EXHIBIT B

Soil/Water/Air Protection Enterprise
525 Broadway, Suite 203
Santa Monica, California 90401
Fax: (949) 717-0069
Matt Hagemann
Tel: (949) 887-9013
Email: mhagemann@swape.com

April 20, 2010

Richard Drury
Lozeau | Drury LLP
1516 Oak Street, Suite 216
Alameda, CA 94501

Subject: Comments on the Proposed Napa 34 Holdings Project, Napa County, California

Dear Mr. Drury:

Soil/Water/Air Protection Enterprise (SWAPE) has reviewed the March 17, 2010 Mitigated Negative Declaration for the proposed Napa 34 Holdings project in Napa, California and supporting documentation. The project involves the construction and operation of 490,500 square feet of warehouses and offices in eight buildings on a currently undeveloped 33.9 acre parcel of land located at the intersection of State Route 29 and Airport Boulevard in Napa, California.

SWAPE conducted an analysis of the project impacts in the areas of stormwater, air emissions (both during project construction and operation), odor impacts, and greenhouse gas emissions. We have concluded that there is a fair argument that the project will result in significant impacts to the community and that an EIR should be prepared to identify and mitigate the impacts, where necessary.

Stormwater Analysis

The MND states, on p. 24, that less than significant impacts would be associated with the following issues (VII, Hydrology and Water Quality Impacts):

- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?
- Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

However, a July 15, 2009 letter from the applicant's consultant to Napa County, states that post-development flow will exceed pre-development volumes.[1] The 2010 Stormwater Management Plan also states that post-development flow will exceed pre-development volumes.[2] The MND makes no mention that post-development stormwater runoff will exceed predevelopment flows.

A waiver request for exceeding the predevelopment flows was the subject of the July 15, 2009 letter. No documentation on the disposition of the waiver request was available in the records reviewed for the preparation of this letter. However, the 2010 Stormwater Management Plan did not include any mention that a waiver was obtained from the County, so we have assumed that a waiver was not granted.

In contrast to the findings in the MND, as cited above, an exceedence of pre-development stormwater runoff should be considered as a significant unmitigated impact. Therefore, a DEIR should be prepared to include a thorough evaluation of all practicable measures to reduce stormwater runoff from the project site. If, after this evaluation, the runoff is still predicted to exceed pre-development volumes, a quantitative evaluation of all feasible BMPs should be conducted to conform to Napa County Post-Construction Runoff Management requirements.

Additionally, because groundwater is approximately 10 feet below ground surface, the evaluation of BMPs included in a DEIR should consider protection of the underlying beneficial uses of the groundwater. Any BMPs that would discharge stormwater to the subsurface in a "bioretention strip" (as proposed in the 2010 Stormwater Management Plan, p. 9) cannot cause or contribute to an exceedence of applicable groundwater quality objectives as established in the RWQCB "Basin Plan" for the Napa area.

Air Quality Analysis

The air quality analysis used as a basis for the MND is deficient. The analysis fails to: (1) adequately screen the project impacts; (2) incorporate the latest regulatory guidance; (3) provide adequate documentation of modeling assumptions; (4) recognize the significance of emissions of particulate matter; (5) analyze potential health risks from diesel particulate matter emissions during project construction; (6) identify feasible mitigation and; (7) identify cumulative impacts. Therefore, a DEIR should be prepared to include a thorough evaluation of all air quality issues associated with the project.

Screening level analysis using BAAQMD shows that the project will have significant air quality impacts

[1] Letter from TLA Engineering and Planning, to Erich Kroll, Napa County Department of Public Works, July 15, 2009

[2] Napa Commerce Center Stormwater Management Plan, March 2010

Screening criteria identified in the 1999 and 2009 CEQA Guidelines from BAAQMD, were developed in order to provide lead agencies and project applicants with a conservative indication of whether proposed project could result in potentially significant air quality impacts[3]. In the 1999 Guidelines, BAAQMD provides a list of projects that are likely to produce potentially significant emissions of NO_x based upon the size of the project, including Office Parks.

Projects With Potentially Significant Emissions[4]

Land Use Category	Trip Generation Rate	Size of Project Likely to Generate 80 lb/day NOx
Office		
General Office	10.9/1,000 sq. ft.	280,000 sq. ft.
Government Office	68.9/1,000 sq. ft.	55,000 sq. ft.
Office Park	12.8/1,000 sq. ft.	210,000 sq. ft.
Medical Office	37.1/1,000 sq. ft.	110,000 sq. ft.

The 2009 Guidelines include operational and construction related screening sizes for criteria pollutant and greenhouse gas emissions form typical projects including office parks and warehouses.

Operational-Related Criteria Air Pollutant and Precursor Screening Level Sizes[5]

Land Use Type	Operational Criteria Pollutant Screening Size	Operational GHG Screening Size	Construction-Related Screening Size
Office Park	323,000 sq. ft (NOx)	50,000 sq. ft	277,000 sq. ft (ROG)
Warehouse	864,000 sq. ft (NOx)	64,000 sq. ft	259,000 sq. ft (NOx)

[3] Bay Area Air Quality Management District, CEQA Guidelines December 2009, p. 3-1

[4] BAAQMD. 1999. BAAQMD CEQA Guidelines. December, 1999. pg 25.

[5] BAAQMD. 2009. CEQA Guidelines. Table 3-1. December 2009, p. 3-2

Based on the 1999 BAAQMD guidance, the proposed Napa 34 project, estimated to be approximately 459,000 square feet of warehouse and office space, is twice as large as the "Office Park" project listed having significant air quality impacts. Based on the 2009 BAAQMD guidance, the Napa 34 project will have significant NOx and GHG issues during construction and operation when compared to comparable projects that would include office parks and warehouses. When a project exceeds an applicable CEQA significance threshold, such as the BAAQMD screening thresholds, there is a fair argument that the project may have significant environmental impacts and an EIR is required. Since the Napa 34 Project exceeds the BAAQMD CEQA screening thresholds, there is a fair argument that the Project will have significant NOx and GHG impacts and an EIR is required to analyze and mitigate these impacts.

The MND failed to incorporate an analysis of this guidance. A DEIR should be prepared to include a comparison of the project to the guidance and to conduct an appropriate analysis of project impacts and identify mitigation, where warranted.

Model Results Prepared by SWAPE Show Significant impacts from Project Construction

The project applicant did not model air emission form the project during the three year construction period. For the preparation of these comments, SWAPE modeled the project using Urbemis 2007 version 9.2.4 and the project description found in the MND. Assuming that the project was to be initiated in November, 2010 and using the default assumptions provided in the model (including the Napa County project location), the emission rates generated in the model are significantly higher than the proponent provided to Napa County. The attached outputs from the model (**Attachment A and B**) show that the ROG and NOx emissions during construction would exceed the BAAQMD thresholds of significance. For the ROG, emissions during the second year of construction exceed the threshold value by nearly 10 times during the summer months of construction (507.3 lbs/day versus 54 lbs/day). For NOx the daily emission value during the second year of construction is nearly double the 54 lbs/day threshold (92 lbs NOx/day).

SWAPE Urbemis Emission Estimates During Construction Phase of Napa 34 Project

		1999 BAAQMD Guidance	2009 BAAQMD Guidance
Criteria Air Pollutant	**SWAPE Model (lbs/day)**	**Construction Related Average Daily Emissions (lbs/day)**	**Construction Related Average Daily Emissions (lbs/day)**
ROG	**507.3**	--	**54**

		1999 BAAQMD Guidance	2009 BAAQMD Guidance
Criteria Air Pollutant	**SWAPE Model (lbs/day)**	**Construction Related Average Daily Emissions (lbs/day)**	**Construction Related Average Daily Emissions (lbs/day)**
NO_x	**92**	--	**54**
PM_{10}	**113**	80 (operation)	Best Management Practice
PM_{10} (exhaust)	5	--	82
$PM_{2.5}$ (exhaust)	3	--	54

There is a fair argument that the project will have significant adverse impacts on air quality during the construction phase of the project and that an EIR is required. Based upon the results above, it is clear that the MND is deficient regarding the impacts of construction on air quality in the area. The proponent must prepare an EIR to include model outputs for emissions during project. Due to the large quantity of particulate matter that is generated during grading operations during the construction phase of the project, the proponent should include a Gaussian dispersion model analysis, using AERMOD, to determine whether the construction phase would increase local PM concentrations above air quality standards. Both the Urbemis analysis and the Gaussian dispersion analysis should be included in the DEIR

Furthermore, given the three-year duration of the construction phase, it is improper to consider this to be a temporary impact. In the absence of any construction phase significance threshold for PM-10, it is appropriate to use the operational phase significance threshold of 80 ppd of PM-10 due to the long duration of the construction phase. The Project's PM-10 emissions of 113 ppd exceed the BAAQMD operational significance threshold of 80 ppd. There is therefore a fair argument that the Project will have significant PM-10 emissions that should be analyzed and mitigated in an EIR.

As a second approach, the MND should have compared construction emissions to significance thresholds established by other air districts that apply specifically to construction emissions. The table below clearly demonstrates that the Project's construction emissions, even after mitigation, far exceed significance thresholds adopted by other air districts.

Construction Phase CEQA Significance Thresholds

Air District	Emissions Significance Thresholds (ton/year)				
	ROG	NOx	CO	PM10	PM2.5
BAAQMD construction	10 (54 ppd)	10 (54 ppd)	-	15 (80 ppd)	10 (54 ppd)
SMAQMD construction	-	11	-	-	-
SCAQMD construction	10	13	73	20	7
SLOCAPCD construction	24	10	-	7	-
AVAQMD construction	18	18	72	11	-
SJVAPCD construction	7	7	-		-
MBUAPCD construction	-	-	-	11	-
Napa 34 Project	507 ppd	91 ppd		113 ppd	

The construction emissions contained in the URBEMIS modeling runs exceed most construction emission significance thresholds. The Napa 34 Project therefore has significant construction air emissions that must be disclosed and analyzed in an EIR.

The MND fails to recognize the significance of emissions of particulate matter from the proposed facility

According to the BAAQMD, particulate matter causes adverse impacts in terms of public health, visibility, atmospheric deposition, aesthetic damage, and may also contribute to climate change. Health effects can result from both short-term and long-term exposure to PM pollution. Exposure to particulate pollution is linked to increased frequency and severity of asthma attacks and even premature death in people with pre-existing cardiac or respiratory disease. Those most sensitive to particulate pollution include infants and children, the elderly, and persons with heart and lung disease. Many scientific studies have linked short-term exposure to PM to a series of significant health problems, including:

- aggravated asthma
- increases in respiratory symptoms like coughing and difficult or painful breathing
- chronic bronchitis
- decreased lung function
- heart attack
- premature death

The Bay Area Air Quality Management District, which includes Napa County, is currently in nonattainment for particulate matter (both PM_{10} and $PM_{2.5}$). The addition of any significant quantity of particulate matter into the air shed will only aggravate the existing air pollution problem in the District. An EIR should be prepared to address and mitigate the addition of particulate matter from the project.

The MND fails to analyze potential health risks from diesel particulate matter emissions during project construction

During construction, a large number of diesel-powered equipment would operate on site and numerous diesel-powered trucks would deliver supplies. The MND does not address the potential health risks associated with exhaust emissions of diesel particulate matter from these sources.

Diesel exhaust contains nearly 40 toxic substances and may pose a serious public health risk for residents in the vicinity of the facility. Diesel exhaust has been linked to a range of serious health problems including an increase in respiratory disease, lung damage, cancer, and premature death. Fine diesel particles are deposited deep in the lungs in the smallest airways and can result in increased respiratory symptoms and disease; decreased lung function, particularly in children and individuals with asthma; alterations in lung tissue and respiratory tract defense mechanisms; and premature death.[6] Exposure to diesel exhaust increases the risk of lung cancer. It also causes non-cancer effects including chronic bronchitis, inflammation of lung tissue, thickening of the alveolar walls, immunological allergic reactions, and airway constriction.[7]

As early as 1988, the National Institute for Occupational Safety and Health identified diesel exhaust as a potential occupational carcinogen. In 1998, the California Air Resources Board ("CARB") formally identified the particulate fraction of diesel exhaust as a toxic air contaminant and concluded that exposure to diesel exhaust particulate matter causes cancer and acute respiratory effects.[8] The U.S. EPA followed suit in 2002 and concluded that "long-term (*i.e.*, chronic) inhalation exposure is likely to pose lung cancer hazard to humans, as well as damage the lung in other ways depending on exposure. Short-term (*i.e.*, acute) exposures can cause irritation and inflammatory symptoms of a transient nature... The assessment also indicates that evidence for exacerbation of existing allergies and asthma symptoms is emerging."[9] Diesel exhaust is estimated to contribute to more than 75% of the added cancer risk from air toxics in the United States.[10]

---

[6] California Air Resources Board (CARB), Initial Statement of Reasons for Rulemaking, Proposed Identification of Diesel Exhaust as a Toxic Air Contaminant, Staff Report, June 1998.

[7] Findings of the Scientific Review Panel on The Report on Diesel Exhaust as adopted at the Panel's April 22, 1998 Meeting

[8] California Air Resources Board, Initial Statement of Reasons for Rulemaking, Proposed Identification of Diesel Exhaust as a Toxic Air Contaminant, Staff Report, June 1998

[9] U.S. EPA, Health Assessment Document for Diesel Engine Exhaust, Report EPA/600/8-90/057F, May 2002

[10] Environmental Defense Fund, Cleaner Diesel Handbook, Bring Cleaner Fuel and Diesel Retrofits into Your Neighborhood, April 2005; http://www.edf.org/documents/4941_cleanerdieselhandbook.pdf

Lagging emission standards and very old equipment in fleets have made construction equipment one of the largest sources of toxic diesel exhaust particulate pollution in California. An estimated 70% of California's construction equipment is currently not covered by federal and state regulations because it is too old.[11] The Project would be built out over a period of three years, concurrently with many other developments in the region. Heavy-duty diesel-powered construction equipment exhaust would release considerable amounts of diesel particulate matter, which is 89% PM2.5. Clouds of soot emitted by heavy-duty construction equipment can travel downwind for miles, then drift into heavily populated areas.

According to the BAAQMD Guidance (page 8-8), the proponent must include in its analysis of the construction impacts:

- The types of off-site receptors and their proximity to construction activity within approximately 1,000 feet.
- The duration of the construction
- The quantity and types of diesel-powered equipment
- The number of hours equipment would be operated each day
- The location(s) of equipment used, distance to nearest off-site sensitive receptors, and orientation with respect to predominant wind direction
- Location of equipment staging areas; and
- The amount of on-site diesel-generated PM2.5 exhaust if mass emission levels from construction activity are estimated.

There is a fair argument that the project will have significant adverse impacts on air quality from diesel particulate matter and the proponent must quantify the concentration of diesel particulate matter in a health risk assessment. A DEIR should be prepared to include a health risk assessment on the basis of construction impacts estimated in accordance with BAAQMD guidance.

Feasible construction mitigation measures exist and should be required for the project

Construction emissions, as modeled by SWAPE in the preparation of these comments, shows significant exceedences of BAAQMD thresholds, including ROG and NOX. Therefore, an EIR need to be prepared to consider and integrate mitigation where warranted. Mitigation measures to consider, as identified by BAAQMD, in the EIR in the reduction of toxic air contaminants include[12]:

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.

---

[11] Los Angeles Times, Dire Health Effects of Pollution Reported, Diesel Soot from Construction Equipment Is Blamed for Illnesses and Premature Deaths, December 6, 2006

[12] Bay Area Air Quality Management District, CEQA Guidelines December 2009, p. 2-6

- All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
- All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- All vehicle speeds on unpaved roads shall be limited to 15 mph.
- All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
- All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.
- Post a publicly visible sign with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours.

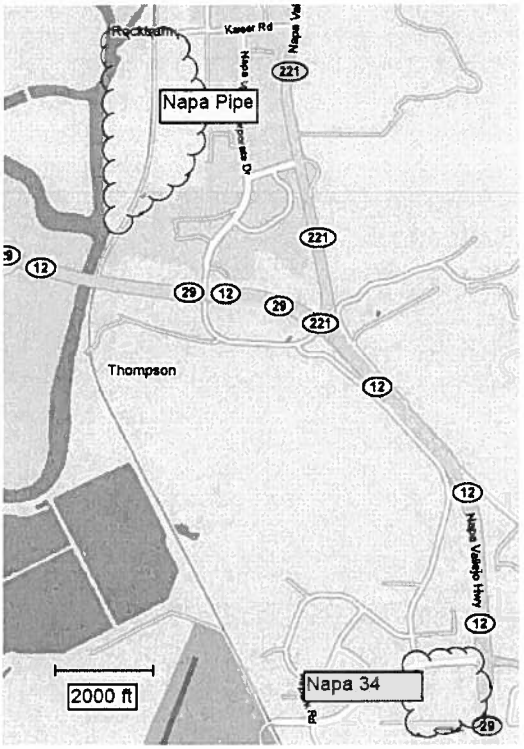
The MND fails to adequately address cumulative impacts on air quality

The MND asserts with no analysis whatsoever that the Project's emissions of criteria pollutants not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in no-attainment under an applicable federal or state ambient air quality standard. A proper cumulative impact analysis is vital for an environmental analysis because the full environmental impact of a proposed project cannot be gauged in a vacuum. One of the most important environmental lessons that has been learned is that the environmental damage often occurs incrementally from a variety of small sources with which they interact."[13] The MND's conclusion is flawed for the following reasons.

First, the discussion in the comments above indicates that the Project would contribute to an existing significant impact, i.e. degraded air quality in the San Francisco Bay Area air basin as evidenced by frequent violations of PM10, PM2.5 and ozone ambient air quality standards. The Project would increase the emissions of PM10, PM2.5, and ozone precursors and thus would contribute to these existing exceedances of ambient air quality standards. Thus, the Project's contribution is *per se* cumulatively significant.

[13] Bakersfield Citizens (2004) 124 Cal. App. 4th at 1214 (quoting Communities for a Better Environment v. California Resources Agency 103 Cal.App.4th at 116).

Second, a cumulative impacts analysis must consider past projects, the effects of other current projects, and the effects of probable future projects."[14] The DEIR did not identify any other closely related, past, present, or reasonably foreseeable probable future projects let alone attempt to quantify their emissions and, thus, to evaluate them cumulatively with the Project. The County is also considering another large project, the Napa Pipe Project, in the vicinity of the Napa 34 Project. The proposed Napa Pipe Project would include the construction of 2,580 residential units, a 150-unit senior living facility, 50,000 square feet of office space, and approximately 40,000 square feet of retail and restaurants. Additionally, 140,000 square feet of R&D/light industrial/warehousing would be constructed along with a condominium hotel.



The County has already determined that the Napa Pipe Project will have significant air quality and other impacts requiring an EIR. The Napa 34 Project will unquestionable contribute to those same air quality impacts. Therefore the Napa 34 Project has cumulative significant air quality impacts together with the Napa Pipe Project, requiring an EIR to analyze the combined impacts. A full cumulative impact analysis must be completed to determine the real impacts on the community.

The cumulative operational impacts from Napa Pipe and Napa 34 projects are significantly higher than the BAAQMD Significance Thresholds.

[14] CEQA Guidelines §15355(b)

Proposed Project	ROG (lbs/day)	NOx (lbs/day)	PM10 (lbs/day)	PM2.5 (lbs/day)
Napa Pipe	262	115	157	33
Napa 34	29	30	39	8
Cumulative Impact	291	145	196	41
BAAQMD Significance Threshold	54	54		

There is a fair argument that the cumulative impacts from both the Napa Pipe and Napa 34 projects will adversely impact the area and that an EIR must be completed to address those impacts.

Greenhouse Gas Emissions – Project Level Threshold

As noted previously, the proposed Napa 34 project is of a size that will, according to the 2009 BAAQMD guidance, have significant green house gas (GHG) emitting potential. The proponent's analysis of the project's GHG emissions clearly shows that the project will exceed the recommended Bay Area Air Quality Management District's (BAAQMD's) threshold of 1,100 metric tons of CO2 equivalent/yr.

The 1,100 MT CO2e/yr is a numeric emissions level above which a project's contribution to global climate change is considered to be "cumulatively considerable."[10] The proponent's analysis calculates the cumulative unmitigated impacts from the project to be 1,093 MT CO2e/yr during the second year of construction (a mere seven pounds below the significance threshold) and 1,896.3 MT CO2e/yr during the operation phase of the project (800 pounds above the significance threshold).

The proponents of the project have proposed an alternative assessment to the Bright Line value above involving an "efficiency" approach outlined in the BAAQMD's Guidance. According to BAAQMD,[15] "local agencies may wish to apply this efficiency-based recommended threshold with some discretion, taking into account not only the project's efficiency, but also its total GHG emissions. Even where a project is relatively GHG-efficient as compared to other projects, in approving the project, the lead agency is committing to use what is essentially its GHG "budget" in a given way. Expending this

[15] BAAQMD. 2009. Proposed Thresholds of Significance. Pg. 21.

"budget" on the proposed project may affect other development opportunities and associated obligations to mitigate or conflict with other actions that the community may wish to take to reduce its overall GHG emissions after it has conducted its programmatic analysis." Development of this project under this method would limit the size and scope of other projects in the Napa region.

Furthermore, there can be no question that the Napa 34 Project will have cumulatively significant GHG impacts when considered together with the nearby and contemporaneous Napa Pipe Project.

There is a fair argument based either on the screening approach or the more complex Urbemis model, that the project will have significant GHG emission potential. The proponent must thoroughly evaluate this potential and address the necessary mitigation measures in the EIR for the project.

Odor

The MND failed to consider the presence of the Napa Sanitation District Soscol Wastewater Treatment Plant, located at 1515 Soscol Ferry Road. The facility is located approximately 1 mile northwest of the proposed project. According to the Napa Sanitation District, the facility is a 15 million gallon per day (mgd) treatment plant that includes preliminary treatment (screening), primary treatment (clarifiers), biological secondary treatment (340 acres of oxidation ponds and/or activated sludge facilities), secondary clarification or sedimentation, sand filtration, chlorination, sludge digestion and solids de-watering facilities.

According to BAAQMD guidance[16], a project is presumed to have significant odor impacts if people are to be located within one to two-miles of facilities known to generate odorous compounds. Those facilities and the screening distances are included in the table below[17].

[16] Bay Area Air Quality Management District, CEQA Guidelines December 2009, p. 3-4

[17] Bay Area Air Quality Management District, CEQA Guidelines December 2009, Table 3-3 p. 3-4

Facilities Known To Generate Odors	Screening Distance
Wastewater Treatment Plant	**2 miles**
Sanitary Landfill	2 miles
Transfer Station	1 mile
Composting Facility	1 mile
Petroleum Refinery	2 miles
Asphalt Batch Plant	2 miles
Chemical Manufacturing	2 miles
Fiberglass Manufacturing	1 mile
Painting/Coating Operations (e.g. auto body shops)	1 mile
Rendering Plant	2 mile
Coffee Roaster	1 mile

According to the BAAQMD CEQA Guidelines:

> Any project with the potential to frequently expose members of the public to objectionable odors would be deemed to have a significant impact [emphasis added]. Odor impacts on residential areas and other sensitive receptors warrant the closest scrutiny, but consideration should also be given to other land uses where people may congregate, such as recreational facilities, worksites and commercial areas. Analysis of potential odor impacts should be conducted for both of the following situations: 1) sources of odorous emissions locating near existing receptors, and 2) receptors locating near existing odor sources.[18]
>
> Determining the significance of potential odor impacts involves a two-step process. First, determine whether the project would result in an odor source and receptors being located within the distances indicated in Table 4. Table 4 lists types of facilities known to emit objectionable odors. The Lead Agency should evaluate facilities not included in Table 4 or projects separated by greater distances than indicated in Table 4 if warranted by local conditions or special circumstances. Second, if the proposed project would result in an odor source and receptors being located closer than the screening level distances indicated in Table 4, a more detailed analysis, as described in Chapter 3, should be conducted.

[18] Bay Area Air Quality Management District, CEQA Guidelines December 2009, p. 7-2

Since the Project may result in exposing members of the public to objectionable odors, namely the District Soscol Wastewater Treatment Plant, an EIR is required to analyze this impact and to propose feasible alternatives and mitigation.

In addition to violating the BAAQMD's CEQA Guidance regarding odor, the proponents have failed to consider the negative impacts from the odorous compounds. The MND does not provide any significant analysis of potential odor problems

Unpleasant odors can also impair mood leading to increased levels of tension, depression, anger, fatigue and confusion. Conditioned aversions may play a role in perceptions and health symptoms induced by malodors. If a malodor has been previously associated with health symptoms, the odor alone may subsequently recreate these symptoms in the absence of the allergy.[19] Ambient odors can provoke a wide distribution of reactions. Variations are most often attributed to differences in individual sensitivity. Behavioral responses for a single individual and among individuals exposed to the same odor over time can be greatly varied. Cognitive processes may be modifying the over perception of odor exposure. Some individuals may exhibit extreme sensitivity and adaptation to environmental odors does not occur.[20]

In 2008, a study on residents living near industrial hog operations found that odors from the facilities restricted residents' activities to an extent that may affect health. Odors were found to restrict social activities, outdoor activities, and effect sleeping patterns. Research has shown that residents in rural communities perceive environmental barriers as reasons for inactivity and inactivity can have a major impact on a person's physical health.[21]. Another study found that malodor reported in communities near swine operations originated from the operations. The study found that odor ratings were related to temperature, PM_{10}, semi volatile PM_{10} and hydrogen sulfide concentration. The odds of reporting a change in daily activities due to odor increased 62% for each unit increase in average odor during a 12 hour period. Odor was related to levels of stress reported in daily diaries. Anticipation of irregular odor events may also cause stress and anxiety about daily activities and social events.[22]

---

[19] Schiffman, S.S., Miller, E.A.S., Suggs, M.S. and Graham, B.G. (1995). The effect of environmental odors emanating from commercial swine operations on the mood of nearby residents. *Brain Res. Bull.,* 37, 369-375

[20] Dalton, P. (1996). Odor perception and beliefs about risk. *Chem. Senses* 21: 447-458

[21] Tajik M, Muhammad N, Lowman A, Thu K, Wing S, and Grant G. (2008). Impact of odor from industrial hog operations on daily living activities. *New Solutions* 18(2): 193-205

[22] Wing S, Horton R, Marshall S, Thu K, Tajik M, Schinasi L, and Schiffman S. (2008). Air pollution and odor in communities near industrial swine operations. *Environmental Health Perspectives*

Conclusion

There is substantial evidence that the Project would result in significant adverse impacts that were not identified in the MND and that are not adequately mitigated. Many of the MND's conclusions that environmental impacts are not significant or less than significant with mitigation are unsupported or contradicted by the analysis we have conducted in the preparation of these comments. As a result, several analyses presented in the MND, including impacts on air quality and odor fail to identify or disclose the magnitude of significant adverse impacts. The CEQA Guidelines require that an EIR be prepared if there is substantial evidence that any aspect of a project, either individually or cumulatively, may cause a significant effect on the environment, regardless of whether the overall effect of the project is adverse or beneficial[23]. Therefore the City should require the preparation of an EIR for the Project.

Sincerely,

James Clark, Ph.D.

Matt Hagemann, P.G.

[23] CEQA Guidelines, 15063(b)(1).

Attachment A: Summer Emission Estimates

4/19/2010 11:54:48 AM

Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:\Documents and Settings\James Clark\Application Data\Urbemis\Version9a\Projects\napa34.urb924

Project Name: Napa 34 Commerical Center

Project Location: Napa County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2010 TOTALS (lbs/day unmitigated)	8.39	52.97	31.37	0.01	112.64	3.24	115.87	23.53	2.98	26.50	5,080.69
2010 TOTALS (lbs/day mitigated)	8.39	52.97	31.37	0.01	112.64	3.24	115.87	23.53	2.98	26.50	5,080.69
2011 TOTALS (lbs/day unmitigated)	507.30	91.97	106.18	0.09	113.01	5.18	118.20	23.66	4.75	28.41	15,703.19
2011 TOTALS (lbs/day mitigated)	507.30	91.97	106.18	0.09	113.01	5.18	118.20	23.66	4.75	28.41	15,703.19

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	3.24	1.74	4.52	0.00	0.01	0.01	2,048.06
TOTALS (lbs/day, mitigated)	3.24	1.74	4.52	0.00	0.01	0.01	2,048.06
Percent Reduction	0.00	0.00	0.00	NaN	0.00	0.00	0.00

4/19/2010 11:54:48 AM

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	26.05	24.39	264.31	0.21	39.06	7.48	22,146.21
TOTALS (lbs/day, mitigated)	26.05	24.39	264.31	0.21	39.06	7.48	22,146.21
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	29.29	26.13	268.83	0.21	39.07	7.49	24,194.27
TOTALS (lbs/day, mitigated)	29.29	26.13	268.83	0.21	39.07	7.49	24,194.27
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 11/30/2010-12/27/2010 Active Days: 20	4.22	33.76	19.13	0.00	112.61	1.80	114.40	23.52	1.65	25.17	3,134.57
Fine Grading 11/30/2010-01/11/2011	4.22	33.76	19.13	0.00	112.61	1.80	114.40	23.52	1.65	25.17	3,134.57
Fine Grading Dust	0.00	0.00	0.00	0.00	112.60	0.00	112.60	23.52	0.00	23.52	0.00
Fine Grading Off Road Diesel	4.16	33.67	17.48	0.00	0.00	1.79	1.79	0.00	1.65	1.65	3,007.48
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.05	0.09	1.65	0.00	0.01	0.00	0.01	0.00	0.00	0.01	127.09

Time Slice 12/28/2010-12/31/2010 Active Days: 4	8.39	52.97	31.37	0.01	112.64	3.24	115.87	23.53	2.98	26.50	5,080.69
Asphalt 12/28/2010-01/11/2011	4.17	19.21	12.24	0.01	0.03	1.44	1.47	0.01	1.32	1.33	1,946.12
Paving Off-Gas	1.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	2.48	14.87	8.27	0.00	0.00	1.28	1.28	0.00	1.18	1.18	1,131.92
Paving On Road Diesel	0.26	4.19	1.33	0.01	0.02	0.15	0.17	0.01	0.14	0.15	610.86
Paving Worker Trips	0.09	0.15	2.64	0.00	0.01	0.01	0.02	0.00	0.00	0.01	203.35
Fine Grading 11/30/2010-01/11/2011	4.22	33.76	19.13	0.00	112.61	1.80	114.40	23.52	1.65	25.17	3,134.57
Fine Grading Dust	0.00	0.00	0.00	0.00	112.60	0.00	112.60	23.52	0.00	23.52	0.00
Fine Grading Off Road Diesel	4.16	33.67	17.48	0.00	0.00	1.79	1.79	0.00	1.65	1.65	3,007.48
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.05	0.09	1.65	0.00	0.01	0.00	0.01	0.00	0.00	0.01	127.09
Time Slice 1/3/2011-1/10/2011 Active Days: 6	7.96	49.72	30.17	0.01	112.64	3.06	115.70	23.53	2.82	26.34	5,080.89
Asphalt 12/28/2010-01/11/2011	4.00	18.03	11.82	0.01	0.03	1.37	1.41	0.01	1.26	1.27	1,946.24
Paving Off-Gas	1.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	2.34	14.17	8.17	0.00	0.00	1.24	1.24	0.00	1.14	1.14	1,131.92
Paving On Road Diesel	0.24	3.73	1.20	0.01	0.02	0.13	0.16	0.01	0.12	0.13	610.86
Paving Worker Trips	0.08	0.14	2.44	0.00	0.01	0.01	0.02	0.00	0.00	0.01	203.47
Fine Grading 11/30/2010-01/11/2011	3.96	31.69	18.35	0.00	112.61	1.69	114.29	23.52	1.55	25.07	3,134.64
Fine Grading Dust	0.00	0.00	0.00	0.00	112.60	0.00	112.60	23.52	0.00	23.52	0.00
Fine Grading Off Road Diesel	3.91	31.61	16.82	0.00	0.00	1.68	1.68	0.00	1.55	1.55	3,007.48
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.05	0.09	1.53	0.00	0.01	0.00	0.01	0.00	0.00	0.01	127.17

Time Slice 1/11/2011-1/11/2011 Active Days: 1	14.68	91.97	106.18	0.09	113.01	5.18	118.20	23.66	4.75	28.41	15,703.19
Asphalt 12/28/2010-01/11/2011	4.00	18.03	11.82	0.01	0.03	1.37	1.41	0.01	1.26	1.27	1,946.24
Paving Off-Gas	1.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	2.34	14.17	8.17	0.00	0.00	1.24	1.24	0.00	1.14	1.14	1,131.92
Paving On Road Diesel	0.24	3.73	1.20	0.01	0.02	0.13	0.16	0.01	0.12	0.13	610.86
Paving Worker Trips	0.08	0.14	2.44	0.00	0.01	0.01	0.02	0.00	0.00	0.01	203.47
Building 01/11/2011-08/22/2011	6.72	42.24	76.01	0.09	0.38	2.12	2.50	0.13	1.94	2.07	10,622.30
Building Off Road Diesel	3.39	15.67	10.85	0.00	0.00	1.14	1.14	0.00	1.05	1.05	1,621.20
Building Vendor Trips	1.79	23.94	18.09	0.05	0.18	0.88	1.06	0.06	0.80	0.86	5,083.18
Building Worker Trips	1.54	2.63	47.07	0.04	0.19	0.11	0.30	0.07	0.09	0.16	3,917.93
Fine Grading 11/30/2010-01/11/2011	3.96	31.69	18.35	0.00	112.61	1.69	114.29	23.52	1.55	25.07	3,134.64
Fine Grading Dust	0.00	0.00	0.00	0.00	112.60	0.00	112.60	23.52	0.00	23.52	0.00
Fine Grading Off Road Diesel	3.91	31.61	16.82	0.00	0.00	1.68	1.68	0.00	1.55	1.55	3,007.48
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.05	0.09	1.53	0.00	0.01	0.00	0.01	0.00	0.00	0.01	127.17
Time Slice 1/12/2011-8/5/2011 Active Days: 148	6.72	42.24	76.01	0.09	0.38	2.12	2.50	0.13	1.94	2.07	10,622.30
Building 01/11/2011-08/22/2011	6.72	42.24	76.01	0.09	0.38	2.12	2.50	0.13	1.94	2.07	10,622.30
Building Off Road Diesel	3.39	15.67	10.85	0.00	0.00	1.14	1.14	0.00	1.05	1.05	1,621.20
Building Vendor Trips	1.79	23.94	18.09	0.05	0.18	0.88	1.06	0.06	0.80	0.86	5,083.18
Building Worker Trips	1.54	2.63	47.07	0.04	0.19	0.11	0.30	0.07	0.09	0.16	3,917.93

Time Slice 8/8/2011-8/22/2011 Active Days: 11	**507.30**	42.64	83.14	0.09	0.41	2.14	2.54	0.14	1.95	2.09	11,216.35
Building 01/11/2011-08/22/2011	6.72	42.24	76.01	0.09	0.38	2.12	2.50	0.13	1.94	2.07	10,622.30
Building Off Road Diesel	3.39	15.67	10.85	0.00	0.00	1.14	1.14	0.00	1.05	1.05	1,621.20
Building Vendor Trips	1.79	23.94	18.09	0.05	0.18	0.88	1.06	0.06	0.80	0.86	5,083.18
Building Worker Trips	1.54	2.63	47.07	0.04	0.19	0.11	0.30	0.07	0.09	0.16	3,917.93
Coating 08/08/2011-09/05/2011	500.58	0.40	7.14	0.01	0.03	0.02	0.05	0.01	0.01	0.02	594.05
Architectural Coating	500.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.23	0.40	7.14	0.01	0.03	0.02	0.05	0.01	0.01	0.02	594.05
Time Slice 8/23/2011-9/5/2011 Active Days: 10	500.58	0.40	7.14	0.01	0.03	0.02	0.05	0.01	0.01	0.02	594.05
Coating 08/08/2011-09/05/2011	500.58	0.40	7.14	0.01	0.03	0.02	0.05	0.01	0.01	0.02	594.05
Architectural Coating	500.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.23	0.40	7.14	0.01	0.03	0.02	0.05	0.01	0.01	0.02	594.05

Phase Assumptions

Phase: Fine Grading 11/30/2010 - 1/11/2011 - Default Fine Site Grading Description

Total Acres Disturbed: 22.53

Maximum Daily Acreage Disturbed: 5.63

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

2 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

4/19/2010 11:54:48 AM

Phase: Paving 12/28/2010 - 1/11/2011 - Default Paving Description

Acres to be Paved: 5.63

Off-Road Equipment:

4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day

1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day

2 Paving Equipment (104 hp) operating at a 0.53 load factor for 6 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day

Phase: Building Construction 1/11/2011 - 8/22/2011 - Default Building Construction Description

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 6 hours per day

2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day

1 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

3 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Phase: Architectural Coating 8/8/2011 - 9/5/2011 - Default Architectural Coating Description

Rule: Residential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Residential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

Time Slice 11/30/2010-12/27/2010 Active Days: 20	4.22	33.76	19.13	0.00	112.61	1.80	114.40	23.52	1.65	25.17	3,134.57
Fine Grading 11/30/2010-01/11/2011	4.22	33.76	19.13	0.00	112.61	1.80	114.40	23.52	1.65	25.17	3,134.57
Fine Grading Dust	0.00	0.00	0.00	0.00	112.60	0.00	112.60	23.52	0.00	23.52	0.00
Fine Grading Off Road Diesel	4.16	33.67	17.48	0.00	0.00	1.79	1.79	0.00	1.65	1.65	3,007.48
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.05	0.09	1.65	0.00	0.01	0.00	0.01	0.00	0.00	0.01	127.09
Time Slice 12/28/2010-12/31/2010 Active Days: 4	8.39	52.97	31.37	0.01	112.64	3.24	115.87	23.53	2.98	26.50	5,080.69
Asphalt 12/28/2010-01/11/2011	4.17	19.21	12.24	0.01	0.03	1.44	1.47	0.01	1.32	1.33	1,946.12
Paving Off-Gas	1.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	2.48	14.87	8.27	0.00	0.00	1.28	1.28	0.00	1.18	1.18	1,131.92
Paving On Road Diesel	0.26	4.19	1.33	0.01	0.02	0.15	0.17	0.01	0.14	0.15	610.86
Paving Worker Trips	0.09	0.15	2.64	0.00	0.01	0.01	0.02	0.00	0.00	0.01	203.35
Fine Grading 11/30/2010-01/11/2011	4.22	33.76	19.13	0.00	112.61	1.80	114.40	23.52	1.65	25.17	3,134.57
Fine Grading Dust	0.00	0.00	0.00	0.00	112.60	0.00	112.60	23.52	0.00	23.52	0.00
Fine Grading Off Road Diesel	4.16	33.67	17.48	0.00	0.00	1.79	1.79	0.00	1.65	1.65	3,007.48
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.05	0.09	1.65	0.00	0.01	0.00	0.01	0.00	0.00	0.01	127.09

Time Slice 1/3/2011-1/10/2011 Active Days: 6	7.96	49.72	30.17	0.01	112.64	3.06	115.70	23.53	2.82	26.34	5,080.89
Asphalt 12/28/2010-01/11/2011	4.00	18.03	11.82	0.01	0.03	1.37	1.41	0.01	1.26	1.27	1,946.24
Paving Off-Gas	1.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	2.34	14.17	8.17	0.00	0.00	1.24	1.24	0.00	1.14	1.14	1,131.92
Paving On Road Diesel	0.24	3.73	1.20	0.01	0.02	0.13	0.16	0.01	0.12	0.13	610.86
Paving Worker Trips	0.08	0.14	2.44	0.00	0.01	0.01	0.02	0.00	0.00	0.01	203.47
Fine Grading 11/30/2010-01/11/2011	3.96	31.69	18.35	0.00	112.61	1.69	114.29	23.52	1.55	25.07	3,134.64
Fine Grading Dust	0.00	0.00	0.00	0.00	112.60	0.00	112.60	23.52	0.00	23.52	0.00
Fine Grading Off Road Diesel	3.91	31.61	16.82	0.00	0.00	1.68	1.68	0.00	1.55	1.55	3,007.48
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.05	0.09	1.53	0.00	0.01	0.00	0.01	0.00	0.00	0.01	127.17

Time Slice 1/11/2011-1/11/2011 Active Days: 1	14.68	91.97	106.18	0.09	113.01	5.18	118.20	23.66	4.75	28.41	15,703.19
Asphalt 12/28/2010-01/11/2011	4.00	18.03	11.82	0.01	0.03	1.37	1.41	0.01	1.26	1.27	1,946.24
Paving Off-Gas	1.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	2.34	14.17	8.17	0.00	0.00	1.24	1.24	0.00	1.14	1.14	1,131.92
Paving On Road Diesel	0.24	3.73	1.20	0.01	0.02	0.13	0.16	0.01	0.12	0.13	610.86
Paving Worker Trips	0.08	0.14	2.44	0.00	0.01	0.01	0.02	0.00	0.00	0.01	203.47
Building 01/11/2011-08/22/2011	6.72	42.24	76.01	0.09	0.38	2.12	2.50	0.13	1.94	2.07	10,622.30
Building Off Road Diesel	3.39	15.67	10.85	0.00	0.00	1.14	1.14	0.00	1.05	1.05	1,621.20
Building Vendor Trips	1.79	23.94	18.09	0.05	0.18	0.88	1.06	0.06	0.80	0.86	5,083.18
Building Worker Trips	1.54	2.63	47.07	0.04	0.19	0.11	0.30	0.07	0.09	0.16	3,917.93
Fine Grading 11/30/2010-01/11/2011	3.96	31.69	18.35	0.00	112.61	1.69	114.29	23.52	1.55	25.07	3,134.64
Fine Grading Dust	0.00	0.00	0.00	0.00	112.60	0.00	112.60	23.52	0.00	23.52	0.00
Fine Grading Off Road Diesel	3.91	31.61	16.82	0.00	0.00	1.68	1.68	0.00	1.55	1.55	3,007.48
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.05	0.09	1.53	0.00	0.01	0.00	0.01	0.00	0.00	0.01	127.17
Time Slice 1/12/2011-8/5/2011 Active Days: 148	6.72	42.24	76.01	0.09	0.38	2.12	2.50	0.13	1.94	2.07	10,622.30
Building 01/11/2011-08/22/2011	6.72	42.24	76.01	0.09	0.38	2.12	2.50	0.13	1.94	2.07	10,622.30
Building Off Road Diesel	3.39	15.67	10.85	0.00	0.00	1.14	1.14	0.00	1.05	1.05	1,621.20
Building Vendor Trips	1.79	23.94	18.09	0.05	0.18	0.88	1.06	0.06	0.80	0.86	5,083.18
Building Worker Trips	1.54	2.63	47.07	0.04	0.19	0.11	0.30	0.07	0.09	0.16	3,917.93

Time Slice 8/8/2011-8/22/2011 Active Days: 11	**507.30**	42.64	83.14	0.09	0.41	2.14	2.54	0.14	1.95	2.09	11,216.35
Building 01/11/2011-08/22/2011	6.72	42.24	76.01	0.09	0.38	2.12	2.50	0.13	1.94	2.07	10,622.30
Building Off Road Diesel	3.39	15.67	10.85	0.00	0.00	1.14	1.14	0.00	1.05	1.05	1,621.20
Building Vendor Trips	1.79	23.94	18.09	0.05	0.18	0.88	1.06	0.06	0.80	0.86	5,083.18
Building Worker Trips	1.54	2.63	47.07	0.04	0.19	0.11	0.30	0.07	0.09	0.16	3,917.93
Coating 08/08/2011-09/05/2011	500.58	0.40	7.14	0.01	0.03	0.02	0.05	0.01	0.01	0.02	594.05
Architectural Coating	500.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.23	0.40	7.14	0.01	0.03	0.02	0.05	0.01	0.01	0.02	594.05
Time Slice 8/23/2011-9/5/2011 Active Days: 10	500.58	0.40	7.14	0.01	0.03	0.02	0.05	0.01	0.01	0.02	594.05
Coating 08/08/2011-09/05/2011	500.58	0.40	7.14	0.01	0.03	0.02	0.05	0.01	0.01	0.02	594.05
Architectural Coating	500.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.23	0.40	7.14	0.01	0.03	0.02	0.05	0.01	0.01	0.02	594.05

Construction Related Mitigation Measures

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.12	1.70	1.43	0.00	0.00	0.00	2,042.44
Hearth							
Landscape	0.25	0.04	3.09	0.00	0.01	0.01	5.62
Consumer Products	0.00						
Architectural Coatings	2.87						
TOTALS (lbs/day, unmitigated)	3.24	1.74	4.52	0.00	0.01	0.01	2,048.06

Area Source Mitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.12	1.70	1.43	0.00	0.00	0.00	2,042.44
Hearth							
Landscape	0.25	0.04	3.09	0.00	0.01	0.01	5.62
Consumer Products	0.00						
Architectural Coatings	2.87						
TOTALS (lbs/day, mitigated)	3.24	1.74	4.52	0.00	0.01	0.01	2,048.06

Area Source Mitigation Measures Selected

Mitigation Description	Percent Reduction

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Office park	11.59	11.62	129.01	0.10	18.56	3.56	10,586.92
Warehouse	14.46	12.77	135.30	0.11	20.50	3.92	11,559.29
TOTALS (lbs/day, unmitigated)	26.05	24.39	264.31	0.21	39.06	7.48	22,146.21

4/19/2010 11:54:48 AM

Operational Mitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Office park	11.59	11.62	129.01	0.10	18.56	3.56	10,586.92
Warehouse	14.46	12.77	135.30	0.11	20.50	3.92	11,559.29
TOTALS (lbs/day, mitigated)	26.05	24.39	264.31	0.21	39.06	7.48	22,146.21

Operational Mitigation Options Selected

Residential Mitigation Measures

Nonresidential Mitigation Measures

Non-Residential Local-Serving Retail Mitigation

Percent Reduction in Trips is 0%

Inputs Selected:

The Presence of Local-Serving Retail checkbox was NOT selected.

Operational Settings:

Includes correction for passby trips

Includes the following double counting adjustment for internal trips:

Residential Trip % Reduction: 0.00 Nonresidential Trip % Reduction: 0.00

Analysis Year: 2012 Temperature (F): 85 Season: Summer

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Office park		11.42	1000 sq ft	134.50	1,535.99	10,788.97
Warehouse		4.96	1000 sq ft	356.00	1,765.76	11,918.54
					3,301.75	22,707.51

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	45.7	0.9	98.7	0.4
Light Truck < 3750 lbs	17.6	2.3	92.6	5.1
Light Truck 3751-5750 lbs	19.9	1.0	98.5	0.5
Med Truck 5751-8500 lbs	7.8	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.6	0.0	68.8	31.2
Lite-Heavy Truck 10,001-14,000 lbs	0.9	0.0	55.6	44.4
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.3	0.0	0.0	100.0
Other Bus	0.1	0.0	100.0	0.0
Urban Bus	0.0	0.0	0.0	0.0
Motorcycle	3.9	59.0	41.0	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.1	0.0	90.9	9.1

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Office park				48.0	24.0	28.0
Warehouse				2.0	1.0	97.0

Operational Changes to Defaults

Attachment B: Winter Emission Estimates

4/19/2010 11:55:23 AM

Urbemis 2007 Version 9.2.4

Combined Winter Emissions Reports (Pounds/Day)

File Name: C:\Documents and Settings\James Clark\Application Data\Urbemis\Version9a\Projects\napa34.urb924

Project Name: Napa 34 Commerical Center

Project Location: Napa County

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2010 TOTALS (lbs/day unmitigated)	8.39	52.97	31.37	0.01	112.64	3.24	115.87	23.53	2.98	26.50	5,080.69
2010 TOTALS (lbs/day mitigated)	8.39	52.97	31.37	0.01	112.64	3.24	115.87	23.53	2.98	26.50	5,080.69
2011 TOTALS (lbs/day unmitigated)	507.30	91.97	106.18	0.09	113.01	5.18	118.20	23.66	4.75	28.41	15,703.19
2011 TOTALS (lbs/day mitigated)	507.30	91.97	106.18	0.09	113.01	5.18	118.20	23.66	4.75	28.41	15,703.19

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	2.99	1.70	1.43	0.00	0.00	0.00	2,042.44
TOTALS (lbs/day, mitigated)	2.99	1.70	1.43	0.00	0.00	0.00	2,042.44
Percent Reduction	0.00	0.00	0.00	NaN	NaN	NaN	0.00

4/19/2010 11:55:24 AM

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	26.18	36.88	290.25	0.19	39.06	7.48	19,242.34
TOTALS (lbs/day, mitigated)	26.18	36.88	290.25	0.19	39.06	7.48	19,242.34
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	29.17	38.58	291.68	0.19	39.06	7.48	21,284.78
TOTALS (lbs/day, mitigated)	29.17	38.58	291.68	0.19	39.06	7.48	21,284.78
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 11/30/2010-12/27/2010 Active Days: 20	4.22	33.76	19.13	0.00	112.61	1.80	114.40	23.52	1.65	25.17	3,134.57
Fine Grading 11/30/2010-01/11/2011	4.22	33.76	19.13	0.00	112.61	1.80	114.40	23.52	1.65	25.17	3,134.57
Fine Grading Dust	0.00	0.00	0.00	0.00	112.60	0.00	112.60	23.52	0.00	23.52	0.00
Fine Grading Off Road Diesel	4.16	33.67	17.48	0.00	0.00	1.79	1.79	0.00	1.65	1.65	3,007.48
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.05	0.09	1.65	0.00	0.01	0.00	0.01	0.00	0.00	0.01	127.09

Time Slice 12/28/2010-12/31/2010 Active Days: 4	8.39	52.97	31.37	0.01	112.64	3.24	115.87	23.53	2.98	26.50	5,080.69
Asphalt 12/28/2010-01/11/2011	4.17	19.21	12.24	0.01	0.03	1.44	1.47	0.01	1.32	1.33	1,946.12
Paving Off-Gas	1.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	2.48	14.87	8.27	0.00	0.00	1.28	1.28	0.00	1.18	1.18	1,131.92
Paving On Road Diesel	0.26	4.19	1.33	0.01	0.02	0.15	0.17	0.01	0.14	0.15	610.86
Paving Worker Trips	0.09	0.15	2.64	0.00	0.01	0.01	0.02	0.00	0.00	0.01	203.35
Fine Grading 11/30/2010-01/11/2011	4.22	33.76	19.13	0.00	112.61	1.80	114.40	23.52	1.65	25.17	3,134.57
Fine Grading Dust	0.00	0.00	0.00	0.00	112.60	0.00	112.60	23.52	0.00	23.52	0.00
Fine Grading Off Road Diesel	4.16	33.67	17.48	0.00	0.00	1.79	1.79	0.00	1.65	1.65	3,007.48
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.05	0.09	1.65	0.00	0.01	0.00	0.01	0.00	0.00	0.01	127.09
Time Slice 1/3/2011-1/10/2011 Active Days: 6	7.96	49.72	30.17	0.01	112.64	3.06	115.70	23.53	2.82	26.34	5,080.89
Asphalt 12/28/2010-01/11/2011	4.00	18.03	11.82	0.01	0.03	1.37	1.41	0.01	1.26	1.27	1,946.24
Paving Off-Gas	1.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	2.34	14.17	8.17	0.00	0.00	1.24	1.24	0.00	1.14	1.14	1,131.92
Paving On Road Diesel	0.24	3.73	1.20	0.01	0.02	0.13	0.16	0.01	0.12	0.13	610.86
Paving Worker Trips	0.08	0.14	2.44	0.00	0.01	0.01	0.02	0.00	0.00	0.01	203.47
Fine Grading 11/30/2010-01/11/2011	3.96	31.69	18.35	0.00	112.61	1.69	114.29	23.52	1.55	25.07	3,134.64
Fine Grading Dust	0.00	0.00	0.00	0.00	112.60	0.00	112.60	23.52	0.00	23.52	0.00
Fine Grading Off Road Diesel	3.91	31.61	16.82	0.00	0.00	1.68	1.68	0.00	1.55	1.55	3,007.48
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.05	0.09	1.53	0.00	0.01	0.00	0.01	0.00	0.00	0.01	127.17

Time Slice 1/11/2011-1/11/2011 Active Days: 1	14.68	91.97	106.18	0.09	113.01	5.18	118.20	23.66	4.75	28.41	15,703.19
Asphalt 12/28/2010-01/11/2011	4.00	18.03	11.82	0.01	0.03	1.37	1.41	0.01	1.26	1.27	1,946.24
Paving Off-Gas	1.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	2.34	14.17	8.17	0.00	0.00	1.24	1.24	0.00	1.14	1.14	1,131.92
Paving On Road Diesel	0.24	3.73	1.20	0.01	0.02	0.13	0.16	0.01	0.12	0.13	610.86
Paving Worker Trips	0.08	0.14	2.44	0.00	0.01	0.01	0.02	0.00	0.00	0.01	203.47
Building 01/11/2011-08/22/2011	6.72	42.24	76.01	0.09	0.38	2.12	2.50	0.13	1.94	2.07	10,622.30
Building Off Road Diesel	3.39	15.67	10.85	0.00	0.00	1.14	1.14	0.00	1.05	1.05	1,621.20
Building Vendor Trips	1.79	23.94	18.09	0.05	0.18	0.88	1.06	0.06	0.80	0.86	5,083.18
Building Worker Trips	1.54	2.63	47.07	0.04	0.19	0.11	0.30	0.07	0.09	0.16	3,917.93
Fine Grading 11/30/2010-01/11/2011	3.96	31.69	18.35	0.00	112.61	1.69	114.29	23.52	1.55	25.07	3,134.64
Fine Grading Dust	0.00	0.00	0.00	0.00	112.60	0.00	112.60	23.52	0.00	23.52	0.00
Fine Grading Off Road Diesel	3.91	31.61	16.82	0.00	0.00	1.68	1.68	0.00	1.55	1.55	3,007.48
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.05	0.09	1.53	0.00	0.01	0.00	0.01	0.00	0.00	0.01	127.17
Time Slice 1/12/2011-8/5/2011 Active Days: 148	6.72	42.24	76.01	0.09	0.38	2.12	2.50	0.13	1.94	2.07	10,622.30
Building 01/11/2011-08/22/2011	6.72	42.24	76.01	0.09	0.38	2.12	2.50	0.13	1.94	2.07	10,622.30
Building Off Road Diesel	3.39	15.67	10.85	0.00	0.00	1.14	1.14	0.00	1.05	1.05	1,621.20
Building Vendor Trips	1.79	23.94	18.09	0.05	0.18	0.88	1.06	0.06	0.80	0.86	5,083.18
Building Worker Trips	1.54	2.63	47.07	0.04	0.19	0.11	0.30	0.07	0.09	0.16	3,917.93

Time Slice 8/8/2011-8/22/2011 Active Days: 11	507.30	42.64	83.14	0.09	0.41	2.14	2.54	0.14	1.95	2.09	11,216.35
Building 01/11/2011-08/22/2011	6.72	42.24	76.01	0.09	0.38	2.12	2.50	0.13	1.94	2.07	10,622.30
Building Off Road Diesel	3.39	15.67	10.85	0.00	0.00	1.14	1.14	0.00	1.05	1.05	1,621.20
Building Vendor Trips	1.79	23.94	18.09	0.05	0.18	0.88	1.06	0.06	0.80	0.86	5,083.18
Building Worker Trips	1.54	2.63	47.07	0.04	0.19	0.11	0.30	0.07	0.09	0.16	3,917.93
Coating 08/08/2011-09/05/2011	500.58	0.40	7.14	0.01	0.03	0.02	0.05	0.01	0.01	0.02	594.05
Architectural Coating	500.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.23	0.40	7.14	0.01	0.03	0.02	0.05	0.01	0.01	0.02	594.05
Time Slice 8/23/2011-9/5/2011 Active Days: 10	500.58	0.40	7.14	0.01	0.03	0.02	0.05	0.01	0.01	0.02	594.05
Coating 08/08/2011-09/05/2011	500.58	0.40	7.14	0.01	0.03	0.02	0.05	0.01	0.01	0.02	594.05
Architectural Coating	500.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.23	0.40	7.14	0.01	0.03	0.02	0.05	0.01	0.01	0.02	594.05

Phase Assumptions

Phase: Fine Grading 11/30/2010 - 1/11/2011 - Default Fine Site Grading Description

Total Acres Disturbed: 22.53

Maximum Daily Acreage Disturbed: 5.63

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

2 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

4/19/2010 11:55:24 AM

Phase: Paving 12/28/2010 - 1/11/2011 - Default Paving Description

Acres to be Paved: 5.63

Off-Road Equipment:

4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day

1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day

2 Paving Equipment (104 hp) operating at a 0.53 load factor for 6 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day

Phase: Building Construction 1/11/2011 - 8/22/2011 - Default Building Construction Description

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 6 hours per day

2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day

1 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

3 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Phase: Architectural Coating 8/8/2011 - 9/5/2011 - Default Architectural Coating Description

Rule: Residential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Residential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Winter Pounds Per Day, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

Time Slice 11/30/2010-12/27/2010 Active Days: 20	4.22	33.76	19.13	0.00	112.61	1.80	114.40	23.52	1.65	25.17	3,134.57
Fine Grading 11/30/2010-01/11/2011	4.22	33.76	19.13	0.00	112.61	1.80	114.40	23.52	1.65	25.17	3,134.57
Fine Grading Dust	0.00	0.00	0.00	0.00	112.60	0.00	112.60	23.52	0.00	23.52	0.00
Fine Grading Off Road Diesel	4.16	33.67	17.48	0.00	0.00	1.79	1.79	0.00	1.65	1.65	3,007.48
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.05	0.09	1.65	0.00	0.01	0.00	0.01	0.00	0.00	0.01	127.09
Time Slice 12/28/2010-12/31/2010 Active Days: 4	8.39	52.97	31.37	0.01	112.64	3.24	115.87	23.53	2.98	26.50	5,080.69
Asphalt 12/28/2010-01/11/2011	4.17	19.21	12.24	0.01	0.03	1.44	1.47	0.01	1.32	1.33	1,946.12
Paving Off-Gas	1.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	2.48	14.87	8.27	0.00	0.00	1.28	1.28	0.00	1.18	1.18	1,131.92
Paving On Road Diesel	0.26	4.19	1.33	0.01	0.02	0.15	0.17	0.01	0.14	0.15	610.86
Paving Worker Trips	0.09	0.15	2.64	0.00	0.01	0.01	0.02	0.00	0.00	0.01	203.35
Fine Grading 11/30/2010-01/11/2011	4.22	33.76	19.13	0.00	112.61	1.80	114.40	23.52	1.65	25.17	3,134.57
Fine Grading Dust	0.00	0.00	0.00	0.00	112.60	0.00	112.60	23.52	0.00	23.52	0.00
Fine Grading Off Road Diesel	4.16	33.67	17.48	0.00	0.00	1.79	1.79	0.00	1.65	1.65	3,007.48
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.05	0.09	1.65	0.00	0.01	0.00	0.01	0.00	0.00	0.01	127.09

Time Slice 1/3/2011-1/10/2011 Active Days: 6	7.96	49.72	30.17	0.01	112.64	3.06	115.70	23.53	2.82	26.34	5,080.89
Asphalt 12/28/2010-01/11/2011	4.00	18.03	11.82	0.01	0.03	1.37	1.41	0.01	1.26	1.27	1,946.24
Paving Off-Gas	1.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	2.34	14.17	8.17	0.00	0.00	1.24	1.24	0.00	1.14	1.14	1,131.92
Paving On Road Diesel	0.24	3.73	1.20	0.01	0.02	0.13	0.16	0.01	0.12	0.13	610.86
Paving Worker Trips	0.08	0.14	2.44	0.00	0.01	0.01	0.02	0.00	0.00	0.01	203.47
Fine Grading 11/30/2010-01/11/2011	3.96	31.69	18.35	0.00	112.61	1.69	114.29	23.52	1.55	25.07	3,134.64
Fine Grading Dust	0.00	0.00	0.00	0.00	112.60	0.00	112.60	23.52	0.00	23.52	0.00
Fine Grading Off Road Diesel	3.91	31.61	16.82	0.00	0.00	1.68	1.68	0.00	1.55	1.55	3,007.48
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.05	0.09	1.53	0.00	0.01	0.00	0.01	0.00	0.00	0.01	127.17

Time Slice 1/11/2011-1/11/2011 Active Days: 1	14.68	91.97	106.18	0.09	113.01	5.18	118.20	23.66	4.75	28.41	15,703.19
Asphalt 12/28/2010-01/11/2011	4.00	18.03	11.82	0.01	0.03	1.37	1.41	0.01	1.26	1.27	1,946.24
Paving Off-Gas	1.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	2.34	14.17	8.17	0.00	0.00	1.24	1.24	0.00	1.14	1.14	1,131.92
Paving On Road Diesel	0.24	3.73	1.20	0.01	0.02	0.13	0.16	0.01	0.12	0.13	610.86
Paving Worker Trips	0.08	0.14	2.44	0.00	0.01	0.01	0.02	0.00	0.00	0.01	203.47
Building 01/11/2011-08/22/2011	6.72	42.24	76.01	0.09	0.38	2.12	2.50	0.13	1.94	2.07	10,622.30
Building Off Road Diesel	3.39	15.67	10.85	0.00	0.00	1.14	1.14	0.00	1.05	1.05	1,621.20
Building Vendor Trips	1.79	23.94	18.09	0.05	0.18	0.88	1.06	0.06	0.80	0.86	5,083.18
Building Worker Trips	1.54	2.63	47.07	0.04	0.19	0.11	0.30	0.07	0.09	0.16	3,917.93
Fine Grading 11/30/2010-01/11/2011	3.96	31.69	18.35	0.00	112.61	1.69	114.29	23.52	1.55	25.07	3,134.64
Fine Grading Dust	0.00	0.00	0.00	0.00	112.60	0.00	112.60	23.52	0.00	23.52	0.00
Fine Grading Off Road Diesel	3.91	31.61	16.82	0.00	0.00	1.68	1.68	0.00	1.55	1.55	3,007.48
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.05	0.09	1.53	0.00	0.01	0.00	0.01	0.00	0.00	0.01	127.17
Time Slice 1/12/2011-8/5/2011 Active Days: 148	6.72	42.24	76.01	0.09	0.38	2.12	2.50	0.13	1.94	2.07	10,622.30
Building 01/11/2011-08/22/2011	6.72	42.24	76.01	0.09	0.38	2.12	2.50	0.13	1.94	2.07	10,622.30
Building Off Road Diesel	3.39	15.67	10.85	0.00	0.00	1.14	1.14	0.00	1.05	1.05	1,621.20
Building Vendor Trips	1.79	23.94	18.09	0.05	0.18	0.88	1.06	0.06	0.80	0.86	5,083.18
Building Worker Trips	1.54	2.63	47.07	0.04	0.19	0.11	0.30	0.07	0.09	0.16	3,917.93

Time Slice 8/8/2011-8/22/2011 Active Days: 11	**507.30**	42.64	83.14	0.09	0.41	2.14	2.54	0.14	1.95	2.09	11,216.35
Building 01/11/2011-08/22/2011	6.72	42.24	76.01	0.09	0.38	2.12	2.50	0.13	1.94	2.07	10,622.30
Building Off Road Diesel	3.39	15.67	10.85	0.00	0.00	1.14	1.14	0.00	1.05	1.05	1,621.20
Building Vendor Trips	1.79	23.94	18.09	0.05	0.18	0.88	1.06	0.06	0.80	0.86	5,083.18
Building Worker Trips	1.54	2.63	47.07	0.04	0.19	0.11	0.30	0.07	0.09	0.16	3,917.93
Coating 08/08/2011-09/05/2011	500.58	0.40	7.14	0.01	0.03	0.02	0.05	0.01	0.01	0.02	594.05
Architectural Coating	500.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.23	0.40	7.14	0.01	0.03	0.02	0.05	0.01	0.01	0.02	594.05
Time Slice 8/23/2011-9/5/2011 Active Days: 10	500.58	0.40	7.14	0.01	0.03	0.02	0.05	0.01	0.01	0.02	594.05
Coating 08/08/2011-09/05/2011	500.58	0.40	7.14	0.01	0.03	0.02	0.05	0.01	0.01	0.02	594.05
Architectural Coating	500.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.23	0.40	7.14	0.01	0.03	0.02	0.05	0.01	0.01	0.02	594.05

Construction Related Mitigation Measures

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.12	1.70	1.43	0.00	0.00	0.00	2,042.44
Hearth							
Landscaping - No Winter Emissions							
Consumer Products	0.00						
Architectural Coatings	2.87						
TOTALS (lbs/day, unmitigated)	2.99	1.70	1.43	0.00	0.00	0.00	2,042.44

Area Source Mitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Winter Pounds Per Day, Mitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.12	1.70	1.43	0.00	0.00	0.00	2,042.44
Hearth							
Landscaping - No Winter Emissions							
Consumer Products	0.00						
Architectural Coatings	2.87						
TOTALS (lbs/day, mitigated)	2.99	1.70	1.43	0.00	0.00	0.00	2,042.44

Area Source Mitigation Measures Selected

Mitigation Description	Percent Reduction

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Office park	12.62	17.59	139.63	0.09	18.56	3.56	9,207.21
Warehouse	13.56	19.29	150.62	0.10	20.50	3.92	10,035.13
TOTALS (lbs/day, unmitigated)	26.18	36.88	290.25	0.19	39.06	7.48	19,242.34

4/19/2010 11:55:24 AM

Operational Mitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Winter Pounds Per Day, Mitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Office park	12.62	17.59	139.63	0.09	18.56	3.56	9,207.21
Warehouse	13.56	19.29	150.62	0.10	20.50	3.92	10,035.13
TOTALS (lbs/day, mitigated)	26.18	36.88	290.25	0.19	39.06	7.48	19,242.34

Operational Mitigation Options Selected

Residential Mitigation Measures

Nonresidential Mitigation Measures

Non-Residential Local-Serving Retail Mitigation

Percent Reduction in Trips is 0%

Inputs Selected:

The Presence of Local-Serving Retail checkbox was NOT selected.

Operational Settings:

Includes correction for passby trips

Includes the following double counting adjustment for internal trips:

Residential Trip % Reduction: 0.00 Nonresidential Trip % Reduction: 0.00

Analysis Year: 2012 Temperature (F): 40 Season: Winter

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Office park		11.42	1000 sq ft	134.50	1,535.99	10,788.97
Warehouse		4.96	1000 sq ft	356.00	1,765.76	11,918.54
					3,301.75	22,707.51

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	45.7	0.9	98.7	0.4
Light Truck < 3750 lbs	17.6	2.3	92.6	5.1
Light Truck 3751-5750 lbs	19.9	1.0	98.5	0.5
Med Truck 5751-8500 lbs	7.8	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.6	0.0	68.8	31.2
Lite-Heavy Truck 10,001-14,000 lbs	0.9	0.0	55.6	44.4
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.3	0.0	0.0	100.0
Other Bus	0.1	0.0	100.0	0.0
Urban Bus	0.0	0.0	0.0	0.0
Motorcycle	3.9	59.0	41.0	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.1	0.0	90.9	9.1

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Office park				48.0	24.0	28.0
Warehouse				2.0	1.0	97.0

Operational Changes to Defaults

SWAPE Technical Consultation, Data Analysis and Litigation Support for the Environment

SOIL WATER AIR PROTECTION ENTERPRISE
525 Broadway, Suite 203
Santa Monica, California 90401
Tel: (310) 907-6165
Fax: (310) 393-3898
Email: jclark@swape.com

James J. J. Clark, Ph.D.

Toxicology/Exposure Assessment Modeling

Principal Toxicologist

Risk Assessment/Analysis/Dispersion Modeling

Education:

Ph.D., Environmental Health Science, University of California, 1995

M.S., Environmental Health Science, University of California, 1993

B.S., Biophysical and Biochemical Sciences, University of Houston, 1987

Professional Experience:

Dr. Clark is the principal toxicologist, principal air modeler, lead scientist for SWAPE's benzene and fuel oxygenates research program, emerging contaminant research program (pharmaceuticals, personal care products, and industrial solvents); and managing partner at SWAPE. He has 20 years of experience in researching the effects of environmental contaminants on human health including environmental fate and transport modeling (SCREEN3, AEROMOD, ISCST3, Johnson-Ettinger Vapor Intrusion Modeling); exposure assessment modeling (partitioning of contaminants in the environment as well as PBPK modeling); conducting and managing human health risk assessments for regulatory compliance and risk-based clean-up levels; and toxicological and medical literature research.

Significant projects performed by Dr. Clark include the following:

LITIGATION SUPPORT

Case: Raymond Saltonstall V. Fuller O'Brien, KILZ, and Zinsser, et al. United States District Court Central District Of California

Client: Rose, Klein, Marias, LLP, Long Beach, California

Dr. Clark performed a toxicological assessment of an individual occupationally exposed to benzene who later developed a leukogenic disease. A review of the individual's medical and occupational history was performed to prepare a quantitative exposure assessment. The exposure assessment was evaluated against the known outcomes in

published literature to exposure to refined petroleum hydrocarbons. The results of the assessment and literature have been provided in a declaration to the court.

Case Result: Settlement in favor of plaintiff.

Case: Richard Boyer and Elizabeth Boyer, husband and wife, V. DESCO Corporation, et al. Circuit Court of Brooke County, West Virginia. Civil Action Number 04-C-7G.

Client: Frankovitch, Anetakis, Colantonio & Simon, Morgantown, West Virginia.

Dr. Clark performed a toxicological assessment of a family exposed to chlorinated solvents released from the defendant's facility into local drinking water supplies. A review of the individual's medical and occupational history was performed to prepare a qualitative exposure assessment. The exposure assessment was evaluated against the known outcomes in published literature to exposure to chlorinated solvents. The results of the assessment and literature have been provided in a declaration to the court.

Case Result: : Settlement in favor of plaintiff.

Case: JoAnne R. Cook, V. DESCO Corporation, et al. Circuit Court of Brooke County, West Virginia. Civil Action Number 04-C-9R

Client: Frankovitch, Anetakis, Colantonio & Simon, Morgantown, West Virginia.

Dr. Clark performed a toxicological assessment of an individual exposed to chlorinated solvents released from the defendant's facility into local drinking water supplies. A review of the individual's medical and occupational history was performed to prepare a qualitative exposure assessment. The exposure assessment was evaluated against the known outcomes in published literature to exposure to chlorinated solvents. The results of the assessment and literature have been provided in a declaration to the court.

Case Result: : Settlement in favor of plaintiff.

Case: Patrick Allen And Susan Allen, husband and wife, and Andrew Allen, a minor, V. DESCO Corporation, et al. Circuit Court of Brooke County, West Virginia. Civil Action Number 04-C-W

Client: Frankovitch, Anetakis, Colantonio & Simon, Morgantown, West Virginia.

Dr. Clark performed a toxicological assessment of a family exposed to chlorinated solvents released from the defendant's facility into local drinking water supplies. A review of the individual's medical and occupational history was performed to prepare a qualitative exposure assessment. The exposure assessment was evaluated

against the known outcomes in published literature to exposure to chlorinated solvents. The results of the assessment and literature have been provided in a declaration to the court.

Case Result: : Settlement in favor of plaintiff.

Case: Michael Fahey, Susan Fahey V. Atlantic Richfield Company, et al. United States District Court Central District Of California Civil Action Number CV-06 7109 JCL.

Client: Rose, Klein, Marias, LLP, Long Beach, California

Dr. Clark performed a toxicological assessment of an individual occupationally exposed to refined petroleum hydrocarbons who later developed a leukogenic disease. A review of the individual's medical and occupational history was performed to prepare a qualitative exposure assessment. The exposure assessment was evaluated against the known outcomes in published literature to exposure to refined petroleum hydrocarbons. The results of the assessment and literature have been provided in a declaration to the court.

Case Result: Settlement in favor of plaintiff.

Case: Tanya Drummond V. E.I. Dupont De Nemours and Company, Meadowbrook Corporation, Mattheissen & Hegler Zinc Company Inc, Nuzum Trucking Company, T.L. Diamond & Company, Inc., and Joseph Paushel, Circuit Court of Harrison County, West Virginia. Civil Action Number 04-C-296-2.

Client: Cochran, Cherry, Givens, Smith, Lane & Taylor, P.C., Dothan, Alabama

Dr. Clark performed a comprehensive exposure assessment of a plaintiff exposed to toxic metals from a former zinc smelting facility. The site has undergone a CERCLA mandated removal action/remediation for the presence of the toxic metals. Intensive modeling results (from physical and numerical models) were used to determine a daily dose of metals in the plaintiff over a life time of exposure along with a causal analysis to determine the contribution of the toxic metals to the renal carcinomas the plaintiff died from.

Case Result: Settlement in favor of plaintiff.

Case: City of Stockton v. BNSF Railway Co., et al. Eastern District of California, Case No. 2:05-CV-02087

Dr. Clark offered opinions regarding the potential health risks from exposure to chemicals present in and emanating from the soil and into the air at a site formerly operated by the defendant using the regulatory guidance framework from USEPA and DTSC. The evaluation was designed to establish cleanup goals based upon the current and future land uses of the Site. A second objective was to evaluate whether current conditions at the Site put patrons and staff

of the Children's Museum at an elevated potential health risk from exposure to chemicals present in and emanating from the soil and into the air at the Site.

Case Result: : Settlement in favor of plaintiff.

Case: Constance Acevedo, et al., V. California Spray-Chemical Company, et al., Superior Court Of The State Of California, County Of Santa Cruz. Case No. CV 146344

Dr. Clark performed a comprehensive exposure assessment of community members exposed to toxic metals from a former lead arsenate manufacturing facility. The former manufacturing site had undergone a DTSC mandated removal action/remediation for the presence of the toxic metals at the site. Opinions were presented regarding the elevated levels of arsenic and lead (in attic dust and soils) found throughout the community and the potential for harm to the plaintiffs in question.

Case Result: Settlement in favor of defendant.

Case: Lori Lynn Moss and Rand Moss, et al. V. Venoco, Inc. et al. Superior Court of the State of California, County of Los Angeles, Central Civil West. Case Number BC 297083

Client: Baron & Budd, PC. Dallas, TX.

Dr. Clark performed a comprehensive exposure assessment of plaintiffs (former students at a school adjacent to the plant) to dioxin-like compounds from a large urban electrical utility generator and from multiple oil and gas production facilities adjacent to an active school. Modeling of emissions has confirmed that emissions from the facilities have impacted the school, resulting in significant exposure to carcinogens and neurotoxins. Intensive modeling results (from physical and numerical models) were used to determine a daily dose of contaminants from multiple sites over decades of exposure.

Case Result: Under Appeal.

SELECTED AIR MODELING RESEARCH/PROJECTS

Client – Confidential

Dr. Clark is performing a comprehensive evaluation of criteria pollutants, air toxins, and particulate matter emissions from a coke production facility to determine the impacts on the surrounding communities. The results of the dispersion model will be used to estimate acute and chronic exposure concentrations to multiple contaminants and will be incorporated into a comprehensive risk evaluation.

Client – Confidential

Dr. Clark is performing a comprehensive evaluation of criteria pollutants, air toxins, and particulate matter emissions from a carbon black production facility to determine the impacts on the surrounding communities. The results of the dispersion model will be used to estimate acute and chronic exposure concentrations to multiple contaminants and will be incorporated into a comprehensive risk evaluation.

Client – Confidential

Dr. Clark is performing a comprehensive evaluation of air toxins and particulate matter emissions from a railroad tie manufacturing facility to determine the impacts on the surrounding communities. The results of the dispersion model have been used to estimate acute and chronic exposure concentrations to multiple contaminants and have been incorporated into a comprehensive risk evaluation.

Client – Los Angeles Alliance for a New Economy (LAANE), Los Angeles, California

Dr. Clark is advising the LAANE on air quality issues related to current flight operations at the Los Angeles International Airport (LAX) operated by the Los Angeles World Airport (LAWA) Authority. He is working with the LAANE and LAX staff to develop a comprehensive strategy for meeting local community concerns over emissions from flight operations and to engage federal agencies on the issue of local impacts of community airports.

Client – City of Santa Monica, Santa Monica, California

Dr. Clark is advising the City of Santa Monica on air quality issues related to current flight operations at the facility. He is working with the City staff to develop a comprehensive strategy for meeting local community concerns over emissions from flight operations and to engage federal agencies on the issue of local impacts of community airports.

Client: Omnitrans, San Bernardino, California

Dr. Clark managed a public health survey of three communities near transit fueling facilities in San Bernardino and Montclair California in compliance with California Senate Bill 1927. The survey included an epidemiological survey of the effected communities, emission surveys of local businesses, dispersion modeling to determine potential emission concentrations within the communities, and a comprehensive risk assessment of each community. The results of the study were presented to the Governor as mandated by Senate Bill 1927.

Client: Confidential, San Francisco, California

Summarized cancer types associated with exposure to metals and smoking. Researched the specific types of cancers associated with exposure to metals and smoking. Provided causation analysis of the association between cancer types and exposure for use by non-public health professionals.

Client: Confidential, Minneapolis, Minnesota

Prepared human health risk assessment of workers exposed to VOCs from neighboring petroleum storage/transport facility. Reviewed the systems in place for distribution of petroleum hydrocarbons to identify chemicals of concern (COCs), prepared comprehensive toxicological summaries of COCs, and quantified potential risks from carcinogens and non-carcinogens to receptors at or adjacent to site. This evaluation was used in the support of litigation.

Client – United Kingdom Environmental Agency

Dr. Clark is part of team that performed comprehensive evaluation of soil vapor intrusion of VOCs from former landfill adjacent residences for the United Kingdom's Environment Agency. The evaluation included collection of liquid and soil vapor samples at site, modeling of vapor migration using the Johnson Ettinger Vapor Intrusion model, and calculation of site-specific health based vapor thresholds for chlorinated solvents, aromatic hydrocarbons, and semi-volatile organic compounds. The evaluation also included a detailed evaluation of the use, chemical characteristics, fate and transport, and toxicology of chemicals of concern (COC). The results of the evaluation have been used as a briefing tool for public health professionals.

EMERGING/PERSISTENT CONTAMINANT RESEARCH/PROJECTS

Client: Ameren Services, St. Louis, Missouri

Managed the preparation of a comprehensive human health risk assessment of workers and residents at or near an NPL site in Missouri. The former operations at the Property included the servicing and repair of electrical transformers, which resulted in soils and groundwater beneath the Property and adjacent land becoming impacted with PCB and chlorinated solvent compounds. The results were submitted to U.S. EPA for evaluation and will be used in the final ROD.

Client: City of Santa Clarita, Santa Clarita, California

Dr. Clark is managing the oversight of the characterization, remediation and development activities of a former 1,000 acre munitions manufacturing facility for the City of Santa Clarita. The site is impacted with a number of contaminants including perchlorate, unexploded ordinance, and volatile organic compounds (VOCs). The site is currently under a number of regulatory consent orders, including an Immanent and Substantial Endangerment Order. Dr. Clark is assisting the impacted municipality with the development of remediation strategies, interaction with the responsible parties and stakeholders, as well as interfacing with the regulatory agency responsible for oversight of the site cleanup.

Client: Confidential, Los Angeles, California

Prepared comprehensive evaluation of perchlorate in environment. As part SWAPE's perchlorate research program, Dr. Clark evaluated the production, use, chemical characteristics, fate and transport, toxicology, and remediation of perchlorate. Perchlorates form the basis of solid rocket fuels and have recently been detected in

water supplies in the United States. The results of this research were presented to the USEPA, National GroundWater, and ultimately published in a recent book entitled *Perchlorate in the Environment.*

Client – Confidential, Los Angeles, California

Dr. Clark is performing a comprehensive review of the potential for pharmaceuticals and their by-products to impact groundwater and surface water supplies. This evaluation will include a review if available data on the history of pharmaceutical production in the United States; the chemical characteristics of various pharmaceuticals; environmental fate and transport; uptake by xenobiotics; the potential effects of pharmaceuticals on water treatment systems; and the potential threat to public health. The results of the evaluation may be used as a briefing tool for non-public health professionals.

PUBLIC HEALTH/TOXICOLOGY

Client: Brayton Purcell, Novato, California

Dr. Clark performed a toxicological assessment of residents exposed to methyl-tertiary butyl ether (MTBE) from leaking underground storage tanks (LUSTs) adjacent to the subject property. The symptomology of residents and guests of the subject property were evaluated against the known outcomes in published literature to exposure to MTBE. The study found that residents had been exposed to MTBE in their drinking water; that concentrations of MTBE detected at the site were above regulatory guidelines; and, that the symptoms and outcomes expressed by residents and guests were consistent with symptoms and outcomes documented in published literature.

Client: Confidential, San Francisco, California

Identified and analyzed fifty years of epidemiological literature on workplace exposures to heavy metals. This research resulted in a summary of the types of cancer and non-cancer diseases associated with occupational exposure to chromium as well as the mortality and morbidity rates.

Client: Confidential, San Francisco, California

Summarized major public health research in United States. Identified major public health research efforts within United States over last twenty years. Results were used as a briefing tool for non-public health professionals.

Client: Confidential, San Francisco, California

Quantified the potential multi-pathway dose received by humans from a pesticide applied indoors. Part of team that developed exposure model and evaluated exposure concentrations in a comprehensive report on the plausible range of doses received by a specific person. This evaluation was used in the support of litigation.

Client: Covanta Energy, Westwood, California

Evaluated health risk from metals in biosolids applied as soil amendment on agricultural lands. The biosolids were created at a forest waste cogeneration facility using 96% whole tree wood chips and 4 percent green waste. Mass loading calculations were used to estimate Cr(VI) concentrations in agricultural soils based on a maximum loading rate of 40 tons of biomass per acre of agricultural soil. The results of the study were used by the Regulatory agency to determine that the application of biosolids did not constitute a health risk to workers applying the biosolids or to residences near the agricultural lands.

Client – United Kingdom Environmental Agency

Oversaw a comprehensive toxicological evaluation of methyl-*tertiary* butyl ether (M*t*BE) for the United Kingdom's Environment Agency. The evaluation included available data on the production, use, chemical characteristics, fate and transport, toxicology, and remediation of M*t*BE. The results of the evaluation have been used as a briefing tool for public health professionals.

Client – Confidential, Los Angeles, California

Prepared comprehensive evaluation of *tertiary* butyl alcohol (TBA) in municipal drinking water system. TBA is the primary breakdown product of M*t*BE, and is suspected to be the primary cause of M*t*BE toxicity. This evaluation will include available information on the production, use, chemical characteristics, fate and transport in the environment, absorption, distribution, routes of detoxification, metabolites, carcinogenic potential, and remediation of TBA. The results of the evaluation were used as a briefing tool for non-public health professionals.

Client – Confidential, Los Angeles, California

Prepared comprehensive evaluation of methyl *tertiary* butyl ether (MTBE) in municipal drinking water system. MTBE is a chemical added to gasoline to increase the octane rating and to meet Federally mandated emission criteria. The evaluation included available data on the production, use, chemical characteristics, fate and transport, toxicology, and remediation of MTBE. The results of the evaluation have been were used as a briefing tool for non-public health professionals.

Client – Ministry of Environment, Lands & Parks, British Columbia

Dr. Clark was part of a team at SWAPE selected to develop water quality guidelines for methyl tertiary-butyl ether (MTBE) to protect water uses in British Columbia (BC). The water uses to be considered includes freshwater and marine life, wildlife, industrial, and agricultural (e.g., irrigation and livestock watering) water uses. Guidelines from other jurisdictions for the protection of drinking water, recreation and aesthetics were to be identified.

Client: Confidential, Los Angeles, California

Prepared physiologically based pharmacokinetic (PBPK) assessment of lead risk of receptors at middle school built over former industrial facility. This evaluation is being used to determine cleanup goals and will be basis for regulatory closure of site.

Client: Kaiser Venture Incorporated, Fontana, California

Prepared PBPK assessment of lead risk of receptors at a 1,100-acre former steel mill. This evaluation was used as the basis for granting closure of the site by lead regulatory agency.

RISK ASSESSMENTS/REMEDIAL INVESTIGATIONS

Client: Confidential, Atlanta, Georgia

Researched potential exposure and health risks to community members potentially exposed to creosote, polycyclic aromatic hydrocarbons, pentachlorophenol, and dioxin compounds used at a former wood treatment facility. Prepared a comprehensive toxicological summary of the chemicals of concern, including the chemical characteristics, absorption, distribution, and carcinogenic potential. Prepared risk characterization of the carcinogenic and non-carcinogenic chemicals based on the exposure assessment to quantify the potential risk to members of the surrounding community. This evaluation was used to help settle class-action tort.

Client: Confidential, Escondido, California

Prepared comprehensive Preliminary Endangerment Assessment (PEA) of dense non-aqueous liquid phase hydrocarbon (chlorinated solvents) contamination at a former printed circuit board manufacturing facility. This evaluation was used for litigation support and may be used as the basis for reaching closure of the site with the lead regulatory agency.

Client: Confidential, San Francisco, California

Summarized epidemiological evidence for connective tissue and autoimmune diseases for product liability litigation. Identified epidemiological research efforts on the health effects of medical prostheses. This research was used in a meta-analysis of the health effects and as a briefing tool for non-public health professionals.

Client: Confidential, Bogotá, Columbia

Prepared comprehensive evaluation of the potential health risks associated with the redevelopment of a 13.7 hectares plastic manufacturing facility in Bogotá, Colombia The risk assessment was used as the basis for the remedial goals and closure of the site.

Client: Confidential, Los Angeles, California

Prepared comprehensive human health risk assessment of students, staff, and residents potentially exposed to heavy metals (principally cadmium) and VOCs from soil and soil vapor at 12-acre former crude oilfield and municipal landfill. The site is currently used as a middle school housing approximately 3,000 children. The evaluation determined that the site was safe for the current and future uses and was used as the basis for regulatory closure of site.

Client: Confidential, Los Angeles, California

Managed remedial investigation (RI) of heavy metals and volatile organic chemicals (VOCs) for a 15-acre former manufacturing facility. The RI investigation of the site included over 800 different sampling locations and the collection of soil, soil gas, and groundwater samples. The site is currently used as a year round school housing approximately 3,000 children. The Remedial Investigation was performed in a manner that did not interrupt school activities and met the time restrictions placed on the project by the overseeing regulatory agency. The RI Report identified the off-site source of metals that impacted groundwater beneath the site and the sources of VOCs in soil gas and groundwater. The RI included a numerical model of vapor intrusion into the buildings at the site from the vadose zone to determine exposure concentrations and an air dispersion model of VOCs from the proposed soil vapor treatment system. The Feasibility Study for the Site is currently being drafted and may be used as the basis for granting closure of the site by DTSC.

Client: Confidential, Los Angeles, California

Prepared comprehensive human health risk assessment of students, staff, and residents potentially exposed to heavy metals (principally lead), VOCs, SVOCs, and PCBs from soil, soil vapor, and groundwater at 15-acre former manufacturing facility. The site is currently used as a year round school housing approximately 3,000 children. The evaluation determined that the site was safe for the current and future uses and will be basis for regulatory closure of site.

Client: Confidential, Los Angeles, California

Prepared comprehensive evaluation of VOC vapor intrusion into classrooms of middle school that was former 15-acre industrial facility. Using the Johnson-Ettinger Vapor Intrusion model, the evaluation determined acceptable soil gas concentrations at the site that did not pose health threat to students, staff, and residents. This evaluation is being used to determine cleanup goals and will be basis for regulatory closure of site.

Client –Dominguez Energy, Carson, California

Prepared comprehensive evaluation of the potential health risks associated with the redevelopment of 6-acre portion of a 500-acre oil and natural gas production facility in Carson, California. The risk assessment was used as the basis for closure of the site.

Kaiser Ventures Incorporated, Fontana, California

Prepared health risk assessment of semi-volatile organic chemicals and metals for a fifty-year old wastewater treatment facility used at a 1,100-acre former steel mill. This evaluation was used as the basis for granting closure of the site by lead regulatory agency.

ANR Freight - Los Angeles, California

Prepared a comprehensive Preliminary Endangerment Assessment (PEA) of petroleum hydrocarbon and metal contamination of a former freight depot. This evaluation was as the basis for reaching closure of the site with lead regulatory agency.

Kaiser Ventures Incorporated, Fontana, California

Prepared comprehensive health risk assessment of semi-volatile organic chemicals and metals for 23-acre parcel of a 1,100-acre former steel mill. The health risk assessment was used to determine clean up goals and as the basis for granting closure of the site by lead regulatory agency. Air dispersion modeling using ISCST3 was performed to determine downwind exposure point concentrations at sensitive receptors within a 1 kilometer radius of the site. The results of the health risk assessment were presented at a public meeting sponsored by the Department of Toxic Substances Control (DTSC) in the community potentially affected by the site.

Unocal Corporation - Los Angeles, California

Prepared comprehensive assessment of petroleum hydrocarbons and metals for a former petroleum service station located next to sensitive population center (elementary school). The assessment used a probabilistic approach to estimate risks to the community and was used as the basis for granting closure of the site by lead regulatory agency.

Client: Confidential, Los Angeles, California

Managed oversight of remedial investigation most contaminated heavy metal site in California. Lead concentrations in soil excess of 68,000,000 parts per billion (ppb) have been measured at the site. This State Superfund Site was a former hard chrome plating operation that operated for approximately 40-years. In its oversight role, SWAPE is working with the overseeing regulatory agency to investigate the source, magnitude, extent and fate of contamination, and develop a remedy for the site.

Client: Confidential, San Francisco, California

Coordinator of regional monitoring program to determine background concentrations of metals in air. Acted as liaison with SCAQMD and CARB to perform co-location sampling and comparison of accepted regulatory method with ASTM methodology.

Client: Confidential, San Francisco, California

Analyzed historical air monitoring data for South Coast Air Basin in Southern California and potential health risks related to ambient concentrations of carcinogenic metals and volatile organic compounds. Identified and reviewed the available literature and calculated risks from toxins in South Coast Air Basin.

IT Corporation, North Carolina

Prepared comprehensive evaluation of potential exposure of workers to air-borne VOCs at hazardous waste storage facility under SUPERFUND cleanup decree. Assessment used in developing health based clean-up levels.

Professional Associations

American Public Health Association (APHA)

Association for Environmental Health and Sciences (AEHS)

California Redevelopment Association (CRA)

International Society of Environmental Forensics (ISEF)

Society of Environmental Toxicology and Chemistry (SETAC)

Publications and Presentations:

Books and Book Chapters

Sullivan, P., **J.J. J. Clark,** F.J. Agardy, and P.E. Rosenfeld. (2007). *Synthetic Toxins In The Food, Water and Air of American Cities.* Elsevier, Inc. Burlington, MA.

Sullivan, P. and **J.J. J. Clark**. 2006. *Choosing Safer Foods, A Guide To Minimizing Synthetic Chemicals In Your Diet.* Elsevier, Inc. Burlington, MA.

Sullivan, P., Agardy, F.J., and **J.J.J. Clark**. 2005. *The Environmental Science of Drinking Water.* Elsevier, Inc. Burlington, MA.

Sullivan, P.J., Agardy, F.J., **Clark, J.J.J.** 2002. *America's Threatened Drinking Water: Hazards and Solutions.* Trafford Publishing, Victoria B.C.

Clark, J.J.J. 2001. "TBA: Chemical Properties, Production & Use, Fate and Transport, Toxicology, Detection in Groundwater, and Regulatory Standards" in *Oxygenates in the Environment.* Art Diaz, Ed.. Oxford University Press: New York.

Clark, J.J.J. 2000. "Toxicology of Perchlorate" in *Perchlorate in the Environment.* Edward Urbansky, Ed. Kluwer/Plenum: New York.

Clark, J.J.J. 1995. Probabilistic Forecasting of Volatile Organic Compound Concentrations At The Soil Surface From Contaminated Groundwater. UMI.

Baker, J.; **Clark, J.J.J.**; Stanford, J.T. 1994. Ex Situ Remediation of Diesel Contaminated Railroad Sand by Soil Washing. Principles and Practices for Diesel Contaminated Soils, Volume III. P.T. Kostecki, E.J. Calabrese, and C.P.L. Barkan, eds. Amherst Scientific Publishers, Amherst, MA. pp 89-96.

Journal and Proceeding Articles

Wu, C., Tam, L., **Clark, J.**, and Rosenfeld, P. (2009). Dioxin and Furan Blood Lipid Concentrations In Populations Living Near Four Wood treatment Facilities In The United States. *In Air Pollution XVII*, Edited by C.A. Brebbia and V. Popov. Pp 319-327.

Tam L. K.., Wu C. D., **Clark J. J.** and Rosenfeld, P.E. (2008) A Statistical Analysis Of Attic Dust And Blood Lipid Concentrations Of Tetrachloro-p-Dibenzodioxin (TCDD) Toxicity Equialency Quotients (TEQ) In Two Populations Near Wood Treatment Facilities. Organohalogen Compounds, Volume 70 (2008) page 002254.

Tam L. K.., Wu C. D., **Clark J. J.** and Rosenfeld, P.E. (2008) Methods For Collect Samples For Assessing Dioxins And Other Environmental Contaminants In Attic Dust: A Review. Organohalogen Compounds, Volume 70 (2008) page 000527

Hensley A.R., Scott, A., Rosenfeld P.E., **Clark, J.J.J.** (2007). "Attic Dust And Human Blood Samples Collected Near A Former Wood Treatment Facility." *Environmental Research.* 105:194-199.

Rosenfeld, P.E., **Clark, J. J.,** Hensley, A.R., and Suffet, I.H. 2007. "The Use Of An Odor Wheel Classification For The Evaluation of Human Health Risk Criteria For Compost Facilities" Water Science & Technology. 55(5): 345-357.

Hensley A.R., Scott, A., Rosenfeld P.E., **Clark, J.J.J.** 2006. "Dioxin Containing Attic Dust And Human Blood Samples Collected Near A Former Wood Treatment Facility." The 26th International Symposium on Halogenated Persistent Organic Pollutants – DIOXIN2006, August 21 – 25, 2006. Radisson SAS Scandinavia Hotel in Oslo Norway.

Rosenfeld, P.E., **Clark, J. J.** and Suffet, I.H. 2005. "The Value Of An Odor Quality Classification Scheme For Compost Facility Evaluations" The U.S. Composting Council's 13th Annual Conference January 23 - 26, 2005, Crowne Plaza Riverwalk, San Antonio, TX.

Rosenfeld, P.E., **Clark, J. J.** and Suffet, I.H. 2004. "The Value Of An Odor Quality Classification Scheme For Urban Odor" WEFTEC 2004. 77th Annual Technical Exhibition & Conference October 2 - 6, 2004, Ernest N. Morial Convention Center, New Orleans, Louisiana.

Clark, J.J.J. 2003. "Manufacturing, Use, Regulation, and Occurrence of a Known Endocrine Disrupting Chemical (EDC), 2,4-Dichlorophnoxyacetic Acid (2,4-D) in California Drinking Water Supplies." National Groundwater Association Southwest Focus Conference: Water Supply and Emerging Contaminants. Minneapolis, MN. March 20, 2003.

Rosenfeld, P. and **J.J.J. Clark**. 2003. "Understanding Historical Use, Chemical Properties, Toxicity, and Regulatory Guidance" National Groundwater Association Southwest Focus Conference: Water Supply and Emerging Contaminants. Phoenix, AZ. February 21, 2003.

Clark, J.J.J., Brown A. 1999. Perchlorate Contamination: Fate in the Environment and Treatment Options. In Situ and On-Site Bioremediation, Fifth International Symposium. San Diego, CA, April, 1999.

Clark, J.J.J. 1998. Health Effects of Perchlorate and the New Reference Dose (RfD). Proceedings From the Groundwater Resource Association Seventh Annual Meeting, Walnut Creek, CA, October 23, 1998.

Browne, T., **Clark, J.J.J.** 1998. Treatment Options For Perchlorate In Drinking Water. Proceedings From the Groundwater Resource Association Seventh Annual Meeting, Walnut Creek, CA, October 23, 1998.

Clark, J.J.J., Brown, A., Rodriguez, R. 1998. The Public Health Implications of MtBE and Perchlorate in Water: Risk Management Decisions for Water Purveyors. Proceedings of the National Ground Water Association, Anaheim, CA, June 3-4, 1998.

Clark J.J.J., Brown, A., Ulrey, A. 1997. Impacts of Perchlorate On Drinking Water In The Western United States. U.S. EPA Symposium on Biological and Chemical Reduction of Chlorate and Perchlorate, Cincinnati, OH, December 5, 1997.

Clark, J.J.J.; Corbett, G.E.; Kerger, B.D.; Finley, B.L.; Paustenbach, D.J. 1996. Dermal Uptake of Hexavalent Chromium In Human Volunteers: Measures of Systemic Uptake From Immersion in Water At 22 PPM. Toxicologist. 30(1):14.

Dodge, D.G.; **Clark, J.J.J.**; Kerger, B.D.; Richter, R.O.; Finley, B.L.; Paustenbach, D.J. 1996. Assessment of Airborne Hexavalent Chromium In The Home Following Use of Contaminated Tapwater. Toxicologist. 30(1):117-118.

Paulo, M.T.; Gong, H., Jr.; **Clark, J.J.J.** (1992). Effects of Pretreatment with Ipratroprium Bromide in COPD Patients Exposed to Ozone. American Review of Respiratory Disease. 145(4):A96.

Harber, P.H.; Gong, H., Jr.; Lachenbruch, A.; **Clark, J.**; Hsu, P. (1992). Respiratory Pattern Effect of Acute Sulfur Dioxide Exposure in Asthmatics. American Review of Respiratory Disease. 145(4):A88.

McManus, M.S.; Gong, H., Jr.; Clements, P.; **Clark, J.J.J.** (1991). Respiratory Response of Patients With Interstitial Lung Disease To Inhaled Ozone. American Review of Respiratory Disease. 143(4):A91.

Gong, H., Jr.; Simmons, M.S.; McManus, M.S.; Tashkin, D.P.; Clark, V.A.; Detels, R.; **Clark, J.J.** (1990). Relationship Between Responses to Chronic Oxidant and Acute Ozone Exposures in Residents of Los Angeles County. American Review of Respiratory Disease. 141(4):A70.

Tierney, D.F. and **J.J.J. Clark.** (1990). Lung Polyamine Content Can Be Increased By Spermidine Infusions Into Hyperoxic Rats. American Review of Respiratory Disease. 139(4):A41.

SWAPE Technical Consultation, Data Analysis and Litigation Support for the Environment

2503 Eastbluff Dr.
Suite 206
Newport Beach, California92660
Tel: (949) 887-9013
Fax: (949) 717-0069
Email: mhagemann@swape.com

Matthew F. Hagemann, P.G.

Geologic and Hydrogeologic Characterization
Investigation and Remediation Strategies
Regulatory Compliance
CEQA Review
Expert Witness

Education:

M.S. Degree, Geology, California State University Los Angeles, Los Angeles, CA, 1984.
B.A. Degree, Geology, Humboldt State University, Arcata, CA, 1982.

Professional Certification:

California Professional Geologist, License Number 8571.

Professional Experience:

Matt has 25 years of experience in environmental policy, assessment and remediation. He spent nine years with the U.S. EPA in the RCRA and Superfund programs and served as EPA's Senior Science Policy Advisor in the Western Regional Office where he identified emerging threats to groundwater from perchlorate and MTBE. While with EPA, Matt also served as a Senior Hydrogeologist in the oversight of the assessment of seven major military facilities undergoing base closure. He led numerous enforcement actions under provisions of the Resource Conservation and Recovery Act (RCRA) while also working with permit holders to improve hydrogeologic characterization and water quality monitoring.

Matt has worked closely with U.S. EPA legal counsel and the technical staff of several states in the application and enforcement of RCRA, Safe Drinking Water Act and Clean Water Act regulations. Matt has trained the technical staff in the States of California, Hawaii, Nevada, Arizona and the Territory of Guam in the conduct of investigations, groundwater fundamentals, and sampling techniques.

Positions Matt has held include:

- Founding Partner, Soil/Water/Air Protection Enterprise (SWAPE) (2003 – present);
- Senior Environmental Analyst, Komex H2O Science, Inc (2000 -- 2003);
- Executive Director, Orange Coast Watch (2001 – 2004);
- Senior Science Policy Advisor and Hydrogeologist, U.S. Environmental Protection Agency (1989–1998);
- Hydrogeologist, National Park Service, Water Resources Division (1998 – 2000);

- Adjunct Faculty Member, San Francisco State University, Department of Geosciences (1993 – 1998);
- Instructor, College of Marin, Department of Science (1990 – 1995);
- Geologist, U.S. Forest Service (1986 – 1998); and
- Geologist, Dames & Moore (1984 – 1986).

Senior Regulatory and Litigation Support Analyst:

With SWAPE, Matt's responsibilities have included:

- Manager of a project to evaluate numerous formerly used military sites in the western U.S.
- Manager of a project to provide technical assistance to a comunity adjacent to a former Naval shipyard under a grant from the U.S. EPA.
- Lead analyst in the review of numerous environmental impact reports under CEQA that identify significant issues with regard to hazardous waste, water resources, water quality, air quality, greenhouse gas emissions and geologic hazards.
- Lead analyst in the review of environmental issues in applications before the California Energy Commission.
- Technical assistance and litigation support for vapor intrusion concerns.
- Manager of a comprehensive evaluation of potential sources of perchlorate contamination in Southern California drinking water wells.
- Manager and designated expert for litigation support under provisions of Proposition 65 in the review of releases of gasoline to sources drinking water at major refineries and hundreds of gas stations throughout California.
- Expert witness on two cases involving MTBE litigation.
- Expert witness and litigation support on the impact of air toxins and hazards at a school.
- Expert witness in litigation at a former plywood plant.

With Komex H2O Science Inc., Matt's duties included the following:

- Senior author of a report on the extent of perchlorate contamination that was used in testimony by the former U.S. EPA Administrator and General Counsel.
- Senior researcher in the development of a comprehensive, electronically interactive chronology of MTBE use, research, and regulation.
- Senior researcher in the development of a comprehensive, electronically interactive chronology of perchlorate use, research, and regulation.
- Senior researcher in a study that estimates nationwide costs for MTBE remediation and drinking water treatment, results of which were published in newspapers nationwide and in testimony against provisions of an energy bill that would limit liability for oil companies.
- Research to support litigation to restore drinking water supplies that have been contaminated by MTBE in California and New York.
- Expert witness testimony in a case of oil production-related contamination in Mississippi.
- Lead author for a multi-volume remedial investigation report for an operating school in Los Angeles that met strict regulatory requirements and rigorous deadlines.
- Development of strategic approaches for cleanup of contaminated sites in consultation with clients and regulators.

Executive Director:

As Executive Director with Orange Coast Watch, Matt led efforts to restore water quality at Orange County beaches from multiple sources of contamination including urban runoff and the discharge of

wastewater. In reporting to a Board of Directors that included representatives from leading Orange County universities and businesses, Matt prepared issue papers in the areas of treatment and disinfection of wastewater and control of the dischrge of grease to sewer systems. Matt actively participated in the development of countywide water quality permits for the control of urban runoff and permits for the discharge of wastewater. Matt worked with other nonprofits to protect and restore water quality, including Surfrider, Natural Resources Defense Council and Orange County CoastKeeper as well as with business institutions including the Orange County Business Council.

Hydrogeology:

As a Senior Hydrogeologist with the U.S. Environmental Protection Agency, Matt led investigations to characterize and cleanup closing military bases, including Mare Island Naval Shipyard, Hunters Point Naval Shipyard, Treasure Island Naval Station, Alameda Naval Station, Moffett Field, Mather Army Airfield, and Sacramento Army Depot. Specific activities were as follows:

- Led efforts to model groundwater flow and contaminant transport, ensured adequacy of monitoring networks, and assessed cleanup alternatives for contaminated sediment, soil, and groundwater.
- Initiated a regional program for evaluation of groundwater sampling practices and laboratory analysis at military bases.
- Identified emerging issues, wrote technical guidance, and assisted in policy and regulation development through work on four national U.S. EPA workgroups, including the Superfund Groundwater Technical Forum and the Federal Facilities Forum.

At the request of the State of Hawaii, Matt developed a methodology to determine the vulnerability of groundwater to contamination on the islands of Maui and Oahu. He used analytical models and a GIS to show zones of vulnerability, and the results were adopted and published by the State of Hawaii and County of Maui.

As a hydrogeologist with the EPA Groundwater Protection Section, Matt worked with provisions of the Safe Drinking Water Act and NEPA to prevent drinking water contamination. Specific activities included the following:

- Received an EPA Bronze Medal for his contribution to the development of national guidance for the protection of drinking water.
- Managed the Sole Source Aquifer Program and protected the drinking water of two communities through designation under the Safe Drinking Water Act. He prepared geologic reports, conducted public hearings, and responded to public comments from residents who were very concerned about the impact of designation.
- Reviewed a number of Environmental Impact Statements for planned major developments, including large hazardous and solid waste disposal facilities, mine reclamation, and water transfer.

Matt served as a hydrogeologist with the RCRA Hazardous Waste program. Duties were as follows:

- Supervised the hydrogeologic investigation of hazardous waste sites to determine compliance with Subtitle C requirements.
- Reviewed and wrote "part B" permits for the disposal of hazardous waste.

- Conducted RCRA Corrective Action investigations of waste sites and led inspections that formed the basis for significant enforcement actions that were developed in close coordination with U.S. EPA legal counsel.
- Wrote contract specifications and supervised contractor's investigations of waste sites.

With the National Park Service, Matt directed service-wide investigations of contaminant sources to prevent degradation of water quality, including the following tasks:

- Applied pertinent laws and regulations including CERCLA, RCRA, NEPA, NRDA, and the Clean Water Act to control military, mining, and landfill contaminants.
- Conducted watershed-scale investigations of contaminants at parks, including Yellowstone and Olympic National Park.
- Identified high-levels of perchlorate in soil adjacent to a national park in New Mexico and advised park superintendent on appropriate response actions under CERCLA.
- Served as a Park Service representative on the Interagency Perchlorate Steering Committee, a national workgroup.
- Developed a program to conduct environmental compliance audits of all National Parks while serving on a national workgroup.
- Co-authored two papers on the potential for water contamination from the operation of personal watercraft and snowmobiles, these papers serving as the basis for the development of nation-wide policy on the use of these vehicles in National Parks.
- Contributed to the Federal Multi-Agency Source Water Agreement under the Clean Water Action Plan.

Policy:

Served senior management as the Senior Science Policy Advisor with the U.S. Environmental Protection Agency, Region 9. Activities included the following:

- Advised the Regional Administrator and senior management on emerging issues such as the potential for the gasoline additive MTBE and ammonium perchlorate to contaminate drinking water supplies.
- Shaped EPA's national response to these threats by serving on workgroups and by contributing to guidance, including the Office of Research and Development publication, Oxygenates in Water: Critical Information and Research Needs.
- Improved the technical training of EPA's scientific and engineering staff.
- Earned an EPA Bronze Medal for representing the region's 300 scientists and engineers in negotiations with the Administrator and senior management to better integrate scientific principles into the policy-making process.
- Established national protocol for the peer review of scientific documents.

Geology:

With the U.S. Forest Service, Matt led investigations to determine hillslope stability of areas proposed for timber harvest in the central Oregon Coast Range. Specific activities were as follows:

- Mapped geology in the field, and used aerial photographic interpretation and mathematical models to determine slope stability.
- Coordinated his research with community members who were concerned with natural resource protection.
- Characterized the geology of an aquifer that serves as the sole source of drinking water for the city of Medford, Oregon.

As a consultant with Dames and Moore, Matt led geologic investigations of two contaminated sites (later listed on the Superfund NPL) in the Portland, Oregon, area and a large hazardous waste site in eastern Oregon. Duties included the following:

- Supervised year-long effort for soil and groundwater sampling.
- Conducted aquifer tests.
- Investigated active faults beneath sites proposed for hazardous waste disposal.

Teaching:

From 1990 to 1998, Matt taught at least one course per semester at the community college and university levels:

- At San Francisco State University, held an adjunct faculty position and taught courses in environmental geology, oceanography (lab and lecture), hydrogeology, and groundwater contamination.
- Served as a committee member for graduate and undergraduate students.
- Taught courses in environmental geology and oceanography at the College of Marin.

Invited Testimony, Reports, Papers and Presentations:

Hagemann, M.F., 2008. Disclosure of Hazardous Waste Issues under CEQA. Presentation to the Public Environmental Law Conference, Eugene, Oregon.

Hagemann, M.F., 2008. Disclosure of Hazardous Waste Issues under CEQA. Invited presentation to U.S. EPA Region 9, San Francisco, California.

Hagemann, M.F., 2005. Use of Electronic Databases in Environmental Regulation, Policy Making and Public Participation. Brownfields 2005, Denver, Coloradao.

Hagemann, M.F., 2004. Perchlorate Contamination of the Colorado River and Impacts to Drinking Water in Nevada and the Southwestern U.S. Presentation to a meeting of the American Groundwater Trust, Las Vegas, NV (served on conference organizing committee).

Hagemann, M.F., 2004. Invited testimony to a California Senate committee hearing on air toxins at schools in Southern California, Los Angeles.

Brown, A., Farrow, J., Gray, A. and **Hagemann, M.**, 2004. An Estimate of Costs to Address MTBE Releases from Underground Storage Tanks and the Resulting Impact to Drinking Water Wells. Presentation to the Ground Water and Environmental Law Conference, National Groundwater Association.

Hagemann, M.F., 2004. Perchlorate Contamination of the Colorado River and Impacts to Drinking Water in Arizona and the Southwestern U.S. Presentation to a meeting of the American Groundwater Trust, Phoenix, AZ (served on conference organizing committee).

Hagemann, M.F., 2003. Perchlorate Contamination of the Colorado River and Impacts to Drinking Water in the Southwestern U.S. Invited presentation to a special committee meeting of the National Academy of Sciences, Irvine, CA.

Hagemann, M.F., 2003. Perchlorate Contamination of the Colorado River. Invited presentation to a tribal EPA meeting, Pechanga, CA.

Hagemann, M.F., 2003. Perchlorate Contamination of the Colorado River. Invited presentation to a meeting of tribal repesentatives, Parker, AZ.

Hagemann, M.F., 2003. Impact of Perchlorate on the Colorado River and Associated Drinking Water Supplies. Invited presentation to the Inter-Tribal Meeting, Torres Martinez Tribe.

Hagemann, M.F., 2003. The Emergence of Perchlorate as a Widespread Drinking Water Contaminant. Invited presentation to the U.S. EPA Region 9.

Hagemann, M.F., 2003. A Deductive Approach to the Assessment of Perchlorate Contamination. Invited presentation to the California Assembly Natural Resources Committee.

Hagemann, M.F., 2003. Perchlorate: A Cold War Legacy in Drinking Water. Presentation to a meeting of the National Groundwater Association.

Hagemann, M.F., 2002. From Tank to Tap: A Chronology of MTBE in Groundwater. Presentation to a meeting of the National Groundwater Association.

Hagemann, M.F., 2002. A Chronology of MTBE in Groundwater and an Estimate of Costs to Address Impacts to Groundwater. Presentation to the annual meeting of the Society of Environmental Journalists.

Hagemann, M.F., 2002. An Estimate of the Cost to Address MTBE Contamination in Groundwater (and Who Will Pay). Presentation to a meeting of the National Groundwater Association.

Hagemann, M.F., 2002. An Estimate of Costs to Address MTBE Releases from Underground Storage Tanks and the Resulting Impact to Drinking Water Wells. Presentation to a meeting of the U.S. EPA and State Underground Storage Tank Program managers.

Hagemann, M.F., 2001. From Tank to Tap: A Chronology of MTBE in Groundwater. Unpublished report.

Hagemann, M.F., 2001. Estimated Cleanup Cost for MTBE in Groundwater Used as Drinking Water. Unpublished report.

Hagemann, M.F., 2001. Estimated Costs to Address MTBE Releases from Leaking Underground Storage Tanks. Unpublished report.

Hagemann, M.F., and VanMouwerik, M., 1999. Potential Water Quality Concerns Related to Snowmobile Usage. Water Resources Division, National Park Service, Technical Report.

VanMouwerik, M. and **Hagemann, M.F.** 1999, Water Quality Concerns Related to Personal Watercraft Usage. Water Resources Division, National Park Service, Technical Report.

Hagemann, M.F., 1999, Is Dilution the Solution to Pollution in National Parks? The George Wright Society Biannual Meeting, Asheville, North Carolina.

Hagemann, M.F., 1997, The Potential for MTBE to Contaminate Groundwater. U.S. EPA Superfund Groundwater Technical Forum Annual Meeting, Las Vegas, Nevada.

Hagemann, M.F., and Gill, M., 1996, Impediments to Intrinsic Remediation, Moffett Field Naval Air Station, Conference on Intrinsic Remediation of Chlorinated Hydrocarbons, Salt Lake City.

Hagemann, M.F., Fukunaga, G.L., 1996, The Vulnerability of Groundwater to Anthropogenic Contaminants on the Island of Maui, Hawaii. Hawaii Water Works Association Annual Meeting, Maui, October 1996.

Hagemann, M. F., Fukanaga, G. L., 1996, Ranking Groundwater Vulnerability in Central Oahu, Hawaii. Proceedings, Geographic Information Systems in Environmental Resources Management, Air and Waste Management Association Publication VIP-61.

Hagemann, M.F., 1994. Groundwater Characterization and Cleanup at Closing Military Bases in California. Proceedings, California Groundwater Resources Association Meeting.

Hagemann, M.F. and Sabol, M.A., 1993. Role of the U.S. EPA in the High Plains States Groundwater Recharge Demonstration Program. Proceedings, Sixth Biennial Symposium on the Artificial Recharge of Groundwater.

Hagemann, M.F., 1993. U.S. EPA Policy on the Technical Impracticability of the Cleanup of DNAPL-contaminated Groundwater. California Groundwater Resources Association Meeting.

Hagemann, M.F., 1992. Dense Nonaqueous Phase Liquid Contamination of Groundwater: An Ounce of Prevention... Proceedings, Association of Engineering Geologists Annual Meeting, v. 35.