0.39
Rollers	2.81	4.31	0.29
Paving Equipment	3.42	5.85	0.40
Cement and Mortar Mixers	1.01	1.32	0.06
Tractors/Loaders/Backhoes	2.62	3.48	0.24
Total	**13.6**	**20.6**	**1.4**

Incremental Increase in Onsite Combustion Emissions from Onroad Mobile Vehicles

Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Mobile Emissions (lb/day)

Vehicle	CO lb/day	NOx lb/day	PM10 lb/day
Delivery Truck	0.02	0.04	0.00
Water Truck	0.33	0.93	0.05
Total	**0.35**	**0.97**	**0.05**

Total Incremental Combustion Emissions from Construction Activities

Sources	CO lb/day	NOx lb/day	PM10 lb/day
On-Site Emissions	**13.9**	**21.6**	**1.4**

Combustion and Fugitive Summary	**PM2.5 Fraction**[h]	**PM10** lb/day	**PM2.5** lb/day
Combustion (Offroad)	0.92	1.4	1.3
Combustion (Onroad)	0.96	0.05	0.05
Fugitive	0.21	0	0
Total		**1.4**	**1.3**

Architectural Coating and Asphalt Paving

Notes:

a) Based on information provided by applicant and URBEMIS defaults.

b) Equipment name match CARB Off-Road Model equipment name for look-up purposes.

c) SCAB values provided by the ARB, Oct 2006. Assumed equipment is diesel fueled except the welders which are powered by the generator.

d) 2011 fleet year. http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html.

e) Assumed haul truck travels 0.1 miles through facility

f) Assumed six foot wide water truck traverses over 200,000 square feet of disturbed area

g) ARB's CEIDARS database PM2.5 fractions - construction dust category for fugitive and diesel vehicle exhaust category for combustion.

Demolition Phase

Santa Monica College		**Construction Activity**		
PAC		Demolition of Existing	5,064	Square Foot Structure[a]
Demolition Schedule -	**10**	**days[a]**		

Equipment Type[a,b]	**No. of Equipment**	**hr/day**	**Crew Size**
Concrete/Industrial Saws	1	8.0	5
Rubber Tired Dozers	1	1.0	
Tractors/Loaders/Backhoes	2	6.0	

Construction Equipment Emission Factors

Equipment Type[c]	**CO** lb/hr	**NOx** lb/hr	**PM10** lb/hr
Concrete/Industrial Saws	0.415	0.591	0.049
Rubber Tired Dozers	1.249	2.685	0.114
Tractors/Loaders/Backhoes	0.382	0.581	0.044

Building Dimensions

Description[a]	**Width of Building** ft	**Length of Building** ft	**Height of Building** ft
Total Project	71	71	12

Fugitive Dust Material Handling

Aerodynamic Particle Size Multiplier[d]	**Mean Wind Speed[e]** mph	**Moisture Content[f]**	**Debris Handled[g]** ton/day
0.35	2.77	2.0	23

Construction Vehicle (Mobile Source) Emission Factors

	CO lb/mile	**NOx** lb/mile	**PM10** lb/mile
Heavy-Duty Truck[h]	0.010215	0.030924	0.001496

Demolition Phase

Construction Worker Number of Trips and Trip Length

Vehicle	**No. of One-Way Trips/Day**[i]	**One-Way Trip Length**[j] **(miles)**
Haul Truck	2	0.1

Incremental Increase in Onsite Combustion Emissions from Construction Equipment

Equation: Emission Factor (lb/hr) x No. of Equipment x Work Day (hr/day) = Onsite Construction Emissions (lb/day)

Equipment Type	**CO** lb/day	**NOx** lb/day	**PM10** lb/day
Concrete/Industrial Saws	3.32	4.73	0.39
Rubber Tired Dozers	1.25	2.69	0.11
Tractors/Loaders/Backhoes	4.59	6.98	0.52
Total	**9.2**	**14.4**	**1.0**

Incremental Increase in Onsite Fugitive Dust Emissions from Construction Equipment

Material Handling[k]: $(0.0032 \times \text{Aerodynamic Particle Size Multiplier} \times (\text{wind speed (mph)}/5)^{1.3}/(\text{moisture content}/2)^{1.4} \times \text{debris handled (ton/day)}) \times$
$(1 - \text{control efficiency}) = \text{PM10 Emissions (lb/day)}$

Description	**Control Efficiency** %	**PM10 Mitigated**[m] lb/day
Material Handling (Demolition)[l]	61	0.00
Material Handling (Debris)	61	0.00
Total		**0.00**

Incremental Increase in Onsite Combustion Emissions from Onroad Mobile Vehicles

Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Mobile Emissions (lb/day)

Vehicle	**CO** lb/day	**NOx** lb/day	**PM10** lb/day
Haul Truck	0.00	0.01	0.001
Total	**0.00**	**0.01**	**0.001**

Demolition Phase

Total Incremental Localized Emissions from Construction Activities			
	CO	**NOx**	**PM10**
Sources	lb/day	lb/day	lb/day
On-site Emissions (Mitigated)	**9.2**	**14.4**	**1.0**

Combustion and Fugitive Summary	**PM2.5 Fraction**[n]	**PM10**	**PM2.5**
		lb/day	lb/day
Combustion (Offroad)	0.92	1.0	0.9
Combustion (Onroad)	0.96	0.001	0.001
Fugitive	0.21	0.00	0.00
Total		**1.0**	**0.9**

Notes:

a) Based on information provided by applicant and URBEMIS defaults.

b) Equipment name match CARB Off-Road Model equipment name for look-up purposes.

c) SCAB values provided by the ARB, Oct 2006. Assumed equipment is diesel fueled.

d) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggregate Handling and Storage Piles, p 13.2.4-3 Aerodynamic particle size multiplier for < 10 µm

e) Mean wind speed - maximum of daily average wind speeds reported in 2005-2007 meteorological data for West Los Angeles.

f) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, equation 2-13, p 2-28

g) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, p 2-28. Debris weight to area ratio = 0.046 ton/sq ft
(5,064 sq ft x 0.046 ton/sq ft)/10 days = 23 ton/day

h) 2012 fleet year. http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html.

i) Assumed 20 cubic yd truck capacity [(23.2944 ton/day x 2,000 lb/ton x cyd/1,620 lb = 29 cyd)/20 cyd/truck = 2 one-way truck trips/day, building debris density is assumed to be 1,620 lb/cyd]
Multiple trucks can be used.

j) Assumed trucks travel 0.1 mile through project site.

k) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, equation 2-13, p 2-28. EPA suggests using the material handling equation for demolition emission estimates.

l) EPA suggests using the material handling equation for demolition emission estimates.

m) Includes watering at least three times a day per Rule 403 (61% control efficiency)

n) ARB's CEIDARS database PM2.5 fractions - construction dust category for fugitive and diesel vehicle exhaust category for combustion.

Grading Phase

Santa Monica College		Construction Activity		
PAC		Grading	74,920	Square Feet[a]
Site Preparation Schedule -	60	days[a]		

Equipment Type[a,b]	No. of Equipment	hr/day	Crew Size
Rubber Tired Dozers	1	6.0	4
Graders	1	6.0	
Tractors/Loaders/Backhoes	1	7.0	

Construction Equipment Emission Factors

	CO	NOx	PM10
Equipment Type[c]	lb/hr	lb/hr	lb/hr
Rubber Tired Dozers	1.249	2.685	0.114
Graders	0.613	1.250	0.065
Tractors/Loaders/Backhoes	0.382	0.581	0.044

Fugitive Dust Grading Parameters

Vehicle Speed (mph)[d]	Vehicle Miles Traveled[e]
3	0.02

Fugitive Dust Stockpiling Parameters

Silt Content[f]	Precipitation Days[g]	Mean Wind Speed Percent[h]	TSP Fraction	Area (acres)[i]
6.9	10	2.5	0.5	0.06

Fugitive Dust Material Handling

Aerodynamic Particle Size Multiplier[j]	Mean Wind Speed[k]	Moisture Content[f]	Dirt Handled[a]	Dirt Handled[l]
	mph		cy	lb/day
0.35	2.77	7.9	61,019	2,542,458

Grading Phase

Construction Vehicle (Mobile Source) Emission Factors

	CO lb/mile	NOx lb/mile	PM10 lb/mile
Heavy-Duty Truck[m]	0.010215	0.030924	0.001496

Construction Worker Number of Trips and Trip Length

Vehicle	No. of One-Way Trips/Day	One-Way Trip Length (miles)
Haul Truck[n]	51	0.1
Water Truck[o]	3	2.4

Incremental Increase in Onsite Combustion Emissions from Construction Equipment

Equation: Emission Factor (lb/hr) x No. of Equipment x Work Day (hr/day) = Onsite Construction Emissions (lb/day)

Equipment Type	CO lb/day	NOx lb/day	PM10 lb/day
Rubber Tired Dozers	7.49	16.11	0.68
Graders	3.68	7.50	0.39
Tractors/Loaders/Backhoes	2.68	4.07	0.30
Total	**13.8**	**27.7**	**1.38**

Incremental Increase in Fugitive Dust Emissions from Construction Operations

Equations:

Grading[p]: PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMT x (1 - control efficiency)

Storage Piles[q]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[r] PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton) (1 - control efficiency)

Description	Control Efficiency %	PM10[s] lb/day
Earthmoving	61	0.00
Storage Piles	61	0.02
Material Handling	61	0.04
Total		**0.06**

Grading Phase

Incremental Increase in Onsite Combustion Emissions from Onroad Mobile Vehicle

Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Mobile Emissions (lb/day)

	CO	NOx	PM10
Vehicle	lb/day	lb/day	lb/day
Haul Truck	0.10	0.32	0.02
Water Truck	0.15	0.45	0.022
Total	**0.25**	**0.77**	**0.04**

Total Incremental Localized Emissions from Construction Activities

	CO	NOx	PM10
Sources	lb/day	lb/day	lb/day
On-site Emissions	**14.1**	**28.4**	**1.5**

Combustion and Fugitive Summary	**PM2.5 Fraction[u]**	**PM10**	**PM2.5**
		lb/day	lb/day
Combustion (Offroad)	0.92	1.4	1.3
Combustion (Onroad)	0.96	0.04	0.04
Fugitive	0.21	0	0
Total		**1.5**	**1.3**

Notes:

a) Based on information provided by applicant and URBEMIS defaults.

b) Equipment name match CARB Off-Road Model equipment name for look-up purposes.

c) SCAB values provided by the ARB, Oct 2006. Assumed equipment is diesel fueled.

d) Caterpillar Performance Handbook, Edition 33, October 2003 Operating Speeds, p 2-3.

e) Assumed 13 foot wide blade with 2 foot overlap (11 foot wide). Vehicle miles traveled (VMT) = (74,920 sq ft/11 foot x mile/5,280 ft)/60 days = 0.02miles

f) USEPA, AP-42, Jan 1995, Table 11.9-3 Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations

g) Table A9-9-E2, SCAQMD CEQA Air Quality Handbook, 1993

h) Mean wind speed percent - percent of time mean wind speed exceeds 12 mph.

i) Assumed storage piles are 0.06 acres in size

j) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggregate Handling and Storage Piles, p 13.2.4-3 Aerodynamic particle size multiplier for < 10 µm

e) Mean wind speed - maximum of daily average wind speeds reported in 2005-2007 meteorological data for West Los Angeles.

l) Assuming 61019 cubic yards of dirt handled [(61019 cyd x 2,500 lb/cyd)/60 days = 2,542,458 lb/day]

m) 2012 fleet year. http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html.

n) Assumed 20 cubic yd truck capacity for 61019 cyd of dirt [(61019 cyd x truck/20 cyd)/60 days = 51 one-way truck trips/day]. Multiple trucks may be used.

o) Assumed six foot wide water truck traverses over 74,920 square feet of disturbed area

p) USEPA, AP-42, Jan 1995, Table 11.9-1, Equation for Site Grading ≤ 10 µm

q) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, Sept 1992, EPA-450/2-92-004, Equation 2-12

r) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggregate Handling and Storage Piles, Equation 1
s) Includes watering at least three times a day per Rule 403 (61% control efficiency).
t) ARB's CEIDARS database PM2.5 fractions - construction dust category for fugitive and diesel vehicle exhaust category for combustion.

Site Preparation Phase

Santa Monica College		**Construction Activity**			
PAC		Site Preparation	74,920	Square Feet[a]	
Site Preparation Schedule -	**15**	**days[a]**			

Equipment Type[a,b]	**No. of Equipment**	**hr/day**	**Crew Size**
Excavators	2	8.0	5
Other general industrial equipment	1	8.0	
Tractors/Loaders/Backhoes	1	0.0	

Construction Equipment Emission Factors

	CO	**NOx**	**PM10**
Equipment Type[c]	lb/hr	lb/hr	lb/hr
Excavators	0.540	0.981	0.054
Other general industrial equipment	0.536	1.452	0.063
Tractors/Loaders/Backhoes	0.382	0.581	0.044

Fugitive Dust Clearing Parameters

Silt Content[d]	**Moisture Content[d]**
6.9	7.9

Fugitive Dust Stockpiling Parameters

Silt Content[d]	**Precipitation Days[e]**	**Mean Wind Speed Percent[f]**	**TSP Fraction**	**Area (acres)[g]**
6.9	10	2.5	0.5	0.06

Fugitive Dust Material Handling

Aerodynamic Particle Size Multiplier[h]	**Mean Wind Speed[i]**	**Moisture Content[d]**	**Dirt Handled[a]**	**Debris Handled[a]**	**Dirt Handled[j]**
	mph		cy	cy	lb/day
0.35	2.77	7.9	0	0	0

Site Preparation Phase

Construction Vehicle (Mobile Source) Emission Factors

	CO lb/mile	NOx lb/mile	PM10 lb/mile
Heavy-Duty Truck[l]	0.010215	0.030924	0.001496

Construction Worker Number of Trips and Trip Length

Vehicle	No. of One-Way Trips/Day	One-Way Trip Length (miles)
Haul Truck[k]	0	0.1
Water Truck[m]	3	2.4

Incremental Increase in Onsite Combustion Emissions from Construction Equipment

Equation: Emission Factor (lb/hr) x No. of Equipment x Work Day (hr/day) = Onsite Construction Emissions (lb/day

Equipment Type	CO lb/day	NOx lb/day	PM10 lb/day
Excavators	8.64	15.70	0.86
Other general industrial equipment	4.29	11.61	0.51
Tractors/Loaders/Backhoes	0.00	0.00	0.00
Total	**12.9**	**27.3**	**1.4**

Incremental Increase in Fugitive Dust Emissions from Construction Operations

Equations:

Clearing[n]: PM10 Emissions (lb/day) = 0.75 x (silt content$^{1.5}$)/(moisture content$^{1.4}$) x hours operated (hr/day) x (1 - control efficiency)

Storage Piles[o]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[p] PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton) (1 - control efficiency)

Description	Control Efficiency %	PM10[q] lb/day
Clearing	61	2.35
Storage Piles	61	0.02
Material Handling	61	0.00
Total		**2.37**

Site Preparation Phase

Incremental Increase in Onsite Combustion Emissions from Onroad Mobile Vehicles

Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Mobile Emissions (lb/day)

	CO	NOx	PM10
Vehicle	lb/day	lb/day	lb/day
Haul Truck	0.00	0.00	0.00
Water Truck	0.15	0.45	0.022
Total	**0.15**	**0.45**	**0.02**

Total Incremental Localized Emissions from Construction Activities

	CO	NOx	PM10
Sources	lb/day	lb/day	lb/day
On-site Emissions	**13.1**	**27.8**	**3.8**

Combustion and Fugitive Summary	**PM2.5 Fraction**[r]	**PM10**	**PM2.5**
		lb/day	lb/day
Combustion (Offroad)	0.92	1.4	1.3
Combustion (Onroad)	0.96	0.02	0.02
Fugitive	0.21	2	0.50
Total		**3.8**	**1.8**

Notes:

a) Based on information provided by applicant and URBEMIS defaults.

b) Equipment name match CARB Off-Road Model equipment name for look-up purposes.

c) SCAB values provided by the ARB, Oct 2006. Assumed equipment is diesel fueled.

d) USEPA, AP-42, July 1998, Table 11.9-3 Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations

e) Table A9-9-E2, SCAQMD CEQA Air Quality Handbook, 1993

f) Mean wind speed percent - percent of time mean wind speed exceeds 12 mph.

g) Assumed storage piles are 0.06 acres in size

h) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggregate Handling and Storage Piles, p 13.2.4-3 Aerodynamic particle size multiplier for < 10 µm

i) Mean wind speed - maximum of daily average wind speeds reported in 2005-2007 meteorological data for West Los Angeles.

j) Emissions associated with dirt handled addressed in concurrent grading phase

k) 2012 fleet year. http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html.

l) Assumed 20 cubic yd truck capacity for 0 cyd of dirt and 0 cyd of debris [(0 cy x truck/20 cy)/15 days = 0 one-way truck trips/day]

m) Assumed six foot wide water truck traverses over 74,920 square feet of disturbed area

n) USEPA, AP-42, July 1998, Table 11.9-1, Equation for bulldozer, overburden, ≤ 10 µm

o) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, Sept 1992, EPA-450/2-92-004, Equation 2-12

p) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggregate Handling and Storage Piles, Equation 1

q) Includes watering at least three times a day per Rule 403 (61% control efficiency).
r) ARB's CEIDARS database PM2.5 fractions - construction dust category for fugitive and diesel vehicle exhaust category for combustion.

Structure Construction 2012

Santa Monica College	**Construction Activity**		
PAC	Building	59,410	Square Foot Structure[a]
Construction Schedule			

Equipment Type[a,b]	No. of Equipment	hr/day	Crew Size
Forklifts	2	6.0	10
Cranes	1	6.0	
Tractors/Loaders/Backhoes	1	6.0	
Generator Sets	1	8.0	
Electric Welders	3	8.0	

Construction Equipment Combustion Emission Factors

	CO	NOx	PM10
Equipment Type[c]	lb/hr	lb/hr	lb/hr
Forklifts	0.226	0.433	0.023
Cranes	0.495	1.275	0.055
Tractors/Loaders/Backhoes	0.382	0.581	0.044
Generator Sets	0.312	0.578	0.035
Electric Welders	N/A	N/A	N/A

Construction Vehicle (Mobile Source) Emission Factors

	CO	NOx	PM10
	lb/mile	lb/mile	lb/mile
Heavy-Duty Truck[d]	0.010215	0.030924	0.001496

Construction Worker Number of Trips and Trip Length

Vehicle	No. of One-Way Trips/Day	One-Way Trip Length (miles)
Flatbed Truck[a,e]	30	0.1
Water Truck[f]	3	3.2

Structure Construction 2012

Incremental Increase in Onsite Combustion Emissions from Construction Equipment

Equation: Emission Factor (lb/hr) x No. of Equipment x Work Day (hr/day) = Onsite Construction Emissions (lb/day)

Equipment Type	CO lb/day	NOx lb/day	PM10 lb/day
Forklifts	2.71	5.19	0.28
Cranes	2.97	7.65	0.33
Tractors/Loaders/Backhoes	2.29	3.49	0.26
Generator Sets	2.50	4.62	0.28
Electric Welders	N/A	N/A	N/A
Total	**10.47**	**20.95**	**1.15**

Incremental Increase in Onsite Combustion Emissions from Onroad Mobile Vehicles

Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Mobile Emissions (lb/day)

Vehicle	CO lb/day	NOx lb/day	PM10 lb/day
Flatbed Truck	0.06	0.19	0.009
Water Truck	0.2	0.59	0.029
Total	**0.26**	**0.78**	**0.04**

Total Incremental Combustion Emissions from Construction Activities

Sources	CO lb/day	NOx lb/day	PM10 lb/day
On-Site Emissions	**10.7**	**21.7**	**1.2**

Combustion and Fugitive Summary	**PM2.5 Fraction**[g]	**PM10** lb/day	**PM2.5** lb/day
Combustion (Offroad)	0.92	1.2	1.1
Combustion (Onroad)	0.96	0.04	0.04
Fugitive	0.21	0	0
Total		**1.2**	**1.1**

Structure Construction 2012

Notes:

a) Based on information provided by applicant and URBEMIS defaults.

b) Equipment name match CARB Off-Road Model equipment name for look-up purposes.

c) SCAB values provided by the ARB, Oct 2006. Assumed equipment is diesel fueled except the welders which are powered by the generator.

d) 2012 fleet year. http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html.

e) Assumed haul truck travels 0.1 miles through facility

f) Assumed six foot wide water truck traverses over 100,000 square feet of disturbed area

g) ARB's CEIDARS database PM2.5 fractions - construction dust category for fugitive and diesel vehicle exhaust category for combustion.

Structure Construction 2013

Santa Monica College		**Construction Activity**		
PAC		Building	59,410	Square Foot Structure[a]
Construction Schedule				

Equipment Type[a,b]	**No. of Equipment**	**hr/day**	**Crew Size**
Forklifts	2	6.0	10
Cranes	1	6.0	
Tractors/Loaders/Backhoes	1	6.0	
Generator Sets	1	8.0	
Electric Welders	3	8.0	

Construction Equipment Combustion Emission Factors

Equipment Type[c]	**CO** lb/hr	**NOx** lb/hr	**PM10** lb/hr
Forklifts	0.223	0.395	0.020
Cranes	0.474	1.193	0.051
Tractors/Loaders/Backhoes	0.378	0.539	0.039
Generator Sets	0.305	0.543	0.032
Electric Welders	N/A	N/A	N/A

Construction Vehicle (Mobile Source) Emission Factors

	CO lb/mile	**NOx** lb/mile	**PM10** lb/mile
Heavy-Duty Truck[d]	0.009318	0.027429	0.001337

Construction Worker Number of Trips and Trip Length

Vehicle	**No. of One-Way Trips/Day**	**One-Way Trip Length (miles)**
Flatbed Truck[a,e]	30	0.1
Water Truck[f]	3	3.2

Incremental Increase in Onsite Combustion Emissions from Construction Equipment

Equation: Emission Factor (lb/hr) x No. of Equipment x Work Day (hr/day) = Onsite Construction Emissions (lb/day)

Equipment Type	**CO** lb/day	**NOx** lb/day	**PM10** lb/day
Forklifts	2.68	4.74	0.24
Cranes	2.84	7.16	0.30
Tractors/Loaders/Backhoes	2.27	3.23	0.23
Generator Sets	2.44	4.34	0.26
Electric Welders	N/A	N/A	N/A
Total	**10.23**	**19.47**	**1.03**

Incremental Increase in Onsite Combustion Emissions from Onroad Mobile Vehicles

Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Mobile Emissions (lb/day)

Vehicle	**CO** lb/day	**NOx** lb/day	**PM10** lb/day
Flatbed Truck	0.06	0.16	0.008
Water Truck	0.18	0.53	0.026
Total	**0.24**	**0.69**	**0.03**

Total Incremental Combustion Emissions from Construction Activities

Sources	**CO** lb/day	**NOx** lb/day	**PM10** lb/day
On-Site Emissions	**10.5**	**20.2**	**1.1**

Combustion and Fugitive Summary	**PM2.5 Fraction[g]**	**PM10** lb/day	**PM2.5** lb/day
Combustion (Offroad)	0.92	1.0	0.9
Combustion (Onroad)	0.96	0.03	0.03
Fugitive	0.21	0	0

Structure Construction 2013

Total	**1.1**	**1.0**

Notes:

a) Based on information provided by applicant and URBEMIS defaults.
b) Equipment name match CARB Off-Road Model equipment name for look-up purposes.
c) SCAB values provided by the ARB, Oct 2006. Assumed equipment is diesel fueled except the welders which are powered by the generator.
d) 2013 fleet year. http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html.
e) Assumed haul truck travels 0.1 miles through facility
f) Assumed six foot wide water truck traverses over 100,000 square feet of disturbed area
g) ARB's CEIDARS database PM2.5 fractions - construction dust category for fugitive and diesel vehicle exhaust category for combustion.

Architectural Coating and Asphalt Paving

Santa Monica College	**Construction Activity**
PAC	Architectural Coating and Asphalt Paving of Parking Lot
Construction Schedule - 20	**days**[a]

Equipment Type[a,b]	**No. of Equipment**	**hr/day**	**Crew Size**
Pavers	1	7.0	10
Paving Equipment	1	8.0	
Rollers	1	7.0	
Cement and Mortar Mixers	4	6.0	
Tractors/Loaders/Backhoes	1	7.0	

Construction Equipment Combustion Emission Factors

	CO	**NOx**	**PM10**
Equipment Type[c]	lb/hr	lb/hr	lb/hr
Pavers	0.536	0.854	0.060
Paving Equipment	0.432	0.771	0.054
Rollers	0.406	0.655	0.045
Cement and Mortar Mixers	0.042	0.056	0.003
Tractors/Loaders/Backhoes	0.378	0.539	0.039

Construction Vehicle (Mobile Source) Emission Factors

	CO	**NOx**	**PM10**
	lb/mile	lb/mile	lb/mile
Heavy-Duty Truck[d]	0.009318	0.027429	0.001337

Construction Worker Number of Trips and Trip Length

Vehicle	**No. of One-Way Trips/Day**	**One-Way Trip Length (miles)**
Delivery Truck[e]	3	0.1
Water Truck[f]	3	3.2

Architectural Coating and Asphalt Paving

Incremental Increase in Onsite Combustion Emissions from Construction Equipment

Equation: Emission Factor (lb/hr) x No. of Equipment x Work Day (hr/day) = Onsite Construction Emissions (lb/day)

	CO	NOx	PM10
Equipment Type	lb/day	lb/day	lb/day
Pavers	3.75	5.98	0.42
Paving Equipment	3.45	6.17	0.43
Rollers	2.84	4.58	0.32
Cement and Mortar Mixers	1.01	1.33	0.06
Tractors/Loaders/Backhoes	2.65	3.77	0.27
Total	**13.70**	**21.83**	**1.50**

Incremental Increase in Onsite Combustion Emissions from Onroad Mobile Vehicles

Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Mobile Emissions (lb/day)

	CO	NOx	PM10
Vehicle	lb/day	lb/day	lb/day
Delivery Truck	0.01	0.02	0.0008
Water Truck	0.18	0.53	0.03
Total	**0.19**	**0.55**	**0.03**

Total Incremental Combustion Emissions from Construction Activities

	CO	NOx	PM10
Sources	lb/day	lb/day	lb/day
On-Site Emissions	**13.9**	**22.4**	**1.5**

Combustion and Fugitive Summary	**PM2.5 Fraction**[g]	**PM10**	**PM2.5**
		lb/day	lb/day
Combustion (Offroad)	0.92	1.5	1.4
Combustion (Onroad)	0.96	0.031	0.030
Fugitive	0.21	0	0
Total		**1.5**	**1.4**

Architectural Coating and Asphalt Paving

Notes:

a) Based on information provided by applicant and URBEMIS defaults.

b) Equipment name match CARB Off-Road Model equipment name for look-up purposes.

c) SCAB values provided by the ARB, Oct 2006. Assumed equipment is diesel fueled except the welders which are powered by the generator.

d) 2011 fleet year. http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html.

e) Assumed haul truck travels 0.1 miles through facility

f) Assumed six foot wide water truck traverses over 100,000 square feet of disturbed area

g) ARB's CEIDARS database PM2.5 fractions - construction dust category for fugitive and diesel vehicle exhaust category for combustion.

Construction Air Concentration										
	Nitrogen Dioxide					Carbon Monoxide				
Construction	ER	1-Hr Site	1-Hr Site	Annual Site	Annual Total	ER	1-Hr Site	1-Hr Total	8-Hr Site	8-Hr Total
Phase	g/s	ug/m3	ppm	ug/m3	ppm	g/s	ug/m3	ppm	ug/m3	ppm
Corsair Stadium Demolition	0.18	8	0.068	2.140	0.021	0.14	199	3.173	66	2.058
Corsair Stadium Grading	0.36	16	0.072	4.169	0.022	0.20	286	3.248	95	2.083
Corsair Stadium Buidling construction 2015	0.29	13	0.071	3.376	0.022	0.18	267	3.233	89	2.077
Corsair Stadium Buidling construction 2016	0.27	12	0.070	3.099	0.022	0.18	263	3.229	88	2.076
Corsair Stadium Paving	0.33	15	0.072	3.874	0.022	0.25	366	3.318	122	2.106
Health & P.E./Central Plant Demolition	0.23	7	0.068	2.657	0.021	0.15	78	3.068	16	2.014
Health & P.E./Central Plant Grading	0.44	14	0.072	5.166	0.023	0.22	119	3.104	25	2.021
Health & P.E./Central Plant Buidling construction	0.37	12	0.070	4.317	0.022	0.20	106	3.092	22	2.019
Health & P.E./Central Plant Health Paving	0.39	13	0.071	4.520	0.022	0.26	139	3.121	29	2.025
Math Demolition	0.17	7	0.067	1.956	0.021	0.14	206	3.179	47	2.041
Math and Science Extension Demolition	0.20	6	0.067	2.325	0.021	0.14	97	3.084	27	2.023
Math and Science Extension Grading	0.39	12	0.070	4.520	0.022	0.20	142	3.124	39	2.034
Math and Science Extension Buidling construction 2014	0.31	10	0.069	3.671	0.022	0.18	122	3.106	34	2.030
Math and Science Extension Buidling construction 2016	0.26	8	0.068	3.044	0.022	0.17	118	3.102	33	2.028
Math and Science Extension Paving	0.29	9	0.069	3.431	0.022	0.21	150	3.130	42	2.036
Drescher Hall Demolition	0.20	5	0.067	2.325	0.021	0.14	86	3.075	34	2.029
Drescher Hall Grading	0.57	14	0.072	6.715	0.024	0.31	194	3.169	76	2.066
Drescher Hall Buidling construction	0.31	8	0.068	3.671	0.022	0.18	108	3.094	43	2.037
Drescher Hall Paving	0.32	8	0.068	3.690	0.022	0.22	134	3.116	52	2.046

Health & P.E./Central Plant Demolition		7.43	0.068	2.66	0.021		78.50	3.068	16.24	2.014
Health & P.E./Central Plant Grading		14.44	0.072	5.17	0.023		119.45	3.104	24.71	2.021
Health & P.E./Central Plant Buidling construction		12.07	0.070	4.32	0.022		105.80	3.092	21.88	2.019
Health & P.E./Central Plant Buidling construction & Drescher Hall Demolition		17.00	0.073	6.64	0.024		191.65	3.167	55.59	2.048
Health & P.E./Central Plant Buidling construction & Drescher Hall Grading		26.31	0.078	11.03	0.026		299.93	3.261	98.12	2.085
Health & P.E./Central Plant Buidling construction & Math and Science Extension Demolition & Drescher Hall Buidling construction		25.98	0.078	10.31	0.025		311.00	3.270	91.31	2.079
Health & P.E./Central Plant Buidling construction & Math and Science Extension Grading & Drescher Hall Buidling construction		31.77	0.081	12.51	0.027		356.16	3.310	103.85	2.090

Health & P.E./Central Plant Buidling construction & Health & P.E./Central Plant Health Paving & Math and Science Extension Grading & Drescher Hall Buidling construction	44.41	0.088	17.03	0.029	495.23	3.431	132.62	2.115
Math and Science Extension Buidling construction 2014 & Drescher Hall Buidling construction	17.47	0.073	7.34	0.024	230.53	3.200	76.46	2.066
Drescher Hall Buidling construction & Corsair Stadium Demolition	15.97	0.072	5.81	0.023	307.17	3.267	108.75	2.095
Drescher Hall Buidling construction & Corsair Stadium Grading	23.73	0.077	7.84	0.024	394.03	3.343	137.67	2.120
Drescher Hall Buidling construction & Drescher Hall Paving & Corsair Stadium Buidling construction 2015 & Math and Science Extension Buidling construction 2014	30.38	0.080	10.72	0.026	497.99	3.433	165.53	2.144
Corsair Stadium Buidling construction 2016 & Math and Science Extension Buidling construction 2016	19.88	0.075	6.14	0.023	380.73	3.331	120.26	2.105
Corsair Stadium Buidling construction 2016 & Corsair Stadium Paving & Math Demolition & Math and Science Extension Buidling construction 2016 & Math and Science Extension Paving	50.33	0.091	15.40	0.028	1102.34	3.959	331.10	2.288
MAX		0.091		0.029		3.959		2.288
Q3 2012		0.072		0.023		3.104		2.021
Q4 2012		0.072		0.023		3.104		2.021
Q1 2013 - Q4 2013		0.070		0.022		3.092		2.019
Q1 2014		0.073		0.024		3.167		2.048
Q2 2014		0.078		0.026		3.261		2.085
Q3 2014		0.088		0.029		3.431		2.115
Q4 2014 - Q2 2015		0.073		0.024		3.200		2.066
Q3 2015		0.077		0.024		3.343		2.120
Q4 2015		0.080		0.026		3.433		2.144
Q1 2016 - Q2 2016		0.075		0.023		3.331		2.105

Q3 2016	0.091	0.028	3.959	2.288

Construction Air Concentration							
	Particulate Matter 10				Particulate Matter 2.5		
Construction Phase	ER-Comb g/s	ER-Fug g/s	24-hr ug/m3	Annual ug/m3	ER-Comb g/s	ER-Fug g/s	24-HR ug/m3
Corsair Stadiu	0.012	0.000	1.98	0.30	0.011	0.000	1.77
Corsair Stadiu	0.017	0.000	2.76	0.43	0.015	0.000	2.50
Corsair Stadiu	0.016	0.000	2.54	0.40	0.015	0.000	2.33
Corsair Stadiu	0.01405	0.000	2.26	0.35	0.013	0.000	2.08
Corsair Stadiu	0.02194	0.000	3.53	0.55	0.020	0.000	3.25
Health & P.E.	0.016	0.000	0.63	0.05	0.015	0.000	0.56
Health & P.E.	0.022	0.000	0.84	0.07	0.020	0.000	0.76
Health & P.E.	0.022	0.000	0.81	0.06	0.020	0.000	0.74
Health & P.E.	0.026	0.000	0.98	0.08	0.024	0.000	0.90
Math Demolit	0.01042	0.00063	1.43	0.18	0.010	0.000	1.18
Math and Scie	0.013	0.001	1.05	0.19	0.012	0.000	0.83
Math and Scie	0.018	0.001	1.34	0.25	0.017	0.000	1.13
Math and Scie	0.017	0.000	1.07	0.21	0.015	0.000	0.98
Math and Scie	0.01326	0.000	0.86	0.17	0.012	0.000	0.77
Math and Scie	0.01941	0.000	1.25	0.24	0.018	0.000	1.15
Drescher Hall	0.013	0.000	1.18	0.27	0.012	0.000	1.03
Drescher Hall	0.029	0.000	2.43	0.56	0.026	0.000	2.26
Drescher Hall	0.017	0.000	1.40	0.32	0.015	0.000	1.28
Drescher Hall	0.021	0.000	1.76	0.41	0.019	0.000	1.63

7/1/2012	7/29/2012		0.63	0.05			0.56
7/30/2012	10/30/2012		0.84	0.07			0.76
10/31/2012	2/28/2014		0.81	0.06			0.74
3/1/2014	4/4/2014		1.98	0.33			1.78
4/5/2014	6/30/2014		3.23	0.62			3.00
7/1/2014	8/15/2014		3.26	0.58			2.85
8/16/2014	8/30/2014		3.55	0.64			3.15

9/1/2014	9/30/2014	4.53	0.71		4.05
10/1/2014	6/30/2015	2.47	0.53		2.26
7/1/2015	7/31/2015	3.38	0.63		3.05
8/1/2015	10/11/2015	4.16	0.75		3.78
12/1/2015	12/30/2015	5.01	0.93		4.60
1/1/2016	8/30/2016	3.11	0.52		2.86
9/1/2016	9/29/2016	9.33	1.49	0.944	8.43
		9.327	1.492		8.431
		0.835	0.066		0.761
		0.835	0.066		0.761
		0.806	0.064		0.741
		1.982	0.333		1.776
		3.233	0.623		2.999
		4.529	0.714		4.053
		2.469	0.530		2.263
		4.160	0.749		3.779
		5.007	0.925		4.597
		3.114	0.518		2.855

9.327	1.492	8.431

Construction Emission Rates								
			PM10		PM2.5			
	Nox	CO	Combustion	Fugitive	Combustion	Fugitive		
Phase	lbs/day	lbs/day		lbs/day	lbs/day	lbs/day		
Corsair Stadium								
Corsair Stadium Demolition	11.60	8.70	0.75	0.020	0.69	0.0040	7/1/2015	7/31/2015
Corsair Stadium Grading	22.60	12.50	1.07	0.010	0.98	0.0020	8/1/2015	10/11/2015
Corsair Stadium Buidling construction 2015	18.30	11.70	1.00	0.000	0.92	0.0000	10/12/2015	12/31/2015
Corsair Stadium Buidling construction 2016	16.80	11.50	0.89	0.000	0.82	0.0000	1/1/2016	9/30/2016
Corsair Stadium Paving	21.00	16.00	1.39	0.000	1.28	0.0000	9/1/2016	9/29/2016
Health & P.E./Central Plant								
Health & P.E./Central Plant Demolition	14.40	9.20	1.03	0.020	0.95	0.0040	7/1/2012	7/29/2012
Health & P.E./Central Plant Grading	28.00	14.00	1.40	0.010	1.29	0.0020	7/30/2012	10/30/2012
Health & P.E./Central Plant Buidling construction	23.40	12.40	1.37	0.000	1.26	0.0000	10/31/2012	9/30/2014
Health & P.E./Central Plant Health Paving	24.50	16.30	1.67	0.000	1.53	0.0000	9/1/2014	9/30/2014
Math Demolition								
Math Demolition	10.60	8.60	0.66	0.040	0.61	0.0100	9/1/2016	9/30/2016
Math and Science Extension								
Math and Science Extension Demolition	12.60	8.80	0.84	0.080	0.77	0.0200	7/1/2014	8/15/2014
Math and Science Extension Grading	24.50	12.90	1.17	0.060	1.08	0.0130	8/16/2014	11/10/2014
ath and Science Extension Buidling construction 201	19.90	11.10	1.05	0.000	0.97	0.0000	11/11/2014	12/31/2015
ath and Science Extension Buidling construction 201	16.50	10.70	0.84	0.000	0.76	0.0000	1/1/2016	9/30/2016
Math and Science Extension Paving	18.60	13.60	1.23	0.000	1.13	0.0000	9/1/2016	9/29/2016
Drescher Hall								
Drescher Hall Demolition	12.60	8.80	0.85	0.020	0.77	0.004	3/1/2014	4/4/2014
Drescher Hall Grading	36.40	19.90	1.81	0.007	1.67	0.015	4/5/2014	6/30/2014
Drescher Hall Buidling construction	19.90	11.10	1.05	0.000	0.96	0.000	7/1/2014	12/30/2015
Drescher Hall Paving	20.00	13.70	1.32	0.000	1.22	0.000	12/1/2015	12/30/2015

Demolition Phase

Santa Monica College		**Construction Activity**		
Corsair Stadium		Demolition of Existing	29,686	Square Foot Structure[a]
Demolition Schedule	**20**	**days**[a]		

Equipment Type[a,b]	**No. of Equipment**	**hr/day**	**Crew Size**
Concrete/Industrial Saws	1	8.0	5
Tractors/Loaders/Backhoes	2	6.0	
Rubber Tired Dozers	1	1.0	

Construction Equipment Emission Factors

	CO	**NOx**	**PM10**
Equipment Type[c]	lb/hr	lb/hr	lb/hr
Concrete/Industrial Saws	0.398	0.492	0.037
Tractors/Loaders/Backhoes	0.372	0.450	0.030
Rubber Tired Dozers	1.042	2.229	0.092

Building Dimensions

Description[a]	**Width of Building**	**Length of Building**	**Height of Building**
	ft	ft	ft
Total Project	172	172	12

Fugitive Dust Material Handling

Aerodynamic Particle Size Multiplier[d]	**Mean Wind Speed**[e]	**Moisture Content**[f]	**Debris Handled**[g]
	mph		ton/day
0.35	2.77	2.0	68

Construction Vehicle (Mobile Source) Emission Factors

	CO	**NOx**	**PM10**
	lb/mile	lb/mile	lb/mile
Heavy-Duty Truck[h]	0.007668912	0.021226781	0.001047152

Demolition Phase

On-Site Number of Trips and Trip Length		
Vehicle	**No. of One-Way Trips/Day**[i]	**One-Way Trip Lengthj (miles)**
Haul Truck	5	0.1

Incremental Increase in Onsite Combustion Emissions from Construction Equipment

Equation: Emission Factor (lb/hr) x No. of Equipment x Work Day (hr/day) = Onsite Construction Emissions (lb/day)

Equipment Type	**CO** lb/day	**NOx** lb/day	**PM10** lb/day
Concrete/Industrial Saws	3.19	3.94	0.30
Tractors/Loaders/Backhoes	4.46	5.39	0.36
Rubber Tired Dozers	1.04	2.23	0.09
Total	**8.69**	**11.56**	**0.75**

Incremental Increase in Onsite Fugitive Dust Emissions from Construction Equipment

Material Handling[k]: (0.0032 x Aerodynamic Particle Size Multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x debris handled (ton/day)) x (1 - control efficiency) = PM10 Emissions (lb/day)

Description	**Control Efficiency** %	**PM10**[m] lb/day
Material Handling (Demolition)[l]	61	0.01
Material Handling (Debris)	61	0.01
Total		**0.02**

Incremental Increase in Onsite Combustion Emissions from Onroad Mobile Vehicles

Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Mobile Emissions (lb/day)

Vehicle	**CO** lb/day	**NOx** lb/day	**PM10** lb/day
Haul Truck	0.01	0.02	0.001
Total	**0.01**	**0.02**	**0.001**

Demolition Phase

Total Incremental Localized Emissions from Construction Activities

Sources	CO lb/day	NOx lb/day	PM10 lb/day
On-site Emissions	**8.7**	**11.6**	**0.8**

Combustion and Fugitive Summary	PM2.5 Fraction[n]	PM10 lb/day	PM2.5 lb/day
Combustion (Offroad)	0.92	0.75	0.69
Combustion (Onroad)	0.96	0.001	0.001
Fugitive	0.21	0.02	0.004
Total		**0.8**	**0.7**

Notes:

a) Based on information provided by applicant and URBEMIS defaults.

b) Equipment name match CARB Off-Road Model equipment name for look-up purposes.

c) SCAB values provided by the ARB, Oct 2006. Assumed equipment is diesel fueled.

d) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggregate Handling and Storage Piles, p 13.2.4-3 Aerodynamic particle size multiplier for < 10 µm

e) Mean wind speed - maximum of daily average wind speeds reported in 2005-2007 meteorological data for West Los Angeles.

f) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, equation 2-13, p 2-28

g) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, p 2-28. Debris weight to area ratio = 0.046 ton/sq ft
(29,686 sq ft x 0.046 ton/sq ft)/20 days = 68 ton/day

h) 2015 fleet year. http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html.

i) Assumed 20 cubic yd truck capacity [(68 ton/day x 2,000 lb/ton x cyd/1,620 lb = 84 cyd)/20 cyd/truck = 5 one-way truck trips/day, building debris density is assumed to be 1,620 lb/cyd]
Multiple trucks can be used.

j) Assumed trucks travel 0.1 mile through project site.

k) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, equation 2-13, p 2-28.

l) EPA suggests using the material handling equation for demolition emission estimates.

m) Includes watering at least three times a day per Rule 403 (61% control efficiency)

n) ARB's CEIDARS database PM2.5 fractions - construction dust category for fugitive and diesel vehicle exhaust category for combustion.

Architectural Coating and Asphalt Paving

Santa Monica College		**Construction Activity**
Corsair Stadium		Architectural Coating and Asphalt Paving of Parking Lot
Construction Schedule	**22**	**days**[a]

Equipment Type[a,b]	**No. of Equipment**	**hr/day**	**Crew Size**
Pavers	1	7.0	9
Cement and Mortar Mixers	4	6.0	
Rollers	1	7.0	
Tractors/Loaders/Backhoes	1	7.0	

Construction Equipment Combustion Emission Factors

	CO	**NOx**	**PM10**
Equipment Type[c]	lb/hr	lb/hr	lb/hr
Pavers	0.513	0.713	0.049
Cement and Mortar Mixers	0.042	0.054	0.002
Rollers	0.394	0.527	0.035
Tractors/Loaders/Backhoes	0.369	0.406	0.026

Construction Vehicle (Mobile Source) Emission Factors

	CO	**NOx**	**PM10**
	lb/mile	lb/mile	lb/mile
Heavy-Duty Truck[d]	0.007046038	0.01887374	0.000944477

On-Site Number of Trips and Trip Length

Vehicle	**No. of One-Way Trips/Day**	**One-Way Trip Length (miles)**
Delivery Truck[e]	3	0.1
Water Truck[f]	3	1.3

Architectural Coating and Asphalt Paving

Incremental Increase in Onsite Idling Emissions from Onroad Mobile Vehicles			
Equation: Emission Factor (lb/hr) x No. of Equipment x Work Day (hr/day) = Onsite Construction Emissions (lb/day)			
	CO	**NOx**	**PM10**
Equipment Type	lb/day	lb/day	lb/day
Pavers	3.59	4.99	0.34
Cement and Mortar Mixers	9.47	12.65	0.85
Rollers	0.29	0.38	0.02
Tractors/Loaders/Backhoes	2.58	2.84	0.18
Total	**15.94**	**20.87**	**1.39**

Incremental Increase in Offsite Combustion Emissions from Construction Vehicles			
Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Mobile Emissions (lb/day)			
	CO	**NOx**	**PM10**
Vehicle	lb/day	lb/day	lb/day
Flatbed Truck	0.004	0.011	0.0006
Water Truck	0.055	0.147	0.0074
Total	**0.059**	**0.159**	**0.0079**

Total Incremental Combustion Emissions from Construction Activities			
	CO	**NOx**	**PM10**
Sources	lb/day	lb/day	lb/day
On-Site Emissions	**16.0**	**21.0**	**1.4**

Combustion and Fugitive Summary	**PM2.5 Fraction[g]**	**PM10**	**PM2.5**
		lb/day	lb/day
Combustion (Offroad)	0.92	1.387	1.276
Combustion (Onroad)	0.96	0.008	0.008
Fugitive	0.21	0.0000	0.0000
Total		**1.4**	**1.3**

Architectural Coating and Asphalt Paving

Notes:

a) Based on information provided by applicant and URBEMIS defaults.

b) Equipment name match CARB Off-Road Model equipment name for look-up purposes.

c) SCAB values provided by the ARB, Oct 2006. Assumed equipment is diesel fueled.

d) 2016 fleet year. http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html.

e) Assumed haul truck travels 0.1 miles through facility

f) Assumed six foot wide water truck traverses over 40,000 square feet of disturbed area

g) ARB's CEIDARS database PM2.5 fractions - construction dust category for fugitive and diesel vehicle exhaust category for combustion.

Structure Construction

Santa Monica College	**Construction Activity**		
Corsair Stadium	Building	20,049	Square Foot Structure[a]

Construction Schedule

Equipment Type[a,b]	**No. of Equipment**	**hr/day**	**Crew Size**
Cranes	1	6.0	8
Forklifts	2	6.0	
Generator Sets	1	6.0	
Welders	1	8.0	
Tractors/Loaders/Backhoes	1	8.0	

Construction Equipment Combustion Emission Factors

	CO	**NOx**	**PM10**
Equipment Type[c]	lb/hr	lb/hr	lb/hr
Cranes	0.440	1.019	0.043
Forklifts	0.220	0.316	0.016
Generator Sets	0.291	0.472	0.027
Welders	0.199	0.230	0.019
Tractors/Loaders/Backhoes	0.372	0.450	0.030

Construction Vehicle (Mobile Source) Emission Factors

	CO	**NOx**	**PM10**
	lb/mile	lb/mile	lb/mile
Heavy-Duty Truck[d]	0.007668912	0.021226781	0.001047152

On-Site Number of Trips and Trip Length

Vehicle	**No. of One-Way Trips/Day**	**One-Way Trip Length (miles)**
Haul Trucks[e]	3	0.1
Water Truck[f]	3	1.3

Structure Construction

Incremental Increase in Onsite Idling Emissions from Onroad Mobile Vehicles

Equation: Emission Factor (lb/hr) x No. of Equipment x Work Day (hr/day) = Onsite Construction Emissions (lb/day)

	CO	NOx	PM10
Equipment Type	lb/day	lb/day	lb/day
Cranes	2.64	6.11	0.26
Forklifts	2.64	3.79	0.19
Generator Sets	1.75	2.83	0.16
Welders	1.59	1.84	0.15
Tractors/Loaders/Backhoes	2.97	3.60	0.24
Total	**11.59**	**18.17**	**0.99**

Incremental Increase in Onsite Combustion Emissions from Onroad Mobile Vehicles

Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Mobile Emissions (lb/day)

	CO	NOx	PM10
Vehicle	lb/day	lb/day	lb/day
Flatbed Trucks	0.005	0.013	0.0006
Water Trucks	0.060	0.166	0.008
Total	**0.07**	**0.18**	**0.009**

Total Incremental Combustion Emissions from Construction Activities

	CO	NOx	PM10
Sources	lb/day	lb/day	lb/day
On-Site Emissions	**11.7**	**18.3**	**1.0**

Combustion and Fugitive Summary	**PM2.5 Fraction**[g]	**PM10**	**PM2.5**
		lb/day	lb/day
Combustion (Offroad)	0.92	0.99	0.91
Combustion (Onroad)	0.96	0.009	0.008
Fugitive	0.21	0.00000	0.00000
Total		**1.0**	**0.9**

Structure Construction

Notes:

a) Based on information provided by applicant and URBEMIS defaults.

b) Equipment name match CARB Off-Road Model equipment name for look-up purposes.

c) SCAB values provided by the ARB, Oct 2006. Assumed equipment is diesel fueled.

d) 2015 fleet year. http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html.

e) Assumed haul truck travels 0.1 miles through facility

f) Assumed six foot wide water truck traverses over 40,000 square feet of disturbed area

g) ARB's CEIDARS database PM2.5 fractions - construction dust category for fugitive and diesel vehicle exhaust category for combustion.

Grading Phase

Santa Monica College		**Construction Activity**	
Corsair Stadium		Grading	58,370 Square Feet[a]
Grading Schedule -	**80** days[a]		

Equipment Type[a,b]	**No. of Equipment**	**hr/day**	**Crew Size**
Rubber Tired Dozers	1	6.0	4
Graders	1	6.0	
Tractors/Loaders/Backhoes	1	7.0	

Construction Equipment Emission Factors

	CO	**NOx**	**PM10**
Equipment Type[c]	lb/hr	lb/hr	lb/hr
Rubber Tired Dozers	1.042	2.229	0.092
Graders	0.593	0.979	0.049
Tractors/Loaders/Backhoes	0.372	0.450	0.030

Fugitive Dust Grading Parameters

Vehicle Speed (mph)[d]	**Vehicle Miles Traveled[e]**
3	0.01

Fugitive Dust Stockpiling Parameters

Silt Content[f]	**Precipitation Days[g]**	**Mean Wind Speed Percent[h]**	**TSP Fraction**	**Area[j] (acres)**
6.9	10	2.5	0.5	0.02

Fugitive Dust Material Handling

Aerodynamic Particle Size Multiplier[j]	**Mean Wind Speed[k]**	**Moisture Content[f]**	**Dirt Handled[a]**	**Dirt Handled[l]**
	mph		cy	lb/day
0.35	2.77	7.9	148	4,625

Construction Vehicle (Mobile Source) Emission Factors

	CO	**NOx**	**PM10**
	lb/mile	lb/mile	lb/mile
Heavy-Duty Truck[m]	0.007668912	0.021226781	0.001047152

Grading Phase

On-Site Number of Trips and Trip Length

Vehicle	No. of One-Way Trips/Day	One-Way Trip Length (miles)
Haul Truck[n]	1	0.1
Water Truck[o]	3	1.9

Incremental Increase in Onsite Combustion Emissions from Construction Equipmen

Equation: Emission Factor (lb/hr) x No. of Equipment x Work Day (hr/day) = Onsite Construction Emissions (lb/day)

Equipment Type	CO lb/day	NOx lb/day	PM10 lb/day
Rubber Tired Dozers	6.25	13.37	0.55
Graders	3.56	5.88	0.29
Tractors/Loaders/Backhoes	2.60	3.15	0.21
Total	**12.4**	**22.4**	**1.1**

Incremental Increase in Fugitive Dust Emissions from Construction Operation:

Equations:

Grading[p]: PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMTx (1 - control efficiency)

Storage Piles[q]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[r] PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton)
(1 - control efficiency)

Description	Control Efficiency %	Unmitigated PM10[s] lb/day
Earthmoving	61	0.00
Storage Piles	61	0.01
Material Handling	61	0.00
Total		**0.01**

Grading Phase

Incremental Increase in Onsite Travel Emissions from Onroad Mobile Equipmen

Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Mobile Emissions (lb/day)

	CO	NOx	PM10
Vehicle	lb/day	lb/day	lb/day
Haul Truck	0.0015	0.0042	0.0002
Water Truck	0.0874	0.2420	0.0119
	0.089	**0.246**	**0.012**

Total Incremental Localized Emissions from Construction Activitie

	CO	NOx	PM10
Sources	lb/day	lb/day	lb/day
On-site Emissions	**12.5**	**22.6**	**1.1**

Combustion and Fugitive Summary	**PM2.5 Fraction**[t]	**PM10**	**PM2.5**
		lb/day	lb/day
Combustion (Offroad)	0.92	1.06	0.97
Combustion (Onroad)	0.96	0.012	0.012
Fugitive	0.21	0.01	0.002
Total		**1.1**	**1.0**

Notes:

a) Based on information provided by applicant and URBEMIS defaults.
b) Equipment name match CARB Off-Road Model equipment name for look-up purposes.
c) SCAB values provided by the ARB, Oct 2006. Assumed equipment is diesel fueled.
d) Caterpillar Performance Handbook, Edition 33, October 2003 Operating Speeds, p 2-3.
e) Assumed 13 foot wide blade with 2 foot overlap (11 foot wide). Vehicle miles traveled (VMT) = (58,370 sq ft/11 foot x mile/5,280 ft)/80 days = 0.01 mile
f) USEPA, AP-42, July 1998, Table 11.9-3 Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations
g) Table A9-9-E2, SCAQMD CEQA Air Quality Handbook, 1993
h) Mean wind speed percent - percent of time mean wind speed exceeds 12 mph.
i) Assumed storage piles are 0.02 acres in size
j) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggregate Handling and Storage Piles, p 13.2.4-3 Aerodynamic particle size multiplier for < 10 µm
k) Mean wind speed - maximum of daily average wind speeds reported in 2005-2007 meteorological data for West Los Angeles.
l) Assuming 148 cubic yards of dirt handled [(148 cyd x 2,500 lb/cyd)/80 days = 4,625 lb/day)
m) 2015 fleet year. http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html.
n) Assumed 20 cubic yd truck capacity for 148 cy of dirt [(148 cy x truck/20 cy)/2 days = 1 one-way truck trips/day]. Assumed haul truck travels 0.1 miles through facility
o) Assumed six foot wide water truck traverses over 58,370 square feet of disturbed area
p) USEPA, AP-42, July 1998, Table 11.9-1, Equation for Site Grading ≤ 10 µm
q) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggregate Handling and Storage Piles, Equation 1
r) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, Sept 1992, EPA-450/2-92-004, Equation 2-12

s) Includes watering at least three times a day per Rule 403 (61% control efficiency)
t) ARB's CEIDARS database PM2.5 fractions - construction dust category for fugitive and diesel vehicle exhaust category for combustion.

Demolition Phase

Santa Monica College		**Construction Activity**		
Drescher Hall		Demolition of Existing	34,402	Square Foot Structure[a]
Demolition Schedule -	**25**	**days[a]**		

Equipment Type[a,b]	**No. of Equipment**	**hr/day**	**Crew Size**
Concrete/Industrial Saws	1	8.0	5
Rubber Tired Dozers	1	1.0	
Tractors/Loaders/Backhoes	2	6.0	

Construction Equipment Emission Factors

	CO	**NOx**	**PM10**
Equipment Type[c]	lb/hr	lb/hr	lb/hr
Concrete/Industrial Saws	0.403	0.527	0.041
Rubber Tired Dozers	1.106	2.382	0.099
Tractors/Loaders/Backhoes	0.375	0.497	0.034

Building Dimensions

Description[a]	**Width of Building**	**Length of Building**	**Height of Building**
	ft	ft	ft
Total Project	157	157	12

Fugitive Dust Material Handling

Aerodynamic Particle Size Multiplier[d]	**Mean Wind Speed[e]**	**Moisture Content[f]**	**Debris Handled[g]**
	mph		ton/day
0.35	2.77	2.0	63

Construction Vehicle (Mobile Source) Emission Factors

	CO	**NOx**	**PM10**
	lb/mile	lb/mile	lb/mile
Heavy-Duty Truck[h]	0.008464	0.024180	0.001185

Demolition Phase

Construction Worker Number of Trips and Trip Length

Vehicle	No. of One-Way Trips/Day[i]	One-Way Trip Length[j] (miles)
Haul Truck	4	0.1

Incremental Increase in Onsite Combustion Emissions from Construction Equipment

Equation: Emission Factor (lb/BHP-hr) x No. of Equipment x Work Day (hr/day) x Equipment rating (hp) x Load Factor (%/100) = Onsite Construction Emissions (lb/day)

Equipment Type	CO lb/day	NOx lb/day	PM10 lb/day
Concrete/Industrial Saws	3.23	4.21	0.33
Rubber Tired Dozers	1.11	2.38	0.10
Tractors/Loaders/Backhoes	4.50	5.97	0.41
Total	**8.8**	**12.6**	**0.8**

Incremental Increase in Onsite Fugitive Dust Emissions from Construction Equipment

Material Handling[k]: (0.0032 x Aerodynamic Particle Size Multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x debris handled (ton/day)) x (1 - control efficiency) = PM10 Emissions (lb/day)

Description	Control Efficiency %	PM10 Mitigated[m] lb/day
Material Handling (Demolition)[l]	61	0.01
Material Handling (Debris)	61	0.01
Total		**0.02**

Incremental Increase in Onsite Combustion Emissions from Onroad Mobile Vehicles

Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Mobile Emissions (lb/day)

Vehicle	CO lb/day	NOx lb/day	PM10 lb/day
Haul Truck	0.01	0.02	0.001
Total	**0.01**	**0.02**	**0.001**

Demolition Phase

Total Incremental Localized Emissions from Construction Activities

Sources	CO lb/day	NOx lb/day	PM10 lb/day
On-site Emissions (Mitigated)	**8.8**	**12.6**	**0.9**

Combustion and Fugitive Summary	PM2.5 Fraction[n]	PM10 lb/day	PM2.5 lb/day
Combustion (Offroad)	0.92	0.84	0.77
Combustion (Onroad)	0.96	0.001	0.001
Fugitive	0.21	0.020	0.004
Total		**0.9**	**0.8**

Notes:

a) Based on information provided by applicant and URBEMIS defaults.

b) Equipment name match CARB Off-Road Model equipment name for look-up purposes.

c) SCAB values provided by the ARB, Oct 2006. Assumed equipment is diesel fueled.

d) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggregate Handling and Storage Piles, p 13.2.4-3 Aerodynamic particle size multiplier for < 10 µm

e) Mean wind speed - maximum of daily average wind speeds reported in 2005-2007 meteorological data for West Los Angeles.

f) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, equation 2-13, p 2-28

g) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, p 2-28. Debris weight to area ratio = 0.046 ton/sq ft
(34,402 sq ft x 0.046 ton/sq ft)/25 days = 63.29968 ton/day

h) 2014 fleet year. http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html.

i) Assumed 20 cubic yd truck capacity [(63.29968 tons/day x 2,000 lb/ton x cyd/1,620 lb = 78 cyd)/20 cyd/truck = 4 one-way truck trips/day, where building debris density is assumed to be 1,620 lb/cyd]
Multiple trucks may be used.

j) Assumed trucks travel 0.1 mile through project site.

k) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, equation 2-13, p 2-28.

l) EPA suggests using the material handling equation for demolition emission estimates.

m) Includes watering at least three times a day per Rule 403 (61% control efficiency)

n) ARB's CEIDARS database PM2.5 fractions - construction dust category for fugitive and diesel vehicle exhaust category for combustion.

Grading Phase

Santa Monica College		**Construction Activity**		
Drescher Hall		Grading	169,400	Square Feet[a]
Site Preparation Schedule -	61	**days[a]**		

Equipment Type[a,b]	**No. of Equipment**	**hr/day**	**Crew Size**
Rubber Tired Dozers	1	8.0	5
Graders	1	8.0	
Tractors/Loaders/Backhoes	2	8.0	

Construction Equipment Emission Factors

	CO	**NOx**	**PM10**
Equipment Type[c]	lb/hr	lb/hr	lb/hr
Rubber Tired Dozers	1.106	2.382	0.099
Graders	0.599	1.080	0.054
Tractors/Loaders/Backhoes	0.375	0.497	0.034

Fugitive Dust Grading Parameters

Vehicle Speed (mph)[d]	**Vehicle Miles Traveled[e]**
3	0.05

Fugitive Dust Stockpiling Parameters

Silt Content[f]	**Precipitation Days[g]**	**Mean Wind Speed Percent[h]**	**TSP Fraction**	**Area[i] (acres)**
6.9	10	2.5	0.5	0.16

Fugitive Dust Material Handling

Aerodynamic Particle Size Multiplier[j]	**Mean Wind Speed[k]**	**Moisture Content[f]**	**Dirt Handled[a]**	**Dirt Handled[l]**
	mph		cy	lb/day
0.35	2.77	7.9	1,111	45,533

Construction Vehicle (Mobile Source) Emission Factors

	CO	**NOx**	**PM10**
	lb/mile	lb/mile	lb/mile
Heavy-Duty Truck[m]	0.008464	0.024180	0.001185

Grading Phase

Construction Worker Number of Trips and Trip Length

Vehicle	No. of One-Way Trips/Day	One-WayTrip Length (miles)
Haul Truck[n]	1	0.1
Water Truck[o]	3	5.4

Incremental Increase in Onsite Combustion Emissions from Construction Equipment

Equation: Emission Factor (lb/BHP-hr) x No. of Equipment x Work Day (hr/day) x Equipment rating (hp) x Load Factor (%/100) = Onsite Construction Emissions (lb/day)

Equipment Type	CO lb/day	NOx lb/day	PM10 lb/day
Rubber Tired Dozers	8.85	19.06	0.79
Graders	4.79	8.64	0.43
Tractors/Loaders/Backhoes	5.99	7.96	0.55
Total	**19.6**	**35.7**	**1.77**

Incremental Increase in Fugitive Dust Emissions from Construction Operations

Equations:

Grading[p]: PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMT x (1 - control efficiency)

Storage Piles[q]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[r]: PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton)
(1 - control efficiency)

Description	Control Efficiency %	PM10[s] lb/day
Earthmoving	61	0.01
Storage Piles	61	0.06
Material Handling	61	0.00
Total		**0.07**

Grading Phase

Incremental Increase in Onsite Combustion Emissions from Onroad Mobile Vehicle

Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Mobile Emissions (lb/day)

Vehicle	CO lb/day	NOx lb/day	PM10 lb/day
Haul Truck	0.00	0.00	0.00
Water Truck	0.27	0.78	0.04
Total	**0.27**	**0.78**	**0.04**

Total Incremental Localized Emissions from Construction Activities

Sources	CO lb/day	NOx lb/day	PM10 lb/day
On-site Emissions	**19.9**	**36.4**	**1.9**

Combustion and Fugitive Summary	PM2.5 Fraction[t]	PM10 lb/day	PM2.5 lb/day
Combustion (Offroad)	0.92	1.77	1.63
Combustion (Onroad)	0.96	0.04	0.04
Fugitive	0.21	0.070	0.015
Total		**1.9**	**1.7**

Notes:

a) Based on information provided by applicant and URBEMIS defaults.
b) Equipment name match CARB Off-Road Model equipment name for look-up purposes.
c) SCAB values provided by the ARB, Oct 2006. Assumed equipment is diesel fueled.
d) Caterpillar Performance Handbook, Edition 33, October 2003 Operating Speeds, p 2-3.
e) Assumed 13 foot wide blade with 2 foot overlap (11 foot wide). Vehicle miles traveled (VMT) = (169,400 sq ft/11 foot x mile/5,280 ft)/ 61 days = 0.05 miles
f) USEPA, AP-42, July 1998, Table 11.9-3 Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations
g) Table A9-9-E2, SCAQMD CEQA Air Quality Handbook, 1993
h) Mean wind speed percent - percent of time mean wind speed exceeds 12 mph.
i) Assumed storage piles are 0.16 acres in size
j) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggregate Handling and Storage Piles, p 13.2.4-3 Aerodynamic particle size multiplier for < 10 µm
k) Mean wind speed - maximum of daily average wind speeds reported in 2005-2007 meteorological data for West Los Angeles.
l) Assuming 1,111 cubic yards of dirt handled [(1,111 cyd x 2,500 lb/cyd)/61 days = 45,533 lb/day]
m) 2014 fleet year. http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html.
n) Assumed 20 cubic yd truck capacity for 1,111 cyd of dirt [(1,111 cy x truck/20 cy)/61 days = 1 one-way truck trips/day]. Assumed haul truck travels 0.1 miles through facility. Multiple trucks may be used.
o) Assumed six foot wide water truck traverses over 169,400 square feet of disturbed area
p) USEPA, AP-42, July 1998, Table 11.9-1, Equation for Site Grading ≤ 10 µm
q) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, Sept 1992, EPA-450/2-92-004, Equation 2-12
r) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggregate Handling and Storage Piles, Equation 1

s) Includes watering at least three times a day per Rule 403 (61% control efficiency).
t) ARB's CEIDARS database PM2.5 fractions - construction dust category for fugitive and diesel vehicle exhaust category for combustion.

Structure Construction

Santa Monica College	**Construction Activity**		
Drescher Hall	Building	7,100	Square Foot Structure[a]
Construction Schedule Unknown			

Equipment Type[a,b]	**No. of Equipment**	**hr/day**	**Crew Size**
Forklifts	2	6.0	10
Cranes	1	6.0	
Tractors/Loaders/Backhoes	1	8.0	
Generator Sets	1	8.0	
Electric Welders	3	8.0	

Construction Equipment Combustion Emission Factors

	CO	**NOx**	**PM10**
Equipment Type[c]	lb/hr	lb/hr	lb/hr
Forklifts	0.221	0.355	0.018
Cranes	0.455	1.106	0.047
Tractors/Loaders/Backhoes	0.375	0.497	0.034
Generator Sets	0.297	0.508	0.030
Electric Welders	N/A	N/A	N/A

Construction Vehicle (Mobile Source) Emission Factors

	CO	**NOx**	**PM10**
	lb/mile	lb/mile	lb/mile
Heavy-Duty Truck[d]	0.008464	0.024180	0.001185

Construction Worker Number of Trips and Trip Length

Vehicle	**No. of One-Way Trips/Day**	**Trip Length (miles)**
Flatbed Truck[a,e]	30	0.1
Water Truck[f]	3	5.6

Structure Construction

Incremental Increase in Onsite Combustion Emissions from Construction Equipment

Equation: Emission Factor (lb/BHP-hr) x No. of Equipment x Work Day (hr/day) x Equipment rating (hp) x Load Factor (%/100) = Onsite Construction Emissions (lb/day)

Equipment Type	CO lb/day	NOx lb/day	PM10 lb/day
Forklifts	2.66	4.26	0.21
Cranes	2.73	6.64	0.28
Tractors/Loaders/Backhoes	3.00	3.98	0.27
Generator Sets	2.38	4.07	0.24
Electric Welders	N/A	N/A	N/A
Total	**10.8**	**18.9**	**1.0**

Incremental Increase in Onsite Combustion Emissions from Onroad Mobile Vehicles

Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Mobile Emissions (lb/day)

Vehicle	CO lb/day	NOx lb/day	PM10 lb/day
Flatbed Truck	0.05	0.15	0.007
Water Truck	0.28	0.81	0.04
Total	**0.33**	**0.96**	**0.05**

Total Incremental Combustion Emissions from Construction Activities

Sources	CO lb/day	NOx lb/day	PM10 lb/day
On-Site Emissions	**11.1**	**19.9**	**1.0**

Combustion and Fugitive Summary	**PM2.5 Fraction**[g]	**PM10** lb/day	**PM2.5** lb/day
Combustion (Offroad)	0.92	1.00	0.92
Combustion (Onroad)	0.96	0.047	0.045
Fugitive	0.21	0.000	0.000
Total		**1.0**	**1.0**

Notes:

a) Based on information provided by applicant and URBEMIS defaults.

b) Equipment name match CARB Off-Road Model equipment name for look-up purposes.

c) SCAB values provided by the ARB, Oct 2006. Assumed equipment is diesel fueled except the welders which are powered by the generator.

d) 2014 fleet year. http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html.

e) Assumed haul truck travels 0.1 miles through facility

f) Assumed six foot wide water truck traverses over 175,000 square feet of disturbed area

g) ARB's CEIDARS database PM2.5 fractions - construction dust category for fugitive and diesel vehicle exhaust category for combustion.

Architectural Coating and Asphalt Paving

Santa Monica College	**Construction Activity**
Drescher Hall	Architectural Coating and Asphalt Paving of Parking Lot
Construction Schedule - **22**	**days[a]**

Equipment Type[a,b]	No. of Equipment	hr/day	Crew Size
Pavers	1	7.00	10
Paving Equipment	1	8.00	
Rollers	1	7.00	
Cement and Mortar Mixers	4	6.00	
Tractors/Loaders/Backhoes	1	7.00	

Construction Equipment Combustion Emission Factors

	CO	NOx	PM10
Equipment Type[c]	lb/hr	lb/hr	lb/hr
Pavers	0.520	0.761	0.053
Paving Equipment	0.423	0.684	0.047
Rollers	0.398	0.570	0.039
Cement and Mortar Mixers	0.042	0.055	0.002
Tractors/Loaders/Backhoes	0.372	0.450	0.030

Construction Vehicle (Mobile Source) Emission Factors

	CO	NOx	PM10
	lb/mile	lb/mile	lb/mile
Heavy-Duty Truck[d]	0.007669	0.021227	0.001047

Construction Worker Number of Trips and Trip Length

Vehicle	No. of One-Way Trips/Day	Trip Length (miles)
Delivery Truck[e]	9	0.1
Water Truck[f]	3	5.6

Architectural Coating and Asphalt Paving

Incremental Increase in Onsite Combustion Emissions from Construction Equipment

Equation: Emission Factor (lb/BHP-hr) x No. of Equipment x Work Day (hr/day) x Equipment rating (hp) x Load Factor (%/100) = Onsite Construction Emissions (lb/day

	CO	**NOx**	**PM10**
Equipment Type	lb/day	lb/day	lb/day
Pavers	3.64	5.32	0.37
Paving Equipment	3.39	5.47	0.38
Rollers	2.79	3.99	0.27
Cement and Mortar Mixers	1.00	1.31	0.06
Tractors/Loaders/Backhoes	2.60	3.15	0.21
Total	**13.42**	**19.25**	**1.28**

Incremental Increase in Onsite Combustion Emissions from Onroad Mobile Vehicles

Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Mobile Emissions (lb/day)

	CO	**NOx**	**PM10**
Vehicle	lb/day	lb/day	lb/day
Offsite (Flatbed Truck)	0.01	0.04	0.00
Water Truck	0.26	0.71	0.04
Total	**0.27**	**0.75**	**0.04**

Total Incremental Combustion Emissions from Construction Activities

	CO	**NOx**	**PM10**
Sources	lb/day	lb/day	lb/day
On-Site Emissions	**13.7**	**20.0**	**1.3**

Combustion and Fugitive Summary	**PM2.5 Fraction**[g]	**PM10**	**PM2.5**
		lb/day	lb/day
Combustion (Offroad)	0.92	1.28	1.18
Combustion (Onroad)	0.96	0.04	0.04
Fugitive	0.21	0.00	0.00
Total		**1.3**	**1.2**

Notes:

a) Based on information provided by applicant and URBEMIS defaults.

b) Equipment name match CARB Off-Road Model equipment name for look-up purposes.

c) SCAB values provided by the ARB, Oct 2006. Assumed equipment is diesel fueled except the welders which are powered by the generator.

d) 2014 fleet year. http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html.

e) Assumed haul truck travels 0.1 miles through facility

f) Assumed six foot wide water truck traverses over 175,000 square feet of disturbed area
g) ARB's CEIDARS database PM2.5 fractions - construction dust category for fugitive and diesel vehicle exhaust category for combustion.

One Acre Site Example - Demolition Phase

Santa Monica College		**Construction Activity**		
Health & PE /Central Plant		Demolition of Existing	24,653	Square Foot Structure[a]
Demolition Schedule	**20**	**days[a]**		

Equipment Type[a,b]	**No. of Equipment**	**hr/day**	**Crew Size**
Concrete/Industrial Saws	1	8.0	5
Tractors/Loaders/Backhoes	2	6.0	
Rubber Tired Dozers	1	1.0	

Construction Equipment Emission Factors

	CO	**NOx**	**PM10**
Equipment Type[c]	lb/hr	lb/hr	lb/hr
Concrete/Industrial Saws	0.415	0.591	0.049
Tractors/Loaders/Backhoes	0.382	0.581	0.044
Rubber Tired Dozers	1.249	2.685	0.114

Building Dimensions

Description[a]	**Width of Building**	**Length of Building**	**Height of Building**
	ft	ft	ft
Total Project	157	157	12

Fugitive Dust Material Handling

Aerodynamic Particle Size Multiplier[d]	**Mean Wind Speed[e]**	**Moisture Content[f]**	**Debris Handled[g]**
	mph		ton/day
0.35	2.77	2.0	57

Construction Vehicle (Mobile Source) Emission Factors

	CO	**NOx**	**PM10**
	lb/mile	lb/mile	lb/mile
Heavy-Duty Truck[h]	0.010215194	0.03092379	0.001496

One Acre Site Example - Demolition Phase

On-Site Number of Trips and Trip Length

Vehicle	No. of One-Way Trips/Day[i]	One-Way Trip Lengthj (miles)
Haul Truck	4	0.1

Incremental Increase in Onsite Combustion Emissions from Construction Equipment

Equation: Emission Factor (lb/hr) x No. of Equipment x Work Day (hr/day) = Onsite Construction Emissions (lb/day)

Equipment Type	CO lb/day	NOx lb/day	PM10 lb/day
Concrete/Industrial Saws	3.32	4.73	0.39
Tractors/Loaders/Backhoes	4.59	6.98	0.52
Rubber Tired Dozers	1.25	2.69	0.11
Total	**9.16**	**14.39**	**1.03**

Incremental Increase in Onsite Fugitive Dust Emissions from Construction Equipment

Material Handling[k]: (0.0032 x Aerodynamic Particle Size Multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x debris handled (ton/day)) x (1 - control efficiency) = PM10 Emissions (lb/day)

Description	Control Efficiency %	PM10[m] lb/day
Material Handling (Demolition)[l]	61	0.01
Material Handling (Debris)	61	0.01
Total		**0.02**

Incremental Increase in Onsite Combustion Emissions from Onroad Mobile Vehicles

Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Mobile Emissions (lb/day)

Vehicle	CO lb/day	NOx lb/day	PM10 lb/day
Haul Truck	0.01	0.02	0.001
Total	**0.01**	**0.02**	**0.001**

One Acre Site Example - Demolition Phase

Total Incremental Localized Emissions from Construction Activities			
	CO	**NOx**	**PM10**
Sources	lb/day	lb/day	lb/day
On-site Emissions	**9.2**	**14.4**	**1.0**
Significance Threshold[n]	***151***	***103***	***4***
Exceed Significance?	**NO**	**NO**	**NO**

Combustion and Fugitive Summary	**PM2.5 Fraction**[o]	**PM10**	**PM2.5**
		lb/day	lb/day
Combustion (Offroad)	0.92	1.03	0.95
Combustion (Onroad)	0.96	0.001	0.001
Fugitive	0.21	0.020	0.004
Total		**1.0**	**1.0**
Significance Threshold[n]			**3**
Exceed Significance?			**NO**

Notes:

Project specific data may be entered into shaded cells. Changing the values in the shaded cells will not affect the integrity of the worksheets. Verify that units of values entered match units for cell.
Adding lines or entering values with units different than those associated with the shaded cells may alter the integrity of the sheets or produce incorrect results.

a) SCAQMD, estimated from survey data, Sept 2004

b) Equipment name must match CARB Off-Road Model (see Off-Road Model EF worksheet) equipment name for sheet to look up EFs automatically.

c) SCAB values provided by the ARB, Oct 2006. Assumed equipment is diesel fueled.

d) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggregate Handling and Storage Piles, p 13.2.4-3 Aerodynamic particle size multiplier for < 10 µm

e) Mean wind speed - maximum of daily average wind speeds reported in 1981 meteorological data.

f) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, equation 2-13, p 2-28

g) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, p 2-28. Debris weight to area ratio = 0.046 ton/sq ft
(24,653 sq ft x 0.046 ton/sq ft)/20 days = 57 ton/day

h) 2009 fleet year. http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html.

i) Assumed 30 cubic yd truck capacity [(57 ton/day x 2,000 lb/ton x cyd/1,620 lb = 70 cyd)/30 cyd/truck = 4 one-way truck trips/day, building debris density is assumed to be 1,620 lb/cyd]
Multiple trucks can be used.

j) Assumed trucks travel 0.1 mile through project site.

k) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, equation 2-13, p 2-28.

l) EPA suggests using the material handling equation for demolition emission estimates.

m) Includes watering at least three times a day per Rule 403 (61% control efficiency)

n) For illustration purposes only, this analysis is based on the most stringent LSTs. Please consult App. C of the Methodology Paper for applicable LSTs.

o) ARB's CEIDARS database PM2.5 fractions - construction dust category for fugitive and diesel vehicle exhaust category for combustion.

One Acre Site Example - Grading Phase

Santa Monica College		Construction Activity		
Health & PE /Central Plant		Grading	55,320	Square Feet[a]
Grading Schedule -	**67**	**days[a]**		

Equipment Type[a,b]	No. of Equipment	hr/day	Crew Size
Rubber Tired Dozers	1	6.0	4
Graders	1	6.0	
Tractors/Loaders/Backhoes	1	7.0	

Construction Equipment Emission Factors

Equipment Type[c]	CO lb/hr	NOx lb/hr	PM10 lb/hr
Rubber Tired Dozers	1.249	2.685	0.114
Graders	0.613	1.250	0.065
Tractors/Loaders/Backhoes	0.382	0.581	0.044

Fugitive Dust Grading Parameters

Vehicle Speed (mph)[d]	Vehicle Miles Traveled[e]
3	0.01

Fugitive Dust Stockpiling Parameters

Silt Content[f]	Precipitation Days[g]	Mean Wind Speed Percent[h]	TSP Fraction	Area[j] (acres)
6.9	10	2.5	0.5	0.02

Fugitive Dust Material Handling

Aerodynamic Particle Size Multiplier[j]	Mean Wind Speed[k] mph	Moisture Content[f]	Dirt Handled[a] cy	Dirt Handled[l] lb/day
0.35	2.77	7.9	148	5,522

Construction Vehicle (Mobile Source) Emission Factors

	CO lb/mile	NOx lb/mile	PM10 lb/mile
Heavy-Duty Truck[m]	0.010215194	0.03092379	0.001496

One Acre Site Example - Grading Phase

On-Site Number of Trips and Trip Length

Vehicle	No. of One-Way Trips/Day	One-Way Trip Length (miles)
Haul Truck[n]	1	0.1
Water Truck[o]	3	1.8

Incremental Increase in Onsite Combustion Emissions from Construction Equipmen

Equation: Emission Factor (lb/hr) x No. of Equipment x Work Day (hr/day) = Onsite Construction Emissions (lb/day)

	CO	NOx	PM10
Equipment Type	lb/day	lb/day	lb/day
Rubber Tired Dozers	7.49	16.11	0.68
Graders	3.68	7.50	0.39
Tractors/Loaders/Backhoes	2.68	4.07	0.30
Total	**13.8**	**27.7**	**1.4**

Incremental Increase in Fugitive Dust Emissions from Construction Operation

Equations:

Grading[p]: PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMTx (1 - control efficiency)

Storage Piles[q]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[r] PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton) (1 - control efficiency)

Description	Control Efficiency %	Unmitigated PM10[s] lb/day
Earthmoving	61	0.00
Storage Piles	61	0.01
Material Handling	61	0.00
Total		**0.01**

One Acre Site Example - Grading Phase

Incremental Increase in Onsite Travel Emissions from Onroad Mobile Equipmen			
Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Mobile Emissions (lb/day)			
	CO	**NOx**	**PM10**
Vehicle	lb/day	lb/day	lb/day
Haul Truck	0.0020	0.0062	0.0003
Water Truck	0.1103	0.3340	0.0162
	0.112	**0.340**	**0.016**

Total Incremental Localized Emissions from Construction Activitie			
	CO	**NOx**	**PM10**
Sources	lb/day	lb/day	lb/day
On-site Emissions	**14.0**	**28.0**	**1.4**
Significance Threshold[t]	***151***	***103***	***4***
Exceed Significance?	**NO**	**NO**	**NO**

Combustion and Fugitive Summary	**PM2.5 Fraction**[u]	**PM10**	**PM2.5**
		lb/day	lb/day
Combustion (Offroad)	0.92	1.38	1.27
Combustion (Onroad)	0.96	0.016	0.016
Fugitive	0.21	0.010	0.002
Total		**1.4**	**1.3**
Significance Threshold[t]			**3**
Exceed Significance?			**NO**

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a) SCAQMD, estimated from survey data, Sept 2004

b) Equipment name must match CARB Off-Road Model (see Off-Road Model EF worksheet) equipment name for sheet to look up EFs automatically.

c) SCAB values provided by the ARB, Oct 2006. Assumed equipment is diesel fueled.

d) Caterpillar Performance Handbook, Edition 33, October 2003 Operating Speeds, p 2-3.

e) Assumed 13 foot wide blade with 2 foot overlap (11 foot wide). Vehicle miles traveled (VMT) = (55,320 sq ft/11 foot x mile/5,280 ft)/67 days = 0.01 mile

f) USEPA, AP-42, July 1998, Table 11.9-3 Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations

g) Table A9-9-E2, SCAQMD CEQA Air Quality Handbook, 1993

h) Mean wind speed percent - percent of time mean wind speed exceeds 12 mph. At least one meteorological site recorded wind speeds greater than 12 mph over a 24-hour period in 1981.

i) Assumed storage piles are 0.02 acres in size

j) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggregate Handling and Storage Piles, p 13.2.4-3 Aerodynamic particle size multiplier for < 10 µm

k) Mean wind speed - maximum of daily average wind speeds reported in 1981 meteorological data.

One Acre Site Example - Grading Phase

l) Assuming 148 cubic yards of dirt handled [(148 cyd x 2,500 lb/cyd)/67 days = 5,522 lb/day)
m) 2009 fleet year. http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html.
n) Assumed 30 cubic yd truck capacity for 148 cy of dirt [(148 cy x truck/30 cy)/2 days = 1 one-way truck trips/day]. Assumed haul truck travels 0.1 miles through facility
o) Assumed six foot wide water truck traverses over 55,320 square feet of disturbed area
p) USEPA, AP-42, July 1998, Table 11.9-1, Equation for Site Grading $\leq$ 10 µm
q) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggregate Handling and Storage Piles, Equation 1
r) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, Sept 1992, EPA-450/2-92-004, Equation 2-12
s) Includes watering at least three times a day per Rule 403 (61% control efficiency)
t) For illustration purposes only, this analysis is based on the most stringent LSTs. Please consult App. C of the Methodology Paper for applicable LSTs.
u) ARB's CEIDARS database PM2.5 fractions - construction dust category for fugitive and diesel vehicle exhaust category for combustion.

One Acre Site Example - Structure Construction

Santa Monica College		**Construction Activity**		
Health & PE /Central Plant		Building	38,000	Square Foot Structure[a]

Construction Schedule

Equipment Type[a,b]	**No. of Equipment**	**hr/day**	**Crew Size**
Cranes	1	6.0	8
Forklifts	2	6.0	
Generator Sets	1	6.0	
Welders	1	8.0	
Tractors/Loaders/Backhoes	1	8.0	

Construction Equipment Combustion Emission Factors

	CO	**NOx**	**PM10**
Equipment Type[c]	lb/hr	lb/hr	lb/hr
Cranes	0.495	1.275	0.055
Forklifts	0.226	0.433	0.023
Generator Sets	0.312	0.578	0.035
Welders	0.215	0.270	0.024
Tractors/Loaders/Backhoes	0.382	0.581	0.044

Construction Vehicle (Mobile Source) Emission Factors

	CO	**NOx**	**PM10**
	lb/mile	lb/mile	lb/mile
Heavy-Duty Truck[d]	0.010215194	0.03092379	0.001496

On-Site Number of Trips and Trip Length

Vehicle	**No. of One-Way Trips/Day**	**One-Way Trip Length (miles)**
Haul Trucks[e]	3	0.1
Water Truck[f]	3	1.3

One Acre Site Example - Structure Construction

Incremental Increase in Onsite Idling Emissions from Onroad Mobile Vehicles

Equation: Emission Factor (lb/hr) x No. of Equipment x Work Day (hr/day) = Onsite Construction Emissions (lb/day)

	CO	NOx	PM10
Equipment Type	lb/day	lb/day	lb/day
Cranes	2.97	7.65	0.33
Forklifts	2.71	5.19	0.28
Generator Sets	1.87	3.47	0.21
Welders	1.72	2.16	0.19
Tractors/Loaders/Backhoes	3.06	4.65	0.35
Total	**12.33**	**23.12**	**1.36**

Incremental Increase in Onsite Combustion Emissions from Onroad Mobile Vehicles

Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Mobile Emissions (lb/day)

	CO	NOx	PM10
Vehicle	lb/day	lb/day	lb/day
Flatbed Trucks	0.006	0.019	0.0009
Water Trucks	0.080	0.241	0.012
Total	**0.09**	**0.26**	**0.013**

Total Incremental Combustion Emissions from Construction Activities

	CO	NOx	PM10
Sources	lb/day	lb/day	lb/day
On-Site Emissions	**12.4**	**23.4**	**1.4**
Significance Threshold[g]	***151***	***103***	***4***
Exceed Significance?	**NO**	**NO**	**NO**

Combustion and Fugitive Summary	**PM2.5 Fraction**[h]	**PM10**	**PM2.5**
		lb/day	lb/day
Combustion (Offroad)	0.92	1.36	1.25
Combustion (Onroad)	0.96	0.013	0.012
Fugitive	0.21	0	0
Total		**1.4**	**1.3**
Significance Threshold[g]			**3**

One Acre Site Example - Structure Construction

Exceed Significance?	**NO**

One Acre Site Example - Structure Construction

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a) SCAQMD, estimated from survey data, Sept 2004

b) Equipment name must match CARB Off-Road Model (see Off-Road Model EF worksheet) equipment name for sheet to look up EFs automatically.

c) SCAB values provided by the ARB, Oct 2006. Assumed equipment is diesel fueled.

d) 2009 fleet year. http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html.

e) Assumed haul truck travels 0.1 miles through facility

f) Assumed six foot wide water truck traverses over 40,000 square feet of disturbed area

g) For illustration purposes only, this analysis is based on the most stringent LSTs. Please consult App. C of the Methodology Paper for applicable LSTs.

h) ARB's CEIDARS database PM2.5 fractions - construction dust category for fugitive and diesel vehicle exhaust category for combustion.

One Acre Site Example - Architectural Coating and Asphalt Paving

Santa Monica College		**Construction Activity**	
Health & PE /Central Plant		Architectural Coating and Asphalt Paving of Parking Lot	
Construction Schedule	**22**	**days[a]**	

Equipment Type[a,b]	**No. of Equipment**	**hr/day**	**Crew Size**
Pavers	1	7.0	9
Cement and Mortar Mixers	4	6.0	
Rollers	1	7.0	
Tractors/Loaders/Backhoes	1	7.0	

Construction Equipment Combustion Emission Factors

	CO	**NOx**	**PM10**
Equipment Type[c]	lb/hr	lb/hr	lb/hr
Pavers	0.528	0.811	0.056
Cement and Mortar Mixers	0.042	0.055	0.002
Rollers	0.402	0.616	0.042
Tractors/Loaders/Backhoes	0.375	0.497	0.034

Construction Vehicle (Mobile Source) Emission Factors

	CO	**NOx**	**PM10**
	lb/mile	lb/mile	lb/mile
Heavy-Duty Truck[d]	0.008464355	0.024180487	0.001185

On-Site Number of Trips and Trip Length

Vehicle	**No. of One-Way Trips/Day**	**One-Way Trip Length (miles)**
Delivery Truck[e]	3	0.1
Water Truck[f]	3	1.3

One Acre Site Example - Architectural Coating and Asphalt Paving

Incremental Increase in Onsite Idling Emissions from Onroad Mobile Vehicles

Equation: Emission Factor (lb/hr) x No. of Equipment x Work Day (hr/day) = Onsite Construction Emissions (lb/day)

	CO	NOx	PM10
Equipment Type	lb/day	lb/day	lb/day
Pavers	3.69	5.68	0.39
Cement and Mortar Mixers	9.64	14.79	1.01
Rollers	0.29	0.38	0.02
Tractors/Loaders/Backhoes	2.62	3.48	0.24
Total	**16.25**	**24.34**	**1.66**

Incremental Increase in Offsite Combustion Emissions from Construction Vehicles

Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Mobile Emissions (lb/day)

	CO	NOx	PM10
Vehicle	lb/day	lb/day	lb/day
Flatbed Truck	0.005	0.015	0.0007
Water Truck	0.066	0.189	0.0092
Total	**0.071**	**0.203**	**0.0100**

Total Incremental Combustion Emissions from Construction Activities

	CO	NOx	PM10
Sources	lb/day	lb/day	lb/day
On-Site Emissions	**16.3**	**24.5**	**1.7**
Significance Threshold[g]	***151***	***103***	***4***
Exceed Significance?	**NO**	**NO**	**NO**

Combustion and Fugitive Summary	**PM2.5 Fraction[h]**	**PM10**	**PM2.5**
		lb/day	lb/day
Combustion (Offroad)	0.92	1.66	1.52
Combustion (Onroad)	0.96	0.010	0.010
Fugitive	0.21	0	0
Total		**1.7**	**1.5**
Significance Threshold[g]			**3**

One Acre Site Example - Architectural Coating and Asphalt Paving

Exceed Significance?	**NO**

One Acre Site Example - Architectural Coating and Asphalt Paving

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a) SCAQMD, estimated from survey data, Sept 2004

b) Equipment name must match CARB Off-Road Model (see Off-Road Model EF worksheet) equipment name for sheet to look up EFs automatically.

c) SCAB values provided by the ARB, Oct 2006. Assumed equipment is diesel fueled.

d) 2009 fleet year. http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html.

e) Assumed haul truck travels 0.1 miles through facility

f) Assumed six foot wide water truck traverses over 40,000 square feet of disturbed area

g) For illustration purposes only, this analysis is based on the most stringent LSTs. Please consult App. C of the Methodology Paper for applicable LSTs.

h) ARB's CEIDARS database PM2.5 fractions - construction dust category for fugitive and diesel vehicle exhaust category for combustion.

One Acre Site Example - Demolition Phase

Santa Monica College		**Construction Activity**		
Math Demo		Demolition of Existing	36,752	Square Foot Structure[a]
Demolition Schedule	**22**	**days[a]**		

Equipment Type[a,b]	**No. of Equipment**	**hr/day**	**Crew Size**
Concrete/Industrial Saws	1	8.0	5
Tractors/Loaders/Backhoes	2	6.0	
Rubber Tired Dozers	1	1.0	

Construction Equipment Emission Factors

	CO	**NOx**	**PM10**
Equipment Type[c]	lb/hr	lb/hr	lb/hr
Concrete/Industrial Saws	0.394	0.459	0.034
Tractors/Loaders/Backhoes	0.369	0.406	0.026
Rubber Tired Dozers	0.983	2.082	0.086

Building Dimensions

Description[a]	**Width of Building**	**Length of Building**	**Height of Building**
	ft	ft	ft
Total Project	192	192	12

Fugitive Dust Material Handling

Aerodynamic Particle Size Multiplier[d]	**Mean Wind Speed[e]**	**Moisture Content[f]**	**Debris Handled[g]**
	mph		ton/day
0.35	2.77	2.0	77

Construction Vehicle (Mobile Source) Emission Factors

	CO	**NOx**	**PM10**
	lb/mile	lb/mile	lb/mile
Heavy-Duty Truck[h]	0.007046038	0.01887374	0.000944

One Acre Site Example - Demolition Phase

On-Site Number of Trips and Trip Length

Vehicle	No. of One-Way Trips/Day[i]	One-Way Trip Lengthj (miles)
Haul Truck	5	0.1

Incremental Increase in Onsite Combustion Emissions from Construction Equipment

Equation: Emission Factor (lb/hr) x No. of Equipment x Work Day (hr/day) = Onsite Construction Emissions (lb/day)

Equipment Type	CO lb/day	NOx lb/day	PM10 lb/day
Concrete/Industrial Saws	3.15	3.67	0.27
Tractors/Loaders/Backhoes	4.43	4.88	0.31
Rubber Tired Dozers	0.98	2.08	0.09
Total	**8.56**	**10.63**	**0.66**

Incremental Increase in Onsite Fugitive Dust Emissions from Construction Equipment

Material Handling[k]: (0.0032 x Aerodynamic Particle Size Multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x debris handled (ton/day)) x (1 - control efficiency) = PM10 Emissions (lb/day)

Description	Control Efficiency %	PM10[m] lb/day
Material Handling (Demolition)[l]	61	0.02
Material Handling (Debris)	61	0.02
Total		**0.04**

Incremental Increase in Onsite Combustion Emissions from Onroad Mobile Vehicles

Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Mobile Emissions (lb/day)

Vehicle	CO lb/day	NOx lb/day	PM10 lb/day
Haul Truck	0.01	0.02	0.001
Total	**0.01**	**0.02**	**0.001**

One Acre Site Example - Demolition Phase

Total Incremental Localized Emissions from Construction Activities

Sources	CO lb/day	NOx lb/day	PM10 lb/day
On-site Emissions	**8.6**	**10.6**	**0.7**
Significance Threshold[n]	***151***	***103***	***4***
Exceed Significance?	**NO**	**NO**	**NO**

Combustion and Fugitive Summary	PM2.5 Fraction[o]	PM10 lb/day	PM2.5 lb/day
Combustion (Offroad)	0.92	0.66	0.61
Combustion (Onroad)	0.96	0.001	0.001
Fugitive	0.21	0.04	0.01
Total		**0.7**	**0.6**
Significance Threshold[n]			**3**
Exceed Significance?			**NO**

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a) SCAQMD, estimated from survey data, Sept 2004

b) Equipment name must match CARB Off-Road Model (see Off-Road Model EF worksheet) equipment name for sheet to look up EFs automatically.

c) SCAB values provided by the ARB, Oct 2006. Assumed equipment is diesel fueled.

d) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggregate Handling and Storage Piles, p 13.2.4-3 Aerodynamic particle size multiplier for < 10 µm

e) Mean wind speed - maximum of daily average wind speeds reported in 1981 meteorological data.

f) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, equation 2-13, p 2-28

g) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, p 2-28. Debris weight to area ratio = 0.046 ton/sq ft
(36,752 sq ft x 0.046 ton/sq ft)/22 days = 77 ton/day

h) 2009 fleet year. http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html.

i) Assumed 30 cubic yd truck capacity [(77 ton/day x 2,000 lb/ton x cyd/1,620 lb = 95 cyd)/30 cyd/truck = 5 one-way truck trips/day, building debris density is assumed to be 1,620 lb/cyd]
Multiple trucks can be used.

j) Assumed trucks travel 0.1 mile through project site.

k) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, equation 2-13, p 2-28.

l) EPA suggests using the material handling equation for demolition emission estimates.

m) Includes watering at least three times a day per Rule 403 (61% control efficiency)

n) For illustration purposes only, this analysis is based on the most stringent LSTs. Please consult App. C of the Methodology Paper for applicable LSTs.

o) ARB's CEIDARS database PM2.5 fractions - construction dust category for fugitive and diesel vehicle exhaust category for combustion.

Four Acre Site Example - Demolition Phase

Santa Monica College		**Construction Activity**		
Math and Science		Demolition of Existing	88,343	Square Foot Structure[a]
Demolition Schedule -	**20**	**days[a]**		

Equipment Type[a,b]	**No. of Equipment**	**hr/day**	**Crew Size**
Concrete/Industrial Saws	1	8.0	4
Rubber Tired Dozers	1	1.0	
Tractors/Loaders/Backhoes	2	6.0	

Construction Equipment Emission Factors

	CO	**NOx**	**PM10**
Equipment Type[c]	lb/hr	lb/hr	lb/hr
Concrete/Industrial Saws	0.403	0.527	0.041
Rubber Tired Dozers	1.106	2.382	0.099
Tractors/Loaders/Backhoes	0.375	0.497	0.034

Building Dimensions

Description[a]	**Width of Building**	**Length of Building**	**Height of Building**
	ft	ft	ft
Total Project	297	297	12

Fugitive Dust Material Handling

Aerodynamic Particle Size Multiplier[d]	**Mean Wind Speed[e]**	**Moisture Content[f]**	**Debris Handled[g]**
	mph		ton/day
0.35	2.77	2.0	203

Construction Vehicle (Mobile Source) Emission Factors

	CO	**NOx**	**PM10**
	lb/mile	lb/mile	lb/mile
Heavy-Duty Truck[h]	0.008464	0.024180	0.001185

Four Acre Site Example - Demolition Phase

Construction Worker Number of Trips and Trip Length

Vehicle	**No. of One-Way Trips/Day**[i]	**One-Way Trip Length**[j] **(miles)**
Haul Truck	13	0.1

Incremental Increase in Onsite Combustion Emissions from Construction Equipment

Equation: Emission Factor (lb/BHP-hr) x No. of Equipment x Work Day (hr/day) x Equipment rating (hp) x Load Factor (%/100) = Onsite Construction Emissions (lb/day)

	CO	**NOx**	**PM10**
Equipment Type	lb/day	lb/day	lb/day
Concrete/Industrial Saws	3.23	4.21	0.33
Rubber Tired Dozers	1.11	2.38	0.10
Tractors/Loaders/Backhoes	4.50	5.97	0.41
Total	**8.8**	**12.6**	**0.8**

Incremental Increase in Onsite Fugitive Dust Emissions from Construction Equipment

Material Handling[k]: (0.0032 x Aerodynamic Particle Size Multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x debris handled (ton/day)) x (1 - control efficiency) = PM10 Emissions (lb/day)

Description	**Control Efficiency**	**PM10 Mitigated**[m]
	%	lb/day
Material Handling (Demolition)[l]	61	0.04
Material Handling (Debris)	61	0.04
Total		**0.08**

Incremental Increase in Onsite Combustion Emissions from Onroad Mobile Vehicles

Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Mobile Emissions (lb/day)

	CO	**NOx**	**PM10**
Vehicle	lb/day	lb/day	lb/day
Haul Truck	0.02	0.06	0.003
Total	**0.02**	**0.06**	**0.003**

Four Acre Site Example - Demolition Phase

Total Incremental Localized Emissions from Construction Activities

Sources	**CO** lb/day	**NOx** lb/day	**PM10** lb/day
On-site Emissions (Mitigated)	**8.8**	**12.6**	**0.9**
Significance Threshold[n]	***350***	***196***	***9***
Exceed Significance?	**NO**	**NO**	**NO**

Combustion and Fugitive Summary	**PM2.5 Fraction[o]**	**PM10**	**PM2.5**
		lb/day	lb/day
Combustion (Offroad)	0.92	0.84	0.77
Combustion (Onroad)	0.96	0.003	0.003
Fugitive	0.21	0.08	0.02
Total		**0.9**	**0.8**
Significance Threshold[n]			**6**
Exceed Significance?			**NO**

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a) SCAQMD, estimated from survey data, Sept 2004

b) Equipment name must match CARB Off-Road Model (see Off-Road Model EF worksheet) equipment name for sheet to look up EFs automatically.

c) SCAB values provided by the ARB, Oct 2006. Assumed equipment is diesel fueled.

d) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggregate Handling and Storage Piles, p 13.2.4-3 Aerodynamic particle size multiplier for < 10 µm

e) Mean wind speed - maximum of daily average wind speeds reported in 1981 meteorological data.

f) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, equation 2-13, p 2-28

g) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, p 2-28. Debris weight to area ratio = 0.046 ton/sq ft
(88,343 sq ft x 0.046 ton/sq ft)/20 days = 203.1889 ton/day

h) 2009 fleet year. http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html.

i) Assumed 30 cubic yd truck capacity [(203.1889 tons/day x 2,000 lb/ton x cyd/1,620 lb = 251 cyd)/30 cyd/truck = 13 one-way truck trips/day, where building debris density is assumed to be 1,620 lb/cyd]
Multiple trucks may be used.

j) Assumed trucks travel 0.1 mile through project site.

k) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, equation 2-13, p 2-28. EPA suggests using the material handling equation for demolition emission estimates.

l) EPA suggests using the material handling equation for demolition emission estimates.

m) Includes watering at least three times a day per Rule 403 (68% control efficiency)

n) Illustration purpose showing the most stringent LSTs. Please consult App. C of the Methodology Paper for applicable LSTs.

o) ARB's CEIDARS database PM2.5 fractions - construction dust category for fugitive and diesel vehicle exhaust category for combustion.

Four Acre Site Example - Grading Phase

Santa Monica College		**Construction Activity**		
Math and Science		Grading	46,170	Square Feet[a]
Site Preparation Schedule -	60	days[a]		

Equipment Type[a,b]	**No. of Equipment**	**hr/day**	**Crew Size**
Rubber Tired Dozers	1	6.0	4
Graders	1	6.0	
Tractors/Loaders/Backhoes	1	7.0	

Construction Equipment Emission Factors

	CO	**NOx**	**PM10**
Equipment Type[c]	lb/hr	lb/hr	lb/hr
Rubber Tired Dozers	1.106	2.382	0.099
Graders	0.599	1.080	0.054
Tractors/Loaders/Backhoes	0.375	0.497	0.034

Fugitive Dust Grading Parameters

Vehicle Speed (mph)[d]	**Vehicle Miles Traveled[e]**
3	0.01

Fugitive Dust Stockpiling Parameters

Silt Content[f]	**Precipitation Days[g]**	**Mean Wind Speed Percent[h]**	**TSP Fraction**	**Area[i] (acres)**
6.9	10	2.5	0.5	0.16

Fugitive Dust Material Handling

Aerodynamic Particle Size Multiplier[j]	**Mean Wind Speed[k]**	**Moisture Content[f]**	**Dirt Handled[a]**	**Dirt Handled[l]**
	mph		cy	lb/day
0.35	2.77	7.9	1,111	46,292

Construction Vehicle (Mobile Source) Emission Factors

	CO	**NOx**	**PM10**
	lb/mile	lb/mile	lb/mile
Heavy-Duty Truck[m]	0.008464	0.024180	0.001185

Four Acre Site Example - Grading Phase

Construction Worker Number of Trips and Trip Length

Vehicle	No. of One-Way Trips/Day	One-WayTrip Length (miles)
Haul Truck[n]	1	0.1
Water Truck[o]	3	1.5

Incremental Increase in Onsite Combustion Emissions from Construction Equipment

Equation: Emission Factor (lb/BHP-hr) x No. of Equipment x Work Day (hr/day) x Equipment rating (hp) x Load Factor (%/100) = Onsite Construction Emissions (lb/day)

	CO	NOx	PM10
Equipment Type	lb/day	lb/day	lb/day
Rubber Tired Dozers	6.64	14.29	0.60
Graders	3.59	6.48	0.32
Tractors/Loaders/Backhoes	2.62	3.48	0.24
Total	**12.8**	**24.3**	**1.16**

Incremental Increase in Fugitive Dust Emissions from Construction Operations

Equations:

Grading[p]: PM10 Emissions (lb/day) = 0.60 x 0.051 x mean vehicle speed$^{2.0}$ x VMT x (1 - control efficiency)

Storage Piles[q]: PM10 Emissions (lb/day) = 1.7 x (silt content/1.5) x ((365-precipitation days)/235) x wind speed percent/15 x TSP fraction x Area) x (1 - control efficiency)

Material Handling[r]: PM10 Emissions (lb/day) = (0.0032 x aerodynamic particle size multiplier x (wind speed (mph)/5)$^{1.3}$/(moisture content/2)$^{1.4}$ x dirt handled (lb/day)/2,000 (lb/ton) (1 - control efficiency)

	Control Efficiency	PM10[s]
Description	%	lb/day
Earthmoving	61	0.00
Storage Piles	61	0.06
Material Handling	61	0.00
Total		**0.06**

Four Acre Site Example - Grading Phase

Incremental Increase in Onsite Combustion Emissions from Onroad Mobile Vehicle

Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Mobile Emissions (lb/day)

	CO	NOx	PM10
Vehicle	lb/day	lb/day	lb/day
Haul Truck	0.00	0.00	0.00
Water Truck	0.08	0.22	0.01
Total	**0.08**	**0.22**	**0.01**

Total Incremental Localized Emissions from Construction Activities

	CO	NOx	PM10
Sources	lb/day	lb/day	lb/day
On-site Emissions	**12.9**	**24.5**	**1.2**
Significance Threshold[t]	***350***	***196***	***9***
Exceed Significance?	**NO**	**NO**	**NO**

Combustion and Fugitive Summary	**PM2.5 Fraction**[u]	**PM10**	**PM2.5**
		lb/day	lb/day
Combustion (Offroad)	0.92	1.16	1.07
Combustion (Onroad)	0.96	0.01	0.01
Fugitive	0.21	0.060	0.013
Total		**1.2**	**1.1**
Significance Threshold[n]			**6**
Exceed Significance?			**NO**

Notes:

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Adding lines or entering values with units different than those associated with the shaded cells may alter the integrity of the sheets or produce incorrect results.

a) SCAQMD, estimated from survey data, Sept 2004

b) Equipment name must match CARB Off-Road Model (see Off-Road Model EF worksheet) equipment name for sheet to look up EFs automatically.

c) SCAB values provided by the ARB, Oct 2006. Assumed equipment is diesel fueled.

d) Caterpillar Performance Handbook, Edition 33, October 2003 Operating Speeds, p 2-3.

e) Assumed 13 foot wide blade with 2 foot overlap (11 foot wide). Vehicle miles traveled (VMT) = (46,170 sq ft/11 foot x mile/5,280 ft)/ 60 days = 0.01 miles

f) USEPA, AP-42, July 1998, Table 11.9-3 Typical Values for Correction Factors Applicable to the Predictive Emission Factor Equations

g) Table A9-9-E2, SCAQMD CEQA Air Quality Handbook, 1993

h) Mean wind speed percent - percent of time mean wind speed exceeds 12 mph. At least one meteorological site recorded wind speeds greater than 12 mph over a 24-hour period in 1981.

i) Assumed storage piles are 0.16 acres in size

j) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggregate Handling and Storage Piles, p 13.2.4-3 Aerodynamic particle size multiplier for < 10 µm

k) Mean wind speed - maximum of daily average wind speeds reported in 1981 meteorological data.

Four Acre Site Example - Grading Phase

l) Assuming 1,111 cubic yards of dirt handled [(1,111 cyd x 2,500 lb/cyd)/60 days = 46,292 lb/day]

m) 2009 fleet year. http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html.

n) Assumed 30 cubic yd truck capacity for 1,111 cyd of dirt [(1,111 cy x truck/30 cy)/60 days = 1 one-way truck trips/day]. Assumed haul truck travels 0.1 miles through facility. Multiple trucks may be used.

o) Assumed six foot wide water truck traverses over 46,170 square feet of disturbed area

p) USEPA, AP-42, July 1998, Table 11.9-1, Equation for Site Grading ≤ 10 μm

q) USEPA, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, Sept 1992, EPA-450/2-92-004, Equation 2-12

r) USEPA, AP-42, Jan 1995, Section 13.2.4 Aggregate Handling and Storage Piles, Equation 1

s) Includes watering at least three times a day per Rule 403 (61% control efficiency).

t) Illustration purpose showing the most stringent LSTs. Please consult App. C of the Methodology Paper for applicable LSTs.

u) ARB's CEIDARS database PM2.5 fractions - construction dust category for fugitive and diesel vehicle exhaust category for combustion.

Four Acre Site Example - Structure Construction

Santa Monica College		**Construction Activity**		
Math and Science		Building	150,000	Square Foot Structure[a]
Construction Schedule Unknown				

Equipment Type[a,b]	**No. of Equipment**	**hr/day**	**Crew Size**
Forklifts	2	6.0	10
Cranes	1	6.0	
Tractors/Loaders/Backhoes	1	8.0	
Generator Sets	1	8.0	
Electric Welders	3	8.0	

Construction Equipment Combustion Emission Factors

	CO	**NOx**	**PM10**
Equipment Type[c]	lb/hr	lb/hr	lb/hr
Forklifts	0.221	0.355	0.018
Cranes	0.455	1.106	0.047
Tractors/Loaders/Backhoes	0.375	0.497	0.034
Generator Sets	0.297	0.508	0.030
Electric Welders	N/A	N/A	N/A

Construction Vehicle (Mobile Source) Emission Factors

	CO	**NOx**	**PM10**
	lb/mile	lb/mile	lb/mile
Heavy-Duty Truck[d]	0.008464	0.024180	0.001185

Construction Worker Number of Trips and Trip Length

Vehicle	**No. of One-Way Trips/Day**	**Trip Length (miles)**
Flatbed Truck[a,e]	30	0.1
Water Truck[f]	3	5.6

Four Acre Site Example - Structure Construction

Incremental Increase in Onsite Combustion Emissions from Construction Equipment

Equation: Emission Factor (lb/BHP-hr) x No. of Equipment x Work Day (hr/day) x Equipment rating (hp) x Load Factor (%/100) = Onsite Construction Emissions (lb/day)

	CO	NOx	PM10
Equipment Type	lb/day	lb/day	lb/day
Forklifts	2.66	4.26	0.21
Cranes	2.73	6.64	0.28
Tractors/Loaders/Backhoes	3.00	3.98	0.27
Generator Sets	2.38	4.07	0.24
Electric Welders	N/A	N/A	N/A
Total	**10.8**	**18.9**	**1.0**

Incremental Increase in Onsite Combustion Emissions from Onroad Mobile Vehicles

Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Mobile Emissions (lb/day)

	CO	NOx	PM10
Vehicle	lb/day	lb/day	lb/day
Flatbed Truck	0.05	0.15	0.007
Water Truck	0.28	0.81	0.04
Total	**0.33**	**0.96**	**0.05**

Total Incremental Combustion Emissions from Construction Activities

	CO	NOx	PM10
Sources	lb/day	lb/day	lb/day
On-Site Emissions	**11.1**	**19.9**	**1.0**
Significance Threshold[g]	***350***	***196***	***9***
Exceed Significance?	**NO**	**NO**	**NO**

Combustion and Fugitive Summary	**PM2.5 Fraction**[h]	**PM10**	**PM2.5**
		lb/day	lb/day
Combustion (Offroad)	0.92	1.00	0.92
Combustion (Onroad)	0.96	0.047	0.045
Fugitive	0.21	0	0
Total		**1.0**	**1.0**
Significance Threshold[n]			**6**
Exceed Significance?			**NO**

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Four Acre Site Example - Structure Construction

Adding lines or entering values with units different than those associated with the shaded cells may alter the integrity of the sheets or produce incorrect results.
a) SCAQMD, estimated from survey data, Sept 2004
b) Equipment name must match CARB Off-Road Model (see Off-Road Model EF worksheet) equipment name for sheet to look up EFs automatically.
c) SCAB values provided by the ARB, Oct 2006. Assumed equipment is diesel fueled except the welders which are powered by the generator.
d) 2009 fleet year. http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html.
e) Assumed haul truck travels 0.1 miles through facility
f) Assumed six foot wide water truck traverses over 175,000 square feet of disturbed area
g) Illustration purpose showing the most stringent LSTs. Please consult App. C of the Methodology Paper for applicable LSTs.
h) ARB's CEIDARS database PM2.5 fractions - construction dust category for fugitive and diesel vehicle exhaust category for combustion.

Santa Monica College		**Construction Activity**
Math and Science		Building
Construction Schedule Unknown		

Equipment Type[a,b]	**No. of Equipment**	**hr/day**
Forklifts	2	6.0
Cranes	1	6.0
Tractors/Loaders/Backhoes	1	8.0
Generator Sets	1	8.0
Electric Welders	3	8.0

Construction Equipment Combustion Emission Factors

	CO	**NOx**
Equipment Type[c]	lb/hr	lb/hr
Forklifts	0.219	0.281
Cranes	0.426	0.938
Tractors/Loaders/Backhoes	0.369	0.406
Generator Sets	0.286	0.437
Electric Welders	N/A	N/A

Construction Vehicle (Mobile Source) Emission Factors

	CO	**NOx**
	lb/mile	lb/mile
Heavy-Duty Truck[d]	0.007046	0.018874

Construction Worker Number of Trips and Trip Length

Vehicle	**No. of One-Way Trips/Day**	**Trip Length (miles)**
Flatbed Truck[a,e]	30	0.1
Water Truck[f]	3	5.6

Incremental Increase in Onsite Combustion Emissions from Construction Equipment

Equation: Emission Factor (lb/BHP-hr) x No. of Equipment x Work Day (hr/day) x Equipment rating (hp) x L

	CO	**NOx**
Equipment Type	lb/day	lb/day
Forklifts	2.63	3.37
Cranes	2.56	5.63
Tractors/Loaders/Backhoes	2.95	3.25
Generator Sets	2.29	3.50
Electric Welders	N/A	N/A
Total	**10.4**	**15.7**

Incremental Increase in Onsite Combustion Emissions from Onroad Mobile Vehicles

Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Mobile Emissio

	CO	NOx
Vehicle	lb/day	lb/day
Flatbed Truck	0.04	0.11
Water Truck	0.24	0.63
Total	**0.28**	**0.74**

Total Incremental Combustion Emissions from Construction Activities

	CO	NOx
Sources	lb/day	lb/day
On-Site Emissions	**10.7**	**16.5**
Significance Threshold[g]	***350***	***196***
Exceed Significance?	**NO**	**NO**

Combustion and Fugitive Summary	**PM2.5 Fraction**[h]
Combustion (Offroad)	0.92
Combustion (Onroad)	0.96
Fugitive	0.21
Total	
Significance Threshold[n]	
Exceed Significance?	

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a) SCAQMD, estimated from survey data, Sept 2004

b) Equipment name must match CARB Off-Road Model (see Off-Road Model EF worksheet) equipment name for sheet to look up EFs autom

c) SCAB values provided by the ARB, Oct 2006. Assumed equipment is diesel fueled except the welders which are powered by the generator.

d) 2009 fleet year. http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html.

e) Assumed haul truck travels 0.1 miles through facility

f) Assumed six foot wide water truck traverses over 175,000 square feet of disturbed area

g) Illustration purpose showing the most stringent LSTs. Please consult App. C of the Methodology Paper for applicable LSTs.

h) ARB's CEIDARS database PM2.5 fractions - construction dust category for fugitive and diesel vehicle exhaust category for combustion.

150,000 Square Foot Structure[a]

Crew Size
10

PM10
lb/hr
0.014
0.039
0.026
0.024
N/A

PM10
lb/mile
0.000944

.oad Factor (%/100) = Onsite Construction Emissions (lb/day)

PM10
lb/day
0.16
0.23
0.21
0.19
N/A
0.8

ons (lb/day)

PM10
lb/day
0.006
0.03
0.04

PM10
lb/day
0.8
9
NO

PM10	**PM2.5**	**Percentage Contribution**
lb/day	lb/day	
0.80	0.73	95.5%
0.036	0.034	4.5%
0	0	0.0%
0.8	**0.8**	
	6	
	NO	

Verify that units of values entered match units for cell.
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Four Acre Site Example - Architectural Coating and Asphalt Paving

Santa Monica College		**Construction Activity**	
Math and Science		Architectural Coating and Asphalt Paving of Parking Lot	
Construction Schedule -	**20**	**days**[a]	

Equipment Type[a,b]	**No. of Equipment**	**hr/day**	**Crew Size**
Pavers	1	7.00	10
Paving Equipment	1	8.00	
Rollers	1	7.00	
Cement and Mortar Mixers	4	6.00	
Tractors/Loaders/Backhoes	1	7.00	

Construction Equipment Combustion Emission Factors

	CO	**NOx**	**PM10**
Equipment Type[c]	lb/hr	lb/hr	lb/hr
Pavers	0.513	0.713	0.049
Paving Equipment	0.420	0.639	0.044
Rollers	0.394	0.527	0.035
Cement and Mortar Mixers	0.042	0.054	0.002
Tractors/Loaders/Backhoes	0.369	0.406	0.026

Construction Vehicle (Mobile Source) Emission Factors

	CO	**NOx**	**PM10**
	lb/mile	lb/mile	lb/mile
Heavy-Duty Truck[d]	0.007046	0.018874	0.000944

Construction Worker Number of Trips and Trip Length

Vehicle	**No. of One-Way Trips/Day**	**Trip Length (miles)**
Delivery Truck[e]	9	0.1
Water Truck[f]	3	5.6

Four Acre Site Example - Architectural Coating and Asphalt Paving

Incremental Increase in Onsite Combustion Emissions from Construction Equipment

Equation: Emission Factor (lb/BHP-hr) x No. of Equipment x Work Day (hr/day) x Equipment rating (hp) x Load Factor (%/100) = Onsite Construction Emissions (lb/day

	CO	NOx	PM10
Equipment Type	lb/day	lb/day	lb/day
Pavers	3.59	4.99	0.34
Paving Equipment	3.36	5.11	0.35
Rollers	2.76	3.69	0.25
Cement and Mortar Mixers	1.00	1.30	0.05
Tractors/Loaders/Backhoes	2.58	2.84	0.18
Total	**13.30**	**17.94**	**1.17**

Incremental Increase in Onsite Combustion Emissions from Onroad Mobile Vehicles

Equation: Emission Factor (lb/mile) x No. of One-Way Trips/Day x 2 x Trip length (mile) = Mobile Emissions (lb/day)

	CO	NOx	PM10
Vehicle	lb/day	lb/day	lb/day
Offsite (Flatbed Truck)	0.01	0.03	0.00
Water Truck	0.24	0.63	0.03
Total	**0.25**	**0.66**	**0.03**

Total Incremental Combustion Emissions from Construction Activities

	CO	NOx	PM10
Sources	lb/day	lb/day	lb/day
On-Site Emissions	**13.6**	**18.6**	**1.2**
Significance Threshold*	***350***	***196***	***9***
Exceed Significance?	**NO**	**NO**	**NO**

Combustion and Fugitive Summary	**PM2.5 Fraction**[h]	**PM10**	**PM2.5**
		lb/day	lb/day
Combustion (Offroad)	0.92	1.2	1.1
Combustion (Onroad)	0.96	0.03	0.03
Fugitive	0.21	0	0
Total		**1.2**	**1.1**
Significance Threshold[n]			**6**
Exceed Significance?			**NO**

Notes:

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Four Acre Site Example - Architectural Coating and Asphalt Paving

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a) SCAQMD, estimated from survey data, Sept 2004

b) Equipment name must match CARB Off-Road Model (see Off-Road Model EF worksheet) equipment name for sheet to look up EFs automatically.

c) SCAB values provided by the ARB, Oct 2006. Assumed equipment is diesel fueled except the welders which are powered by the generator.

d) 2016 fleet year. http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html.

e) Assumed haul truck travels 0.1 miles through facility

f) Assumed six foot wide water truck traverses over 175,000 square feet of disturbed area

g) Illustration purpose showing the most stringent LSTs. Please consult App. C of the Methodology Paper for applicable LSTs.

h) ARB's CEIDARS database PM2.5 fractions - construction dust category for fugitive and diesel vehicle exhaust category for combustion.

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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: G:\2008 Projects\SMC Master Plan\Final EIR\Appendices\AQ\AET.urb924

Project Name: Santa Monica College

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	1.72	2.37	3.53	0.00	0.01	0.01	2,828.57

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	23.53	33.00	301.82	0.54	89.03	17.29	53,156.58

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	25.25	35.37	305.35	0.54	89.04	17.30	55,985.15

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Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.17	2.35	1.98	0.00	0.00	0.00	2,825.76
Hearth							
Landscape	0.12	0.02	1.55	0.00	0.01	0.01	2.81
Consumer Products	0.00						
Architectural Coatings	1.43						
TOTALS (lbs/day, unmitigated)	1.72	2.37	3.53	0.00	0.01	0.01	2,828.57

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Junior college (2 yrs)	23.53	33.00	301.82	0.54	89.03	17.29	53,156.58
TOTALS (lbs/day, unmitigated)	23.53	33.00	301.82	0.54	89.03	17.29	53,156.58

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2017 Temperature (F): 80 Season: Summer

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

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Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Junior college (2 yrs)		23.31	1000 sq ft	243.60	5,678.32	51,573.30
					5,678.32	51,573.30

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	50.9	0.0	100.0	0.0
Light Truck < 3750 lbs	7.2	0.0	98.6	1.4
Light Truck 3751-5750 lbs	23.2	0.0	100.0	0.0
Med Truck 5751-8500 lbs	10.9	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.7	0.0	82.4	17.6
Lite-Heavy Truck 10,001-14,000 lbs	0.5	0.0	60.0	40.0
Med-Heavy Truck 14,001-33,000 lbs	0.9	0.0	22.2	77.8
Heavy-Heavy Truck 33,001-60,000 lbs	0.6	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.9	44.8	55.2	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	0.9	0.0	88.9	11.1

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	13.3	7.4	8.9

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Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Junior college (2 yrs)				5.0	2.5	92.5

6/24/2010 3:32:16 PM

Urbemis 2007 Version 9.2.4

Combined Winter Emissions Reports (Pounds/Day)

File Name: G:\2008 Projects\SMC Master Plan\Final EIR\Appendices\AQ\AET.urb924

Project Name: Santa Monica College

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	1.60	2.35	1.98	0.00	0.00	0.00	2,825.76

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	26.07	39.61	285.02	0.45	89.03	17.29	48,059.44

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	27.67	41.96	287.00	0.45	89.03	17.29	50,885.20

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Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.17	2.35	1.98	0.00	0.00	0.00	2,825.76
Hearth							
Landscaping - No Winter Emissions							
Consumer Products	0.00						
Architectural Coatings	1.43						
TOTALS (lbs/day, unmitigated)	1.60	2.35	1.98	0.00	0.00	0.00	2,825.76

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Junior college (2 yrs)	26.07	39.61	285.02	0.45	89.03	17.29	48,059.44
TOTALS (lbs/day, unmitigated)	26.07	39.61	285.02	0.45	89.03	17.29	48,059.44

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2017 Temperature (F): 60 Season: Winter

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

6/24/2010 3:32:16 PM

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Junior college (2 yrs)		23.31	1000 sq ft	243.60	5,678.32	51,573.30
					5,678.32	51,573.30

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	50.9	0.0	100.0	0.0
Light Truck < 3750 lbs	7.2	0.0	98.6	1.4
Light Truck 3751-5750 lbs	23.2	0.0	100.0	0.0
Med Truck 5751-8500 lbs	10.9	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.7	0.0	82.4	17.6
Lite-Heavy Truck 10,001-14,000 lbs	0.5	0.0	60.0	40.0
Med-Heavy Truck 14,001-33,000 lbs	0.9	0.0	22.2	77.8
Heavy-Heavy Truck 33,001-60,000 lbs	0.6	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.9	44.8	55.2	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	0.9	0.0	88.9	11.1

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	13.3	7.4	8.9

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Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Junior college (2 yrs)				5.0	2.5	92.5

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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: G:\2008 Projects\SMC Master Plan\Final EIR\Appendices\AQ\LST operation PAC.urb924

Project Name: Santa Monica College

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	NOx	CO	PM10	PM2.5
TOTALS (lbs/day, unmitigated)	0.93	2.31	0.01	0.01

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	NOx	CO	PM10	PM2.5
TOTALS (lbs/day, unmitigated)	1.55	14.45	0.42	0.11

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	NOx	CO	PM10	PM2.5
TOTALS (lbs/day, unmitigated)	2.48	16.76	0.43	0.12

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Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	NOx	CO	PM10	PM2.5
Natural Gas	0.91	0.76	0.00	0.00
Hearth				
Landscape	0.02	1.55	0.01	0.01
Consumer Products				
Architectural Coatings				
TOTALS (lbs/day, unmitigated)	0.93	2.31	0.01	0.01

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	NOX	CO	PM10	PM25
Junior college (2 yrs)	1.55	14.45	0.42	0.11
TOTALS (lbs/day, unmitigated)	1.55	14.45	0.42	0.11

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2017 Temperature (F): 80 Season: Summer

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

6/25/2010 4:51:50 PM

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Junior college (2 yrs)		23.30	1000 sq ft	93.73	2,183.91	218.39
					2,183.91	218.39

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	50.9	0.0	100.0	0.0
Light Truck < 3750 lbs	7.2	0.0	98.6	1.4
Light Truck 3751-5750 lbs	23.2	0.0	100.0	0.0
Med Truck 5751-8500 lbs	10.9	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.7	0.0	82.4	17.6
Lite-Heavy Truck 10,001-14,000 lbs	0.5	0.0	60.0	40.0
Med-Heavy Truck 14,001-33,000 lbs	0.9	0.0	22.2	77.8
Heavy-Heavy Truck 33,001-60,000 lbs	0.6	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.9	44.8	55.2	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	0.9	0.0	88.9	11.1

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	0.1	0.1	0.1	0.1	0.1	0.1

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Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Rural Trip Length (miles)	0.1	0.1	0.1	0.1	0.1	0.1
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Junior college (2 yrs)				5.0	2.5	92.5

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Urbemis 2007 Version 9.2.4

Combined Winter Emissions Reports (Pounds/Day)

File Name: G:\2008 Projects\SMC Master Plan\Final EIR\Appendices\AQ\LST operation PAC.urb924

Project Name: Santa Monica College

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	NOx	CO	PM10	PM2.5
TOTALS (lbs/day, unmitigated)	0.91	0.76	0.00	0.00

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	NOx	CO	PM10	PM2.5
TOTALS (lbs/day, unmitigated)	1.78	19.21	0.42	0.11

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	NOx	CO	PM10	PM2.5
TOTALS (lbs/day, unmitigated)	2.69	19.97	0.42	0.11

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Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

Source	NOx	CO	PM10	PM2.5
Natural Gas	0.91	0.76	0.00	0.00
Hearth				
Landscaping - No Winter Emissions				
Consumer Products				
Architectural Coatings				
TOTALS (lbs/day, unmitigated)	0.91	0.76	0.00	0.00

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

Source	NOX	CO	PM10	PM25
Junior college (2 yrs)	1.78	19.21	0.42	0.11
TOTALS (lbs/day, unmitigated)	1.78	19.21	0.42	0.11

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2017 Temperature (F): 60 Season: Winter

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

6/25/2010 4:52:39 PM

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Junior college (2 yrs)		23.30	1000 sq ft	93.73	2,183.91	218.39
					2,183.91	218.39

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	50.9	0.0	100.0	0.0
Light Truck < 3750 lbs	7.2	0.0	98.6	1.4
Light Truck 3751-5750 lbs	23.2	0.0	100.0	0.0
Med Truck 5751-8500 lbs	10.9	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.7	0.0	82.4	17.6
Lite-Heavy Truck 10,001-14,000 lbs	0.5	0.0	60.0	40.0
Med-Heavy Truck 14,001-33,000 lbs	0.9	0.0	22.2	77.8
Heavy-Heavy Truck 33,001-60,000 lbs	0.6	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.9	44.8	55.2	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	0.9	0.0	88.9	11.1

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	0.1	0.1	0.1	0.1	0.1	0.1

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Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Rural Trip Length (miles)	0.1	0.1	0.1	0.1	0.1	0.1
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Junior college (2 yrs)				5.0	2.5	92.5

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** AERMOD Input Produced by:
** AERMOD View Ver. 6.5.0
** Lakes Environmental Software Inc.
** Date: 6/22/2010
** File: C:\Data\SMC Master Plan\Constru\Constru.ADI
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** AERMOD Control Pathway
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**
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CO STARTING
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   TITLETWO Localized Concentration
   MODELOPT DFAULT CONC NODRYDPLT NOWETDPLT
   AVERTIME 1 8 24 ANNUAL
   URBANOPT 9862049 LA_County
   POLLUTID X/Q
   RUNORNOT RUN
CO FINISHED
**
****************************************
** AERMOD Source Pathway
****************************************
**
**
SO STARTING
** Source Location **
** Source ID - Type - X Coord. - Y Coord. **
   LOCATION CORS AREAPOLY 363999.550 3764877.300 43.190
** DESCRSRC Fugitive Emissions Corair Stadium
   LOCATION MATHDEMO AREAPOLY 364180.740 3764851.600 44.220
** DESCRSRC Fugitive Emissions Math Demolition
   LOCATION CENTRAL AREAPOLY 364028.660 3764889.830 43.440
** DESCRSRC Fugitivie Emissions Central Plant and Health/PE Center
   LOCATION MSEXT AREAPOLY 364252.660 3764976.710 46.190
** DESCRSRC Fugitive Emissions Math and Science Extension Replacement
   LOCATION DRESCHER AREAPOLY 364028.160 3765091.800 44.720
** DESCRSRC Fugitive Emissions Drescher Hall
** Line Source represented by Separated Volume Sources
** ----------------------------------------------------------------------
** LINE Source ID = VCORS
** DESCRSRC Combustion Emissions from Corsair
** Length of Side = 10.00
** Emission Rate = 1.0
** Vertical Dimension = 1.00
** SZINIT = 0.47
** Nodes = 11
** 364005.11, 3764878.00, 43.18, 0.00, 0.0
** 364122.16, 3764733.79, 43.06, 0.00, 9.08
** 364131.52, 3764738.48, 43.13, 0.00, 4.89
** 364014.47, 3764880.81, 43.27, 0.00, 8.57
** 364137.14, 3764745.03, 43.15, 0.00, 8.38
** 364179.28, 3764771.25, 43.31, 0.00, 7.70
** 364142.76, 3764760.01, 43.24, 0.00, 8.09
** 364129.65, 3764768.44, 43.30, 0.00, 7.26
** 364026.65, 3764886.43, 43.37, 0.00, 9.11
** ----------------------------------------------------------------------
   LOCATION L0000001 VOLUME 364008.244 3764874.118 43.24
   LOCATION L0000002 VOLUME 364020.551 3764858.953 43.32
   LOCATION L0000003 VOLUME 364032.858 3764843.788 43.36
```

Note: Due to page limitations, the complete AEROMOD output file has not been included in this hardcopy (approximately 1,500 pages). To obtain this file, please contact SMC's Administrative Offices during normal business hours at 2714 Pico Boulevard, Room 320, Santa Monica, California.

Appendix C:

SCAQMD Rule 1403

(Adopted October 6, 1989)(Amended April 8, 1994)
(Amended November 3, 2006)(Amended October 5, 2007)

RULE 1403. ASBESTOS EMISSIONS FROM DEMOLITION/RENOVATION ACTIVITIES

(a) Purpose

The purpose of this rule is to specify work practice requirements to limit asbestos emissions from building demolition and renovation activities, including the removal and associated disturbance of asbestos-containing materials (ACM). The requirements for demolition and renovation activities include asbestos surveying, notification, ACM removal procedures and time schedules, ACM handling and clean-up procedures, and storage, disposal, and landfilling requirements for asbestos-containing waste materials (ACWM). All operators are required to maintain records, including waste shipment records, and are required to use appropriate warning labels, signs, and markings.

(b) Applicability

This rule, in whole or in part, is applicable to owners and operators of any demolition or renovation activity, and the associated disturbance of asbestos-containing material, any asbestos storage facility, or any active waste disposal site.

(c) Definitions

For the purpose of this rule, the following definitions shall apply:

(1) ACTIVE WASTE DISPOSAL SITE is any disposal site that receives, or has received or processed ACWM within the preceding 365 calendar days.

(2) ADEQUATELY WET is the condition of being sufficiently mixed or penetrated with amended water to prevent the release of particulates or visible emissions. The process by which an adequately wet condition is achieved is by using a dispenser or water hose with a nozzle that permits the use of a fine, low-pressure spray or mist.

(3) AMENDED WATER is water to which a chemical wetting agent or surfactant has been added to improve penetration into ACM.

(4) ASBESTOS is the asbestiform varieties of serpentine (chrysotile), riebeckite (crocidolite), cummingtonite-grunerite (amosite), anthophyllite, actinolite or tremolite.

(5) ASBESTOS-CONTAINING MATERIAL (ACM) is both friable asbestos-containing material or Class I nonfriable asbestos-containing material.

(6) ASBESTOS-CONTAINING WASTE MATERIAL (ACWM) is any waste that contains commercial asbestos and that is generated by a source subject to the provisions of this rule. ACWM includes, but is not limited to, ACM which is friable, has become friable, or has a high probability of becoming friable, or has been subjected to sanding, grinding, cutting, or abrading, and the waste generated from its disturbance, such as asbestos waste from control devices, particulate asbestos material, asbestos slurries, bags or containers that previously contained asbestos, used asbestos-contaminated plastic sheeting and clothing, and clean-up equipment waste, such as cloth rags or mop heads.

(7) ASBESTOS HAZARD EMERGENCY RESPONSE ACT (AHERA) is the act which legislates asbestos-related requirements for schools (40 CFR 763, Subpart E).

(8) ASSOCIATED DISTURBANCE of ACM or Class II nonfriable ACM is any crumbling or pulverizing of ACM or Class II nonfriable ACM, or generation of uncontrolled visible debris from ACM or Class II nonfriable ACM.

(9) CLASS I NONFRIABLE ASBESTOS-CONTAINING MATERIAL is material containing more than one percent (1%) asbestos as determined by paragraph (h)(2), and that, when dry, can be broken, crumbled, pulverized, or reduced to powder in the course of demolition or renovation activities. Actions which may cause material to be broken, crumbled, pulverized, or reduced to powder include physical wear and disturbance by mechanical force, such as, but not limited to, sanding, sandblasting, cutting or abrading, improper handling or removal or leaching of matrix binders. Class I nonfriable asbestos-containing material includes, but is not limited to, fractured or crushed asbestos cement products, transite materials, mastic, roofing felts, roofing tiles, cement water pipes and resilient floor covering.

(10) CLASS II NONFRIABLE ASBESTOS-CONTAINING MATERIAL is all other material containing more than one percent (1%) asbestos as determined by paragraph (h)(2), that is neither friable nor Class I nonfriable.

(11) COMMERCIAL ASBESTOS is any material containing asbestos that is extracted from asbestos ore.

(12) CUTTING is penetrating with a sharp-edged instrument and includes sawing, but does not include shearing, slicing, or punching.

(13) DEMOLITION is the wrecking or taking out of any load-supporting structural member of a facility and related handling operations or the intentional burning of any facility.

(14) EMERGENCY DEMOLITION is a demolition ordered by a governmental agency for the purpose of eliminating peril to the safety of persons, property or the environment resulting from hazards such as collapse, fire, crime, disease, or toxic contamination or other hazard as determined by the Executive Officer.

(15) EMERGENCY RENOVATION is any renovation that was not planned and results from a sudden unexpected event that results in unsafe conditions. Such events include, but are not limited to, renovations necessitated by non-routine failures of equipment, earthquake or fire damage. An economic burden alone, without a sudden, unexpected event, does not give rise to conditions that meet this definition.

(16) ENCAPSULATION is the treatment of ACM with a material that surrounds or embeds asbestos fibers in an adhesive matrix to prevent the release of fibers, as the encapsulant creates a membrane over the surface (bridging encapsulant) or penetrates the material and binds its components together (penetrating encapsulant).

(17) ENCLOSED STORAGE AREA means a storage room, drum, roll-off container, other hard-sided container, or fenced area that is designed to be securely closed with a lock.

(18) FACILITY is any institutional, commercial, public, industrial or residential structure, installation, building; any ship; and any active waste disposal site. A facility is subject to this rule regardless of its current use or function. For example, a facility destroyed by fire, explosion, or natural disaster, including any debris, remains subject to this rule's provisions.

(19) FACILITY COMPONENT is any part of a facility including foundations and or utility/commodity pipelines; and equipment such as but not limited to heaters, boilers, HVAC, and motors.

(20) FRIABLE ASBESTOS-CONTAINING MATERIAL is material containing more than one percent (1%) asbestos as determined by paragraph (h)(2), that, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure.

(21) GLOVEBAG is a sealed compartment with attached inner gloves used for handling ACM. When properly installed and used, glove bags provide a small work area enclosure used for small-scale asbestos stripping operations. Information on glovebag installation, equipment, and supplies, and work practices is contained in the Occupational Safety and Health Administration's final rule on occupational exposure to asbestos (Appendix G to 29 CFR 1926.1101(g)).

(22) HIGH EFFICIENCY PARTICULATE AIR (HEPA) FILTER is a filter capable of trapping and retaining at least 99.97 percent of all monodispersed particles of 0.3 micrometer in diameter or larger.

(23) INSTALLATION is any building or structure or any group of buildings or structures at a single demolition or renovation site that are under the control of the same owner or operator (or owner or operator under central control).

(24) ISOLATED WORK AREA is the immediate enclosed containment area in which the asbestos abatement activity takes place.

(25) LEAK-TIGHT is the condition whereby any contained solids or liquids are prevented from escaping or spilling out.

(26) LOCKED means rendered securely closed and able to be opened only with a key or access code.

(27) NONSCHEDULED RENOVATION OPERATION is a renovation operation necessitated by the routine failure of equipment, which is expected to occur within a given calendar year based on past operating experience, but for which an exact date cannot be predicted.

(28) OUTSIDE AIR is air outside of the facility or outside of the isolated work area.

(29) OWNER or OPERATOR OF A DEMOLITION OR RENOVATION ACTIVITY is any person who owns, leases, operates, controls or supervises activities at the facility being demolished or renovated; the demolition or renovation operation; or both.

(30) PERSON is any individual, firm, association, organization, partnership, business, trust, corporation, company, contractor, supplier, installer, user

or owner, or any state or local government agency or public district or any other officer or employee thereof. PERSON also means the United States or its agencies to the extent authorized by Federal law.

(31) PLANNED RENOVATION is a renovation operation, or a number of such operations, in which the amount of ACM that will be removed or stripped within a given period of time can be predicted. Individual nonscheduled renovation operations are included if a number of such operations can be predicted to occur during a given period of time based on operating experience.

(32) PROJECT is any renovation or demolition activity, including site preparation and clean-up activity.

(33) REMOVAL is the taking out of ACM or facility components that contain or are covered with ACM from any facility.

(34) RENOVATION is the altering of a facility or the removing or stripping of one or more facility components in any way, including, but not limited to, the stripping or removal of ACM from facility components, retrofitting for fire protection, and the installation or removal of heating, ventilation, air conditioning (HVAC) systems. Activity involving the wrecking or taking out of load-supporting structural members are demolitions.

(35) RESIDENTIAL SINGLE UNIT DWELLING is a structure that contains only one residential unit. Apartment buildings, townhouses, and condominiums are not residential single unit dwellings.

(36) RESILIENT FLOOR COVERING is asbestos-containing floor tile, including asphalt and vinyl floor tile, and sheet vinyl floor covering containing more than one percent (1%) asbestos as determined by paragraph (h)(2).

(37) STRIPPING is the taking off of ACM from any part of a facility or facility component.

(38) STRUCTURAL MEMBER is any load-supporting member of a facility, such as beams and load-supporting walls; or any nonload-supporting member, such as ceilings and nonload-supporting walls.

(39) WASTE GENERATOR is any person who owns or operates a source subject to the provisions of this rule according to subdivision (b), and whose act or process produces ACWM.

(40) WASTE SHIPMENT RECORD is the shipping document, required to be originated and signed by the waste generator, used to track and

substantiate the disposition of ACWM as specified by the provisions of subdivision (f).

(41) WORKING DAY is Monday through Friday and includes holidays that fall on any of the days Monday through Friday.

(d) Requirements

A person subject to this rule shall prevent emissions of asbestos to the outside air by complying with the following requirements:

(1) Demolition and Renovation Activities

The owner or operator of any demolition or renovation activity shall comply with the following requirements:

(A) Facility Survey

(i) The affected facility or facility components shall be thoroughly surveyed for the presence of asbestos prior to any demolition or renovation activity. The survey shall include the inspection, identification, and quantification of all friable, and Class I and Class II non-friable asbestos-containing material, and any physical sampling of materials.

(ii) A thorough survey shall include, at a minimum, identification of all affected materials at the facility, including but not limited to all layers of flooring materials to the joist level, and all material in the wall or ceiling cavities as necessary to identify and sample them.

(iii) The survey shall be documented with the following information:

(I) The name, address, and telephone number of the person who conducted the survey;

(II) A written statement of the qualifications of the person who conducted the survey, demonstrating compliance with clause (d)(1)(A)(iv);

(III) The dates the survey was conducted;

(IV) A listing of all suspected materials containing any asbestos, a listing of all samples collected, and a sketch of where the samples were taken;

(V) The name, address, and telephone number of any laboratory used to conduct analyses of materials for asbestos content;

(VI) A statement of qualification of the laboratory which conducted the analyses, demonstrating compliance with paragraph (h)(2);

(VII) A list of the test methods used, demonstrating compliance with subdivision (h), including sampling protocols and laboratory methods of analysis, test data, and any other information used to identify or quantify any materials containing asbestos; and

(VIII) A general description of the condition of the facility, including but not limited to a description of any obvious fire or structural damage.

(iv) Persons conducting asbestos surveys in accordance with subparagraph (d)(1)(A) shall be certified by Cal/OSHA pursuant to regulations required by subdivision (b) of Section 9021.5 of the Labor Code, and shall have taken and passed an EPA-approved Building Inspector Course and conform to the procedures outlined in the Course.

(B) Notification

The District shall be notified of the intent to conduct any demolition or renovation activity. Notifications shall be submitted in a District-approved format which may include but not be limited to U.S. mail, telephone, facsimile, digital, internet, and e-mail. Telephone, facsimile, digital, and e-mail notifications shall be confirmed with follow-up written notifications to the District postmarked or delivered to the District within 48 hours from submitting the telephone, facsimile, digital, or e-mail notification. No notification shall be considered received unless it is accompanied by the required fee pursuant to Rule 301, as part of the required written notification. Notifications shall be provided in accordance with the following requirements:

(i) Time Schedule

(I) Demolition or Renovation Activities

The notification shall be submitted to the District no later than 10 working days before any demolition or renovation activities other than emergency demolition, emergency renovation, or planned renovations involving individual nonscheduled renovation operations begin.

(II) Planned Renovation - Annual Notification

The District shall be notified by December 17 of the year preceding the calendar year for which notice is being given for planned renovation activities which involve individual nonscheduled renovation operations.

(III) Emergency Demolition or Renovation

The District shall be notified as soon as possible, but prior to any emergency demolition or renovation activity.

(ii) Notification Required Information

All notifications shall include the following information:

(I) An indication of whether the notice is the original or a revised notification;

(II) Name, address and telephone number of both the owner and operator of the facility, supervising person, and the asbestos removal contractor, owner or operator;

(III) Address and location of the facility to be demolished or renovated and the type of operation: demolition or renovation;

(IV) Description of the facility or affected part of the facility to be demolished or renovated including the size (square meters or square feet and number of floors), age, and present or prior uses of the facility;

(V) The specific location of each renovation or demolition at the facility and a description of the facility components or structural members contributing to the ACM to be removed or stripped from the facility;

(VI) Scheduled project starting and completion dates of demolition or renovation. Notifications shall also include the ACM removal starting and completion dates for demolition or renovation; planned renovation activities involving individual nonscheduled renovation operations need only include the beginning and ending dates of the report period as described in subclause (d)(1)(B)(i)(II);

(VII) Brief description of work practices and engineering controls to be used to comply with this rule, including asbestos removal and waste handling emission control procedures;

(VIII) A separate estimate for each of the amounts of friable, Class I, and Class II nonfriable asbestos-containing material to be removed from the facility in terms of length of pipe in linear feet, surface area in square feet on other facility components, or volume in cubic feet if off the facility components. The total as equivalent surface area in square feet shall also be reported;

(IX) Name and location of waste disposal site where ACWM will be deposited.

(X) Description of steps to be followed in the event that unexpected ACM is found or Class II nonfriable asbestos-containing material becomes crumbled, pulverized, or reduced to powder;

(XI) California State Contractors License Certification number;

(XII) Cal/OSHA Registration number;

(XIII) Name and location address of off-site storage area for ACWM;

(XIV) Name, address, and telephone number of transporters used to transport ACWM off-site;

(XV) Procedures, including analytical methods, used to detect the presence of friable and nonfriable asbestos-containing material; and

(XVI) Signed certification that at least one person trained as required in subparagraph (d)(1)(G) will supervise the stripping and removal described by this notification.

(iii) Emergency Demolition Additional Information

Notification of all emergency demolition activities shall include the following additional information

(I) The agency, name, title, telephone number and authority of the representative who ordered the emergency demolition; and

(II) A copy of the order, and the date on which the demolition was ordered to begin.

(iv) Emergency Renovation Additional Information

Notification of all emergency renovation activities shall include the following additional information:

(I) The name and phone number of the responsible manager or authorized person who is in charge of the emergency renovation;

(II) The date and hour that the emergency occurred;

(III) A description of the sudden, unexpected event;

(IV) An explanation of how the event caused an unsafe condition, or would cause equipment damage or an unreasonable financial burden; and.

(V) A signed letter from the person directly affected by the emergency, such as the property owner or property manager, attesting to the circumstances of the emergency.

(v) Notification Updates

All notifications shall be updated when any of the following conditions arise:

(I) Change in Quantity of Asbestos

A change in the quantity of affected asbestos of 20 percent or more from the notified amount shall be reported to the District as soon as the information becomes available, but not later than the project end date, unless otherwise specified in an approved Procedure 5.

(II) Later Starting Date

A delay in the starting date of any demolition or renovation activity shall be reported to the District as soon as the information becomes available, but no later than the original start date.

(III) Earlier Starting Date

A change in the starting date of any demolition or renovation activity to an earlier starting date shall be reported to the District no later than 10 working days before any demolition or renovation activities begin.

(IV) Completion Date Change

Changes in the completion date shall be reported to the District at least 2 calendar days before the original scheduled completion date. In the event renovations or demolitions are not completed, are delayed or are completed ahead of schedule, the District shall be notified as soon as possible, but no later than the following business day.

(V) Planned Renovation Progress Report

Notifications for on-going planned renovation operations in which the scheduled starting and completions dates are more than 1 year apart shall be updated, every year of the operation by December 17, unless the most recent written notification update was postmarked or delivered after October 1 of that year and include the amount of ACM removed and the amount of ACM remaining to be removed.

(C) Asbestos Removal Schedule

Material containing asbestos shall be removed from a facility according to the following schedule:

(i) Burning Demolitions

All ACM and Class II asbestos-containing material shall be removed from a facility prior to any demolition by intentional burning. All demolition by intentional burning shall be performed in accordance with Rule 444 – Open Burning.

(ii) Renovations and Non-Burning Demolitions

(I) All ACM shall be removed from a facility being demolished or renovated before any non-burning demolition or renovation activity begins that would break up, dislodge, or similarly disturb the material or preclude access to the material for subsequent removal.

(II) ACM not accessible for testing or not discovered until after the renovation or demolition activities begin may be removed after the start of the renovation or non-burning demolition activities, pursuant to the appropriate procedure in subparagraph (d)(1)(D).

(III) Notwithstanding the above, asbestos-containing packings, gaskets, resilient floor covering, and asphalt roofing products which are not friable and are not crumbled, cut, abraded, or otherwise not damaged and in good condition, may be removed after the start of renovation or non-burning demolition activities if prior approval from the District is obtained (Procedure 5).

(IV) If the renovation or demolition activity involves any mechanical force such as, but not limited to, sanding, sandblasting, cutting, or abrading and thus would render the materials friable, they must be removed prior to the renovation or demolition.

(V) If for any reason, any renovation or demolition results in an associated disturbance of ACM or Class II nonfriable ACM outside of a containment or work area then, prior to continuing with any renovation or demolition activity, the owner/operator shall secure, stabilize and survey the affected facility areas and submit and obtain an approved Procedure 5 plan, prior to any asbestos clean-up.

(D) Removal Procedures

(i) One or more of the following procedures shall be used when removing or stripping ACM:

(I) Procedure 1 - HEPA Filtration

Remove ACM within an isolated work area. The following techniques shall be used during Procedure 1 ACM removal activities:

(1) All stationary objects and surfaces not intended for removal or stripping of ACM shall be covered with plastic sheeting;

(2) All air passageways, such as doors, windows, vents and registers in the work area, shall be covered and rendered air tight with plastic sheeting or hard wooden barriers with studded support. Air passageways used to provide makeup air for the isolated work space need not be covered;

(3) All sources of air movement, including the air-handling system, shall be shut off or temporarily modified to restrict air movement into the work zone;

(4) The barriers used for the construction of the isolated work area shall be equipped with transparent viewing ports which allow outside observation of all stripping and removal of ACM;

(5) The isolated work area shall be vented, with negative air pressure to a HEPA filtration system, which shall be operated continuously from the commencement of removal activities through the final clean-up of the work area;

(6) The HEPA filter shall be free of tears, fractures, holes or other types of damage and shall be securely latched and properly situated in the holding frame to prevent air leakage from the filtration system; and

(7) ACM shall be adequately wet during the removal process.

(II) Procedure 2 - Glovebag

Remove by the glovebag method or minienclosures designed and operated according to 29 CFR Section 1926.1101(g), Appendix G, and current Cal/OSHA requirements.

(III) Procedure 3 - Adequate Wetting

Procedure 3 shall only be used to remove nonfriable asbestos-containing materials, using the following techniques:

(1) All exposed ACM shall be adequately wet during cutting or dismantling procedures.

(2) ACM shall be adequately wet while it is being removed from facility components and prior to its removal from the facility.

(3) Drop cloths and tenting shall be used to contain the work area to the extent feasible.

(4) Only non-power tools shall be used.

(IV) Procedure 4 - Dry Removal

Obtain written approval from the Executive Officer's designee prior to using dry removal methods for the control of asbestos emissions when adequate wetting procedures in the renovation work area would unavoidably damage equipment or present a safety hazard. Dry removal methods may include one or more of the following:

(1) Use of a HEPA filtration system, operated in accordance with subclause (d)(1)(D)(i)(I), within an isolated work area;

(2) Use of a glovebag system, operated in accordance with subclause (d)(1)(D)(i)(II); or

(3) Use of leak-tight wrapping or an approved alternative, to contain all ACM removed in units or sections prior to dismantlement.

(V) Procedure 5 - Approved Alternative

(1) Use an alternative combination of techniques and/or engineering controls. Written approval from the Executive Officer or his designee shall be obtained prior to the use of a Procedure 5 Approved Alternative.

(2) The Executive Officer may pre-approve specific combinations of techniques and/or engineering controls in writing, which may be used by any person as a Procedure 5 Approved Alternative, subject to such conditions and limitations as required by the Executive Officer.

(3) No person shall use a Procedure 5 Approved Alternative without complying with all of the conditions and limitations set forth therein.

(ii) Specific procedure requirements

(I) No person shall remove or strip ACM or Class II nonfriable ACM that has suffered damage from fire, explosion, or natural disaster without the use of a Procedure 5 Approved Alternative.

(E) Handling Operations

All ACWM shall be collected and placed in transparent, leak-tight containers or wrapping. The following techniques shall be used.

(i) ACM shall be carefully lowered to the ground or a lower floor without dropping, throwing, sliding, or otherwise damaging or disturbing the ACM;

(ii) ACM which has been removed or stripped more than 50 feet above ground level and was not removed as units or in sections shall be transported to the ground via leak-tight chutes or containers;

(iii) ACWM shall be collected, and sealed in leak-tight containers. ACWM shall be adequately wet prior to and during collection and packaging. Alternatively, areas of Class I nonfriable asbestos-containing material which have become friable or have been subjected to sanding, grinding, cutting, or abrading, may be sealed via encapsulation; and

(iv) All surfaces in the isolated work area shall be cleaned, with a vacuum system utilizing HEPA filtration, wet mopping and wipe down with water, or by an equivalent method~~s~~, prior to the dismantling of plastic barriers or sealed openings within the work area.

(F) Freezing Temperature Conditions

When the temperature at the point of wetting is below 0^{o}C (32^{o}F), the wetting provisions of subparagraph (d)(1)(D) shall be superseded by the following requirements:

(i) Facility components containing, coated with, or covered with ACM shall be removed as units or in sections to the maximum extent possible; and

(ii) The temperature in the area containing the facility components shall be recorded at the beginning, middle, and end of each workday during periods when wetting operations are suspended due to freezing temperatures. Daily temperature records shall be available for inspection by the District during normal business hours at the demolition or renovation site. Records shall be retained for at least 2 years.

(G) On-Site Representative

At least one on-site representative, such as a foreman, manager, or other authorized representative, trained in accordance with the provisions of paragraphs (i)(1) and (i)(3), shall be present during the stripping, removing, handling, or disturbing of ACM. Evidence that the required training has been completed shall be posted at the demolition or renovation site and made available for inspection by the Executive Officer's designee.

(H) On-Site Proof

The following shall be maintained on-site and shall be provided to the District upon request:

(i) California State Contractor's License certification number;

(ii) Cal/OSHA Registration number;

(iii) copies of surveys, conducted pursuant to subparagraph (d)(1)(A); and

(iv) copies of notifications submitted pursuant to subparagraph (d)(1)(B).

Proof shall be consistent with the most recently updated information submitted in the notification.

(I) On-Site Storage

No ACWM shall be stored on-site except in a leak-tight container. When leak-tight containers are not in use, they shall be kept inside an enclosed storage area. The enclosed storage area shall not be accessible to the general public and shall be locked when not in use.

(J) Disposal

All ACWM shall be disposed of at a waste disposal site that is operated in accordance with paragraph (d)(3) of this rule.

(K) Container Labeling

Leak-tight containers which contain ACWM shall be labeled as specified in subdivision (e).

(L) Transportation Vehicle Marking

Vehicles used to transport ACWM shall be marked, as specified in subdivision (e), during the loading and unloading of ACWM.

(M) Waste Shipment Records

Waste Shipment Records shall be prepared and handled in accordance with the provisions of paragraph (f)(1).

(N) Recordkeeping

Records shall be kept as specified in subdivision (g).

(2) ACWM Storage Facilities

The owner or operator of any ACWM storage facility shall comply with the following requirements:

(A) Maintenance and Handling

(i) ACWM shall be stored in leak-tight containers;

(ii) All leak-tight containers shall be labeled as specified in paragraph (e)(1); and

(iii) ACWM shall be stored in an enclosed locked area.

(B) Transportation Vehicle Marking

Vehicles used to transport ACWM shall be marked, as specified in paragraph (e)(3), during the loading and unloading of ACWM.

(C) Waste Shipment Records

Waste Shipment Records shall be handled in accordance with the provisions of paragraph (f)(2).

(D) Recordkeeping

Records shall be maintained as specified in paragraph (g)(2).

(3) Active Waste Disposal Sites

The owner or operator of any waste disposal site where ACWM is being deposited shall comply with the following requirements:

(A) Maintenance and Handling

(i) ACWM shall be in leak-tight containers;

(ii) Warning signs, as specified in paragraph (e)(2), shall be displayed at all entrances and at intervals of 330 feet or less along the property line of the site or along the perimeter of the sections of the site where ACWM is being deposited;

(iii) Access to the general public shall be deterred by maintaining a fence along the perimeter of the site or by using a natural barrier;

(iv) All ACWM shall be maintained in a separate disposal section;

(v) ACWM deposited at the site shall be covered with at least six (6) inches of nonasbestos-containing material at the end of normal business hours. The waste shall be compacted only after it has been completely covered with nonasbestos-containing material. A low pressure water spray or nontoxic dust suppressing chemical shall be used for any surface wetting after compaction; and

(vi) ACWM shall be covered with a minimum of an additional thirty (30) inches of compacted nonasbestos-containing material prior to final closure of the waste disposal site, and shall be maintained to prevent exposure of the ACWM.

(B) Transportation Vehicle Marking

Vehicles used to transport ACWM shall be marked, as specified in paragraph (e)(3), during the loading and unloading of ACWM.

(C) Waste Shipment Records

Waste Shipment Records shall be handled in accordance with the provisions of paragraph (f)(2).

(D) Recordkeeping

Records shall be maintained as specified in paragraph (g)(3).

(e) Warning Labels, Signs, and Markings

Warning labels, signs, and markings shall be used to identify asbestos related health hazards and comply with the following requirements:

(1) Leak-Tight Containers

Leak tight containers shall be labeled according to the following requirements:

(A) Warning labels for leak-tight containers and wrapping shall have letters of sufficient size and contrast as to be readily visible and legible, and shall contain the following information, or as specified by Occupational Safety and Health Standards of the Department of Labor, Occupational Safety and Health Administration (OSHA) under 29 CFR 1910.1001(j)(2) or 1926.58(k)(2)(iii), or current Cal/OSHA requirements:

CAUTION

Contains Asbestos Fibers

Avoid Opening or Breaking Container

Breathing Asbestos is Hazardous to Your Health

or

DANGER

CONTAINS ASBESTOS FIBERS

AVOID CREATING DUST

CANCER AND LUNG DISEASE HAZARD

(B) Leak-tight containers that are transported off-site shall be labeled with the name of the waste generator and the location at which the waste was generated. The location description shall include the street address.

(2) Active Waste Disposal Sites

No person shall operate an active waste disposal site unless warning signs are conspicuously posted and meet the following:

(A) Are displayed in such a manner and location that a person can easily read the legend;

(B) Conform to the requirements for 51 cm x 36 cm (20 inch x 14 inch) upright format signs specified in 29 CFR 1910.145 (d)(4) and this paragraph;

(C) Display the following legend in the lower panel with letter sizes and styles of a visibility at least equal to those specified in this subparagraph:

Legend	Notation
Asbestos Waste Disposal Site	2.5 cm (1 inch) Sans Serif, Gothic or Block
Do Not Create Dust	1.9 cm (3/4 inch) Sans Serif, Gothic or Block
Breathing Asbestos is Hazardous to Your Health	14 Point Gothic

; and

(D) Have spacing between any two lines at least equal to the height of the upper of the two lines.

(3) Transportation Vehicles

Markings for transportation vehicles shall:

(A) Be displayed in such a manner and location that a person can easily read the legend;

(B) Conform to the requirements for 51 cm x 36 cm (20 inch x 14 inch) upright format signs specified in 29 CFR 1910.145 (d)(4) and this paragraph; and

(C) Display the following legend in the lower panel with letter sizes and styles of a visibility at least equal to those specified in this paragraph:

Legend	Notation
DANGER	2.5 cm (1 inch) Sans Serif, Gothic or Block
ASBESTOS DUST HAZARD	2.5 cm (1 inch) Sans Serif, Gothic or Block
CANCER AND LUNG DISEASE HAZARD	1.9 cm (3/4 inch) Sans Serif, Gothic or Block
Authorized Personnel Only	14 Point Gothic

; and

(D) Have spacing between any two lines at least equal to the height of the upper of the two lines.

(f) Waste Shipment Records

(1) Waste Generators

A waste generator shall comply with the following:

(A) Waste shipment information shall include, but not be limited to, the following:

(i) The name, address, and telephone number of the waste generator;

(ii) The name, address, and telephone number of the South Coast Air Quality Management District;

(iii) The quantity of ACWM in cubic meters or cubic yards;

(iv) The name and telephone number of the disposal site owner and operator;

(v) The name and physical site location of the disposal site;

(vi) The date transported;

(vii) The name, address, and telephone number of the transporter; and

(viii) A signed certification that the contents of this consignment are fully and accurately described by proper shipping name and are classified, packed, marked, and labeled, and in proper condition for highway transport according to applicable federal, state, and local regulations.

(B) A copy of the Waste Shipment Record shall be provided to the disposal site owner or operator at the same time the ACWM is delivered to the disposal site.

(C) If a copy of the Waste Shipment Record, signed by the owner or operator of the designated disposal site, is not received within 35 days of the date the ACWM was accepted by the initial transporter, the transporter and/or the owner or operator of the designated disposal site shall be contacted to determine the status of the waste shipment.

(D) If a copy of the Waste Shipment Record, signed by the owner or operator of the designated disposal site, is not received within 45 days of the date the ACWM was accepted by the initial transporter, a written report shall be submitted to the District and shall include the following:

(i) A copy of the Waste Shipment Record for which a confirmation of delivery was not received; and

(ii) A signed cover letter explaining the efforts taken to locate the ACWM shipment and the results of those efforts.

(2) Storage and Active Waste Disposal Facilities

The owner or operator of any storage facility or active waste disposal site shall comply with the following requirements:

(A) Waste shipment information shall be filled out on the Waste Shipment Record forms provided by the waste generator, for all ACWM received from an off-site facility, and shall include, but not be limited to, the following:

(i) The name, address, and telephone number of the waste generator;

(ii) The name, address, and telephone number of the transporter;

(iii) The quantity of ACWM received in cubic meters or cubic yards; and

(iv) The date of receipt.

(B) No shipment of ACWM shall be received from an off-site facility unless it is accompanied with a completed Waste Shipment Record signed by the waste generator.

(C) If there is a discrepancy between the quantity of ACWM designated in the Waste Shipment Record and the quantity actually received, and if the discrepancy cannot be resolved with the waste generator within 15 days of the date the ACWM was received, a written report shall be filed with the District. The report shall include the following:

(i) A copy of the Waste Shipment Record; and

(ii) A signed cover letter explaining the discrepancy, and the attempts to reconcile it.

(D) If any shipment of ACWM is not properly containerized, wrapped, or encapsulated, a written report shall be filed with the District. The report shall be postmarked or delivered within 48 hours after the shipment is received, or the following business day.

(E) A signed copy of the Waste Shipment Record shall be provided to the waste generator no later than 30 calendar days after the ACWM is delivered to the disposal site.

(g) Recordkeeping

(1) Demolition and Renovation Activities

The owner or operator of any demolition or renovation activity shall maintain the following records for not less than three (3) years and make them available to the District upon request:

(A) A copy of all survey-related documents;

(B) A copy of all submitted notifications. A copy of the most recently updated written notification submitted in accordance with the provisions of this rule shall be maintained on-site;

(C) A copy of all written approvals obtained under the requirements of subparagraph (d)(1)(D);

(D) A copy of all Waste Shipment Records;

(E) All training informational materials used by an owner or operator to train supervisors or workers for the purposes of this rule; and

(F) A copy of all supervisors and workers training certificates and any annual reaccreditation records which demonstrate EPA-approved or state accreditation to perform asbestos-related work.

(2) Storage Facilities

The owner or operator of any storage facility shall maintain a copy of all Waste Shipment Records on site for not less than three (3) years and make them available to the District upon request.

(3) Active Waste Disposal Sites

The owner or operator of an active waste disposal site shall maintain the following information on site for not less than three (3) years and make them available to the District upon request:

(A) A description of the active waste disposal site, including the specific location, depth and area, and quantity, in cubic meters or cubic yards, of ACWM within the disposal site on a map or diagram of the disposal area;

(B) A description of the methods used to comply with waste disposal requirements; and

(C) A copy of all Waste Shipment Records.

(4) In lieu of the requirements of paragraph (g)(1), the owner or operator of a renovation activity at any facility, in which less than 100 square feet of surface area of ACM on facility components is removed or stripped, may instead elect to maintain the following information for a period of not less than three (3) years, and make it available to the District upon request:

(A) A copy of all survey-related documents;

(B) Records containing an estimate of the amount of ACM removed or stripped at each renovation subject to this paragraph;

(C) Type of removal controls used for each renovation; and

(D) A copy of all Waste Shipment Records.

(h) Sampling Protocols and Test Methods

(1) Sampling of materials suspected to contain asbestos, to comply with this rule, shall be conducted following the provisions of 40 CFR Part 763.86.

(2) Analysis of materials for asbestos, to comply with this rule, shall be determined by using SCAQMD Method 300-91 as detailed in the District's *Laboratory Methods of Analysis for Enforcement Samples* manual, or by using the Method specified in Appendix A, Subpart F, 40 CFR Part 763, Section 1, Polarized Light Microscopy. Asbestos analyses performed to comply with this rule must be undertaken by laboratories accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).

(i) Training Requirements

The owner or operator performing a demolition or renovation activity shall provide asbestos-related training as follows:

(1) On-site supervisory personnel shall successfully complete the Asbestos Abatement Contractor/Supervisor course pursuant to the Asbestos Hazard Emergency Response Act (AHERA), and obtain and maintain accreditation as an AHERA Asbestos Abatement Contractor/Supervisor.

(2) Workers shall successfully complete the Abatement Worker course pursuant to the AHERA.

(3) Supervisory personnel and workers shall be trained on the provisions of this rule as well as on the provisions of 40 CFR Part 61.145, 61.146, 61.147 and 61.152 (Asbestos NESHAP provisions) and Part 763, and the means by which to comply with these provisions.

(j) Exemptions

(1) The notification requirements of subparagraph (d)(1)(B) and the training requirements of subdivision (i) shall not apply to renovation activities, other than planned renovation activities which involve non-scheduled renovation operations, in which less than 100 square feet of surface area of ACM are removed or stripped.

(2) The notification requirements of subparagraph (d)(1)(B) and the training requirements of subdivision (i) shall not apply to planned renovation activities which involve non-scheduled renovation operations, in which the total quantity of ACM to be removed or stripped within each calendar year of activity is less than 100 square feet of surface area.

(3) Clauses (d)(1)(A)(iii)(V), (VI), and (VII) and subclause (d)(1)(B)(ii)(XV) shall not apply to the owner or operator of any renovation or demolition activity, when the suspected material is treated as ACM when being removed, stripped, collected, handled, and disposed of in accordance with the provisions of this rule.

(4) The portion of clause (d)(1)(A)(iv) which requires Cal/OSHA certification shall not apply to persons performing work not subject to the certification requirement established by regulations pursuant to the Labor Code, Section 6501.5.

(5) Subclause (d)(1)(B)(ii)(XI) and clause (d)(1)(H)(i), requiring a California State Contractors License Certification number, shall not apply to persons

performing work not subject to the certification requirement established pursuant to the Business and Professions Code, Section 7058.5.

(6) Subclause (d)(1)(B)(ii)(XII) and clause (d)(1)(H)(ii), requiring Cal/OSHA registration, shall not apply to persons performing work not subject to the registration requirement established pursuant to the Labor Code, Section 6501.5

(7) The provisions of subparagraph (f)(2)(E) shall not apply to storage facilities that do not meet the definition of an active waste disposal site as defined by paragraph (c)(1).

(8) The handling requirements of phrases (d)(1)(D)(i)(I)(2), (d)(1)(D)(i)(I)(5), and (d)(1)(D)(i)(I)(6), the training requirements of paragraphs (i)(1) and (i)(2), the reporting of training certificate requirement of subclause (d)(1)(B)(ii)(XVI), and the on-site proof of training requirement of subparagraph (d)(1)(G) and subdivision (i) shall not apply to the exclusive removal of asbestos-containing packings, gaskets, resilient floor covering and asphalt roofing products which are not friable, have not become friable, and have not been subjected to sanding, grinding, cutting, or abrading.

(9) The provisions of this rule shall not apply to an owner-occupant of a residential single-unit dwelling who personally conducts a renovation activity at that dwelling.

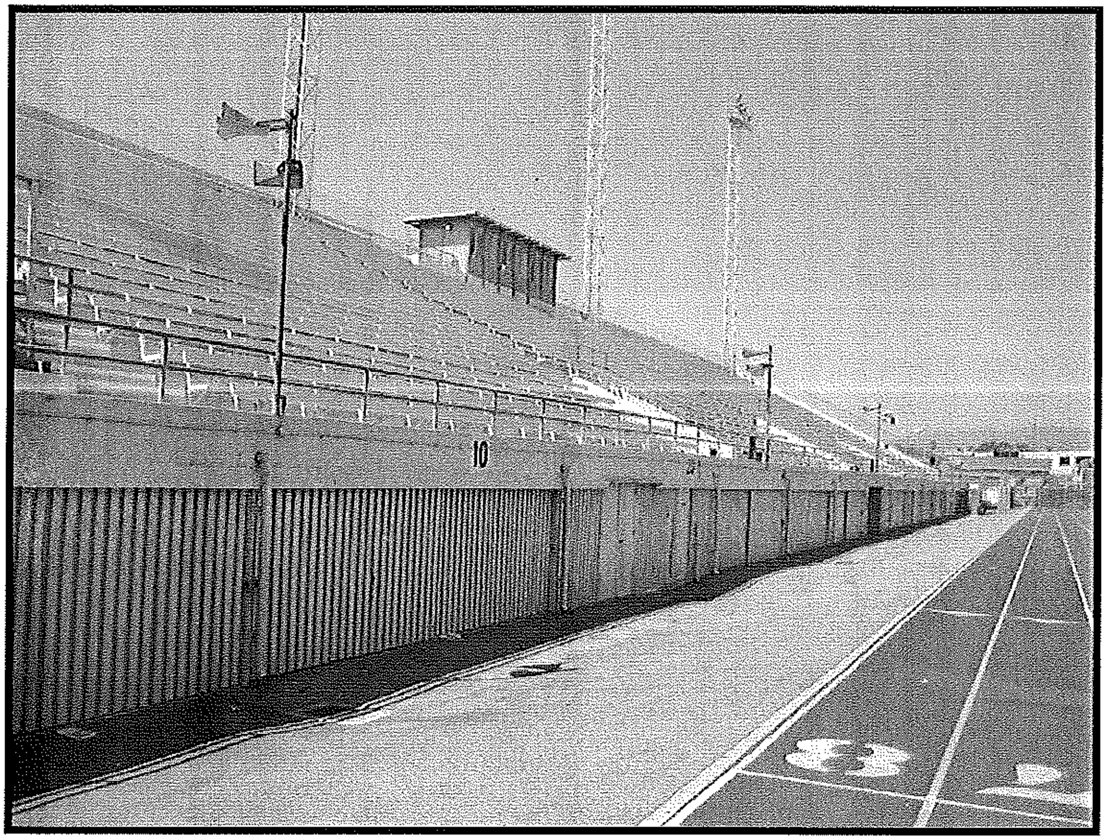
(10) The survey requirements of subparagraph (d)(1)(A) shall not apply to renovation activities of residential single-unit dwellings in which less than 100 square feet of surface area of ACM are removed or stripped.

Appendix D:

Corsair Stadium Seismic Evaluation Study

Corsair Field Stadium Seismic Evaluation Study

Santa Monica College



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JAMA Project No. 11542

1.3 TIER 1 EVALUATION OF EXISTING STRUCTURE

Tier 1 evaluation phase consists of evaluating a series of check list items that include structural, non structural, and geotechnical aspects of the structure. The purpose evaluating each item on the checklist is to determine if the existing structure is compliant or non compliant with the seismic performance objective. Any non compliant item must be reevaluated in the Tier 2 phase. Table 3-2 shown in Appendix B describes each checklist item that is required to be evaluated.

1.3A COMPLIANT ITEMS

Most of the structural, non structural, and geotechnical issues evaluated in the Tier 1 phase were complaint with the life safety seismic performance objective and are too numerous to describe in this report. Therefore, a full listing of each result of each Tier 1 checklist item is provided in Appendix B.

1.3B NON COMPLIANT ITEMS

As shown in Appendix B, there are some noncompliant components of the existing structure that do not meet the life safety seismic performance objective. Each noncompliant item is described below.

SHEAR STRESS IN CONCRETE SHEAR WALLS

The average shear stresses in the shear walls in the longitudinal direction are equal to 90 PSI. This stress is less than the 100 PSI limit set by the Tier 1 analysis and thus the concrete walls are compliant with Tier 1 analysis. However this Tier 1 method of calculating shear stress in the walls is very simplified and does not consider torsion. If torsion was considered than the 3 feet and 5 feet wide walls piers along grid C would be stressed in excess of 100 PSI.

TORSION

Structure's center of mass is offset by more than 20% from the center of rigidity in the longitudinal direction due to the tall narrow shear walls along grid C and the long short stiff walls along grid A on the south side of the diaphragm as shown in Figure 1 in Appendix C.

DETERIORATION OF CONCRETE

The top side of the sloped concrete seating area, which acts as a rigid diaphragm, had several locations of open concrete spalls. Some of these open spalls had exposed reinforcement bars that showed signs of heavy corrosion. These opens spalls are shown in Photo # 9 through #16. The concrete spalls are generally located on the west side of the seating area.

DIAPHRAGM CONTINUITY

There is a 1/2 – inch wide expansion joint in the transverse direction that runs the entire length of the sloped concrete seating area. The expansion joint is located at the center of the seating area. The expansion joint causes the concrete seating area diaphragm to be discontinuous because horizontal shear forces are unable to be transferred across the expansion joint. The expansion joint is shown in Photo #24 and #25.

1.0 STRUCTURAL EVALUATION

1.1 GENERAL

This report summarizes the findings of a structural evaluation that was performed on the Corsair Field Stadium to determine the structural condition of the stadium and to evaluate if the stadium met the life safety seismic performance objective. Also this report provides a recommended seismic retrofit scheme.

The structural evaluation consisted of reviewing existing drawings, performing a site visit and evaluating the seismic performance by following the ASCE seismic evaluation of existing building standard.

The existing drawings reviewed were structural sheets 1 though 5 dated March 5th 1947, Electrical sheet E-2 dated March 10th 1947, and maintenance shop modification plans dated February 7th 1979.

A site visit was conducted on October 10th 2006. Present at the site visit was Mr. Craig Harris who is the construction systems supervisor from the Santa Monica College Facilities Department, Mr. Marcello Sgambelluri and Mr. Matt Timmers from John A. Martin structural engineering office. Photos were taken during the site visit and are shown in Appendix A

The structural evaluation method used is a nationally recognized standard set forth in ASCE/SEI 31-03 "Seismic Evaluation of Existing Buildings. The structural evaluation was broken into two phases, the screening phase or Tier 1, and the evaluation phase or Tier 2.

1.2 EXISTING STRUCTURE

The Corsair Field Stadium is a concrete structure that consists of a sloped concrete seating area that is approximately 325 feet by 67 feet in plan as shown in Photo #1. The sloped concrete seating is supported on 14-inch square concrete columns spaced uniformly on a 21-foot by 17-foot 9-inch grid. Spanning between each column in each orthogonal direction, at an elevation of approximately 16 feet, is a 12-inch wide by 14-inch deep concrete tie beam as shown in Photo #2. The grid and wall layout on the lower level is diagrammatically shown in Figure 1 in Appendix C.

The lateral load resisting system in the East-West or transverse direction consists of full height 8-inch concrete shear walls located near grids 2, 4, 5, 11, and 15 between grids A to B and grid A to C. The transverse shear wall near grid 11 is shown in Photo #3.

The lateral load resisting system in the North-South or longitudinal direction consists of short full height 8-inch concrete shear wall that runs almost the entire length on the east side of the stadium of the stadium on grid A. Four full height walls piers, 3 feet and 5 feet wide, are the only lateral resisting elements in the North-South direction on the west side of the stadium along grid C as shown in Photo #4.

The stadium also has two concrete braces that are discontinuous along Grid D between grids 4 to 5 and 12 to 13 and provide minimal lateral resistance to the stadium as shown in Photo #5 to #8.

Additional photos of the existing structure are shown in Appendix A.

1.4 TIER 2 EVALUATION OF EXISTING STRUCTURE

Tier 2 evaluation phase consists of reevaluating, in more detail, all of the non compliant items found in the Tier 1 phase. The results of the Tier 2 analysis are summarized below.

1.4A SHEAR STRESS IN CONCRETE SHEAR WALLS AND TORSION

As described above, the average shear stresses calculated in the Tier 1 analysis was lower than the 100 PSI limit. However, the Tier 1 method is simplified and does not consider torsion. When torsion was considered in the Tier 2 analysis, the wall piers along grid C are overstressed by 12% above the life safety criteria.

A 3 dimensional computer model was created using the Linear Static Procedure to reevaluate the structure. The computer model only modeled the concrete walls that contributed to the structures lateral resistance. Images of this model are shown in Figures 4 and 5 in Appendix C. From this analysis it was concluded that the wall piers along grid C do not meet the life safety requirement. The Tier 2 analysis of the concrete walls and torsion was performed per Section 4.4.2.2.1 of the ASCE Seismic Evaluation of Existing Building Document.

1.4B DETERIORATION OF CONCRETE

The deterioration of concrete or the open spalls on the top side of the sloped concrete stepping seating area shown in Photo # 9 through #16 are not located in critical areas, nor due the spalls significantly reduce the capacity of the diaphragm. The Tier 2 analysis of deteriorated concrete was performed per Section 4.3.3.4 of the ASCE Seismic Evaluation of Existing Building Document.

1.4C DIAPHRAGM CONTINUITY

As described above there is a 1/2 – inch wide expansion joint in the transverse direction that runs the entire length of the sloped concrete seating area. No Tier 2 analysis is required because it is clear that there is no load path around the expansion joint. Therefore, the diaphragm does not meet the life safety requirement. The Tier 2 analysis of non compliant diaphragm continuity was performed per Section 4.5.1.1 of the ASCE Seismic Evaluation of Existing Building Document.

1.4D MEZZANINES

Based on Tier 2 analysis or reevaluation of the mezzanine between grid 6 and 7, it was determined that the mezzanine is supported by the main lateral resisting system in each orthogonal direction, a requirement for Tier 2 reevaluation. Therefore this mezzanine, as well as all the mezzanines meets the life safety requirement. The Tier 2 analysis of non compliant mezzanines was performed per Section 4.3.1.3 of the ASCE Seismic Evaluation of Existing Building Document.

1.5 RECOMMENDED RETROFITS/MITIGIATION OF NON-COMPLIANT ITEMS

This portion of the report presents recommended retrofits to the existing stadium in order to upgrade to meet the life safety performance objective. All retrofits are presented below and categorized based on the non compliant items reevaluated in the Tier 2 analysis.

1.5 MITIGATING NON COMPLIANT CONCRETE SHEAR WALLS AND TORSIONAL IRREGULARIES

As described above, it was concluded that the wall piers along grid C do not meet the life safety requirement. In order for the stresses in the shear walls to be reduced to an expectable limit per the ASCE standard, it is recommended that at least 63 feet of new 12 inch thick concrete walls be placed along grid line D on the north side of the building.

It should be noted that the shear walls are added not only to mitigate the 12% overstress of the life safety requirement but also to mitigate against torsion. These new shear walls can be broken into 3 separate segments and placed between any of the bays between grids 1 to 12. Also the existing tie beam may be removed in any bay along grid D that contains the new shear walls. Since the walls are very tall, boundary elements will need to be provided at the ends of the walls. These boundary elements at the ends of the walls will need to be at least 2 feet square. These new boundary elements may encase the existing columns. This concept is shown in Figure 2.

1.5B MITIGATING DETERIORATION OF CONCRETE

As described above, it was concluded that the concrete deterioration did not occur at any critical locations on the stadium seating area. However it is recommended that concrete spall locations be repaired to mitigate any further degradation of the concrete seating area.

1.5C MITIGATING THE DIAPHRAGM DISCONTINUITY

As described above the diaphragm does not meet the life safety requirement because the expansion joint in the stadium seating area extends the entire length of the structure and creates a discontinuity. In order to mitigate this discontinuity the two stadium slabs adjacent to the expansion joint will need to be linked together. It is recommended that these slabs be linked by steel horizontal cross bracing. These braces may consist of steel tubes that cross the expansion joint, are bolted to the underside of the stadium seating slab and tie into the concrete walls below. Also the existing expansion joint must be filled by epoxy injection to ensure that no water leakage will occur onto the new steel link beams. This concept is shown in Figure 3.