4.7 AIR QUALITY

4.7 AIR QUALITY

INTRODUCTION

This section examines potential impacts on air quality associated with implementation of the CCRMP and project alternatives. The main issues addressed within this section include:

- potential emission of particulates (PM-10);
- potential emission of ozone precursors (ROG and NOx); and
- effects on attainment of state and federal air quality standards.

The following air quality setting is based on documents prepared by the Yolo-Solano Air Quality Management District (YSAQMD), United States Environmental Protection Agency (EPA) and the California Air Resources Board (CARB).

SETTING

Description of Regional Environment

The primary factors that determine air quality are the location of air pollutant sources and the amounts of pollutants emitted. Meteorological and topographical conditions, however, are also important. Atmospheric conditions such as wind speed, wind direction, and air temperature gradients interact with the physical features of the landscape to determine the movement and dispersal of air pollutants.

The planning area lies in the southern portions 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 to the southwest, and the intervening terrain is very flat. The prevailing wind direction is southerly, 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 southerly winds still predominate.

Like most areas of California, the planning area is subject to inversions (layers of very stable air) that can trap pollutants near the ground. This is most likely to occur during the winter months when radiational cooling during the night results in a ground-based inversion. Such inversions usually dissipate a few hours after the sun rises, but under certain conditions may remain throughout the day.

The CCRMP area is within the Yolo-Solano Air Quality Management District (AQMD), which is part of the Sacramento Valley Air Basin. The Yolo-Solano AQMD is comprised of Yolo County and the eastern half of Solano County. 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 Yolo County is partially determined by the release of pollutants elsewhere. In turn, pollutants generated in Yolo County affect air quality in areas to the north and east.

Description of Local Environment

The CCRMP area encompasses about 14.5 miles of the Cache Creek basin, from Capay Dam to the town of Yolo. This area is primarily farmland interspersed with aggregate processing operations along the creek bed. Unincorporated towns in the vicinity include Capay, Esparto, Madison and Yolo. The nearest city is Woodland, the county seat, located about 3 miles southeast of Cache Creek.

Major air pollutant sources in the planning area include vehicles traveling on U. S. Interstates 5 and 505, State Highway 16 and various county roads, agricultural activities and existing aggregate processing plants. Estimated existing annual emissions from aggregate processing plants are shown in Table 4.7-3. These estimates are based on YSAQMD permit information, adjusted to 1995 production levels. Fugitive emissions, on-site vehicle exhausts, and on-site truck/employee vehicle exhausts were estimated independently, since these emission sources are not included in the YSAQMD emission calculations.

These plants all operate under permits issued by the YSAQMD. These plants are considered to utilize Best Available Control Technology (BACT), and have not been the subject of recent complaints or permit violations within the last few years.[1]

The closest air monitoring location to the project site is located in Woodland at 40 Sutter Street. This monitoring site, operated by the Yolo-Solano Air Quality Management District, measures levels of ozone and PM-10. During the 5 year period 1989-1993 no violations of the federal ozone or PM-10 standards were recorded at Woodland. The more stringent state ozone standard was exceeded from 1 to 9 days per year during this period, while the more stringent state PM-10 standard was exceeded from 7 to 16 days during this period.

The term "sensitive receptor" is often applied to facilities likely to be used by the elderly, children, infirm, or persons with particular sensitivity to air pollutants. Examples are hospitals, schools and convalescent homes. There are two sensitive receptors located along roadways serving the planning area:

- Esparto High School (adjacent to SR 16 in Esparto); and
- Madison Migrant Center Daycare (adjacent SR 16 east of Road 89).

[1] Steve Speckert, Air Pollution Engineer, Yolo-Solano AQMD, telephone conversion with Donald Ballanti, January 18, 1996.

REGULATORY FRAMEWORK

Air Quality Standards

Both the U. S. Environmental Protection Agency and the California Air Resources Board have established ambient air quality standards for common pollutants. These standards 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. Table 4.7-1 identifies the major criteria pollutants, their characteristics, health effects and typical sources.

The federal and California state ambient air quality standards are summarized in Table 4.7-2 for important criteria pollutants. The federal and state ambient standards were developed independently with differing purposes and methods, although both processes attempted to limit 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 suspended particulate matter (PM-10).

Current Air Quality

The Yolo-Solano Air Quality Management District (YSAQMD) and the California Air Resources Board (CARB) maintain several air quality monitoring sites in Yolo County. Currently the CARB monitors ozone levels in Davis, while the YSAQMD monitors PM-10 levels in West Sacramento. Prior to 1991, the YSAQMD also monitored ozone levels in Broderick and Woodland, carbon monoxide levels in Woodland, and PM-10 levels in Woodland.

During the 5-year period of 1989-1993, exceedances were recorded in Yolo County for the state/federal ozone standards and state PM-10 standards. Both pollutants are considered regional problems affecting the entire Sacramento Valley Air Basin. All other standards were met during this time.

Regional Air Quality Programs

The federal Clean Air Act of 1970 (as amended) and the California Clean Air Act of 1988 require that the State Air Resources Board, based on air quality monitoring data, designate portions of the state as "nonattainment areas" where the federal or state ambient air quality standards are not met. Because of the differences between the national and state standards, the designation of nonattainment areas varies under the federal and state programs.

Table 4.7-1: Major Criteria Pollutants

Pollutant	Characteristics	Health Effects	Major Sources
Ozone	A highly reactive photochemical pollutant created by the action of sunshine on ozone precursors (primarily reactive hydrocarbons and oxides of nitrogen. Often called photochemical smog.	• Eye Irritation • Respiratory function impairment.	The major sources ozone precursors are combustion sources such as factories and automobiles, and evaporation of solvents and fuels.
Carbon Monoxide	Carbon monoxide is an odorless, colorless gas that is highly toxic. It is formed by the incomplete combustion of fuels.	• Impairment of oxygen transport in the bloodstream. • Aggravation of cardiovascular disease. • Fatigue, headache, confusion, dizziness. • Can be fatal in the case of very high concentrations.	Automobile exhaust, combustion of fuels, combustion of wood in woodstoves and fireplaces.
Nitrogen Dioxide	Reddish-brown gas that discolors the air; formed during combustion.	• Increased risk of acute and chronic respiratory disease.	Automobile and diesel truck exhaust, industrial processes, fossil-fueled power plants.
Sulfur Dioxide	Sulfur dioxide is a colorless gas with a pungent, irritating odor.	• Aggravation of chronic obstruction lung disease. • Increased risk of acute and chronic respiratory disease.	Diesel vehicle exhaust, oil-powered power plants, industrial processes.
PM-10	Solid and liquid particles of dust, soot, aerosols and other matter which are small enough to remain suspended in the air for a long period of time.	• Aggravation of chronic disease and heart/lung disease symptoms.	Combustion, automobiles, field burning, factories and unpaved roads. Also a result of photochemical processes.

Table 4.7-2: Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Primary Standard	State Standard
Ozone	1-Hour	0.12 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 Average 1-Hour	0.05 PPM --	-- 0.25 PPM
Sulfur Dioxide	Annual Average 24-Hour 1-Hour	0.03 PPM 0.14 PPM --	-- 0.04 PPM 0.25 PPM
PM-10	Annual Average 24-Hour	50 $\mu g/m^3$ 150 $\mu g/m^3$	30 $\mu g/m^3$ 50 $\mu g/m^3$
Lead	30-Day Avg. Month Avg.	-- 1.5 $\mu g/m^3$	1.5 $\mu g/m^3$ --

PPM = Parts per Million
$\mu g/m^3$ = Micrograms per Cubic Meter

Under the federal Clean Air Act Yolo County is designated a "severe nonattainment" area for the federal ozone standard, and "attainment" or "unclassified" for other pollutants. Under the California Clean Air Act the county is a "serious nonattainment" area for the state ozone standard, and is also considered "nonattainment" for the state PM-10 standard.

Authority for air quality planning is divided. Local air pollution control districts have full regulatory authority for achieving the state standards, while the designated Metropolitan Planning Organization (in this case Sacramento Council of Governments) has air quality planning responsibility under the federal law.

The current regional air quality plan for Yolo County is the Yolo-Solano Air Quality Management District's Air Quality Attainment Plan.[2] Although the District is "nonattainment" for both ozone and PM-10, the AQAP focusses on ozone. The goal of the AQAP is to establish controls that reduce mobile and stationary source emissions through three programs:

[2] Yolo-Solano Air Quality Management District, *Air Quality Attainment Plan*, 1992.

- Public Education Program;
- Mobile Source Control Program; and
- Stationary Source Control Program.

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.

YSAQMD Rules and Regulations

The Yolo-Solano Air Quality Management District (YSAQMD) is the primary agency responsible for protecting human health and property from the harmful effects of air pollution within the boundaries of the District (all of Yolo County and the northeastern half of Solano County). The District is required to adopt an Air Quality Attainment Plan and is empowered to achieve and maintain the state and federal ambient air quality standards in all areas affected by emissions sources under its jurisdiction. The YSAQMD regulates, permits and inspects stationary sources of air pollution, and also implements transportation control measures designed to reduce emissions from mobile sources.

All currently operating aggregate facilities within the planning area operate under permits issued by the YSAQMD. The YSAQMD rules and regulations determine the conditions under which permits are issued. For the aggregate industry, the relevant rules and regulations are:

Rule 2.3: Limits the opacity of pollutant plumes.

Rule 2.5: Prohibits the release of air contaminants or other materials which cause injury, detriment, nuisance or annoyance to any considerable number of persons or the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause or have natural tendency to cause injury or damage to business or property.

Rule 2.11: Limits the loading of particulate matter in plumes.

Rule 2.19: Establishes maximum allowable emission rates based on process weight.

Rule 3.1: Provides for the issuance of permits for new or modified sources of air pollution.

Rule 3.4: Provides for the review of new and modified stationary sources of pollutants, including emissions offsets, by which authorities to construct may be granted without interfering with the attainment or maintenance of ambient air quality standards. Requires the use of Best Available Control Technology and offsets for new or modified sources exceeding specified emission levels.

For facilities with asphalt batch plants, the following additional rules would also apply:

Rule 2.28: Limits the emission of organic compounds from the use of cutback and emulsified asphalt in paving materials.

Rule 8.1: Establishes standards of performance for asphaltic concrete plants.

The YSAMQD calculates emissions for each permitted stationary source based on capacity of the equipment and emission factors for that equipment. For aggregate processing the District uses emission factors from the Fourth Edition of AP-42.[3] The Fifth Edition of AP-42[4] was recently published containing greatly reduced emission factors for aggregate processing, but the California Air Resources Board has not yet approved these lower emission factor. If these lower emission factors are approved for use in California, the potential emission from sources within the planning area would be revised downward.

Yolo County General Plan

The Yolo County General Plan includes policies related to air quality and the reduction of air pollutant emissions. The following specific policies from the Circulation (CIR) and Conservation (CON) Elements of the General Plan apply to the proposed project:

CIR 20: Yolo County shall seek to avoid or mitigate all formes of possible, air, water or noise pollution from construction or operation of the transportation system.

CIR 21: Yolo County shall actively support systems of transit and transport, patterns and densities of development, and technological or organizational means to reduce or mitigate air pollution problems in the community, the County, and the region.

CON 15: Yolo County shall maintain or improve air quality by means of the following actions:

- Coordination with the Yolo-Solano Air Pollution Control District.
- Coordination with the Sacramento Council of Governments, Air Quality Management Plan.
- Development of redevelopment project approval only with avoidance or appropriate mitigation of probable air pollution.
- Land use and transportation planning and implementation.
- Support of transportation systems that generate less air pollution problems.
- Planning and implementing more compact urban forms to stabilize or reduce aggregate commuting and other travel distance requirements.

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[3] U. S. Environmental Protection Agency, *Compilation of Air Pollutant Emissions Factors*, AP-42, Fourth Edition, 1985.

[4] U. S. Environmental Protection Agency, *Compilation of Air Pollutant Emissions Factors,* AP-42, Fifth Edition, 1995.

- Continue to improve the County waste collection and disposal to avoid waste burning.
- Protect air quality levels required for agricultural productivity.
- Implementation of the Air Quality Management Plan adopted by the Sacramento Area Council of Governments.

Yolo County Resource Conservation District (RCD) Agricultural Land Preservation and Protection Policy

The Yolo County RCD is empowered by state law to develop and carry out natural resource conservation programs that protect county resources. One policy deals with air quality:

Policy III. 5.C: Proposals for urban growth or proposals requiring a significant increase in water use, losses to groundwater recharge, increased flooding or overall increase in air pollution will be discouraged unless plans for alternative water supply (through development or conservation) and air pollution reduction are also provided for review, approval, and subsequent implementation.

IMPACTS AND MITIGATION MEASURES

Standards of Significance

The YSAQMD has published thresholds of significance to be used in evaluating air quality impacts of projects.[5] The CCRMP would have a significant impact on air quality if it would exceed the following quantitative thresholds:

- Reactive Organic Gases (ROG): 82 lbs/day (15 tons/year);
- Oxides of Nitrogen (NOx): 82 lbs/day (15 tons/year);
- Carbon Monoxide (CO): 550 lbs/day (100 tons/year); or
- Particulate Matter (PM-10): 82 lbs/day (15 tons/year).

The District has also identified qualitative thresholds. Projects would have a significant air quality impact if they would:

- Affect the attainment of the Federal or State ambient air quality standards by either violating or contributing to an existing or projected air quality violation;
- Generate vehicle trips that cause a CO hot spot;
- Subject sensitive receptors within one-fourth mile to toxic air emissions or elevated CO emissions;
- Result in the production or disposal of a material that poses a health hazard; or
- Create or subject sensitive receptors to an objectionable odor.

[5] Yolo-Solano Air Quality Management District, *Draft Air Quality Handbook*, 1994.

Impact 4.7-1
Potential Emissions of PM-10

Potential emissions of PM-10 for the project and alternatives have been estimated and are shown in Table 4.7-3. PM-10 sources include process emissions, fugitive emissions, on-site equipment and vehicle exhausts, and off-site truck and auto emissions associated with maintenance mining and earthwork involved in creation of habitat, channel stabilization and erosion control.

Process emissions are those related to stationary equipment used in the processing of aggregate. These sources include screens, conveyors, crushers, radial stackers and other equipment utilized to process or store aggregate as well as ancillary sources such as asphalt batch plants. Calculations of process emissions based on current permit process limits were obtained from the Yolo-Solano Air Quality Management District. For each proposed operation, future emissions were assumed to be proportional to the forecast maximum throughput under each alternative, assuming that control technology and other factors would remain constant. The composition of raw materials and proportion of various product types were assumed to remain constant at each of the processing facilities.

Fugitive emissions are related to the movement of raw materials or earth. Fugitive sources include equipment and vehicles used in the excavation and transportation of materials such as scrapers, bulldozers and front end loaders. The excavation of raw materials is considered to result in negligible fugitive emissions because of the high moisture content of the raw materials. The transport of these materials and general earthwork associated with habitat creation or erosion control, would take place on unpaved haul roads that, even with regular watering, would be a source of fugitive dust. These sources were estimated based on assumed average travel distances, road surface conditions, typical vehicle weights and other factors. Emissions from these sources were assumed to be directly proportional to the forecast throughput for the proposed mining operations under the CCRMP.

On-site equipment and vehicle exhaust sources involved in maintenance mining and aggregate handling and dust control would include diesel powered scrapers, front-end loaders, motor graders, bulldozers, watering trucks and a dragline crane. Annual hours of use for each of these categories of equipment were estimated and exhaust emissions calculated. Emissions from these sources were assumed to be directly proportional to the forecast throughput for the proposed mining operations.

Off-site truck and exhaust emissions would be generated by diesel trucks hauling materials to and from the proposed mining operations and automobile trips made by employees. Diesel truck emissions were estimated based on 1997 EMFAC7-F emission factors for heavy-duty diesel vehicles, an average speed of 35 MPH, and an estimated round trip

Table 4.7-3: Projected Maximum Emissions in Tons/Year[6]

Alternative	Pollutant	Process Emissions	Fugitive Emissions	On-Site Equipment & Vehicles	Total On-Site Emissions	Off-Site Truck/ Auto Exhausts	Total of On-site/ Off-site	Change[7] from Existing
Existing/ Alternative 1a	ROG	1.58	-	2.11	3.69	21.95	25.64	0.00
	NOx	13.52	-	24.60	38.12	96.57	134.69	0.00
	PM-10	56.70	89.12	2.36	148.18	27.81	175.99	0.00
	CO	6.51	-	8.01	14.52	93.60	108.12	0.00
	SOx	13.83	-	2.62	16.45	3.82	20.27	0.00
CCRMP (After First Five Years)	ROG	0.12	-	0.17	0.29	2.02	2.31	2.31
	NOx	0.79	-	2.00	2.79	8.88	11.67	11.67
	PM-10	6.19	5.71	0.19	12.09	2.56	14.65	14.65
	CO	0.45	-	0.65	1.10	8.54	9.64	9.64
	SOx	1.88	-	0.21	2.09	0.35	2.44	2.44
Alternative 1b	ROG	2.88	-	3.26	6.14	26.19	32.33	6.69
	NOx	23.84	-	37.98	61.82	149.46	211.28	76.59
	PM-10	130.20	139.31	3.64	273.15	34.41	307.72	131.73
	CO	11.58	-	12.37	23.95	162.14	186.09	77.97
	SOx	48.81	-	4.05	52.86	6.61	59.47	39.20
Alternative 3	ROG	0.75	-	1.74	2.49	20.53	23.02	-2.62
	NOx	10.40	-	14.15	24.55	90.39	114.94	-19.75
	PM-10	68.28	57.97	3.22	129.47	26.05	155.52	-20.47
	CO	3.18	-	6.60	9.78	86.62	96.40	-11.72
	SOx	4.42	-	2.16	6.58	3.53	10.11	-10.16

ROG = Reactive Organic Gases
NOx = Nitrogen Oxides
PM-10 = Particulate Matter, 10 Microns
CO = Carbon Monoxide
SOx = Sulfur Oxides
SOx= Sulfur Oxides

[6] Emissions associated with Alternative 2 (No Mining) are not shown. Under this alternative, emissions similar to those for the project would occur at plants outside Yolo County but within the Sacramento Valley Air Basin.

[7] Total for CCRMP shows emissions associated with 200,000 tons/year maintenance mining, totals for other alternatives show the difference from existing levels.

travel distance of 58 miles.[8] Emissions from employee trips were estimated using the URBEMIS-5 computer program.[9] Emissions from these sources were assumed to be directly proportional to the forecast throughput for the six aggregate processors.

Draft CCRMP

Even though implementation of the CCRMP would result in increased channel stabilization and erosion control, in-channel commercial mining currently being conducted by Solano Concrete, Schwarzgruber and Syar Industries would cease. Since the quantity of in-channel mining from the producers is far greater than the level of maintenance mining, PM-10 emissions would be substantially reduced.

Under cumulative conditions, the CCRMP is projected to result in a total of 200,000 tons per year of additional maintenance mining in addition to off-channel mining as proposed under the OCMP. The resulting incremental increase in PM-10 emissions from maintenance mining is shown in Table 4.7-3. The projected increase in PM-10 emissions shown in Table 4.7-3 does not exceed the YSAQMD threshold of significance of 15 tons per year; therefore, impacts on PM-10 air quality would not be considered significant.

Performance Standard 6.5-3 of the CCRMP would provide for following dust controls:

PS. 6.5-3 All unpaved roads shall be adequately watered to keep soil moist at all times.

Alternative 1a: No Project (Existing Conditions)

Under this alternative, aggregate production is assumed to continue at 1995 levels. Existing PM-10 emissions would be unaffected by this alternative, as current levels of raw material excavated, processed, and transported from the area would continue (see Table 4.7-3). Based on the YSAMQD threshold of significance of 15 tons per year, Alternative 1a would not have a significant effect on PM-10 air quality.

Alternative 1b: No Project (Existing Permits and Regulatory Condition)

Under this alternative, production is assumed to occur at the maximum permitted levels under existing permits and no maintenance mining would occur. PM-10 emissions would increase substantially (compared to existing levels) with this alternative due to assumed increases in the amount of raw material excavated, processed, and transported from the area (see Table 4.7-3). The projected increase in PM-10 emissions shown in Table 4.7-3 exceeds the YSAQMD threshold of significance of 15 tons per year; therefore, impacts of Alternative 1b on PM-10 air quality would be considered significant.

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[8] Based on the following assumed distribution of trips and average round trip distances: Solano County 60%, 70 miles; Yolo County 35%, 40 miles; other 5%, miles.

[9] California Air Resources Board, *URBEMIS Computer Program Version 5.0 User Guide: Vehicle-Related Emissions Estimation for Land Development Projects*, 1995.

Alternative 2: No Mining (Alternative Site)

On-site emissions from processing plants would be eliminated with this alternative. Based on the YSAMQD threshold of significance of 15 tons per year, Alternative 2 would not have a significant effect on PM-10 emissions.

Assuming that market demand for aggregate products is met at other processing plants outside the County, this alternative could result in secondary air quality impacts. As production is shifted to other plants, emissions of PM-10 at those facilities would be increased by an amount similar to emissions eliminated from the planning area. This would shift impacts outside Yolo County, but PM-10 emissions within the greater Sacramento Valley Air Basin would be expected to remain unchanged since alternative sites (Yuba County, Rancho Cordova, Folsom, etc.) are all within the Sacramento Valley Air Basin.

At the same time, additional diesel truck travel may be induced by this alternative. Haul distances to supply former lower Cache Creek aggregate users would be increased, resulting in increased diesel truck emissions within the region.

Alternative 3: Channel Bank Widening (Implement Streamway Influence Boundary)

Under this alternative, no commercial mining, erosion control or channel restabilization activities would occur in-channel. Just over two million tons per year of raw material would be mined off-channel. PM-10 emissions would be reduced compared to current levels (Table 4.7-3). The net effect would be an overall decrease of about 20 tons per year. Based on YSAQMD thresholds of significance, this alternative would not have a significant PM-10 air quality impact.

Mitigation Measure 4.7-1a (CCRMP, A-1a, A-2, A-3)

None required.

Mitigation Measure 4.7-1b (A-1b)

Scraper travel over unpaved roads is a substantial source of fugitive PM-10 emissions. The following measure would be an effective means of reducing these emissions:

> *Wherever practical and economically feasible, portable or movable conveyor systems shall be used to transport raw materials and overburden instead of diesel-powered equipment.*

Even total elimination of emissions from scraper travel over unpaved roads would not, however, reduce impacts to levels below the YSAQMD threshold of significance, so impacts on PM-10 air quality would remain significant after implementation of this measure. The potential for further reductions in emissions is limited. Statutory

authority over process emissions within the area lies with the YSAMQD, which considers all processing and abatement equipment at each of the plants as Best Available Control Technology. The California Air Resources Board has authority over on-road vehicles and off-road construction equipment and vehicles.

Impact 4.7-2
Potential Emissions of Ozone Precursors (ROG and NOx)

Emissions of ROG and NOx have been estimated and are shown in Table 4.7-3. ROG and NOx sources would include process emissions, on-site equipment and vehicle exhausts, and off-site truck and auto emissions associated with maintenance mining and earthwork involved in creation of habitat, channel stabilization and erosion control.

Process emissions are those related to combustion-powered stationary equipment used in the processing of aggregate. These sources are limited to asphalt batch plants and gasoline dispensing equipment. Calculations of process emissions based on current permit process limits were obtained from the Yolo-Solano Air Quality Management District. Future emissions for the CCRMP and alternatives were assumed to be proportional to the forecast throughput.

On-site equipment and vehicle exhaust sources involved in channel stabilization include diesel powered scrapers, front-end loaders, motor graders, bulldozers, and watering trucks. Annual hours of use for each of these categories of equipment were estimated and exhaust emissions calculated. Emissions from these sources were assumed to be directly proportional to the forecast throughput for the creek management.

Off-site truck and exhaust emissions would be generated by diesel trucks hauling materials to and from the mining sites and automobile trips made by employees. Diesel truck emissions were estimated based on 1997 EMFAC7-F emission factors for heavy-duty diesel vehicles, an average speed of 35 MPH, and an estimated round trip travel distance of 58 miles. Emissions from employee trips were estimated using the URBEMIS-5 computer program.[10] Emissions from these sources were assumed to be directly proportional to the forecast throughput for the proposed creek management operations under the CCRMP.

Draft CCRMP

Even though implementation of the CCRMP would result in increased production for maintenance mining, in-channel commercial mining currently being conducted by Solano Concrete, Schwarzgruber and Syar Industries would cease. Since the quantity of in-channel mining from the producers is far greater than the level of maintenance mining, ROG and NOx emissions would be substantially reduced.

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[10] California Air Resources Board, *URBEMIS Computer Program Version 5.0 User Guide: Vehicle-Related Emissions Estimation for Land Development Projects*, 1995.

Under cumulative conditions, the CCRMP is projected to result in a total of 200,000 tons per year of additional maintenance mining in addition to off-channel mining as proposed under the OCMP. The resulting incremental increase in ROG and NOx emissions from maintenance mining is shown in Table 4.7-3. The projected increase in ROG and NOx emissions shown in Table 4.7-3 does not exceed the YSAQMD threshold of significance of 15 tons per year; therefore, impacts on PM-10 air quality would not be considered significant.

Alternative 1a: No Project (Existing Conditions)

ROG and NOx emissions would be unaffected by this alternative, as current levels of raw material excavated, processed, and transported from the area would continue. Based on the YSAMQD threshold of significance of 15 tons per year, Alternative 1a would not have a significant effect on ozone air quality.

Alternative 1b: No Project (Existing Permits and Regulatory Condition)

ROG and NOx emissions would increase substantially with the implementation Alternative 1b due to assumed increases in the amount of raw material excavated, processed, and transported from the area. The projected increase in NOx emissions would exceed the YSAQMD threshold of significance of 15 tons per year, so impacts of Alternative 1b on ozone air quality would be considered significant.

Alternative 2: No Mining (Alternative Site)

On-site emissions from processing plants would be eliminated with this alternative. Based on the YSAMQD threshold of significance of 15 tons per year Alternative 2 would not have a significant effect on ozone air quality.

Assuming that market demand for aggregate products is met at other processing plants outside the County, this alternative could result in secondary air quality impacts. As production is shifted to other plants, emissions of ROG and NOx at these facilities would be increased by an amount similar to emissions eliminated from the area. This would shift impacts outside Yolo County, but ROG and NOx emissions within the greater Sacramento Valley Air Basin would be expected to remain unchanged since alternative sites (Yuba County, Rancho Cordova, Folsom, etc.) are all within the Sacramento Valley Air Basin.

At the same time, additional diesel truck travel may be induced by this alternative. Haul distances to supply former lower Cache Creek aggregate users would be increased, resulting in increased diesel truck emissions within the region.

Alternative 3: Channel Bank Widening (Implement Streamway Influence Boundary)

Under this alternative, no maintenance mining would occur in-channel; but 2.03 millions tons per year of raw material would be mined off-channel. ROG and NOx emissions would be reduced compared to current levels (Table 4.7-3). The net effect would be an overall decrease of about 5 tons per year for ROG and 42 tons per year for NOx . Based on YSAQMD thresholds of significance, this alternative would not have a significant ROG and NOx air quality impact.

Mitigation Measure 4.7-2a (CCRMP)

None required, however, the following is recommended.

The following new Performance Standard should be added to the CCRMP:

All internal combustion engine driven equipment and vehicles shall be kept tuned according to the manufacturers specifications and properly maintained to minimize the leakage of oils and fuels. No vehicles or equipment shall be left idling for a period of longer than 5 ~~2~~ minutes.

Mitigation Measure 4.7-2b (A-1a, A-2, A-3)

None required.

Mitigation Measure 4.7-2c (A-1b)

Implement Mitigation Measure 4.7-1(b).

Implementation of Mitigation Measure 4.7-2b would reduce ROG and NOx, however, this would remain a significant and unavoidable impact under Alternative 1b.

Impact 4.7-3
Cumulative Effects on Attainment of State and Federal Standards

Yolo County is considered nonattainment (standards have not been attained) for PM-10 (state standard) and ozone (state and federal standard). To the extent that the CCRMP and alternatives would increase production of aggregate products from the lower Cache Creek basin over existing amounts, existing sources of these PM-10 and ozone precursors (ROG and NOx) would be increased, adding to the emissions burden within Yolo County and within the Yolo-Solano Air Quality Management District. Also, a number of additional developments and operations (beyond the proposed CCIP) are assumed to be reasonably foreseeable that would cumulatively increase regional emissions. Table 4.7-4 shows projected emissions from cumulative projects listed in Section 4.8, Impacts and Mitigation Measures (Assumptions and Methodologies).

The following discussion assesses effects on attainment of the PM-10 and ozone standards direct and indirect, associated with planning area activities. It has been

assumed that, for non-attainment pollutants, any cumulative increase in emissions would be considered significant.

It should be noted that changes in production assumed for the CCRMP and alternatives would likely have effects on production at other aggregate processing areas within the larger Sacramento Valley Air Basin. These changes are likely to offset emission changes within the planning area, i.e., increased production of emissions at the planning area could be offset by reduced emissions at other aggregate processing plants within the air basin.

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The emissions of cumulative projects (Table 4.7-4), would be expected to delay by a small amount the eventual attainment of the state PM-10 and state/federal ozone standards within the YSAQMD. There is, however, no current estimate of when state standards for PM-10 or ozone will be attained in Yolo County. The CCRMP would, however, reduce in-channel mining and related emissions and thus would make a positive contribution to cumulative air quality. This impact is considered beneficial.

Alternative 1a: No Project (Existing Conditions)

PM-10 and ozone precursor emissions would be unaffected by this alternative, as current levels of raw material excavated, processed, and transported from the area would continue. When considered with the emissions of cumulative projects (Table 4.7-4), cumulative emissions would be expected to delay by a small amount the eventual attainment of the state PM-10 and state/federal ozone standards within the YSAQMD. There is, however, no current estimate of when state standards for PM-10 or ozone will be attained in Yolo County. This impact is considered significant.

Alternative 1b: No Project (Existing Permits and Regulatory Condition)

PM-10 and ozone precursor emissions are expected to increase substantially with the implementation Alternative 1b due to assumed increases in the rate of mining as compared to actual levels. When considered with the emissions of cumulative projects (Table 4.7-4), cumulative emissions would be expected to delay by a small amount the eventual attainment of the state PM-10 and state/federal ozone standards within the YSAQMD. There is, however, no current estimate of when state standards for PM-10 or ozone will be attained in Yolo County. This impact is considered significant.

Alternative 2: No Mining (Alternative Site)

On-site emissions from processing plants would be eliminated with this alternative. This reduction in emissions would accelerate slightly the eventual attainment of the state PM-10 and state/federal ozone standards within Yolo County, but the additional truck travel that results within the entire air basin could delay slightly attainment within the larger Sacramento Valley Air Basin.

Alternative 3: Channel Bank Widening (Implement Streamway Influence Boundary)

PM-10 and ozone precursor emissions would be reduced compared to current levels, The net effect would be an overall increase of about 7 tons per year for PM-10, 15 tons per year for ROG and 107 tons per year for NOx.

The projected increase in emissions exceeds the YSAQMD threshold of significance of 15 tons per year for ROG and NOx, so this alternative would be expected to delay by a small amount the eventual attainment of the state/federal ozone standards within the YSAQMD.

Mitigation Measure 4.7-3a (CCRMP,A-1a, A-1b, A-2, A-3)

Implement Mitigation Measures 4.7-1b and 4.7-2a.

Although implementation of the mitigation measures listed above would reduce the CCRMP and alternatives' contribution to cumulative air quality, cumulative impacts would remain significant and unavoidable.

Table 4.7-4: Cumulative Project Emissions (Tons per Year)

	ROG	NOx	PM-10
Automobile Emissions	250.60	641.61	613.16
Area Source Emissions	205.62	157.29	236.91
Total	456.22	798.90	850.07