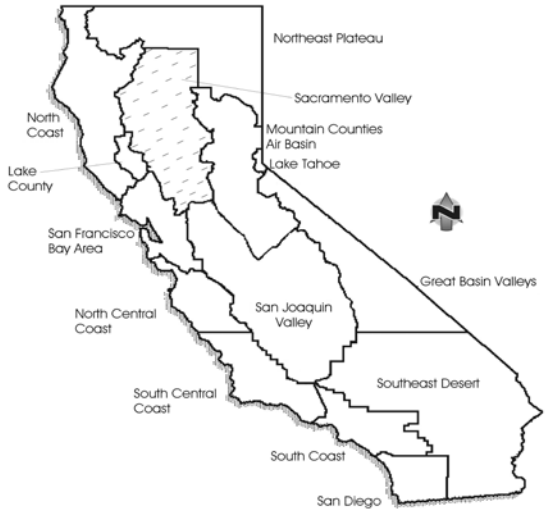

The project is located in the Sacramento Valley Air Basin.

4.6.1 ENVIRONMENTAL ISSUE

This chapter describes the impacts of the proposed project on local and regional air quality. The section was prepared using methodologies and assumptions recommended within the indirect source review guidelines of the Sacramento Metropolitan Air Quality Management District (SMAQMD.) In keeping with these guidelines the chapter describes existing air quality; construction-related impacts, 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.

4.6.2 METHODOLOGY

Donald Ballanti, Certified Consulting Meterologist, prepared an Air Quality Analysis using URBEMIS 7G, Version 3.2.

Project emissions during operation would consist of emissions from mobile and area sources (natural gas combustion, fireplaces, consumer products, etc.). The URBEMIS7G computer program (SJVUAPCD, 1998) was used to calculate emissions from these sources, utilizing parameters appropriate for the Sacramento Metropolitan area. The methodology and assumptions used in calculating emissions are described in **Appendix E**.

Project traffic would add to carbon monoxide concentrations along surface streets in the vicinity of the project site. A screening form of the CALINE-4 computer simulation model was applied to intersections near the project site to predict worst-case concentrations of carbon monoxide at project buildout. The analysis assumed a year 2005 buildout date for the project. The methodology and assumptions used in the analysis are described in **Appendix E**.

4.6.3 SIGNIFICANCE CRITERIA

Attainment Status and Regional Air Quality Plans

Federal and state air quality laws require identification of areas not meeting the ambient air quality standards. These areas must develop regional air quality plans to eventually attain the standards. Under the federal Clean Air Act, Sacramento County is a nonattainment area (standards have not been attained) for ozone. The County is either attainment or unclassified for other federal standards. Under the California Clean Air Act, Sacramento County is a nonattainment area for ozone and PM_{10}.

The SMAQMD is the local air quality agency and is responsible for preparing regional air quality plans

under the state and federal Clean Air Acts. The current regional plan addresses ozone and identifies strategies for progressive reduction in emissions of ozone precursors. In addition to planning responsibilities, the SMAQMD has permitting authority over stationary sources of pollutants. Authority over mobile sources of pollutants is given to the California Air Resources Board (CARB).

The California Legislature, when it passed the California Clean Air Act in 1988, recognized the relative intractability of the PM_{10} problem and excluded it from the basic planning requirements of the Act. The Act did require the CARB to prepare a report to the Legislature regarding the prospect of achieving the State ambient air quality standard for PM_{10}. This report recommended a menu of actions, but did not recommend imposing a planning process similar to that for ozone or other pollutants for achievement of the standard within a certain period of time.

Draft General Plan

Goal 52: Protect and improve air quality in the Citrus Heights area to the maximum extent possible.

Policies:

52.1 Promote measures that improve air quality and help meet air quality attainment standards.

52.2 Minimize the impacts of vehicle emissions on air quality.

52.3 Promote use of clean alternative fuel vehicles and construction equipment.

52.4 Enable use of electric (rather than gasoline-powered) equipment and natural gas appliances, including outdoor grills.

Goal 53: Integrate air quality planning with land use and transportation planning

Policies:

53.1 Encourage alternative modes of transportation and trip-reducing strategies such as telecommuting and mixed-use development.

53.2 Participate in educational efforts aimed at improving air quality, such as notifying residents and businesses during "Spare the Air" days designated by the Sacramento Air Quality Management District.

Standards of Significance

For the purposes of this study a significant impact on <u>local</u> air quality is defined as:

- A predicted violation of the carbon monoxide ambient air quality standards due to project traffic on the local street network.

- The potential to frequently expose members of the public to objectionable odors.

A significant impact on regional air quality is defined in this analysis as:

- An increase in emissions of an ozone precursor or PM_{10} exceeding the SMAQMD's recommended thresholds of significance. The District considers increases in emissions, during construction or operation of the project, of 85 pounds per day of either ozone precursor or 275 pounds per day of PM_{10} to represent a significant adverse impact (SMAQMD, 1994).

4.6.4 EXISTING SETTING

Air Pollution Climatology

The project site lies in the southern portion of the Sacramento Valley, a broad, flat valley bounded by the coastal ranges to the west and the Sierra Nevada to the east. A sea level gap in the Coast Range-- the Carquinez Strait -- is located about 50 miles southwest and the intervening terrain is very flat. The prevailing wind direction is southwesterly, which is the wind direction when marine breezes flow through the Carquinez Strait. Marine breezes dominate during the spring and summer months, and show a strong daily variation. Highest average windspeeds occur in the afternoon and evening hours; lightest winds occur in the night and morning hours. During fall and winter, when the sea breeze diminishes, northerly winds occur more frequently, but southwesterly winds still predominate.

The project is within the SMAQMD, which is part of the Sacramento Valley Air Basin. The San Francisco Bay Area Air Basin lies to the west, and the San Joaquin Valley Air Basin is located to the south. Considerable transport of pollutants occurs between these air basins, so that air quality in Sacramento County is partially determined by the release of pollutants elsewhere. In turn, pollutants generated in Sacramento County affect air quality in areas to the north and east.

Air Pollutants and Ambient Air Quality Standards

Both the U. S. Environmental Protection Agency and the CARB have established ambient air quality standards for common pollutants. These ambient air quality standards 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 California state ambient air quality standards are summarized in **Table 4.6-1**. The federal and state ambient standards were developed independently with differing purposes and methods, although both processes attempted to avoid health-related effects. As a result, the federal and state standards differ in some cases. In general, the California state standards are more stringent. This is particularly true for ozone and PM_{10}.

Table 4.6-1
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 PPM 35 PPM	9.0 PPM 20.0 PPM
Nitrogen Dioxide	Annual Average 1-Hour	0.05 PPM --	-- 0.25 PPM
Sulfur Dioxide	Annual Average 24-Hour 1-Hour	0.03 PPM 0.14 PPM --	-- 0.05 PPM 0.25 PPM
PM_{10}	Annual Average 24-Hour	50 µg/m^3 150 µg/m^3	30 µg/m^3 50 µg/m^3
$PM_{2.5}$	Annual 24-Hour	15 µg/m^3 65 µg/m^3	-- --

PPM = Parts per Million
µg/m^3 = Micrograms per Cubic Meter
Source: California Air Resources Board, California Air Quality Data, Annual Summary, Vol. XXIX, 1998.

The U.S. Environmental Protection Agency (EPA) in 1997 adopted new national air quality standards for ground-level ozone and for fine Particulate Matter. The existing one-hour ozone standard of 0.12 PPM will be phased out and replaced by an eight-hour standard of 0.08 PPM. New national standards for fine Particulate Matter (diameter 2.5 microns or less) have also been established for 24-hour and annual averaging periods. The current PM_{10} standards were retained, but the method and form for determining compliance with the standards were revised.

Implementation of the new ozone and Particulate Matter standards has been complicated by a recent lawsuit. On May 14, 1999 the Court of Appeals for the District of Columbia Circuit issued a decision ruled that the Clean Air Act as applied in setting the new public health standards for ozone and particulate matter, was unconstitutional as an improper delegation of legislative authority to the EPA. The decision has been appealed to the Supreme Court, and the legal status of the new standards will probably remain uncertain for some time.

The most problematic pollutants in Sacramento County are ozone and particulate matter. The health effects and major sources of these pollutants are described below:

Ozone. Ozone is the most prevalent of a class of photochemical oxidants formed in the urban atmosphere. The creation of ozone is a result of a complex chemical reactions between hydrocarbons and oxides of nitrogen in the presence of sunshine. Unlike other pollutants, ozone is not released directly into the atmosphere from any sources. The major sources of oxides of nitrogen and reactive hydrocarbons, known as ozone precursors, are combustion sources such as factories and automobiles, and evaporation of solvents and fuels.

The health effects of ozone are eye irritation and damage to lung tissues. Ozone also damages some materials such as rubber, and may damage plants and crops.

Particulate Matter. Particulate matter consists of solid and liquid particles of dust, soot, aerosols and other matter that are small enough to remain suspended in the air for a long period of time. A portion of the particulate matter in the air is due to natural sources such as wind blown dust and pollen. Man-made sources include combustion, automobiles, field burning, factories and road dust. A portion of the particulate matter in the atmosphere is also a result of photochemical processes.

The effects of high concentrations on humans include aggravation of chronic disease and heart/lung disease symptoms. Non-health effects include reduced visibility and soiling of surfaces.

Current Air Quality

The SMAQMD maintains several air quality monitoring sites in the Sacramento area, although none are located in Citrus Heights. The closest monitoring sites to the project site are located in Folsom, several miles to the east, and North Highlands, several miles to the west. Both of these monitoring sites measure multiple pollutants. A summary of air quality data from these two monitoring sites is shown in **Table 4.6-1**. Most of the standards shown in **Table 4.6-2** are met in at these sites with the exception of ozone (state and national) and PM_{10} (state 24-hour and annual).

Sensitive Receptors

Sensitive receptors are facilities where sensitive population groups (children, the elderly, the acutely ill and the chronically ill) are likely to locate. These land uses include schools, playgrounds, childcare centers, retirement homes, convalescent homes, hospitals and medical clinics. There are three such sensitive receptors adjacent the project site to the southeast: Manor Care Health Alzheimer's care facility, Vintage Oaks Senior Apartments and Merrill Gardens senior care facility.

4.6.6 PROJECT IMPACTS AND MITIGATION MEASURES

Construction Impacts

Impact 4.6.1 Construction activities such as excavation and grading operations, construction vehicle traffic and wind blowing over exposed earth would generate exhaust emissions and fugitive particulate matter emissions that would affect local air quality at various times during the build-out period of the project. This impact is considered potentially significant. *Note: This impact can be mitigated to an acceptable level. See discussion below.*

Project-related air quality impacts fall into two categories: short term impacts due to construction, and long term impacts due to project operation. SMAQMD guidance documents differentiate between clearing, grading, trenching, etc. (i.e. Phase I construction activities) and structure construction (i.e. Phase II) activities and air pollutant sources. **Table 4.6-3** shows calculated emissions for project Phase I and Phase II activities assuming a five-year buildout of the project site.

Table 4.6-2
Ambient Air Quality

Pollutant/Standard	Year	Exceedances At North Highlands Monitoring Site	Exceedances At Folsom Monitoring Site
Ozone/State 1 Hour	1997	3	19
	1998	13	31
	1999	11	22
Ozone/Fed. 1 Hour	1997	0	1
	1998	3	10
	1999	0	4
Carbon Monoxide/ State-Fed 8-Hour	1997	0	-
	1998	0	-
	1999	0	-
Nitrogen Dioxide/State 1 Hour	1997	0	0
	1998	0	0
	1999	0	0
Sulfur Dioxide	1997	0	-
	1998	0	-
	1999	0	-
PM_{10}/State 24-Hour	1997	1	-
	1998	2	-
	1999	4	-
PM_{10}/Federal 24-Hour	1997	0	-
	1998	0	-
	1999	0	-

Source: California Air Resources Board, California Air Quality Data, Annual Summary, Vol. XXIX, 1998.

Table 4.6-3
Estimated Maximum Daily Emissions from Construction, in Pounds Per Day

Source	ROG	NO_x	PM_{10}
Clearing, Grading and Earthmoving (Phase I)			
Equipment	4.9	31.0	5.4
Fugitive Dust	--	--	1177.6
Total	4.9	31.0	1183.0
Structure Construction (Phase II)			
Employee Trips	2.1	1.6	0.2
Asphalt Paving	10.2	--	--
Stationary Equipment	8.4	6.9	0.4
Mobile Equipment	8.0	80.5	6.0
Architectural Coatings	32.8	--	--
Total	61.5	89.0	6.6
SMAQMD Significance Threshold	**85.0**	**85.0**	**275.0**

ROG = Reactive Organic Gases
NO_x = Nitrogen Oxides
PM_{10} = Particulate Matter, 10 Microns
Source: Donald Ballanti, Certified Consulting Meteorologist

Emissions in Phase I of construction are associated with heavy equipment. Emissions occur both from equipment exhaust and fugitive dust from the disturbed soil surface. Emissions in Phase II of construction are primarily associated with construction employee commute vehicles, asphalt paving, mobile equipment, stationary equipment, and architectural coatings. SMAQMD guidance provides a methodology for estimating emissions during each phase of construction, and a methodology for calculating the mitigation effect of certain construction practices in reducing impacts (SMAQMD, 1994).

Although the SMAQMD guidance document differentiates between construction into two phases, development within the project area may be proceeding on several individual sites at the same time with overlapping between the two phases of construction. The Phase I and Phase II emissions shown in **Table 4.6-3** may be additive at times during buildout of the project. When this occurs estimated emissions of ROG, NO_x and PM_{10} would exceed the SMAQMD thresholds, so this would be a significant impact.

Construction activities would be subject to SMAQMD Rule 403 that requires taking reasonable precautions to prevent the emissions of fugitive dust, such as using water or chemicals for control of dust in the demolition of existing buildings or structures, construction operations, the construction of roadways, or the clearing of land where possible and applying asphalt, oil, water, or suitable chemicals on dirt roads, materials, stockpiles and other surfaces which can give rise to airborne dust.

Mitigation Measures

MM 4.6.1a Conditions of approval shall require the implementation of the following mitigation measures for control of PM_{10}/dust during the construction of all components of the proposed project:

- Water exposed surfaces, graded areas, storage piles and haul roads at least twice daily.
- Minimize the amount of disturbed area, the amount of material actively worked, and the amount of material stockpiled.
- Limit onsite construction vehicles to 15 mph.
- Sweep or wash paved streets adjacent to construction sites at least once a day to remove accumulated dust.
- Maintain at least two feet freeboard when transporting soil or other material by truck.

Responsible for Implementation:	Applicant/Developer
Responsibility for Monitoring:	City of Citrus Heights Building Department
Timing:	During clearing, grading, and construction.

MM 4.6.1b All construction contracts will require designation of a dust control coordinator. All neighboring properties within the standard noticing area will be provided with the name and phone number of a designated construction dust control coordinator

who will respond to complaints by suspending dust-producing activities or providing additional personnel or equipment for dust control.

Responsible for Implementation:	Applicant/Developer
Responsibility for Monitoring:	City of Citrus Heights Building Department
Timing:	During clearing, grading, and construction.

MM 4.6.1c Conditions of approval shall require the implementation of the following mitigation measures for control of ozone precursors during the construction of any component of the proposed project:

- Encourage construction employees to use means other than single-occupancy vehicles to commute to the work site.
- All stationary and mobile construction equipment will be operated and maintained in proper running order though routine tune-ups. NO_x emissions from stationary and mobile construction equipment will be reduced by 5 percent.
- Use alternative fuel or electric powered equipment where feasible.
- Use diesel engines that meet the most recent emission standards.

Responsible for Implementation:	Applicant/Contractors
Responsibility for Monitoring:	Building Department
Timing:	Prior to and during construction

The above measures would substantially reduce construction-phase emissions of PM_{10}. Such measures would normally reduce construction impacts to a **less than significant** level.

Regional Air Quality Impacts from Project Uses

Impact 4.6.2 Project-related emissions of ozone precursors and PM_{10} would exceed the SMAQMD's thresholds of significance. This would be a significant and unavoidable impact.

Total emissions of criteria pollutants associated with the project are shown in **Table 4.6-4** for the two ozone precursors (reactive organic gases and nitrogen oxides) and PM_{10}. Project emissions of ROG and NO_x exceed the SMAQMD's significance threshold of 85 pounds per day. Based on this criterion, the project would have a significant impact on regional ozone air quality.

Table 4.6-4
Project Regional Emissions at Buildout, in Pounds Per Day

	ROG	NO_X	PM_{10}
Scenario 1 – 385,000 sq. ft.			
Vehicles	174.9	345.9	128.7
Area Sources	0.9	12.1	0.1
Total	175.8	358.0	128.8
Scenario 2 – 450,000 sq. ft.			
Vehicles	185.4	366.2	137.4
Area Sources	1.0	12.7	0.1
Total	186.4	178.9	137.5
SCAQMD Threshold of Significance	85.0	85.0	275.0

ROG = Reactive Organic Gases
NO_x = Nitrogen Oxides
PM_{10} = Particulate Matter, 10 Microns
Source: Donald Ballanti, Certified Consulting Meteorologist, 2000

The proposed project incorporates features that increase opportunities for non-auto travel. The proposed project is an infill development providing residential uses in close proximity to neighborhood commercial and existing government facilities. These characteristics provide opportunity for a higher internal and non-auto travel mode percentages compared to typical suburban residential or commercial development.

Mitigation Measures

MM 4.6.2a The following mitigation measures shall be implemented to reduce project impacts on a regional scale by reducing automobile travel or reducing direct emissions from residences:

- Develop a bikeway and pedestrian trail system along major roadways and through open space areas to connect residences to proposed and existing commercial areas near the project.
- Residential garages shall have electrical service that would allow installation of electric car recharge outlets at a later date.
- Wire each housing unit to allow use of emerging electronic communication technology.
- Implement feasible travel demand management (TDM) measures for a project of this type. This would include a ride-matching program for commuters and a public education program to inform residents of ridesharing and transit opportunities.

- Open-hearth fireplaces are prohibited. Require residential use of EPA-certified woodstoves, pellet stoves or fireplace inserts. EPA-certified fireplaces and fireplace inserts are 70 to 90 percent effective in reducing emissions from this source.

- Outdoor outlets shall be installed at residences to allow use of electrical lawn and landscape maintenance equipment.

- Natural gas shall be available in residential backyards to allow use of natural gas-fired barbecues.

- Electrical or alternatively fueled (e.g. Propane, CNG, methanol) equipment should be used by the City or any other entity for maintenance of the area under its jurisdiction.

Responsible for Implementation: Applicant/Developers
Responsibility for Monitoring: City of Citrus Heights Building Department
Timing: Review plans at time of building permit submittal.

MM 4.6.2b The commercial portions of the site will be developed under a Transportation Demand Management (TDM) program. The TDM program shall, at a minimum, include the following components:

- Designation of an on-site TDM coordinator.

- Provisions to encourage bicycle commuting.

- Provision of transit use incentives, provision of information, printed schedules and commuter promotions.

- Carpool incentives.

- Installation of secure bicycle parking facilities at commercial areas and parks.

Responsibility for Implementation: Applicant/Developers
Responsibility for Monitoring: Planning Department
Timing: Prior to issuance of occupancy permit.

The above design features and regional air quality mitigations described below can be expected to provide a 15 percent reduction in emissions. The above measures would not, however provide the 77 percent reduction necessary to bring operational emissions of ROG and NO_x to below the SMAQMD thresholds. New emissions from project traffic would represent a **significant impact** after mitigation.

Project Generated CO Impacts.

Impact 4.6-3 Traffic generated by the project would increase local carbon monoxide concentrations. *This is a less-than-significant impact, and does not require mitigation.*

Table 4.6-5 shows predicted concentrations of carbon monoxide near selected intersections. Concentrations are predicted for existing conditions and for the year 2005 under no project, and project conditions. Between 2000 and 2005 levels of carbon monoxide are expected to decrease as the average rate of emission from vehicles declines as older, more polluting vehicles are replaced with newer, cleaner vehicles. The proposed project would increase 1-hour averaged concentrations by up to 1.3 PPM and eight-hour averaged concentrations by up to 0.9 PPM. Predicted concentrations do not exceed the state/federal ambient air quality standards in any of the scenarios.

Table 4.6-5
Worst Case Carbon Monoxide Concentrations at Selected Intersections (PPM)

Intersection	Existing (2000)		No Project (2005)		Project (2005)	
	1-Hr	8-Hr	1-Hr	8-Hr	1-Hr	8-Hr
Greenback/ San Juan	11.6	8.1	8.3	5.8	9.0	6.3
Greenback/ Fountain Square	11.0	7.7	7.8	5.5	8.1	5.7
Auburn/ Sylvan	11.2	7.8	7.9	5.5	9.2	6.4
Auburn/ Van Maren Lane	10.6	7.5	7.4	5.2	8.3	5.8
Stock Ranch/ Sylvan	9.4	6.6	6.8	4.7	7.6	5.3
Most Stringent Standard	20.0	9.0	20.0	9.0	20.0	9.0

Source: Donald Ballanti, Certified Consulting Meteorologist, 2000

The concentrations in **Table 4.6-5** are based on worst-case meteorology, traffic and location assumptions. Concentrations and project impacts at other locations and under more typical meteorological conditions would be less than those shown. Project and cumulative impacts on local carbon monoxide concentrations are considered **less than significant**.

4.6.7 CUMULATIVE IMPACTS

Impact 4.6-3 Traffic generated by the project would increase cumulative local carbon monoxide concentrations. *This is a less-than-significant impact, and does not require mitigation.*

Table 4.6-6 shows predicted concentrations of carbon monoxide near selected intersections under cumulative conditions. Similar to project and no project conditions shown in **Table 4.6-5**, levels of

carbon monoxide are expected to decrease as the average rate of emission from vehicles declines in conjunction with the increase in cleaner vehicles between 2000 and 2005. Therefore, predicted cumulative carbon monoxide concentrations do not exceed the state/federal ambient air quality standards.

Table 4.6-6
Cumulative Worst Case Carbon Monoxide Concentrations at Selected Intersections (PPM)

Intersection	Existing (2000) 1-Hr	Existing (2000) 8-Hr	Cumulative + Project (2005) 1-Hr	Cumulative + Project (2005) 8-Hr
Greenback/San Juan	11.6	8.1	10.3	7.2
Greenback/Fountain Square	11.0	7.7	8.7	6.1
Auburn/Sylvan	11.2	7.8	9.1	6.4
Auburn/Van Maren Lane	10.6	7.5	8.4	5.9
Stock Ranch/Sylvan	9.4	6.6	8.3	5.8
Most Stringent Standard	20.0	9.0	20.0	9.0

Source: Donald Ballanti, Certified Consulting Meteorologist, 2000

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