

# Item No.14-2

## Supplemental Material

For  
**City of Sacramento**  
City Council  
Housing Authority  
Redevelopment Agency  
Economic Development Commission  
Sacramento City Financing Authority

### Agenda Packet

**Submitted:** January 29, 2008

**For the Meeting of:** January 29, 2008

- Additional Material
- Revised Material

**Subject:** Greenbriar Correspondence

Staff received the following correspondence for the Greenbriar project:

- Letter from James P. Pachl dated January 29, 2008 (4 pages)
  - RE: Council Agenda, Greenbriar project, January 29, 2008 agenda, 6 p.m.
- Letter from Remy, Thomas, Moose, and Manley, LLP dated January 29, 2008 (14 pages)
  - RE: Greenbriar Project, Sacramento – Toxic Air Contaminants, Noise Analysis, and Flooding: A Response to William Kopper
- Letter from Eric J. Ross dated January 29, 2008 (12 pages)
  - RE: Greenbriar (M05-046 / P05-069) Public Hearing Agenda Item No. 14 (1-29-08)

**Contact Information:** Arwen Wacht (808-1964)

Please include this supplemental material in your agenda packet. This material will also be published to the City's Intranet. For additional information, contact the City Clerk Department at Historic City Hall, 915 I Street, First Floor, Sacramento, CA 95814-2604 ■ (916) 808-7200.

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January 29, 2008

Mayor Heather Fargo  
City Council  
c/o: Scott Mende, New Growth Director  
City of Sacramento

RE **Council Agenda, Greenbriar project, January 29, 2008 agenda, 6 p.m.**

Dear Mayor Fargo and City Councilmembers,

On January 22, 2008, the Council adopted an "intent" motion which stated the intention of the Council to adopt the actions proposed pertaining to the Greenbriar project. Adoption of an "intent" motion is not adoption of the proposed Greenbriar action, which will be heard and acted upon on January 29, 2008. By law, the administrative record of this matter remains open until the Council acts on Greenbriar on January 29, 2008. This letter supplements my previous letters on behalf of ECOS, Sierra Club, and Friends of the Swainson's Hawk dated January 15 and 22, 2008, and my previous letters to the Sacramento City Planning Commission dated October 6, October 11, and November 7, 2007, which were earlier submitted to City staff for inclusion in the administrative record of this matter.

**1. Override of Airport Comprehensive Land Use Plan ("CLUP")**

These comments are intended to supplement the comment letter of Eric Ross, attorney, submitted on behalf of ECOS on January 22, 2008, commenting on the proposed override of the CLUP by the Sacramento City Council. I have reviewed the 1994 Airport CLUP, Airport Land Use Commission ("ALUC") and letter of Gregory Chew, for the SACOG Airport Land Use Commission, dated December 7, 2005.

Mr. Chew's letter, pp. 2, 3, correctly states that the CLUP allows residential development in the overflight zone where said development would not result in a large concentration of people, defined as an average density of greater than 25 persons per acre per hour during any 24 hour period, and not to exceed 50 persons per acre at any time for all types of land uses. See 1994 CLUP, pp. 33, 36 footnote 13.

Mr. Chew's letter, p. 3, then states that the average density for the entire Overflight Safety Zone within the Greenbriar project is less than the above CLUP thresholds, but then admits that "the Greenbriar proposal will have high concentrations of people above 25 person acre on an average hourly basis and above 50 persons per acre at times. *"The most notable place is surrounding the proposed light rail station, which is outright prohibited under the CLUP."*

The letter then states that Airport Land Use Commission will consider the Greenbriar proposal compatible with the two density criteria, but fails to state any reason for that finding other than "In the spirit in which the current CLUP was written in 1994. The phrase "In the spirit with which the current CLUP was written . . .," is not substantial evidence that supports the Finding No. 1 of the ALUC that the residential and commercial uses are compatible with the CLUP based on the densities proposed. (Mr. Chew's letter p. 3).

Appendix A of the 1994 CLUP p. A-1 requires that the findings be based on parcel-specific development proposals, "such as tentative maps". "General Plan or zoning code amendment proposals for large areas usually do not provide sufficient parcel specific or site specific information on which to be a conformity determination on the concentration of persons standard." (1994 CLUP, p. A-1). Override of the CLUP at this time is premature because there is no tentative map. There is no authority for the proposition that widely-varying densities on a number of parcels within a 405-acre area can be averaged to exempt the entire property when the densities on certain large residential projects on separate parcels will be higher than allowable under the CLUP. To the contrary, "averaging" densities over a large multi-use project to defeat the CLUP prohibitions on high densities beneath an Overflight Zone of a very busy airport the very purpose of Public Utilities Code §§21670 and 21676, and the CLUP of the Airport Land Use Commission, which is to minimize hazard to life and property within the Overflight Zone.

The proposed Findings are not supported by substantial evidence that the project complies with the purpose of Public Utilities Code § 21676 as stated in § 21670, including the critical purpose of "prevent the creation of new noise and safety problems. The replacement of existing agricultural uses by a dense residential subdivision which includes parcels of residential development which exceed even SACOG's 1994 ACLUP, is by definition the creation of new noise and safety problems which do not now exist with the present agricultural use of the property. There is no authority for the proposition that compliance with SACOG's 1994 CLUP is the exclusive criteria for demonstrating compliance with Sections 21670 and 21676.

Such findings must be based upon the best available scientific and other information, including the statewide guidance set forth by the standards of the 2002 Airport Land Use Planning Handbook of the Division of Aeronautics of the California Department of Transportation, which is referenced in the letter of SACOG/ALUC, by Gregory Chew, December 2005, attached to the staff report.

That document is available at <http://www.dot.ca.gov/hq/planning/aeronaut/documents/ALUPHComplete-7-02rev.pdf>, which is incorporated herein and into the administrative record of this matter by reference.

## **2. Mitigation for Loss of Wildlife Habitat**

The table titled "Open Space, Species, and Agriculture : Projects Impacts and Mitigation", attached to the latest version of the Mitigation Monitoring Plan, states that the area of impacts on wildlife species is reduced by 51.2 acres due to "MAP direct and indirect impacts on Greenbriar, previously mitigated by MAP." Nothing in the Greenbriar EIR or other documents which verify that Metro Air Park has actually mitigated for the loss of 51.2 acres of wildlife habitat on the Greenbriar site, or that Metro Air Park has undertaken activities impacting 51.2 acres of the Greenbriar. The Metro Air Park HCP identifies loss of 40.7 acres from the proposed construction of a trunk sewer line by Metro Air Park to Hwy 99 if it is ever built and if it is built across the

Greenbriar site, but the actual route of the sewer line will be determined if and when it is constructed. Given the apparent lack of market for new development on the Metro Air Park site to date, it is possible that it would never be built if the Greenbriar site remained agricultural, or that it would be built along a different route. The entire Greenbriar site will obviously be impacted by the initial grading for Greenbriar, and all habitat destroyed, including the 51.2 acres attributed by the EIR to Metro Air Park's proposed off-site infrastructure, which is very unlikely to be implemented by Metro Air Park prior to grading of Greenbriar. Deferral of mitigation until Metro Air Park actually builds its trunk sewer (if it builds it) is unacceptable under CEQA unless Metro Air Park builds its trunk sewer before Greenbriar is graded (which is highly unlikely). A sewer trunk line necessarily must be built by Greenbriar if Greenbriar develops before Metro Air Park builds the sewer line, and thus Greenbriar would have the responsibility to mitigate for lost habitat. Deferral of this mitigation measure until Metro Air Park actually builds its trunk sewer line is unacceptable under CEQA if Greenbriar earlier destroys that affected habitat.

The Mitigation Measures include the conversion of the 235.4 acre Spangler site into wetland habitat suitable for Giant Garter Snake and upland habitat managed for high-quality Swainson's Hawk foraging habitat. The Sacramento County Airport pointed out, in its letter dated August 20, 2006, (FEIR p. 4-222) that such management would create an "extreme hazard to commercial aircraft" due to danger of aircraft striking birds which would be attracted to the Spangler site if it were managed for wildlife. There is no evidence that the mitigation project proposed on the Spangler property has been modified so that the Airport is satisfied that it would not induce the presence of wildlife (birds) hazardous to aircraft operations due to potential for collision of birds with aircraft.

If the County Airport or Federal Aviation Administration objects to conversion of the Spangler site to wildlife habitat mitigation, the consequence could be that the Spangler site cannot be used for that purpose and consequently would be infeasible and unenforceable. There is no evidence of any plan for alternative mitigation measures in the event that use of the Spangler site is impossible.

There is no evidence that any of the sites proposed for mitigation measures have been deemed suitable for habitat mitigation by the Natomas Basin Conservancy or the Federal and State wildlife agencies, or that the sites proposed for "high quality" Swainson's Hawk mitigation foraging habitat can, in fact, successfully provide that "high quality foraging habitat." There has certainly been sufficient time for City to consult with the Conservancy on this issue, but City has apparently failed to do so. There has been plenty of time for the City to reach agreement with the wildlife agencies regarding the needed Incidental Take Permits and appropriate mitigation (if the wildlife agencies feel that they can issue the Permits without violating the NBHCP or the Federal or California Endangered Species Acts), but City has failed to do so, and there is no evidence in the record that City has made a good faith effort to reach agreement.

The proposed rezoning, if adopted, places the City in violation of the 2003 NBHCP and Incidental Take Permits issued thereunder. The 2003 NBHCP Implementation Agreement, p. 3, § 3.1.1(a), executed by the City, is clear:

"Thus, the CITY and SUTTER further agree in the event this future urban development should occur [outside the City's NBHCP Permit Area], **prior to approval of any related rezoning or prezoning**, such future urban development shall trigger a reevaluation of the Plan and Permits, a new effects analysis, potential amendments and/or revisions to the

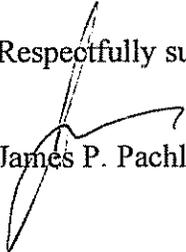
Plan and Permits, a separate conservation strategy and **issuance of Incidental Take Permits** to the permittee for that additional development ...."

The letter of the U.S. Fish and Wildlife Service dated September 18, 2007, to City, states that City may proceed with certain pre-project approvals, but for the City to remain in compliance with the NBHCP, IA, and ITP's, "the City may not take action to approve the Greenbriar project through specific project approvals, i.e., approval of a tentative subdivision map, final subdivision map, or a development agreement until after the project proponent has obtained federal incidental take permits." This letter of the USFWS is in error to the extent that it would appear to allow City to approve rezoning, which is prohibited by the above-quoted section of the Implementation Agreement of the NBHCP. Nothing in the NBHCP authorizes USFWS to waive a condition of the Implementation Agreement, Incidental Take Permits or the NBHCP. The statement in City staff reports that City may lawfully approve the development agreement, and tentative and final subdivision maps, after City only "consults" with the wildlife agencies is untrue and may seriously mislead City Council into premature approvals which would violate the NBHCP and lead to revocation of City's existing Incidental Take Permits for the NNCP area.

MM 6.12-1(a) and (b) constitute deferral of formulation of mitigation measures. Neither the decision-makers nor the public can form an opinion on the effectiveness of these measures or whether these measures will reduce impacts to less than significant, because the measures are unknown. Such deferral of mitigation measures until after approval of annexation and rezoning is unacceptable under CEQA.

Thank you for the opportunity to comment.

Respectfully submitted,

  
James P. Pachl

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January 29, 2008

**HAND DELIVERED**

Sacramento City Council  
Honorable Mayor and Councilmembers  
915 "I" Street, 5<sup>th</sup> Floor  
Sacramento, CA 95814

Re: Greenbriar Project, Sacramento  
Toxic Air Contaminants, Noise Analysis, and Flooding:  
A Response to William Kopper

Dear Mayor and Councilmembers:

This letter responds to comments and concerns raised by Mr. William Kopper both at the January 22, 2008, City Council hearing on the proposed Greenbriar project ("project"), and through written correspondence submitted on the same date. Specifically, Mr. Kopper presents the following issues for Council consideration: (1) whether the health risk assessment ("HRA") prepared for the project is adequate; (2) whether the noise impacts caused by the project will be greater than assumed in the Environmental Impact Report ("EIR") for the project; and (3) whether the project will be constructed within an unsafe flood zone. With regard to the first issue, Mr. Kopper relies upon a report prepared by Dr. Camille Sears. Regarding the second issue, Mr. Kopper cites to a letter authored by Steve Pettyjohn of the Acoustics & Vibration Group, Inc. And finally, regarding the flood issue, Mr. Kopper presents a report authored by an Independent Review Panel for the Department of Water Resources, entitled "A California Challenge – Flooding in the Central Valley." Each of these three issues is discussed below. Please note that a written response to the Toxic Air Contaminant ("TAC") issue was recently provided to the Planning Commission on November 1, 2007, and was also provided to the Council on January 22, 2008. For ease of reference and to provide a comprehensive

response to the letter/HRA prepared by Mr. Kopper and Ms. Sears, the issue of TACs is addressed again in this letter.

Prior to addressing Mr. Kopper's comments, however, we note for the record that Mr. Kopper's letter dated January 22, 2008 – the date of the Council hearing on the proposed Greenbriar project – is untimely. The Draft EIR ("DEIR") for the project was circulated for a 60-day comment period in July 2006. The DEIR was circulated without a threshold for analyzing the potential risks from TACs because no significance threshold had been (nor have they been since) established by the Sacramento Metropolitan Air Quality Management District ("SMAQMD") for exposure of sensitive receptors to mobile source TAC emissions. (DEIR, p. 6.2-15.) The SMAQMD has established a "10 in 1 million cancer risk" threshold for assessing impacts caused by stationary sources, but no such threshold has been established for mobile sources. In the absence of a threshold, the DEIR nevertheless analyzed the potential risk from exposure to mobile sources on-site. As part of that analysis, a health risk assessment was prepared by Sierra Research to evaluate the potential health-related impacts to on-site sensitive receptors from exposure to mobile source TACs. Based upon the results of the HRA, the DEIR determined that the impact was less than significant, taking into consideration that the health risks from mobile source TACs are declining as a result of federal and state emissions regulations. Notably, Mr. Kopper submitted comments on the DEIR, but his comments were limited to traffic issues and did not address the adequacy of the HRA.

In response to comments from SMAQMD regarding the air quality analysis, as well as other comments, the EIR was recirculated for a 45-day review period in November 2006 (the "Recirculated DEIR" or "RDEIR"). The RDEIR contained discussion of SMAQMD's protocol and an enhanced analysis regarding the potential significance of impacts from TACs. Mr. Kopper did not comment on this document.

In April, 2007, the City recirculated the Draft EIR for a second time (the "Second RDEIR") to address the significance of certain traffic impacts. The Second RDEIR did not revise the air quality analysis. Mr. Kopper submitted comments on the Second RDEIR, but again his comments were limited to traffic.

The Final EIR ("FEIR") was released in August 2007, a full five months prior to the City Council hearing on January 22. While Mr. Kopper participated at the Planning Commission's workshops and public hearings, as well as at the Council workshop in advance of the Council hearing, he opted not to raise the specific issues presented in his January 22 letter until the evening of January 22, 2008. Clearly, Mr. Kopper has been an active participant throughout the CEQA process – he was not deprived of an opportunity to comment on air quality issues, or any other issues for that matter. Nevertheless, he withheld substantive comment on the HRA until the day the project was before the

Council for consideration. It is questionable whether Mr. Kopper's strategy of providing highly technical last minute comments is consistent with the legislative intent specified in Public Resources Code Sections 21003, subdivision (f) (persons involved in the environmental review process shall carry out the process in the most efficient, expeditious manner), 21003.1, subdivision (a) (comments from the public on the environmental effects of a project shall be made to lead agencies as soon as possible in the review of environmental documents), or with the overall requirement that CEQA should result in informed decisionmaking. Decisionmaking cannot be well-informed by the absence of sufficient environmental information; nor can it be well-informed by the intentional subversion of information. The above concerns notwithstanding, we turn to Mr. Kopper's specific concerns as set forth in his January 22, 2008 letter.

## **I. The Health Risk Assessment Is Adequate**

By a letter dated January 21, 2008, attached to Mr. Kopper's January 22, 2008 letter to the Council, Ms. Sears critiques the HRA prepared for the project, and subsequently concludes that the EIR's analysis of potential impacts from off-site mobile TACs is inadequate. Ms. Sears' criticisms generally fall into four categories: (a) the HRA should have been prepared in accordance with the SMAQMD-recommended protocol; (b) the HRA should have included the models relied upon for data collection; (c) the HRA improperly assumed future reductions in mobile source emissions; and (d) The HRA fails to assess potential impacts from respirable and fine particulate matter ("PM<sub>10</sub> and PM<sub>2.5</sub>") As discussed below, each of Ms. Sears' criticisms is unfounded.

### A. The EIR Complies With The SMAQMD Protocol

The Greenbriar Draft EIR was published in July, 2006, and includes a discussion of the advisory recommendations set forth in the California Air Resources Board's ("CARB") 2005 "Air Quality and Land Use Handbook: A Community Health Perspective" ("Handbook"). The DEIR also discloses the results of the HRA prepared for the project, in order to provide the best informational basis for considering the relative risk of exposure at the site. In August 2006, after the July 2006 publication of the DEIR, SMAQMD adopted a protocol for determining potential risk from exposure to mobile source TACs. The protocol was revised in October, 2006. The recommended protocol is a three-step process: (1) determine if any residences are within 500 feet of a major roadway; (2) if they are, determine via a table included in the protocol if the project is subject to a cancer risk from TACs of 370 in 1 million or greater (i.e., SMAQMD's

evaluation criterion)<sup>1</sup>; if they are subject to this level of risk, conduct a site-specific health risk assessment; if they are not subject to this level of risk, report the results; (3) if they are not within 500 feet of a major roadway, no further roadway air quality analysis is recommended. The Greenbriar project includes residences within 500 feet of I-5 and SR 70/99. Thus, had the protocol been existed at the time the DEIR was published, the protocol would have been invoked.

The DEIR was recirculated in November, 2006, after the SMAQMD protocol was released. The Recirculated DEIR properly included the analysis required by the protocol. The protocol revealed that the cancer risk at the Greenbriar site was low enough that it did not trigger the need for a site-specific health risk assessment. Based upon SMAQMD's tables in the protocol, residences closest to I-5 would be subject to an incremental cancer risk of between 90 and 135 per 1 million and residences closest to SR 70/99 would be subject to an incremental cancer risk of between 24 and 45 per 1 million. In either instance, the risk is well below 370 in 1 million, meaning that by the SMAQMD's own protocol, no additional analysis was required. This information was disclosed on page 6.2-27 of the RDEIR, and was reiterated in summary form by SMAQMD representative Jeane Borkenhagen in her testimony before the Council at the Greenbriar Workshop on January 15, 2008, and again by SMAQMD representative Larry Green in his testimony before the Council on January 22, 2008.

Although not required by the SMAQMD protocol, a site-specific HRA was prepared for the DEIR, and was also included in the RDEIR because it was determined that the HRA provided the best informational basis for considering relative risk of exposure at the site. As discussed in the DEIR and RDEIR, the HRA for the project concludes that the project's cancer risk from exposure to on-road mobile source TACs for the residents closest to freeways is 29 in 1 million. According to CARB's emissions inventory, the most current background cancer risk (the average risk in the entire basin) in the greater Sacramento area from on-road mobile source TACs is 143 in 1 million. The background risk is expected to be reduced by 75%-85% by 2020 as a result of regulations aimed at reducing diesel emissions, thus the background risk would range from 21 (85% reduction) to 36 (75% reduction) in 1 million. The HRA prepared for Greenbriar shows that residences nearest the freeway would be exposed to an on-road mobile-source risk of 29 in 1 million. As compared to the most current background of 143 in 1 million, the risk at the project is significantly less. As compared to the year 2020 background of 21 to 36 in 1 million, the risk at the project is similar. To simplify:

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<sup>1</sup> The SMAQMD evaluation criteria changed from 370 in 1 million in the October, 2006 Handbook to 446 in 1 million in the January, 2007 Handbook. In either case, however, the Greenbriar project is not required to prepare a site-specific HRA.

Project	29 in 1 million
<u>Current Background (assumes no emissions improvements)</u>	<u>143 in 1 million</u>
Increased risk over background	0 *

(\*long terms project risk is less than risk from current exposure levels)

Project	29 in 1 million
<u>Future Background, assumes emissions improvements (low end)</u>	<u>21 in 1 million</u>
Increased risk over background	8 in 1 million

Project	29 in 1 million
<u>Future Background (high end)</u>	<u>36 in 1 million</u>
Increased Risk over Background	0

In all instances, the incremental risk (the project as compared to the background) from the project does not exceed 10 in 1 million.<sup>2</sup> The impact is less than significant. (RDEIR, p. 6.2-29.)

Ms. Sears' assertion that the EIR somehow "discounted" the cancer risk is without merit. As discussed above and explained by EDAW at the October 11, 2007 hearing before the Planning Commission and again at the January 15, 2008 workshop before the Council, the risk of 29 in 1 million was compared to the background, or baseline conditions, as is proper under CEQA. (See CEQA Guidelines § 15126.2 (in assessing the impact of a project on the environment, the lead agency should normally limit its examination to changes in the existing physical conditions in the affected area as they exist at the time the notice of preparation is published, or where no notice of preparation is published, at the time environmental analysis commenced).) Compared to the background, the project risk is never greater than 8 in 1 million. The risk does not exceed 10 in 1 million.

To summarize: the project complied with the SMAQMD protocol, which is the only guidance provided by SMAQMD regarding off-site mobile sources. In addition, the

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<sup>2</sup> / After much consideration and deliberation, and in consultation with EDAW, the City adopted a threshold for the Greenbriar RDEIR based upon established approaches to risk assessment and CEQA's requirement to compare the impacts of a project to baseline conditions (normally, existing conditions; however, in a case where the future conditions will change and are relevant to the analysis of impacts, it is appropriate to also consider future conditions, which in the case of the Greenbriar EIR provided for a more health-conservative analysis) Pursuant to the threshold used in the Greenbriar RDEIR, the cancer risk level would be considered significant if 10 additional persons in 1 million would develop cancer over a 70 year exposure period, as compared to the baseline exposure levels. (RDEIR, p. 6.2-16.)

DEIR and RDEIR disclose the results of the HRA prepared for the project. The project design incorporates the mitigation measures suggested in the HRA. The project applicant has also agreed to provide additional mitigation; at the request of SMAQMD, the applicant shall plant fine-needled conifer trees in the buffer area between the I-5 and SR 70/99 freeways and proposed residential uses. Thus, using the SMAQMD protocol, the project's health risk is below the level requiring a site-specific health risk assessment. Using the results of the HRA prepared for the project, and comparing with the existing and future background risk, the project's health risk is less than the established threshold of 10 in 1 million. Under either methodology, the potential health risk from mobile sources TACs is less than significant.

For purposes of CEQA, the EIR's analysis of the potential health risks from off-site mobile sources is adequate. In fact, the EIR provides information and analysis that is additional to SMAQMD requirements. The fact that Ms. Sears does not agree with the additional analysis (the HRA) performed by the EIR consultant is rendered moot by the fact that the RDEIR also followed the SMAQMD protocol, as suggested by Ms. Sears herself. Moreover, disagreement among experts does not constitute grounds for overturning a lead agency's certification of an EIR. (*Cadiz Land Company v. Rail Cycle* (2000) 83 Cal.App.4th 74.)

Notwithstanding the above, it is important to note that Ms. Sears' letter ignores a very important fact: SMAQMD supports the Greenbriar project. Indeed, SMAQMD has testified that the project complies with the protocol. As stated in its October 29, 2007 letter to the City, SMAQMD supports the Greenbriar project because it offers "many air quality-friendly elements." SMAQMD notes that "[t]he mixed-use design, density, and transit features are consistent with Blueprint, which is one of the key planning tools designed to limit the air quality and transportation impacts of projects in the Sacramento region." In addition, SMAQMD recognizes that the project "is an essential step toward ensuring the Downtown-Natomas-Airport Regional Transit light rail line implementation." SMAQMD representative Larry Greene reiterated SMAQMD's endorsement at the November 8, 2007 Planning Commission hearing, where he unequivocally stated that SMAQMD supports the project. Mr. Greene further stated that the project complies with the SMAQMD protocol for evaluating health risks associated with land uses adjacent to major freeways, although SMAQMD disagrees over some technical aspects of the HRA prepared for the project. In conclusion, Mr. Greene noted that the "project meets the Blueprint's protocols [and] supports transit," and further stated that the project has an "air quality mitigation plan which we [SMAQMD] have approved." Mr. Greene provided similar testimony in support of the project at the Council hearing on January 22, 2008. Ms. Sears' apparent disregard for SMAQMD's testimony in support of the project substantially weakens her argument that the Greenbriar EIR is defective for failing to comply with SMAQMD protocol – not only is

the EIR consistent with the protocol, but SMAQMD itself has endorsed the project as a Smart Growth project that is consistent with its protocol.

Equally telling is the fact that, while on the one hand Ms. Sears advocates for the SMAQMD protocol, the HRA prepared by Ms. Sears herself deviates from the protocol. Although Ms. Sears proclaims to have prepared an HRA that “is consistent with SMAQMD recommended protocol,” she in fact strays from the protocol when its general recommendations deviate from site-specific conditions at Greenbriar. In reality, if Ms. Sears would have actually followed SMAQMD protocol, she would not have prepared a site-specific HRA for Greenbriar because, as discussed above, the protocol adopted by SMAQMD clearly states that the risk at Greenbriar is substantially below the risk requiring an HRA. Moreover, it is interesting to note that although Ms. Sears purportedly follows SMAQMD protocol, she criticizes the model recommended by SMAQMD and instead uses a different model and a different data-set when preparing her own HRA (McClellan instead of Sacramento Executive Airport data).

B. The HRA Provides Adequate Citation to Underlying Data

Ms. Sears criticizes the project’s HRA for its alleged failure to show the emission rates data used for the dispersion modeling. From this alleged shortcoming, Ms. Sears extrapolates that the public has been denied access to important information regarding the assumptions used for the models.

The HRA conducted by Sierra Research and included in the technical appendix of the EIR clearly describes the data it relies upon, and details the approach by which the data was incorporated into the EIR. No other information was required by CEQA. That fact notwithstanding, however, had any commenter requested the data sets, such data would have been provided by Sierra Research and/or EDAW. Since the date the DEIR was first circulated in July 2006, not one commenter has requested such information. Notably, although Mr. Kopper submitted comments on the DEIR and Second RDEIR, his comments focused on traffic and at no time did Mr. Kopper request additional data pertaining to the HRA. Mr. Kopper’s decision to remain silent on this issue for nearly two years, and then to raise concerns regarding the data points for the HRA on the eve of the Council hearing, is contrary to CEQA’s requirement that concerned members of the public submit comments on the Draft EIR “as soon as possible in the review of environmental documents...in order to allow the lead agencies to identify, at the earliest possible time in the environmental review process, potential significant effects of a project...” (Pub. Resources Code, § 21003.1, subd. (a).) Although case law provides that the public may submit comments up until the time the project is actually approved, the fact that Mr. Kopper reviewed the DEIR, RDEIR, Second RDEIR, and Final EIR, submitted written comments on the RDEIR and Second RDEIR, and yet failed to submit

comments regarding the adequacy of the HRA (which was contained in the DEIR, RDEIR, and Final EIR) until the date of project approval, appears disingenuous and is certainly at odds with the concept of collaboration and cooperation between the public and the lead agency.

C. The HRA Properly Assumed Future Reductions in Mobile Source Emissions

Much of Ms. Sears' letter focuses on her theory that the HRA for the project should not assume that future estimates of TACs will be lower than present rates. Rather, Ms. Sears proposes a methodology that assumes current emission rates for an indefinite period of time, regardless of the fact that CARB is expected to enforce emissions reductions requirements that will dramatically reduce TACs in years to come.

Although Ms. Sears proclaims her approach is the so-called "industry standard" for preparing HRAs, especially in situations where a permit is required, she fails to note that such "industry standard" relates to HRAs prepared for *stationary sources*. Different standards apply for mobile sources. Indeed, the "industry standard" for preparing HRAs to address mobile-source emissions includes accounting for future emissions reductions. For instance, nearly all air districts within California recommend the use of CARB's emission factor model ("EMFAC"), as contained in the urban emissions model ("URBEMIS") that accounts for future emissions reduction to assess mobile-source emissions. Sierra Research properly utilized EMFAC emissions factors, which accounts for fleet turnover, when preparing the HRA for Greenbriar.<sup>3</sup>

Moreover, EDAW has testified that the "standard" approach for stationary sources is not, in this instance, consistent with CEQA. Pursuant to CEQA, an EIR need not engage in speculation to analyze a "worst case scenario," such as assuming for purposes of analysis that air quality reductions regulations will not be enforced in future years. (*Napa Citizens for Honest Government v. Napa County Bd. of Supervisors* (2001) 91 Cal.App.4th 342, 373.) By suggesting the health risks to future residents of Greenbriar should rely on the assumption that emissions from vehicles will not improve over time, Ms. Sears recommends rejecting the historic trend of reduced emissions in favor of a hypothetical "worst case" scenario for purposes of environmental analysis. She also disregards the legal requirements placed upon manufacturers to continue to improve emissions reductions, particularly the requirements for the reduction of diesel emissions which most contribute to TACs that would affect residents of Greenbriar. To follow Ms. Sears' logic

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<sup>3</sup> / Note also that no adjustments were made to the HRA or the EIR to account for anticipated residency terms (e.g., the average homeowner resides in his/her home for 11 years, while the average renter resides in his/her home for 3.5 years). Rather, the information was provided only for informational purposes. (See RDEIR, p. 6.2-28.)

is to disregard known scientific conclusions and legal directives, and to plainly assume a future “baseline” condition that is simply not reasonably foreseeable.

Emissions reductions required by EPA and CARB are expected to be implemented as required (see, “Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles,” which has 2010 and 2020 target years (ARB, 2000)), and no evidence is provided to suggest implementation will be delayed or derailed. Further, from a simple historical perspective, we know that over time, the older, more polluting vehicles will eventually be replaced by newer, more emission-efficient vehicles. Just as there are few vehicles from the 1940’s on the road today, one would expect that vehicles currently on the road will be largely retired over the lifetime of the Greenbriar project. Thus, although the analysis in the EIR may be unique, it comports with industry standard for addressing mobile source emissions and is supported by substantial evidence. Moreover, although Ms. Sears can argue that the methodology used in the HRA is not the industry standard, she must also recognize that there is no industry standard approach to conducting an HRA for mobile source emissions.

Ms. Sears also cites to a letter dated September 26, 2007, in which the Office of Environmental Health Hazard Assessment (“OEHHA”) disagreed with the emissions reductions assumed in the HRA. Notably, however, Ms. Sears ignores a letter submitted by Sierra Research on October 27, 2007, in response to OEHHA’s letter. The letter from Sierra Research, the firm that prepared the HRA for the project, directly addresses Ms. Sears’ citation to the OEHHA comment regarding the expected per-vehicle emissions decrease in California, and provides a thorough response:

The evaluation of risks from vehicle sources considered both the per vehicle emissions reductions due to current regulatory requirements and the growth in vehicle traffic in future years. Pages 5-6 of both the draft and final analysis contain an extensive discussion of the collection and use of historical and forecast traffic levels included in the risk assessment. These data were obtained from the Sacramento Area Council of Governments, and showed a predicted 22% increase in peak period traffic volumes, and a predicted 26% increase in annual average traffic volumes, from 2007 to 2027 at the freeway segments adjacent to the proposed Greenbriar Farms development. As discussed on page 6 of the draft and final analyses, these VMT estimates were interpolated for intermediate years, and extrapolated out to 2037. Also as discussed on page 6, these VMT estimates were combined with the emission factors predicted by the EMFAC model to develop the gram per second emission rates used in the dispersion model. Both VMT and emission factors were held constant

subsequent to 2037, as there were no reliable models available to predict either parameter beyond that year. The impact of Mexican vehicles is addressed within EMFAC1; however, the California Air Resources Board concluded that these vehicles significantly affected California fleet average emissions in San Diego and Imperial Counties only, and would not have a significant impact in other counties, including Sacramento. Finally, all of the forecast emission rates were based on CARB's EMFAC2002 model, which was the then-current version of the model. This is the official model used for all air quality and transportation-related forecasts in California, and includes future emission reductions only to the extent that they have already been adopted and are enforceable.

(Letter dated 10-250-7 from Gary Rubenstein, Sierra Research, to Larry Greene, SMAQMD, pp. 2-3.) Ms. Sears' criticism is without merit.

In any event, and as is discussed in detail above, although the EIR utilizes an approach by which the HRA assumes an emissions reduction over time, it also utilizes the standard approach advocated by Ms. Sears --- reliance on the SMAQMD protocol. And, as is also discussed above, under either approach the project's impact is less than significant.

D. The EIR and HRA Properly Assess Potential Impacts From PM<sub>10</sub> and PM<sub>2.5</sub>.

The EIR quantifies PM<sub>10</sub> and PM<sub>2.5</sub> emissions and includes them in an appendix to the DEIR. The analysis followed SMAQMD direction for considering analysis of these construction emissions. In fact, construction-generated PM emissions were assessed in strict accordance with SMAQMD's recommendation for the project. (See RDEIR, p. 6.2-7, citing Tholen pers. comm.) Ms. Sears' last minute suggestion that the EIR include dispersion modeling of these emissions is not consistent with SMAQMD direction, and is not timely.

**II. The Noise Analysis Is Adequate.**

A. Noise Impacts from Heavy Trucks Was Properly Analyzed in EIR

At the January 15, 2008 Greenbriar Council workshop, Mr. Kopper testified that the noise study underestimated traffic noise, as it assumed that both SR-99 and I-5 would have the same level of truck traffic. He also stated that the analysis assumed that 2.2% of the traffic on both SR 99 and I 5 would be truck traffic. He alleged that the actual percentage of truck traffic for I-5 is 9.63% and 6.12% for SR 99 according to Caltrans

records. The noise study prepared for Mr. Kopper by the Acoustics and Vibration Group, and submitted as an attachment to Mr. Kopper's January 22, 2008 letter, raises similar concerns.

According to the noise analysis in the Draft EIR, noise levels associated with vehicular traffic were modeled using the FHWA Traffic Noise Model (FHWA 1988) and traffic data obtained from the traffic analysis prepared for the project (TJKM 2005). Additional input data included day/night percentages of autos, medium and heavy trucks vehicle speeds, ground attenuation factors and roadway widths. (DEIR, p. 6.3-5.) While the traffic modeling presented in the DEIR and Second RDEIR included a standard assumption that 2% of the traffic passing through *intersections* along I-5 and SR 70/99 would be regional truck traffic, in the modeling performed for the *freeway mainline segments* (see Impacts 6.1-4 and 6.1-8 in the Second RDEIR), 15% of the vehicles using I-5 and SR 70/99 were assumed to be trucks. This is consistent with Caltrans' published guidelines, as incorporated into the Caltrans I-5 Route Concept Report (dated April 1997) as incorporated into the SACOG I-5 Corridor in Sacramento and Yolo Counties Existing Conditions Report (dated May 2001). The Caltrans document is the most recent and up to date document describing truck trips that occur along I-5 and SR 70-99. (Final EIR, pp. 492, 4-553.) As is clear from the EIR, the traffic analysis actually assumed a greater amount of truck traffic on SR-99 and I-5 (15%) than cited by Mr. Kopper (6.12% and 9.63%, respectively).

With respect to traffic mixes, the standard 2% used in the noise analysis for heavy-duty trucks, and all other traffic mix percentages, were derived from information contained in the URBEMIS and EMFAC models for existing and future year conditions. Such models provide detailed vehicle fleet data (by 13 vehicle types) based on information from the Department of Motor Vehicles for the project area. With respect to the temporal distributions, all day/evening/night percentages were based on default information contained within the noise model. Mr. Pettyjohn states that these input parameters and associated noise modeling results were not calibrated with site-specific information. As stated in the source reference of Table 6.3-13, however, predicted traffic noise modeling results were calibrated by Bollard Consultants. The results of the calibration, as shown in the FHWA traffic noise prediction model calibration worksheets of Appendix G of the DEIR, indicated that the traffic noise modeling, based on the standard assumptions above, was actually over-predicting the traffic noise levels at the project site from approximately 3 to 7 dB. These calibrations included traffic counts conducted during the field tests. In sum, the traffic noise calibrations were performed in accordance with recommended standards, and thus, support the predicted noise levels and the associated input parameters

B. The EIR Properly Analyzes Potential Single Event Noise Level (“SENL”) Impacts from the Sacramento International Airport

The City and County of Sacramento have not established any SENL standards, and no definitive SENL guidelines currently exist nationwide. Notably, neither the FAA nor the Federal Interagency Committee on Aviation Noise (FICAN) has recommended a threshold for SENL. In fact, FICAN and the California Airport and Land Use Planning Handbook continue to use CNEL as the primary tool for the purpose of land use compatibility planning. One agency, the City of Los Angeles, adopted a SENL significance threshold of 10% of the population being awakened once every 10 days for use in the LAX Master Plan EIR/EIS. However, that document specifically cautioned that the threshold was for use in the LAX EIR/EIS only and should not be used for other projects.

The City of Sacramento General Plan’s exterior noise standard at residential land uses for noise generated by aircraft activity associated with a metropolitan airport is 60 dBA CNEL. No portion of the project is located within the 60 dBA CNEL aircraft noise contour. Therefore, aircraft noise levels at all of the land uses proposed on the project site would be considered “normally acceptable” with respect to the City’s General Plan land use compatibility noise levels. The impact from aircraft noise is therefore less than significant.

However, because CNEL noise levels essentially represent a weighted daily average, there is an argument that CNEL metrics may not adequately identify some aspects of noise exposure effects from individual flights such as speech interference and sleep disturbance. The EIR therefore analyzed the potential impacts (sleep disturbance and speech interference) caused by exposure of the project to Single Event Noise Levels generated by aircraft overflights. Notably, the project lies partially beneath only two departure routes, which is considerably fewer than many other residential areas within the City. To analyze the potential impacts, the EIR relies upon studies conducted by FICAN, which indicate 10% of the population will be awakened when the SENL interior noise levels are 81 dBA and above. Using FICAN formulas, the EIR analyzes potential sleep disturbances, assuming that windows in residences would be open. The results indicate that the project site does not produce sound levels that would awaken more than 10% of the population. Thus, even if the conservative threshold used at LAX was applied to Greenbriar, it would likely suggest that the impacts from overflights, as they relate to sleep disruption, would be less than significant. In effect, the EIR assumes the LAX 10% sleep disturbance as a “de facto” threshold in the absence of any other threshold or similar guidance from the City, the County, or the FAA.

The letter submitted by the Acoustics & Vibration Group asserts that firm guidance regarding proper analysis of SENLs has been decided in the courts – specifically by the Court of Appeal in *Berkeley Keep Jets Over the Bay Committee v Board of Port Commissioners* (2001) 91 Cal.App.4th 1344 (*Berkeley Keep Jets*). In *Berkeley Keep Jets*, the court held that an EIR prepared for the development of a nighttime air cargo facility at Oakland International Airport must include a single event noise analysis in addition to the EIR’s analysis of time averaged noise levels. Although the Court directed that the significance of single event noise effects be evaluated in the EIR to “assess whether the [project] will merely inconvenience the Airport’s nearby residents or damn them to a somnambulate-like existence,” there was no established basis for defining or assessing the significance of single event aircraft noise, and the Court did not set forth any standards of significance for the evaluation of such events. (*Id.*, at p. 1382.) The Greenbriar EIR provides a thorough evaluation of potential impacts from SENLs and quantifies the potential for sleep disturbance caused by nighttime aircraft, using the best available information and assuming a very conservative “de facto” threshold. The EIR is consistent with the requirements of *Berkeley Keep Jets*.

Regarding disclosure requirements, the DEIR provides that the applicant will dedicate an overflight easement over the entire project site in order to grant a right-of-way for free and unobstructed passage of aircraft through the airspace over the property, and will also grant a right to subject the property to noise and vibration associated with normal airport activity. In addition, recorded deed notices will be required to ensure that initial and subsequent prospective buyers, lessees, and renters of property on the project site, particularly residential property, are informed that the project site is subject to routine overflights and associated noise by aircraft from the Sacramento International Airport; that the frequency of aircraft overflights is routine and expected to increase through the year 2020 and beyond; and that such overflights could cause occasional speech interference, sleep disruption that could affect more than 10 percent of all residents at any one time, and other annoyances associated with exposure to aircraft noise. Furthermore, the applicant is proposing to require the posting of signs on all on-site real estate sales offices and/or at key locations on the project site that alert the initial purchasers about the overflight easement and the required deed notices. (DEIR, pp. 6.3-41 to 6.3-42.)

### **III. The Project Will Not Be Constructed Until 100 Year Flood Protection Is Achieved.**

Mr. Kopper did not raise specific flood-related issues in his comment letter; rather he simply submitted a report entitled “A California Challenge – Flooding in the Central Valley.” The report, dated October 15, 2007, applies generally to the Central Valley and was published before FEMA determined that the entire Natomas Basin fell within an “AE Zone,” as discussed below. Therefore, the relevance of the report is questionable, other

than as a background document on flood risks generally. In any event, potential flood impacts at the Greenbriar site are adequately addressed in the Greenbriar EIR.

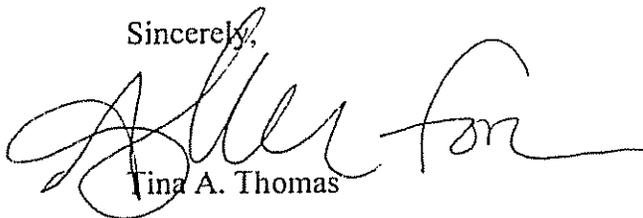
FEMA recently announced its plan to remap the Natomas Basin as an "AE Zone," which means that all development will either have to build at elevations above flood levels or forestall vertical construction until such time that 100-year flood protection is restored. The EIR requires compliance with FEMA flood designations; moreover, the EIR contemplated the possibility that FEMA would designate the area as an AE Flood Hazard Zone. Therefore, the new designation does not alter the analysis or the conclusions set forth in the EIR.

Specifically, implementation of Mitigation Measure 6.10-3, as required by the EIR and the Mitigation Monitoring and Reporting Program, would ensure that all development that occurs at the project site prior to recertification of the Natomas levee system would comply with the development restrictions established for flood hazard areas and would result in a less-than-significant long-term flooding impact because 100-year flood protection would be provided at the project site. Moreover, the Project applicant submitted a letter to Sacramento LAFCo dated September 19, 2007, wherein the applicant states that it will not pursue vertical residential construction until and unless the property has 100-year flood protection. (Letter dated September 19, 2007, from AKT Development to Sacramento LAFCo.) By this commitment, the applicant has ensured compliance with FEMA regulations, and the potential impact from flooding remains less than significant in the long term, and significant and unavoidable in the short term (until 100 year protection is achieved).

\* \* \* \* \*

Thank you for your consideration. If you have any questions or concerns regarding the above, or regarding any other matters pertaining to the Greenbriar project, please contact me or my partner Ashle Crocker at your convenience.

Sincerely,



Tina A. Thomas

cc: Rich Archibald  
Scot Mende  
Nancy Miller  
Phil Serna

**Eric J. Ross**  
**Attorney at Law**  
508 41<sup>st</sup> Street  
Sacramento, California 95819  
(916) 451-2602  
[ketejr@sbcglobal.net](mailto:ketejr@sbcglobal.net)

January 29, 2008

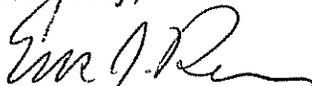
Honorable Mayor Heather Fargo  
Members of the City Council  
City of Sacramento  
Sacramento, CA 95814-2604

Re: **Greenbriar** (M05-046/ P05-069) Public  
Hearing Agenda Item No. 14 (1-29-08)

Dear Mayor Fargo and City Council Members:

I am submitting the attached documents as a follow up on my previous letter of January 22, 2008. The documents were obtained with the assistance of Greg Chew of the SACOG staff and are from the ALUC file No. 05-20 associated with the ALUC's staff review of the Greenbriar project.

Sincerely,

  
Eric J. Ross

**From:** Greg Chew  
**To:** Lockhart, Don  
**Date:** 11/3/2005 10:35:59 AM  
**Subject:** Re: CLUP Query

Finally getting back to you, Don. I have some summary remarks in response to your questions. Disclosure: as this is an inquiry not requesting a legal review, I have not asked SACOG's legal counsel to comment on what I have written. If you need a reply with legal review, please let me know and I will ask counsel to research this issue. The following are the way that I believe the process works:

Question 1: The Airport Land Use Commission will review the project if the city or county which claims to have jurisdictional land use authority requests it. If the ALUC review has conditions on it, or finds the proposed development is incompatible with the Comprehensive Land Use Plan for the associated airport, then whichever governing body that is determined to have legal jurisdiction must override the ALUC review if the project is to proceed. The ALUC will not take a part in determining which city or county has legal authority over land use matters.

Question 2: It does not matter to the ALUC staff where in the process of incorporation the subject land is located in. The ALUC review does not consider this when reviewing for compatibility of the proposed development relative to the CLUP.

Question 3: It is irrelevant to the ALUC review whether a Board of County Supervisors cedes land use authority - the development application is treated the same regardless. If the application is not compatible, the whichever jurisdiction does have jurisdiction over development review will need to either ask the developer to make appropriate adjustments to the application proposal, deny the project, or override the ALUC findings as prescribed by state law.

If you have any further questions, please give me a call.

Greg Chew  
Sacramento Area Council of Governments/Airport Land Use Commission  
(916) 340-6227

>>> "Don Lockhart" <Donald.Lockhart@SacLAFCo.org> 10/17/2005 10:04:06 AM >>>

Hi Greg, Please review the attached outline of a scenario that we have previously discussed. Kindly comment on the points raised/ questions posed. I would like to send a memo to the city sooner, rather than later, to allow others to contemplate the scenario. Thanks in advance for your assistance. Don= Don Lockhart, AICP Assistant Executive Officer Sacramento LAFCo 1112 I Street, Suite 100 Sacramento, CA 95814-2836 916.874.2937 916.874.2939 (FAX) Donald.Lockhart@SacLAFCo.org

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This e-mail and any attachments thereto may contain private, confidential, and privileged material for the sole use of the intended recipient. Any review, copying, or distribution of this email (or any attachments thereto) by other than Sacramento LAFCo or the intended recipient is strictly prohibited.  
If you are not the intended recipient, please contact the sender immediately and permanently delete the original and any copies of this email and any attachments thereto.

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### *Hypothetical Development Scenario*

A project will require a Statement of Overrides of an affected Airport Comprehensive Land Use Plan, (CLUP.) The Airport Land Use Commission will defer said finding to the applicable land use authority. A County Board of Supervisors has land use authority over unincorporated lands.

In the event a City Council successfully completes a Reorganization (annexation and detachments) through the LAFCo proceedings the City Council would assume land use authority, and would then be in position to override the CLUP. However, the affected territory must be pre-zoned by the City Council prior to application to LAFCo for the Reorganization.

#### Questions:

1. In order to approve the prezone, and related general plan/ community plan land use designations, is the City required to Override the CLUP?
2. Can the City Council adopt the Statement of Override of the CLUP, while the land remains unincorporated, subject to County BoS land use authority.
3. Can a BoS cede land use authority to a city, of unincorporated land?

**REQUEST FOR STAFF REVIEW**

AIRPORT LAND USE COMMISSION  
 FOR SACRAMENTO, SUTTER, YOLO AND YUBA COUNTIES  
 3000 S STREET, SUITE 300  
 SACRAMENTO, CA 95816-7056  
 PHONE: (916) 457-2264  
 FAX: (916) 457-3299

DATE RECEIVED: 4/27/00

ALUC REVIEW No.: 00-52

AFFECTED AIRPORT: Sacramento International

REQUESTED BY: City of Sacramento Planning Division

CONTROL NO : IR00-020

DATE COMMENTS  
 REQUESTED: 5/5/00

PROJECT APPLICANT: Remy, Thomas & Moose, LLP  
 PROJECT TITLE: Greenbriar Farms

APPLICATION FOR:  REZONE  GENERAL/COMMUNITY PLAN AMENDMENT  OTHER: Preliminary Review

DESCRIPTION OF PROPOSED PROJECT: Project consists of the Preliminary Review of a 513-acre mixed-use development consisting of approximately 232 acres of residential uses and 224 acres of light industrial, light industrial/office, highway commercial, and employment center uses. The project also includes a school and park site, as well as a portion of the future Downtown-Airport light rail alignment. The project site is currently located in Sacramento County. Future entitlements will involve amendment to the City's Sphere of Influence, Annexation, General Plan Amendments, Rezoning, Development Agreement, establishment of a PUD, and Tentative Maps.

LOCATION OF PROJECT (REFERENCE TO AIRPORT): The project is located approximately 6,500 feet east of the south end of International's east runway, at the northwest corner of Interstate 5 and Highway 99/70.

APPLICABLE ALUC POLICY:  HEIGHT  SAFETY  NOISE

ALUC STAFF COMMENTS:

Approximately two-thirds of the western portion of the project is located within the Overflight Zone, as established by the Sacramento Metropolitan Airport Comprehensive Land Use Plan (CLUP). Proposed project uses that are located within the Overflight Zone include: Employment Center, Light Industrial, Light Industrial/Office, Commercial, Highway Commercial, Single-family Residential, and Multi-family Residential. An elementary school, a park site and two possible light rail stations are also proposed.

Uses specifically defined by the CLUP as being incompatible within the Overflight Zone include elementary schools and passenger terminals or stations. Thus, the school use and light rail stations constitute incompatible uses. Residential, as well as most light industrial and commercial uses, are defined by the CLUP as being compatible; however, these uses are subject to the following condition regarding maximum allowable densities:

*"Uses compatible only if they do not result in a large concentration of people. A large concentration of people is defined as a gathering of individuals in an area that would result in an average density of greater than 25 persons per acre per hour during any 24 hour period ending at midnight, not to exceed 50 persons per acre at any time. This restriction does not apply to the Metro Airpark Special Planning Area"*

(Continued on next page)

APPLICABLE ALUC PLAN:

Sacramento Metropolitan Airport Comprehensive Land Use Plan

PROJECT IS:

- COMPATIBLE
- COMPATIBLE, SUBJECT TO CONDITIONS (Part)
- INCOMPATIBLE (Part), DUE TO:

HEIGHT  SAFETY  NOISE

REVIEWED BY: David Boyer, Associate Planner *DB*

DATE: 5/4/00

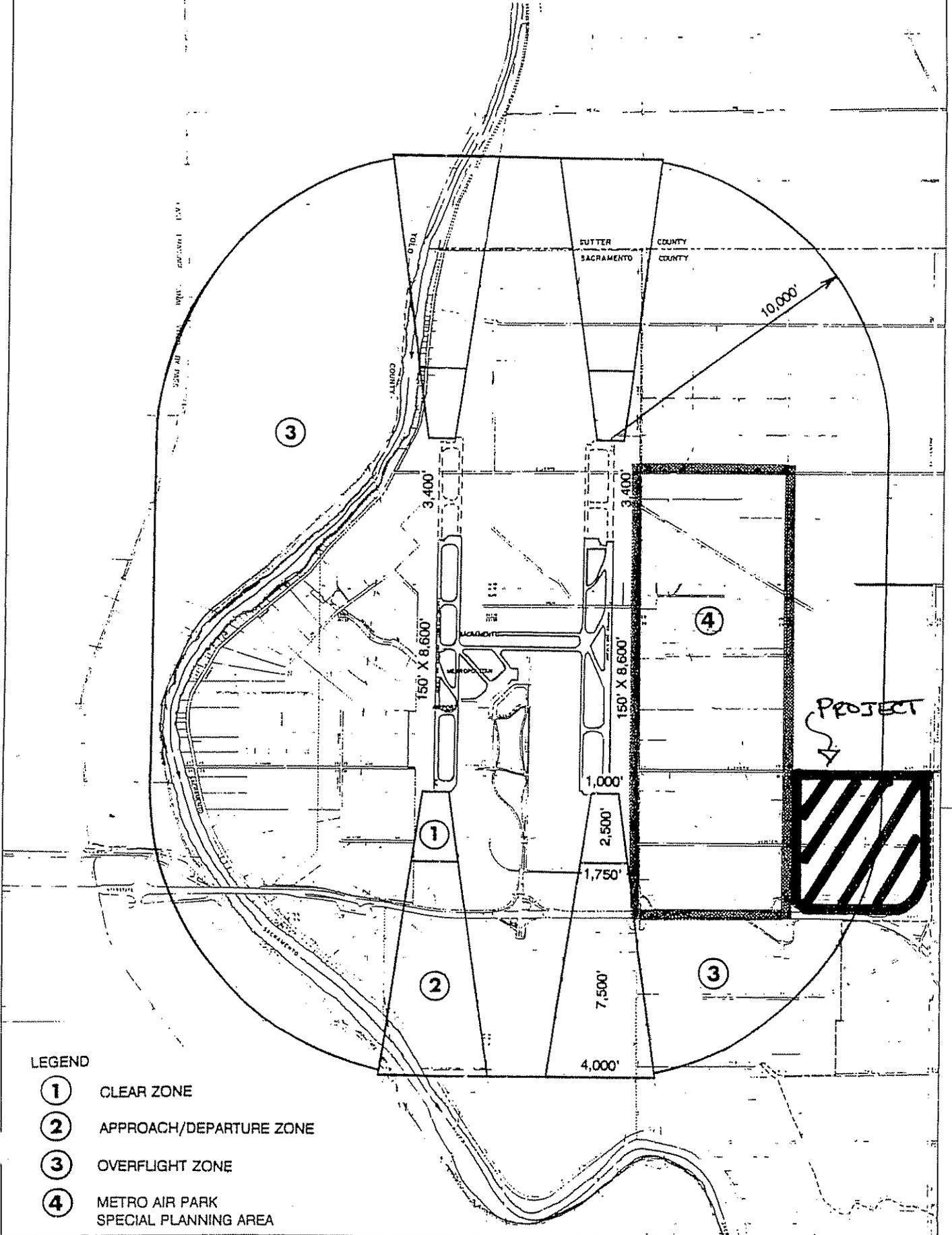
Without specific uses being proposed, it is not possible to determine whether or not the general types of uses being proposed are compatible with this density standard. It is likely, however, that some low-density single-family residential, as well as certain types of light industrial and office uses, could be developed consistent with this standard. However, low-density single-family residential uses, even if compatible with the CLUP, may not be a desirable use located this close to a major airport. Experience has shown that many residents will complain about aircraft noise levels, even if they are located farther from a major airport than those proposed at Greenbriar Farms. In addition, a review of actual flight track data for Sacramento International indicates that, on a typical day, there are numerous aircraft overflights over areas-- including the eastern portion of Greenbriar Farms-- that are well outside of the currently adopted Overflight Zone. Pending completion of the current update of the Caltrans Aeronautics Program's Airport Land Use Planning Handbook, there is a possibility that the ALUC may consider alternatives to the way it presently establishes Overflight Zone planning boundaries for the region's airports.

The uses least likely to be consistent with the persons-per-acre standard include the multi-family, employment center and commercial uses. It is also not possible to determine the compatibility of the park site at this time. The CLUP defines Neighborhood Parks as being compatible within the Overflight Zone, but they must meet the persons-per-acre density standard as well as the following standard:

*"No high intensity uses or facilities, such as structured playgrounds, ballfields, or picnic pavilions."*

Attachments include Map 1, which generally depicts the location of the safety zones established by the CLUP, and Map 2, which specifically depicts (to the best of ALUC staff's ability given the supplied project map) the location of the Overflight Zone as it affects the Greenbriar Farms project. Also attached for reference are the Land Use Compatibility Guidelines for Safety excerpted from the CLUP.

# SACRAMENTO METROPOLITAN AIRPORT SAFETY ZONES



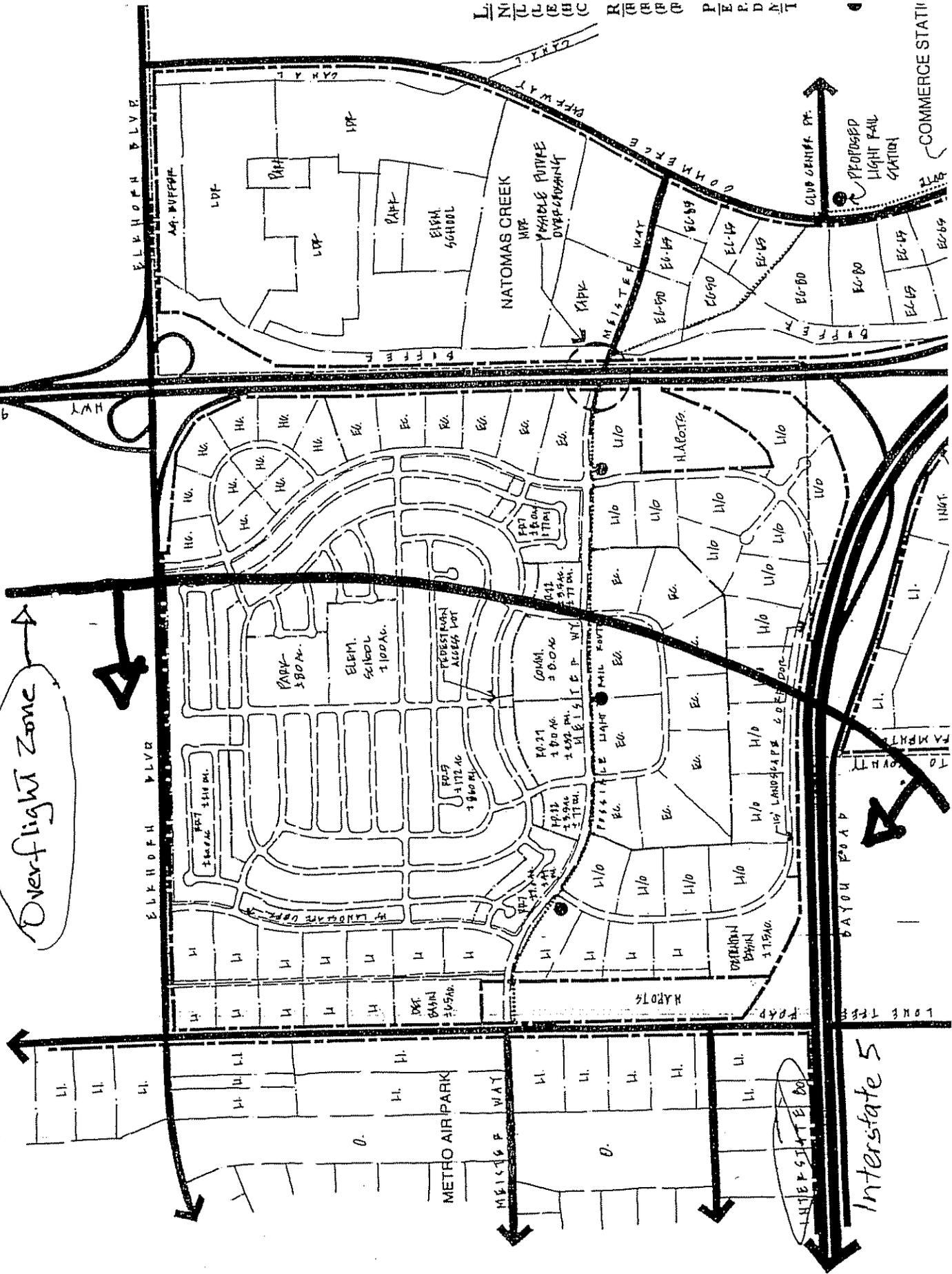
LEGEND

- ① CLEAR ZONE
- ② APPROACH/DEPARTURE ZONE
- ③ OVERFLIGHT ZONE
- ④ METRO AIR PARK SPECIAL PLANNING AREA

MAP 64

TO MARKOVILLE / YODA CITY 9/70

Overflight Zone



TO INTERNATIONAL FLAND / SEATTLE

Interstate 5

COMMERCE STATION

LINE NUMBER REFERENCE



August 3, 2005

Mr. Don Lockhart  
Sacramento Local Agency Formation Commission  
1112 I Street, Suite 100  
Sacramento, CA 95814

Mr. Lockhart:

On behalf of the Sacramento Area Council of Governments, I am submitting to you the following comments regarding the Greenbriar Farms development proposal. As cities and counties in the region review development applications, SACOG staff is occasionally asked to provide an assessment of how well a proposal meets the principles of SACOG's Blueprint Project (which is described later in this letter and in the attachment). The city of Sacramento requested that SACOG review the Greenbriar application.

#### Findings and Evaluation

Overall, the project clearly conforms with the principles of the Blueprint Project. SACOG used the PLACE<sup>3</sup>S modeling software to review the application, which revealed a number of observations related to the principles of the Blueprint Project:

- The Blueprint Project encourages mixed land uses. Mixed use allows more opportunities for people to live, work and play within one community, thus making the community more complete. This helps reduce the need for residents to drive to other parts of the region. The Greenbriar proposal does offer a mixture of uses: residential, commercial, park/open space and public schools. Our analysis of the surrounding 610-acre site includes 389 acres of residential development, 30 acres of neighborhood commercial uses, 100 acres of park and lake, 30 acres of open space buffer. Parks are also dispersed throughout the project area, thus reducing the distance residents must travel for recreational purposes.
- Balancing jobs and housing is another Blueprint principle. If jobs are closer to where people live, the amount of traffic congestion and air pollution will be reduced. The applicant's ratio of 2.6 dwelling units per job improves on the 3.6 dwelling units per job for the site in the Blueprint scenario.
- The project offers non-automotive transportation alternatives, which is another Blueprint Principle. The proposal provides a grid street system, which helps pedestrian travel. In addition, pedestrian paseos and trails are included throughout the development.

- Compact development is considered essential for the Blueprint to succeed. This project offers a net density of 10.4 dwelling units per net acre, a slight increase from the Blueprint Preferred Scenario density of 10.3 dwelling units per net acre.
- The proposal also includes a light rail station as part of the Downtown-Natomas-Airport line. For light rail to be successful, it requires high concentrations of residential and/or commercial uses, particularly within a quarter mile radius. The proposal offers a mix of uses within the station area, including retail areas, vertical mixed use and residential densities ranging from 15 to 30 dwelling units per acre.
- A variety of housing options are important to the Blueprint principles so that multiple segments of the housing market can be met. The Greenbriar proposal offers a mixture of housing types including attached, detached, senior, and cluster products. Detached products range in densities from 8 to 11 dwelling units per acre, and attached products vary from 11 to 30 units per acre.
- A commonly used measure within the planning profession to determine whether automotive transportation is reduced is vehicle miles traveled. VMT is the amount of mileage the average residential household and employee in the proposed area will travel in one day. The Greenbriar proposal reduces VMT per household by 8% from the Blueprint Preferred Scenario. A VMT per employee reduction of similar magnitude would be realized.
- The Greenbriar project site is inside of the urban footprint of the Blueprint Preferred Scenario map for development through 2050. The Blueprint map does not recommend a phasing schedule for development, although SACOG is undertaking this process currently for its 2030 map.

#### Blueprint Project and Preferred Scenario

SACOG's Blueprint Project serves as the 6-county Sacramento region's voluntary land use and transportation vision to the year 2050. The Blueprint Project has been widely accepted by the region's 28 cities and counties and the basis for managing the region's projected doubling of population over the next 45 years. The success of Blueprint will be measured by how well individual jurisdictions are able to plan and implement the fundamental principles of smart growth: compact development, mixes of uses, transportation and housing choices, quality design, open space, and utilization of existing resources.

The following attachment provides a fuller background about the Blueprint Project, including a description of what the Blueprint map depicts.

#### Airport Land Use Commission Law

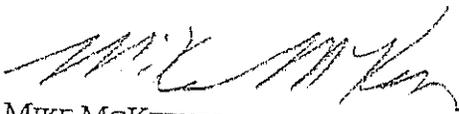
Note: The proposal could be stronger with higher residential densities and employment if not for regulations regarding airport flight safety. At a later point when all the data is collected, this proposal will need to be reviewed by the Airport Land Use Commission, which is another role that SACOG plays. Airport Land Use Commission Law, which is a state regulation as implemented by SACOG through the Comprehensive Land Use Plan for Sacramento

Mr. Don Lockhart  
Page 3  
August 3, 2005

International Airport, does seek to cap overall densities for airport safety reasons. The Greenbriar project area is mostly located with the airport's Overflight (safety) Zone. This letter is strictly the review from SACOG's Blueprint standpoint. The Greenbriar development team has been working closely with ALUC staff to prepare the highest development that will be allowed within the airport safety regulations.

If you have any questions, please feel free to contact me. Thank you for your consideration.

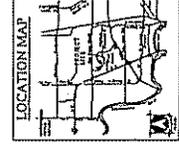
Sincerely,



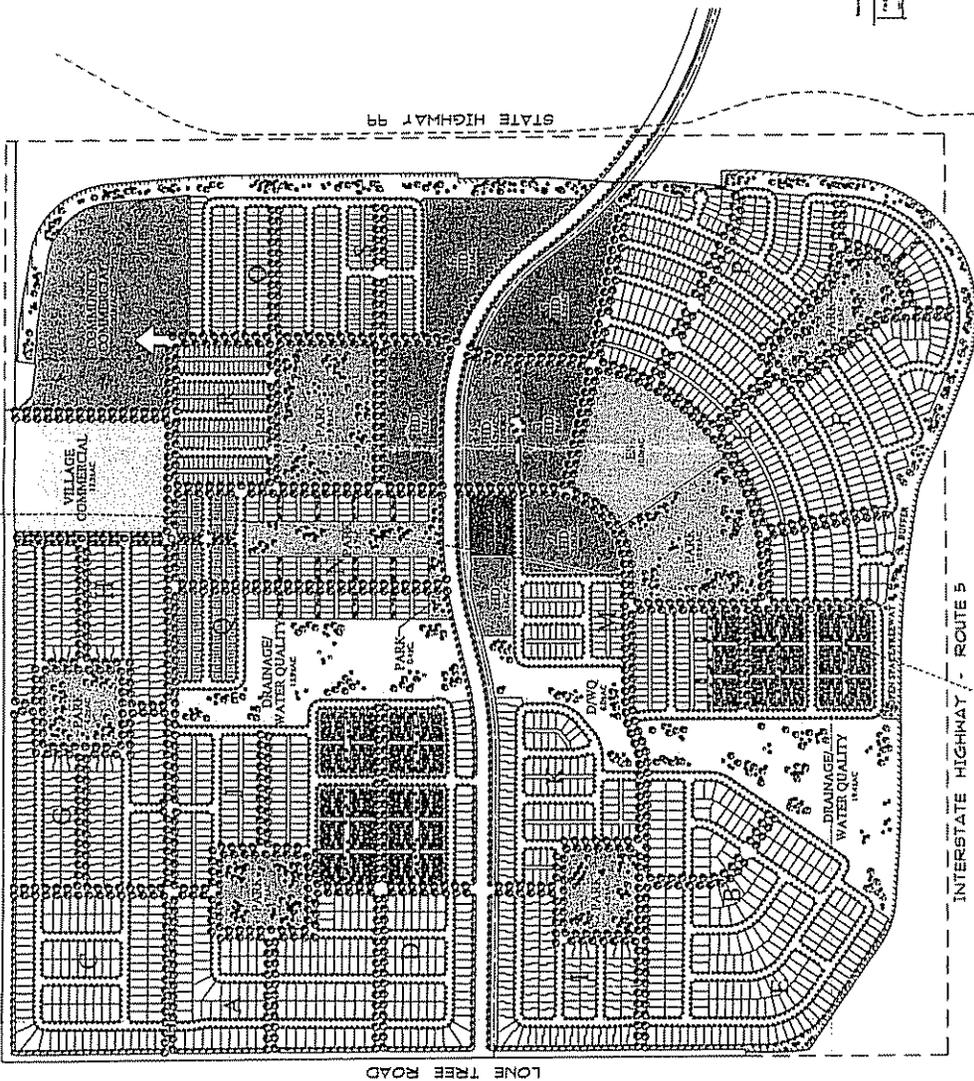
MIKE MCKEEVER  
Executive Director

MM:ef

PRELIMINARY CONCEPT L SITE PLAN  
**GREENBURY**  
 CITY OF SACRAMENTO, CALIFORNIA  
 NOVEMBER 3, 2004

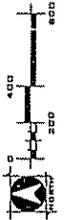
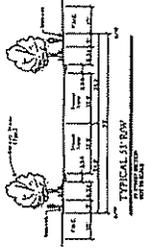


*State*



**LAND USE SUMMARY**

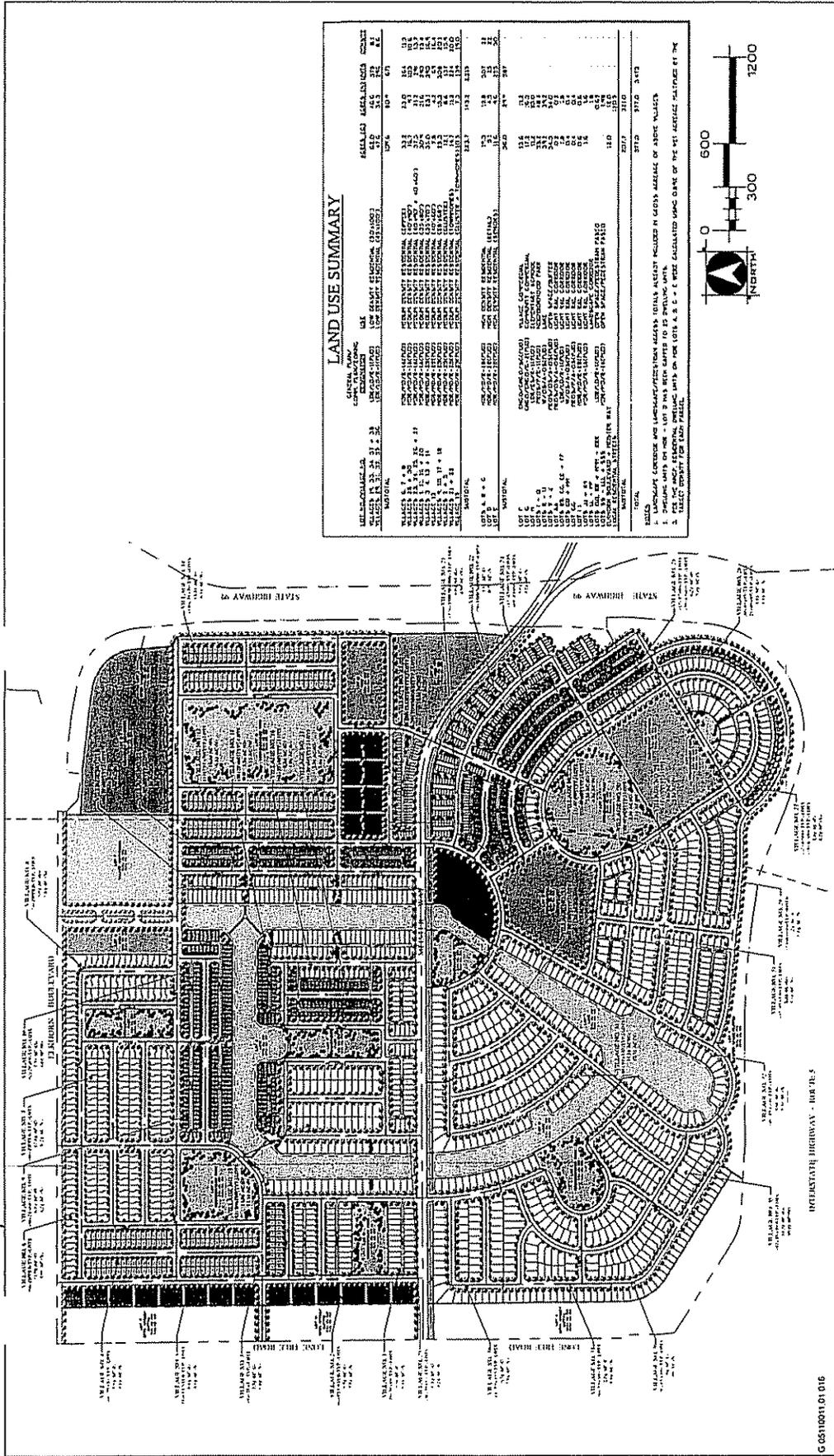
SYMBOL	DESCRIPTION	AREA (SQ. FT.)	PERCENT
[Symbol]	OFFICE	100,000	10.0%
[Symbol]	RESIDENTIAL	900,000	90.0%
[Symbol]	COMMERCIAL	100,000	10.0%
[Symbol]	PARK	100,000	10.0%
[Symbol]	DRAINAGE/WATER QUALITY TRANK	100,000	10.0%
[Symbol]	AFFORDABLE HOUSING TRAIL	100,000	10.0%
[Symbol]	UNDEVELOPED	100,000	10.0%
[Symbol]	TOTAL	1,000,000	100.0%



**WOOD ROEBERS**  
 2801 E. AL. ROAD, SUITE 200  
 SACRAMENTO, CALIFORNIA 95820  
 (916) 486-1100  
 WWW.WOODROEBERS.COM

*1-10-04*  
*1-12-04*  
*1-12-04*

no change since Sep. 05. all APN's letter was not based on this



### LAND USE SUMMARY

GENERAL PLANNING CATEGORY	LAND USE	AREA (AC)	AREA (SQ FT)	AREA (SQ YD)	AREA (SQ MI)
SINGLE-FAMILY RESIDENTIAL	1-1 SINGLE-FAMILY RESIDENTIAL (SFR)	120.0	8,280,000	2,300,000	0.1875
	1-2 SINGLE-FAMILY RESIDENTIAL (SFR)	120.0	8,280,000	2,300,000	0.1875
	1-3 SINGLE-FAMILY RESIDENTIAL (SFR)	120.0	8,280,000	2,300,000	0.1875
	1-4 SINGLE-FAMILY RESIDENTIAL (SFR)	120.0	8,280,000	2,300,000	0.1875
	1-5 SINGLE-FAMILY RESIDENTIAL (SFR)	120.0	8,280,000	2,300,000	0.1875
	1-6 SINGLE-FAMILY RESIDENTIAL (SFR)	120.0	8,280,000	2,300,000	0.1875
	1-7 SINGLE-FAMILY RESIDENTIAL (SFR)	120.0	8,280,000	2,300,000	0.1875
	1-8 SINGLE-FAMILY RESIDENTIAL (SFR)	120.0	8,280,000	2,300,000	0.1875
	1-9 SINGLE-FAMILY RESIDENTIAL (SFR)	120.0	8,280,000	2,300,000	0.1875
	1-10 SINGLE-FAMILY RESIDENTIAL (SFR)	120.0	8,280,000	2,300,000	0.1875
MULTI-FAMILY RESIDENTIAL	2-1 MULTI-FAMILY RESIDENTIAL (MFR)	120.0	8,280,000	2,300,000	0.1875
	2-2 MULTI-FAMILY RESIDENTIAL (MFR)	120.0	8,280,000	2,300,000	0.1875
	2-3 MULTI-FAMILY RESIDENTIAL (MFR)	120.0	8,280,000	2,300,000	0.1875
	2-4 MULTI-FAMILY RESIDENTIAL (MFR)	120.0	8,280,000	2,300,000	0.1875
	2-5 MULTI-FAMILY RESIDENTIAL (MFR)	120.0	8,280,000	2,300,000	0.1875
	2-6 MULTI-FAMILY RESIDENTIAL (MFR)	120.0	8,280,000	2,300,000	0.1875
	2-7 MULTI-FAMILY RESIDENTIAL (MFR)	120.0	8,280,000	2,300,000	0.1875
	2-8 MULTI-FAMILY RESIDENTIAL (MFR)	120.0	8,280,000	2,300,000	0.1875
	2-9 MULTI-FAMILY RESIDENTIAL (MFR)	120.0	8,280,000	2,300,000	0.1875
	2-10 MULTI-FAMILY RESIDENTIAL (MFR)	120.0	8,280,000	2,300,000	0.1875
COMMERCIAL	3-1 COMMERCIAL (C)	120.0	8,280,000	2,300,000	0.1875
	3-2 COMMERCIAL (C)	120.0	8,280,000	2,300,000	0.1875
	3-3 COMMERCIAL (C)	120.0	8,280,000	2,300,000	0.1875
	3-4 COMMERCIAL (C)	120.0	8,280,000	2,300,000	0.1875
	3-5 COMMERCIAL (C)	120.0	8,280,000	2,300,000	0.1875
	3-6 COMMERCIAL (C)	120.0	8,280,000	2,300,000	0.1875
	3-7 COMMERCIAL (C)	120.0	8,280,000	2,300,000	0.1875
	3-8 COMMERCIAL (C)	120.0	8,280,000	2,300,000	0.1875
	3-9 COMMERCIAL (C)	120.0	8,280,000	2,300,000	0.1875
	3-10 COMMERCIAL (C)	120.0	8,280,000	2,300,000	0.1875
INDUSTRIAL	4-1 INDUSTRIAL (I)	120.0	8,280,000	2,300,000	0.1875
	4-2 INDUSTRIAL (I)	120.0	8,280,000	2,300,000	0.1875
	4-3 INDUSTRIAL (I)	120.0	8,280,000	2,300,000	0.1875
	4-4 INDUSTRIAL (I)	120.0	8,280,000	2,300,000	0.1875
	4-5 INDUSTRIAL (I)	120.0	8,280,000	2,300,000	0.1875
	4-6 INDUSTRIAL (I)	120.0	8,280,000	2,300,000	0.1875
	4-7 INDUSTRIAL (I)	120.0	8,280,000	2,300,000	0.1875
	4-8 INDUSTRIAL (I)	120.0	8,280,000	2,300,000	0.1875
	4-9 INDUSTRIAL (I)	120.0	8,280,000	2,300,000	0.1875
	4-10 INDUSTRIAL (I)	120.0	8,280,000	2,300,000	0.1875
PARKS AND RECREATION	5-1 PARKS AND RECREATION (P)	120.0	8,280,000	2,300,000	0.1875
	5-2 PARKS AND RECREATION (P)	120.0	8,280,000	2,300,000	0.1875
	5-3 PARKS AND RECREATION (P)	120.0	8,280,000	2,300,000	0.1875
	5-4 PARKS AND RECREATION (P)	120.0	8,280,000	2,300,000	0.1875
	5-5 PARKS AND RECREATION (P)	120.0	8,280,000	2,300,000	0.1875
	5-6 PARKS AND RECREATION (P)	120.0	8,280,000	2,300,000	0.1875
	5-7 PARKS AND RECREATION (P)	120.0	8,280,000	2,300,000	0.1875
	5-8 PARKS AND RECREATION (P)	120.0	8,280,000	2,300,000	0.1875
	5-9 PARKS AND RECREATION (P)	120.0	8,280,000	2,300,000	0.1875
	5-10 PARKS AND RECREATION (P)	120.0	8,280,000	2,300,000	0.1875
SPECIAL USE	6-1 SPECIAL USE (SU)	120.0	8,280,000	2,300,000	0.1875
	6-2 SPECIAL USE (SU)	120.0	8,280,000	2,300,000	0.1875
	6-3 SPECIAL USE (SU)	120.0	8,280,000	2,300,000	0.1875
	6-4 SPECIAL USE (SU)	120.0	8,280,000	2,300,000	0.1875
	6-5 SPECIAL USE (SU)	120.0	8,280,000	2,300,000	0.1875
	6-6 SPECIAL USE (SU)	120.0	8,280,000	2,300,000	0.1875
	6-7 SPECIAL USE (SU)	120.0	8,280,000	2,300,000	0.1875
	6-8 SPECIAL USE (SU)	120.0	8,280,000	2,300,000	0.1875
	6-9 SPECIAL USE (SU)	120.0	8,280,000	2,300,000	0.1875
	6-10 SPECIAL USE (SU)	120.0	8,280,000	2,300,000	0.1875
TOTAL	TOTAL	1200.0	82,800,000	23,000,000	1.875

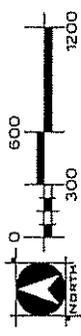


Exhibit 3-4

EDAW  
Project Description

Project Site Plan

Greenbriar Development Project DEIR  
City of Sacramento and Sacramento LAFCo

G 0511001.01 016

Source: Wood Rodgers, September 2005

# Item No. 14-3

## Supplemental Material

### For City of Sacramento

City Council  
Housing Authority  
Redevelopment Agency  
Economic Development Commission  
Sacramento City Financing Authority

## Agenda Packet

**Submitted:** January 29, 2008

**For the Meeting of:** January 29, 2008

- Additional Material
- Revised Material

**Subject:** Revisions to EIR / MMRP Resolution

The following revisions have been made to the Environmental Impact Report and Mitigation Monitoring and Reporting Plan Resolution and are included as a portion of this packet:

- Additions of Sections 8 and 9 to the Resolution regarding future entitlements, development, and vertical construction (1 page)
- Greenbriar – Open Space, Species and Agriculture: Project Impacts and Mitigation Exhibit (2 pages)

**Contact Information:** Arwen Wacht (808-1964)

Please include this supplemental material in your agenda packet. This material will also be published to the City's Intranet. For additional information, contact the City Clerk Department at Historic City Hall, 915 I Street, First Floor, Sacramento, CA 95814-2604 ■ (916) 808-7200.

Section 5. Pursuant to CEQA section 21081.6 and CEQA Guidelines section 15091, and in support of its approval of the Project, the City Council adopts the Mitigation Monitoring and Reporting Program to require all reasonably feasible mitigation measures be implemented by means of Project conditions, agreements, or other measures, as set forth in the Mitigation Monitoring and Reporting Program as set forth in Exhibit B of this Record of Decision.

Section 6. The City Council directs that, upon approval of the Project, the City's Environmental Planning Services shall file a notice of determination with the County Clerk of Sacramento County and, if the Project requires a discretionary approval from any state agency, with the State Office of Planning and Research, pursuant to the provisions of CEQA section 21152.

Section 7. Pursuant to Guidelines section 15091(e), the documents and other materials that constitute the record of proceedings upon which the City Council has based its decision are located in and may be obtained from, the Office of the City Clerk at 915 I Street, Sacramento, California. The City Clerk is the custodian of records for all matters before the City Council.

Section 8 The entitlements for which the EIR was prepared are first stage legislative entitlements, and do not authorize any actual development. Before any actual development may occur, the following must be approved by Council: a development agreement, a tentative map, any subdivision modifications, and PUD development guidelines and any necessary changes to the PUD Schematic Plan and Guidelines, and any special permits or other entitlements required for development. Before the tentative map, development agreement and other entitlements are approved, and before a grading permit may be issued, a habitat conservation plan must be prepared and approved, and an incidental take permit issued, by U.S. Fish and Wildlife and California Department of Fish and Game.

Section 9 In recognition of the pending remapping by FEMA of the area in which the project is located, the project has been conditioned to prohibit vertical construction unless and until the property has at least 100 year flood protection.

Table of Contents:

Exhibit A - CEQA Findings of Fact and Statement of Overriding Considerations for the Greenbriar Development Project

Exhibit B – Mitigation Monitoring and Reporting Program for the Greenbriar Development Project

**Greenbriar  
Open Space, Species and Agriculture: Project Impacts and Mitigation<sup>1</sup>**

**IMPACTS**

<b>Project Impacts</b>	
<b>Impact to Open Space</b>	
577.0 acres (Total Project Acreage)	
- 30.7 acres (Lone Tree Canal Corridor) <sup>2</sup>	
- 27.5 acres (Freeway Buffers) <sup>3</sup>	
- <u>26.9 acres</u> (MAP Direct Impacts on Greenbriar, previously mitigated by MAP) <sup>4</sup>	
491.9 acres	
<b>Impact to Species</b>	
577.0 acres (Total Project Acreage)	
- 30.7 acres (Lone Tree Canal Corridor) <sup>2</sup>	
- <u>51.2 acres</u> (MAP Direct and Indirect Impacts on Greenbriar, previously mitigated by MAP) <sup>4</sup>	
495.1 acres **	
** Impact to Swainson's Hawk = 495.1 acres. Impact to GGS = 58.87 (55.56 permanent and 3.31 temporary; note GGS impacts include both aquatic and upland buffer)	

**MITIGATION**

<b>Open Space Mitigation</b>	
Lone Tree Canal Corridor	30.7 <sup>2</sup>
Freeway Buffer	27.5
Detention Basin/Lake	37.9
Spangler	235.4
Tsakopoulos 65 (Cummings + Natomas 130)	65.0
West Lakeside Buffer	15.9
Unidentified Site as required by EIR (Within Natomas Basin and Consistent with 1994 Guidelines)	49.0
Unidentified Site (Within Natomas Basin), pursuant to County Board Of Supervisors action on November 27, 2007	<u>30.5<sup>5</sup></u>
<b>Total</b>	<b>491.9</b>
<b>Mitigation Ratio<sup>6</sup>: 1:1</b>	

<sup>1/</sup> All numbers are rounded to nearest tenth. Unless otherwise indicated, all numbers were obtained from the Environmental Impact Report and/or the Effects Analysis prepared for the Greenbriar project.

<sup>2/</sup> This number was obtained from a GIS calculation produced by Wood Rodgers.

<sup>3/</sup> This number was obtained from a GIS calculation produced by Wood Rodgers.

<sup>4/</sup> This number was obtained from a GIS calculation produced by Wood Rodgers based on the Final EIS for the Metro Air Park Habitat Conservation Plan, prepared by the US Fish and Wildlife Service dated July 2001.

<sup>5/</sup> This number was not identified in the Greenbriar EIR, however the applicant has since committed to providing this additional acreage

<b>Total Species Habitat Mitigation <sup>7</sup></b>	
Lone Tree Canal Corridor	30.7 <sup>2</sup>
Spangler	235.4
Tsakopoulos 65 (Cummings + Natomas 130)	65.0
Unidentified Site as required by EIR (Within Natomas Basin and Consistent with 1994 Guidelines)	49.0
Unidentified Site (Within Natomas Basin)	<u>30.5 <sup>5</sup></u>
<b>Total</b>	<b>410.6</b>
<b>Mitigation Ratio <sup>8</sup>: 0.83:1</b>	
<b>GGS Habitat Mitigation <sup>7</sup></b>	
Lone Tree Canal Corridor	30.7 <sup>2</sup>
Spangler	190.0
Tsakopoulos 65 (Cummings + Natomas 130)	<u>14.4 <sup>9</sup></u>
<b>Total</b>	<b>235.1</b>
<b>Swainson's Hawk Habitat Mitigation <sup>7</sup></b>	
Lone Tree Canal Corridor	25.5 <sup>10</sup>
Spangler	100.6
Tsakopoulos 65 (Cummings + Natomas 130)	54.9 <sup>11</sup>
Unidentified Site as required by EIR (Within Natomas Basin and Consistent with 1994 Guidelines)	49.0
Unidentified Site (Within Natomas Basin)	<u>30.5 <sup>5</sup></u>
<b>Total</b>	<b>260.5</b>
<b>Mitigation Ratio <sup>12</sup>: 0.53:1 (consistent with 1994 Guidelines)</b>	
<b>Agricultural Land</b>	
Spangler (Approx. 87% Prime Ag Land)	45.4 <sup>13</sup>
Tsakopoulos 65 (Approx. 81% Prime Ag Land)	47.7
Unidentified Site as required by EIR (Within Natomas Basin and Consistent with 1994 Guidelines)	49.0
Unidentified Site (Within Natomas Basin)	<u>30.5 <sup>5</sup></u>
<b>Total</b>	<b>172.6</b>

<sup>6/</sup> To mitigate at ratios required by the Natomas Joint Vision MOU, project must provide open space mitigation lands at a ratio of 1:1, or 491.9 acres.

<sup>7/</sup> The distribution between Swainson's hawk and GGS mitigation may change pending additional scientific review, further negotiations with the Wildlife Agencies, and preparation of an EIS.

<sup>8/</sup> To mitigate at ratios required by the Natomas Basin HCP, the project must provide species mitigation at a ratio of 0.5:1, or 247.5 acres.

<sup>9/</sup> Number represents 4.3 acres of upland and 10.1 acres of wetland/open water.

<sup>10/</sup> Number represents the upland/dry portion of the Corridor.

<sup>11/</sup> Number includes 1.8 acres of potential nesting habitat that is also present at this site; the 1.8 acres is not included in 0.5:1 mitigation ratio for Swainson's hawk foraging because it is not foraging habitat.

<sup>12/</sup> To mitigate at ratios required by the Department of Fish and Game 1994 Guidelines, the project must provide managed hawk mitigation lands at a ratio of 0.5:1, or 247.7 acres.

<sup>13/</sup> This number represents a small percentage of the Spangler site, because Spangler will be largely converted from rice to managed marsh for habitat mitigation.

RIVER PLAZA DRIVE  
ROUTE 460

**Item 14: 1/29/08**

SACRAMENTO, CA 95833

phone: 916 649 3331

fax 916 649 3322

January 29, 2008

Ms. Ashle T. Crocker  
Attorney at Law  
Remy, Thomas, Moose and Manley, LLP  
455 Capitol Mall, Suite 210  
Sacramento, CA 95814

Dear Ms. Crocker:

This clarifies the Conservancy's communications with your client, AKT, over the past many months with respect to mitigation land for AKI's Greenbriar project. We realize that the Greenbriar project proposal documents specify that the project will identify and secure a combined total of 79.5 acres of mitigation land (49 acres of "Unidentified Site as required by EIR" plus 30.5 acres of land, "Unidentified Site pursuant to County Board of Supervisors action...") at or before issuance of grading permits.

The Conservancy's offer is that if for some reason the Greenbriar project proponents cannot make available 79.5 acres of mitigation from its inventory of holdings in the Basin, the Conservancy would entertain a proposal to make such mitigation available in an amount to meet the shortfall from the Conservancy's current surplus. These surplus lands have been secured by the Conservancy with the intention that they would become integrated with mitigation needs in the Natomas Basin. This land--and all land secured by the Conservancy for mitigation purposes under the Natomas Basin Habitat Conservation Plan and the Metro Air Park Habitat Conservation Plan--has been approved by the Conservancy's Board of Directors, the California Department of Fish and Game and the U.S. Fish and Wildlife Service.

Sincerely,

THE NATOMAS BASIN CONSERVANCY, a California Non-Profit  
Public Benefit Corporation



by: John Roberts  
Executive Director

OFFICERS AND  
BOARD OF DIRECTORS

DAVID CHRISTOPHEL  
*President*

PAUL JUNKER  
*Vice President*

WILLIAM EDGAR  
*Chief Financial Officer*

JOHN HEWITT  
*Secretary*

MICHAEL BRADBURY  
*Board Member*

JANELI E. GRAY  
*Board Member*

DENNIS NELSON  
*Board Member*

BETTINA REDWAY  
*Board Member*

EXECUTIVE OFFICER  
JOHN R. ROBERTS  
*Executive Director*





Ms. Tina A Thomas  
Attorney  
Remy Thomas, Moose and Manley, LLP  
455 Capitol Mall, Suite 210  
Sacramento, CA 95814

January 25, 2008

RE: Mitigation measure for TAC impact from nearby highways, Greenbriar project  
SAC20040304Z

Dear Ms. Thomas,

Thank you for your letter of January 15, 2008 in which you stated the Greenbriar project applicant has agreed to the planting of fine-needled conifer trees in the freeway buffer area to mitigate air quality impacts. It is our understanding that mitigation measure 6.2-4 has been revised to reflect this mitigation of an off-site Toxic Air Contaminant (TAC) impact. We appreciate the proponent's willingness to create this vegetation buffer.

The issue of the impact of mobile sourced Toxic Air Contaminants coming from the nearby highways or major roadways is one which has gained recent attention since the 2005 publication of the CARB [Air Quality and Land Use Handbook: A Community perspective](#). Studies have been on-going to determine the nature of that impact on nearby sensitive receptors of roadway traffic. There have also been recent studies about measures that could be effective mitigation for the impact.

We requested a tree buffer for both highways (I-5 and SR 99) adjacent to the Greenbriar project primarily because of the results of studies (attached) done by Dr. Thomas Cahill of UC Davis. Dr. Cahill's study was laboratory-based and found a 65-85% reduction of fine particles at certain wind velocities in a wind tunnel with specific vegetation in it. Obviously, the mitigation efficiency of trees out next to a highway, subject to various wind speeds, will be different from those in the laboratory. However, we are encouraged enough by Dr. Cahill's work to offer up a densely planted tree barrier as an acceptable mitigation for the Greenbriar project.

We also assume that the scientific community will be testing the effectiveness of other mitigation measures such as filters, walls, etc. We hope the proponent will be willing to consider some of those measures for this project, if, in the future, they are found to be promising.

Sincerely,

A handwritten signature in cursive script that reads "Jeane Borckenhagen".

Jeane Borckenhagen  
Associate Planner

CC: Scott Johnson City of Sacramento  
Leslie Buford City of Sacramento  
Dr. Tom Cahill

Enc: Erin Fujii, Jonathan Lawton, Tom Cahill, et al, "Removal Rates of Particulate Matter onto Vegetation as a Function of Particle Size."

# Removal Rates of Particulate Matter onto Vegetation as a Function of Particle Size

Final Report to  
The Breathe California of Sacramento Emigrant Trails Health Effects Task Force (HETF)  
and Sacramento Metropolitan AQMD

January 15, 2008

Erin Fujii, Project Manager, wind tunnel program  
Jonathan Lawton, Project Manager, chamber studies

with Thomas A. Cahill, David E. Barnes, Chui Hayes (IASTE intern) and Nick Spada,  
The DELTA Group, University of California, Davis 95616

and the active collaboration of The Health Effects Task Force (HETF), Jan Sharpless,  
Chair, Breathe California, Sacramento/Emigrant Trails, and the Pacific Southwest USFS  
Urban Forest Program, Dr. Greg McPherson, UC Davis.

**Executive Summary:** We have measured the removal rate of particulate matter passing through leaves and needles in realistic vegetation configurations as a function of particulate size. Two methods were used:

1. We generated particles in the UC Davis wind tunnel and collected them by size before and after they passed through vegetative layers at low wind velocities. (redwood, deodar, and live oak) in 50 separate runs, each with 8 particle size modes before and after the vegetation,
2. We generated particles into a 3.4 m<sup>3</sup> static chamber and allowed particles to diffuse to vegetation. (redwood, deodar, live oak, and oleander), followed by decay in time of mass concentrations, 8 size modes, over the next 2 to 3 hours

We especially focused on the ability of finely needled and leaved trees to remove the most dangerous highway pollutants, very fine (< 0.25 µm) and ultra fine (< 0.1 µm) particles from diesel and smoking cars near roadways.

The results of the tunnel study were that all forms of vegetation were able to remove 65% to 85% of very fine particles at wind velocities below about 1.5 m/sec (roughly 3 mi/hr) during the 2 to 4 seconds in which the particles were within the vegetation chamber. Redwood and deodar were about twice as effective as live oak.

The chamber studies were performed with effective wind velocities less than 0.1 m/sec to allow diffusion to surfaces without the impaction that occurs in the wind tunnel. However, the very fine particles were essentially removed from the chambers during fill and in the 1 minute equilibration time allowed in the experiment by coagulation, diffusion to chamber walls, and vegetation. By sharply reducing the amount a vegetation, (to roughly a few percent of that used in the tunnel studies), we were able to obtain adequate particles in the slightly coarser 0.26 to 0.34 µm size mode and follow the decay of these particles in time.

## Table of Contents

### Executive summary

#### A. Introduction

1. Health effects of aerosols
2. Ambient concentrations of aerosols

#### B. Theory of particulate deposition

#### C. Experiments

1. Equipment and Experimental Capabilities
2. Wind tunnel
3. Chamber studies

#### D. Interpretation and Conclusions

#### References

#### Appendices

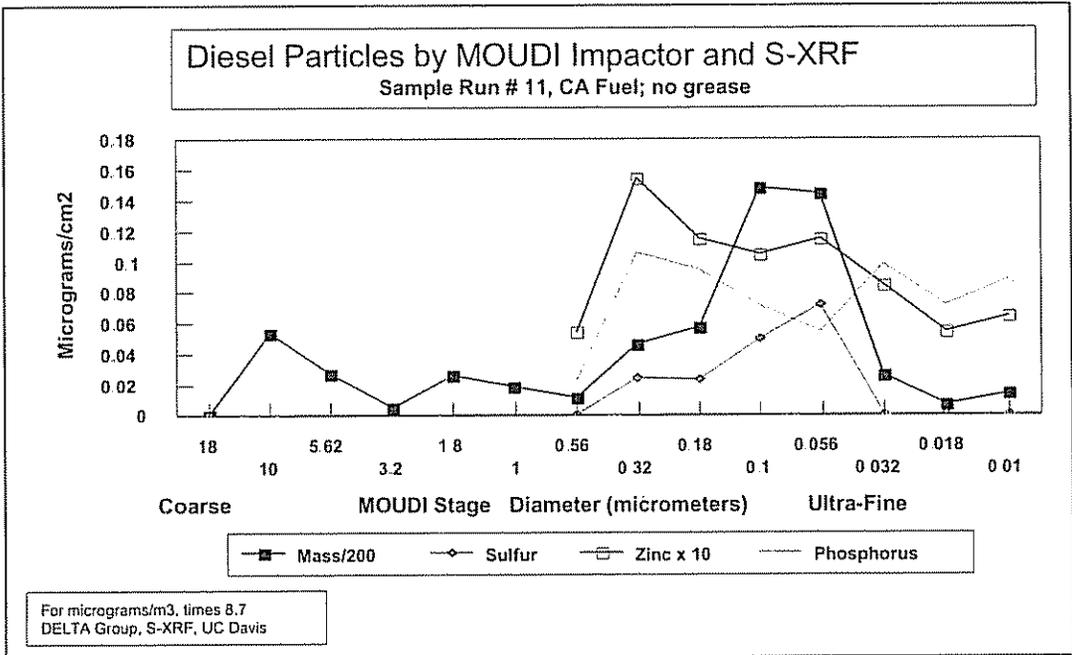
- I. DRUM Quality Assurance Protocols (DQAP) ver 1/06 (2005)
- II.

## Introduction

There is a crisis in the field of environmental regulation of particulate matter. The antiquated measuring technology (24 hr mass, one day in six) has lead to statistically based mass standards, originally TSP ( $< 35 \mu\text{m}$ ) then in 1987  $\text{PM}_{10}$  ( $< 10 \mu\text{m}$ ) and now after 1997  $\text{PM}_{2.5}$  ( $< 2.5 \mu\text{m}$ ), that have little connection to causality in morbidity and mortality. Most of the fine mass we breathe is harmless, but within it are harmful agents. Robert Devlin (US EPA) listed then in a AAAR meeting in 2003:

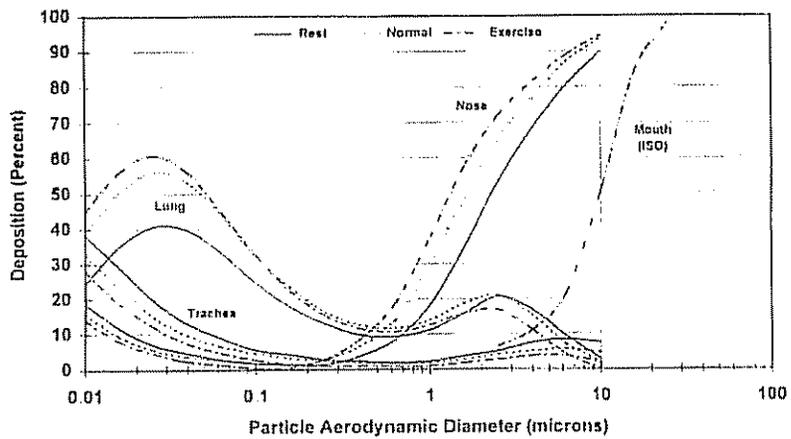
1. Biological agents, fungi, spores, bacteria,
2. Acidic aerosols (evidence weakening),
3. Fine transition metals in the lung,
4. Ultra fine insoluble particles of any kind,
5. High temperature organic products (diesel, smoking cars...).

As an example, I present below a graph of diesel exhaust we measured under a contract with DRI. Note that a very small amount of mass at  $0.01 \mu\text{m}$  results in an enormous number of particles.



These particles, which include carcinogenic compounds (PAHs) and transition metals, match the peak of deep lung capture (below), and thus pose a grave health risk (70% of all the impact of all California TACs combined – CA ARB Almanac)

## Particle Size versus Percent Deposition



Journal of Inhalation Research (1995)

This figure shows the relationship between particle size and what percent is deposited in different parts of the respiratory tract.

Roads are always going to act as pollution sources to nearby areas. Our work with the Breathe California (née American Lung Association) Health Effects Task Force has shown major and unacceptable impacts of non-freeway arterials, such as Watt Avenue, on schools and residences. Since we can not assume all pollution can or will be eliminated, the Health effects Task Force, working with the DELTA Group, CalTrans, and Sacramento County, is studying the effectiveness of vegetation both in the roadway right of way and between the roadways and schools and residences. The recent realization that almost all the most dangerous roadway particles are in the very fine ( $< 0.25 \mu\text{m}$ ) and ultra fine ( $< 0.1 \mu\text{m}$ ) modes offers the possibility of using vegetation as a removal mechanism, based on the relatively high diffusion lengths and sticky nature of these particles. The literature is devoid of such information, but the results could have a major impact on roadway design in future as well as offering retrofit possibilities in the present.

Thus there are two problems – identify and measure these particles in the community (our reports, 2002 and 2005 for Breathe California plus a lot of work at UCLA), and find ways to remove them from the air.

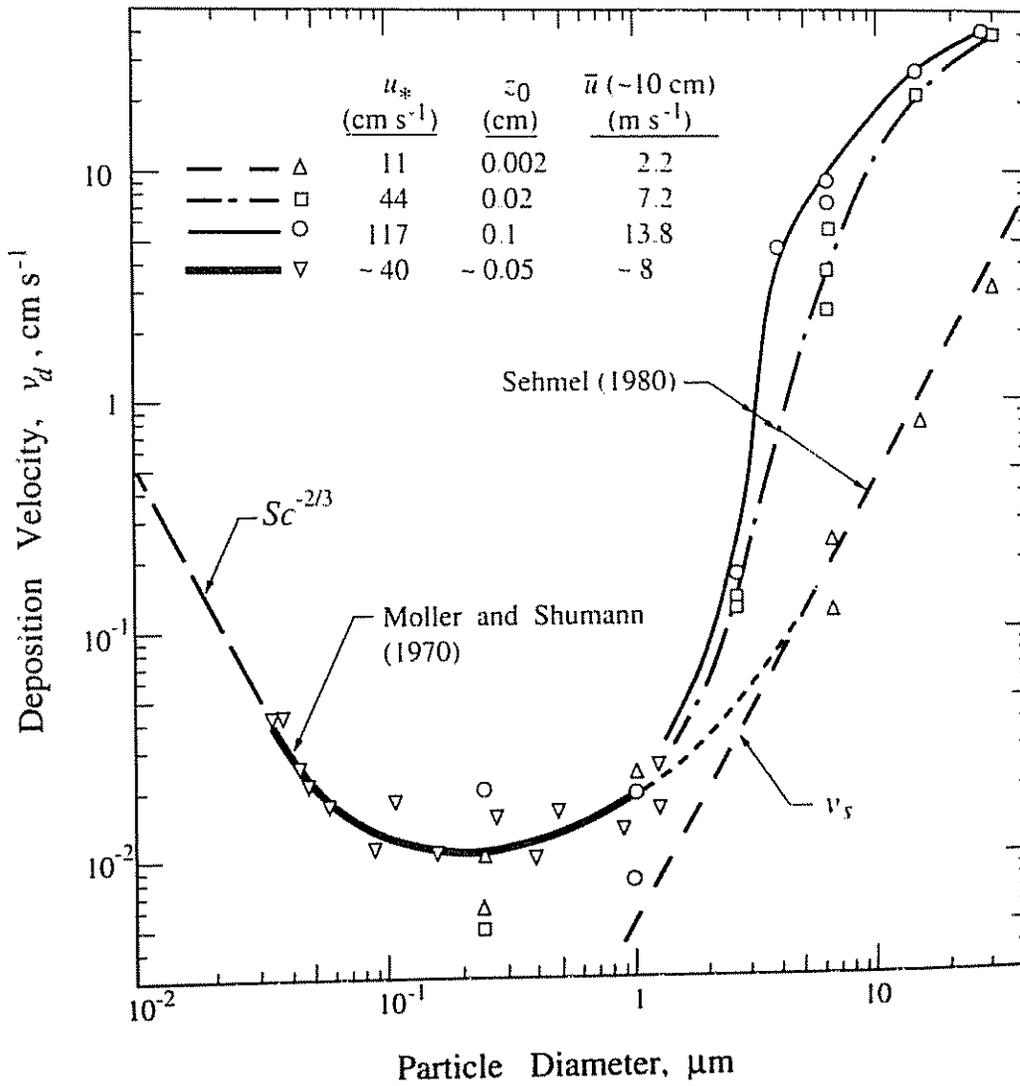
The mitigation of these particles falls into 4 classes, and represents the heart of the effort of the Breathe California of Sacramento Emigrant Trails work for 2005-2007:

1. Mitigation at the source – support AB1807 on particle in smog check, etc,
2. Mitigation in highway design – out “green Highways initiative with CalTrans and the ARB),
3. Mitigation for the right of way fence to the receptor dwelling, school house, ...,
4. Mitigation via indoor air control.

In these efforts, vegetation may be able to play a role, especially as the most dangerous particles have a high diffusion velocity.

### **Theory of Particle Deposition**

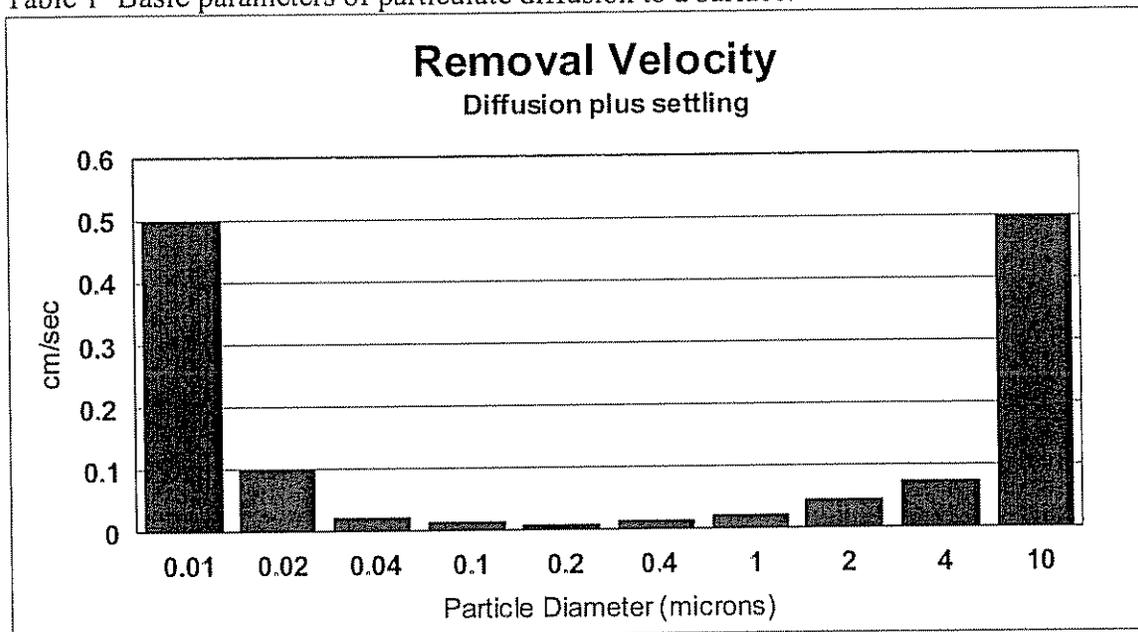
Particle removal rates for the ultra fine particles ( $< 0.1 \mu\text{m}$ ) are greatly enhanced over accumulation mode particles ( $\sim 0.5 \mu\text{m}$ ) because the finer particles can diffuse more easily to surfaces. Since they are oil rich, they then stick and are removed from the air. This has the results that the most important particles for human health are also those that can be most easily removed by diffusion to a surface, assuming such a surface is available. Removal of these particles occurs at later times in rainfall, sloughing of leaves and needles, etc.



The basic physical parameters are summarized in Seinfeld and Pandas, 1889, pg 970, which have then been extend to our situation in Table 1, column 7.

Particle diameter microns	Diffusion Theory cm <sup>2</sup> /sec	Diffusion Theory nm/sec	cp cm/sec	Dep. vel. S&P pg970 cm/sec	Settling velocity cm/sec	Migration v = 1 m/sec 10 m veg. 10 sec distance cm
0.002	1.28E-002	0.866	4965	Total		
0.004	3.23E-003	0.435	1760			
0.01	5.24E-004	0.175	444	0.500		5.0
0.02	1.30E-004	0.087	157	0.100		1.0
0.04	3.59E-005	0.046	55.5	0.022		0.2
0.1	6.82E-006	0.020	14	0.015		0.2
0.2	2.21E-006	0.011	4.96	0.010		0.1
0.4	8.32E-007	0.007	1.76	0.015		0.2
1	2.74E-007	0.004	0.444	0.018	0.004	0.2
2	1.27E-007	0.003	0.157	0.030	0.015	0.3
4	6.1E-008	0.002	0.056		0.075	0.8
10	2.38E-008	0.001	0.014		0.500	5.0

Table 1 Basic parameters of particulate diffusion to a surface.



Calculations for removal rate in realistic conditions are complex, and involve both the residence time of the particles in the 3 dimensional arrays of surfaces and the deposition velocity. If the average spacing of the surfaces is, for example, 1 cm, then a 0.1 µm particle would require 50 seconds to reach the surface (100% removal rate). One would then have a 50% removal rate with 25 seconds residence time, etc.

If one considers smaller particles at the peak of the number and surface area distributions, 0.02  $\mu\text{m}$ , the time becomes 10 seconds, and for 0.01  $\mu\text{m}$  particles, 2 seconds.

Thus, provision of a high surface area of vegetation adequate to slow (but not stop) wind motion will maximize particle removal rates. This effect is in addition to the wind transfer function effect, with the lateral wind resistance of the vegetation tipping the wind transport vector to a more vertical direction driven by the waste heat (engine exhaust plus hot pavement) of the highway. (Cahill et al, 1974; Feeney et al, 1976).

Specifically, we originally proposed to:

1. Configure the wind tunnel with particulate inputs, two particulate DRUM samplers, one before and one after a removable frame holding various kinds of vegetation. The frames will include screens to preclude losses of materials into the tunnel
2. The smoke/diesel/ozone input will be introduced, and the tunnel operated at up to 5 wind low velocities, with a return to the lowest at the end for a QA check.
3. The DRUM samplers will operate continuously, collecting particles on greased substrates in the size modes from  $> 5.0$ , 5.0 to 2.5, 2.5 to 1.15, 1.15 to 0.75, 0.75 to 0.56, 0.56 to 0.34, 0.34 to 0.26, and 0.26 to 0.09 microns. For the diesel smoke, a  $< 0.09$  micron filter will be added.
4. Analyze all samples for mass using the DELTA Group soft beta ray mass system matched to the periods on constant wind velocity in the tunnel in a time resolution of 1  $\frac{1}{2}$  hr for the DRUM samples, 24 hr for the filter samples.
5. Provide a Final Report on all aspects of the project, including an extensive section on the Quality Assurance of the results.

In practice, we were unable to obtain a diesel source, and ended up relying on road flares. No work was done for ozone.

However, we added the chamber studies, not call for in the original proposal, as a way to study process at very low wind velocities typical of winter stagnation periods in the Sacramento valley.

## **C. Experiments**

### **1. Technological Resources**

The primary studies were based on the 20 m long UC Davis wind tunnel, which we reconfigured as a low velocity wind tunnel, and a 3.5  $\text{m}^3$  static chamber for diffusion removal studies. The technical resources available include trained faculty, staff and student personnel, plus:

1. Two DELTA Group 8 stage rotting drum (DRUM) impactors, with size collection from  $> 5 \mu\text{m}$  to 0.09  $\mu\text{m}$  particle aerodynamic diameter.

- a. For the diesel/car aerosols, an after filter collects from 0.09 to 0.0  $\mu\text{m}$  continuously.
2. DELTA Group's recently developed soft beta ray mass measurement system for DRUM Apiezon-L coated Mylar substrates.
3. DELTA Group Synchrotron induced X-Ray Fluorescence (S-XRF) capabilities at the LBNL Advanced Light Source Beam Line 10.3.1 (presently operated by UC Davis by Dr. Cliff at DAS)
4. DELTA Group optical attenuation vs wavelengths, 350 nm – 820 nm (in final development phase)

For more on our technology See <http://delta.ucdavis.edu> for details



Figure 1 DELTA Group 8 DRUM sampler - case open, inlet off.

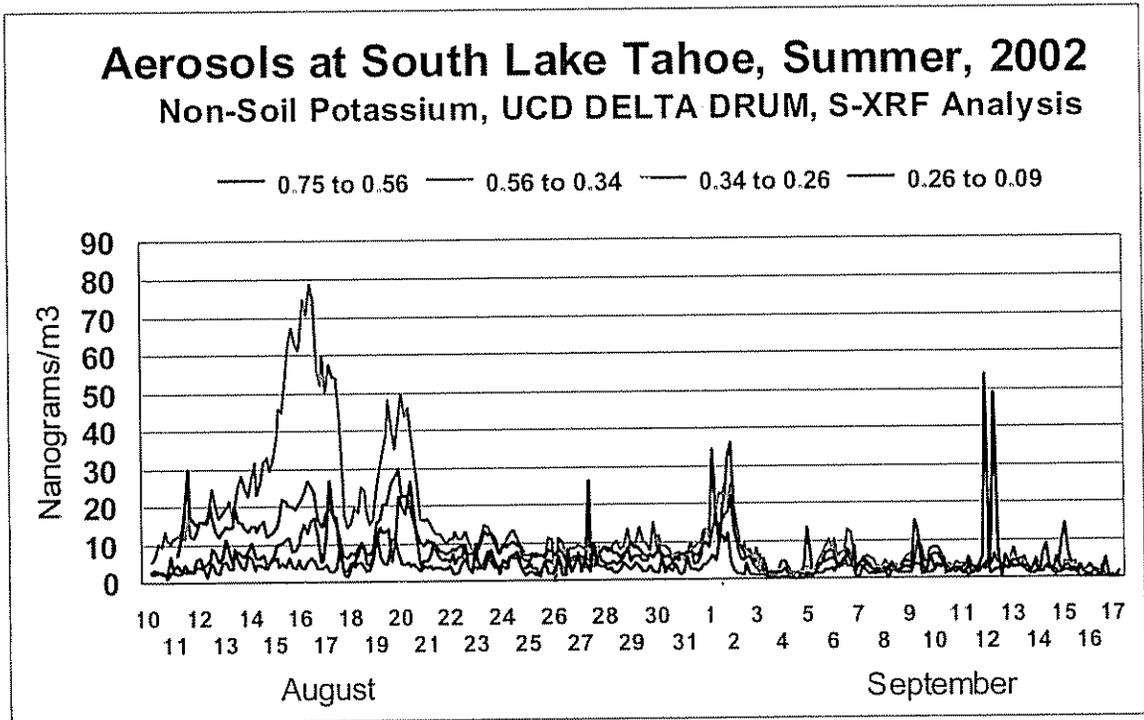


Figure 2. Forest fire smoke at South Lake Tahoe, dominated by  $0.56 > D_p > 0.34 \mu\text{m}$ .

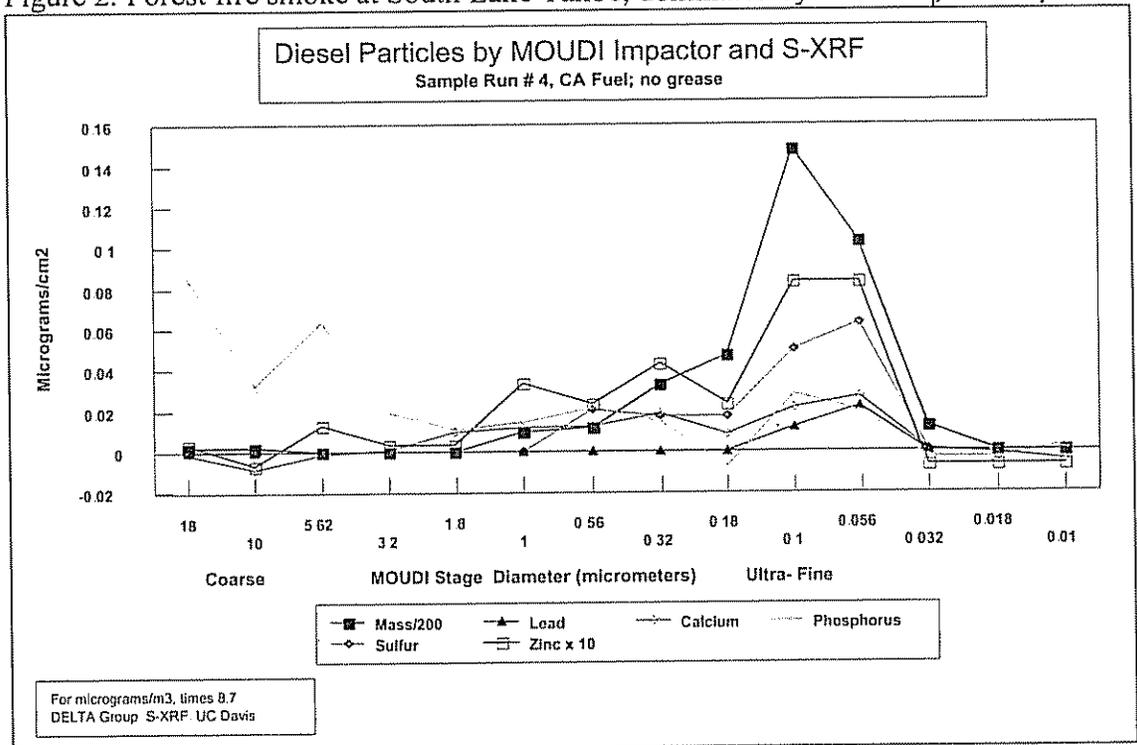
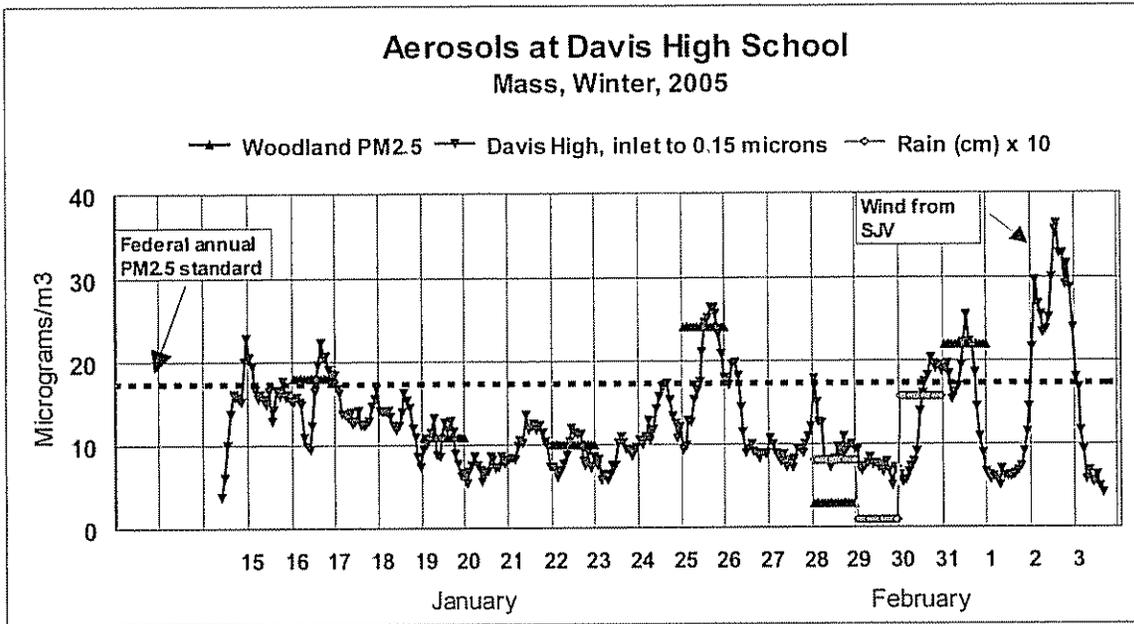


Figure 3: Diesel smoke from DELTA Group's collaboration with Desert research Institute, showing diesel smoke dominated by  $< 0.32 \mu\text{m}$  very fine particles.

**Soft Beta ray Mass measurements**

Below we compare masses measured at Davis HS by DRUM impactor and soft beta ray mass measurements to the Woodland Yolo-Solano APCD district 1 day in 3 filter based site. Agreement is excellent except for one rainy day.



## 2. Wind tunnel studies

With the assistance of Prof. Bruce White, his graduate student Dave, and funding from the grant, we have been able to clean, repair, and modify the UC Davis low velocity wind tunnel for the vegetation studies.

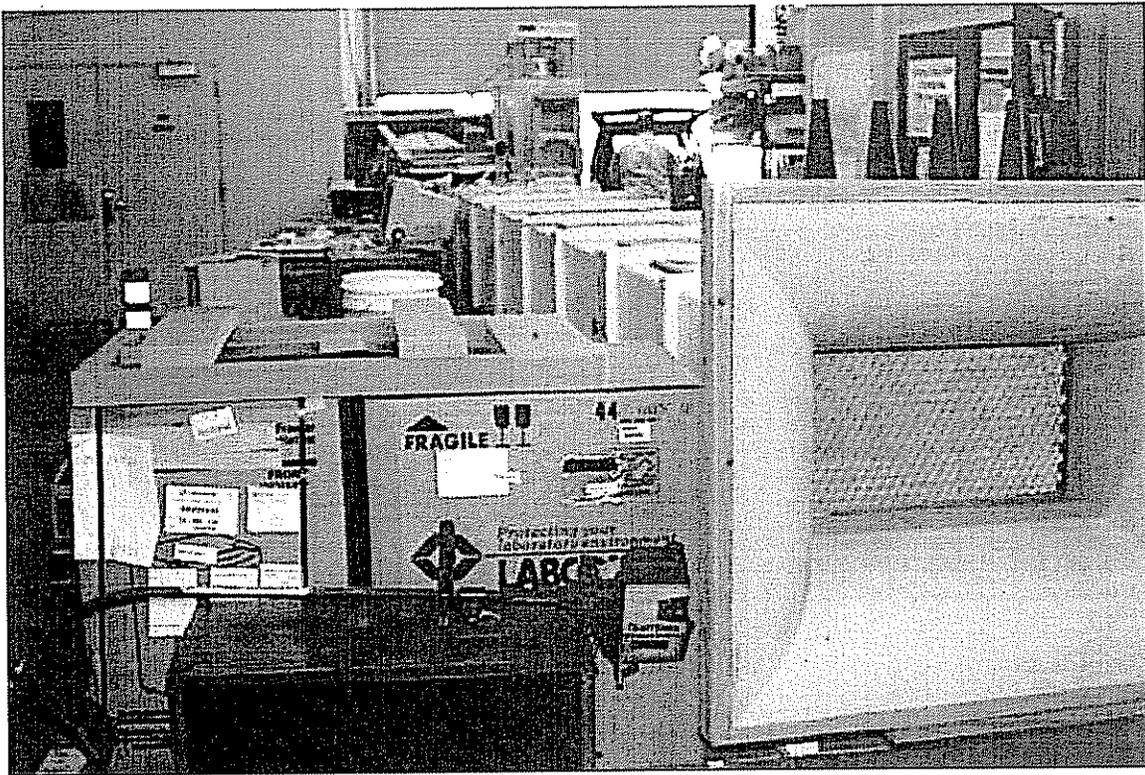


Figure 1 The 60 ft UC Davis low velocity wind tunnel. The collimators on the entrance are shown, then the 20 ft section for flow treatment, and in the distance the end of the tunnel and outside exhaust.

The wind tunnel was instrumented with wind flow measurers and profilers, a pair of DELTA Group 8 drum samplers, from circa 12  $\mu\text{m}$  down to 0.09  $\mu\text{m}$  diameter, two Dustrak nephelometers, all placed in front of and after the vegetation section..

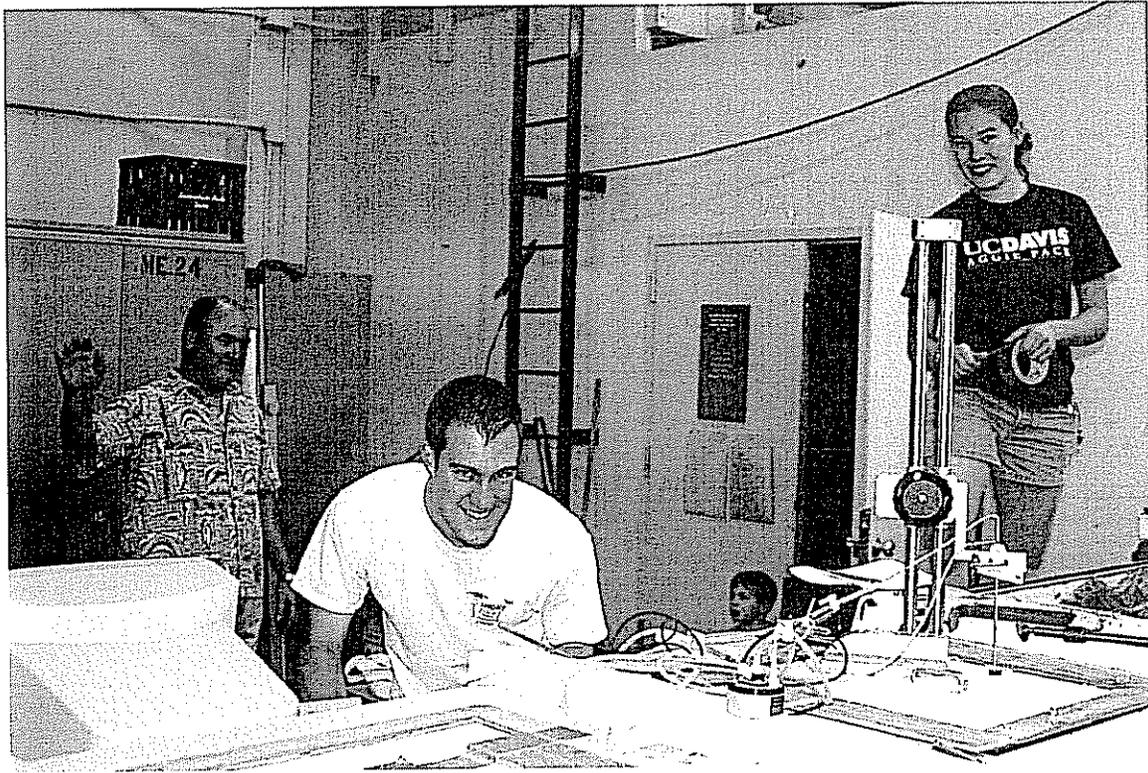


Figure 2 Dave is calibrating the wind flow devices while Erin is mounting the sampler inlets on the exit section.

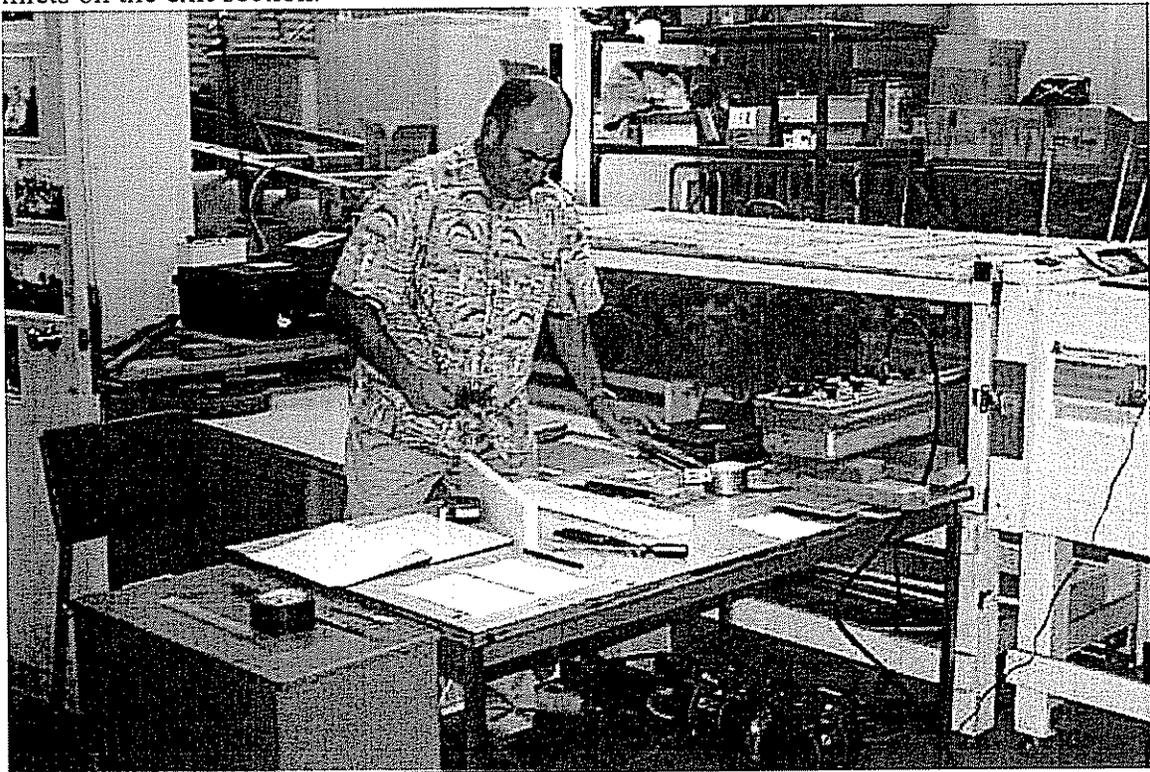


Figure 3. Dave Barnes next to the inlet DRUM and Dustrak, with the vegetation section beside him. The exit DRUM and Dustrak can be seen behind him.



Figure 4 Redwood vegetation in place. Erin worried about something.

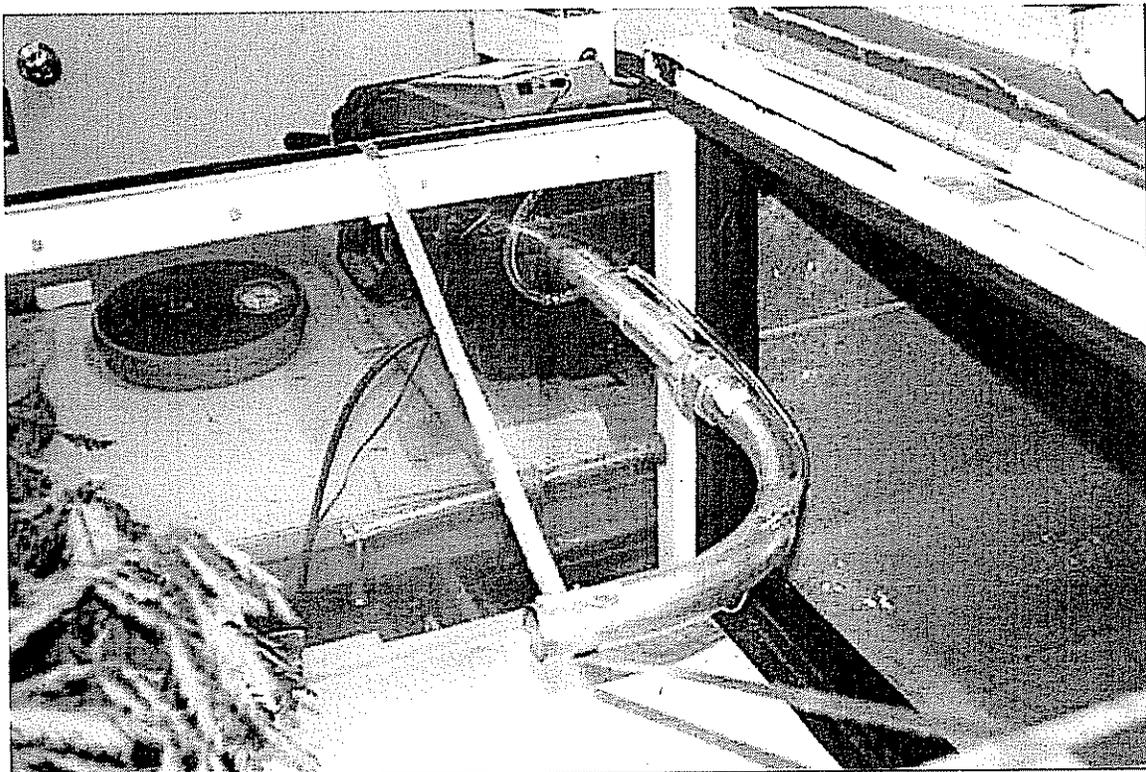


Figure 5 Exit inlets for DRUM and Dustrak.

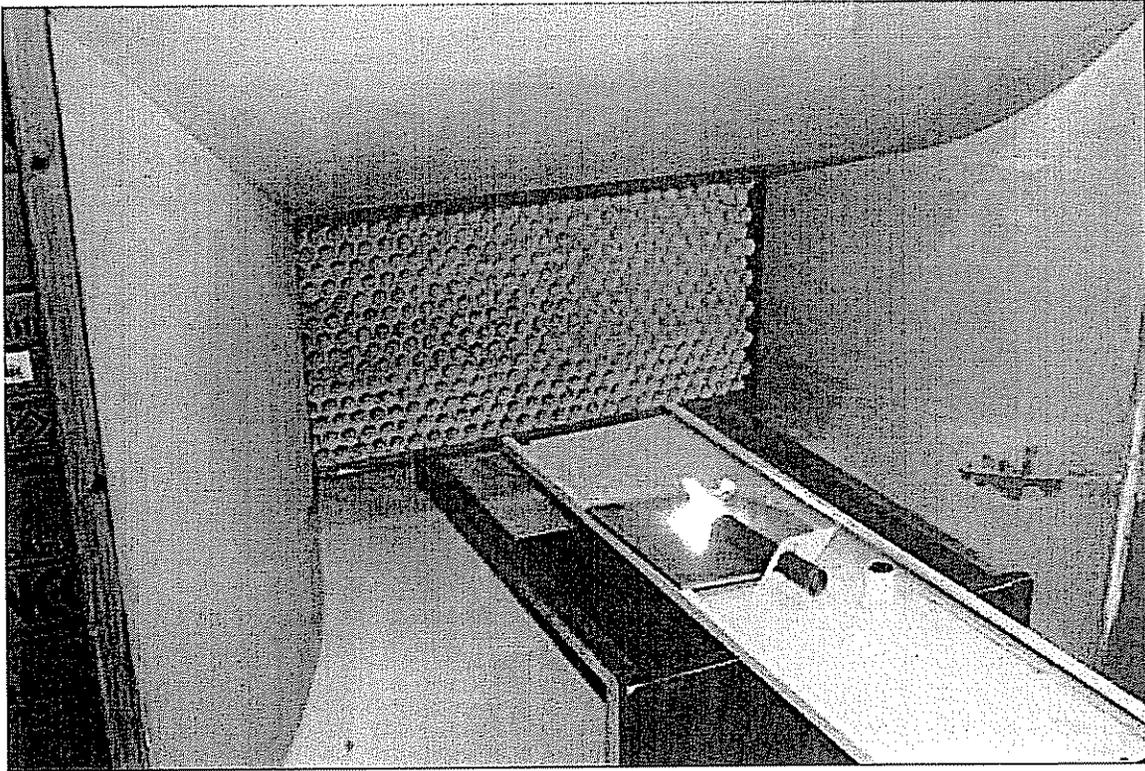


Figure 6 Use of a road flare to generate accumulation mode and very fine aerosol. The flare lasted 15 minutes with the output integrated on the 8 non rotating stages, inlet and exit. The mean aerosol level before the tests was  $13 \mu\text{g}/\text{m}^3$ , and during the test  $250 \mu\text{g}/\text{m}^3$ .

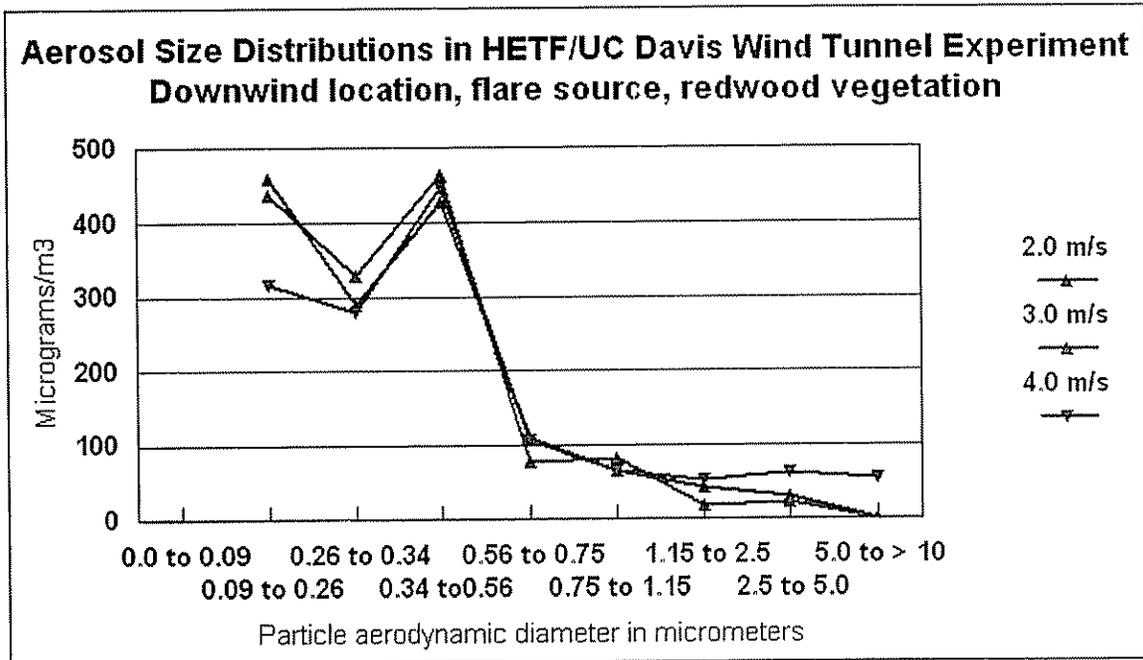


Figure yyy Three runs on flare particles with an empty tunnel. Note that the differences reflect both differences in the flare burn and all uncertainties associated with the beta gauge measurements.

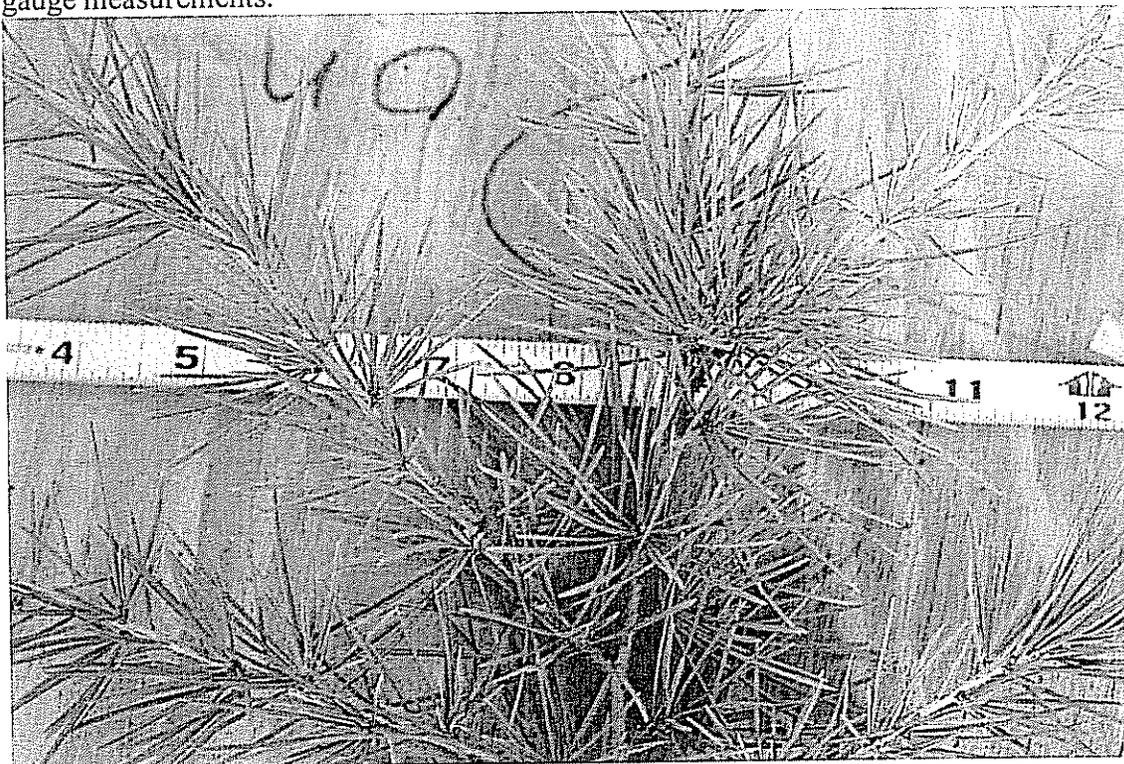


Figure yyy Example of measurements made to determine branch and needle area.

Two types of data are available from these tests. First, since we have a direct measurement of the volume of air in the tunnel, and since the flares proved surprisingly uniform in their ability to generate fine particles, (Figure yyy), we can simply measure the particle mass after the vegetation to detect removal, with the concentrations corrected for the dilution rate. Figure yyy shows an example of this type of test.

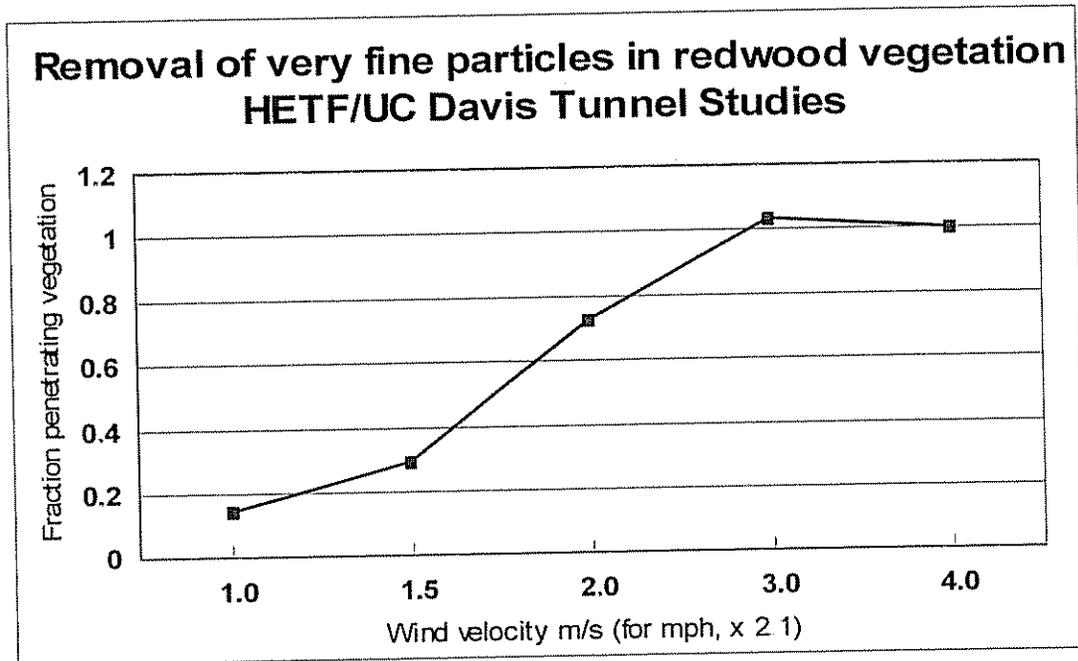


Figure yyy Removal rate of very fine particles on redwood branches via the dilution method.

The second type of measurement involves comparison of the upwind versus downwind DRUM sampler data. These results had higher uncertainties, partially caused by the  $\pm 15\%$  uncertainty in replicates, part by suspected non uniformities in the particle distribution after moving through the vegetation. Efforts were made to reduce this by placing air barriers at all edges designed to avoid air passing around the vegetation rather than through it, but variations were still much higher than via the dilution method.

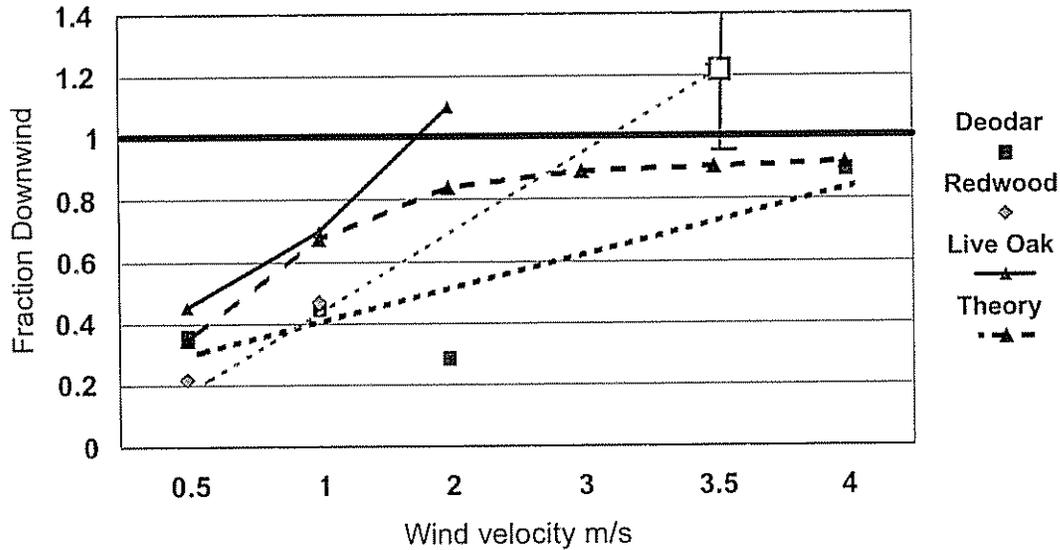
Figure yyy shows the results of these tests for very fine particles. S-XRF strontium data were used, as it was unique to the flare and did not occur in background air, but mass data are also available from all runs.

The ploy marker “theory” was based on a deposition velocity (Figure yyy) of 0.1 cm/sec, but suffers from the wildly non-uniform leaf and branch configuration that makes quantitative calculation unreliable. It should merely be used as a qualitative measure of expected behavior versus exposure time in the vegetation array.

### BC/SET HETF/SMAQMD/UC Davis Wind Tunnel Vegetation Study

Fraction of particles  $0.26 > D_p > 0.09$  microns surviving after 2 m of branches

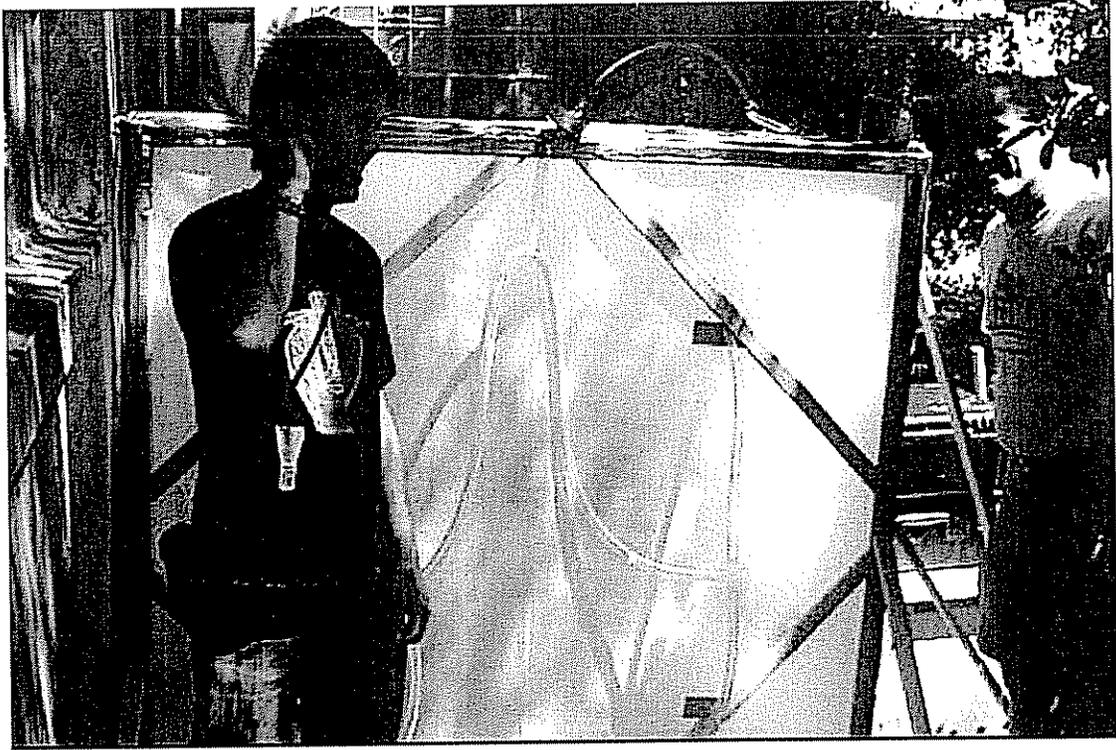
All S-XRF Sr data (red flare); Mean error in replicates  $\pm 15\%$



### 3. Chamber studies

The chamber studies were based on an attempt to perform a diffusion-limited particle removal study without the complexity of air motion and impaction of particles inherent in the wind tunnel studies.

A plastic chamber 1.5 m/side ( $3.5 \text{ m}^3$ ) was constructed, with a removable side wall and a frame at the bottom into which was placed fresh vegetation: oleander, redwood, deodar, and live oak, derived from prunings for the UC Davis grounds program. The placement was designed to provide a reasonable natural mass of vegetation far less dense than the vegetation array used in the tunnel study.



As in the tunnel study, particles were derived from highway flares placed in a sealed combustion chamber. Air was inserted into this chamber at the rate of roughly 10 L/min, and the smoke pushed through a 10 cm diameter plastic tube into the center of the chamber. The velocity of the incoming smoke was a few cm/sec, and it fell like slow motion stream of water towards the bottom of the changer during the fill process. After the flare was burned (originally for the full 15 min, later reduced to 1.5 min), the input air was stopped from the burn chamber.

After 1 min, the DRUM sampler was started (10 L/min) and 10 L/min of new filtered (stretched Teflon) ambient input air was added at 4 points in each near corner of the chamber on the vertical wall opposite the smoke input. The purpose of this was to provide clean make up air for that lost into the DRUM sampler and provide low velocity mixing. The DRUM input was a 5 cm diameter aluminum tube in the center of the chamber.

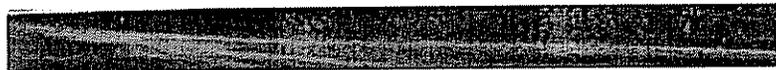
**Example of drums from 3 redwood chamber runs**

**Particle diameter ( $\mu\text{m}$ )**

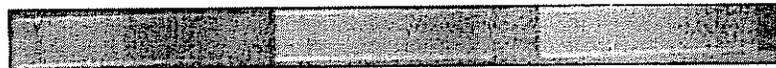
**10 to 5.0**

**Not shown**

**5.0 to 2.5**



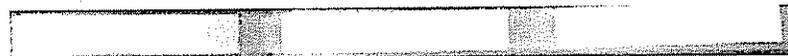
**2.5 to 1.15**



**1.15 to 0.75**



**0.75 to 0.56**



**0.56 to 0.34**



**0.34 to 0.26**



**0.26 to 0.09**



Table xxx shows the measurements made during the chamber studies. Each study involved multiple runs of the 8 stage impactor, generally of duration 1 to 3 hr in duration. Typically 3 measurements were made on a single set of drum strips. The samples were then beta gauged, and mass profiles provided.

The initial set runs were done with the empty chamber and a 15 minute flare burn. The chamber was visually observed to be uniformly filled with flare smoke, which then decreased in time. Note that the removal rate of the DRUM impactor, 10 L/min, would take 350 minutes, almost 6 hr, to empty the chamber. The first runs were on oleander branches, essentially loosely filling the chamber (10 to 12 m<sup>2</sup> of branch and leaf surface area). Two points were immediately evident. First, that the mass of aerosols present in the filled chamber was a small fraction, circa 10%, of the mass of aerosols in the empty chamber. Second, almost all particles in the very fine (0.26 > D<sub>p</sub> > 0.09 μm) size mode were absent. Note that the comparison of the empty chamber and filled chamber studies argues against any serious role in coagulation in reducing the aerosol concentrations.

In a way, these measurements by themselves proved the effectiveness of vegetation in removing very fine aerosols from the flare smoke, and especially those in the very fine. Theory predicts that the unmeasured low end of the ultra fine mode were even more effectively scavenged (see Figure xxx). However, the process was so fast that it was invisible to the DRUM, so the experiment was modified in two ways:

1. the amount of vegetation was greatly reduced, until the leaf area was on the order of 1.5 m<sup>2</sup>, rather than 10 m<sup>2</sup>.
2. the length of the flare burn was reduced to 1.5 min.

The empty chamber runs were then duplicated, now with lower concentrations. With this revised protocol, the concentrations in the chamber seen with the branches in place were increased to the point where measurements could be made. Figure yyy shows an example of one set of three runs taken on redwood branches using this protocol.

From these runs, two quantitative results are available. First, the concentration seen at the beginning of each run was a measure of the effectiveness of particle removal by the vegetation during the fill and the 1 minute delay before the DRUM started to sample. Second, the decay versus time was then available to examine the removal process.

Table xxx shows the data on the initial concentrations, while Figure yyy shows examples of the decay rate for each type of vegetation.

## **D. Interpretation and Conclusions**

The data above show that the basic premise of the study has been confirmed. Vegetation does remove particles from the atmosphere, especially very fine particles such as diesel exhaust, and that removal is semi-quantitatively predicted by theory. These data thus encourage the use of vegetation to not only disperse but to capture and remove the most toxic components of aerosols, very fine ( $< 0.25 \mu\text{m}$ ) and ultra fine ( $< 0.1 \mu\text{m}$ ), from the air. When vegetation is placed near sources, such as along roads, there will be mitigation at the source before it is dispersed into the local and regional air mass.

The differences in the two types of study are intriguing, and a clear and unique explanation is not derivable from the present data alone. However, there are important points to note in the information from each study that can help in interpretation.

1. The air velocity of the tunnel study was from 0.5 m/s to 4 m/s, that of the chamber study circa 0.05 m/sec.
2. In the tunnel study, redwood and deodar were the most effective removal agents, twice as good as live oak, but in the chamber study live oak was much more effective than either redwood or deodar.

We propose that the differences in the leaf and branch structure are key to these differences, as the redwood and deodar have most of the capture area closely packed onto the branches, while the live oak is a much more open structure that allows air to pass through rather than over the branches.

Appendix A

Run Summary Data

Set:	Run #	Date	Vegetation/PM	Velocity	gth of Rur/	egeteence enhanc	Comments
tain stages 1-8)							
1	1	09/18/2006	Redwood/flare	1.03	875	6	none
	2	9/18-9/19	Redwood/no PM	1.06	1750	15	ard scaffold/pie plate
	3	19-Sep	Redwood/flare	0.49	1110	28	as above
	4		Redwood/flare	1.99	1150	29	as above
	5		Redwood/flare	4.08	1150	29	as above
	6		Redwood/flare	1.015	1115	30	as above
	7		Redwood/no PM	1.975	3960	31	as above
2	8	09/20/2006	Redwood/woodsmoke	2			as above
	9		Redwood/woodsmoke	4			as above
	10		Redwood/woodsmoke	1.05			as above
	11		Redwood/woodsmoke	0.54			as above
	12	09/24/2006	spun glass filter/flare	0.99			as above filter facing wrong way
	13		spun glass filter/flare	2			as above filter facing wrong way
3	14		spun glass filter/flare	1			as above filter facing ok, filter bloc
	15		spun glass filter/flare	1.97			as above
	16		spun glass filter/flare	3.91			as above
	17		spun glass filter/flare	0.51			as above
	18		spun glass filter/flare	0.98	480		as above blockages in stg. 7/8 ren
	19	09/25/2006	live oak/flare	0.94	480		as above
	20		live oak/flare	1.99	360		
4	21		live oak/flare	3.13	360		
	22		live oak/flare	0.53	360		
	23		live oak/flare	1.04	360		
	24		live oak/woodsmoke	1	900		
	25		live oak/woodsmoke	2.02	1200		
	26		live oak/woodsmoke	3.95	1200		
	27		live oak/woodsmoke	0.56	900		
	28		live oak/woodsmoke	0.98	900		
	29	09/26/2006	diedar/woodsmoke	1.01	900		
	30		diedar/woodsmoke	2	900		
	5	31		diedar/woodsmoke	3.91	1200	
32			diedar/woodsmoke	0.5	903		
33			diedar/woodsmoke	0.95	885		
34			diedar/flare	0.97	390		
35			diedar/flare	2	360		
36			diedar/flare	3.82	360		
37			diedar/flare	0.52	360		
38			diedar/flare	1.02	360		
39			electrostatic filter/flare	1.01	315		
40			electrostatic filter/flare	1.98	330		
6		41		electrostatic filter/flare	4	360	
	42		electrostatic filter/flare	0.51	331		
	43		electrostatic filter/flare	0.5	360		of tunnel, blowing perpendicular to tunnel
	44		electrostatic filter/flare	0.97	315		as above
	45		paper filter/flare	0.93	360		as above
	46		paper filter/flare	1.88	360		as above
	47		paper filter/flare	2.55	360		as above
	48		paper filter/flare	0.5	348		as above with afterfilter
	49		paper filter/flare	1.95	373		as above
	50		spun glass filter/flare	0.97	360		

Additional Material regarding

Item 14- Greenbriar

may be available at the

Clerk's Office, 916-808-7200.