

3.16 Air Resources

3.16.1 Existing Air Resources

The Legacy Ridge project is in Orange County which is classified as being in a non-attainment area for 1-hour ozone by the USEPA.¹⁰⁶ This means that the area fails to meet the national ambient air quality standard for 1-hour Ozone.¹⁰⁷ The National Ambient Air Quality Standard (NAAQS) for ozone is 0.12 ppm (1-hr average) and 0.08 ppm (8-hr average). Ozone is the major component of smog. Although ozone in the upper atmosphere is beneficial because it shields the earth from the sun's harmful ultraviolet radiation, high concentrations of ozone at ground level are a major health and environmental concern. The reactivity of ozone causes health problems because it damages lung tissue, reduces lung function and sensitizes the lungs to other irritants. Scientific evidence indicates that ambient levels of ozone not only affect people with impaired respiratory systems, such as asthmatics, but healthy adults and children as well. Exposure to ozone for several hours at relatively low concentrations has been found to significantly reduce lung function and induce respiratory inflammation in normal, healthy people during exercise.

Ozone is not usually emitted directly but is formed through complex chemical reactions in the atmosphere. Precursor compounds like volatile organic compounds (VOC) and oxides of nitrogen (NOx) react to form ozone in the presence of sunlight. These reactions are stimulated by ultraviolet radiation and temperature, so peak ozone levels typically occur during the warmer times of the day and year.

Particulate matter (PM) is a mixture of particles that can adversely effect human health, damage materials and form atmospheric haze that degrades visibility. PM is usually divided up into different classes based on size, ranging from total suspended matter (TSP) to PM-10 (particles less than 10 microns in aerodynamic diameter) to PM-2.5 (particles less than 2.5 microns). In general, the smallest particles pose the highest human health risks. PM exposure can affect breathing, aggravate existing respiratory and cardiovascular disease, alter the body's defense systems against foreign materials, and damage lung tissue, contributing to cancer and premature death. Individuals with chronic obstructive pulmonary or cardiovascular disease, asthmatics, the elderly and children are most sensitive to the effects of PM.

Particulate matter (PM) includes dust, dirt, soot, smoke and liquid droplets directly emitted into the air by sources such as factories, power plants, cars, construction activity, fires and natural windblown dust. Particles formed in the atmosphere by condensation or the transformation of emitted gases such as SO₂ and volatile organic compounds (VOCs) are also considered particulate matter. The PM₁₀ NAAQS is 50 ug/m³ (annual mean) and 150 ug/m³ (24-hr average) and PM_{2.5} NAAQS: 15 ug/m³ (annual mean) and 65ug/m³ (24-hr average).

¹⁰⁶ <http://www.epa.gov/oar/oaqps/greenbk/onca.html>.

¹⁰⁷ http://www.scorecard.org/community/cmy-cap_psi.tcl?fips_county_code=36071&name=ORANGE&zip_code=10930

3.16.2 Potential Impacts to Air Resources

Potential air quality impacts would come from construction activities on the project site through the generation of fugitive dust. Fugitive (airborne) dust is generated during ground clearing and grading activities as earthmoving equipment modifies the landform to its final elevation. Throughout the construction period, passage of delivery trucks and other vehicles over temporary dirt roads and other exposed soil surfaces also generates fugitive dust.

Upon complete development and inhabitation of the houses, increased motor vehicle usage is expected. However, the proposed development represents a modest projected increase of between 6.5% and 8.5% more vehicles during the peak hours at the nearby major intersections of Route 32 and Trout Brook and Route 32 and Smith Clove Road. The Route 32/Trout Brook intersection only shows additional vehicle delay of an additional 5 seconds during the morning peak, and less than 15 seconds during the evening peak hour. The Route 32 Smith Clove Road intersection is already signalized, and delays at this intersection only increase an average of 5 seconds during the morning peak hour, and 25 seconds during the evening peak hour. Therefore, the project is not likely to have a significant impact on the ability of the region to attain and maintain ground level ozone standards, and a significant deterioration in air quality (ozone and carbon monoxide) is unlikely given the limited nature of increased traffic delays.

3.16.3 Air Resources Mitigation Measures

During construction, dust would be generated as a result of vehicle movement on unpaved areas and disturbance of surface soils during excavation for internal roads and building foundations. Mitigation measures to avoid impacts on air quality during construction are principally designed to prevent blowing of dust off-site. The majority of soil dust emissions are expected to settle out within a few feet of the area of disturbance. Smaller dust particles may, however, become airborne for longer periods of time and, depending on wind velocity and turbulence could be carried off-site. The following measures will be undertaken to avoid blowing of dust off-site:

- Maintenance of the forest and brush cover found at the property boundary as the screen to trap fugitive dust emissions and prevent off-site release.
- Placement of all removed topsoil into a topsoil storage area which would be seeded with quick cover vegetation to prevent erosion.
- Grading and graveling of all roadways along with periodic regading, compacting and replacement of gravel as needed.
- Wetting of the roadways with water daily.
- Maintenance of a maximum on-site speed limit of 15 mph to minimize pulverization and lifting of surface soil in the air-current wake of heavy equipment.
- Providing base course of pavement on road sections as early in the process as feasible

- Upon completion of building construction, upgrading all roads with pavement and drainage structures.
- Strict adherence to the erosion control plan established for this project

It should be noted that vegetation and trees would remain around the perimeter of the property and would continue to retain dust particles generated as a result of occupancy of the site.

The Legacy Ridge project is located in the New York Metropolitan Area which has additional New York State Department of Environmental Conservation programs for reducing air pollution from vehicles which includes: The sale of fuels that burn cleaner - oxygenated fuels (used in some parts of the state), reformulated gasoline (RFG, used in the NY Metropolitan Area) and less volatile fuels (used seasonally in the warmer months).

- At gasoline pumps - using special nozzles that recover vapors before they can be released to the air.
- An enhanced inspection and maintenance program (I/M) for the NY Metropolitan Area - vehicles, in the downstate area with the most severe air pollution, will undergo more comprehensive emissions testing. For the upstate area, vehicles' pollution control components will be checked during regular safety inspections.¹⁰⁸

Despite projected increases in traffic volumes at the studied intersections, vehicle related carbon monoxide emissions are projected to decrease over time as outlined in USEPA Office of Mobile Sources document # EPA 400-F-92-005, Automobiles and Carbon Monoxide.¹⁰⁹

The EPA motor vehicle program has achieved considerable success in reducing carbon monoxide emissions. EPA standards in the early 1970's prompted automakers to improve basic engine design. By 1975, most new cars were equipped with catalytic converters designed to convert carbon monoxide to carbon dioxide. Catalysts typically reduce carbon monoxide emissions upwards of 80 percent. In the early 1980's, automakers introduced more sophisticated converters, plus onboard computers and oxygen sensors to help optimize the efficiency of the catalytic converter. Today's passenger cars are capable of emitting 90 percent less carbon monoxide over their lifetimes than their uncontrolled counterparts of the 1960's. As a result, ambient carbon monoxide levels have dropped, despite large increases in the number of vehicles on the road and the number of miles they travel.

The decrease in emissions is the result of strict regulation requiring emission control devices (catalytic converters) on all new vehicles to meet mandated air quality levels. These regulations will remain in effect; therefore, total vehicle emissions would steadily decline.

¹⁰⁸ <http://www.dec.state.ny.us/website/dar/beim/factsht1.html>.

¹⁰⁹ <http://www.epa.gov/otaq/consumer/03-co.pdf>.

Alternative Plans

Preferred Plan

The current plan will generate 287 houses with a total of 1,166 residents. The total residents include 285 school children (K-HS) and an additional amount of children below school age.

R-3A Zoning

The 3 acre zoning plan will generate 162 houses with a total of 658 residents. The total residents include approximately 154 school children (K-HS) and an additional number of children below school age. Development under this plan will potentially have 45% fewer adults and presumably fewer motor vehicles than the preferred plan, and therefore less vehicle emission.

Significant, however, is that the site would include more tree clearing than the preferred plan (214.12 acres vs. 195.49 acres in the preferred plan). The removal of mature vegetative cover both increases the likelihood that particulate matter will be blown off-site during construction, and decreases the beneficial impact of additional trees on the site.

Under the R-3A cluster plan, less deciduous forest would be removed than under the conventional plan, with 227.5 acres vs. 214.12 acres.

R2-A Conventional Zoning

The 2 acre conventional zoning plan will generate 233 houses with a total of 946 residents. The total residents include approximately 231 school children (K-HS) and an additional number of children below school age. This plan will potentially have fewer motor vehicles than the other plans, and presumably less vehicle emission. Development under this plan would potentially have approximately 15% fewer adults and presumably fewer motor vehicles than the preferred plan, and therefore less emission.

Significant, however, is that the site would include more tree clearing than the preferred plan (343.78 acres vs. 195.49 acres). The removal of mature vegetative cover both increases the likelihood that particulate matter will be blown off-site during construction, and decreases the beneficial impact of additional trees on the site.

Under the R-2A cluster plan, less deciduous forest would be removed than under the conventional plan, with 157.99 acres vs. 343.78.