

Master Response 3.7

Greenhouse Gas Emissions and Analysis

Overview

This master response specifically focuses on greenhouse gas (GHG) emissions and the method used to quantify emissions in Chapter 14, *Energy and Greenhouse Gases*. In Chapter 14, the State Water Resources Control Board (State Water Board) identifies and discloses potential GHG emission effects resulting from the Lower San Joaquin River (LSJR) alternatives. The potential GHG emissions that could be emitted as a result of the plan amendments are inherently indirect and difficult to quantify. Nonetheless, the State Water Board made reasonable assumptions to analyze and quantify potential GHG emissions that could result, indirectly, from each of the LSJR alternatives, as compared to the baseline. The method used to estimate the indirect effects of potential GHG emissions resulting from the LSJR alternatives is described in Section 14.4.2, *Methods and Approach*.

Consistent with California Environmental Quality Act (CEQA) Guidelines section 15064.4, the State Water Board used a legally sufficient numeric threshold of significance to evaluate the significance of potential GHG emission impacts. The analysis presented in the substitute environmental document (SED) indicates that impacts under LSJR Alternative 2, without adaptive implementation, would be less than significant, while impacts under LSJR Alternatives 3 and 4, with or without adaptive implementation, would be significant and unavoidable. The State Water Board identified and considered more than a dozen mitigation measures to address significant GHG emission impacts, described in Section 14.4.3, *Impacts and Mitigation Measures*, but determined that potential mitigation measures are infeasible.

The State Water Board reviewed all comments related to GHG emissions and the analysis of GHG emissions and developed this master response to address recurring comments and common themes. This master response references related master responses, as appropriate, where recurring comments and common themes overlap with other subject matter areas. This master response addresses concerns related to GHG emissions, the approach to the analysis in Chapter 14, and related mitigation measures and includes, for ease of reference, a table of contents on the following page to help guide readers to specific subject areas. In particular, this master response addresses, but is not limited to, the following topics.

- Direct and indirect GHG impacts and GHG-related conclusions.
- Thresholds of significance used to evaluate GHGs.
- Long-term GHG reduction goals as they relate to the GHG analysis contained in Chapter 14.
- Mitigation measures associated with GHGs.

Comments concerning more general issues related to mitigation measures are addressed in Master Response 1.1, *General Comments*. Comments concerning climate change effects on the LSJR alternatives or plan amendments and climate change effects on hydrology, are addressed in Master Response 3.2, *Surface Water Analyses and Modeling*.

Table of Contents

Master Response 3.7 Greenhouse Gas Emissions and Analysis	1
Overview.....	1
Direct and Indirect Impacts	3
Greenhouse Gas-Related Conclusions	4
Threshold of Significance.....	5
Mitigation Measures	8
References Cited.....	9
Printed References.....	9

Direct and Indirect Impacts

Some commenters asserted that the SED dispenses with the direct impacts of the LSJR alternatives on climate change and “nakedly” concludes that an individual project cannot have a direct environmental effect. To support the assertion, commenters cited footnote 1 (Chapter 14, *Energy and Greenhouse Gases*, Section 14.1, *Introduction*), which they purported states that GHG impacts are too remote to be studied. That footnote is mischaracterized by the commenters. The footnote does not discuss the State Water Board’s climate change analysis but defines the term *rim dam*. The footnote is included here for ease of reference:

In this document, the term *rim dams* is used when referencing the three major dams and reservoirs on each of the eastside tributaries: New Melones Dam and Reservoir on the Stanislaus River; New Don Pedro Dam and Reservoir on the Tuolumne River; and New Exchequer Dam and Lake McClure on the Merced River.

The SED analysis considers all potentially significant GHG emission impacts resulting from the LSJR alternatives. CEQA Guidelines section 15126.2 requires that the SED clearly identify and describe both the direct and indirect significant effects of the project on the environment, giving due consideration to both the short-term and long-term effects. Here, because the LSJR alternatives would not directly cause GHG emissions, there are no direct significant GHG emission effects to identify and describe. New LSJR flow requirements described under the LSJR alternatives would not themselves cause or create direct GHG emissions. (Cal. Code Regs., tit. 14, § 15358, subd. (a) [“Direct or primary effects [] are caused by the project and occur at the same time and place”].) Commenters did not explain what direct impact they believe was not considered.

The SED identifies and considers all potentially significant indirect GHG emission-causing impacts. These include increased energy consumption and generation. Chapter 14, Table 14-15 presents total GHG emissions generated indirectly by LSJR alternatives associated with (1) increased power generation to balance the loss of hydropower production, and (2) the increased energy consumption for groundwater pumping to compensate for the reduction of surface water supply. These are indirect impacts because they are “not immediately related to the project, but [may be] caused indirectly by the project” (*Id.*, § 15064, subd. (d)(2); see also *id.*, § 15358, subd. (a) [“[i]ndirect or secondary effects [that] are caused by the project and are later in time or farther removed in distance, but are still reasonably foreseeable”].)

Quantifying indirect GHG emissions involves speculation, especially over the long term. It is unknown what type of power source (e.g., renewable, natural gas) would be substituted for the potential reduction of hydropower production or if some of the lost power would be made up with higher efficiency. It was conservatively assumed that reduced hydropower would be compensated for by ramping up other generating facilities owned and operated by local utilities. The increased demand on existing power-generating facilities would be caused by dozens of independent electricity users making independent decisions about different ways to substitute for the lost power. Similarly, while decreases in available irrigation water may lead to a corresponding increase in groundwater pumping, it is possible that some croplands would be removed from active agriculture operation, thereby reducing groundwater pumping and agriculture emissions. Any GHG emissions resulting from changes in power generation and energy consumption for groundwater pumping would also change over time as technology and regulation of pumps changes (for example, increased penetration of solar-powered pumps). As explained in footnote 6 (Section 14.4.1, *Thresholds of Significance*), the LSJR alternatives “would not have any direct control over GHG generating

activities.” For purposes of a good faith disclosure in the CEQA analysis, however, the State Water Board has treated these indirect GHG emission effects as reasonably foreseeable and has identified conservative methods to quantify potential indirect GHG emissions.

As described further, the State Water Board does not underestimate the significance of the emission impacts. To the contrary, it uses a “conservative” threshold of significance in determining that two of the three LSJR alternatives would have significant GHG emission impacts (Section 14.4.1, *Thresholds of Significance*).

Greenhouse Gas-Related Conclusions

The SED appropriately provides information about the amount of GHGs indirectly produced by the LSJR alternatives. The SED estimates the magnitude of the LSJR alternatives’ GHG emissions by identifying and considering all potential GHG emissions that could be indirectly caused by the LSJR alternatives. Consistent with CEQA Guidelines section 15064.4 subdivision (a), the SED performs a quantitative analysis of potential GHG emissions then uses the factors under section 15064.4, subdivision (b) to determine the significance of those emissions. The SED does not omit data or fail to identify impacts of the potential GHG emission impacts of the LSJR alternatives. As discussed previously, the LSJR alternatives would not directly cause GHG emissions. Table 14-15 discloses the estimated indirect GHG emissions for all of the LSJR alternatives. The plan amendments and GHG analysis include those parameters evaluated under LSJR Alternative 3, with adaptive implementation, including an unimpaired flow of 40 percent with a range of 30 to 50 percent that could be adaptively managed. (See Chapter 3, *Alternatives Description*, for a description of the plan amendments and LSJR alternatives evaluated in the SED.) Commenters did not indicate what potential GHG impacts or data they believe were omitted from the analysis.

The SED also adequately discloses the significant of the potential indirect GHG emission impacts. The SED uses a cumulative threshold of significance to determine that impacts from LSJR Alternatives 3 and 4 would be significant under Impact EG-3 and would conflict with an applicable plan, policy, or regulation adopted for the purposes of reducing GHG emissions under Impact EG-4 (Table 14-1).

The California Supreme Court has explained that the significance determination for GHG emissions must consider the emissions’ cumulative significance because, while it is unlikely that an individual project will have a significant effect on climate change taken alone, an individual project may contribute cumulatively and incrementally to climate change. (*Cleveland National Forest Foundation v. San Diego Association of Governments (SANDAG)* (2017) 3 Cal.5th 497, 512.) Thus, it is not contradictory, as commenters asserted, for an impact to be an indirect consequence of the project or individually insignificant, while still significant cumulatively for CEQA purposes.

While Chapter 17, *Cumulative Impacts, Growth-Inducing Effects, and Irreversible Commitment of Resources*, states that no single project would result in an appreciable impact to climate change by itself, this language is used to clarify that climate change is a cumulative phenomenon, and not to preclude any environmental analysis, as a commenter asserted. As the Bay Area Air Quality Management District’s (BAAQMD) 2017 CEQA Guidelines indicate, “GHG emissions contribute, on a cumulative basis, to the significant adverse environmental impacts of global climate change... No single project could generate enough GHG emissions to noticeably change the global average

temperature.” As indicated in Chapter 17, climate change impacts under LSJR Alternatives 3 and 4, with or without adaptive implementation, would be cumulatively considerable.

Threshold of Significance

Commenters asserted that the SED fails to adopt a legally sufficient threshold of significance for purposes of evaluating the significance of the potential environmental impact. Chapter 14, *Energy and Greenhouse Gases*, Section 14.4.1, *Thresholds of Significance*, describes the threshold used to evaluate climate change impacts associated with the LSJR alternatives. The SED explains that a threshold of 10,000 metric tons (MT) of carbon dioxide equivalent (CO₂e) per year is the threshold used to determine the significance of GHG emission impacts associated with the LSJR alternatives, consistent with State CEQA Guidelines section 15064.4, subdivision (b). The State CEQA Guidelines further define a threshold of significance as an “identifiable quantitative, qualitative or performance level of a particular environmental effect, non-compliance with which means the effect will normally be determined to be significant by the agency and compliance with which means the effect normally will be determined to be less than significant.” (Cal. Code Regs., tit. 14, § 15064.7.) CEQA leaves the determination of significance to the reasonable discretion of the lead agency and encourages lead agencies to develop and publish thresholds of significance to use in determining the significance of environmental effects. As the California Supreme Court concluded in *Center for Biological Diversity v. Department of Fish & Wildlife (CBD)* (2015) 62 Cal.4th 204 at p. 230, “a lead agency may rely on existing numerical thresholds of significance for greenhouse gas emissions” adopted, for example, by local air districts.

For CEQA purposes, the State Water Board determined that an appropriate numeric threshold of significance to assess GHG impacts is the South Coast Air Quality Management District (SCAQMD) and the BAAQMD threshold is 10,000 MT of CO₂e per year. This threshold is consistent with thresholds adopted by other air districts throughout the state, such as the San Luis Obispo Air Pollution Control District, Santa Barbara Air Pollution Control District, and the Sacramento Metropolitan Air Quality Management District. The threshold is used to evaluate whether projects would be consistent with the Assembly Bill (AB) 32 reduction goal of 1990 levels by the year 2020. BAAQMD established the threshold to capture approximately 95 percent of all GHG emissions from new permit applications from stationary sources (Bay Area Air Quality Management District 2017). SCAQMD established the threshold to capture 90 percent of all permitted industrial GHG emissions. Use of a numeric threshold from other air quality districts is consistent with existing California legislation and policy, and expert opinions. Commenters claiming that the SED lacks a threshold of significance with an identifiable quantitative, qualitative, or performance level are simply incorrect.

The use of the air district-recommended numeric threshold of 10,000 MT of CO₂e per year is appropriate because, as of December 2017, the State Water Board had not proposed, approved, nor adopted its own specific numeric thresholds for GHG emissions. Furthermore, as discussed in Section 14.4.1, the San Joaquin Valley Air Pollution Control District’s (SJVAPCD) has not adopted a local threshold that is directly applicable to the LSJR alternatives. SJVAPCD’s CEQA guidelines in their *Final Staff Report Addressing Greenhouse Gas Emissions Impacts under the California Environmental Quality Act* (SJVAPCD 2009) recommend a 29 percent reduction goal for land use development and stationary source projects. This goal is based on the statewide AB 32 target of 1990 emissions levels by 2020, which is equivalent to a 29 percent reduction in GHG emissions from 2020 business as usual conditions. Using “a quantitative comparison method developed . . . as a

measure of the greenhouse gas emissions reduction effort required by the state as a whole, and attempting to use that method, without consideration of any changes or adjustments, for a purpose very different from its original design” will result in a deficient CEQA GHG analysis. (*CBD, supra*, 62 Cal.4th at p. 227.) SJVAPCD’s 29 percent reduction goal is an ill-suited metric for evaluating the significance of the LSJR alternatives’ potential indirect GHG emissions relative to the 10,000 MT of CO₂e per year numeric threshold used in the SED, because it is not based on substantial evidence that correlates achievement of the State’s AB 32 reduction target to project-specific emission sources or unique geographic conditions that would influence the emissions-generating potential of the plan amendments.

As explained previously, the two sources of GHG emissions identified in the SED because of the plan amendments are evaluated and quantified in Table 14-15. The emissions presented in Table 14-15 are compared to the 10,000 MT of CO₂e per year threshold to evaluate the significance of the LSJR alternatives’ indirect GHG emission impact. In assessing the significance of impacts from GHG emissions on the environment, the SED thus considers “the extent to which the project may increase or reduce greenhouse gas emissions as compared to the existing environmental setting” and “whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project,” consistent with CEQA Guidelines section 15064.4, subdivisions (b)(1) and (2).

Consistent with CEQA Guidelines section 15064.4, subdivision (b)(3), the SED considers “the extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions” by using the 10,000 MT of CO₂e per year numeric threshold to evaluate whether the GHG emissions listed in Table 14-15 would be consistent with the AB 32 reduction goal of 1990 levels by the year 2020. The 10,000 MT CO₂e per year threshold was developed for emissions generated by a single stationary source project, and is therefore a conservative threshold for the emissions at issue here, comprising numerous individual emissions sources. Stated another way, the analysis adds emissions from multiple sources and compares the total emissions to a threshold that was established to evaluate emissions from just a single source.

As discussed in Section 14.3.2, *State (Regulatory Background)*, Senate Bill (SB) 32 (now Health & Safety Code section 38566) requires a reduction in California GHG emissions to 40 percent below 1990 levels by 2030. Executive Order S-3-05 sets forth a long-range goal of 80 percent below 1990 levels by 2050. Neither the State nor any local air district has proposed or adopted quantitative thresholds for evaluating project-level emissions beyond 2020. Accordingly, there are no applicable published numeric thresholds for assessing compliance with the State’s 2030 and 2050 long-term GHG reduction targets. Similarly, while the State Water Board has adopted Resolution No. 2017-002 as a comprehensive response to climate change, there are no concrete implementation measures or a specifically applicable reduction plan for achieving the 2050 goal articulated by Executive Order S-3-05.

The 2030 and 2050 targets are part of the regulatory setting and are relevant to the GHG context under which the plan amendments would be implemented. However, the California Supreme Court has explained that, absent concrete implementation measures or specific reduction targets for achieving a long-term GHG reduction goal, an agency is not required to adopt that long-term goal as a threshold of significance. (See *SANDAG, supra*, 3 Cal.5th at p. 517 [in its EIR, SANDAG used 2020 and 2035 goals reduction targets for cars and light trucks but did not perform a 2050 comparison because no targets existed for 2050].)

Air districts will likely develop 2030 thresholds based on the California Air Resources Board's (ARB) Scoping Plan, *California's 2017 Climate Change Scoping Plan* (2017 Scoping Plan), which was updated in November 2017 to describe how the 2030 reduction goal would be met by the State. Potential 2030 GHG thresholds derived from the updated 2017 Scoping Plan would presumably be lower than current GHG thresholds, as current GHG thresholds are based on meeting the AB 32 reduction goal of 1990 levels by 2020. SB 32 is even more stringent because it requires a reduction in California GHG emissions to 40 percent below the 1990 levels by 2030. For example, if one assumes that, to meet the 2050 target, 100 percent of discretionary projects should be required to consider mitigation, and then interpolates between BAAQMD's 95 percent capture in 2020 and 100 percent capture in 2050, the resultant capture rate for 2030 would be 97 percent. As such, the 10,000 MT of CO₂e per year threshold would be lowered to capture the deeper reductions needed to meet the State's long-term GHG goals. More stringent GHG thresholds are recognized in the 2017 Scoping Plan, which states:

...achieving no net additional increase in GHG emissions, resulting in no contribution to GHG impacts, is an appropriate overall objective for new development." However, the plan does acknowledge that "achieving net zero increases in GHG emissions, resulting in no contribution to GHG impacts, may not be feasible or appropriate for every project" and that "the inability of a project to mitigate its GHG emissions to net zero does not imply the project results in a substantial contribution to the cumulatively significant environmental impact of climate change under CEQA.

Notwithstanding the speculative nature of predicting and quantifying indirect GHG emissions over several decades, if LSJR Alternatives 3 and 4 were to continue to result in 16,948 and 62,984 MT of CO₂e per year, and it is assumed that the 10,000 MT of CO₂e per year threshold would need to be lowered to address future objectives, then these potential indirect GHG emissions would likely continue to have a significant and unavoidable impact, measured against the long-term (2030 and 2050) GHG reduction goals. In other words, there would be no change in the impact determination for 2020 versus the impact determination for 2030 and 2050.

Concluding that indirect GHG emissions would be significant and unavoidable is a conservative impact determination because it does not account for potential future emission reductions measures that might significantly reduce indirect emissions resulting from the LSJR alternatives, as discussed under *Direct and Indirect Impacts*. Further, the significant and unavoidable conclusion does not account for measures in the AB 32 Scoping Plan and the 2017 Scoping Plan, such as the cap-and-trade program, which will facilitate the State's achievement of their 2020 and 2030 GHG reduction goals. The cap-and-trade program sets GHG limits on sources responsible for approximately 85 percent of California's GHG emissions. Under the program, GHG-emitting sources covered by the program must either purchase allowances (i.e., emission permits) issued by ARB for any GHG emissions that exceed their designated cap, or they must directly reduce their emissions to levels below their designated cap.

Governor Brown signed into law AB 398 to extend the California cap-and-trade program through December 31, 2030, and to ensure compliance with SB 32 targets. Fossil-fueled electric-generating facilities that increase production to replace lost hydropower or accommodate increased groundwater pumps would be required to reduce their emissions to levels below the designated cap or purchase emissions allowances for any increase in emissions above their designated cap. AB 398 may thus ensure that indirect emissions associated with the plan amendments would not conflict with the State's 2030 GHG reduction goal of reducing statewide emissions by 40 percent below 1990 levels. While not legislatively extended to 2050, the cap-and-trade regulations, as amended by

AB 398, include an approach for setting the annual cap through 2050, indicating that cap-and-trade is likely to continue as part of the state’s long-term strategy to addressing GHG emissions.

Commenters indicated that the ARB’s “recent” 2008 efforts to establish GHG significance thresholds for CEQA, as well as the requirement that the SED use Executive Order S-3-05 to evaluate GHG emissions, was not addressed, included, evaluated, considered, or otherwise acknowledged in the SED. Please refer to the previous information for a discussion of the numeric (i.e., quantitative) thresholds appropriately identified and used to evaluate GHG impacts associated with the proposed amendments in the SED. With respect to ARB’s efforts to establish a GHG significance threshold under CEQA, ARB has not actively pursued this process since 2008, and any work done on this matter by ARB is outdated.

Mitigation Measures

Commenters asserted that the SED fails to identify or discuss the feasibility of mitigation measures. As impacts from potential indirect GHG emissions associated with LSJR Alternatives 3 and 4, with or without adaptive implementation, were found to be significant and unavoidable, Chapter 14, *Energy and Greenhouse Gases*, identifies and considers potential mitigation designed to reduce the severity of GHG emission impacts, based on a review of GHG mitigation measure guidance documents. These measures are identified in Section 14.4.3, *Impacts and Mitigation Measures*, under Impact EG-3. However, none of these measures is feasible.

Once a significant effect has been identified, the EIR must propose and describe mitigation measures that will minimize the significant environmental effects that the EIR has identified. (Pub. Res. Code, § 21100, subd. (b)(3); Cal. Code Regs., tit. 14, § 15126, subd. (e).) Mitigation measures must be feasible and enforceable. (Cal. Code Regs., tit. 14., § 15126.4, subds. (a)(1) & (a)(2).) “Feasible” means “capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors.” (Pub. Res. Code, § 21061.1.) “CEQA does not require analysis of every imaginable alternative or mitigation measure; its concern is with feasible means of reducing environmental effects.” [Citation and italics omitted.] (*Concerned Citizens of South Central L.A. v. Los Angeles Unified School Dist.* (1994) 24 Cal.App.4th 826, 841.)

The SED explains that multiple relevant GHG mitigation measure guidance documents were reviewed to determine if any measures could be identified and proposed to reduce indirect GHG emission impacts resulting from the LSJR alternatives (Section 14.4.3, *Impacts and Mitigation Measures* [citing ARB’s Scoping Plan, DWR’s Draft Climate Action Plan, the Office of the Attorney General’s (OAG) list of proposed project-level GHG mitigation measures, and others]). Seventeen mitigation measures are consequently listed in the SED, taken from documents reviewed, as example measures relating relevantly to water system energy efficiency, water use efficiency, and environmental restoration to improve carbon sequestration (*Ibid.*) Some are mitigation measures that local agencies and governments should impose, such as “improving irrigation efficiency” (SED Section 14.4.3, *Impacts and Mitigation Measures, LSJR Alternative 3 (Significant and unavoidable/Significant and unavoidable with adaptive implementation)*). None of the 17 mitigation measures identified in Chapter 14 as potentially reducing indirect GHG emissions is feasible. For example, the SED concludes that “quantification of the effects of applying irrigation efficiency measures would be speculative,” and “[e]ven with well-implemented irrigation efficiency measures,

GHG emissions are not expected to be reduced to less-than-significant levels” (Section 14.4.3). Further, because the GHG emission impacts to be mitigated are indirect in nature, it is speculative and infeasible to determine now whether any measures imposed by the State Water Board in a subsequent implementation proceeding would reduce GHG emission impacts to below significant levels, or to develop specific performance criteria for potential later-imposed mitigation measures. None of the 33 mitigation measures listed in OPR’s June 2008 Technical Advisory on CEQA and Climate Change, referenced by one commenter, is applicable to the LSJR alternatives, or to water system energy efficiency, or water use efficiency and conservation, more broadly, and thus none of these measures was included on the SED’s list of mitigation measures in Chapter 14.

Additionally, the State Water Board lacks authority to impose many potential GHG reducing mitigation measures because the identified GHG-emitting and generating activities would be indirect effects of the LSJR alternatives and would not be under the Board’s control now or later. Many of the potentially applicable mitigation measures would fall on local agencies and governments—not the State Water Board—to impose because project-related GHG emission impacts would be the result of indirect activity over which the State Water Board has no control: e.g., machinery used for groundwater pumping, energy generation, and irrigation practices. The SED concludes that:

It is infeasible for the State Water Board to impose mitigation measures at this time because it is undertaking a programmatic analysis . . . and does not now have specific facts associated with an individual project to legally and technically apply the above mitigation measures (Section 14.4.3).

The State Water Board will consider and impose mitigation measures where legally supportable in future project-specific proceedings. The State Water Board also notes that it may impose water conservation or efficiency requirements through the adoption of regulation, but such rule-making proceedings are infeasible currently due to resource constraints. (*Ibid.*)

References Cited

Printed References

- Bay Area Air Quality Management District (BAAQMD). 2017. *California Environmental Quality Act Air Quality Guidelines*. May. Available: http://www.baaqmd.gov/~media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en. Accessed: April 26, 2018.
- California Air Resources Board (ARB). 2017. *The 2017 Climate Change Scoping Plan Update: The Proposed Strategy for Achieving California’s 2030 Greenhouse Gas Target*. January 20. Available: https://www.arb.ca.gov/cc/scopingplan/2030sp_pp_final.pdf. Accessed: June 29, 2018.
- San Joaquin Valley Air Pollution Control District (SJVAPCD). 2009. *Final Staff Report Addressing Greenhouse Gas Emissions Impacts under the California Environmental Quality Act*. December 17. Available: <http://www.valleyair.org/programs/CCAP/12-17-09/1%20CCAP%20-%20FINAL%20CEQA%20GHG%20Staff%20Report%20-%20Dec%2017%202009.pdf>. Accessed: April 26, 2018.