Air Quality

Appendix H

Trinity River Mainstem
Fishery Restoration

October 1999

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Appendix H

AIR QUALITY

1.1 AIR QUALITY

1.1.1 Climate

The main project area is located in Trinity County, which is in the coastal range of Northern California. This area is mountainous with significant elevation changes. The eastern border of Trinity County lies along the divide of the coastal range. Storm systems typically progress from west to east. Winters are moist and cool, and summers tend to be hot and dry. During the summer, daytime temperatures of greater than 90°F are not uncommon. Temperatures tend to decrease and precipitation tends to increase with higher elevations. Table H-1 shows historical temperature and precipitation data for the Big Bar and Weaverville Ranger Stations, located in proximity to the project.

Table H-1
Representative Historical Climate Data in Proximity to Project Site

Parameter	Unit	Big Bar, CA	Weaverville, CA
Station Elevation	Feet	1,270	2,050
Average Annual Temperature	°F	56.5	53.1
Average High Temperature in January	°F	48.2	46.1
Average Low Temperature in January	°F	32.4	26.3
Average High Temperature in July	°F	96.7	93.5
Average Low Temperature in July	°F	54.4	49.3
Highest Recorded Temperature	°F	115	115
Lowest Recorded Temperature	°F	0	-10
Average Annual Precipitation	inches	38.0	36.53
Average Days with 0.01 Inch per Year	days	87	82
Average Snowfall	inches	7.1	18.3

1.1.2 Air Quality Standards

Air quality in California is regulated through both national and state Ambient Air Quality Standards (AAQS) and emissions limits for sources of air pollutants.

Pursuant to the federal Clean Air Act (CAA) of 1970, the U.S. Environmental Protection Agency (USEPA) established the National Ambient Air Quality Standards (NAAQS) for six major pollutants referred to as "criteria" pollutants. The NAAQS are two- tiered: the primary objective is to protect public health, and the secondary objective is to prevent degradation to the environment (e.g., impairment of visibility, damage to vegetation and property). The six criteria pollutants are ozone (O_3), carbon monoxide (CO), particulate matter less than 10 microns in diameter (PM_{10}), nitrogen oxides (NO_x, sulfur dioxide (SO_2), and lead (Pb).

Table H-2 lists the State of California and National Ambient Air Quality Standards.

Table H-2
State of California and National Ambient Air Quality Standards

Pollutant	Averaging Time	State Standard	Primary Standard	Secondary Standard
CO	1-hour 8-hour	20 ppm 9 ppm	35 ppm 9 ppm	- - - - - -
PM_{10}	24-hour Annual	50 mg/m^3 30mg/m^3	150 mg/m^3 50 mg/m^3	150 mg/m^3 50 µg/m^3
$PM_{2.5}$ (new)	24-hour Annual	- - - - -	65 µg/m^3 15 mg/m^3	65 mg/m^3 15 mg/m^3
NO_x	1-hour Annual	0.25 ppm - - -	100 mg/m^3 (0.053 ppm)	100 µg/m^3 (0.053 ppm)
SO_2	1-hour 3-hour 24-hour Annual	105 mg/m^3 (0.25 ppm) - - - - - - - - -	- - - - - - - - - - - 365 mg/m^3 (0.14 ppm) 80 mg/m^3 (0.03 ppm)	- - - - - - 1,300 mg/m^3 (0.5 ppm) - - - - - -
Pb	30-day average Calendar Quarter	1.5 mg/m3 - - -	- - - 1.5 mg/m^3	- - - 1.5 mg/m^3
O_3	1-hour 8-hour (new)	0.09 ppm - - -	0.12 ppm (old) 0.08 ppm	- - - 0.08 ppm
Sulfates	24 hour	25 mg/m^3	- - -	- - -
Hydrogen Sulfide	1 hour	0.03 ppm (42 mg/m^3)	- - -	- - -

PPM = parts per million.
Mg/$m^{3.}$ = milligrams per cubic meter.
µg/m^3=- micrograms per cubic meter.

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The USEPA has recently added a new standard for ozone and for particulate matter under 2.5 microns in diameter ($PM_{2.5}$). Subsequently, several states and associations petitioned the U.S. Circuit Court of Appeals for the District of Columbia (D.C. Circuit) to review the standards. On May 14, 1999, the Court issued its ruling. The Court said the USEPA did not adequately justify the levels it picked for the standards. These pollutants do not have a well-defined threshold at which health effects begin to occur; at lower levels the effects become less certain and less severe. The Court ruled that the USEPA did not specify how much uncertainty is too much, nor how severe the impact must be to justify picking a specific level. The Court said that the USEPA must have a principle to identify where to stop considering effects.

The Court did not "vacate" the new ozone and fine particulate standards but sent them back to the USEPA, with the opportunity for the USEPA to respond with a clear set of criteria to justify the levels they select.

The Court found that any control requirements under the new ozone standard are unenforceable because of the specific classifications, dates, and controls set forth by Congress for the old ozone standard in the 1990 Clean Air Act Amendments.

The Court did "vacate" the coarse particulate standard. The Court ruled that the USEPA was justified in controlling coarse (larger) particulates, but not in doing so by using a PM_{10} standard in combination with a fine particulate standard ($PM_{2.5}$). The Court said that the level of the PM_{10} standard is arbitrary because PM_{10} contains everything smaller than 10 microns, including $PM_{2.5}$. Areas with very little fine particulate would be allowed to have relatively high coarse particulates, while areas with higher fine particle levels would be required to have lower coarse particulates—in effect, different standards for different areas.

On June 28, 1999, the federal government filed a petition for rehearing key aspects of the case in the U.S. Court of Appeals for the D.C. Circuit. The new standards may not be in effect until the USEPA satisfies the Court's requirement for criteria in setting the level of the standards.

1.1.2.1 Regulatory Framework and Attainment Status

At the federal level, the USEPA has been charged with implementing the national air quality programs as outlined in the federal CAA. For the State of California, the Air Resources Board (ARB) is responsible for implementing the state air quality programs and for developing and implementing air quality control plans designed to achieve and maintain the NAAQS. State law recognized that air pollution does not respect political boundaries and therefore required ARB to divide the state into air basins that have similar geographical and meteorological conditions. Each basin is managed by a regional air district that is responsible for the control of air pollution and the enforcement of the applicable state and federal laws.

Air quality within each of the three geographical impact areas is influenced by a number of factors, including stationary sources such as industrial facilities, non-stationary sources such as vehicles, and the meteorology of a given area.

Trinity River Basin. Trinity County is part of the North Coast Unified Air Quality Management District, which covers the Northern Coast Air Basin (NCAB). The air basin is bound by the ocean on the west and the coast range on the east. Other member counties include Del Norte, Humboldt, Mendocino, and Sonoma. The air quality of the Trinity River Basin meets the national AAQS for all criteria pollutants. However, it is designated non-attainment by the state with respect to PM_{10}. Sources of PM_{10} in the Trinity River Basin include residential wood combustion, motor vehicle exhaust, forest management/ waste burning, and fugitive road dust (that is, emissions from entrained dust from unpaved roads in the summer and sanded roads in the winter).

Table H-3 shows PM_{10} measurements taken at Weaverville, California. The 24-hour state PM_{10} standard was exceeded twice in 1997 and three times in 1996.

Table H-3
Summary of Monitored PM_{10} Data at Visalia—North Church Street Station

Year	Max 24-hour PM_{10} Concentration (mg/m^3)	Annual Geometric Average (mg/m^3)	Annual Arithmetic Average (mg/m^3)
Standard	**65 (State) 150 (Federal)**	**30 (State)**	**50 (Federal)**
1997	54	15.5	18.0
1996	72	15.0	17.7
1995	41	15.5	17.4

Source: CARB

Lower Klamath River Basin/Coastal Area. The Lower Klamath River Basin/Coastal Area is also in the NCAB. However, because of the rural nature of the Lower Klamath River Basin/Coastal Area, the attainment status has not been classified for many state and federal criteria pollutants. However, it is also designated non-attainment for the state PM_{10} standard.

Central Valley. Although not in the NCAB, the project might indirectly affect air quality within the central valley (e.g., changes in land use in response to project). At this time, any potential direct or indirect activity that may affect air quality in the Central Valley has not been defined, and therefore; any emission estimate of any alleged activity would be highly speculative. Also, any associated changes based on future land use conversions or other activities would require local agency discretionary approvals and could be subject to project-specific California Environmental Quality Act (CEQA) review. Therefore, impacts to the Central Valley will not be considered further.

1.1.3 Environmental Consequences

1.1.3.1 Significance Criteria

Impacts on air quality would be significant if they resulted in any of the following:

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- Violate any AAQS
- Substantially contribute to an existing or projected air quality violation
- Expose sensitive receptors to substantial pollutant concentrations
- Generate objectionable odors

Air quality is usually evaluated in terms of emissions and impacts. Generally, if a project keeps it emissions below threshold levels, it is assumed that the impacts will be insignificant. Threshold levels are typically selected for each pollutant according to the attainment status of the area. Thresholds of significance are shown in Table H-4 and were identified from CEQA guidelines and from Prevention of Significant Deterioration (PSD) Significant Emission Rates.

Table H-4
Air Quality Thresholds of Significance

Pollutant	Pounds (lb/day)	Tons/year	Rule
ROG (as ozone precursor)	219	40	PSD[a]
NO_x	219	40	PSD[a]
PM_{10}	82	15	NSR[b]
SO_2	219	40	PSD
CO	548	100	PSD

[a]PSD = Prevention of Significant Deterioration
[b]NSR = State New Source Review

1.1.3.2 Methodology

Heavy equipment activities related to channel rehabilitation projects, spawning gravel placement, watershed protection, and modification of Trinity Dam are sources of potential air quality impacts. These impacts would generally have two components: (1) PM_{10} emissions from vehicles on unpaved roads and from ground-disturbing activities, and (2) increased emissions from vehicle exhaust.

At this time, a comprehensive estimate of emissions is not possible because site locations, material sources, equipment descriptions, and other project-related activities have not been sufficiently quantified. Because of this, it was assumed that all alternatives with construction activities could have the potential for temporary short-term impacts and would be significant.

For regular operations, a rough estimate of emissions for each alternative was made based on the amount of spawning gravel needed. It was assumed that it would take 10 times the raw material to generate the necessary amount of spawning gravel. For PM_{10}, emissions from material handling and heavy equipment exhaust emissions were considered. It was assumed that the material handling would involve screening (coarse and fine), crushing, and two conveyer drops. Emissions were estimated using the uncontrolled crushed stone emission factors from the USEPA's Compilation of Air Pollutant Emission Factors (AP-42, Fifth Edition, Volume I: Stationary Point and Area Sources, Chapter 11.19). It was also assumed

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that the raw material had a density of 3.82 tons/yd^3 (2.65 g/cc), which is representative of typical sands. For all pollutants, exhaust emissions were estimated from Bay Area Air Quality Management District (BAAQMD) CEQA guidelines, Table 7 (Light and Heavy Construction Equipment). The resulting emission estimates are shown in Table H-5.

Table H-5
Emission Estimates for Regular (Non-construction) Operations for each Alternative

		Emission Factor (lb/yd^3)				
		PM_{10}[(a)]	**NO_x[(b)]**	**CO[(b)]**	**ROG[(b)]**	**SO_2[(b)]**
		0.090	0.093	0.30	0.02	0.01
Alternative	**Spawn Gravel Placed (yd^3)**	**Emissions[(c)] (tons/year)**				
No Action	3,400	1.5	1.6	5.2	0.3	0.2
Maximum Flow	100,000	45.0	46.7	152.0	10.1	5.1
Percent Inflow	49,100	22.1	22.9	74.6	5.0	2.5
Flow Evaluation	4,650	2.1	2.2	7.1	0.5	0.2
Mechanical Removal	3,400	1.5	1.6	5.2	0.3	0.2
State Permit	3,700	1.7	1.7	5.6	0.4	0.2
Threshold	- -	15	40	100	40	40

[a] Based on the USEPA's AP-42 Section 11.19, Table 11.19.2-2 and exhaust emission factors from BAAQMD CEQA Guidelines (April1996) and is equal to (3.82 ton/yd^3)(EF_s +EF_c+EF_f + 2*Efc) + (2.2 g/yd^3)(lb/454g)) where EF_s, EF_c, EF_f, and EF_x are the AP-42 uncontrolled screening, crushing, fine screening, and conveying emission factors.

[b] Based on construction equipment exhaust emission factors from BAAQMD CEQA Guidelines (April 1996).

[c] Assumed 10 times the spawn gravel placed. Emission =Emission Factor*10*spawn gravel placed

This table suggests that the No Action, Flow Evaluation, Mechanical Removal, and State Permit alternatives would have emissions well below the threshold level and therefore would have insignificant air quality impacts during regular operations. Because of the large amounts of gravel needing processing, the Maximum Flow and Percent Flow alternatives could result in significant impacts and would need to be evaluated in more detail. Again, it should be stressed that these emission estimates are extremely rough because the extent, locations, and requirements for the alternative are not completely defined.

Table H-6 summarizes the potential impacts associated with the construction and operation phases of each alternative.

Table H-6 Summary of Each Alternative's Potential Significant Impacts		
Alternative	**Potential Significant Construction Impact?**	**Potential Significant Operation Impact?**
No Action	No	No
Maximum Flow	Yes (PM_{10}, may be others)	Yes (PM_{10}, NO_x, CO)
Flow Evaluation	Yes (PM_{10}, may be others)	Yes (PM_{10})
Percent Inflow	Yes (PM_{10}, may be others)	No
Mechanical Restoration	Yes (PM_{10}, may be others)	No
State Permit	No	No

1.1.4 Mitigation

A project's construction phase produces many types of emissions. In general, construction activities are temporary and would cause only a short-term impact. However, because of the dry climate, emissions of PM_{10} are of primary concern. During ground surface preparation of the project area, most of the PM_{10} emissions would be composed of fugitive dust from construction activities on dirt roads and open areas and potentially from gravel processing. Emission sources would include vehicles and construction equipment traveling over dirt surfaces, site clearing, grading, cut-and-fill operations, and wind-blown dust. The impact of dust emissions on PM_{10} levels would be temporary, but could be significant.

All projects should comply with state and local regulations concerning fugitive dust. More detailed mitigation measures should be identified later when the details of the construction are available. Example measures would include the following:

- Educate construction crews regarding measures that can reduce or minimize emissions, including operation of motor vehicles to minimize emissions and suppress dust.
- All on-site unpaved roads and off-site unpaved access roads shall be effectively stabilized of dust emission using water, chemical stabilizers/suppressants, or vegetative ground cover.
- All disturbed areas, including storage piles, that are not being actively utilized for construction purposes shall be effectively stabilized of dust emission using water or chemical stabilizers/suppressants.
- All land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities shall be effectively controlled of fugitive dust emissions utilizing application of water or pre-soaking.
- When materials are transported off-site, all material shall be covered, effectively wetted to limit visible dust, or at least 6 inches of freeboard space from the top of the containers shall be maintained.

- All operations shall limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at least once every 24 hours when operations are occurring. (The use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit the visible dust emissions. Thus, use of blower devices is expressly forbidden.)
- Following the addition of materials to, or the removal of materials from, the surface of outdoor storage piles, the piles shall be effectively stabilized of fugitive dust emissions utilizing sufficient water or chemical stabilizer/suppressants.
- Limit traffic speeds on unpaved roads to 15 mph.

For alternatives that may have impacts associated with other pollutants, additional analysis should be conducted to quantify, assess potential impacts, and define appropriate mitigation measures.

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