4.5 AIR QUALITY

INTRODUCTION

This section describes the impacts of the Covell Village project on local and regional air quality and was prepared using thresholds of significance recommended by the Yolo-Solano Air Quality Management District. This section includes a discussion of the existing air quality in the region; construction-related air quality impacts resulting from grading and equipment emissions; direct and indirect emissions associated with the project; the impacts of these emissions on both the local and regional scale; and mitigation measures warranted to reduce or eliminate any identified significant impacts. The air quality discussion is based primarily on an Air Quality Impact Analysis[1] provided by Donald Ballanti, Certified Consulting Meteorologist under contract with Raney Planning & Management, Inc. and the City of Davis. Information for this section was also drawn from the *City of Davis General Plan*[2].

ENVIRONMENTAL SETTING

The amount of a given pollutant in the atmosphere is determined by the amount of pollutant released and the atmosphere's ability to transport and dilute the pollutant. The major factors affecting transport and dilution are terrain, wind, atmospheric stability, and, for photochemical pollutants, sunshine.

Air Pollution Climatology

The project is located in southern Yolo County, which is within the Sacramento Valley Air Basin (SVAB). The basin is relatively flat and bordered by mountains on the east, west and north. Movement of air into the SVAB is through the Carquinez Strait in a northeasterly direction from the Sacramento-San Joaquin River Delta. Quality of the air is either fresh from the marine environment or polluted from the urbanized San Francisco Bay area, depending on the meteorological conditions. Davis' climate includes primarily hot, dry summers and cool, rainy winters. Prevailing winds are from the south-southwest. Atmospheric temperature inversions occur frequently that limit the vertical dispersion of pollutants. These inversions may result in elevated levels of carbon monoxide (CO) during the winter months and high ozone levels during summer and fall.

Ambient Air Quality Standards

Criteria Pollutants

Both the U. S. Environmental Protection Agency and the California Air Resources Board have established ambient air quality standards for common pollutants. These ambient air

quality standards are levels of contaminants, which represent safe levels that avoid specific adverse health effects associated with each pollutant. The ambient air quality standards cover what are called "criteria" pollutants because the health and other effects of each pollutant are described in criteria documents. The federal and State ambient air quality standards are summarized in Table 4.5-1.

Table 4.5-1
Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Primary Standard	State Standard
Ozone	1-Hour 8-Hour	0.12 ppm 0.08 ppm	0.09 ppm --
Carbon Monoxide	8-Hour 1-Hour	9.0 ppm 35.0 ppm	9.0 ppm 20.0 ppm
Nitrogen Dioxide	Annual 1-Hour	0.05 ppm --	-- 0.25 ppm
Sulfur Dioxide	Annual 24-Hour 1-Hour	0.03 ppm 0.14 ppm --	-- 0.05 ppm 0.5 ppm
PM_{10}	Annual 24-Hour	50 ug/m^3 150 ug/m^3	20 ug/m^3 50 ug/m^3
$PM_{2.5}$	Annual 24-Hour	15 ug/m^3 65 ug/m^3	12 ug/m^3 --
Lead	30-Day Avg. Month Avg.	-- 1.5 ug/m^3	1.5 ug/m^3 --

ppm = parts per million
ug/m^3 = Micrograms per Cubic Meter
Source: California Air Resources Board, Ambient Air Quality Standards (7/9/03); http://www.arb.ca.gov.aqs/aaqs2.pdf

The federal and State ambient standards were developed independently with differing purposes and methods, although both processes attempt to avoid health-related effects. As a result, the federal and State standards differ in some cases. In general, the California standards are more stringent, particularly for ozone and particulate matter (PM_{10} and $PM_{2.5}$)

The U.S. Environmental Protection Agency established new national air quality standards for ground-level ozone and for fine particulate matter in 1997. The existing 1-hour ozone standard of 0.12 PPM microns or less is to be phased out and replaced by an 8-hour standard of 0.08 PPM. Implementation of the 8-hour standard was delayed by litigation, but was determined to be valid and enforceable by the U. S. Supreme Court in a decision issued in February of 2001.

The State of California regularly reviews scientific literature regarding the health effects and exposure to PM and other pollutants. On May 3, 2002, the California Air Resources Board (CARB) staff recommended lowering the level of the annual standard for PM_{10} and establishing a new annual standard for $PM_{2.5}$ (particulate matter 2.5 micrometers in diameter and smaller). The new standards became effective on July 5, 2003.

Toxic Air Contaminants

In addition to the criteria pollutants discussed above, Toxic Air Contaminants (TACs) are another group of pollutants of concern. Toxic Air Contaminants (TACs) are injurious in small quantities and are regulated despite the absence of criteria documents. The identification, regulation and monitoring of TACs is relatively recent compared to that for criteria pollutants. Many different types of TACs, with varying degrees of toxicity, exist. Sources of TACs include industrial processes such as petroleum refining and chrome plating operations, commercial operations such as gasoline stations and dry cleaners, and motor vehicle exhaust. Cars and trucks release at least forty different toxic air contaminants. The most important in terms of health risk are diesel particulates, benzene, formaldehyde, 1,3-butadiene, and acetaldehyde.

Public exposure to TACs can result from emissions from normal operations, as well as accidental releases. Health effects of TACs include cancer, birth defects, neurological damage, and death.

Current Air Quality

The California Air Resources Board (CARB) operates an air quality monitoring site within the UC Davis campus that monitors the gaseous pollutants of ozone, nitrogen dioxide, and carbon monoxide. The closest particulate monitoring site is operated by the Yolo-Solano Air Quality Management District (YSAQMD), which operates a monitoring site on Gibson Street in the City of Woodland. The Woodland monitoring site measures several gaseous pollutants as well as PM_{10}. A three-year summary of air quality data from these two monitoring sites is shown in Table 4.5-2. Table 4.5-2 shows that the federal/State standards for ozone, $PM_{10,}$ and $PM_{2.5}$ are sometimes exceeded in the project area.

Table 4.5-2
Ambient Air Quality at Davis and Woodland

Pollutant/Standard	Year	Days Exceeding Standard at	
		Davis Monitoring Site	Woodland Monitoring Site
Ozone/State 1-Hour	2002	3	9
	2003	2	3
	2004	0	0
Ozone/Fed. 1-Hour	2002	0	0
	2003	0	0
	2004	0	0
Ozone/Fed. 8-Hour	2002	2	4
	2003	0	0
	2004	0	0
Carbon Monoxide State/Fed. 8-Hour	2002	0	-
	2003	0	-
	2004	0	-
Nitrogen Dioxide State 1- Hour	2002	0	-
	2003	0	-
	2004	0	-
PM_{10}/State 24-Hour	2002	-	6
	2003	-	2
	2004	-	2
PM_{10}/Federal 24-Hour	2002	-	0
	2003	-	0
	2004	-	0
$PM_{2.5}$/Federal 24-Hour	2002	-	1
	2003	-	0
	2004	-	0

Source: Air Resources Board, Aerometric Data Analysis and Management (ADAM), 2004. (http: //www.arb.ca.gov./adam/cgi-bin/adamtop/d2wstart)

Health Effects of Pollutants

The primary air quality problems in the Sacramento Valley Air Basin are with ozone and particulate matter levels. Carbon monoxide has been a problem in the past within urban Sacramento. The following is a discussion of the health effects of these significant pollutants.

Ozone

Ozone is produced by sunlight-activated chemical reactions between nitrogen oxides (NO_x) and reactive organic gases (ROGs). Nitrogen oxides are created during combustion of fuels, while reactive organic gases are emitted during combustion and evaporation of organic solvents. Because ozone is not directly emitted into the atmosphere, but is formed as a result of photochemical reactions, ozone is considered a secondary pollutant. In the Sacramento Valley Air Basin, ozone is a seasonal problem, occurring roughly from April through October.

Ozone is a strong irritant that attacks the respiratory system, leading to the damage of lung tissue. Asthma, bronchitis, and other respiratory ailments, as well as cardiovascular diseases, are aggravated by exposure to ozone. A healthy person exposed to high concentrations may become nauseated or dizzy, develop headaches, and experience coughing or a burning sensation in the chest.

Research has shown that exposure to ozone damages the alveoli (the individual air sacs in the lung where the exchange of oxygen and carbon dioxide between the air and blood takes place). Research has shown that ozone also damages vegetation.

The YSAQMD is classified as a "severe" non-attainment area for the federal one-hour ozone standard and a "serious" non-attainment area for the State ozone standard.

Suspended Particulate

Suspended particulate matter (PM) is a complex mixture of tiny particles that consists of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid particles small enough to remain suspended in the atmosphere indefinitely. These particles vary greatly in shape, size and chemical composition, and can be made up of many different materials such as metals, soot, soil, and dust, although the major components of suspended particulate are dust particles, nitrates, and sulfates. A portion of suspended particulate is directly emitted into the atmosphere as a by-product of combustion, wind erosion of soil, and unpaved road travel. Small particles are also created in the atmosphere through chemical reactions.

Particles greater than 10 microns in diameter can cause irritation in the nose, throat, and bronchial tubes. Natural mechanisms remove much of these particles, but smaller particles are able to pass through the body's natural defenses and the mucous membranes of the upper respiratory tract, and enter into the lungs. The particles can damage the alveoli. The particles may also carry carcinogens and other toxic compounds, which adhere to the particle surfaces and can enter the lungs.

"Inhalable" PM consists of particles less than 10 microns in diameter, and is defined as "suspended particulate matter" or PM_{10}. Fine particles are less than 2.5 microns in diameter ($PM_{2.5}$). $PM_{2.5}$, by definition, is included in PM_{10}.

The YSAQMD is an attainment area for the federal PM_{10} standard and a non-attainment area for the State PM_{10} standard.

Carbon Monoxide

Carbon monoxide (CO) is a local pollutant because high concentrations occur only very near the source. The major source of carbon monoxide, a colorless, odorless, and poisonous gas, is automobile traffic. Elevated concentrations, therefore, are usually only found near areas of high traffic volumes.

Carbon monoxide's health effects are related to its affinity for hemoglobin in the blood. At high concentrations, carbon monoxide reduces the amount of oxygen in the blood, causing heart difficulties in people with chronic diseases, reduced lung capacity, and impaired mental abilities.

Carbon monoxide concentrations are highly seasonal, with the highest concentrations occurring in the winter. This phenomenon is partly due to the fact that automobiles create more carbon monoxide in colder weather, and partly due to the very stable atmospheric conditions that exist on cold winter evenings when winds are calm. Concentrations typically are highest during the stagnant air period of November through January.

The YSAQMD is an attainment-area for the federal CO standard and the State standard.

REGULATORY CONTEXT

Regulation of air quality is achieved through both federal and State ambient air quality standards, and emission limits for individual sources of air pollutants.

Federal Regulations

The Federal Clean Air Act (FCAA) requires the states to classify basins (or portions thereof) as either "attainment" or "non-attainment" with respect to the criteria air pollutants, based on whether or not the national ambient air quality standards (NAAQS) have been achieved, and to prepare air quality plans containing emission reduction strategies for those areas designated as "non-attainment."

The YSAQMD includes all of Yolo County and eastern portions of Solano County. As previously mentioned, the YSAQMD is classified as a "severe" non-attainment area for the federal one-hour ozone standard. The YSAQMD is classified as attainment or unclassified for other national standards.

Within the YSAQMD, West Sacramento is considered a "maintenance" attainment area for CO, meaning that the area was once designated non-attainment for that pollutant, but is now designated as attainment in light of improved conditions. The remainder of the District is attainment for this pollutant.

Because the SVAB is designated as a non-attainment area for ozone, the air pollution control districts and air quality management districts within the air basin have prepared the Sacramento Area Regional Ozone Attainment Plan as the basin's contribution to the State Implementation Plan (SIP), pursuant to the FCAA. The SIP includes plans for each of the State's non-attainment areas, along with rules and regulations and other control measures adopted by the air districts and the California Air Resources Board (CARB). The air districts included in the Sacramento Metropolitan Federal Ozone Non-Attainment area (El Dorado APCD, Feather River AQMD, Placer County APCD, Sacramento Metropolitan AQMD and Yolo-Solano AQMD) are currently preparing an update to the Attainment Plan that is scheduled for completion at the end of 2004.

State Regulations

The California Air Resources Board (CARB), California's air quality management agency, regulates mobile emissions sources and oversees the activities of County Air Pollution Control Districts (APCDs) and regional Air Quality Management Districts (AQMDs). The CARB regulates local air quality indirectly using State standards and vehicle emission standards, by conducting research activities, and through its planning and coordinating activities.

California has adopted ambient standards that are in some cases more stringent than the federal standards for the criteria air pollutants and shown in Table 4.5-1. Under the California Clean Air Act (CCAA), patterned after the federal CAA, areas have been designated as attainment or non-attainment with respect to State standards. As previously mentioned, the project region is considered to be in attainment for the State CO standard, non-attainment for the State ozone standard, and non-attainment for the State PM_{10} standard.

Local Regulations

The YSAQMD is the agency responsible for implementing emissions standards and other requirements of federal and State laws in Yolo County. The YSAQMD Yolo-Solano Air Quality Attainment Plan (1992) addresses the requirement to attempt to bring the district into compliance with the federal and State ambient air quality standards. The plan includes carefully planned strategies for progressive reduction of air pollutants by promoting active public involvement, encouraging compliance through positive influence and behavior, and through public education in both the public and private sectors. The YSAQMD also provides a handbook of guidelines for determining air quality thresholds of significance and mitigation measures for proposed development projects that generate emissions from motor vehicles.[3]

The closest monitoring site for other gaseous pollutants such as carbon monoxide and nitrogen dioxide is the UCD campus in Davis. Concentrations of these pollutants at this monitoring site are well within the State and federal standards.

City of Davis General Plan

The following goals and policies from the City of Davis General Plan pertain to air quality:

Air Quality

Goal AIR 1.	Maintain and strive to improve air quality.
Policy AIR 1.1	Take appropriate measures to meet the AQMD's goal for improved air quality.

IMPACTS AND MITIGATION MEASURES

Standards of Significance

The YSAQMD has established the following quantitative standards of significance:

- The District considers increases in emissions during construction or operation of 82 pounds per day of ozone precursors (ROG or NO_x) or 150 pounds per day of PM_{10} as potentially significant;
- A predicted violation of any California Ambient Air Quality Standard (CAAQS) during both construction or operation of the project would be considered a potentially significant impact; or,
- A project is considered to contribute substantially to an existing or project violation of the CAAQS if it emits pollutants at a level equal to or greater than five percent of the CAAQS.

The YSAQMD has also established the following qualitative standards of significance:

- Potential to create or be near an objectionable odor;
- Potential for accidental release of air toxic emissions or acutely hazardous materials;
- Potential to emit an air toxic contaminant regulated by the District or on a federal or State air toxics list;
- Burning of hazardous, medical, or municipal waste as waste-to-energy facilities;
- Potential to produce a substantial amount of wastewater or potential for toxic discharge;
- Sensitive receptors (e.g., schools, households, etc.) located with a quarter mile of air toxic emissions or near CO hot spots; or,
- Carcinogenic or air toxic contaminant emissions that exceed or contribute to exceeding the District's action level for cancer, chronic and acute risks.

Development projects are considered potentially cumulatively significant under YSAQMD significance criteria if the following occur:

- The project requires a change in the existing land use designation (i.e., General Plan Amendment); and
- Projected emissions (ROG, NO_x or PM_{10}) of the Proposed Project are greater than the emissions anticipated for the site if developed under the existing land use designation.

Method of Analysis

Local Carbon Monoxide Concentrations

A screening procedure for estimating carbon monoxide concentrations was applied to signalized intersections affected by project traffic under existing and future traffic conditions. The highest carbon monoxide concentrations would be expected at major signalized intersections due to the deceleration, idling, and acceleration of vehicles at these locations. Three intersections were selected for analysis at signalized intersections where the Level of Service (LOS) is forecast to be D or worse under cumulative conditions. These locations are worst-case locations in that they would be the location of the highest concentrations of carbon monoxide.

The screening procedure contained in *Transportation Project-Level Carbon Monoxide Protocol* was utilized.[4] The screening procedure is intended to allow the prediction of conservative estimates of carbon monoxide concentrations without having to run computational models such as EMFAC and CALINE4. The methodology uses estimates of the contributions to carbon monoxide concentrations for a "base case" characterized by a specific intersection configuration, meteorology, traffic volume and indicators of intersection performance. A series of correction factors are then applied to adjust the initial estimates of carbon monoxide concentrations for the specific conditions of the intersection under study. Correction factors are provided by a series of tables.

The screening procedure provides a worst-case estimate of concentrations of carbon monoxide generated by vehicles impacting an intersection. Concentrations were calculated at the corner of the intersection, which would be expected to be the location of the highest carbon monoxide concentrations due to the deceleration, idling, and acceleration of vehicles at these locations. Concentrations were estimated for a distance of 7 meters (20 feet) from the roadway edge.

Another contribution to the total local carbon monoxide concentration is the background level attributed to more distant traffic. The background concentration was estimated using the highest concentration of carbon monoxide measured at the UC Davis monitoring site during the period 2002-2004.

Construction

The URBEMIS-2002 program[5] was applied to the project to estimate the maximum construction emissions from site grading, equipment exhaust, construction worker vehicle trips and other construction activities. Construction was assumed to be completed over the seven-year build-out period for the development.

Operation

Estimates of regional emissions generated by project traffic and area sources were made using the URBEMIS-2002 program. URBEMIS-2002 estimates the emissions that result from various land use development projects. Land use projects can include residential uses such as single-family dwelling units, apartments and condominiums, and nonresidential uses such as shopping centers, office buildings, and industrial parks. Inputs to the URBEMIS-2002 program include trip generation rates, vehicle mix, average trip length by trip type, and average speed. Average trip lengths and vehicle mixes for the Lower Sacramento Valley air basin were used. Average speed for all types of trips was assumed to be 35 MPH.

The URBEMIS-2002 program was run to calculate daily operational emissions during the summer months with an ambient temperature of 85 degrees Fahrenheit. Analysis year was 2010. Both summer and winter runs were made. The summer results were used to estimate ozone precursor emissions while the winter results were used to estimate PM_{10} emissions.

Project Impacts and Mitigation Measures

4.5-1 Exhaust emissions and fugitive particulate matter emissions from project-associated construction activities.

Proposed Project

Maximum construction emissions would occur during the first phases of construction when clearing, earthmoving, and grading occur. Table 4.5-3 shows expected maximum daily construction emissions for the project with and without the incorporation of mitigation. According to Table 4.5-3, ROG and NO_x emissions generated by the project would exceed the YSAQMD thresholds, while PM_{10} emissions would not exceed the YSAQMD thresholds. However, because particulate matter emitted during construction activities would occur near existing residences (thereby causing a nuisance), PM_{10} could be considered to have an adverse effect even though the YSAQMD threshold for PM_{10} would not be exceeded. Residences currently exist east, west, and south of the project site. The residences are separated from the project site in all cases by roadways. In addition, existing residences west of the site are buffered by the ConAgra property and the railroad right-of-way, while the residences south of the site are buffered by Oak Tree Plaza. It should be noted that the current zoning for the ConAgra property, adjacent to the project site, is Planned Development #1-00, for a range of industrial and business park uses. A discretionary Final Planned Development would have to be approved before any new construction or new

uses on the site, requiring a public hearing before the Planning Commission. To allow the construction or use, the Commission would need to find that the use is appropriate in area, location, and overall planning for the purpose intended. Therefore, pollutant emissions associated with any future use of the Con Agra property would not have adverse effects on the Proposed Project.

Table 4.5-3
Maximum Construction Emissions (Pounds Per Day)

Pollutant	Project Emissions (Unmitigated)	Project Emissions (Mitigated)	YSAQMD Significance Threshold
ROG	87.1	78.4	82.0
NO_x	721.0	576.8	82.0
PM_{10}	133.7	15.2	150.0

Source: Don Ballanti, 2004.

As shown in Table 4.5-3, the majority of the PM_{10} from construction would be soil particles, while a small fraction would be from diesel exhaust (During construction, various diesel-powered vehicles and equipment would be used on the site). Diesel exhaust particulate is a pollutant that has come under increased scrutiny in recent years.

In 1998, the California Air Resources Board identified particulate matter from diesel-fueled engines as a toxic air contaminant (TAC). CARB has completed a risk management process that identified potential cancer risks for a range of activities using diesel-fueled engines.[6] High volume freeways, stationary diesel engines and facilities attracting heavy and constant diesel vehicle traffic (distribution centers, truckstops) were identified as having the highest associated risk. In terms of the project, the diesel-powered vehicles and equipment used during the construction of the project would generate TACs.

Health risks from TACs are a function of both concentration and duration of exposure. Construction diesel emissions are temporary, affecting an area for a period of days or perhaps weeks. Additionally, construction-related sources are mobile and transient in nature. Therefore, health risks from construction emissions of diesel particulate would be considered *less-than-significant*. In addition, because the applicant would be required to implement dust control measures recommended in the YSAQMD *Air Quality Handbook* (which are approximately 88.6 percent effective in controlling PM_{10} emissions), adverse effects associated with particulate matter being considered a nuisance to nearby sensitive receptors would be reduced to a *less-than-significant* level. However, the project would have a ***significant*** impact due to ROG and NO_x emissions generated by the Proposed Project.

<u>High Density Alternative</u>

Because the High Density Alternative would result in the same amount of area being graded as the Proposed Project, the Alternative would have the same level of impacts associated with construction activities as the Proposed Project. Therefore, the High Density Alternative would have a ***significant*** air quality impact resulting from construction activities.

Mitigation Measure(s)

Implementation of Mitigation Measures 4.5-1(a) and 4.51(b) would reduce emissions of ROG to below the YSAQMD threshold of significance; however, emissions of NO_x would remain well above the threshold. Therefore, construction emissions of NO_x would result in a *significant and unavoidable* temporary impact on regional air quality.

The following measures are identified for the Proposed Project and the High Density Alternative. Upon approval of the current project entitlements, additional approvals would be required in order to develop the site, including but not limited to obtaining a grading permit.

4.5-1(a) *Prior to issuance of grading permits, the applicant shall submit a dust control plan to the City Engineer and the Yolo-Solano Air Pollution Control District. This plan shall ensure that adequate dust controls are implemented during all phases of project construction, including the following:*

- *Apply nontoxic soil stabilizers according to manufacturer's specifications to all inactive construction areas (previously graded areas inactive for ten days or more).*
- *Reestablish ground cover in disturbed areas quickly.*
- *Water active construction sites at least three times daily to avoid visible dust plumes.*
- *Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites.*
- *Enclose, cover, water twice daily or apply non-toxic soil binders to exposed stockpiles (dirt, sand, etc.).*
- *Enforce a speed limit of 15 MPH for equipment and vehicles operated on unpaved areas.*
- *All vehicles hauling dirt, sand, soil, or other loose materials should be covered or should maintain at least two feet of freeboard.*
- *Sweep streets at the end of the day if visible soil material is carried onto adjacent public paved roads.*

4.5-1(b) *The contractor shall include in construction contracts that heavy-duty (>50 horsepower) off-road vehicles to be used in the*

construction project, including owned, leased and subcontractor vehicles, will achieve a project-wide fleet-average 10 percent ROG reduction and 20 percent NO_x reduction compared to the most recent CARB fleet average at time of construction.

4.5-2 Increased carbon monoxide concentrations at project-area intersections.

Proposed Project

On the local scale, the pollutant of greatest interest is carbon monoxide (CO). Concentrations of this pollutant are related to the levels of traffic and congestion along streets and at intersections. Predicted worst-case carbon monoxide concentrations for existing conditions and future conditions with the project are shown in Table 4.5-4.

The concentrations in Table 4.5-4 are for worst-case locations under theoretical worst-case meteorological conditions. Carbon monoxide concentrations at greater distances from the intersections listed in Table 4.5-4 would be substantially lower than the concentrations at the intersections. Table 4.5-4 shows that existing concentrations meet State and federal standards. The development of the Proposed Project would increase CO concentrations; however, the concentrations would remain below the most stringent air quality standards. Therefore, project impacts on local carbon monoxide concentrations would be ***less-than-significant***.

Table 4.5-4
Worst-Case Carbon Monoxide Concentration in Parts Per Million

Intersection	**Existing (2004)**		**Existing + Project (2004)**		**Existing + High Density Alternative (2004)**		**Cumulative+ Project (2012)**		**Cumulative + High Density Alternative (2012)**	
	1-Hr.	**8-Hr.**	**1-Hr.**	**8-Hr.**	**1-Hr.**	**8-Hr.**	**1-Hr.**	**8-Hr.**	**1-Hr.**	**8-Hr.**
Covell/ Pole Line	5.4	3.8	6.7	4.7	7.3	5.1	5.8	4.1	5.8	4.1
Covell/ F Street	5.4	3.8	6.7	4.7	6.7	4.7	5.5	3.8	5.5	3.8
Covell/ J Street	5.4	3.8	6.4	4.5	6.9	4.9	5.5	3.8	6.0	4.2
Most Stringent Standard	20.0	9.0	20.0	9.0	20.0	9.0	20.0	9.0	20.0	9.0

Source: Don Ballanti, 2004.

High Density Alternative
The development of the High Density Alternative would increase CO concentrations above the levels generated by the Proposed Project. However, these CO levels would remain below the applicable air quality standards. Therefore, the impact relating to local carbon monoxide concentrations would be ***less-than-significant***.

Mitigation Measure(s)
None Required.

4.5-3 New air pollutant emissions within the air basin resulting from vehicle trips to and from the project site.

Proposed Project
The construction of 1,515 new residential units in the project vicinity would increase the number of vehicle trips on surrounding roadways. Furthermore, project traffic emissions would not only have an effect on local air quality, but also air quality outside the project vicinity. Trips to and from the project site would result in air pollutant emissions within the air basin. Project land uses would also result in an increased number of area pollutant sources, such as natural gas combustion, fireplace/woodstove emissions and maintenance equipment.

However, because the Proposed Project is a mixed-use development with a wide range of land uses, the project would include transit improvements and amenities such as dedicated bus turnouts and sufficient rights-of way for transit movement, bus shelters, and pedestrian access to transit, which would reduce vehicle trips. The project also includes bicycle and pedestrian facilities such as bicycle lanes and pedestrian walkways, which connect residential areas with neighborhood commercial centers, recreational facilities, schools, and other public areas. These are all mitigating factors for air pollutants because these features allow for capturing of trips within the project site, and promote non-automotive travel.

Despite these benefits, and although these factors have been accounted for in the emissions estimates shown in Table 4.5-5, operational emissions with implementation of the Proposed Project would exceed the YSAQMD thresholds of significance for both ozone precursors and PM_{10}. Therefore, project regional air quality impacts would be considered ***significant***.

Table 4.5-5 **Project Regional Emissions in Pounds Per Day**			
	ROG	**NO_x**	**PM_{10}**
Proposed Project:			
Area Sources	81.4	19.7	807.8
Vehicles	164.1	184.9	218.6
Total	245.5	204.6	1026.4
High Density Alternative:			
Area Sources	84.4	20.9	838.0
Vehicles	184.9	211.7	250.5
Total	269.3	232.6	1088.5
YSAQMD Threshold of Significance	**82.0**	**82.0**	**150.0**
Source: Don Ballanti, 2004.			

High Density Alternative

Because the High Density Alternative would result in a greater number of residential units than the Proposed Project, air quality impacts would be more significant than those generated by the Proposed Project. Table 4.5-5 shows that, similar to the Proposed Project, the High Density Alternative operational emissions would exceed the YSAQMD thresholds of significance for both ozone precursors and PM_{10}; therefore, project regional air quality impacts would be ***significant***.

Mitigation Measure(s)

Implementation of the following mitigation measures would reduce the magnitude of this impact by such measures as reducing the number of employee work trips to and from the project site. However, measures are not available to reduce the above impact to a less-than-significant level. Therefore, the impact would remain *significant and unavoidable.*

The following measures are identified for the Proposed Project and the High Density Alternative.

4.5-3(a) *In conjunction with submittal of a Final Planned Development application for the commercial site, the applicant shall submit a transportation management plan and provide evidence, to the satisfaction of the Planning Commission, that indicates compliance with the following measures outlined in the transportation management plan:*

- *Provide transit information kiosks.*
- *Implement feasible travel demand management (TDM) measures for a project of this type. This would include a ride-matching program, guaranteed ride home programs,*

coordination with regional ridesharing organizations, and transit incentives program.

- *Provide preferential parking for carpool/vanpool vehicles.*
- *Implement parking cash-out program for employees of large employers (non-driving employees receive transportation allowance equivalent to the value of subsidized parking).*
- *Provide showers and lockers for employees bicycling or walking to work. Provide secure and conveniently located bicycle parking and storage for workers and patrons.*
- *Provide a satellite telecommute center or offices of 100 to 300 square feet conducive to telecommuters and small businesses within the Village Center.*
- *Provide preferential parking for Low Emission Vehicles (LEVs).*

In addition, compliance with the following measures shall be included within the Final Planned Development with specific criteria and standards to be reviewed and approved by the Planning Commission:

- *Specialty equipment (utility carts, forklifts, etc.) should be electrically, CNG or propane powered.*
- *Use electric lawn and garden equipment for landscaping.*
- *Utilize reflective (or high albedo) and emissive roofs and light colored construction materials to increase the reflectivity of roads, driveways, and other paved surfaces, and include shade trees near buildings to directly shield them from the sun's rays and reduce local air temperature and cooling energy demand.*
- *Provide electric vehicle charging facilities.*
- *Use energy-efficient lighting and process systems, such as low NO_x water heaters, furnaces and boiler units.*
- *Orient building structures and install landscape that takes advantage of passive solar design principles.*

4.5-3(b) *Residential development within the project shall utilize the following mitigation strategies. Compliance with the following measures shall be incorporated within the Final Planned Development with specific criteria and standards to be reviewed and approved by the Planning Commission:*

- *Allow only natural gas fireplaces, pellet stoves or EPA-Certified wood-burning fireplaces or stoves in single-family houses. Conventional open-hearth fireplaces should not be permitted. EPA-Certified fireplaces and fireplace inserts are 75 percent effective in reducing emissions from this source.*

- *Allow only natural gas fireplaces in the multifamily residential portion of the project.*
- *Equip residential structures with electric outlets in the front and rear of the structure to facilitate use of electrical lawn and garden equipment.*
- *Utilize reflective (or high albedo) and emissive roofs and light colored construction materials to increase the reflectivity of roads, driveways, and other paved surfaces, and include shade trees near buildings to directly shield them from the sun's rays and reduce local air temperature and cooling energy demand.*
- *Orient building structures and install landscape that takes advantage of passive solar design principles.*
- *Install solar or on-demand water heaters for at least 25 percent of the residential units in the development.*

Information on the effectiveness of various air quality mitigation measures on actual emissions is not readily available. Where estimates have been made, a wide range is generally provided, indicating that local conditions will have a profound influence on the effectiveness of a given measure. In Davis, most strategies for reducing air pollutants are requirements of development, and the infrastructure for non-auto travel is uniquely available and utilized. The mitigation measures outlined above would be expected to reduce emissions by 5 to 10 percent, which would not reduce project-related regional air quality impacts to a level that is less than significant. Project-generated regional air quality impacts thus would remain *significant and unavoidable* because additional measures are not available to further reduce air quality impacts.

Cumulative Impacts and Mitigation Measures

4.5-4 Long-term air quality impacts from the Proposed Project in combination with existing and future developments in the Davis area.

Proposed Project

The YSAQMD has developed significance criteria for cumulative impacts (YSAQMD, 1996). Development projects are considered cumulatively significant if the following occur:

- The project requires a change in the existing land use designation (i.e., General Plan Amendment), and
- Projected emissions (ROG, NO_x or PM_{10}) of the Proposed Project are greater than the emissions anticipated for the site if developed under the existing land use designation.

The project site is currently under the jurisdiction of Yolo County but is proposed for annexation to the City of Davis. The Davis General Plan designates the project

site as Agriculture. Furthermore, the site is currently used for agricultural purposes. The Proposed Project involves a request for a General Plan Amendment to redesignate the project site in order to accommodate urban development. Because the emissions associated with the Proposed Project would be substantially greater than those generated by existing on-site agricultural uses, which are anticipated for the site in the General Plan, the majority of the emissions shown in Table 4.5-5 have not been anticipated to be generated from the site. Therefore, the project would therefore have a ***significant*** cumulative air quality impact.

High Density Alternative

Because the amount of acreage utilized for the High Density Alternative would be equivalent to that of the Proposed Project, and because the High Density Alternative also involves a General Plan Amendment to redesignate the site from agriculture to urban uses, the Alternative would result in the same cumulative air quality impacts as the Proposed Project. Consequently, the effects of the High Density Alternative would be considered ***significant***.

Mitigation Measure(s)

Implementation of the following mitigation measures would reduce the magnitude of this impact by such measures as reducing the number of employee work trips to and from the project site. However, measures are not available to reduce the above impacts to less-than-significant level. Therefore, the impact would remain *significant and unavoidable.*

The following measures are identified for the Proposed Project and the High Density Alternative.

4.5-4 Implement Mitigation Measures 4.5-3(a) and 4.5-3(b).

Endnotes

[1] Ballanti, Donald. *Air Quality Impact Analysis[1] for the Proposed Covell Village Project, City of Davis.* November 2004.
[2] *City of Davis General Plan*, May 2001.
[3] Yolo-Solano Air Quality Management District, *Air Quality Handbook*, May 1996.
[4] Garza, Vincente J.; Peter Granly; Daniel Sperling, *Transportation Project-Level Carbon Monoxide Protocol*, Institute of Transportation Studies Report UCD-ITS-RR-97-21, 1997.
[5] Jones and Stokes Associates. *Software User's Guide: URBEMIS2002 for Windows with Enhanced Construction Module, Version 7.4*. 2003.
[6] California Air Resources Board, *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles*, October 2000.